

### Wireless Magnet Clamping Force Control Sensor Type SML-WME

The perfect help For Maximum, Uniform Clamping Force without overloading Toggle or Tie Bars



- Avoid tie bar broken.
- Keep mould and machine aligned
- Extend die and bushing life.
- Less mould wear and flashing.
- Repeatable setup from run to run.

#### Feature :

-Quick and easy mounting with 2 supper magnets.

- -Wireless sensor without connecting cable.
- -7 inch tablet PC display, measuring data can be save and print.
- -Measuring data can be save in Excel file, also can be made graph.
- -2 sensors for bending compensated measurement.
- -Fit any tie bar diameter.
- -High resolution, 1% accuracy.
- -Direct tonnage reading no calculation or conversion list.

#### **Ordering Information:**

-Set with 8 sensors: **SML - WME / 8** -Set with 10 sensors: **SML - WME / 10** 

All sets in aluminum carrying case with inlet, sensors and Receiver.

#### **Technical Data:**

Strain Gauges Measuring Range Sensitivity of sensor (1/2 bridge compensated) Overall accuracy Repeatability Hysteresis Linearity Operating temperature range Sensor dimension Power supply

± 800 με 1.0 mV/V @ F.S. ± 0.5% F.S. < 0.1% F.S. ± 0.1% F.S. ± 0.1% F.S. 0...+ 60°C 88 x 31 x 30mm (exclude nut) 2 AA NiMH rechargeable or Alkaline battery

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350 ohms



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







## 磁附式鎖模力感測儀

### Magnet Clamping Force Control Sensor

### 型號 SML-ME/8

機器安裝、生產和安全裝置, 確保曲臂歌林柱不再超負載 Uniform Clamping force without overloading Toggle or Tie Bars





左: 2 SML-ME感测儀在歌林柱上進行彎曲補償測量。

Right: **2 SML-ME** on a tie bar for bending compensated measuring.

- 避免歌林柱斷裂
   Avoid tie bar broken.
- ▲ 保持模具和機器的平行度
- Keep mould and machine aligned
   延長模具和軸襯壽命
   Extend die and bushing life.
- 減少模具的磨損和噴料 Less mould wear and flashing.
- 可重覆使用 Repeatable setup from run to run.

#### 特徵:

- 用2個強力磁鐵,快速容易地安裝
   Quick and easy mounting with 2 supper magnets
   2 御式測係可進行総曲構成測量
- 2個感測儀可進行彎曲補償測量 2 sensors for bending compensated measurement.
- 適合任何歌林柱直徑 Fit any tie bar diameter.
- 高解析度精度 ± 1%精度
   High resolution, 1% accuracy.
- 直接的量測值讀數,不用計算或對照表, DM4DB 顯示器直接顯示με, kN或ton。 Direct reading in με, kN or ton without calculation or conversion list.

#### 技術資料:

#### **Technical Data:**

應變片 strain gauge 量測範圍 Measuring range 感測器靈敏度(1/2 電橋補償)Sensitivity 量測值線性誤差 Linearity 總精度 Over all accuracy 重覆性 Repeatability 遲滯現象Hysteresis 操作環境溫度範圍 Operating temperature range 感測器尺寸 Sensor dimension 電源供應電壓 Power supply 350 Ω ± 800 με 1.0 mV/V @ F.S. < 0.5 % ± 0.5 % F.S. 0.1% F.S. 0.1% F.S. +20...+40℃ 88 x 31 x 30 (不含螺帽高度) 110...220 VAC / 50-60Hz

帶 8 個感測儀,對歌林柱進行彎曲補 償自動測量。可以快速測試結果和直 接顯示總鎖模力,1%精度.

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





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## SML-SC/F

#### The extensometer set of the type SC/F

measures the strain on tie bars or round pro-files. Thereby one module is placed exactly opposite the other and fixed by two small stainless steel bands.

The extensometer set can be adapted very easy to different diameters by changing the appropriate length of the steel bands.

The applied press-on technology allows to mount and dismount this measuring system without destroying the used strain gauges by

bonding or similar operations.

Due to the simple way of mounting the extensometers. as well as to the high precision and industry confirm execution, these extensometer sets can be used for strain and force measurements. they are excellent for molding and die casting machine manufactures.

#### Features:

- · Very easy installation.
- Used for traction, compression and torsion
- measurements.
- Accuracy better than 0.5%.
- To measure tie bar diameter rang 40..500mm
- Uniform gauge factor.
- Available with incorporated amplifier (0...10 V or 4...20mA)
- Needs no further calibration.
- Ideal for online control of clamping force

#### **Technical Specifications**

Sensing element: strain gauges Gauge Factor Transverse sensitivity Measuring range (F.S.) Output signal Accuracy Hysteresis Repeatability Recommended bridge supply voltage Sensor Housing Steel Band Press-on torque (M4 screws) Operating temperatures range





350 ohm 2.0 % %(standard) 0.9+/-0.5 +/-500зų mV/V (2x1/4bridge) 0.5 < 0.5% < 0.2 % <1% % at F.S. 5(max. 10) VDC Aluminum anodized Stainless steel 10mm (w) x 0.4mm (t) 2 Nm 0...+55 °C

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## Hints

Zero point: +/-250% of F.S. The zero point depend on the mounting of the sensors, because

of pressing the strain gauges, the measuring bridge has usually a large offset. Amplifiers and displaying instruments have standard analog or digital reset circuit for resetting the signal. The sensor output signal should be reset preferably before the beginning of each measuring cycle.

## Dimensions



### Accessorie

Stainless steel bands, type STB-xxx (xxx = tie bar diameter) 40...500

mm





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## SML-DSB

STRAIN BAR

**Integrated Digital Amplifier** 



#### **Description**

Specially developed Strain Gauges are pressed onto the measured surface, the measurement is instantly without any calibration needed.

**The surface at the measuring area** shall be free of layers of materials other than the measured material (e.g. rust, color, scale, etc.). It has not to be chemically clean or mechanically treated.

**Creeping of the strain gauges** may occur with not ideal surfaces or bad mounting. This can easily be detected by the signal creeping under load and without load towards zero in both cases.

The **Zero-offset** of the pressed-on strain-gauges is after mounting never at zero. This does not influence the sensitivity or signal amplitude. The integrated amplifier features offset function.

The **mounting** is very easy with a torque-screw-driver. The sensor is simply screwed onto the surface with a given 3 Nm torque.

For machine-control, our sensor were integrated rugged and industrial strain-gauge amplifiers of the with reset function recommended.

For **machine-control**, e.g. press or stamping machines, two can be screwed to the machine and connected to one amplifier where the medium value of both sensors is measured and controlled.

The **dimensions** can be adapted to the customers needs. The standard dimensions are as follows:

Housing	Thread	Thread Dist.	
85 x 22 x 24 mm	M4	65mm	

#### **TECHNICAL DATA**

2x1/4 Bridge	350Ω
Linearity	${<}0.5\%~{\rm FS}$
Hysteresis	<0.5% FS
Repeatability	<0.2% FS
Measuring range Standa	ard 0~500 με
Power Supply	22~24 VDC
Input Sensitivity	± 0.1 mV/ V
Excitation (Bridge Supply)	5.0V
Analog output	± 10V FS
Working temperature	<b>-20~+ 65</b> ℃
Reset voltage	24 V

- Easy an accurate strain measurement on surfaces
- Brace Strain-Link onto the surface and measure.
- No surface treatment necessary The sensor use an integrated amplifier and use an aluminum housing is EMC safe.
- 1% accuracy without calibration
- For machine-control, Mold-and tool protection or general strain measurement.
- Strain gauges not bonded anymore thus multiple use and no soldering!
- Ideal for cyclical applications.
- For Die Height automatic adjustment.
- For Clamping Force on line control.
- For Clamping Force presetting.
- For Machine overload alarm.

The mounting is extremely easy: The sensor is screwed with a given torque onto the surface. The output is directly in Volt, as with all our strain-sensors. 10Volt output are usually 500 micro-strain.

The surface at the measuring spot does not have to be chemically clean or mechanically treated in any way. Just clean it with some acetone. The sensors are made in aluminum materials.



## Measuring Strain Ring for strain measurement

The measuring StrainRing type SML-RS,SML-RA measures the strain on tie-bars or round profiles through the built-in strain gauges. These measuring Strain Ring can be adapted to different tie bar diameters. The applied press-on technology allows to mount and dismount this measuring system without to destroy the used strain gauge bonding or similar operations. There have 2 version:

### SML-RS standard type SML-RA integrated amplifier

Due to the simple way of mounting these rings, as well as to there high precision and industry conform execution, these measuring Strain Rings can be used for strain and force measurements respectively by machine manufacturers.



SML-RS / RA mounted on a tie-bar



- · Very easy installation through two M8 screws
- Accuracy: 1%
- Measuring range:SML-RS +/-1000 με, SML-RA +/- 500 με
- Uniform k-factor
- Idea for online clamping force control SML-RS with separate amplifier or SML-RA integrated amplifier.

#### **Technical specifications**

2x1/4 brldge, gauge K-Factor Measuring range (F.S.)µɛ Accuracy Hysteresis Repeatability Press-on torque Operating temperature range °C Protection class Signal output (integrated amplifier) Power supply (SML-RA) 350Ω standard 2.0 standard +/- 1000 (RS),+/- 500(RA) 1% < 0.2% < 0,1% of F.S. 3 Nm 0...+55 IP-54 500με = 10 VDC 24 VDC

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## SML-LH

#### Measuring-Probe for strain measurement in bore-holes

The measuring probe SML-LH measures the strain at the sensor tip in any bore-hole. The mounting is rather easly insert, torque connect ready. The signal output is designed for a calibrated proportional output signal. Due to the easy mounting, as well as to its high precision and industry conform execution, this measuring probe can used for strain and force measurements respectively, by machine manufacturers.





#### Features:

- . Very easy installation using a torque wrench
- Strain gauges protected byan aluminum or steel sleeve
- Accuracy 1%
- . Measuring range ±1000με
- . Calibrated signal output
- . Voltage or current output
- Safe mounting by using an elastic insertion unit



#### **Technical specifications**

Sensing element strain gauges			350 ohm
Measuring range (f.s.)			+ 10.00
output signal 1000, traction			+ 10,00 V
			<0.2 %
nysteresis			200 % of fs
Mounting torque			3 Nm
Power supply			1833 V
Current input			< 40 mA
operating temperature range			-20 °C ~ +70 °C
Protection class			IP54
Reset voltage			10~30 V
Connector type, male			DIN 45326
	Ordering infor	mation	
SML-LH-	-O-DD-LLL>	LLL = Length in mm	
1			
₩		DD = Diameter of hole (s	ensor—tin) in mm
·	¥ F		
Туре	o = output options	16 = sensor tip 16mm	
	1 = Voltage output +/-10V		
	2 = Current output 020mA		
	3 = Current output 420mA		



R

### 有效解决 SENSOR SOLUTIONS FOR

注塑机 Injection Molding

压铸机 Die Casting

工业上应用 Industrial Applications

19.0

18.8

## 我们专业在锁模力与射出压力 WE ARE PROFESSIONAL IN CLAMPING FORCE CONTROL



### SENSORMATE for SENSOR SOLUTIONS

我们创新的传感器和量测系统具有高精度、 效率以及连续性,其高精度之水准使全世界 许多机器制造厂相信我们的产品且在制程中 使用,并使其成为机器的配备之一 。

Our innovative sensors and measure systems possess high accuracy, efficiency and continuity. Because of the high level of the accuracy, many machine manufactures of the world trust our products by using them on their machines and using them in the manufacture process as well.

#### 应用 Applications

- A 锁模力测量 Measurement of clamping force
- B 机器调适 Machine setup
- C 射出压力量测 Injection pressure and touch force
- 在线锁模力测量
   Clamping force online control
- 接触压力和射出压力量测 Touch force and injection pressure

#### 传感器可被应用于 The sensors could be used for

▶ 品质控制 Quality control

- 机器校准参数 Machine alignment parameters
- ▶ 在线监控 Machine online monitoring
- ▶ 维修及保养 Service and maintenance
- ▶ 研究发展 Research and development

我们的传感器提高您的生产品质 OUR SENSORS FOR YOUR QUALITY PRODUCTION.

## SML-DSB 🗛 🖪

#### 应变片预压式技术安装容易

Simplified mounting of technology with pressed-on strain gauges.





A D

A D

A D

#### 应用:

锁模力量测可装置于头板或曲臂 冲压机器负载控制和其他周期性动作机器 取代黏贴应变片量测应变 亦可应用于模具保护

D

## SML-RS 标准型 Q D

#### 应变测试环 , 用于应变量测

经由内建应变片量测歌林柱或圆柱体,应变测 试环依不同直径,装置于不同歌林柱,应用预 压式技术,安装与拆卸不会损坏应变片。由于 安装容易,并且高精度和经过工业证实,这款 测试环被机器制造厂用来量测应变与力量。

## Measuring Strain Ring for strain measurement

The measuring Strain Ring type SML-RS measure the strain on tie-bars or round profiles through the buit-in strain gauges. These measuring Strain Ring can be adapted to different tie-bar diameters. The applied press-on technology allows to mount and dismount this measuring system without to destroy the used strain gauge bonding or similar operations.





## SML-SC O D

#### 低价位锁模力感测仪,量测歌林柱或圆柱体之应变

它是由钢带将两个传感器正对面固定于歌林柱或圆柱体。SML-SC 连接线与传 感器固定,连接 DILA/2 放大器,被应用于在线锁模力监控,同时可以利用这 输出讯号做自动调模与上限下限报警,必须由机器制造厂安装。

#### Low cost Extensometer set

A B

A B

A B

The low cost extensometer set on the type SML-SC measures the strain on the tie-bars or round pro-files. Thereby one module is placed exactly opposite the other and fixed by two small stainless stees bands. The low cost extensometer set can be adapted very easy to different diameters by changing the appropriate length of the steel bands. The applied press-on technology allows to mount and dismount this measuring system without destroying the used strain gauges by bonding or similar operation.





SML-SC/F

## DM1D

应变和力量单屏数位显示器 Digital Monitor for Strain and Force

- 在线量测读取数据可设定上下线和报警
   Idea for online measuring, can be Setting upper and lower limit with Alarm function
- ▶ 避免拉秆断裂 Avoid tie bar broken
- ▶ 维持模具与机器准线 Keep mould and machine aligned
- ▶ 延长模具寿命 Extend die and bushing life









## SML-ME OBD

#### 磁附式锁模力感测仪

搭配两个超强力磁铁吸附于歌林柱或圆柱体,对机器调整安装与校正, 是一套完美的仪器,它可以防止歌林柱断裂,维持模具寿命。

#### **Magnet Clamping Force Control Sensor**

The magnet clamping force control sensor SML-ME, which is perfect for machine setup, and calibration. It can avoid the tie-bars broken and keeping the lives of mold and the machines aligned.



2.0

8281

388

8888

0.75



## SML-WME/WMEH OO

#### 无线磁附式锁模力感测仪

无线磁附式锁模力感测仪不需要数据线,利用无线讯号传输。并适用于不同尺寸的 歌林柱,对机器是最佳的感测仪器。无线磁附式锁模力感测仪可以搭配我们的掌上 型显示器或是安卓系统的平板。

#### Wireless Magnet Clamping Force Control Sensor

The perfect help for maximum, uniform clamping force without overloading toggle or tie bars. This monitor is available with our handhold monitor or tablet PC Android system.



## SML-DLH 0

#### 高品质应变量测传感整合放大器

柱塞式锁模力传感器装置于歌林柱孔内,不受抽 歌而撞击传感器避免在恶劣的工作环境受损害。 是最适合压铸机的最佳选择。

SML-DLH 适用于整合式或分离式放大器。

High quality strain measuring system with integrated amplifiers. The strain probe measures the strain inside of the tie-bar, therefore protected against harsh industrial environment. This is the most ideal choice for die casting machines. SML-DLH is available for integrated or separated amplifiers.

## NOZZLE MATE @

磁铁吸附传感器在头板与射嘴之间,少量塑料射出到 NOZZLE MATE 传感器,同时可以量测出射出多少压 力,尤其是电动式注塑机开发是必备的仪器。

Magnetic mounting of the sensor between mold and nozzle. A smell volume is injected into the NOZZLE MATE pressure and touch force measured simultaneously. Especially developed for all electric machines.



射出压力和接触压力量测 Injection Pressure and Touch Force Measutement

# SML-DLC

#### 射出压力量测

最佳量测射出压力传感器,位置是在射出螺秆腔内,传感器本体户露出, 易受到损害。使用荷重元量装置于螺秆后方,量测出压力是今日被接受的 解决方式。

我们的荷重元整合放大器,精准地量测出射出压力以及背压。

#### For Injection Force Measurement

The best place to measure the injection pressure is theoretically in the screw antechamber. As this location exposed, the sensor will be easily broken. The measurement of the injection force with load cells set behind the screw is the most widely accepted solution nowadays. Our load cells with integrated amplifiers are used in lots of applications and allow precise measurement of the injection pressure and same as the back pressure





## Amplifier

#### 放大器

工业用放大器适用于我们 SML 系列传感器 可以电压输出和颠刘输出,放大器具有清零 功能给周期性应用。 Amplifiers Industrial amplifiers are available for our SML-Sensos. Various exections with Voltage and mA Output available. Majority of amplifiers with reset-function for cyclical applications.



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The tie bar stretch in automatically

measured bending compensated.

This is for fastest results and direct

total clamping force indication with

1% accuracy.

## 2 x 1/4 Bridge Digital Monitor For Strain and Force

Type SML-DM1DA

The perfect help for Clamping force & strain reading Without Overloading Toggle or Tie Bars





- Idea for online measuring.
- Avoid tie bar broken.
- Keep mould and machine aligned
- Extend die and bushing life.
- Less mould wear and flashing.
- Repeatable setup from run to run.
- RS 485 output port (option), idea for Industrial 4.0 production monitoring.

#### Feature :

- Sensors for bending compensated measurement.
- High resolution, 1% accuracy.
- Direct tonnage reading no calculation or conversion list.
- Digital monitor DM-1DA connecting cables, manual.

#### **Technical Data:**

Strain Gauges Measuring Range Sensitivity of sensor (1/2 bridge compensated) Linearity error in % of measuring value Overall accuracy Repeatability Hysteresis Operating temperature range Power supply RS 485 output

± 800 με 1.0 mV/V @ F.S. < 0.5 ± 0.5% F.S. 0.1% F.S. +20...+60°C 110...220 VAC / 50-60Hz Baud Rate 9600, N, 8, 1



350 ohms

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### DUALSENSOR 'NOZZLE-MATE'

### **MEASURE** NOZZLE PRESSURE (=Specific Injection Pressure) & NOZZLE TOUCH FORCE (=Carriage Force) AT THE SAME TIME:

- Proven Quartz-Technology for High Temperature Ranges
- Fits onto every machine one sensor for the whole moulding shop
- Adapter plates for specific nozzles available
- Quick magnet mounting; instant results without any adaption-work
- · Optional cooling systems allows the use in hot chamber die casting
- Optional heated nozzle for calibration of LOAD CELLS on all-electric injection moulding machines

Sets: Set for Nozzle Pressure measurement, with Nozzle Pressure Sensor only, incl. Display Box,

Battery charger and Standard Nozzle Adapter

**Options:** - Another Nozzle Adapter

- Nozzle Adapter plate
- (no nozzle recess)
- Carrying case with insert
- Heated Nozzle for continuous pressure measurement (not only PEAK pressure)

	Magnet base to hold the unit in p included in ever			
Technical	lata			
Nozzlo Pressuro Sensor:				
- Pressure range I 0 2000bar				
- Pressure Range II		04000bar		
- Max. Error		< 1% FS		
- Temperature range		10200°C		
- Overload; max.		200%		
- Reset/CalibrationIntegrated				
- Dimensions		Ø79 x 60mm		
- can not be used for online				
measurement				
<ul> <li>only a small volume is filled with</li> </ul>				
plastic				
Nozzle Touch Force Sensor:				
- Standard	load range	0400kN		
- Calibrated partial range		0200.0kN		
- Max. Erro	r	< 1%		
- Strain gag	ge Bridge	350 Ohm		



(partial range: 200.0 kN).



Advantage of this mesurment:

- Recognise pressure drops hydraulic-→Nozzle
- Recognize wear of screw
- Fast, simple and reliable results
- Machine check within the ISO9000ff tests
- Data acquisition for set up protocols
- One sensor for the whole molding



Specific Injection Pressure: up to 4000ba Nozzle Touch Force : up to 400 kN

Digital Dual-display instrument for the 'Nozzle-Mate' sensor. The Nozzle Pressure is indicated directly in bar, and the Nozzle Touch Force in kN. One channel Instruments are available to measure only one parameter.

#### NEW : NOZZLE PRESSURE & NOZZLE TOUCH FORCE MEASUREMENT

This new line of sensors is a world novelty: Two important molding parameters can be measured at the same time, in one mounting:

- the Nozzle Touch Force(Strain Gauges) and
- Nozzle pressure (with Quartz Technology)

Especially developed for injection molding and Die Casting Machines. The Nozzle Pressure(=specific Injection Pressure) is measured by a quartz load cell behind a measuring pin. Pressures up to 4000bar can be measured with high accuracy, by only injecting plastic into a recess in the sensor tip.

The load cell measures static by means of bonded strain gauges. The load range of 40 tons scopes with even the largest machines



The DUALSENSOR measures the Nozzle Pressure and the Nozzle Touch force