

Operating Manual

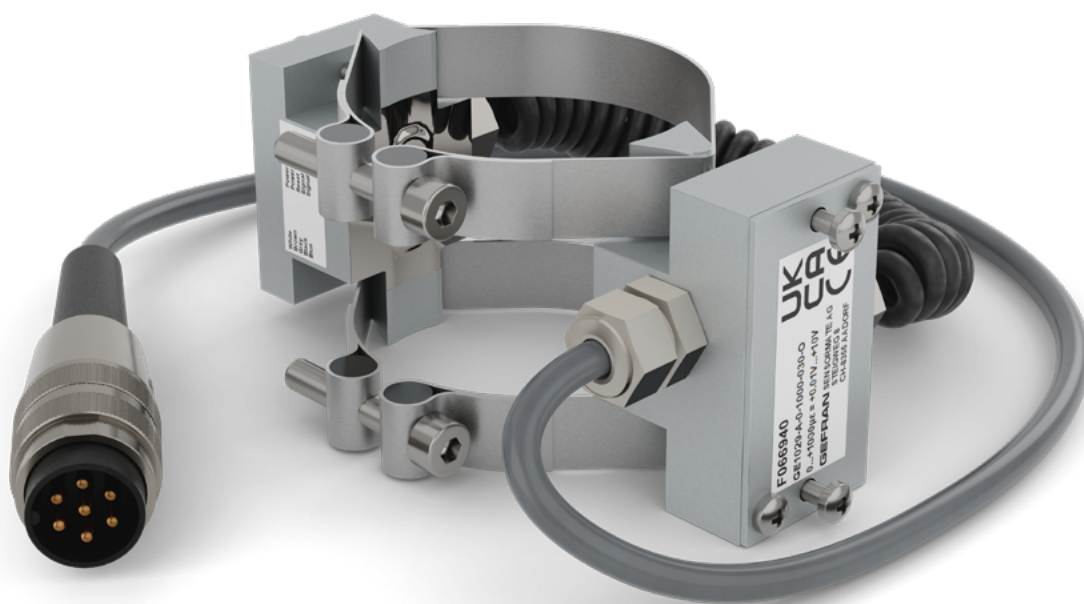


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PREFACE

Device data

Note the device serial number, order code and type, which are listed on the label, here:

Should you need technical assistance, they must be communicated to Gefran Customer Service.

Tie-Bar Strain Sensor With Amplifier	
Serial No.	
Order code	
Type	

Warnings and safety

Always make sure you have the latest manual version, that can be freely downloaded from the Gefran website (www.gefran.com).

The devices illustrated in the manual must be installed by qualified technicians, following the laws and regulations in effect and according to the instructions contained in this manual.

Installation and/or maintenance technicians must read this manual and strictly follow the instructions herein and found in the annexes since Gefran cannot be held liable for personal, property and/or product damages should the following conditions not be met.

Disposal



The Tie-Bar strain sensor with amplifier must be disposed of in accordance with applicable regulations.

Some of the components used in the devices can cause damage to the environment if incorrectly disposed.



Disclaimer

Although all information contained within this document has been carefully checked, Gefran S.p.A. cannot be held liable for the possible presence of errors, or damage to persons or property due to improper use of this manual.

Gefran S.p.A. also reserves the right to make changes to the content and form of this document as well as the characteristics of the illustrated devices at any time without prior notice.

The technical and performance data indicated in this manual are to be considered as a guide for the user to determine the suitability for a certain use, and are not guarantees. They may be the result of Gefran S.p.A. test conditions and the user must compare them to his/her real application requirements.

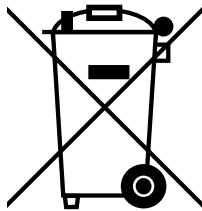
Gefran S.p.A. cannot be held in any way liable for any damage to persons or property resulting from IN Sensor and indicator tampering, incorrect and improper use or otherwise non compliant with controller features and instructions in this manual.

Copyright

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DE

„Umsetzung der Richtlinie 2012/19/EU über Elektro- und Elektronik-Altgeräte (EEA)“

Das Symbol der durchgekreuzten Mülltonne auf dem Gerät oder der Geräteverpackung weist darauf hin, dass Sie das Produkt am Ende seines Lebenszyklus separat entsorgen müssen.

Die Getrenntsammlung dieses Geräts an seinem Lebenszyklusende wird vom Hersteller organisiert und besorgt.

Der Nutzer, der das Gerät entsorgen möchte, muss sich daher an den Hersteller wenden, um Auskunft über seine Vorgehensweise zur Getrenntsammlung des Geräts an dessen Lebenszyklusende zu erhalten.

Die entsprechende Getrenntsammlung für die anschließende Zuführung des Altgeräts zum Recycling, zur Wiederaufbereitung und zur umweltverträglichen Entsorgung trägt dazu bei, negative Auswirkungen auf die Umwelt und die Gesundheit zu unterbinden und begünstigt die Wiederverwendung und/oder das Recycling von Werkstoffen, aus denen das Gerät besteht.

EN

“Implementation of Directive 2012/19/EU on waste electrical and electronic equipment (WEEE)”

The symbol showing a crossed-out wheeled bin on equipment or its packaging indicates that the product must be collected separately from other waste at the end of its useful life.

The manufacturer is responsible for organising and managing the separate collection of this piece of equipment at the end of its useful life. Users wishing to dispose of the equipment must therefore contact the manufacturer to obtain instructions from the same on how to have the equipment collected separately at the end of its useful life.

By collecting the disused equipment separately, it can be recycled, treated or disposed of in an environmentally friendly manner, thus helping to prevent the environment and public health from being affected negatively and enabling reuse and/or recycling of the materials forming the same equipment.

FR

“Transposition de la Directive 2012/19/UE relative aux déchets d’équipements électriques et électroniques (RAEE)”

Le pictogramme de la poubelle barrée, figurant sur l’équipement ou sur son emballage, indique que le produit en fin de vie doit être traité séparément des autres déchets.

Le ramassage sélectif de cet équipement en fin de vie est organisé et géré par le constructeur.

Tout utilisateur qui souhaiterait se débarrasser de l’équipement devra donc contacter le constructeur pour obtenir des informations concernant la méthode adoptée pour permettre le ramassage sélectif de l’équipement en fin de vie.

Un ramassage sélectif correct, en vue de l’acheminement de l’équipement vers des opérations de recyclage, de traitement et de mise au rebut respectueuses de l’environnement, contribue à réduire les impacts potentiellement néfastes sur l’environnement et la santé, outre à favoriser la réutilisation des matériaux/composants dont l’équipement est constitué.

IT

“Attuazione della direttiva 2012/19/UE sui rifiuti di apparecchiature elettriche ed elettroniche (RAEE)”

Il simbolo del cassonetto barrato riportato sull’apparecchiatura o sulla sua confezione indica che il prodotto alla fine della propria vita utile deve essere raccolto separatamente dagli altri rifiuti.

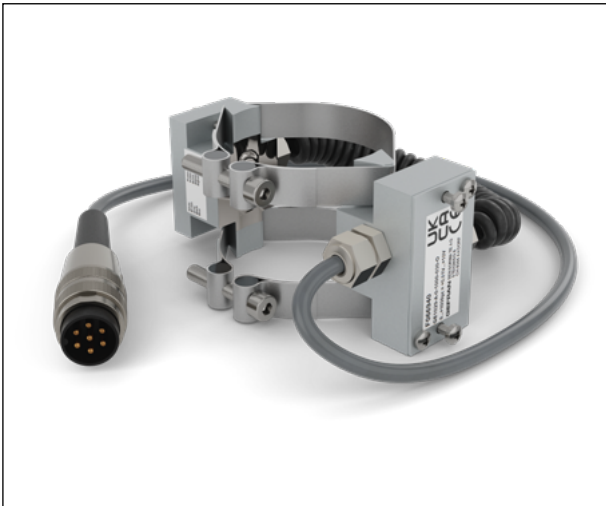
La raccolta differenziata della presente apparecchiatura giunta a fine vita è organizzata e gestita dal produttore.

L’utente che desidera disfarsi dell’apparecchiatura dovrà quindi contattare il produttore per ricevere indicazioni sul sistema da quest’ultimo adottato per consentire la raccolta separata dell’apparecchiatura giunta a fine vita.

L’adeguata raccolta differenziata per l’avvio successivo dell’apparecchiatura dismessa al riciclaggio, al trattamento e allo smaltimento ambientalmente compatibile contribuisce ad evitare possibili effetti negativi sull’ambiente e sulla salute e favorisce il reimpiego e/o riciclo dei materiali di cui è composta l’apparecchiatura.

1. GENERAL DESCRIPTION

1.1. GE1029-A



Main features:

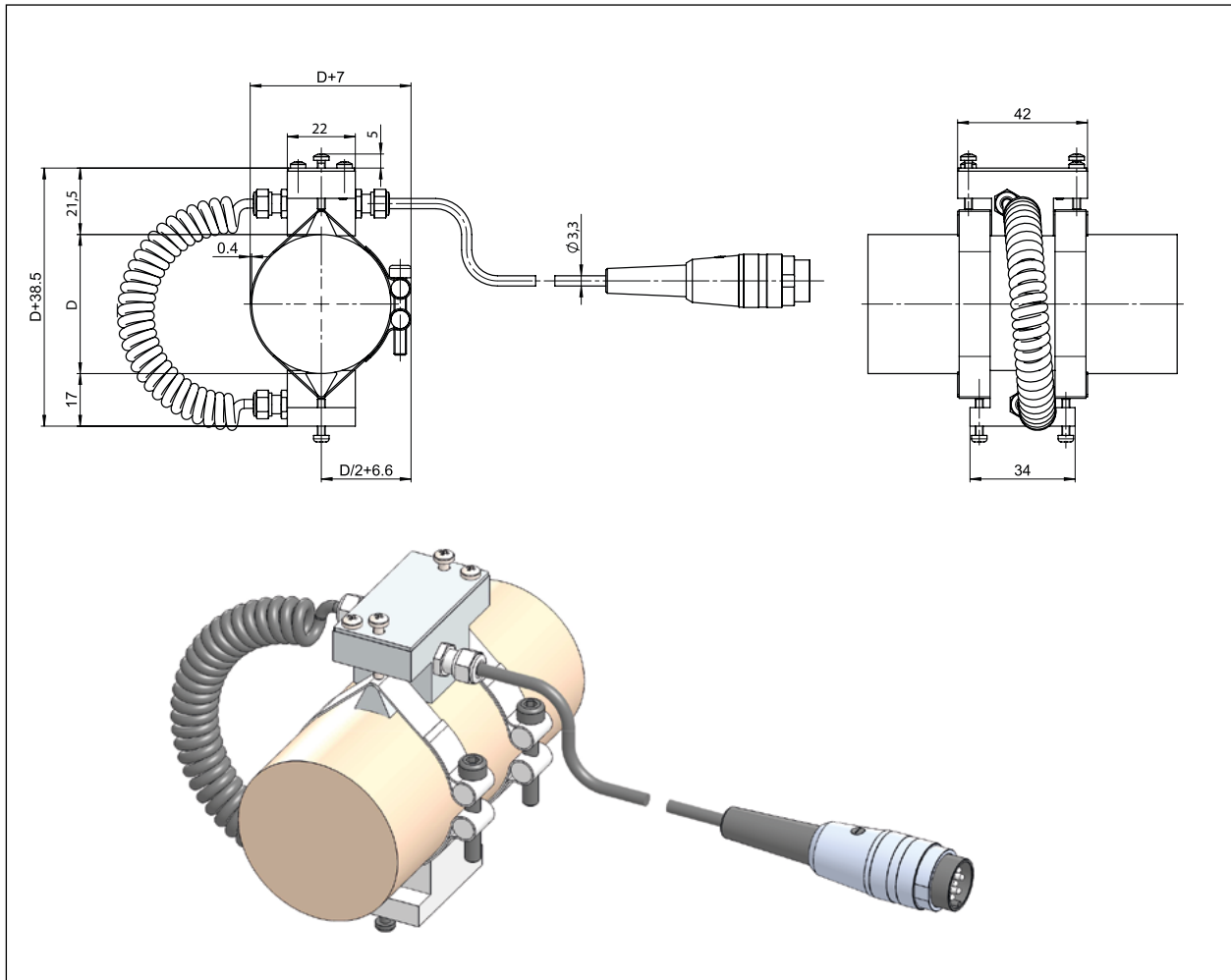
- Direct measurement of surface strain
- With integrated digital amplifier
- Quick and easy non-destructive assembly
- High accuracy and linearity in tension and pressure (like bonded strain gauges)
- Ideal for use on presses, injection-moulding and die-casting machines
- One system for many different tie bar diameters (25...250mm)
- Dynamic applications
- Ideal for online monitoring of clamping force
- Ideal for self-made load cells

1.2. Function

The strain gauge sensor GE1029-A measures the surface-strain directly at the mounting location in the same quality as bonded strain gauges. The integrated variable digital amplifier amplifies the signal on the spot, avoiding EMC problems. The sensor does not have to be recalibrated between remove and re-installation. The press-on technology, developed by Gefran Schweiz AG, presses the strain gauges under the stainless protective film so strongly against the surface to be measured that frictional contact occurs.

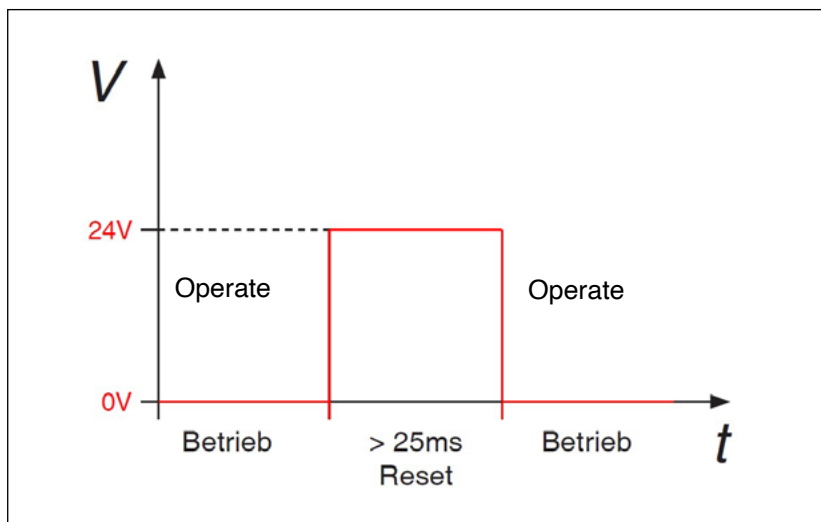
The sensor is mounted using stainless steel straps, is non-destructive, very fast and simple. For each tie-bar diameter outside tolerance of $\pm 2.5\text{mm}$ a different pair of steel straps is required. The sensor can not be overloaded. The GE1029-A sensors require a cyclic reset.

1.3. Dimension



Dimensions in mm

1.4. Reset Function



Reset control input	Reset	16...30V
	Operate	0V / open
Minimum reset pulse duration	>25ms	

2. MOUNTING AND INSTALLATION



Warning! The installation of the devices described in the manual must be carried out by qualified personnel, following the laws and regulations and in accordance with the instructions contained in this manual.



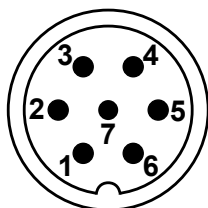
Warning! Use extreme caution when installing and fixing the sensor unit.
If the sensor unit is installed at a height of more than 1.8 meters, all persons near the moulding machine must wear the protective helmet.



Warning! If even one of the above-mentioned requirements is not met, suspend installation and contact your Gefran dealer or Gefran Customer Service.

2.1. Electrical connection

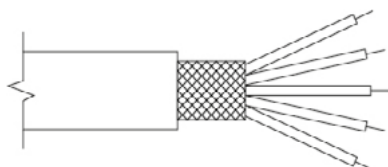
Option C



Option C with connector	Function
1	Power (20...28VDC)
2	n.c.
3	Power ground
4	Reset
5	Signal-Output
6	Signal ground
7	Power ground

Option O

PUR screened cable (standard); 5 x 0.09 mm²; Ø 3.3mm



Option O with open leads	Function
white	Power (20...28VDC)
braun	Power ground
grey	Reset
black	Signal-Output
blue	Signal ground

2.2. Mounting

These sensors are precision instruments. The devices must be handled with the appropriate care. These instructions must be read and understood by every user.

2.2.1. Preparation

- Oil and other surface impurities as well as paint must be removed from the place of installation.
- The surface roughness of the place of installation has not to be rougher than N7.
- Check the foil of the sensor GE1029-A for damage.
- The foil of the sensor GE1029-A must be absolutely clean.

2.2.2. Mounting procedure

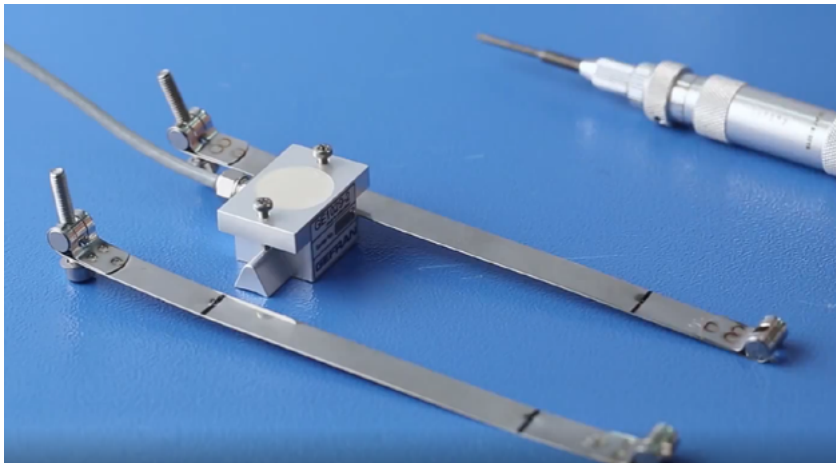


(In the following pictures of this chapter the sensor GE1029 is shown. In the mounting there is no difference to the GE1029-A).

1:

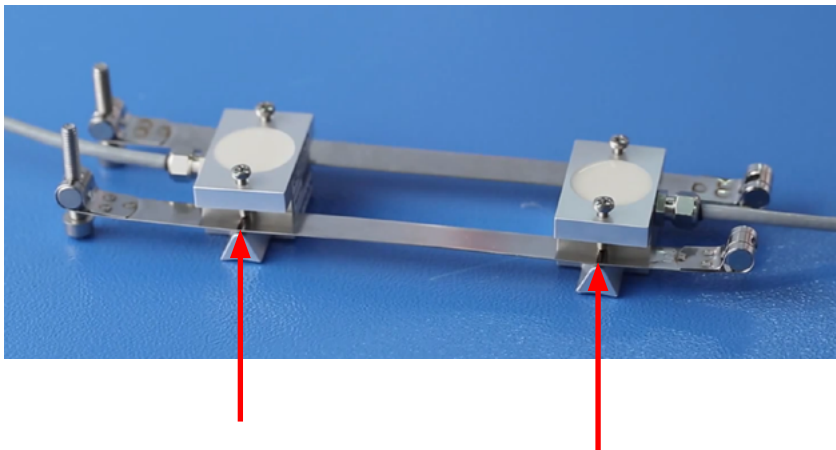
There are markings on the stainless steel bands.

(The distance between these markings depends on the diameter of the object to be measured)



2:

The stainless steel strips are fixed at the marked position with the individual measuring modules.

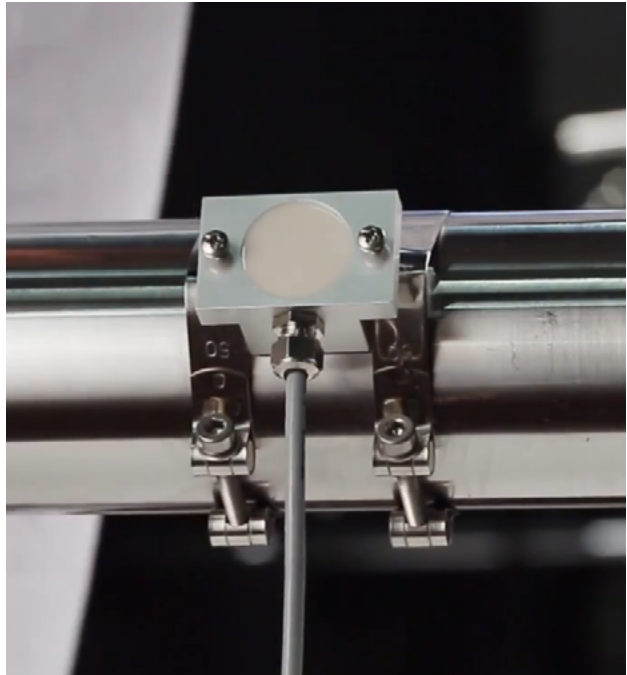


3:

Place the sensor around the object to be measured and screw it on carefully.

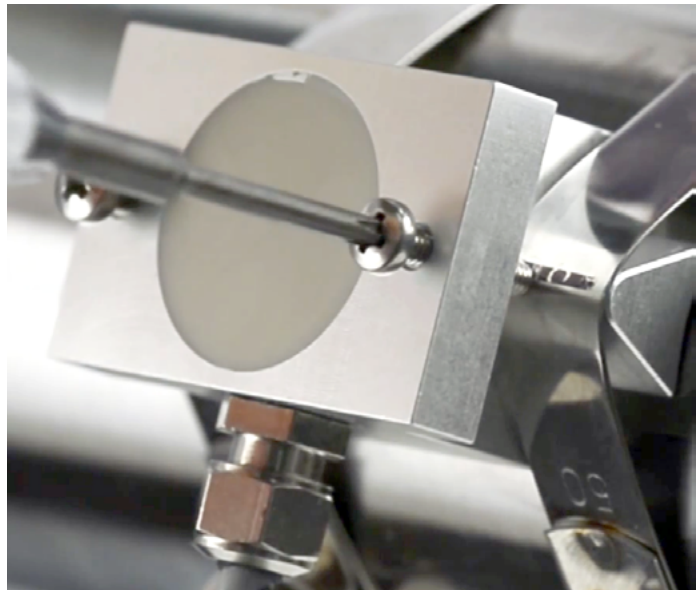
Do not tighten with final torque yet!

Cables must not be jammed.



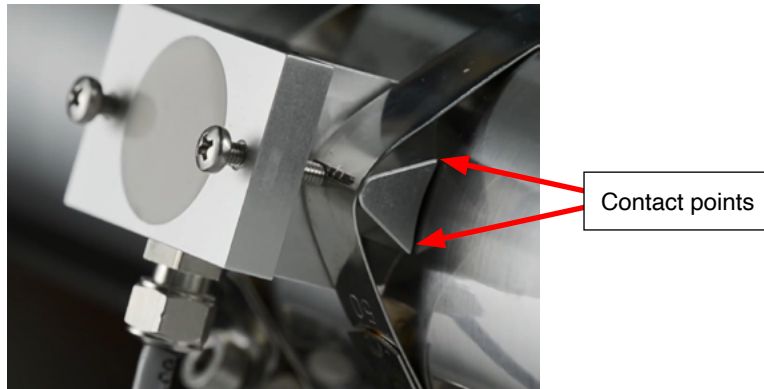
4:

Slightly loosen the fixing so that the individual measuring modules can rest perfectly on the circumference of the measuring object.



5:

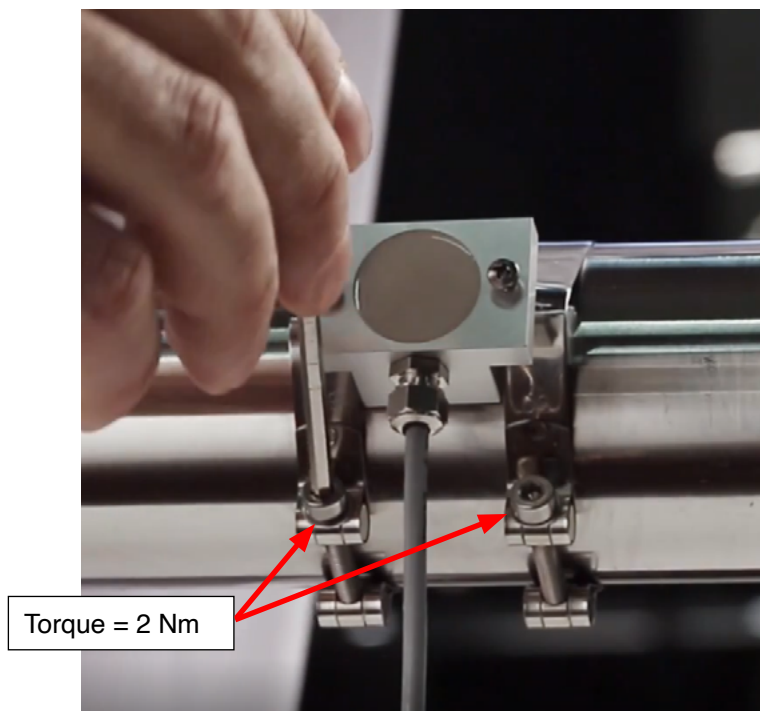
The contact points must lie exactly in the axial direction on the surface to be measured.



6:

Screw the sensors hand-tight. Torque = 2 Nm

The two measuring modules must be exactly opposite each other.



The system is now ready to measure.



Attention:

It is important that the screws are checked with the above torque after the machine has warmed up or after two days of operation at the latest.



3. MAINTENANCE

3.1. Inspection

To prevent damage to the film, it should always be checked before using the sensor.
Remove any impurities immediately.

3.2. Maintenance

The sensor GE1029-A should be checked every 12 months. For maintenance the sensor must be sent to Gefran Schweiz AG.

4. TECHNICAL DATA

Strain gauge type	Foil (GF 2.0)
Measuring range	$\pm 1000 \mu\epsilon$
Sampling rate	4 kHz
Output rate	4 kHz
Low-pass filter	500 Hz
Output signal (0...+100% FS)	+0...+10VDC,+1...+10VDC
Noise	< 25mV
Accuracy	< $\pm 0.5\%$ FS
Accuracy of zero point	< $\pm 0.15\%$ FS (typ) < $\pm 0.25\%$ FS (max)
Linearity	< $\pm 0.5\%$ FS
Hysteresis	< $\pm 0.2\%$ FS
Repeatability	< 0.1% FS
Output resistance	5 k Ω
Reset time	> 25ms
Reset voltage	16...30VDC
Supply voltage	16...30VDC
Supply current	< 30mA
Inverse polarity protection	YES
Accidental short-circuit protection	YES
Operating temperature range	-20...70°C
Storage temperature range	-20...70°C
Overload capability	indefinite (offset occurs)
Protection class	IP64
EMC	2014/30/EU
Case material	Anodized aluminium
Weight, including cable	150g

5. ORDER CODE

Tie-bar sensor with amplifier

GE1029-A

- - - -

Signal output	
0...10 VDC	0
1...10 VDC	1

Calibration	
0500 $\mu\epsilon$	0500
0750 $\mu\epsilon$	0750
1000 $\mu\epsilon$	1000

Cable length	
0.5 m	005
3 m	030
5 m	050
10 m	100

Connection	
Cable with open leads	O
Cable with connector	C

Example: GE1029-A - 0 - 0500 - 030 - C

Tie-bar sensor with amplifier GE1029-A, Output signal = 0...10VDC, Calibration = 500 $\mu\epsilon$, Cable length = 3m, Cable with connector

5.1. Accessories

Description	Order code	Code		Description	Order code	Code
Stainless steel belt (in pairs) (tie-bar diameter 25...148 mm)				Stainless steel belt (in pairs) (tie-bar diameter 150...250 mm)		
25 mm	GB-29-025	F062437		150 mm	GB-29-150	F060628
28 mm	GB-29-028	F062438		152 mm	GB-29-152	F071309
30 mm	GB-29-030	F062439		155 mm	GB-29-155	F061256
35 mm	GB-29-035	F062009		160 mm	GB-29-160	F061989
38 mm	GB-29-038	F062440		165 mm	GB-29-165	F062383
40 mm	GB-29-040	F062441		170 mm	GB-29-170	F065814
45 mm	GB-29-045	F062431		175 mm	GB-29-175	F065815
50 mm	GB-29-050	F062432		180 mm	GB-29-180	F061259
53 mm	GB-29-053	F062442		185 mm	GB-29-185	F065816
55 mm	GB-29-055	F061809		190 mm	GB-29-190	F061257
56 mm	GB-29-056	F062443		195 mm	GB-29-195	F066931
58 mm	GB-29-058	F062444		200 mm	GB-29-200	F062108
60 mm	GB-29-060	F062011		205 mm	GB-29-205	F071306
62 mm	GB-29-062	F064215		210 mm	GB-29-210	F060009
64 mm	GB-29-064	F062445		215 mm	GB-29-215	F064224
65 mm	GB-29-065	F062446		220 mm	GB-29-220	F061475
68 mm	GB-29-068	F071302		225 mm	GB-29-225	F069667
70 mm	GB-29-070	F061400		230 mm	GB-29-230	F061255
75 mm	GB-29-075	F062094		240 mm	GB-29-240	F060626
80 mm	GB-29-080	F065817		250 mm	GB-29-250	F071322
82 mm	GB-29-082	F064216				
85 mm	GB-29-085	F061258				
90 mm	GB-29-090	F065839				
92 mm	GB-29-092	F064247				
95 mm	GB-29-095	F061251				
100 mm	GB-29-100	F062450				
105 mm	GB-29-105	F061474				
110 mm	GB-29-110	F062284				
115 mm	GB-29-115	F061253				
118 mm	GB-29-118	F064214				
120 mm	GB-29-120	F065834				
125 mm	GB-29-125	F062408				
127 mm	GB-29-127	F062453				
130 mm	GB-29-130	F061252				
132 mm	GB-29-132	F064219				
135 mm	GB-29-135	F061401				
140 mm	GB-29-140	F061988				
145 mm	GB-29-145	F062435				
148 mm	GB-29-148	F071273				

Notes:

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06-2025