VACUTAP® VV®-EX, VM®-EX AND VR®-EX

ON-LOAD TAP-CHANGER FOR EXPLOSION-PRONE SITES.

TRANSFORMER CONTROL

EXPLOSIVE ATMOSPHERES – EXPLOSION PREVENTION

MR is the first OLTC manufacturer to have its products certified in accordance with guideline 94/9/EG (ATEX) (comparable to IEC and NEC 505/500 in North America). This also applies to MR's own internal quality assurance system.

Effective immediately we deliver the VACUTAP® VV®-EX, VM®-EX and VR®-EX on-load tap-changers as well as the motor-drive ED, protective relay RS and drive shaft also in an Ex-protection version. It is used in explosion-prone locations such as oil rigs, the chemical industry, and transformers in closed areas.

Benefits of Reinhausen's Ex-protection concept

- Simple and easy Ex-certification of the entire transformer if Ex-certified products are used.
- All our Ex-certified products are delivered in a fully finished and ready-to-install condition.
- The ED-Ex motor-drive operates with compressed air. Therefore, no time consuming and labor intensive replacement of the nitrogen bottles during nitrogen flushing is required.
- Conforms completely with IEC, i.e. no operational restrictions when compared with non-Ex applications.

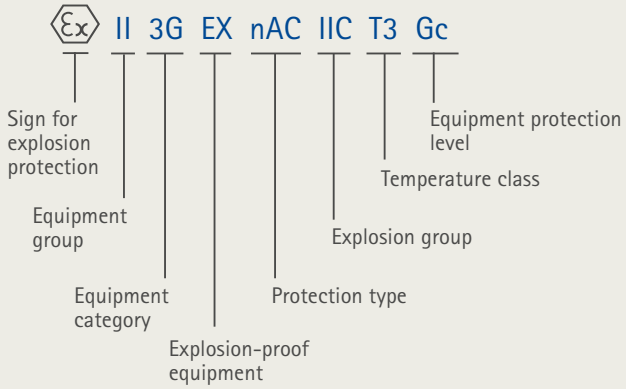
	Equipment category	Temperature class
VACUTAP® VV®-EX	3G	T3
VACUTAP® VM®-EX	3G	T3
VACUTAP® VR®-EX	3G	T3
Motor drive ED-EX	2G	T3/T4 (T4 with reservations)*
Protective relay RS 2001-EX	2G/3G	T4 (depending on protection type)
Drive shaft-EX	2G	T4

Our certified marks:

- OLTC: II 3G Ex nAC IIC T3 Gc
- ED: II 2G Ex px IIC T3 Gb
  II 2G Ex px IIC T4 Gb*
- RS: II 3G Ex nA nC IIC T4 Gc
  II 2G Ex ia IIC T4 Gb
- Drive shaft: II 2G IIC T4

* with limits on the switching frequency:
A pause of 10 hours must be made after 216 directly successive switching operations without interruption.

Example:



Motor Drive ED-EX

VACUTAP® VV®-EX

VACUTAP® VM®-EX

VACUTAP® VR®-EX

Conditions in potentially explosive area

Flammable materials	Temporary behavior of the flammable material in EX area	Division of the potentially explosive areas			Required identification of the usable resource as per CELENEC	
		CELENEC/IEC	US NEC 505	US NEC 500	Device group	Equipment category
Gases, fumes	Present continuously, over the long-term, or frequently	ZONE 0	Class I Zone 0	Class I Division 1	II	1G
	Occur occasionally	ZONE 1	Class 1 Zone 2		II	2G or 1G
	Probably will not occur, but if they do, then only rarely or briefly	ZONE 2	Class I Zone 2	Class I Division 2	II	3G or 2G or 1G
Dusts	Present continuously, over the long-term, or frequently	Zone 20	–	Class II Division 1	II	1D
	Occur occasionally	ZONE 21	–		II	2D or 1D
	Probably will not occur, due to swirling dust, but if they do, then only rarely or briefly	ZONE 22	– –	Class II Division 2	II	3D or 2D or 1D
Methane, dust	–	Mining	–	Mining	I	M1
		Mining		–	I	M2 or M1

Temperature classes and maximum surface temperature of the resources

Temperature class =>	T1	T2	T3	T4	T5	T6
Surface temperature =>	< 450 °C	< 300 °C	< 200 °C	< 135 °C	< 100 °C	< 85 °C
Ignition temperature =>	> 450 °C	450 °C to 300 °C	300 °C to 200 °C	200 °C to 135 °C	135 °C to 100 °C	100 °C to 85 °C

Reference: Transformer manufactured by France Transfo for TOTAL E & P off-shore oil production platform in DR CONGO

Three-phased transformer, "ONAN/ONAF" cooling type:

- breathing type with conservator
- with VACUTAP® VV®-Ex
- power: 16,000 kVA ONAN / 20,000 kVA ONAF
- voltages: 11,000 V / 31,970 V +/- 10 x 1.5 %
- total weight: 28,900 kg

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THE POWER BEHIND POWER.