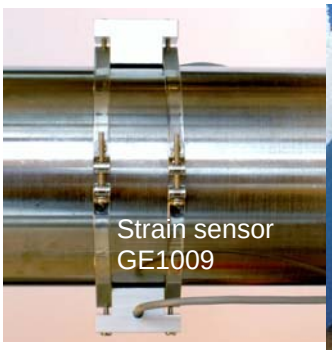
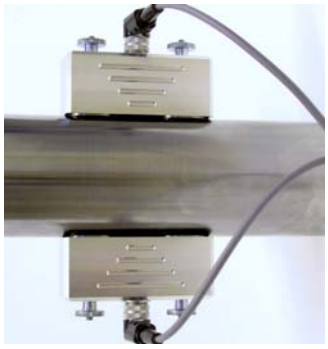
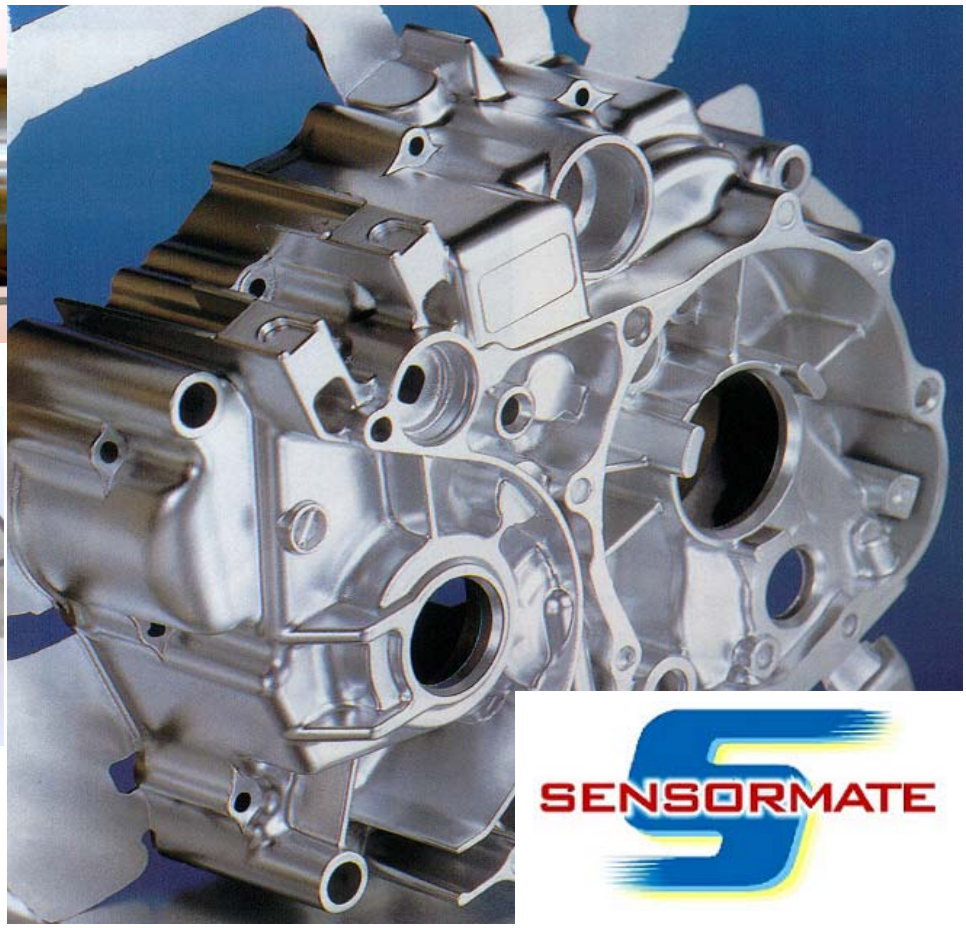
SENSORS FOR DIE CASTERS:

MEASURE LOCKING FORCE
AND
AVOID TIE BAR BREAKAGE







⇒ ***TIE BAR STRAIN SENSORS PREVENT***

BROKEN TIE-BARS, FLASHING AND MOLD WEAR

⇒ ***LOCKING FORCE SENSORS TELL YOU***

ACTUAL LOCKING TONNAGE ONLINE

SENSORMATE LTD. DIE_CAST_e1
Schöntalstrasse 23; CH - 8486 RIKON-Switzerland
Tel:++41-(0)52-242-1818,Fax:++41-(0)52-366-1884
www.sensormate.ch

Tie Bar Sensors for Die Casting

Optimum locking tonnage and evenly distributed load on the tie bars are important parameters for die cast machines. Only perfect machine alignments ensure the quality of the parts and also extend the lifetime of tool and machine (bushings, die spitting).
Parallelism in particular plays an important role. If the platens are not parallel or the tool is not parallel, different tensile stresses occur in the individual tie bars. In some cases, the result is an overload of an individual tie bar, resulting in cracks or even broken tie bars.
It is strongly recommended to check the machine with every mould change for parallelism. This is done most simply and reliable by measuring the strain tie bar strain.

Advantages of the QE1008/8 magnet sensor system:

- Can be used for **ALL** tie rod diameters (1“ to>40“)
- simple and time-saving installation with magnets
- cost-effective alternative to GE1009 steel belt mounting (or bonded strain gages) which are used for permanent process control and monitoring
- process optimization and quality assurance
- ideal for machine revisions, service and mold set-up
- Obtain MAXIMUM & UNIFORM locking tonnage each time you set-up a new mold
- Protect your investment and increase your machine availability

Quick and efficient measuring of locking force of your die-casting machines

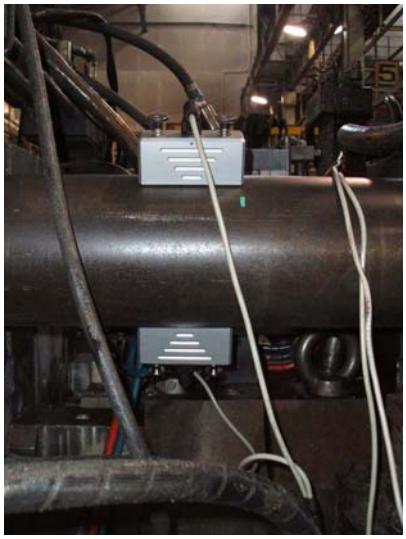
The values measured are analogue or can be shown by optional USB-cable on any PC. The results can also be exported via CSV-files into Excel files etc.
The new magnet strain sensors are based on a new technology: Specially developed strain gauges are pressed onto the surface to be measured – and the surface strain is measured directly and without calibration. 2 sensors opposite each other guarantee bending compensated results.
→ **NEVER** buy a system using only one sensor on each tie bar!

The installation is a simple matter:

2 magnet sensors are set onto each tie bar to be measured with help of the 2 magnets integrated in each sensor. No tools are required. The output signal consists of extension units (με = microstrain) which are converted into kN or tons.
The surface to be measured does not need to be chemically clean like in the case of bonded strain gauges: Cleaning the surface with a little solvent is enough. All parts of the sensor are made of rust-free material. This system is used by most die cast machine manufacturers.

Left Picture:
2 sensors are mounted opposite on a tie bar → NEVER use only one sensor to measure the tie bar load.

Right picture:
a machine is measured in one setup with 8 magnet sensors



SENSORS ON DIE CASTING MACHINES

INDIRECT LOCKING FORCE :

Surface Strain sensors measure the deformation on the fix platen which is proportional to the Clamping Force.
Calibration of the sensor with QE1008.

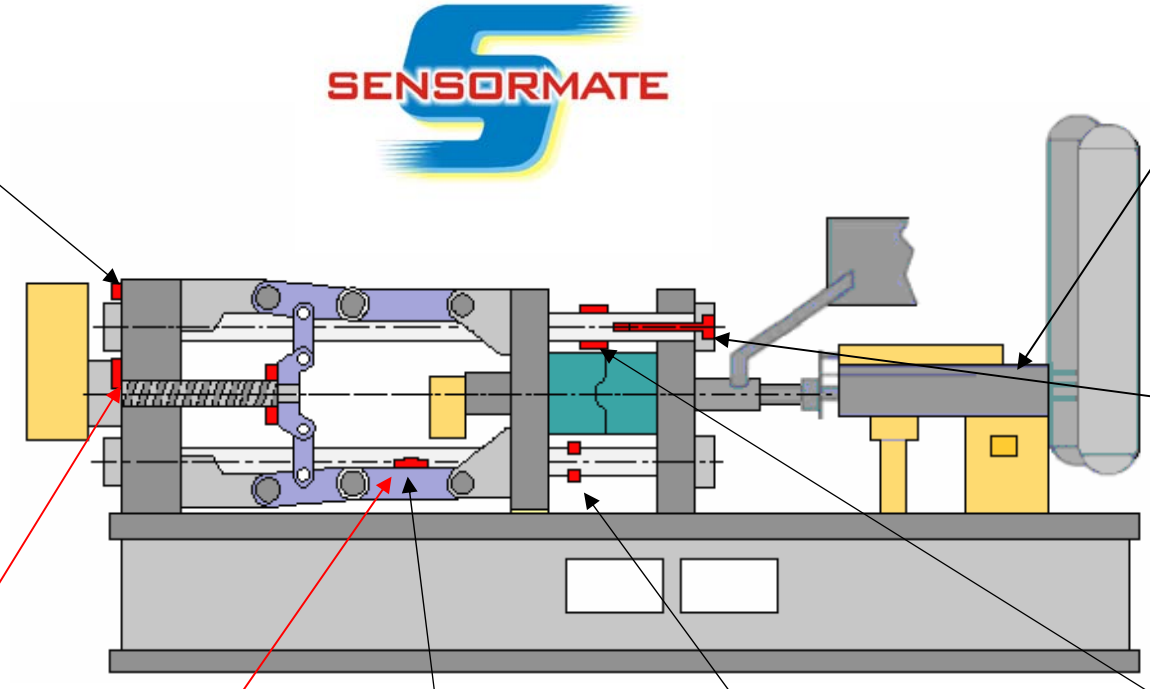
→ SB76 for high accuracy
→ SL for harsh environment
→ SB50 if space is rare
→ SB46; 1 mounting thread

SB76

SL76

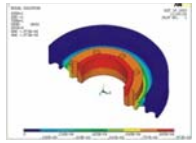
SB46

SB50



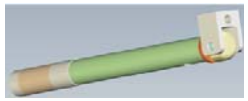
Injection Force LOADCELL

Diaphragm load cell for all electric Die Casting Machines!

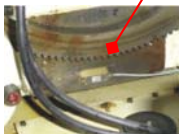


LOCKING FORCE

NEW Sensor ML1018, inside tie bar, fast and easy lever mounting, new clamping system.



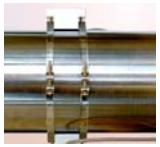
Strain Sensor type SB on fix platen:



Strain Sensor SB-Type mounted on the toggle

MOLD PROTECT & LOCKING FORCE

- Strain gage Type
- Clamping Force signal
- Mold Protection mode detects parts between mold halves instantly



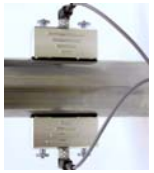
LOCKING FORCE Continous measurement

GE1009 measures around the tie bar with 2 steel belts.

- flexible with diameter
- fast and easy install
- very high accuracy
- for continuous online-control
-

LOCKING FORCE Temporary Measurement

QE1008 Magnet Tie Bar Sensors for Machine Setup & Service, fast and accurate, used by most machine manufacturers worldwide.



SENSORMATE AG; Schöntalstrasse 23; CH-8486 RIKON – SWITZERLAND
Tel: +41-(0)52-2421818
www.sensormate.ch; info@sensormate.chm

COMPACT SET Type CQE-8/USB
Top of the line plus ultracompact, measures all tie bar diameters and on flat surfaces, detects cracks on tie bars, connects to Computer, no Displays:

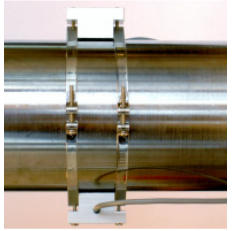
- 8 QE1008 magnet sensors incl. 5 meter 'Y'-cable
- 4 Channel USB-box, no displays, works only with PC and our Software 'Inspectmate'
- Very small Carrying case: 15 x 11 x 6 Inch

USB-Out with Software for alignment protocols (Euromap #7)

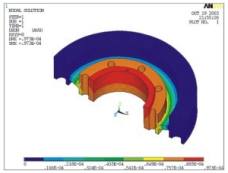
ONLINE-CONTROL Type DU-1D/GE
Controls the clamping force continuously, fast and easy to set, uses one tie bar for measurement, System containing:

- 1 pair of GE1009 strain sensors with 5meter cable
- 1 DU-1D digital monitor with alarm-function (UL), strain conversion,
- 1 pair of steel bands (specify tie bar diameter)
- Power plug and manual

OTHER PRODUCTS



GE1009
Tie Bar Strain sensor, highest accuracy at affordable prices, mounting with steel band, fits any tie bar diameter, for continuous measurements



Load Cells
Custom made load cells for Injection Force Measurement and press calibration. Web tension sensors and other specialties are available

Amplifiers
Wide range of amplifiers. Above is a load cell with digital InLine-Amplifier; small and reliable. Analogue and digital strain gage amps.

Strain Sensors
Wide range of surface strain sensors:
- Strain Links
- Strain Bars
- Digital Strain Links

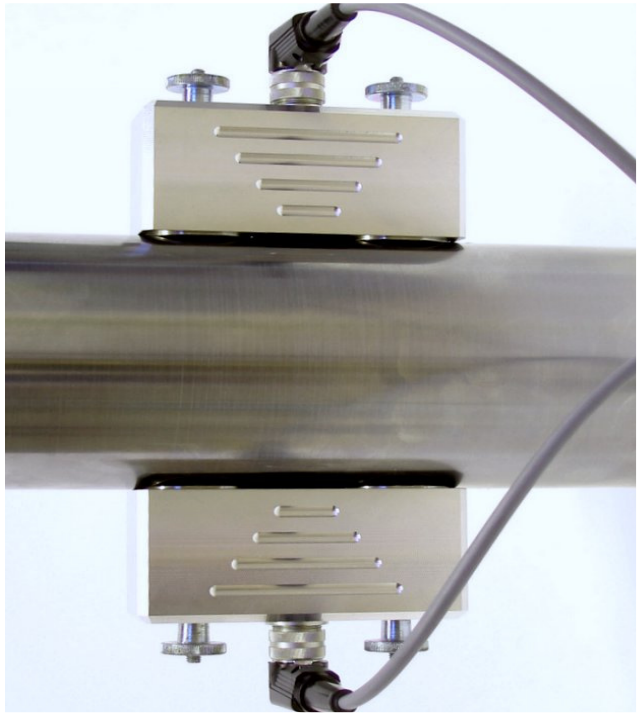
→ **Visit our homepage**

www.sensormate.ch

SENSORMATE LTD.
SCHOENTALSTRASSE 23
CH-8486 RIKON-ZURICH
Tel:+4152-2421818;

YOUR AGENT:

TIE BAR MEASURING SYSTEM



SENSORMATE

SWISS MADE

- **Analyse, report AND improve casting quality**
- **Avoid tie bar breakage**
- **Extend bushing life**
- **For service, final acceptance , machine setup and inspection**
- **Verify actual press-tonnage**
- **Repeat setup from run to run**
- **Keep Mould/machine aligned**

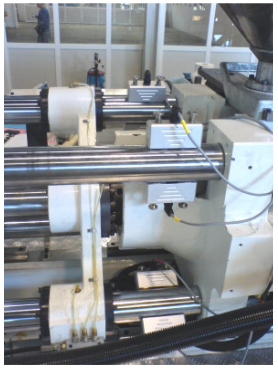
The Monitors: Type DU-4D

(see pictures to the left, front- and rear view)

- Easy to learn, intuitive handling
- Bright, easy to read LED-Displays
- Developed by moulders for moulders
- Direct strain, kN or ton reading
- Tie bar diameter setting by push button
- optional USB-Out
- various settings are integrated
- rugged, EMC-safe aluminium housing

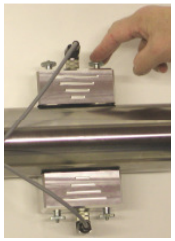
USB-amplifier-box, very small and light, instead of DU-4D (Service people will like it)

Strain calibrator to check the system (Traceable according ISO)



Some Applications:

Right: the compact and easy to mount Sensor with 2 magnets (push mounting)

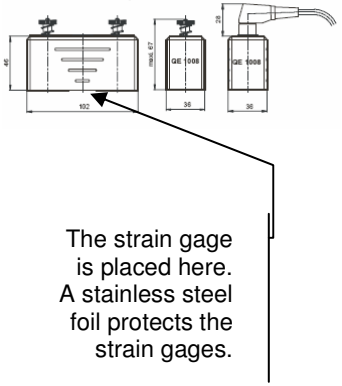


Left:: 8 sensors on a molding machine to calibrate the injection force

Detect cracking tie bar before breaking by using just one sensor → low strain value indicates crack.

The 2 magnets are preloaded with stainless steel springs. (Preload can be adjusted depending on tie bar diameter)

Dimensions of QE1008:



The strain gage is placed here. A stainless steel foil protects the strain gages.

Compact and portable Tie Rod Measuring Systems:

- Quick and easy mounting, simple to use
- 2 sensors measure bending compensated (only on sensor provides wrong results!)
- Quality assurance for final check , machine setup, inspection and service
- Fits all diameters (Ø >1000mm)
- Measures even on flat surfaces

The standard QE1008/8 set contains:

- 8 extensometers
- 4 connecting cable
- 1 x 4-channel Monitor DU4D
- GND-cable & Manual
- Optional USB Software
- System weight starts at 16 pounds for 8 sensors

The QE1008/2 Set

- Practical and economical starter set
- includes 2 sensors and display
- small and handy case
- digital 1-channel unit, with alarm option
- also for long term machine check (e.g. changing locking force while warming up)

Flex Starter Set type QE1008-F1 → Low cost system

Measures all tie bar diameters and on flat surfaces, detects cracks on tie bar, System containing:

- 2 pieces QE1008 magnet sensors incl. 5 meter 'Y'-cable
- Strain-Display with amplifier and Power plug
- Manual and conversion table

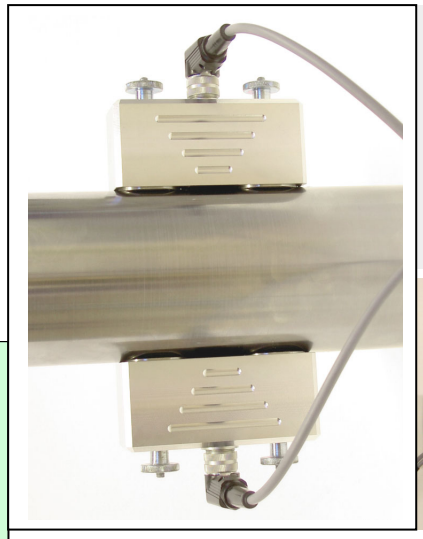
Analysis and Protocol - with 'Inspectmate' Software:

- Ideal reporting tool
- Connects monitor via USB to PC
- Generates reports according to EUROMAP/ISO9000
- Machine history can be generated

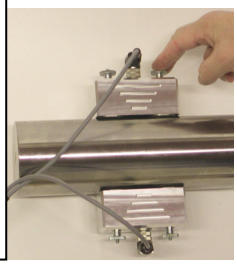
MACHINE SETUP, PRODUCTION AND SAFETY DEVICE
TYPE QE1008
TIE BAR STRAIN GAUGES pat.pend.

The perfect help FOR MAXIMUM, UNIFORM CLAMPING FORCE
without overloading toggles or tie bars

- **Avoid tie bar failures**
- **Keep mould and machine aligned**
- **Extend bushing life**
- **Less mould wear and flashing**
- **Verify actual press-tonnage**
- **Repeatable setup from run to run**

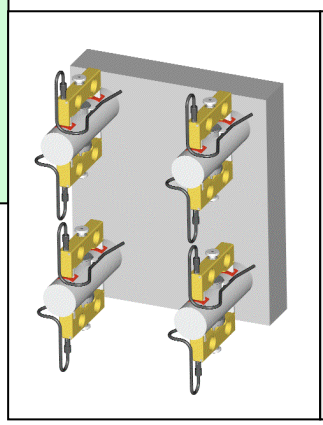


Left: 2 QE1008 sensors on a tie bar for bending compensated results. **Below:** easy mounting by pushing down the screw.

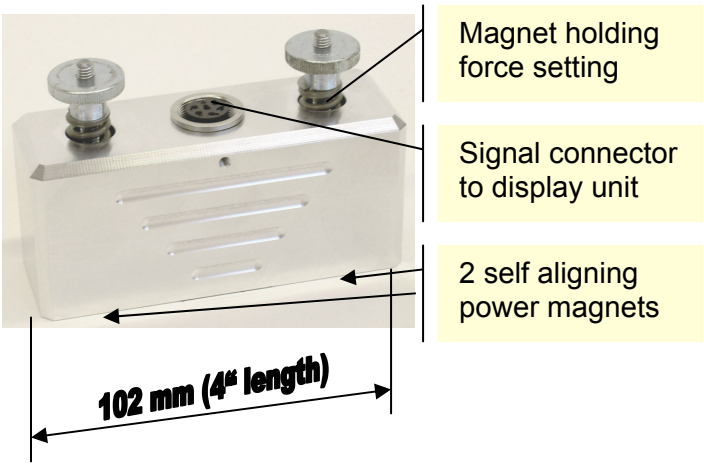


FEATURES:

- Quick and Easy mounting with two super magnets
- 2 sensors for bending compensated measurement
- Fully electronic system, latest technology
- Fits any tie bar diameter
- High resolution – 1% accuracy
- Signals can be recorded and stored
- Direct tonnage reading – no calculation



With 8 sensors, the tie bar stretch is automatically measured bending compensated. This is for fastest results and direct total clamping force indication with 1% accuracy!



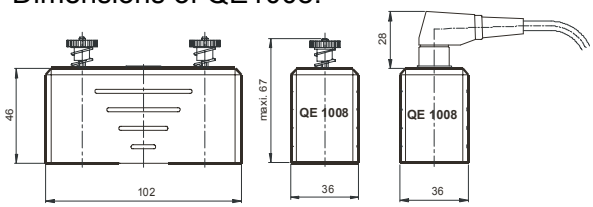
DU-4/D unit displays directly tie bar elongation, kN or tonnage. USB output (opt.) and software available.

Ordering Information:

- Set with 2 sensors: No. QE1008/2
- Set with 4 sensors: No. QE1008/4
- Set with 8 sensors: No. QE1008/8

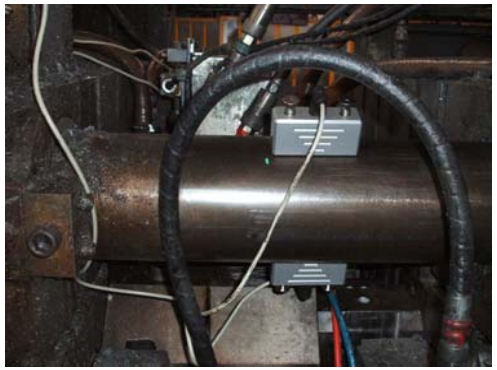
All sets in carrying case with inserts, sensors, digital display unit, connecting cables, manual, and GND-cable. Optional USB cable and software to record and store data.

Dimensions of QE1008:

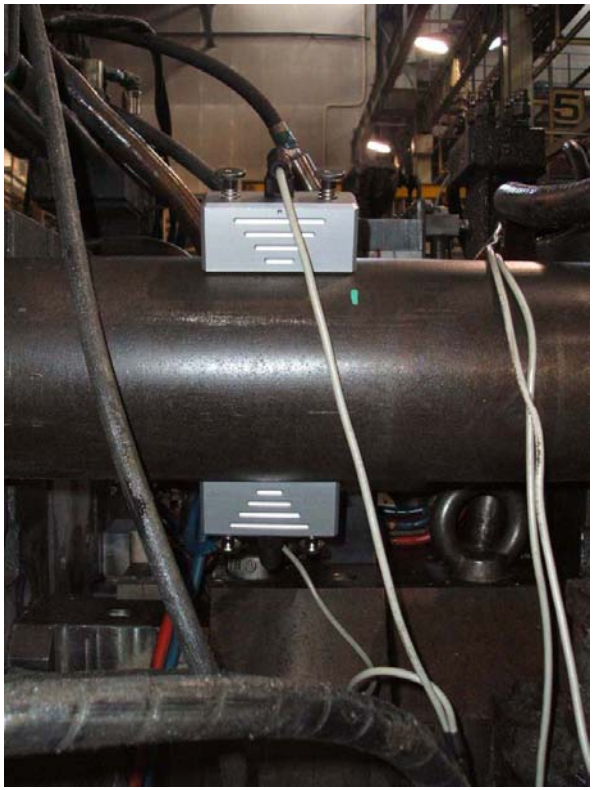


SENSORMATE INC. – SCHOENTALSTRASSE 23 - CH-8486 RIKON-ZURICH
Tel:+4152-2421818; **www.sensormate.ch**

QE1008
Application in Die Casting

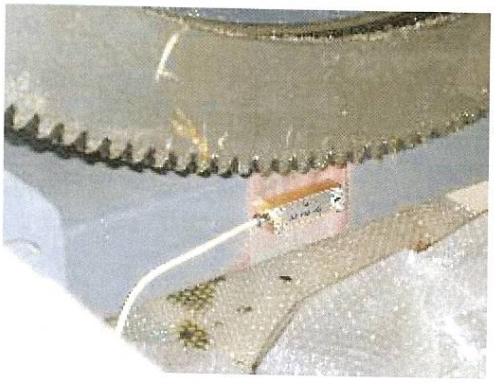


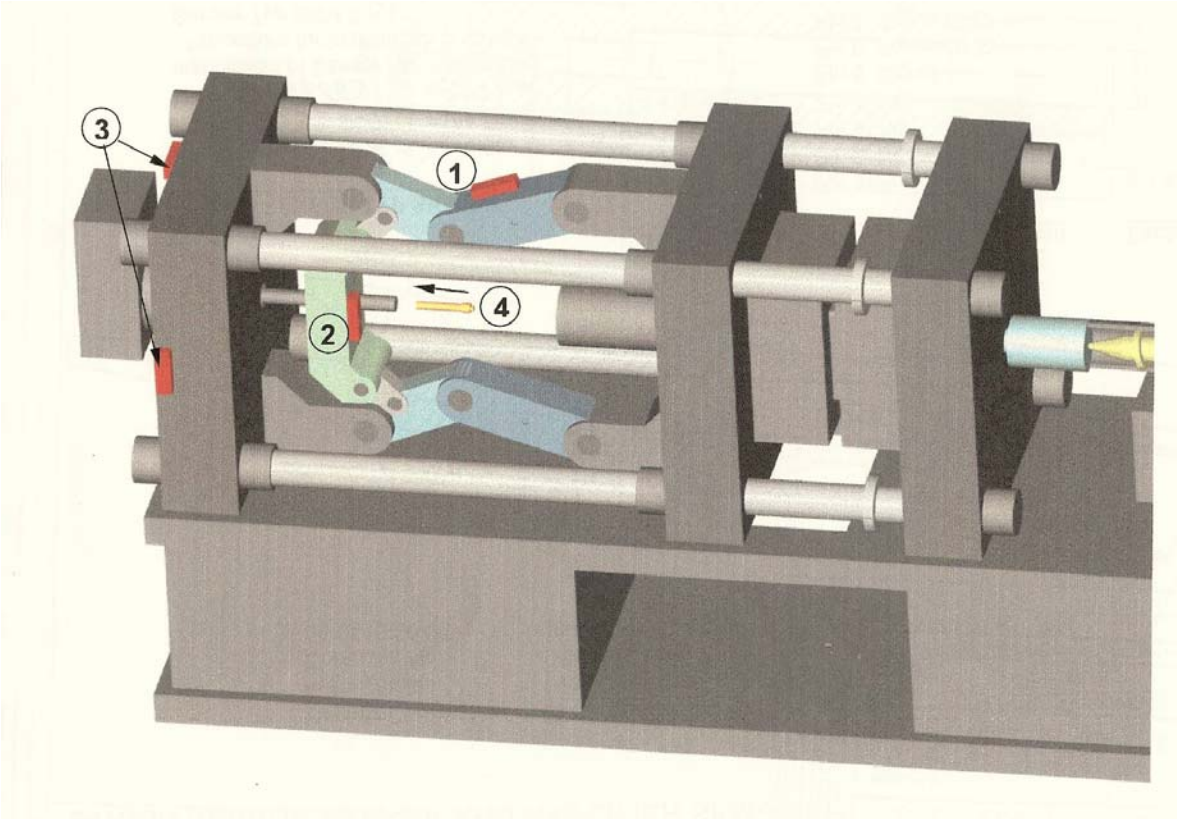
Our sensors are being used even in the most demanding environment like Die Casting (e.g. Nissan, Toyota, Peugeot etc.)



SENSORMATE AG CH-8486 Rikon/Zurich - Switzerland
www.sensormate.ch Tel: 001-4152 2421818 Fax: 001-41 52 3661884

STRAIN-BAR SB Application pictures





Sensors on All Electric Machines

Indirect Clamping Force Measurement, various solutions
→ IMPORTANT: This requires calibration (e.g. with QE1008), ***BUT*** Strain probe MLO1018 inside strain bar or GE1009 do not need calibration.

Possible Sensor Locations:

1.) **SB50 or SB76**
on the Toggle, compression signal, SB-sensors generate a very linear sensor signal in compression **AND** elongation mode

→ Place here *Mold Protection Sensor* on piezo-ceramic base! This new sensor features very high sensitivity. Ask us for your customized solution.

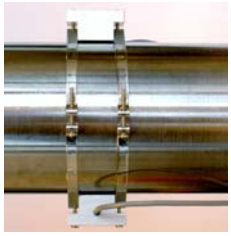
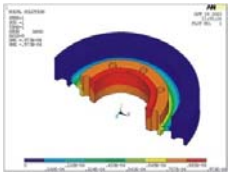
2.) **SL-Sensors**
Strain sensor located at or in Toggle Joint. Can be used for central clamping Force Measurement or mold protection (with strain pin).

3.) **SL76 or SB76**
Low cost solution for clamping force measurement. Sensor signal has to be calibrated with QE1008.

4.) **Strain Pin**
This strain Pin inside the Toggle Joint can be used for a very sensitive Mold Protection System

SENSORMATE INC. CH-8486 Rikon-Switzerland
www.sensormate.ch Tel: 001-4152 2421818 Fax: 001-41 52 3661884

OTHER PRODUCTS

				
GE1009 Tie Bar Strain sensor, highest accuracy at affordable prices, mounting with steel band, fits any tie bar diameter	**Load Cells** Custom made load cells for Injection Force Measurement and press calibration. Web tension sensors and other specialties are avialable	**Amplifiers** Wide range of amplifiers. Above is a load cell with digital InLine-Amplifier; small and reliable. Analogue and digital strain gage amps.	**Monitors** Digital Monitors for calibration und Machine-control. Easy set-up with ALARM-Outputs.	**Strain Sensors** Wide range of surface strain sensors: - Strain Links - Strain Bars - Digital Strain Links **Visit our homepage!**

FAX-REPLY-CARD:

NAME: _____

COMPANY: _____

ADDRESS: _____

CITY: _____

INTEREST: O Tie Bar Strain O Loadcell/Injection Force direct

O Loadcell/Injection indirect O Locking Force indirect

O Digital amplifier O Strain sensors

CONTACT: info@sensormate.ch; B.Schlaepfer or D.Mächler

---

www.sensormate.ch

SENSORMATE INC.
SCHOENTALSTR. 23
CH-8486 RIKON-Switzerland
Tel: 001-4152-2421818
Fax: 001-4152-3661884