

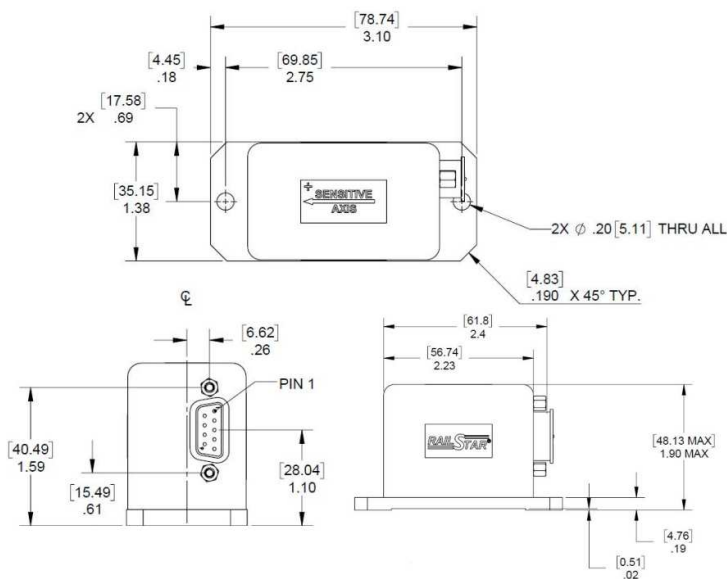
## JMA-165-R

### MEMS Analog Inclinometer

Our recently CENELEC and AREMA qualified JMA-165 series MEMS accelerometers are now a cost effective and viable alternative to the traditional force-balance designs.

#### FEATURES:

- $\pm 0.5G$  &  $\pm 1.0G$  full ranges
- CENELEC/AREMA certified
- Low-cost MEMS technology
- RoHS Compliant
- Filtering Available
- Internal heater for reduced thermal drift available



Dimensions: in [mm]

# RAILSTAR®



#### APPLICATIONS:

- Automated Train Controls
- Rail Maintenance & Testing
- Acceleration/Deceleration Control
- Train Performance Testing



**CENELEC**

**AREMA**

CENELEC EN 55022:2010  
CENELEC EN 50155:2007  
CENELEC EN 61000-4-8:2010

AREMA PART 11.5.1



# JMA-165-R

Jewell has a 40+ year history of supplying acceleration sensors for driver and driverless metro trains throughout the world. Jewell accelerometers are crucial components in safety and control systems providing a safe, controlled ride by providing train acceleration, deceleration and position information.

## PERFORMANCE SPECIFICATIONS

### STATIC/DYNAMIC

INPUT RANGE (g) <sup>1</sup>	±0.5	±1
FULL RANGE OUTPUT (Volts) <sup>2</sup>	±5.00	
NONLINEARITY (% FRO) <sup>2</sup> max	0.2	0.1
BIAS (g, max.)	±0.01	
BIAS TEMP COEFFICIENT (mg/°C max)	1	0.5
BANDWIDTH (Hz, 3db)	100	
TRANSVERSE AXIS SENSITIVITY, (%)	0.7	
CROSS AXIS SENSITIVITY (g/g max.)	0.01	0.005
NONREPEATABILITY (mg, max.)	2	1
RESOLUTION & THRESHOLD (mg) max	0.3	0.6
SCALE FACTOR TOLERANCE (mg)	±5	±10
SCALE FACTOR TEMP COEFFICIENT (ppm/°C, max.)	300	150
WARM-UP TIME (seconds, max.)	1	

### PIN OUTS

A	+PWR
B	PWR RTN
C	N?C
D	X OUT
E	Y OUT
F	N/C
G	SIG RTN
H	TEMP OUT
I	N/C

#### NOTES:

- Intermediate ranges available, please see model number structure below. Custom ranges available on request.
- Full Range is defined "from negative full input angle to positive full input angle."

\*Specifications subject to change without notice on account of continued product development



# PRODUCT SPECIFICATIONS

## ELECTRICAL

INPUT VOLTAGE RANGE (VDC)	±12 to ±18
INPUT CURRENT (mA, max)	±8
OUTPUT IMPEDENCE (Ohms, nom.)	1
NOISE (Broadband grms max)	0.005

## ENCLOSURE

WEIGHT	80g
PROTECTION CLASS (per IEC 529)	IP65
CONNECTOR	DB9

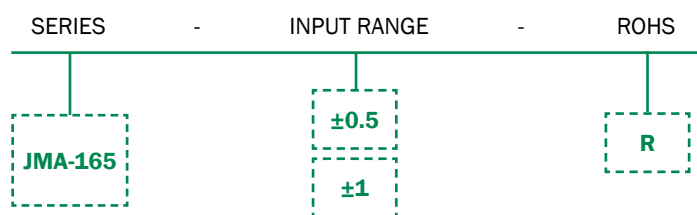
## ENVIRONMENTAL

OPERATING TEMP. RANGE	-40° to +70°C
STORAGE TEMP. RANGE	-55° to +85°C
VIBRATION	20 grms
SHOCK	10g, 11msec ½ sine

# ORDERING INFORMATION

## HOW TO ORDER

Model Numbers are comprised of the series, the connector option, and the input range.



	MODEL #	PART #
±0.5	JMA-165-0.5-R	02550357-002
±1	JMA-165-1-R	02550357-003



# JMA-165-RH: Heater Version

Jewell has a 40+ year history of supplying acceleration sensors for driver and driverless metro trains throughout the world. Jewell accelerometers are crucial components in safety and control systems providing a safe, controlled ride by providing train acceleration, deceleration and position information.

## PERFORMANCE SPECIFICATIONS

### STATIC/DYNAMIC

INPUT RANGE (g) <sup>1</sup>	±0.5	±1
FULL RANGE OUTPUT (Volts) <sup>2</sup>	±5.00	
NONLINEARITY (% FRO) <sup>2</sup> max	0.2	0.1
BIAS (g, max.)	±0.01	
BIAS TEMP COEFFICIENT (mg/°C max)	1	0.5
BANDWIDTH (Hz, 3db)	100	
TRANSVERSE AXIS SENSITIVITY, (%)	0.7	
CROSS AXIS SENSITIVITY (g/g max.)	0.01	0.005
NONREPEATABILITY (mg, max.)	2	1
RESOLUTION & THRESHOLD (mg) max	0.3	0.6
SCALE FACTOR TOLERANCE (mg)	±5	±10
SCALE FACTOR TEMP COEFFICIENT (ppm/°C, max.)	125	75
WARM-UP TIME (seconds, max.)	30	

### PIN OUTS

A	+VCC
B	COMMON
C	-VCC
D	SIG OUT
E	N/C
F	N/C
G	N/C
H	N/C
I	N/C

#### NOTES:

1. Intermediate ranges available, please see model number structure below. Custom ranges available on request.
2. Full Range is defined "from negative full input angle to positive full input angle."

\*Specifications subject to change without notice on account of continued product development



# PRODUCT SPECIFICATIONS

## ELECTRICAL

INPUT VOLTAGE RANGE (VDC)	±12 to ±18
INPUT CURRENT (mA, max)	±8
HEATER PRESET ( ° C)	25
OUTPUT IMPEDENCE (Ohms, nom.)	1
NOISE (Broadband grms max)	0.005

## ENCLOSURE

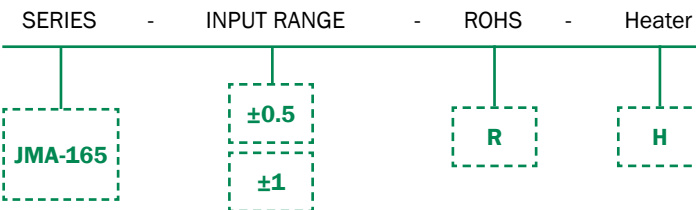
WEIGHT	85g
PROTECTION CLASS (per IEC 529)	IP65
CONNECTOR	DB9

## ENVIRONMENTAL

OPERATING TEMP. RANGE	-40° to +70° C
STORAGE TEMP. RANGE	-55° to +85° C
VIBRATION	20 grms
SHOCK	10g, 11msec ½ sine

# ORDERING INFORMATION

**HOW TO ORDER** Model Numbers are comprised of the series, the connector option, and the input range.



	MODEL #	PART #
±0.5	JMA-165-0.5-RH	02550358-002
±1	JMA-165-1-RH	02550358-003

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