FMA SERIES MICROFORCE SENSORS

For Use in Industrial Knitting Machines

Honeywell

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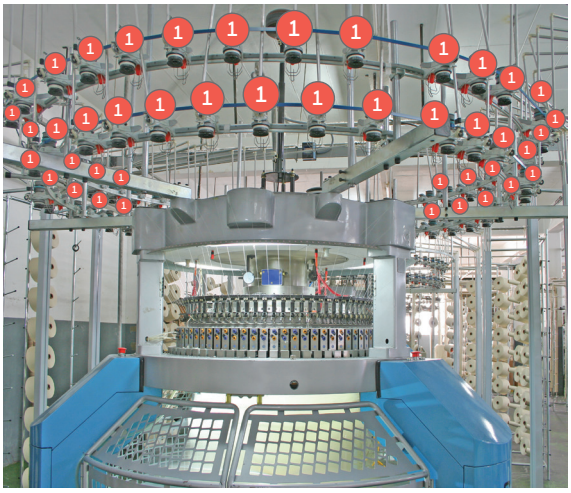
FOR USE IN INDUSTRIAL KNITTING MACHINES

The FMA Series may be used in industrial knitting machines to monitor the yarn/thread tension, helping to provide feedback for precise control.



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- Used in thread tension monitoring feedback loop to ensure correct amount of force is being applied under all conditions
- Provides more accurate control of the feedback loop where response time is critical
- Provides multiple digital addresses on the same bus
- Monitors many different thread tensions at once
- Minimizes thread tension concerns, resulting in less scrap due to garments ruined by incorrect thread tension
- Minimizes machine downtime due to broken threads
- Small size allows many sensors to fit into small space
- Cost-effective solution to the load cell sensors that are usually used to measure thread tension

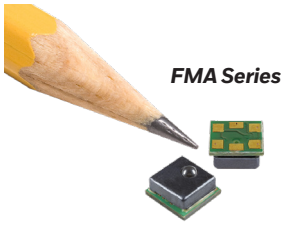
The FMA Series piezoresistive-based force sensors offer a digital output for reading force over the specified full scale force span and temperature range. They are fully calibrated and temperature compensated for sensor offset, sensitivity, temperature effects, and nonlinearity using an on-board Application Specific Integrated Circuit (ASIC).

The direct mechanical coupling allows for easier interface with the sensor (using tubing, membrane or a plunger), providing repeatable performance and a more reliable mechanical interface to the application. These sensors offer a more stable output which is directly proportional to the force applied to the mechanically-coupled sphere.

The digital I²C interface permits multiple addresses on the same bus, allowing the use of multiple sensors and helping to reduce system complexity. The optional internal diagnostics function enables fault detection.

FMA SERIES SPECIFICATIONS

CHARACTERISTIC	PARAMETER
Description	compensated/amplified
Force range	5 N, 15 N, 25 N
Output	SPI, I²C
Supply voltage	3.3 V, 5.0 V
Supply current, typ.	2.8 mA (3.3 V), 3.9 mA (5.0 V)
Operating temperature range	-40°C to 85°C [-40°F to 185°F]
Compensated temperature range	5°C to 50°C [41°F to 122°F]
Accuracy, typ.	±2% FSS BFSL
Total Error Band, max.	±8% FSS BFSL
Output resolution	12 bits
Long term stability	±1.6 FSS
Humidity	0% to 95% RH, non-condensing
Shock	MIL-STD-202, Method 213, Condition A (50 G)
Vibration	MIL-STD-202, Method 214, Condition 1F (20.71 Gms)
Life	1 million full scale force cycles minimum
Package size	5 mm x 5 mm [0.20 in x 0.20 in]



Sensor optimized to be as small as possible while still allowing for mechanical coupling.

PRODUCT NOMENCLATURE

FM[1]	A	M	S	D	XX	025[2]	W	C	S	C[3]	3
MicroForce Sensors	Type	Coupling	Contact Element	Option Code	Option Code 1	Force Range	Force Unit	Force Type	Output	Transfer Function	Supply Voltage
	A Compensated/ amplified	M Mechanical	S Sphere	N No diagnostics D Sensor short and open diagnostics	XX Future placeholder	005 5 (Newtons) 015 15 (Newtons) 025 25 (Newtons)	W Newton (N)	C Compression	S SPI 2 I²C, Address 0x28 3 I²C, Address 0x38 4 I²C, Address 0x48 5 I²C, Address 0x58 6 I²C, Address 0x68 7 I²C, Address 0x78	A 10% to 90% C 20% to 80%	3 3.3 V ±10% 5 5.0 V ±5%

[1] Custom configurations are available upon request. Please contact Honeywell Sales.
[2] Three characters specify the desired force level; allowable characters are the numbers 0 through 9 for currently configurable force ranges.
[3] For other available transfer functions, contact Honeywell Customer Service.

⚠WARNING
PERSONAL INJURY
DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.
Failure to comply with these instructions could result in death or serious injury.

⚠ WARNING
MISUSE OF DOCUMENTATION
- The information presented in this document is for reference only.
  Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

Failure to comply with these instructions could result in death or serious injury.

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