

Our portfolio.
Sensors, instruments and accessories

reinhausen.com

Sensors, instruments and accessories

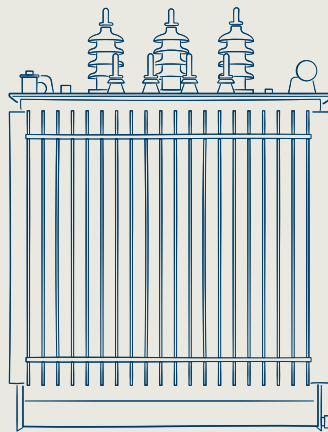
50 % of the electricity produced worldwide is regulated with products from Reinhausen. We enable energy producers, transformer manufacturers as well as public and industrial grid operators to guarantee a safe, economical and resilient power supply. Beyond proven on-load tap-changers and de-energized tap-changers, our portfolio covers products and system solutions for distribution and power transformers – look out for design-optimized instruments, intelligent sensors and monitoring solutions with the product brands CEDASPE®, MESSKO® and MSENSE®.

For distribution transformers



Protection

Instruments for protection include pressure relief devices and gas relays. These devices ensure that distribution transformers can operate under safe conditions.



Fittings/Breathers

Dehydrating breathers – also for distribution transformers – are available in our product portfolio.



Indication

Indicators, e.g. for oil level and temperature, show the current values of your transformer.



Insulation

Our bushings are the perfect solution for insulating your transformer – thanks to the high level of application fit and easy handling.

For power transformers



ETOS®

Modular scope of function and the ability to expand to individual needs. Smart monitoring and control as the basis for networked transformers.



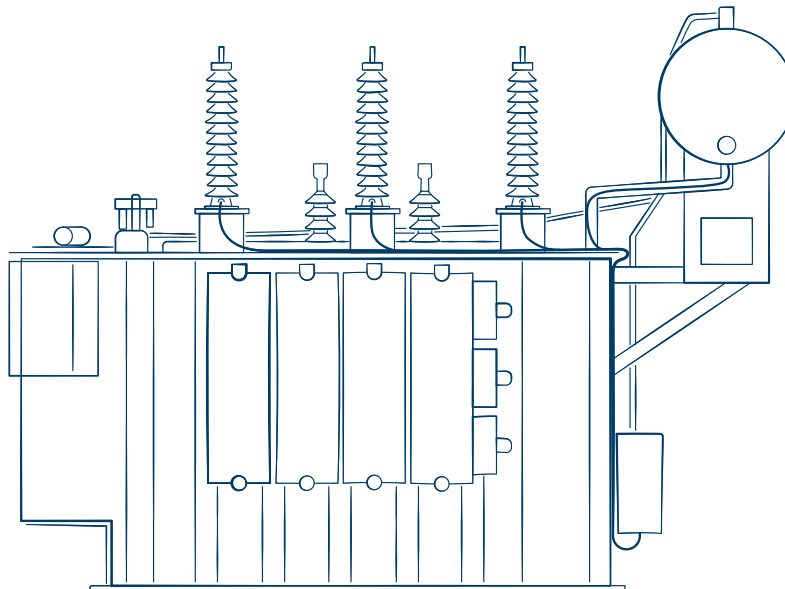
Protection

Protective devices are a must for every transformer. Our product portfolio is convincing due to both its quality and its price-performance ratio.



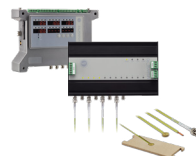
Fittings/Breathers

In addition to conventional or maintenance-free dehydrating breathers, our portfolio also includes other tank accessories, e.g. butterfly valves as well as various terminal boxes.



Indication

Thermometer, oil level indicators, flow indicators, and other accessories to indicate the operating status of your transformer – our products offer a wide range of analog and digital monitoring devices for every type of transformer.



Sensors

With its intelligent sensors, MR offers the best and most practical monitoring of transformers. They ensure permanent and efficient operation, process the physical and chemical measured variables, make this data available and provide recommendations for action.

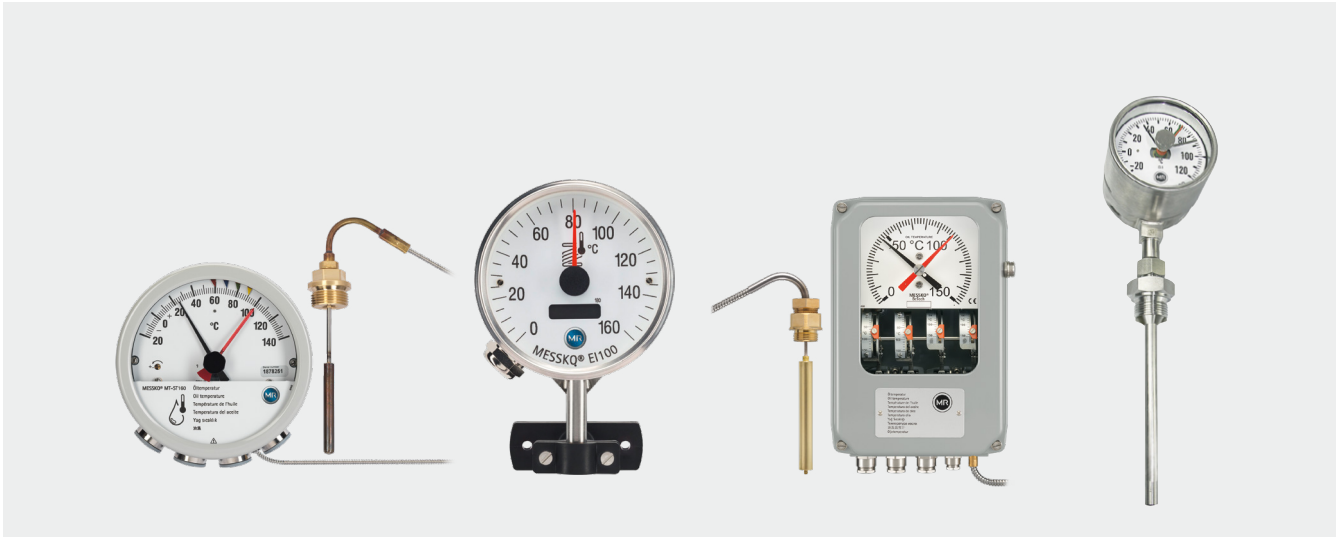


Insulation

Our bushings are the perfect solution for insulating your transformer – thanks to the high level of application fit and easy handling. Standardized design up to 52 kV and many years of production expertise provide the best price-performance ratio on the market.

Temperature indicators

Oil and winding thermometers with expansion bellows and Bourdon technology as well as bimetal technology.



Continually monitoring temperature is one of the most important tasks for ensuring the functionality, reliability and operational readiness of a transformer. Three generic thermometer technologies – the Bourdon tube measuring system, the bellow type technology and the bimetallic technology – have developed over the decades and are widely used today. MR customers can obtain all of these three proven technologies from one source.



MESSKO® COMPACT

- Bourdon tube measuring system
- Extremely durable and reliable
- Safe function even under extreme conditions



CEDASPE® VT

- Small thermometer, highly reliable and accurate
- BTS – quick delivery on standard variants
- Versions with capillaries or for direct mounting available



Indication

→ [More information](#)

Oil level indicators

Oil level indicators and accessories

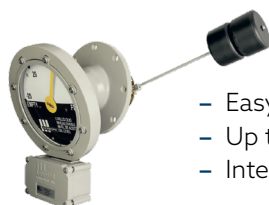


With our oil level indicators, the oil level in transformers can be reliably controlled and measured. They are suited for various applications and particularly stand out for their long service life. Our oil level monitoring range is completed by suitable functional accessories.



MESSKO® MTO

- Separation of sensor and display, element with magnetic coupling
- Optional installation with angle of inclination (15°, 30°, 45°)
- Laminated composite safety glass with UV filter



CEDASPE® IFG

- Easy to read (inclined mounting)
- Up to 4 changeover switches
- Interchangeable with equivalent models of other brands

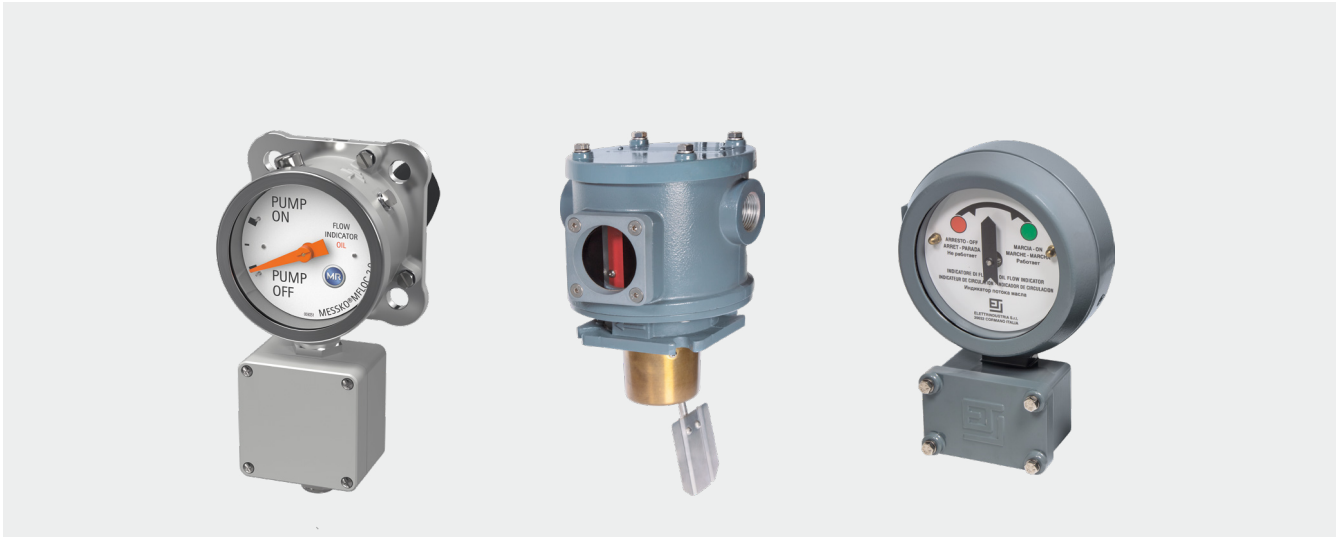
→ [More information](#)



Indication

Oil flow indicators

Solutions for measuring and monitoring your most critical transformer elements



Various oil flow indicators and other accessories to indicate the operating status of the transformer cooling circuit – our product series offer a broad selection of analog and digital monitoring devices for every type of transformer and various application possibilities.

MESSKO® MFLOC 2.0®

- State-of-the-art paddle design and material
- Reworked internal architecture
- Optimized venting



CEDASPE® CCL

- Variants for oil or water available
- Compact design
- Pipe diameter: DN 50 up to DN 300

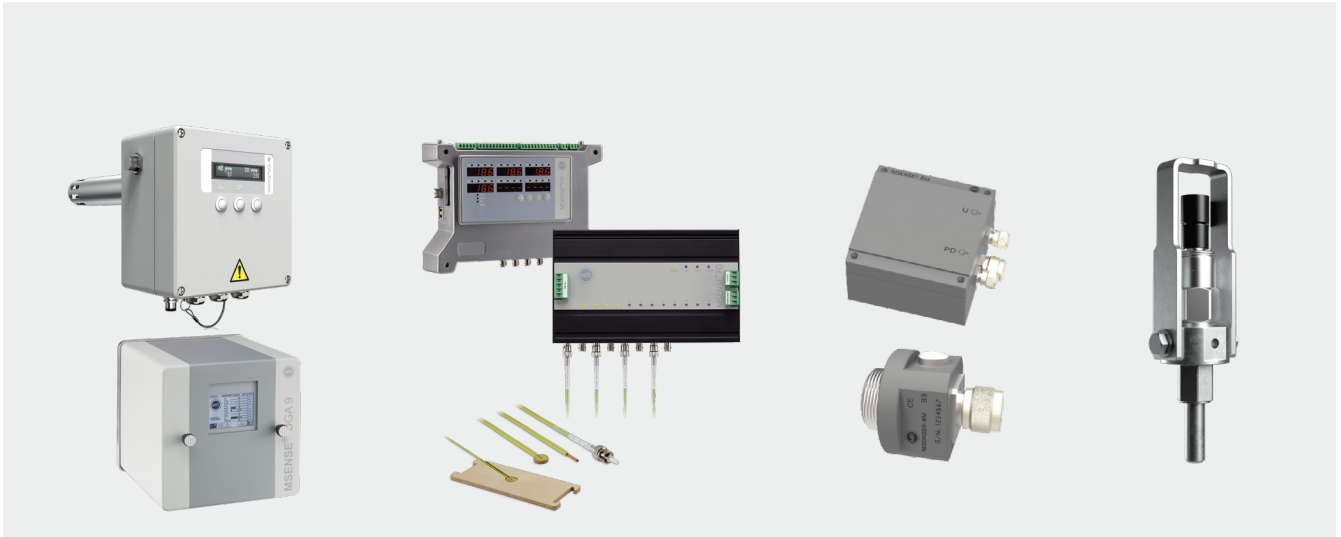


Indication

→ [More information](#)

DGA & intelligent sensors

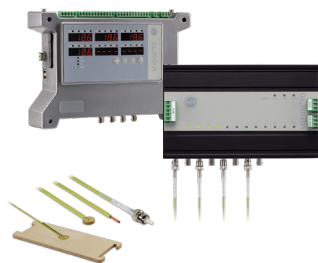
Enter a new dimension of reliability!



Long-term reliability and cost-efficient operation of a system even in the limit range – the intelligent sensors by MR offer the best and most practical monitoring of transformers. The field devices provide solutions for all aspects of the power transformer system. They ensure permanent and efficient operation, process the physical and chemical measured variables, make this data available and provide recommendations for action.

MSENSE® DGA

- Precise monitoring of the primary leading indicators
- Optional fault classification of thermal and electrical faults by detection of CxHy
- Maintenance-free



MSENSE® FO

- Continuous, real-time recording of the winding temperature
- Early detection of potential hotspots, enabling service-life management
- Effective overload management in combination with ETOS®

→ [More information](#)



Sensors

Pressure relief devices

Pressure relief devices in various sizes (1"–6")



Short circuits are a frequent reason for failures and problems in transformers. They can cause massive overpressure development in the tank and in the tap changer of the transformer. Pressure relief devices protect medium and large distribution transformers, electric coils, power transformers and tap changers in case of sudden pressure increases in the oil system – reliably and safely.



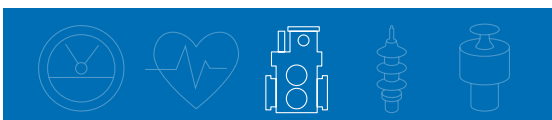
MESKO® MPREC®

- Hood with interior micro-switches
- Opens within 2 ms; closes within 70 ms
- Suitable for wind turbines



CEDASPE® VP150-QT/VP150-ST

- Works automatically based on valve setting
- Electrical switches: from 1 up to 2 (2 contacts each)
- Features compression spring(s) outside



Protection

→ [More information](#)

Buchholz relays

Buchholz relays, gas sampling devices and shutter valves in accordance with various standards



Our Buchholz relays are characterized by a rugged design based on our over 100 years of experience in measuring, control and safety technology. The Buchholz relay takes over the function of a central protective device for liquid-filled transformers and reactors with an expansion tank. Installed in the pipeline between the tank and expansion tank, it responds to errors that occur inside the transformer being protected. Damage can be detected at an early stage by the Buchholz relay, thus preventing possible damage.



MESSKO® MSAFE®

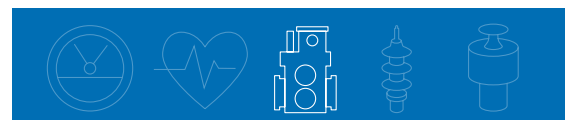
- Long service life thanks to high-quality materials
- High operating safety due to helium leak test for oil and gas tightness
- Protective magnetic switches to prevent false triggering



CEDASPE® EB

- BTS – quick delivery of selected variants
- Wiring diagram from 2 up to 6 contacts
- Large inspection window

→ [More information](#)



Protection

Bushings

The most reliable solution to insulate your transformer



Our bushings are the perfect solution for insulating your transformer, thanks to the high level of application fit and easy handling. Standardized design up to 52 kV and production expertise developed over many years represent the best value-for-price guarantee in the market. To meet specific customer requirements, we can offer a variety of suitable options.



CEDASPE® 1kV Series and LV Series

- Standardized design
- Optimal tightening solution
- Best value-price



CEDASPE® SBC

- Maintenance free and self cleaning
- Fully interchangeable with DIN/EN standard bushings
- Easy and fast installation



Insulation

→ [More information](#)

Dehydrating breathers & fittings

Let the energy "pass through"



Our fittings offer our customers reliable and indispensable products to keep the transformer running optimally. We not only provide maintenance-free, intelligent or conventional breathers for different applications from distribution to power transformers, but also other tank accessories such as isolation and radiator valves as well as various terminal boxes.

MESSKO® MTRAB® 2.5

- Reduces operating costs and increases operational reliability
- Actively protects the insulation medium against humidity
- Condition-dependent and self-learning algorithm



CEDASPE® VE

- Single body design with hydraulic inlet valve
- Interchangeable with DIN series breathers
- Multiple options in different sizes

→ [More information](#)



Fittings

Temperature indicators

Product name	MESSKO® COMPACT	MESSKO® TRASY	MESSKO® BETECH®	CEDASPE® VT	CEDASPE® TESS	CEDASPE® BM
Version	WTI / OTI	WTI / OTI	WTI / OTI	OTI	OTI	OTI
Interfaces	4...20 mA, Modbus RTU	only with ext. Transmitter	4...20 mA / PT100/0...5V	-	-	-
Measuring range	0°C...+160°C / -20°C...+140°C	0°C...+160°C / -20°C...+140°C	0°C...+150°C	-20°C...+120°C	-20°C...+120°C	0...+120°C
Measuring accuracy	class 1	class 1	class 1	class 1	class 2	class 2
Number of switches	6	6	6	2	2	-
Protection degree	IP55	IP55	IP55 / IP65	IP65 / IP66	IP55	IP55
Probe connection	1/2" - 1"	-	3/4" - 1"	1"	1/2" - 1"	1/2" - 1"
Corrosion Class	C4H / CX*	C4H / CX*	C4H / CX*	-	-	-

Oil level indicators

Product name	MESSKO® MTO	MESSKO® MMK	CEDASPE® IFG	CEDASPE® NFG	CEDASPE® IMLO R100	CEDASPE® PRIS OLG
Version	Radial / Axial	-	Radial / Axial	Radial / Axial	Radial	Direct mount
Dial Diameter	160 mm	-	150 mm	100/150/200 mm	100 mm	-
Interfaces	4..20 mA, Modbus RTU	4...20 mA	-	-	-	-
Electrical connection	Terminal box	4...20 mA with terminal box	Terminal box	Terminal Box	Terminal Box	-
Mounting flange	Std. / ANSI	-	-	-	-	-
Number of switches	0 - 3 / 7* (with TT-Box)	depending on length	0 - 4	0 - 4	0 - 2	-
Protection degree	IP55	IP67 with limit switch	IP65	IP65	IP65	-
Float design	1 - 4	-	1	1	1	-
Corrosion class	C4H / CX*	-	C4H	C4H	C4H	-

Oil flow indicators

Product name	MESSKO® MFLOC®	CEDASPE® CCL	CEDASPE® SCFR
Version	Side mount	Top mount	Side mount
Pipe diameter	DN100 - DN300	DN50 - DN300	DN80 - DN400
Flow speed	0,7 m/s - 2,5 m/s	0,3 m/s - 5 m/s	0,5 m/s - 3 m/s
Electrical connection	MIL plug, terminal box, ANSI plug	Cable gland	Terminal box
No. of switches	2	0 - 2	0 - 2
Medium	Water / Oil / alternative insulating liquids	Water / Oil	Water / Oil
Protection degree	IP54	IP65 / IP67	IP65 / IP67
Corrosion class	C4H / CX*	C4H	C4H

* optional

Dissolved gas analysis sensors (DGA)

Product name	MSENSE® DGA 9	MSENSE® DGA 5	MSENSE® DGA 3	MSENSE® DGA 2
Version	H ₂ O, H ₂ , CO, CH ₄ , CO ₂ C ₂ H ₂ , C ₂ H ₄ , C ₂ H ₆ , O ₂	H ₂ O, H ₂ , CO, C ₂ H ₂ , C ₂ H ₄ ,	H ₂ O, H ₂ , CO	H ₂ , CO
Display	yes	yes	yes / no	yes / no
Measuring tube length	-	-	285 mm / 507 mm	285 mm / 507 mm
Electrical connection	Cable gland	Cable gland	3x M20 x 1,5 / 3x 1/2 NPT	3x M20 x 1,5 / 3x 1/2 NPT
Outputs	9 x 4...20 mA 9 x switches	5 x 4...20 mA 5 x switches	3 x 4...20 mA 3 x switches	2 x 4...20 mA 2 x switches
Interfaces	Modbus RTU RS485, Modbus TCP RJ45*, DNP3* & IEC61850*	Modbus RTU RS485, Modbus TCP RJ45*, DNP3* & IEC61850*	Modbus RTU RS485, Modbus TCP*, DNP3* & IEC61850*	Modbus RTU RS485, Modbus TCP*, DNP3* & IEC61850*
Protection degree	IP55	IP55	IP66	IP66
Corrosion class	C4H	C4H	C4H / CX	C4H / CX
Application	Fault Classification (Rogers, Duval)	Fault analysis	Trend analysis	Trend analysis
Accuracy	H ₂ ± 15 %, CmHn/COy ± 20 %, H ₂ O ± 3 %	H ₂ ± 15 %, CmHn/COy ± 20 %, H ₂ O ± 3 %	H ₂ ± 10 %, CO ± 15 %, H ₂ O ± 2 % RH	H ₂ ± 10 %, H ₂ O ± 2 % RH

Intelligent sensors

Product name	MSENSE® FO	MSENSE® BM	MSENSE® VAM	MESSKO® MLOG®
Product description	Fiberoptic online temperature monitoring	Transformer bushing monitoring system	Vibroacoustic measurement for all types and brands of OLTCs	Transport monitoring indoors and outdoors
Technical Data	Measuring range: -80°C to +200°C	Calculation of main capacitance (C1) and dissipation factor (tan δ) change (optional. Partial discharge signal decoupling)	Recording of vibrations during the switching	Recording of vibrations, ambient temperature and humidity during transportation
Measuring system	Hot-spot winding temperature measurement	Precise voltage measurement taken at the potential or test tap of the bushing and reference voltage transformer (VT)	Self-learning algorithm with gradual narrowing of the limit values	3-axis accelerometer
Accuracy	Accuracy: ± 1°C	$\Delta \tan \delta = \pm 0,01 \%$ $\Delta C = \pm 0,04 \%$ (calculated according to GUM ISO/IEC Guide°98)	Multiple values	± 0,16 g
Interfaces	Integration into ETOS® IEC 61850*, DNP 3.0* and Modbus TCP*	Integration into ETOS® IEC 61850*, DNP 3.0* and Modbus TCP*	Integration into ETOS® IEC 61850*, DNP 3.0* and Modbus TCP*	USB
Protection degree	IP65	IP66 (offshore option)	-	IP65

* optional

Pressure relief devices



Product name	MESSKO® MPREC®	CEDASPE® VP	CEDASPE® VP150	CEDASPE® VST2	CEDASPE® R1/R2
Version	Std. / OD	Std. / OD	OD	OD	Std.
Operating pressure	4 psi - 30 psi	4,3 psi - 22 psi	4,3 psi - 22 psi	5 psi - 10 psi	2 psi - 10 psi
Electrical connection	ANSI / Terminal box / Cable gland	Terminal box	Terminal box	Terminal box	-
Number of switches	1 - 2	1 - 3	1 - 2	1 - 2	-
Protection degree	IP66	IP65 / IP67	IP65 / IP67	IP65	IP65
Flange opening	Ø 170 mm	Ø 60 - 150 mm	Ø 160 mm	Ø 88 mm	1" / 2"
Corrosion Class	C4H / CX*	C4H	C4H	C4H	-

Buchholz relays



Product name	MESSKO® MSAFE®	RR SERIES	GQ SERIES	CEDASPE® ET	CEDASPE® EB
Version	2 Float	2 Float	2 Float	2 Float	2 Float
Flange	DN25 - DN80	DN25 - DN100	DN25 - DN100	DN25 - DN100	DN25 - DN80
Flow rate	1 ms - 3 ms	0,5 ms - 3 ms	0,5 ms - 3 ms	0,65 ms - 2 ms	0,65 ms - 2 ms
Electrical connection / No. and type of cable glands	M25 x 1,5 / 1/2-14 NPT	M25 / M20	M25 / M20	M25 / M20	M25 / M20
Number of switches	2 - 4 CO / 2 - 4 NO	2 - 6 NO / 2 - 4 CO	2 - 6 NO / 2 - 4 CO	2 - 6 NO / 2 - 4 CO	2 - 6 NO / 2 - 4 CO
Protection degree	IP66**	IP55	IP55 / IP65	IP65	IP65
Reset function	yes	yes	yes	-	-
Corrosion Class	C4H / CX*	C4H / CX*	C4H / CX*	C4H	C4H

Bushings MV



Product name	CEDASPE® MV	CEDASPE® HC	CEDASPE® SBC	Cable Box Bushings	Condenser Cable Box
Max. rated voltage	12 - 52 kV	24 - 36 kV	12 - 52 kV	12 - 36 kV (Air: 24 kV)	36 kV - 52 kV
Max. rated current	250 - 3150 A	5000 - 12500 A	250 - 4500 A	250 - 4000 A (Air: 630 A)	250 A - 3300 A
Nominal creepage distance	290 - 1655 mm	440 - 1100 mm (1560 mm)	500 - 1690 mm	102 - 409 mm (Air 185 - 300 mm)	178 mm - 340 mm
Standard reference	EN 50180, EN 50243	EN 50243, DIN 42537	IEC 60137	EN 50336, IEC 60137	BS6435, IEC 60137
Insulating body material	Porcelain	Porcelain	Silicone Composite	Porcelain	Resin Bonded Paper

Bushings LV



Product name	CEDASPE® 1kV	CEDASPE® LV	BS Bushing	Monoblock
Max. rated voltage	1 kV	3 kV	1.1 - 52 kV	1.1 - 3.6 kV
Max. rated current	250 - 4500 A	250 - 6300 A	250 - 7500 A	1700 - 4000 A
Nominal creepage distance	60 - 150 mm	120 - 130 mm	89 - 1650 mm	64 - 148 mm
Standard reference	EN 50386	DIN 42539	IEC 60137 (EATS 35-1)	EN 50336, IEC 60137
Insulating body material	Porcelain	Porcelain	Porcelain	Cast resin

* optional

** standard from 04.2023

Protective relays and shutter valves

Product name	RS2001	CEDASPE® CPR3	CEDASPE® OC	CEDASPE® DAROC
Version	OLTC protection	Conservator protection	Distribution transformer protection	Conservator oil check
Flange	DN25	DN25	DN25	DN50 - DN100
Flow rate	0,65 - 4,8 m/s	-	-	>> 30 dm ³ /min
Electrical connection	M25 x 1,5	M25 x 1,5	M25 x 1,5	M25 x 1,5
Number of switches	1 - 2	1	2	1 - 3
Protection degree	IP66	IP65	IP65	IP65 / IP67
Application	OLTC oil loop	Rubber bag failure detection	Gas detection	Oil leakage protection
Corrosion class	C4H / CX*	C4H	C4H	C4H / CX*



Breathers

Product name	MESSKO® MTRAB® 2.5	CEDASPE® VE	CEDASPE® VC	CEDASPE® ETF	CEDASPE® E700	CEDASPE® TV
Version	Maintenance free DB100, DB200	Hydraulic valve	Mech. valve	2 sep. one-way valves	Hydraulic valve / Mech. valve	Hydraulic valve
Flange	DIN 42562, DIN 2558, 1/2" GF	DIN 42562, DN25/PN10, DN40/PN10	DIN 42562, DN25/PN10, 1/2" G	8-hole DIA12	1/2" G, 1"1/4 G, 1"1/2 G, 2" G	1/2" G
Silicagel capacity	1,1 - 4,4 kg	1 - 45 kg	0,35 - 45 kg	0,8 / 2,4 kg	0,18 - 13,7 kg	0,25 kg
Outputs	2 x 4...20 mA, 2 x CO switches	-	-	-	-	-
Interfaces	Modbus RTU RS485, NFC	-	-	-	-	-
Protection degree	IP66 / IP67	-	-	-	-	-
Ambient temperature	0...+70°C / -50...+70°C	-40°C...+100°C	-40°C...+100°C	-40°C...+100°C	-40°C...+100°C	-40°C...+100°C
Corrosion class	C4H / CX*	C4H	C4H	C4H	C4H	C4H



Fittings

Product name	CEDASPE® DN	CEDASPE® TW & SW	CEDASPE® TBX Series	CEDASPE® CGX Series
Version	Wafer type	Wafer type	-	-
Diameter	DN25 - DN400	DN80 - DN100	DN125	DN125
Flange connection holes	4 - 16	4	4 - 8	4
Corrosion class	C4H	C4H	C4H	C4H
Protection degree	-	-	IP65	IP65
Operating pressure	10 bar max.	10 bar max.	-	-
Shape	Round	Square	Square / Round	Round



* optional

Power and distribution transformer solutions – your benefits.

+ **Maximum safety and reliability**

MR components provide maximum safety of your most valuable assets. They detect errors and malfunctions very early, thus providing fewer operating costs, plannable maintenance and long service life.

+ **All products from one source**

You can obtain all sensors, instruments and accessories for your transformer directly from MR. Whether you operate power or distribution transformers, we offer suitable solutions for all applications, including renewables and offshore.

+ **Best and added value**

Whether you are looking for a standard product offering with proven best value or the highest quality, safety and reliability for more complex tasks – you will find exactly what you need within the MR portfolio.

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THE POWER BEHIND POWER.