



With ATEX and IECEx approval

# tecsis force transducers for hazardous areas.

ONE NAME. ALL SOLUTIONS.



# tecsis force transducers for explosion hazard zones.

## ATEX- and IECEx-approval: the safe solution.

Whether offshore or on land, gas or oil industry, mining or other dusty environments: The equipment and safety systems used in explosion hazardous areas must be certified and marked. This also applies to force transducers, since primary explosion protection is not always possible. With tecsis transducers you are on the safe side. Thanks to the approvals granted to us, we are able to furnish uninterrupted chains of evidence: from the materials used, through the manufacturing process. From inspection up to approval.

## Classification of hazardous areas and approvals for tecsis force transducers in hazardous zones according to ATEX and IECEx:

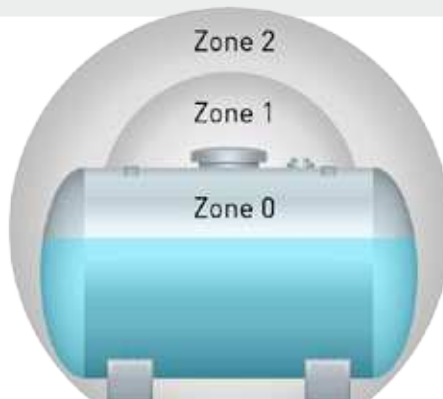
Zone	Gases			Dusts			Mining	
	0	1	2	20	21	22	M1	M2
ATEX (Europe)		✓	✓		Ⓞ	Ⓞ		✓
IECEx (international)		✓	✓		Ⓞ	Ⓞ		✓
FM (NEC 505-7) (USA)		✱	✱	—	—	—		
CSA (CEC 18-006) (Canada)		✱	✱	—	—	—		

✓ available    ✱ in progress    Ⓞ on request  
 — According to NEC and CEC not defined for North America

## Classification of hazardous areas in North America: gases as an example

Class 1: Gases, vapors, mist (the plant operator selects classification division or zone)	
NEC 505-5 / CEC J18-004: Classification of divisions	NEC 505-7 / CEC 18-006: Classification of zones
Division 1: An explosive atmosphere is present <b>continuously</b> or <b>occasionally</b> under normal operating conditions.	Zone 0: An explosive atmosphere is present <b>continuously</b> and over <b>long periods</b> .
	Zone 1: An explosive atmosphere is present <b>occasionally under</b> normal operating conditions. ✓
Division 2: An explosive atmosphere occurs <b>rarely</b> and <b>only for a short time under</b> normal operating conditions. ✱	Zone 2: An explosive atmosphere occurs <b>rarely</b> and <b>only for a short time under</b> normal operating conditions. ✓

This classification into zones, as an example, applies for storage tanks and analogously for tanker trucks or other hazardous zones. The zone classification is similar for combustible dusts [from 20-22]. The assessment of the risk for an explosion and zonal classification is to be carried out by the plant operator. The plant operator selects the accepted approval.



## tecsis: highest safety.

Systems and components from tecsis are in use worldwide: in all those places where the highest safety matters. Thanks to our high level of expertise in development, we are able to find optimal solutions – even in unusual applications and highly specialised fields. Amongst our customers are leading corporations as well as small businesses, which we support worldwide through local offices. If you want to meet high safety-related standards most reliably, then we are the right partner for you, too!

## Approvals required and zone classification by country and region

Country/Region	Required Approvals	Zone classification
Europe	ATEX 94/9/EG (Atmosphere Explosive)	According to ATEX (CENELEC) (European Committee for electro technical standardization) <b>Oil and gas:</b> 0 / 1 / 2 <b>Dust:</b> 20 / 21 / 22 ✓ <b>Equipment group I Mining:</b> Category M1 and M2
USA	FM (Can also be done by UL)	hazardous classified locations acc. to NEC 500 (or 505) (National Electrical Code) <b>For Gases Vapors Mist: Class I</b> Division 1 and 2 or Zone 0 / 1 / 2 (In 1996, the US introduced the IEC classification system additionally to the existing system for Class I. This change was made by Article 505 of the NEC, enabling users to select the optimal system from a technical and economic point of view. <b>For Dust: Class II</b> Division 1 and 2 <b>Fibers and threads: Class III</b> ✱ Division 1 and 2 (Division 1 demands are similar to Zone 0 bzw. 20)
Canada	CSA	✱ According to CEC J18 (as USA)
South Africa	IECEX	✓ According to IECEX (as Europe)
Australia New Zealand	IECEX	✓ According to IECEX (as Europe)
India	IECEX and FM accepted	✓ According to IECEX (as Europe)
China	NEPSI	on request
Russia	GOST R	GOST R 51330-99 Zone classification as IECEX Zone 0/1/2
South America Brazil	IECEX	✓ According to IECEX (as Europe)

## Suitable types of protection for tectis force transducers Typical product identification.

Zone	Types of protection		
	Ex i	Ex d	Ex m
0			
1	✓	✓	✓
2	✓	✓	✓

<b>Ex i</b>	II 2G Ex ib IIC T4 -25°C<Tamb<85°C
<b>Ex m</b>	II 2G Ex mb IIC T6 -40°C<Tamb<60°C

✓ available

„Ex i“ (Intrinsic safety)	„Ex d“ (flame proof enclosure) and „Ex m“ (encapsulation)
<ul style="list-style-type: none"> <li>+ Purely electronics-based type of protection: other protective measures are not necessary, similar on the housing</li> <li>+ Plug connections permitted: limited voltage and current values prevention spark formation</li> <li>+ Suitable for gas and dust zones</li> <li>+ Globally recognized and accepted ignition protection</li> <li>+ Suitable for all geometries</li> <li>- Operation permitted only with isolated supply units</li> </ul>	<ul style="list-style-type: none"> <li>+ Purely enclosure-based type of protection: no electronics-based protection necessary</li> <li>+ No power limitation</li> <li>+ No isolated supply unit necessary</li> <li>+ Suitable for gas and dust zones</li> <li>- Force transducers are part of the enclosure, so a separate approval is required for each geometry</li> <li>- Does not have the same status worldwide as „Ex i“</li> <li>- Plug connections are not permitted: no power limitation specified</li> <li>- Suitable only for specific geometries</li> </ul>

# Force transducers from tecsis: a wide range of uses.

## Deliverable worldwide: Force transducers for any application.

At tecsis you will find a comprehensive range of products. Our force transducers with thin-film technology or standard strain gauges are approved for use in hazardous zones.



F13C1 Compression transducers



F23CA Tension-/Compression transducers



F23C1 Tension-/Compression transducers F53C1 / F53C8 Load pin



## The persuasive product features:

- ATEX and international IECEx approval
- FM (USA) and CSA approval (Canada) in preparation for zones 1 and 2 according to NEC 505-7 and for division 2 (according to 505-5 (in Class 1 = gases))
- Nominal load from 1 kN up to 10,000 kN
- Integrated amplifier (Ex i = 4... 20 mA; Ex d = 4... 20 mA or 0... 10 V or CAN output)
- Depending on the version between -40°C und +100°C ambient temperature suitable
- For temperature classes up to T6 and Explosionsgroup IIC
- Suitable for zones 1 and 2 (optionally 0, 20, 21 and 22)
- With standard strain gauges or thin-film sensors for excellent long-term stability, reliable and precise force measurement – whilst taking up minimal space
- Can be supplied with different geometries

## tecsis – where safety counts.

tecsis Systems and components: Our products help you to achieve highest safety.



Please contact us: We will be happy to advise you. Visit us: [www.tecsis.de](http://www.tecsis.de)

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