



# 9331-TI



- ◆ Reduces the cost of installing hazardous-area cabling
- ◆ Saves installation time, space and weight
- ◆ Highlights problems quickly with diagnostic reporting systems
- ◆ Accepts eight independently configurable RTD, thermocouple, ohm, and millivolt inputs
- ◆ Suitable for process environments

**The 9331-TI 8-channel temperature-input multiplexer** simplifies and reduces the cost of temperature inputs in a process plant. Traditional temperature monitoring methods (control system temperature input cards, low cost single input transmitters and remote I/O) will be eliminated with the introduction of this intrinsically safe, eight input multiplexer that mounts beside the process. The use of FOUNDATION fieldbus™ enables easy integration with today's process control systems.

#### Cost savings

The 9331-TI offers the lowest cost solution for temperature monitoring measurements, e.g. distillation columns, tanks, reactors, boilers, etc. This multiplexer can reduce installed costs by as much as 70% per point when compared to traditional single temperature inputs.

#### Reduces costs of intrinsic safety

For intrinsically safe installations, only one IS isolator is needed to safely power several 9331-TI multiplexers. As a result, one IS isolator can support at least 32 temperature inputs in Gas Group IIC (A,B) and at least 80 temperature inputs in Gas Group IIB (C,D), offering significant savings.

#### Eight independent sensor inputs

The 9331-TI accepts eight, independently configurable sensor inputs (2- and 3-wire RTDs, thermocouples,

mV, and ohm). 4-20mA analogue inputs are also supported using a 93-AI optional connector, which enables 4-20mA inputs to be output as values onto FOUNDATION fieldbus™.

#### Suitable for process environment

The 9331-TI's ambient temperature limits, EMC compliance, intrinsic safety approvals, and ability to mount in process environments provide optimum mounting flexibility.

#### FOUNDATION fieldbus function blocks

FOUNDATION fieldbus offers diagnostics that provide continuous measurement status (good, bad, or uncertain) as well as sensor failure indication. The 9331-TI offers the Analog Input (AI), Input Selector (ISEL) and Multiple Analog Input (MAI) function blocks. The MAI block allows all eight sensor inputs to be communicated with one function block, resulting in greater network efficiency.

#### IP66 enclosures

MTL Process JB's are designed for mounting fieldbus components in order to meet the exacting requirements of the process industry. The FCS-9331 enclosure is manufactured from 316 stainless steel while the FCS-833x enclosures are manufactured from carbon-loaded polyester; both combine strength with the highest levels of corrosion resistance.



# 9331-TI FIELD BUS TEMPERATURE INPUT MULTIPLEXER

## SPECIFICATIONS

### FUNCTIONAL

#### Inputs

Eight independently configurable channels including combinations of 2- and 3-wire RTDs, thermocouples, mV, and  $\Omega$  inputs.

4-20mA using optional 93-AI Analogue Connector

All sensor terminals are rated to 42.4V DC.

#### Outputs

IEC61158-2 FOUNDATION fieldbus™ H1.

#### Status

If self-diagnostics detect a sensor burnout or a multiplexer failure,

the status of the measurement will be updated accordingly.

#### Update Time

Approximately 1.5 seconds to read all eight inputs.

#### Turn-on Time

Performance within specifications is achieved in less than 50 seconds after power is applied to the multiplexer.

#### Alarms

The AI and ISEL function blocks allow the user to configure the alarms to HI-HI, HI, LO, or LO-LO with a variety of priority levels

and hysteresis settings.

#### Backup Link Active Scheduler (LAS)

The multiplexer is classified as a device link master, which means

it can function as a Link Active Scheduler (LAS) if the current link master device fails or is removed from the segment.

The host or other configuration tool is used to download the schedule for the application to the link master device. In the absence of a primary link master, the multiplexer will claim the LAS and provide permanent control for the H1 segment.

#### FOUNDATION Fieldbus Parameters

Schedule entries	25
Links	30
Virtual Communications Relationships (VCR)	20

### ELECTRICAL

#### Isolation

Input/output isolation is tested to 500V AC rms. Input/input isolation between each sensor input connector is tested to 500V AC rms. Input/input isolation between sensors on the same input connector is 3V AC at 50 - 60Hz, 1.5V DC.

#### Power Supply

Powered over FOUNDATION fieldbus with standard fieldbus power supplies. The 9331-TI operates between 9.0 and 32.0V dc, 22mA maximum. (Multiplexer power terminals are rated to 42.4V DC)

#### CE Electromagnetic Compatibility Compliance Testing

Meets the criteria under IEC 61326 Amendment 1, 2000:

### FUNCTION BLOCKS

#### Analog Input (AI)

Processes the measurement and makes it available on the fieldbus segment.

Allows filtering, alarming, and engineering unit changes.

#### Input Selector (ISEL)

Used to select between inputs and generate an output using specific selection strategies such as minimum, maximum, midpoint, or average temperature.

Since the temperature value always contains the measurement status, this block allows the selection to be restricted to the first good measurement.

#### Multiple Analog Input Block (MAI)

The MAI block allows the eight AI blocks to be multiplexed together so they serve as one function block on the H1 segment, resulting in greater network efficiency.

#### Instantiable Function Blocks

All the function blocks used by the multiplexer are instantiable, meaning the total number of function blocks is only limited by the physical memory available in the multiplexer. Since only the instantiable blocks use physical memory, any combination of function blocks can be used at any given time as long as the physical memory size is not exceeded.

### STANDARD CONFIGURATION SETTINGS

Unless otherwise specified, the multiplexer will be shipped as follows for all eight sensors.

#### Sensor Type

Thermocouple Type J

#### Damping

5 seconds

#### Measurement units

°C

#### Output

Linear with temperature

#### Line Voltage Filter

50Hz

#### Temperature Specific Blocks

Measurement Transducer Block (1)

Sensor Transducer Block (8)

Differential Transducer Block (4)

#### FOUNDATION fieldbus™ Function Blocks

Analog Input (8)

Multiple Analog Input (1)

Input Selector (4)

### ENVIRONMENTAL

#### Ambient Temperature Limits

(-40°C to 85°C)

#### Humidity Limits

0-100% non-condensing relative humidity.

#### Vibration Effect

Multiplexers are tested to the following vibration conditions with no effect on performance

Frequency	Acceleration
10 - 60 Hz	0.21 mm peak displacement
60 - 2000 Hz	3 g

### MECHANICAL

#### Mounting

The 9331-TI can be mounted directly onto a DIN rail or it can be ordered with a range of Process Junction Boxes.

#### Weight

270g

FOUNDATION fieldbus™ is a trademark of the Fieldbus Foundation



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Jan 2008

# 9331-TI

## FIELDBUS TEMPERATURE

### INPUT MULTIPLEXER

#### PERFORMANCE

The multiplexer maintains a specification conformance of at least  $\pm 3$  sigma.

#### Stability

$\pm 0.1\%$  of reading or  $0.1\text{ }^{\circ}\text{C}$  ( $0.18\text{ }^{\circ}\text{F}$ ), whichever is greater, for 2 years for RTDs.

$\pm 0.1\%$  of reading or  $0.1\text{ }^{\circ}\text{C}$  ( $0.18\text{ }^{\circ}\text{F}$ ), whichever is greater, for 1 year for thermocouples.

#### Self Calibration

The multiplexer's analog-to-digital circuitry automatically self-calibrates for each temperature update by comparing the dynamic measurement to extremely stable and accurate internal reference elements.

#### ACCURACY

Table 1. Input Options/Accuracy

Sensor Option	Sensor Reference	Input Ranges		Accuracy Over Range(s)	
		$^{\circ}\text{C}$	$^{\circ}\text{F}$	$^{\circ}\text{C}$	$^{\circ}\text{F}$
<b>2- and 3-Wire RTDs</b>					
Pt 100 ( $\alpha = 0.00385$ )	IEC 751; $\alpha = 0.00385$ , 1995	-200 to 850	-328 to 1562	$\pm 0.30$	$\pm 0.54$
Pt 100 ( $\alpha = 0.003916$ )	JIS 1604, 1981 -	-200 to 645	-328 to 1193	$\pm 0.30$	$\pm 0.54$
Pt 200	IEC 751; $\alpha = 0.00385$ , 1995	-200 to 850	-328 to 1562	$\pm 0.54$	$\pm 0.98$
Pt 500	IEC 751; $\alpha = 0.00385$ , 1995	-200 to 850	-328 to 1562	$\pm 0.38$	$\pm 0.68$
Pt 1000	IEC 751; $\alpha = 0.00385$ , 1995	-200 to 300	-328 to 572	$\pm 0.40$	$\pm 0.72$
Ni 120	Edison Curve No. 7	-70 to 300	-94 to 572	$\pm 0.30$	$\pm 0.54$
Cu 10	Edison Copper Winding No. 15	-50 to 250	-58 to 482	$\pm 3.20$	$\pm 5.76$
Cu 100 ( $\alpha = 428$ )	GOST 6651-94	-185 to 200	-365 to 392	$\pm 0.48$	$\pm 0.86$
Cu 50 ( $\alpha = 428$ )	GOST 6651-94	-185 to 200	-365 to 392	$\pm 0.96$	$\pm 1.73$
Cu 100 ( $\alpha = 426$ )	GOST 6651-94	-50 to 200	-122 to 392	$\pm 0.48$	$\pm 0.86$
Cu 50 ( $\alpha = 426$ )	GOST 6651-94	-50 to 200	-122 to 392	$\pm 0.96$	$\pm 1.73$
<b>Thermocouples</b> — Cold Junction adds + $0.5\text{ }^{\circ}\text{C}$ to Listed Accuracy					
NIST Type B (Accuracy varies according to input range)	NIST Monograph 175	100 to 300 301 to 1820	212 to 572 573 to 3308	$\pm 6.00$ $\pm 1.54$	$\pm 10.80$ $\pm 2.78$
NIST Type E	NIST Monograph 75	-50 to 1000	-58 to 1832	$\pm 0.40$	$\pm 0.72$
NIST Type J	NIST Monograph 175	-180 to 760	-292 to 1400	$\pm 0.70$	$\pm 1.26$
NIST Type K	NIST Monograph 175	-180 to 1372	-292 to 2502	$\pm 1.00$	$\pm 1.80$
NIST Type N	NIST Monograph 175	-200 to 1300	-328 to 2372	$\pm 1.00$	$\pm 1.80$
NIST Type R	NIST Monograph 175	0 to 1768	32 to 3214	$\pm 1.50$	$\pm 2.70$
NIST Type S	NIST Monograph 175	0 to 1768	32 to 3214	$\pm 1.40$	$\pm 2.52$
NIST Type T	NIST Monograph 175	-200 to 400	-328 to 752	$\pm 0.70$	$\pm 1.26$
DIN L	DIN 43710	-200 to 900	-328 to 1652	$\pm 0.70$	$\pm 1.26$
DIN U	DIN 43710	-200 to 600	-328 to 1112	$\pm 0.70$	$\pm 1.26$
w5Re26	ASTME 988-96	0 to 2000	32 to 3632	$\pm 1.60$	$\pm 2.88$
GOST Type L	GOST R 8.585-2001	-200 to 800	-392 to 1472	$\pm 0.71$	$\pm 1.28$
<b>mV Input<sup>(1)</sup></b> Not approved for use with CSA intrinsically safe and non-incendive applications.		-10 to 100 mV		$\pm 0.05\text{ mV}$	
<b>2- and 3-Wire Ohm Input</b>		0 to 2000 ohms		$\pm 0.90\text{ ohm}$	
<b>Multipoint Sensors<sup>(2)</sup></b>					

(1) 4–20 mA inputs are scaled to 20 – 100 mV

(2) Input ranges and accuracy for these sensors will depend on the specific multipoint sensor chosen.

#### Accuracy Notes

Differential capability exists between any two sensor types:  
For all differential configurations, the input range is X to +Y where  
X = Sensor 1 minimum - Sensor 2 maximum  
Y = Sensor 1 maximum - Sensor 2 minimum.

#### Accuracy for differential configurations:

If sensor types are similar (for example, both RTDs or both thermocouples), the accuracy = 1.5 times worst case accuracy of either sensor type. If sensor types are dissimilar (for example, one RTD and one thermocouple), the accuracy = Sensor 1 Accuracy + Sensor 2 Accuracy.



# 9331-TI

## FIELD BUS TEMPERATURE

### INPUT MULTIPLEXER

#### AMBIENT TEMPERATURE EFFECT

Multiplexers may be installed in locations where the ambient temperature is between -40°C and +85°C (-40°F and 185°F).

NIST Type	Accuracy per 1.0°C (1.8°F) Change in Ambient Temperature	Temperature Range (°C)
<b>RTD</b>		
Pt 100 ( $\alpha = 0.00385$ )	0.003°C (0.0054°F)	NA
Pt 100 ( $\alpha = 0.003916$ )	0.003°C (0.0054°F)	NA
Pt 500, Pt 1000, Ni 120	0.003°C (0.0054°F)	NA
Pt 200	0.004°C (0.0072°F)	NA
Cu 10	0.03°C (0.054°F)	NA
Cu 100 ( $\alpha = 428$ )	0.002°C (0.0036°F)	NA
Cu 50 ( $\alpha = 428$ )	0.004°C (0.0072°F)	NA
Cu 100 ( $\alpha = 426$ )	0.002°C (0.0036°F)	NA
Cu 50 ( $\alpha = 426$ )	0.004°C (0.0072°F)	NA
<b>Thermocouple</b> (R = the value of the reading)		
Type B	NA	
	0.014°C	$R \geq 1000$
	0.032°C - (0.0025% of (R - 300))	$300 \leq R < 1000$
	0.054°C - (0.011% of (R - 100))	$100 \leq R < 300$
Type E	0.005°C + (0.00043% of R)	All
Type J, DIN Type L	0.0054°C + (0.00029% of R)	$R \geq 0$
	0.0054°C + (0.0025% of  R )	$R < 0$
Type K	0.0061°C + (0.00054% of R)	$R \geq 0$
	0.0061°C + (0.0025% of  R )	$R < 0$
Type N	0.0068°C + (0.00036% of R)	All
Type R, Type S	0.016°C	$R \geq 200$
	0.023°C - (0.0036% of R)	$R < 200$
Type T, DIN Type U	0.0064°C	$R \geq 0$
	0.0064°C - (0.0043% of  R )	$R < 0$
GOST Type L	0.007 > 0°C	
	0.007 $\pm$ 0.003% < 0°C	
<b>Millivolt</b>	0.0005 mV	NA
<b>2- and 3-wire Ohm</b>	0.0084 ohms	NA

#### AMBIENT TEMPERATURE NOTES

##### Examples:

When using a Pt 100 ( $\alpha = 0.00385$ ) sensor input and the multiplexer is at 40°C ambient temperature, temperature effects would be:  
 $0.003^\circ\text{C} \times (40 - 20) = 0.06^\circ\text{C}$ .

Worst case error would be:

Sensor Accuracy + Temperature Effects =  $0.30^\circ\text{C} + 0.06 = 0.36^\circ\text{C}$ .

Total Probable Error =  $\sqrt{0.30^2 + 0.06^2} = 0.31^\circ\text{C}$

#### Analog to Fieldbus Performance

4–20mA inputs are scaled to 20–100mV.

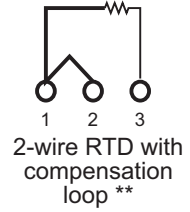
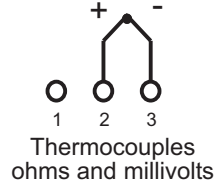
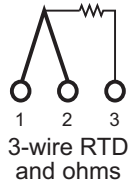
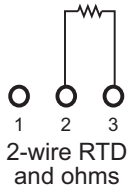
Accuracy<sup>(1)</sup>: 0.0625% of span

Temperature Effect: [0.002% of reading + 0.000625% of span] per 1.0°C change in Ambient Temperature.

(1) To obtain accuracy, the mV input must be calibrated while using the optional analog connector

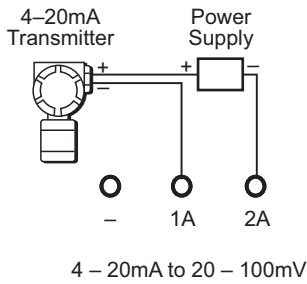


## 9331-TI SENSOR WIRING DIAGRAM

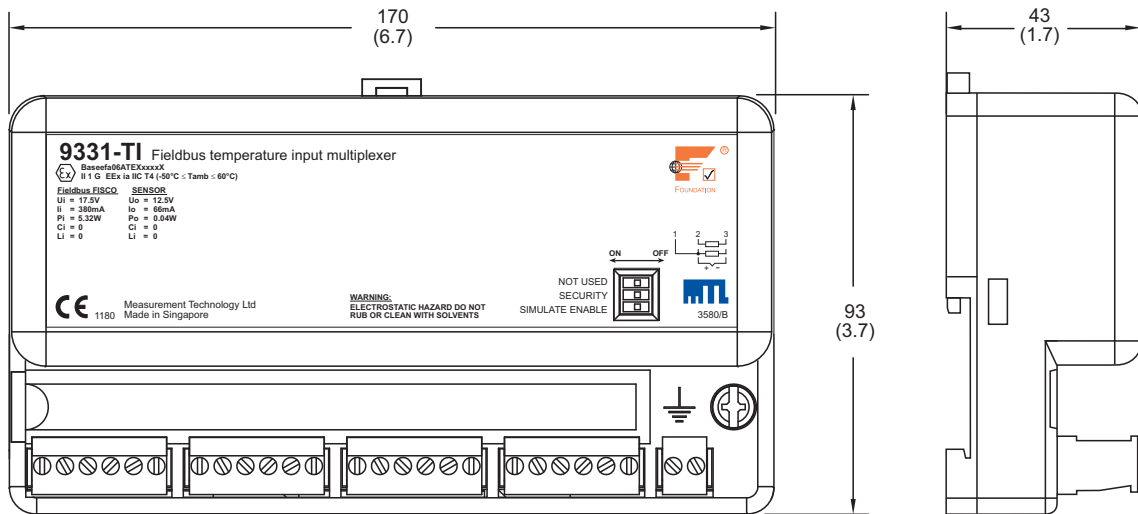


\*\* The multiplexer must be configured for a 3-wire RTD in order to recognise an RTD with a compensation loop.

## 93-AI ACCESSORY



## DIMENSIONS



## 9331-TI APPROVALS

<b>Region</b>	<b>Europe</b>			
<b>Authority</b>	<b>Baseefa</b>			
	<b>9331-TI</b>			
		<b>9331-TI-EN</b>	<b>9331-TI-NL</b>	<b>9331-TI-NA</b>
<b>Standard</b>	EN60079-0: 2004 EN 50020: 2002	EN60079-0: 2004 EN 50020: 2002	EN60079-15: 2005	EN60079-15: 2005
<b>Approved for</b>	⊕ II 1G EEx ia IIC T4 (-50°C<T <sub>o</sub> <+60°C)	⊕ II 1G EEx ia IIC T4 (-50°C<T <sub>o</sub> <+60°C)	⊕ II 3G EEx nL IIC T4 (-50°C<T <sub>o</sub> <+85°C) or ⊕ II 3G EEx nL IIC T5 (-50°C<T <sub>o</sub> <+70°C)	⊕ II 3G EEx nA nL IIC T4 (-50°C<T <sub>o</sub> <+85°C) or ⊕ II 3G EEx nA nL IIC T5 (-50°C<T <sub>o</sub> <+70°C)
<b>Cert. no.</b>	Baseefa06ATEX0328X	Baseefa06ATEX0328X	Baseefa06ATEX0325U	Baseefa06ATEX0325U
<b>Field Wiring Parameters</b>				
<b>Fieldbus</b>	U <sub>i</sub> = 17.5V I <sub>i</sub> = 380mA P <sub>i</sub> = 5.32W C <sub>i</sub> = 0 L <sub>i</sub> = 0	U <sub>i</sub> = 30V I <sub>i</sub> = 300mA P <sub>i</sub> = 1.3W C <sub>i</sub> = 0 L <sub>i</sub> = 0	U <sub>i</sub> = 42.4Vdc C <sub>i</sub> = 0 L <sub>i</sub> = 0	U <sub>i</sub> = 42.4Vdc C <sub>i</sub> = 0 L <sub>i</sub> = 0
<b>Sensor</b>	U <sub>o</sub> = 12.5V I <sub>o</sub> = 66mA P <sub>o</sub> = 41mW C <sub>i</sub> = 0 L <sub>i</sub> = 0 L <sub>o</sub> = 8.5mH C <sub>o</sub> = 1.19μF	U <sub>o</sub> = 12.5V I <sub>o</sub> = 66mA P <sub>o</sub> = 41mW C <sub>i</sub> = 0 L <sub>i</sub> = 0 L <sub>o</sub> = 8.5mH C <sub>o</sub> = 1.19μF	U <sub>o</sub> = 5V I <sub>o</sub> = 2.5mA L <sub>o</sub> = 1000mH C <sub>o</sub> = 1000μF	U <sub>o</sub> = 5V I <sub>o</sub> = 2.5mA L <sub>o</sub> = 1000mH C <sub>o</sub> = 1000μF

<b>Region</b>	<b>USA</b>		
<b>Authority</b>	<b>FM</b>		
	<b>9331-TI</b>		
<b>Standard</b>	3600, 3610, 3611, 3810, Supplement #1		
<b>Approved</b>	IS/I/1/ABCD/T4 Ta = 60°C - SCI-1015; Entity FISCO; Intrinsically Safe for use in Class I, Division 1, Groups A,B,C,D T4 (Tamb = 40° to 60°C)	NI/1/2/ABCD/T4A Ta = 85°C; T5 Ta = 70C SCI-1015; Non-incendive for use in Class 1, Division 2, Division 2, Groups A,B,C,D T4A (Tamb = 40° to 85°C), T5 (Tamb = 40° to 70°C)	
	<b>Entity</b>	<b>FISCO</b>	
<b>Cert. no.</b>	3030156	3030156	3030156
<b>Field Wiring Parameters</b>			
<b>Fieldbus</b>	V <sub>max</sub> = 30V I <sub>max</sub> = 300mA P <sub>max</sub> = 1.3W C <sub>i</sub> = 2,1nF L <sub>i</sub> = 0	V <sub>max</sub> = 17.5V I <sub>max</sub> = 380mA P <sub>max</sub> = 5.32W C <sub>i</sub> = 2.1nF L <sub>i</sub> = 0	V <sub>max</sub> = 42.4V  C <sub>i</sub> = 2.1nF L <sub>i</sub> = 0
<b>Sensor</b>	V <sub>t</sub> = 12.02V I <sub>sc</sub> = 13.6mA P <sub>o</sub> = 0.04W C <sub>a</sub> = 1.36μF L <sub>a</sub> = 160mH	V <sub>t</sub> = 12.02V I <sub>sc</sub> = 13.6mA P <sub>o</sub> = 0.04W C <sub>a</sub> = 1.36μF L <sub>a</sub> = 160mH	V <sub>t</sub> = 12.02V I <sub>sc</sub> = 13.6mA P <sub>o</sub> = 0.04W C <sub>a</sub> = 1.36μF L <sub>a</sub> = 160mH



<b>Region</b>	<b>Canada</b>			
<b>Authority</b>	<b>CSA</b>			
	<b>9331-TI</b>		<b>9331-TI (with 93-AI option)</b>	
<b>Standard</b>	CSA Std C22.2 No.25-1966, CSA Std C22.2 No.30-M1986, CAN/CSA-C22.2 No. 94-M91, CSA Std C22.2 No. 142-M1987, CAN/CSA-C22.2 No. 157-92, CSA Std C22.2 No. 213-M-1987			
<b>Approved for</b>	Intrinsically Safe Class I, Division 1, Groups A,B,C,D; T3C (-50°C<Ta<+60°C)		Class I, Div 1, Groups B,C,D; Cl. II, Groups E, F and G; Cl. III; T3C (-50°C<Ta<+60°C)	Class I, Div 2, Groups A,B,C,D T3C (-50°C<Ta<+60°C)
	<b>Entity</b>	<b>FISCO</b>		
<b>Cert. no.</b>	1920422	1920422	1920422	1920422
<b>Field Wiring Parameters</b>				
<b>Fieldbus</b>	Ui = 30V dc Ii = 300mA  Ci = 2.1nF Li = 0	Ui = 17.5V dc Ii = 380mA Pi = 5.32W Ci = 2.1nF Li = 0	Vmax = 42.4V  Ci = 2.1nF Li = 0	Vmax = 42.4V  Ci = 2.1nF Li = 0
<b>Sensor</b>	Voc = 12.02V Isc = 11.8mA  Ca = 1.36µF La = 225mH	Voc = 12.02V Isc = 11.8mA  Ca = 1.36µF La = 225mH	Vt = 12.02V Isc = 13.6mA Po = 0.04W Ca = 1.36µF La = 160mH	Vt = 12.02V Isc = 13.6mA Po = 0.04W Ca = 1.36µF La = 160mH



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# 8331-TI ACCESSORIES

## FCS-8331/8332 junction boxes

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The FCS-8331/2 Process JB's are suitable for Zone 2 and Zone 1 intrinsically safe (Ex i) applications. The FCS-8331 is designed for mounting one 9331-TI Temperature Multiplexer, while the FCS-8332 will accommodate two multiplexers.

The carbon loaded polyester enclosures provide the highest levels of corrosion resistance for the harshest process environments, while the controlled surface resistance eliminates the risk of static buildup.

A wide choice of glands, including stainless steel, nickel-plated brass and plastic, enables a high quality seal to be achieved with either standard or wire-armoured cables.

The mounting screws are insulated by the case material and are located outside of the lid seal. A 10mm earth stud and a breather are included as standard.

An adhesive backed, Traffolyte tag label is supplied loose or can be engraved with the tag number and fitted, if details are supplied when ordering.

One or two 9331-TI temperature multiplexers can be ordered pre-installed in one of these Process JB junction box, see ordering information for details.

### SPECIFICATION

#### GENERAL

##### Materials

Carbon-loaded, glass-fibre reinforced polyester, halogen-free, surface resistance < 10<sup>9</sup>Ω to EN 50014  
Stainless steel lid screws, silicone lid seal

##### DIN rail

DIN rail to EN 50022 35 x 7.5 'T' section, mounted horizontally  
and fitted with two end stops

##### Breather plug

Provided

##### External earth connection

M10 threaded stud

##### Tag label

Traffolyte, adhesive backed - white background - black text



#### ENVIRONMENTAL

##### Operating Temperature

-45°C to +70°C - Steel & nickel plated brass glands  
-30°C to +70°C - Plastic glands

##### Storage Temperature

-45°C to +85°C

##### Relative Humidity % RH (non-condensing)

5 to 95%

##### IP rating

IP66 to EN 60529

##### Impact resistance

7 Nm to EN 50014

##### Location of Process JB

Safe area, Zone 2, IIC T4 hazardous area or Zone 1, IIC T4 hazardous area for intrinsically safe fieldbus segment.

**Note:** If used in a hazardous area, the contents must be suitably certified/approved.



EUROPE (EMEA)  
AMERICAS  
ASIA PACIFIC

Tel: +44 (0)1582 723633  
Tel: +1 603 926 0090  
Tel: +65 6 487 7887

Fax: +44 (0)1582 422283  
Fax: +1 603 926 1899  
Fax: +65 6 487 7997

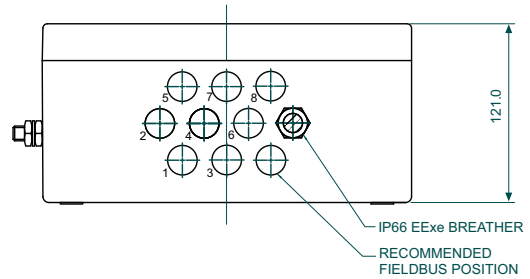
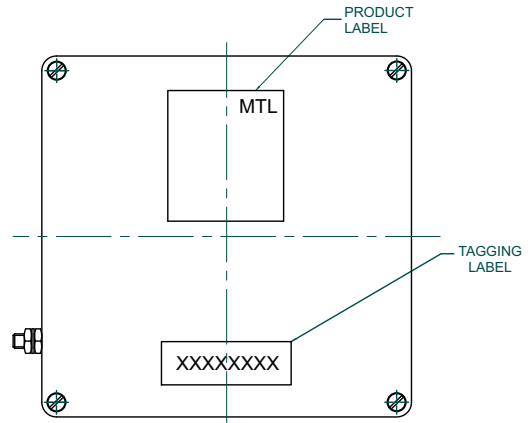
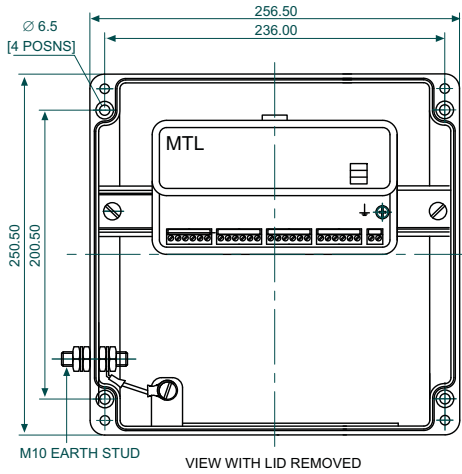
E-mail: [enquiry@mtl-inst.com](mailto:enquiry@mtl-inst.com) Web site: [www.mtl-inst.com](http://www.mtl-inst.com)

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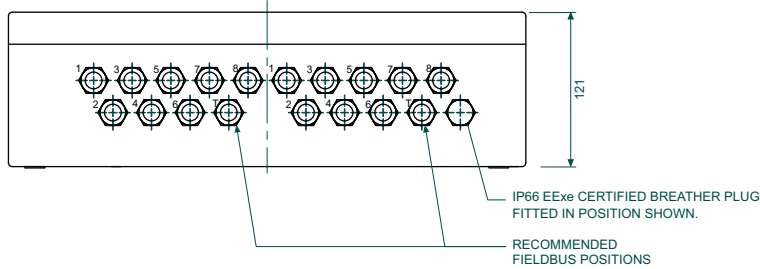
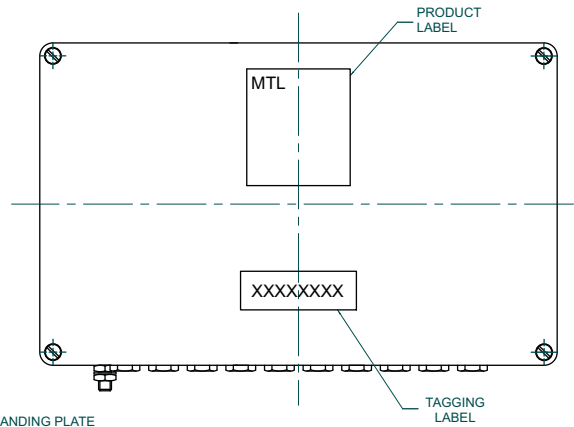
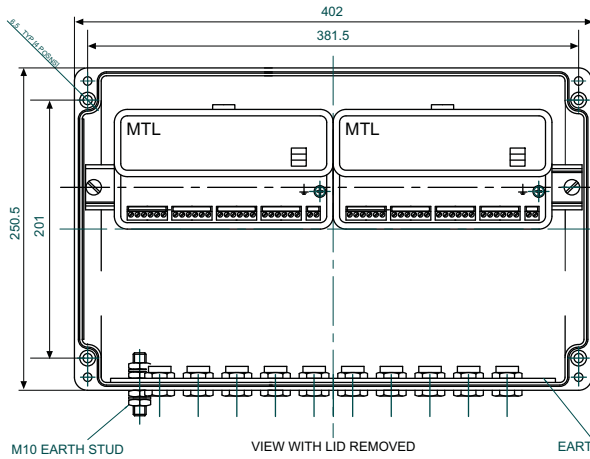


# ENCLOSURE DIMENSIONS

## FCS-8331



## FCS-8332



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# 9331-TI ACCESSORIES

## FCS-9331 junction box

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The FCS-9331 Process JB is suitable for Zone 2 and Zone 1 intrinsically safe (Ex i) and increased safety applications. The FCS-9331 is designed for mounting one 9331-TI Temperature Multiplexer.

The FCS-9331 enclosure is manufactured from polished 316 stainless steel to provide the highest levels of corrosion resistance for the harshest process environments.

A wide choice of glands, including stainless steel, nickel-plated brass and plastic, enables a high quality seal with standard or wire armoured cables.

The box incorporates a rain channel that prevents standing water from damaging the one-piece seal; diverting it away from the contents when the door is opened. A 10mm earth stud and a breather are also included as standard.

An adhesive backed, Traffolyte tag label is supplied loose or can be engraved with the tag number and fitted, if details are supplied when ordering.

A 9331-TI temperature multiplexer can be ordered pre-installed in one of these Process JB junction boxes, see ordering information for details.

### SPECIFICATIONS

#### GENERAL

##### Materials

Electrochemically polished 316 Stainless Steel  
Chloroprene gasket

##### DIN rail

DIN rail to EN 50022 35 x 7.5 'T' section, mounted horizontally  
and fitted with two end stops

##### Breather plug

Provided

##### External earth connection

M10 threaded stud

##### Tag label

Traffolyte, adhesive backed - white background - black text

##### Other

Hinged lid



#### ENVIRONMENTAL

##### Operating Temperature

-45°C to +70°C - Steel & nickel-plated brass glands  
-30°C to +70°C - Plastic glands

##### Storage Temperature

-45°C to +85°C

##### Relative Humidity % RH (non-condensing)

5 to 95%

##### IP rating

IP66 to EN 60529

##### Impact resistance

7 Nm to EN 50014

##### Location of Process JB

Safe area, Zone 2, IIC T4 hazardous area or Zone 1, IIC T4 hazardous area for intrinsically safe fieldbus segment.

**Note:** If used in a hazardous area, the contents must be suitably certified/approved.



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ASIA PACIFIC

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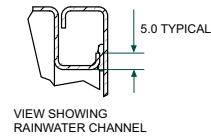
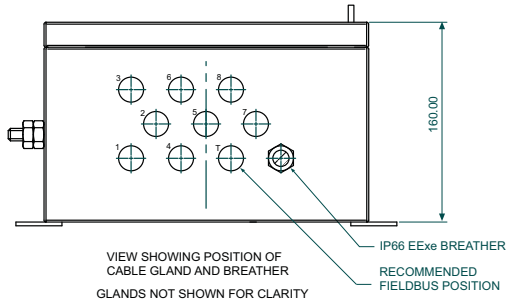
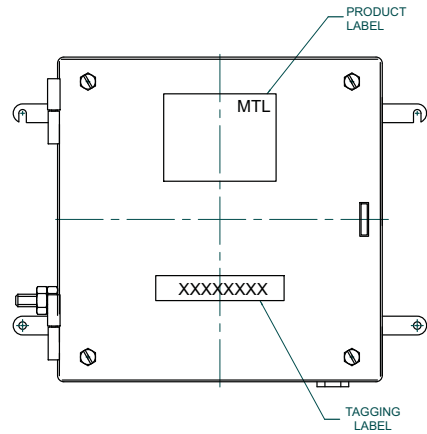
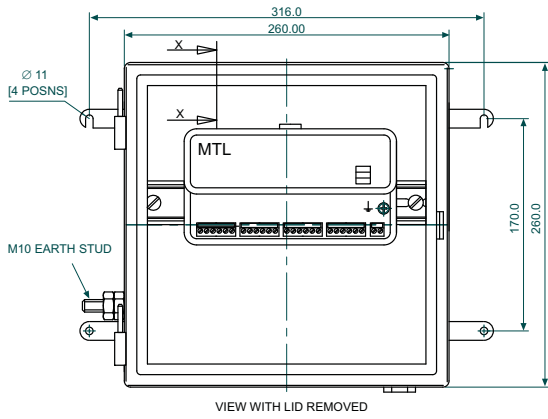
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# ENCLOSURE DIMENSIONS

## FCS-9331



## ENCLOSURE APPROVALS

Region		Europe	N America	
Authority		Kema	UL	
Standard		EN 50014:1992 + prA1 EN 50019:1994 + prA1 EN 50281-1:1998	UL50 C22.2 No94-M91	UL508 16th edition C22.2 No14 1983 IEC 79-0 1983 Amendments 1 + 2 IEC79-7 1990
Approved for		II 2 G EEx e II	Nema 4X for Class I Div 2	Class I, Zone 1 AEx e II, Ex e II
MTL Part No.	<b>Crouse Hinds Enclosure Part Number</b>	<b>Certificate Numbers</b>		
<b>FCS-9331</b>	NXT262616	Kema 99ATEX3174U	E115376	E108296

Region		Europe	N America	
Authority		PTB	UL	
Standard		EN 50014:1997 +A1+A2 EN 50019:1994	UL50	
Approved for		II 2 G EEx e II	Nema 4X for Class I Div 2	
MTL Part No.	<b>Bartec Enclosure Part Number</b>	<b>Certificate Numbers</b>		
<b>FCS-8331</b>	07-5185-2552/5012	PTB 01ATEX1014U	E188224	
<b>FCS-8332</b>	07-5185-4002/5012	PTB 01ATEX1014U	E188224	

## ASSEMBLY APPROVALS

Region	Europe	
Authority	Baseefa	
Standard	EN 60079-0: 2006, EN 60079-15: 2005,	
Approved for	⊕ II 3G Ex nL IIC T5 (-40°C<Ta<+65°C)	⊕ II 3G Ex nA nL IIC T5 (-40°C<Ta<+65°C)
Cert. no.	Baseefa07ATEX0117X	Baseefa07ATEX0117X
MTL Part No.	<b>9331-TI-8331y, 9331-TI-8332y, 9331-TI-9331y</b> (see ordering information)	

## GLAND OPTION DETAILS

Enclosures	Assemblies	Description	Gland model no.	Cable Size mm	Socket size mm	Temp. range
-A20	A	Nickel plated brass gland, for steel wired <b>armoured cable</b> M20 EEx d/e double seal	Capri ADE 4F 846694 6.0 – 12.0 inner diam. 0 – 1.25 armour	8.5 – 16.0 outer diam.	24	-40°C to +70°C
-R20	R	Stainless steel gland, for steel wired <b>armoured cable</b> M20 EEx d/e double seal	Capri ADE 4F 846699 6.0 – 12.0 inner diam. 0 – 1.25 armour	8.5 – 16.0 outer diam.	24	-40°C to +70°C
-S20	S	Stainless steel gland, M20, EEx e, single seal	Capri ADE 1F 816699	6.0 – 12.0 outer diam.	19/24	-40°C to +70°C
-C20	C	Nickel plated brass gland, M20, EEx e, single seal	Capri ADE 1F 816694	6.0 – 12.0 outer diam.	19/24	-40°C to +70°C
-P20	P	Black nylon gland M20, EEx e, single seal	Jakob 50.620 PASWL/EX	5.5 – 13.0 outer diam.	24	-30°C to +70°C



## ORDERING INFORMATION

Part No.	Description
<b>Multiplexers</b>	
<b>9331-TI</b>	Fieldbus TI multiplexer
<b>9331-TI-EN</b>	Fieldbus TI multiplexer-IS entity
<b>9331-TI-NA</b>	Fieldbus TI multiplexer-nA/nL
<b>9331-TI-NL</b>	Fieldbus TI multiplexer-nL

### Accessories

<b>93-AI</b>	Analogue connector (2 inputs/connector)
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### Enclosures (see table below)

<b>FCS-8331-YYY</b>	Process JB, carbon loaded GRP for 1 x 9331-TI
<b>FCS-8332-YYY</b>	Process JB, carbon loaded GRP for 2 x 9331-TI
<b>FCS-9331-YYY</b>	Process JB, 316 stainless steel for 1 x 9331-TI

### Assemblies (see table below)

<b>9331-TI-8331y</b>	One fieldbus TI multiplexer installed in FCS-8331 enclosure
<b>9331-TI-8332y</b>	Two fieldbus TI multiplexers installed in FCS-8332 enclosure
<b>9331-TI-9331y</b>	One fieldbus TI multiplexer installed in FCS-9331 enclosure

### Glanding options for enclosures and assemblies

Enclosure suffix 'YYY'	Assembly suffix 'y'	Trunk & Spur glanding type
<b>O20</b>	-	Predrilled for M20 glands - none fitted
<b>X20</b>	<b>X</b>	Predrilled, with M20 brass blanking plugs
<b>Y20</b>	<b>Y</b>	Predrilled, with M20 plastic blanking plugs
<b>A20</b>	<b>A</b>	Nickel-plated brass M20 glands for wire-armoured cable
<b>R20</b>	<b>R</b>	Stainless Steel M20 glands for wire-armoured cable
<b>S20</b>	<b>S</b>	Stainless Steel M20 glands
<b>C20</b>	<b>C</b>	Nickel-plated brass M20 glands
<b>P20</b>	<b>P</b>	Plastic M20 glands

