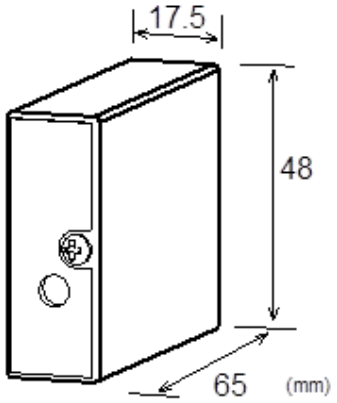
DESCRIPTION

The MS2900-TH is an I/O adapter that does not provide any signal conditioning. The module includes a front-accessible push-button switch, which allows the user to utilize the internal shunt resistor (250Ω) to convert current signal into voltage signal.



ORDERING INFORMATION

Ordering Code
MS2900-TH

SPECIFICATIONS

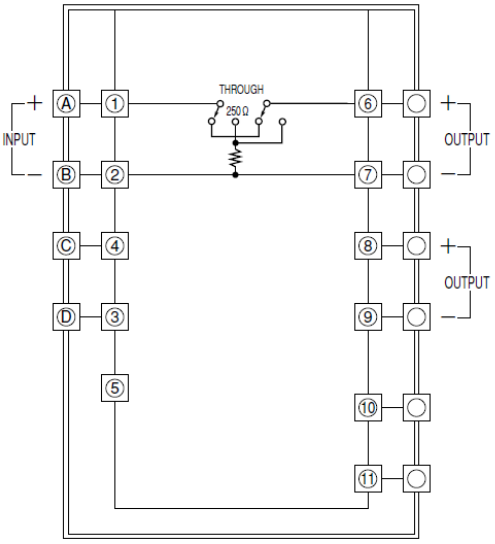
INPUT SECTION	
Input	1 to 5V DC voltage signals or 4 to 20mA DC current signals Note: When the front-accessible switch is turned on for current signal input, the internal 250Ω shunt resistor is connected across the input to output voltage signals. The switch must be turned off for voltage signal input.
Shunt Resistor	250Ω (Accuracy: ±0.1%)

PERFORMANCE	
Operating Environment	Ambient temperature: 0 to 55°C Humidity: 5 to 90% RH (non-condensing)
Storage Temperature	−10 to 60°C

PHYSICAL	
Installation	Mounted in an optional chassis (RC2900).
Wiring	Wired to an optional chassis (RC2900).
External Dimensions	W17.5 × H48 × D65 mm
Weight	Approx. 70g

MATERIAL	
Housing	ABS resin (UL 94V-0)
PC Board	Glass fabric, epoxy resin (FR-4: UL 94V-0)

BLOCK DIAGRAM



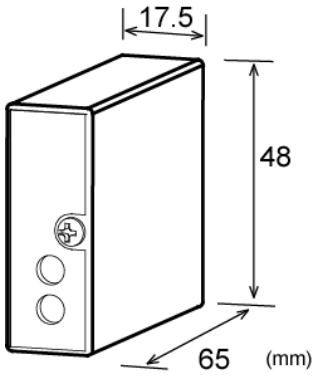
Product Specification Sheet Model: MS2901

Chassis-Mount Thermocouple Temperature Transmitter with Isolated Dual Output

DESCRIPTION

The MS2901 is a chassis-mount thermocouple temperature transmitter that converts millivolt input signals from a thermocouple into mutually isolated dual channel DC output signals.

- ▽ Features cold junction compensation, linearization, and burnout protection.
- ▽ A multi-slot chassis provides ease of maintenance and high-density mounting.
- ▽ Input, output 1, output 2, and power circuits are all isolated from each other.
- ▽ Equipped with a fuse on the DC power line as standard.



ORDERING INFORMATION

Ordering Code
MS2901-□ (□–□)-8□□-B□ [1] [2] [3] [4]

SPECIFICATIONS

POWER SECTION

Power Requirement	24V DC±10%
Power Sensitivity	Better than ±0.1% of span per 10% change in supply voltage
Power Line Fuse	2.2Ω 1/4W fuse resistor
Current Consumption	50mA max.

INPUT SECTION

Input (Specify a code in the field [1].)	JIS or other standard thermocouples (Span: 3mV min.) Code ■ Type K thermocouple ····· K ■ Type E thermocouple ····· E ■ Type J thermocouple ····· J ■ Type T thermocouple ····· T ■ Type B thermocouple ····· B ■ Type R thermocouple ····· R ■ Type S thermocouple ····· S ■ Type N thermocouple ····· N ■ Other than those above ····· X Specify a thermocouple standard (A) and symbol (B) as indicated below: X = A / B Notes: 1. When the type of a thermocouple is specified with a JIS symbol, the latest edition of the relevant JIS will be used, unless otherwise requested. 2. For non-JIS standard thermocouples, submission of a relevant EMF table may be required.
Input Range (Specify a range in the field [2].)	Specify a measuring temperature range in °C within the range given in the EMF table. The input span must be 3mV or greater. Notes: 1. For input temperature ranges starting from any specified temperature below 0°C, the accuracy may be partly out of specification. 2. For the type B thermocouple, the accuracy in the temperature range below 600°C is not guaranteed.
Input Resistance	1MΩ min. (without power, 10kΩ at rated input)
Allowable Signal Source Resistance	1kΩ max.
Allowable Input Voltage	30V DC max., continuous.
Cold Junction Compensation	A cold-junction compensation sensor attached to an optional chassis (RC2900).
Cold Junction Compensation Error	±0.3°C max.
Linearizer	Built-in (6 segments max.)

OUTPUT SECTION

Output (Specify a code in the field [3].)	Output 1 / Output 2 ····· Code ■ 1–5V DC / 1–5V DC ····· V1 ■ 0–5V DC / 0–5V DC ····· V5 ■ 0–10V DC / 0–10V DC ····· V6 ■ 1–5V DC / 4–20mA DC ····· C1 Note: Combinations of two outputs are only available as shown above.
Allowable Output Load	Voltage output: 2mA max. Current output: 300Ω max.
Zero Adjustment	Approx. ±2% of span (Adjustable by front-accessible trimmer)
Span Adjustment	Approx. ±2% of span (Adjustable by front-accessible trimmer)

Burnout Protection (Specify a code in the field [4].)	■ Upscale ····· U ■ Downscale ····· D (Selectable by selector switch on the side of the unit) Note: Upscale burnout protection will apply if nothing is specified.

PERFORMANCE

Accuracy Rating	Better than ± (0.1% of span + 0.3°C[*1] + linearity error[*2]) (at 25°C±5°C) *1: Accuracy of the cold-junction compensation sensor *2: Linearity errors vary with input spans. (0.1% of span, typical)
Temperature Effect	Better than ±0.2% of span per 10°C change in ambient.
Burnout Drive Time	Approx. input span (mV) × 0.3 seconds
Standard Response Time	Approx. 2Hz−3dB
Isolation	Isolation between input, output 1, output 2, and power.
Insulation Resistance	100MΩ min. (@ 500V DC) between input, output 1, output 2, and power.
Dielectric Strength	Input / [Output 1, Output 2, Power]: 1500V AC for 1 minute (Cutoff current: 0.5mA) Output 1 / Output 2 / Power: 500V AC for 1 minute (Cutoff current: 0.5mA)
Surge Withstand Capability	Tested as per ANSI/IEEE C37.90.1-1989.
Operating Environment	Ambient temperature: 0 to 55°C Humidity: 5 to 90% RH (non-condensing)
Storage Temperature	−10 to 60°C

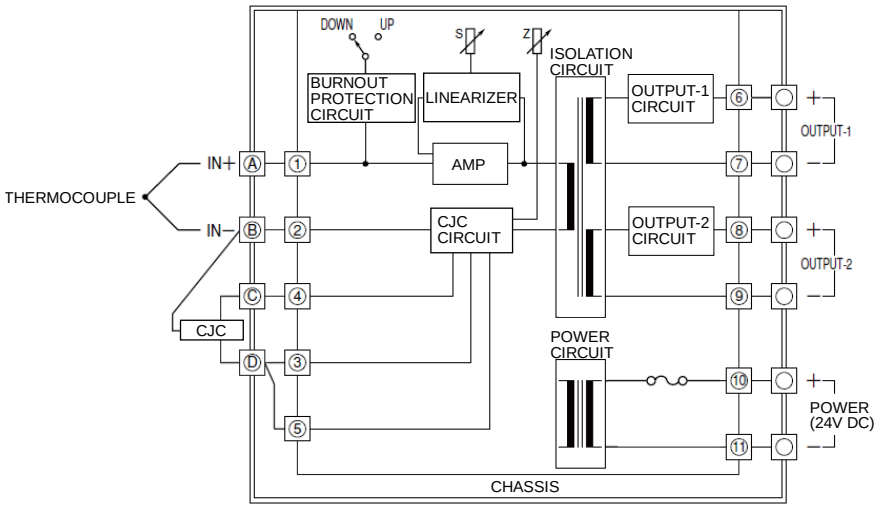
PHYSICAL

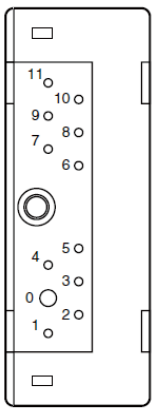
Installation	Mounted in an optional chassis (RC2900).
Wiring	Wired to an optional chassis (RC2900).
External Dimensions	W17.5 × H48 × D65 mm
Weight	Approx. 70g

MATERIAL

Housing	ABS resin (UL 94V-0)
PC Board	Glass fabric, epoxy resin (FR-4: UL 94V-0)
Potting Agent	Polyurethane

BLOCK DIAGRAM AND CONNECTION DIAGRAM





I/O PIN LAYOUT

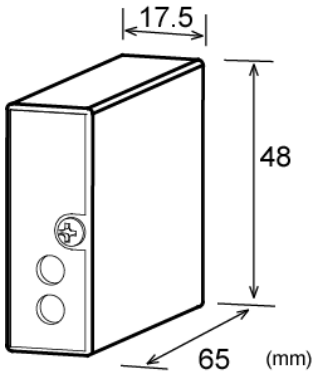
Product Specification Sheet Model: MS2902

Chassis-Mount RTD Temperature Transmitter with Isolated Dual Output

DESCRIPTION

The MS2902 is a chassis-mount RTD temperature transmitter that supplies constant current to a three-wire RTD and converts its mV input signals into mutually isolated dual channel DC output signals.

- ▽ Features linearization and burnout protection.
- ▽ A multi-slot chassis provides ease of maintenance and high-density mounting.
- ▽ Input, output 1, output 2, and power circuits are all isolated from each other.
- ▽ Equipped with a fuse on the DC power line as standard.



ORDERING INFORMATION

Ordering Code
MS2902-□ (□–□)-8□□ [1] [2] [3]

SPECIFICATIONS

POWER SECTION

Power Requirement	24V DC±10%
Power Sensitivity	Better than ±0.1% of span per 10% change in supply voltage
Power Line Fuse	300mA fuse
Current Consumption	50mA max.

INPUT SECTION

Input (Specify a code in the field [1].)	JIS or other 3-wire RTDs Code ■ Pt 100Ω ····· Pt100 ■ JPt 100Ω ····· JPt100 ■ Other than those above····· X Specify an RTD standard (A) and symbol (B) as indicated below: X = A / B Notes: 1. When a JIS symbol is specified, the resistance table of the latest edition of the relevant JIS will be used, unless otherwise requested. 2. For other RTD types, submission of a resistance table may be required.
Input Range (Specify a range in the field [2].)	Specify an input range in °C within the range given in the resistance table.
Excitation Current	Approx. 1mA with Pt for 0 to 100°C
Input Lead Wire Resistance	200Ω max. per wire
Lead-Wire Resistance Sensitivity	Better than 0.1% of span per 5Ω

OUTPUT SECTION

Output (Specify a code in the field [3].)	Output 1 / Output 2 ····· Code ■ 1–5V DC / 1–5V DC·····V1 ■ 0–5V DC / 0–5V DC·····V5 ■ 0–10V DC / 0–10V DC·····V6 ■ 1–5V DC / 4–20mA DC ·····C1 Note: Combinations of two outputs are only available as shown above.
Allowable Output Load	Voltage output: 2mA max. Current output: 300Ω max.
Zero Adjustment	Approx. ±2% of span (Adjustable by front-accessible trimmer)
Span Adjustment	Approx. ±2% of span (Adjustable by front-accessible trimmer)
Burnout Protection	Upscale

PERFORMANCE

Accuracy Rating	Better than ± (0.15% of span + 0.1°C) (at 25°C±5°C)
Temperature Effect	Better than ±0.2% of span per 10°C change in ambient.
Burnout Drive Time	30ms max.
Standard Response Time	Approx. 2Hz−3dB
Isolation	Isolation between input, output 1, output 2, and power.
Insulation Resistance	100MΩ min. (@ 500V DC) between input, output 1, output 2, and power.
Dielectric Strength	Input / [Output 1, Output 2, Power]: 1500V AC for 1 minute (Cutoff current: 0.5mA) Output 1 / Output 2 / Power: 500V AC for 1 minute (Cutoff current: 0.5mA)
Surge Withstand Capability	Tested as per ANSI/IEEE C37.90.1-1989.
Operating Environment	Ambient temperature: 0 to 55°C Humidity: 5 to 90% RH (non-condensing)

Storage Temperature	−10 to 60°C

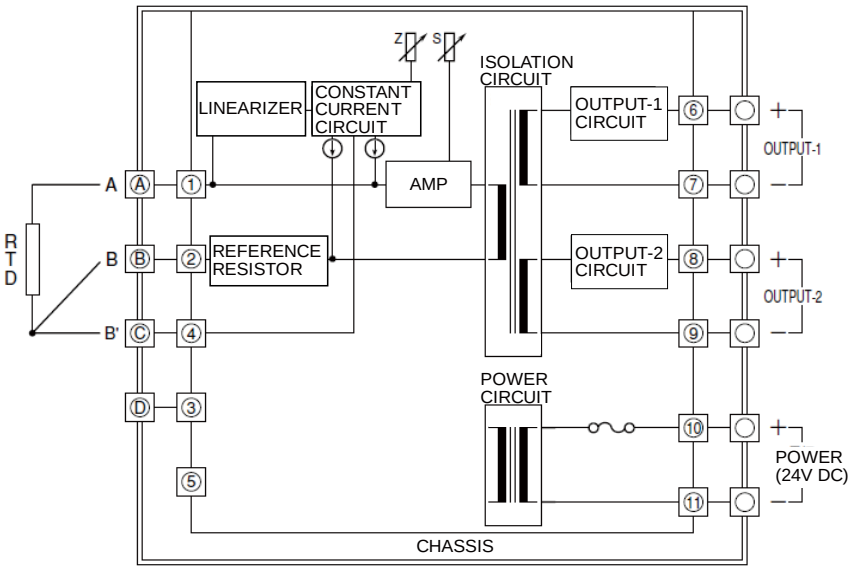
PHYSICAL

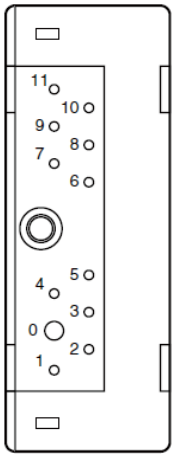
Installation	Mounted in an optional chassis (RC2900).
Wiring	Wired to an optional chassis (RC2900).
External Dimensions	W17.5 × H48 × D65 mm
Weight	70g max.

MATERIAL

Housing	ABS resin (UL 94V-0)
PC Board	Glass fabric, epoxy resin (FR-4: UL 94V-0)
Potting Agent	Polyurethane

BLOCK DIAGRAM AND CONNECTION DIAGRAM





I/O PIN LAYOUT

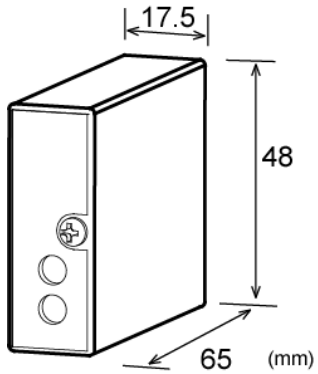
Product Specification Sheet Model: MS2903

Chassis-Mount Millivolt Isolator with Isolated Dual Output

DESCRIPTION

The MS2903 is a chassis-mount millivolt isolator that converts millivolt signals from sensors or other devices into mutually isolated dual channel DC output signals.

- ▽ A multi-slot chassis provides ease of maintenance and high-density mounting.
- ▽ Input, output 1, output 2, and power circuits are all isolated from each other.
- ▽ Equipped with a fuse on the DC power line as standard.



ORDERING INFORMATION

Ordering Code
MS2903-1□□-8□□ [1] [2]

SPECIFICATIONS

POWER SECTION

Power Requirement	24V DC±10%
Power Sensitivity	Better than ±0.1% of span per 10% change in supply voltage
Power Line Fuse	300mA fuse
Current Consumption	50mA max.

INPUT SECTION

Input (Specify a code in the field [1].)	■ ±10mV DC ·····W2 ■ ±100mV DC·····W3 ■ Other DC voltage signals ·····X1 (□–□) Specify an input range in parentheses. The span must be between 5mV and 200mV.
Input Resistance	1MΩ min. (10kΩ min. without power)
Allowable Input Voltage	30V DC max., continuous.

OUTPUT SECTION

Output (Specify a code in the field [2].)	Output 1 / Output 2 ·····Code ■ 1–5V DC / 1–5V DC·····V1 ■ 0–5V DC / 0–5V DC·····V5 ■ 0–10V DC / 0–10V DC·····V6 ■ 1–5V DC / 4–20mA DC ·····C1 Note: Combinations of two outputs are only available as shown above.
Allowable Output Load	Voltage output: 2mA max. Current output: 300Ω max.
Zero Adjustment	Approx. ±2% of span (Adjustable by front-accessible trimmer)
Span Adjustment	Approx. ±2% of span (Adjustable by front-accessible trimmer)

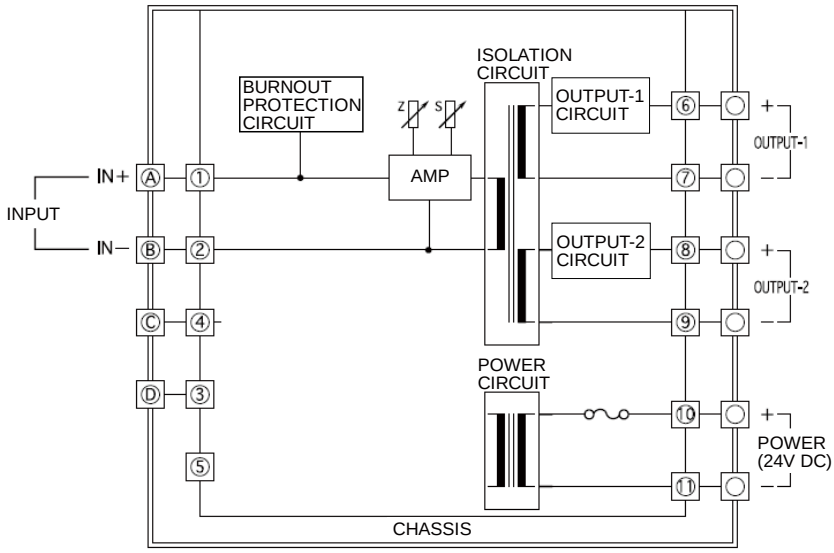
PERFORMANCE

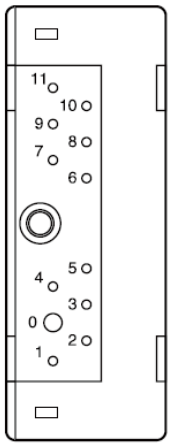
Accuracy Rating	Better than ±0.1% of span (at 25°C±5°C)
Temperature Effect	Better than ±0.2% of span per 10°C change in ambient.
Standard Response Time	Approx. 2Hz−3dB
Isolation	Isolation between input, output 1, output 2, and power.
Insulation Resistance	100MΩ min. (@ 500V DC) between input, output 1, output 2, and power.
Dielectric Strength	Input / [Output 1, Output 2, Power]: 1500V AC for 1 minute (Cutoff current: 0.5mA) Output 1 / Output 2 / Power: 500V AC for 1 minute (Cutoff current: 0.5mA)
Surge Withstand Capability	Tested as per ANSI/IEEE C37.90.1-1989.
Operating Environment	Ambient temperature: 0 to 55°C Humidity: 5 to 90% RH (non-condensing)
Storage Temperature	−10 to 60°C

PHYSICAL	
Installation	Mounted in an optional chassis (RC2900).
Wiring	Wired to an optional chassis (RC2900).
External Dimensions	W17.5 × H48 × D65 mm
Weight	70g max.

MATERIAL	
Housing	ABS resin (UL 94V-0)
PC Board	Glass fabric, epoxy resin (FR-4: UL 94V-0)
Potting Agent	Polyurethane

BLOCK DIAGRAM AND CONNECTION DIAGRAM





I/O PIN LAYOUT

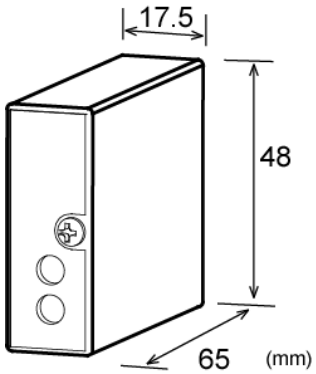
Product Specification Sheet Model: MS2904

Chassis-Mount High-Level Signal Conditioner (Isolator) with Isolated Dual Output

DESCRIPTION

The MS2904 is a chassis-mount high-level signal conditioner (isolator) that converts high-level DC input signals into mutually isolated dual channel DC output signals.

- ▽ A multi-slot chassis provides ease of maintenance and high-density mounting.
- ▽ Input, output 1, output 2, and power circuits are all isolated from each other.
- ▽ Equipped with a fuse on the DC power line as standard.



ORDERING INFORMATION

Ordering Code
MS2904-1□□-8□□ [1] [2]

SPECIFICATIONS

POWER SECTION

Power Requirement	24V DC±10%
Power Sensitivity	Better than ±0.1% of span per 10% change in supply voltage
Power Line Fuse	300mA fuse
Current Consumption	50mA max.

INPUT SECTION

Input (Specify a code in the field [1].)	■ 1–5V DC ····· V1 ■ 0–1V DC ····· V4 ■ 0–5V DC ····· V5 ■ 0–10V DC ····· V6 ■ ±5V DC ····· W5 ■ ±10V DC ····· W6 ■ Other DC voltage signals ····· X2 (□–□) Specify a DC voltage range in parentheses. The ranges available are from 0–200mV to 0–50V and from ±200mV to ±50V. ■ 4–20mA DC ····· C1
Input Resistance	Voltage input: 1MΩ min. (10kΩ min. without power) Current input: 250Ω
Allowable Input Voltage	Voltage input: 30V DC max., continuous. Current input: 40mA DC max., continuous.

OUTPUT SECTION

Output (Specify a code in the field [2].)	Output 1 / Output 2 ····· Code ■ 1–5V DC / 1–5V DC ····· V1 ■ 0–5V DC / 0–5V DC ····· V5 ■ 0–10V DC / 0–10V DC ····· V6 ■ ±5V DC / ±5V DC ····· W5 ■ ±10V DC / ±10V DC ····· W6 ■ 1–5V DC / 4–20mA DC ····· C1 Note: Combinations of two outputs are only available as shown above.
Allowable Output Load	Voltage output: 2mA max. Current output: 300Ω max.
Zero Adjustment	Approx. ±2% of span (Adjustable by front-accessible trimmer)
Span Adjustment	Approx. ±2% of span (Adjustable by front-accessible trimmer)

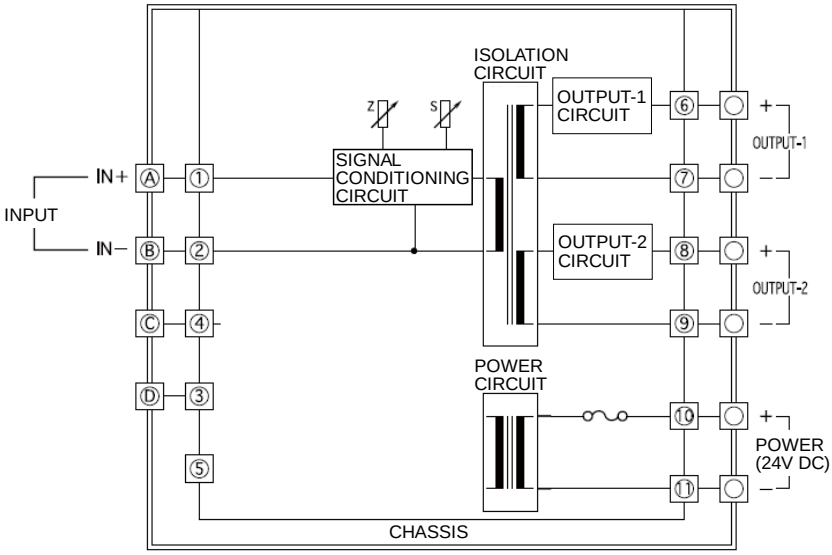
PERFORMANCE

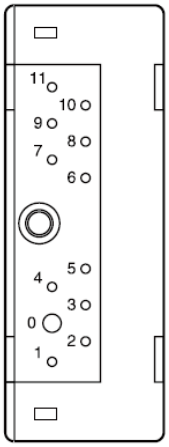
Accuracy Rating	Better than ±0.1% of span (at 25°C±5°C)
Temperature Effect	Better than ±0.2% of span per 10°C change in ambient.
Standard Response Time	Approx. 30Hz−3dB
Isolation	Isolation between input, output 1, output 2, and power.
Insulation Resistance	100MΩ min. (@ 500V DC) between input, output 1, output 2, and power.
Dielectric Strength	Input / [Output 1, Output 2, Power]: 1500V AC for 1 minute (Cutoff current: 0.5mA) Output 1 / Output 2 / Power: 500V AC for 1 minute (Cutoff current: 0.5mA)
Surge Withstand Capability	Tested as per ANSI/IEEE C37.90.1-1989.
Operating Environment	Ambient temperature: 0 to 55°C Humidity: 5 to 90% RH (non-condensing)
Storage Temperature	−10 to 60°C

PHYSICAL	
Installation	Mounted in an optional chassis (RC2900).
Wiring	Wired to an optional chassis (RC2900).
External Dimensions	W17.5 × H48 × D65 mm
Weight	70g max.

MATERIAL	
Housing	ABS resin (UL 94V-0)
PC Board	Glass fabric, epoxy resin (FR-4: UL 94V-0)
Potting Agent	Polyurethane

BLOCK DIAGRAM AND CONNECTION DIAGRAM





I/O PIN LAYOUT

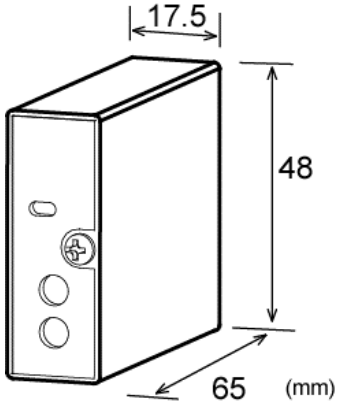
Product Specification Sheet Model: MS2905

Chassis-Mount Alarm Setter

DESCRIPTION

The MS2905 is a chassis-mount alarm setter that compares the level of a DC input signal with a preset trip point and outputs an isolated relay contact closure signal.

- ▽ A multi-slot chassis provides ease of maintenance and high-density mounting.
- ▽ Input, output, and power circuits are all isolated from each other.
- ▽ Equipped with a fuse on the DC power line as standard.



ORDERING INFORMATION

Ordering Code
MS2905-1□□-8□□ [1] [2]

SPECIFICATIONS

POWER SECTION

Power Requirement	24V DC±10%
Power Line Fuse	300mA fuse
Current Consumption	50mA max.

INPUT SECTION

Input (Specify a code in the field [1].)	■ 1–5V DC ····· V1 ■ 0–5V DC ····· V5 ■ 0–10V DC ····· V6 ■ 4–20mA DC (input resistance 250Ω) ·····C1
Input Resistance	Voltage input: 1MΩ min. (10kΩ without power) Current input: 250Ω
Allowable Input Voltage	Voltage input: 30V DC max., continuous. Current input: Twice the rated input, continuous.

OUTPUT SECTION

Relay Activation Modes (Specify a code in the field [2].)	Mode of operation can be selected from the table below. The relay state without power cannot be changed by users, but the mode of operation can be altered using the push-button switch on the bottom.

Input value > Set value	Input value < Set value	Relay state without Power	Switch Setting	Output Code
ON	OFF	OFF		OH
OFF	ON	OFF		OL
OFF	ON	ON		CH
ON	OFF	ON		CL

Trip Point (Specify a value.)	Specify a trip point within the range of 0 to 99.5% of input span, as in the example below; otherwise, it will be adjusted to 50% of input span. (Example) Trip point: 80%
Output	SPST relay contact closure signal
Setting	Through the front-accessible rotary switches.
Range	0 to 99% in 1% steps (+0.5% with the toggle switch on)
Accuracy	±0.5% of span
Hysteresis	±0.1% of span

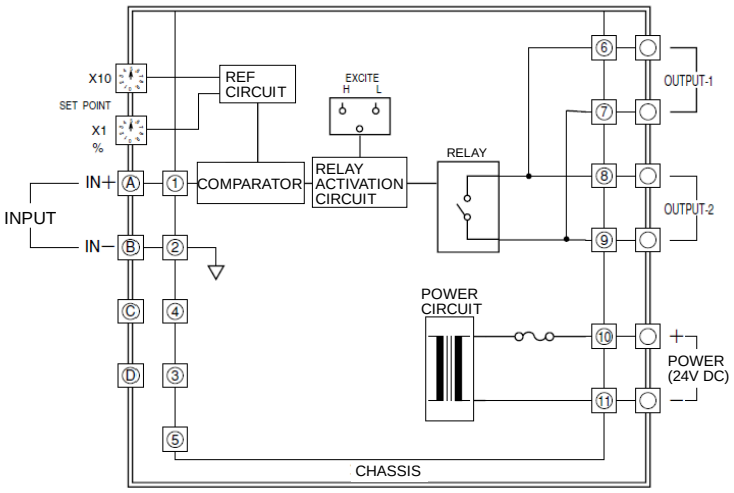
PERFORMANCE

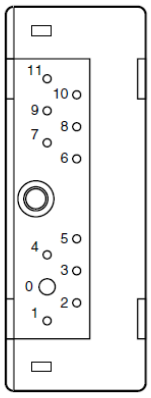
Input Response Frequency	Approx. 2Hz−3dB
Relay Response Time	Approx. 3ms
Isolation	Isolation between input, output, and power.
Insulation Resistance	100MΩ min. (@ 500V DC) between input, output, and power.
Dielectric Strength	Input / [Output, Power]: 1500V AC for 1 minute (Cutoff current: 0.5mA) Output / Power: 500V AC for 1 minute (Cutoff current: 0.5mA)
Contact Dielectric Strength	Contact / Contact: 500V AC for 1 minute (Cutoff current: 10mA) Contact/ Coil: 500V AC for 1 minute (Cutoff current: 10mA)
Contact Capacity	Rated control capacity (resistive load): 1A 30V DC Maximum allowable power (resistive load): 30W DC / 62.5VA AC Maximum allowable voltage: 110V DC / 125V AC Maximum allowable current: 1A
Surge Withstand Capability	Tested as per ANSI/IEEE C37.90.1-1989.
Operating Environment	Ambient temperature: 0 to 55°C Humidity: 5 to 90% RH (non-condensing)
Storage Temperature	−10 to 60°C

PHYSICAL	
Installation	Mounted in an optional chassis (RC2900).
Wiring	Wired to an optional chassis (RC2900).
External Dimensions	W17.5 × H48 × D65 mm
Weight	Approx. 70g

MATERIAL	
Housing	ABS resin (UL 94V-0)
PC Board	Glass fabric, epoxy resin (FR-4: UL 94V-0)
Potting Agent	Polyurethane

BLOCK DIAGRAM AND CONNECTION DIAGRAM





I/O PIN LAYOUT

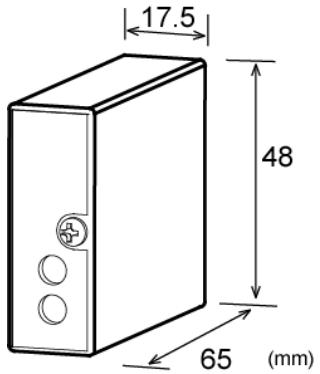
Product Specification Sheet Model: MS2906

Chassis-Mount Strain Gauge Transmitter with Isolated Dual Output

DESCRIPTION

The MS2906 is a chassis-mount strain gauge transmitter that supplies excitation voltage to strain-gauge type pressure sensors, load cells, and the like and converts their output signals into mutually isolated dual channel DC output signals.

- ▽ Built-in excitation for sensors
- ▽ A multi-slot chassis provides ease of maintenance and high-density mounting.
- ▽ Input, output 1, output 2, and power circuits are all isolated from each other.
- ▽ Equipped with a fuse on the DC power line as standard.



ORDERING INFORMATION

Ordering Code
MS2906-□□-□□Ω-1□□ [1] [2] [3]

SPECIFICATIONS

POWER SECTION

Power Requirement	24V DC±10%
Power Sensitivity	Better than ±0.1% of span per 10% change in supply voltage
Power Line Fuse	2.2Ω 1/4W fuse resistor
Current Consumption	80mA max.

INPUT SECTION

Excitation Voltage (Specify a code in the field [1].)	■ 5V DC ····· E2 ■ 10V DC ····· E3 ■ Other excitation voltages ····· EY (□□□) Specify an excitation voltage within the range of 5 to 10V in parentheses.
Excitation Current	Maximum current: 42mA
Bridge Resistance (Specify a value in the field [2].)	Specify a resistance value.
Input (Specify a code in the field [3].)	DC voltage signal from strain-gauge type sensors ■ 0–10mV DC ····· V2 ■ 0–100mV DC ····· V3 ■ ±10mV DC ····· W2 ■ ±100mV DC ····· W3 ■ Other DC voltage signals ····· X1 (□–□) Specify an input range in parentheses. The span must be at least 5mV.
Input Resistance	1MΩ min. (10kΩ min. without power)
Allowable Input Voltage	30V DC max., continuous.

OUTPUT SECTION

Output 1	1–5V DC
Output 2	4–20mA DC
Allowable Output Load	Voltage output: 2mA max. Current output: 300Ω max.
Zero Adjustment	Approx. ±30% of span (Adjustable by front-accessible trimmer)
Span Adjustment	Approx. ±10% of span (Adjustable by front-accessible trimmer)

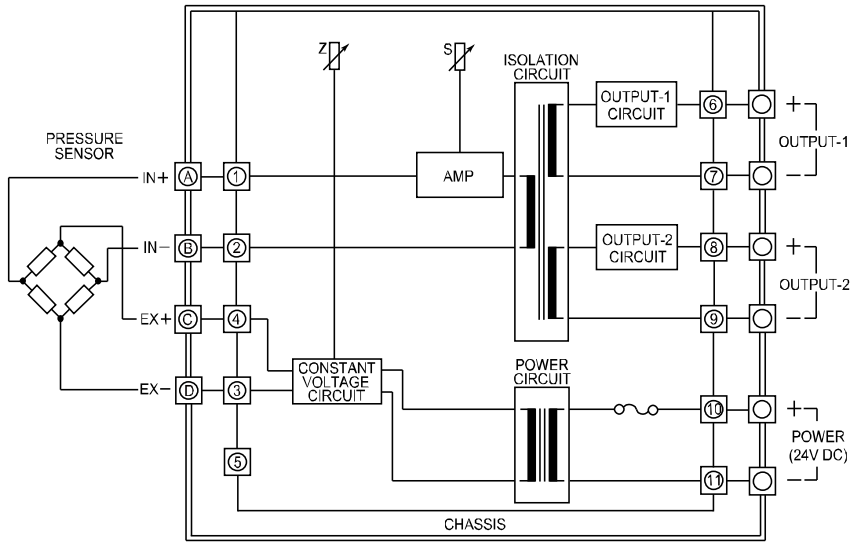
PERFORMANCE

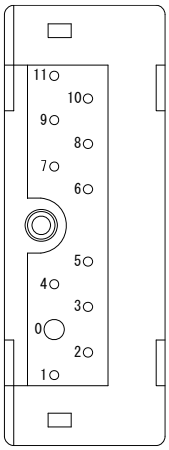
Accuracy Rating	Better than ±0.1% of span (at 25°C±5°C)
Temperature Effect	Better than ±0.2% of span per 10°C change in ambient.
Standard Response Time	Approx. 2Hz−3dB (63%, 0.1s)
Isolation	Isolation between input, output 1, output 2, and power.
Insulation Resistance	100MΩ min. (@ 500V DC) between input, output 1, output 2, and power.
Dielectric Strength	Input / [Output 1, Output 2, Power]: 1500V AC for 1 minute (Cutoff current: 0.5mA) Output 1 / Output 2 / Power: 500V AC for 1 minute (Cutoff current: 0.5mA)
Surge Withstand Capability	Tested as per ANSI/IEEE C37.90.1-1989.
Operating Environment	Ambient temperature: 0 to 55°C Humidity: 5 to 90% RH (non-condensing)
Storage Temperature	−10 to 60°C

PHYSICAL	
Installation	Mounted in an optional chassis (RC2900).
Wiring	Wired to an optional chassis (RC2900).
External Dimensions	W17.5 × H48 × D65 mm
Weight	Approx. 70g

MATERIAL	
Housing	ABS resin (UL 94V-0)
PC Board	Glass fabric, epoxy resin (FR-4: UL 94V-0)
Potting Agent	Polyurethane

BLOCK DIAGRAM AND CONNECTION DIAGRAM





I/O PIN LAYOUT

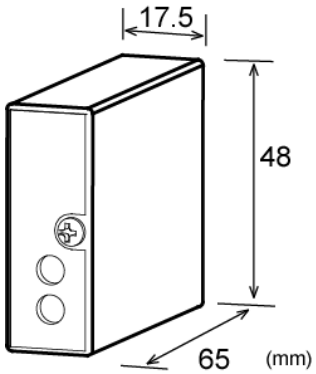
Product Specification Sheet Model: MS2907

Chassis-Mount Distributor with Isolated Dual Output

DESCRIPTION

The MS2907 is a chassis-mount distributor that powers a two-wire transmitter and converts its 4−20mA signals into mutually isolated dual channel DC output signals.

- ▽ A multi-slot chassis provides ease of maintenance and high-density mounting.
- ▽ Input, output 1, output 2, and power circuits are all isolated from each other.
- ▽ Equipped with a fuse on the DC power line as standard.



ORDERING INFORMATION

Ordering Code
MS2907-8□□ [1]

SPECIFICATIONS

POWER SECTION

Power Requirement	24V DC±10%
Power Sensitivity	Better than ±0.1% of span per 10% change in supply voltage
Power Line Fuse	300mA fuse
Current Consumption	80mA max.

INPUT SECTION

Input	4 to 20mA DC from 2-wire transmitters
Input Resistance	250Ω
Transmitter Power Supply	Output voltage: 24V DC, typical (0% input) 18V DC, typical (100% input) Maximum current: Approx. 25mA
Transmitter Load Resistance	550Ω max.
Limit Current for Short-Circuit Protection	26mA, typical. Built-in short-circuit detection circuit for output codes of V1, V5, and V6.
Permissible Short-Circuit Duration	Continuous.

OUTPUT SECTION

Output (Specify a code in the field [1].)	Output 1 / Output 2 ····· Code ■ 1–5V DC / 1–5V DC ····· V1 ■ 0–5V DC / 0–5V DC ····· V5 ■ 0–10V DC / 0–10V DC ····· V6 ■ 1–5V DC / 4–20mA DC ····· C1 Note: Combinations of two outputs are only available as shown above.
Allowable Output Load	Voltage output: 2mA max. Current output: 300Ω max.
Zero Adjustment	Approx. ±2% of span (Adjustable by front-accessible trimmer)
Span Adjustment	Approx. ±2% of span (Adjustable by front-accessible trimmer)

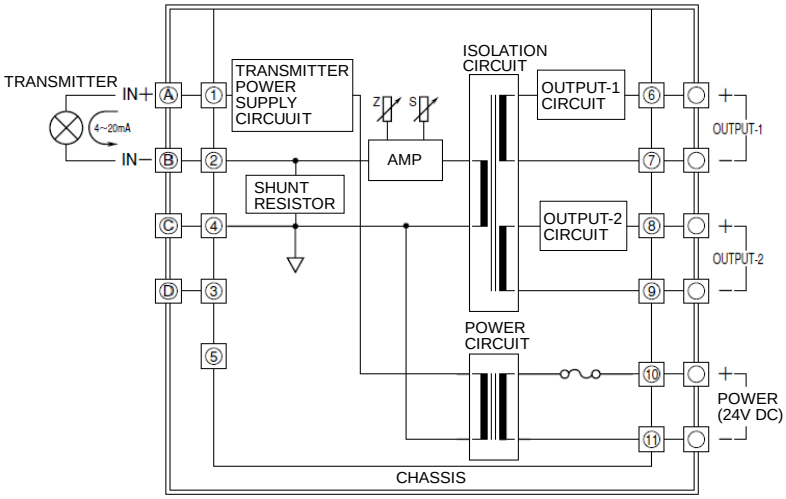
PERFORMANCE

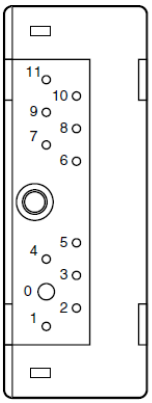
Accuracy Rating	Better than ±0.1% of span (at 25°C±5°C)
Temperature Effect	Better than ±0.2% of span per 10°C change in ambient.
Standard Response Time	Approx. 30Hz−3dB
Isolation	Isolation between input, output 1, output 2, and power.
Insulation Resistance	100MΩ min. (@ 500V DC) between input, output 1, output 2, and power.
Dielectric Strength	Input / [Output 1, Output 2, Power]: 1500V AC for 1 minute (Cutoff current: 0.5mA) Output 1 / Output 2 / Power: 500V AC for 1 minute (Cutoff current: 0.5mA)
Surge Withstand Capability	Tested as per ANSI/IEEE C37.90.1-1989.
Operating Environment	Ambient temperature: 0 to 55°C Humidity: 5 to 90% RH (non-condensing)
Storage Temperature	−10 to 60°C

PHYSICAL	
Installation	Mounted in an optional chassis (RC2900).
Wiring	Wired to an optional chassis (RC2900).
External Dimensions	W17.5 × H48 × D65 mm
Weight	60g max.

MATERIAL	
Housing	ABS resin (UL 94V-0)
PC Board	Glass fabric, epoxy resin (FR-4: UL 94V-0)
Potting Agent	Polyurethane

BLOCK DIAGRAM AND CONNECTION DIAGRAM





I/O PIN LAYOUT

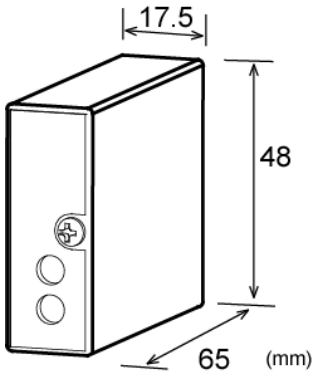
Product Specification Sheet Model: MS2907B

Chassis-Mount Distributor with Dual Output

DESCRIPTION

The MS2907B is a chassis-mount distributor that powers a two-wire transmitter and converts its 4−20mA signals into a 1−5V DC signal, which is obtained via a 250Ω shunt resistor, and an isolated 4−20mA DC signal.

- ▽ A multi-slot chassis provides ease of maintenance and high-density mounting.
- ▽ Isolation is provided between [input, output 1], output 2, and power circuits. No isolation is provided between the input and output 1.
- ▽ Equipped with a fuse on the DC power line as standard.



ORDERING INFORMATION

Ordering Code
MS2907B

SPECIFICATIONS

POWER SECTION

Power Requirement	24V DC±10%
Power Sensitivity	Better than ±0.1% of span per 10% change in supply voltage
Power Line Fuse	300mA fuse
Current Consumption	80mA max.

INPUT SECTION

Input	4 to 20mA DC from 2-wire transmitters
Input Resistance	250Ω
Transmitter Power Supply	Output voltage: 25V DC, typical (0% input) 18V DC, typical (100% input) Maximum current: Approx. 25mA The transmitter power can be turned on and off using the push-button switch on the bottom of the unit. By default, the power is set to ON.
Limit Current for Short-Circuit Protection	26mA, typical.
Permissible Short-Circuit Duration	Continuous.

OUTPUT SECTION

Output 1	1–5V DC, non-isolated.
Output 2	4–20mA DC, isolated.
Allowable Output Load	Voltage output: 250kΩ min. Current output: 300Ω max.
Zero Adjustment	Approx. ±2% of span (Adjustable by front-accessible trimmer)
Span Adjustment	Approx. ±2% of span (Adjustable by front-accessible trimmer)

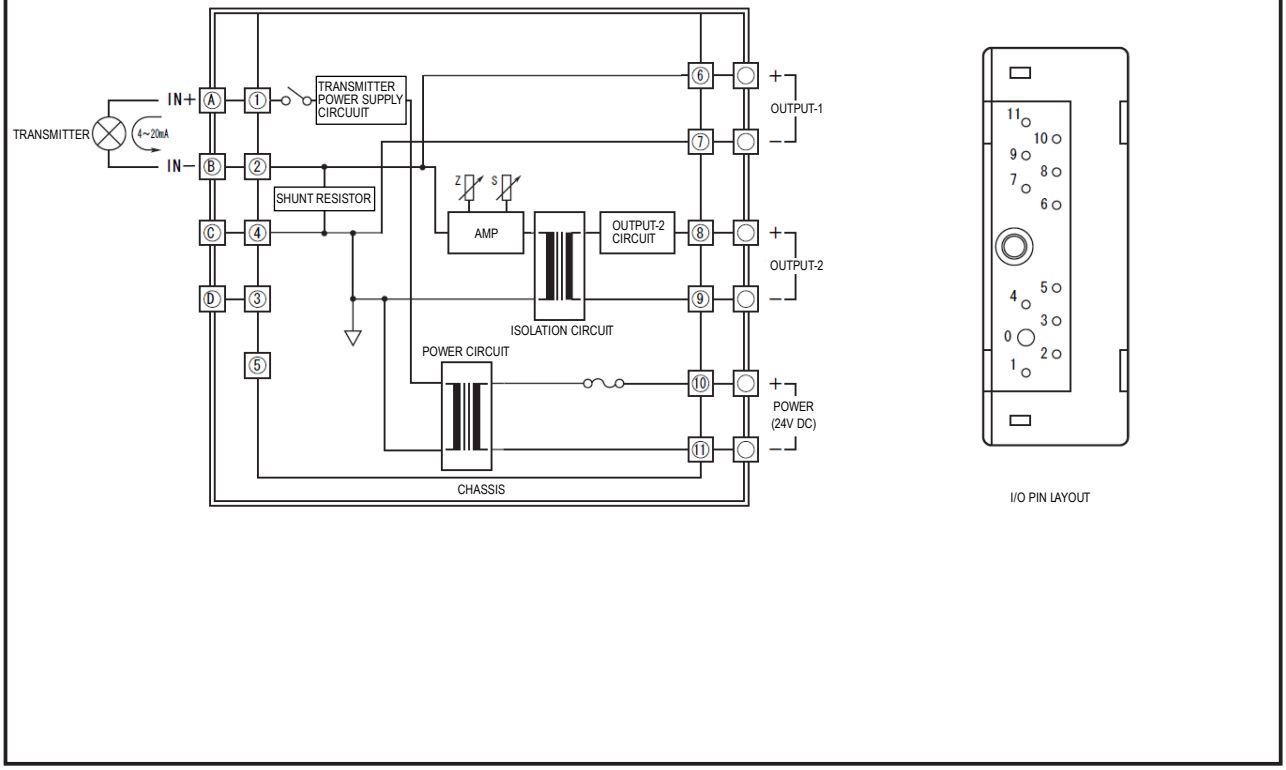
PERFORMANCE

Accuracy Rating	Better than ±0.1% of span (at 25°C±5°C) (Output 1: Accuracy of the shunt resistor)
Temperature Effect	Better than ±0.2% of span per 10°C change in ambient.
Response Time	Approx. 30Hz−3dB
Isolation	Isolation between [input, output 1], output 2, and power.
Insulation Resistance	100MΩ min. (@ 500V DC) between [input, output 1], output 2, and power.
Dielectric Strength	[Input, Output 1] / Power: 1500V AC for 1 minute (Cutoff current: 0.5mA) [Input, Output 1] / Output 2: 500V AC for 1 minute (Cutoff current: 0.5mA)
Surge Withstand Capability	Tested as per ANSI/IEEE C37.90.1-1989.
Operating Environment	Ambient temperature: 0 to 55°C Humidity: 5 to 90% RH (non-condensing)
Storage Temperature	−10 to 60°C

PHYSICAL	
Installation	Mounted in an optional chassis (RC2900).
Wiring	Wired to an optional chassis (RC2900).
External Dimensions	W17.5 × H48 × D65 mm
Weight	60g max.

MATERIAL	
Housing	ABS resin (UL 94V-0)
PC Board	Glass fabric, epoxy resin (FR-4: UL 94V-0)
Potting Agent	Polyurethane

BLOCK DIAGRAM AND CONNECTION DIAGRAM



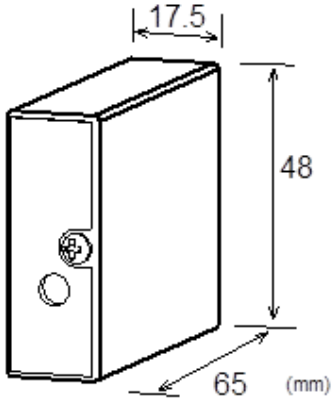
Product Specification Sheet Model: MS2908

Chassis-Mount Frequency/Analog Converter with Isolated Dual Output

DESCRIPTION

The MS2908 is a chassis-mount frequency to analog converter that converts pulse train signals from flow sensors and the like into mutually isolated dual channel DC analog output signals.

- ▽ A multi-slot chassis provides ease of maintenance and high-density mounting.
- ▽ Input, output 1, output 2, and power circuits are all isolated from each other.
- ▽ Equipped with a fuse on the DC power line as standard.



ORDERING INFORMATION

Ordering Code
MS2908-1□□ (□–□)-8□□ [1] [2] [3]

SPECIFICATIONS

POWER SECTION

Power Requirement	24V DC±10%
Power Sensitivity	Better than ±0.1% of span per 10% change in supply voltage
Power Line Fuse	300mA fuse
Current Consumption	50mA max.

INPUT SECTION

Input (Specify a code in the field [1].)	■ Dry contact or open collector ····· OP (Pull-up: Approx. 12V, 3.3kΩ) ■ AC voltage pulse (0.1 to 100Vp-p) ····· AP (□□□) Specify the peak-to-peak value of input voltage in parentheses. ■ DC voltage pulse····· ····· DP (□–□ / □) └A┘ B (Standard threshold voltage: Approx. 2.5V) Specify an input voltage range at A. If you require a non-standard threshold voltage, specify the value at B.
Measuring Frequency Range (Specify a range in the field [2].)	Specify a measuring frequency range between 0–100Hz and 0–20kHz.
Input Resistance	Approx. 40kΩ (voltage pulse input)
Allowable Input Voltage	DC voltage input: 30V DC max., continuous. AC voltage input: 100Vp-p AC max., continuous (up to ±50V with reference to 0V)
Input Pulse Width	20μs min.

OUTPUT SECTION

Output (Specify a code in the field [2].)	Output 1 / Output 2 ····· Code ■ 1–5V DC / 1–5V DC ····· V1 ■ 0–5V DC / 0–5V DC ····· V5 ■ 0–10V DC / 0–10V DC ····· V6 ■ 1–5V DC / 4–20mA DC ····· C1 Note: Combinations of two outputs are only available as shown above.
Allowable Output Load	Voltage output: 2mA max. Current output: 300Ω max.
Zero Adjustment	Approx. ±2% of span. (Adjustable by front-accessible trimmer)
Span Adjustment	Approx. ±2% of span. (Adjustable by front-accessible trimmer)

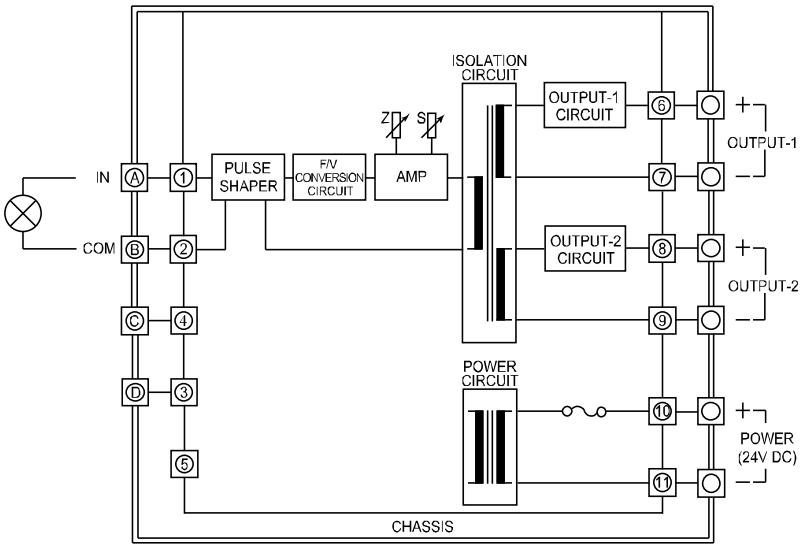
PERFORMANCE

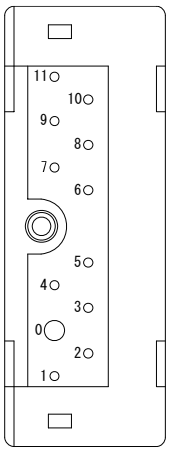
Accuracy Rating	Better than ±0.1% of span (at 25°C±5°C)	
Temperature Effect	Better than ±0.2% of span per 10°C change in ambient.	
Response Time	Input Frequency	90% Response Time
	100Hz	Approx. 0.8s
	200Hz	Approx. 0.4s
	2kHz	Approx. 0.04s
	20kHz	Approx. 0.004s
Isolation	Isolation between input, output 1, output 2, and power.	
Insulation Resistance	100MΩ min. (@ 500V DC) between input, output 1, output 2, and power.	
Dielectric Strength	Input / [Output 1, Output 2, Power]: 1500V AC for 1 minute (Cutoff current: 0.5mA) Output 1 / Output 2 / Power: 500V AC for 1 minute (Cutoff current: 0.5mA)	
Surge Withstand Capability	Tested as per ANSI/IEEE C37.90.1-1989.	
Operating Environment	Ambient temperature: 0 to 55°C Humidity: 5 to 90% RH (non-condensing)	
Storage Temperature	−10 to 60°C	

PHYSICAL	
Installation	Mounted in an optional chassis (RC2900).
Wiring	Wired to an optional chassis (RC2900).
External Dimensions	W17.5 × H48 × D65 mm
Weight	70g max.

MATERIAL	
Housing	ABS resin (UL 94V-0)
PC Board	Glass fabric, epoxy resin (FR-4: UL 94V-0)
Potting Agent	Polyurethane

BLOCK DIAGRAM AND CONNECTION DIAGRAM





I/O PIN LAYOUT

Product Specification Sheet **Model: MS2909** **MS2900**

Chassis-Mount Pulse Shaper (Pulse Isolator) with Isolated Dual Output

DESCRIPTION

The MS2909 is a pulse shaper (pulse isolator) that converts pulse train signals into mutually isolated dual channel pulse train signals.

- ▽ A multi-slot chassis provides ease of maintenance and high-density mounting.
- ▽ Input, output 1, output 2, and power circuits are all isolated from each other.
- ▽ Equipped with a fuse on the DC power line as standard.

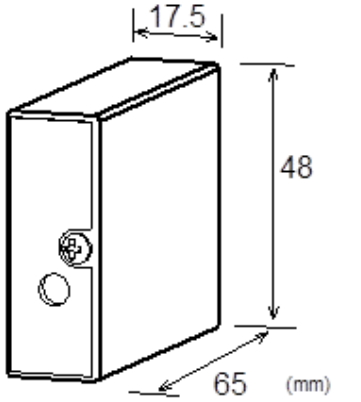
ORDERING INFORMATION

Ordering Code
MS2909-1□□-8□□-□□□ [1] [2] [3]

SPECIFICATIONS

POWER SECTION

Power Requirement	24V DC±10%
Power Sensitivity	Better than ±0.1% of span per 10% change in supply voltage
Power Line Fuse	300mA fuse
Current Consumption	50mA max. (w/ transmitter power supply: 80mA max.)



INPUT SECTION

Input (Specify a code in the field [1].)	■ Dry contact or open collector ····· OP (Pull-up: Approx. 12V, 3.3kΩ) ■ AC voltage pulse (0.1 to 100Vp-p) ····· AP (□□□) (Threshold voltage: Approx. 0.06Vp-p) Specify the peak-to-peak value of input voltage in parentheses. ■ DC voltage pulse ····· ····· DP (□–□ / □) └A┘ B (Standard threshold voltage: Approx. 2.5V) Specify an input voltage range at A. If you require a non-standard threshold voltage, specify the value at B. ■ 4–20mA DC pulse ·····IP (Threshold current: Approx. 8mA)
Maximum Input Frequency	50kHz
Input Resistance	Voltage input: 1MΩ min. with power (Standard, 5V input) 10kΩ min. without power Current input: 250Ω (Standard for 4 to 20mA)
Allowable Input Voltage	DC voltage input: 30V DC max., continuous. DC current input: 40mA DC max., continuous. AC voltage input: 200Vp-p AC max., continuous (up to ±100V with reference to 0V)
Input Pulse Width	20μs min.
Transmitter Power Supply (Optional) (Specify a code in the field [3].)	Output voltage: ■ 24V DC (±10%), 2-wire type (specify shunt resistor value) ····· 2E1 ■ 12V DC (±10%), 2-wire type (specify shunt resistor value) ····· 2E4 ■ 24V DC (±10%), 3-wire type ····· 3E1 ■ 12V DC (±10%), 3-wire type ····· 3E4 Maximum current: 30mA

OUTPUT SECTION

Output (Specify a code in the field [2].)	Output 1 / Output 2 ·····Code ■ TTL level / TTL level ····· TT (Maximum output: 5mA, 3.5V) ■ Open collector / open collector ···· OP (Maximum rating: 30V, 50mA) Note: Combinations of two outputs are only available as shown above. ■ Other voltage pulses····· VP Specify between 5 and 12V.

PERFORMANCE

Isolation	Isolation between input, output 1, output 2, and power.
Insulation Resistance	100MΩ min. (@ 500V DC) between input, output 1, output 2, and power.
Dielectric Strength	Input / [Output 1, Output 2, Power]: 1500V AC for 1 minute (Cutoff current: 0.5mA) Output 1 / Output 2 / Power: 500V AC for 1 minute (Cutoff current: 0.5mA)
Surge Withstand Capability	Tested as per ANSI/IEEE C37.90.1-1989.
Operating Environment	Ambient temperature: 0 to 55°C Humidity: 5 to 90% RH (non-condensing)
Storage Temperature	−10 to 60°C

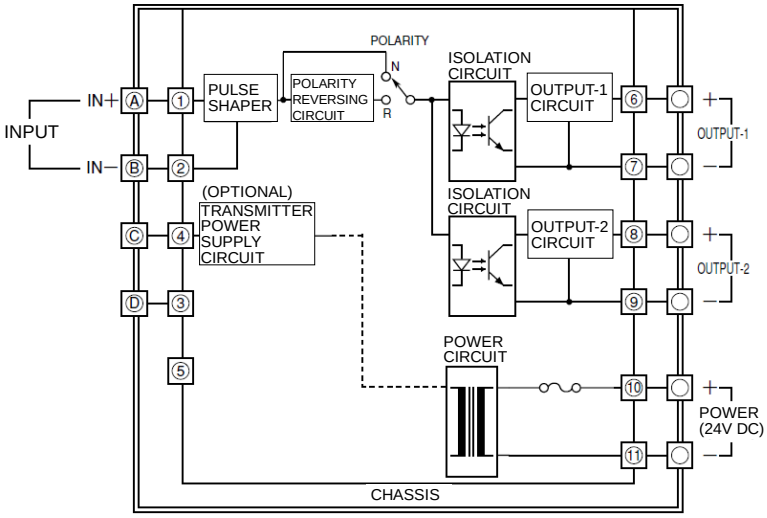
PHYSICAL

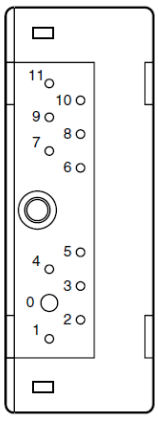
Installation	Mounted in an optional chassis (RC2900).
Wiring	Wired to an optional chassis (RC2900).
External Dimensions	W17.5 × H48 × D65 mm
Weight	Approx. 70g

MATERIAL

Housing	ABS resin (UL 94V-0)
PC Board	Glass fabric, epoxy resin (FR-4: UL 94V-0)
Potting Agent	Polyurethane

BLOCK DIAGRAM AND CONNECTION DIAGRAM





I/O PIN LAYOUT

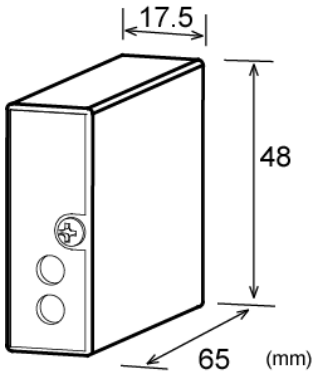
Product Specification Sheet Model: MS2910

Chassis-Mount Potentiometer Transmitter with Isolated Dual Output

DESCRIPTION

The MS2910 is a chassis-mount potentiometer transmitter that supplies constant voltage to potentiometric sensors and converts their mV input signals into mutually isolated dual channel DC output signals.

- ▽ A multi-slot chassis provides ease of maintenance and high-density mounting.
- ▽ Input, output 1, output 2, and power circuits are all isolated from each other.
- ▽ Equipped with a fuse on the DC power line as standard.



ORDERING INFORMATION

Ordering Code
MS2910-(□–□)-8□□ [1] [2]

SPECIFICATIONS

POWER SECTION

Power Requirement	24V DC±10%
Power Sensitivity	Better than ±0.1% of span per 10% change in supply voltage
Power Line Fuse	300mA fuse
Current Consumption	50mA max.

INPUT SECTION

Input Range (Specify a range in the field [1].)	Specify an input range between 0–100Ω and 0–10kΩ.
Measuring Voltage	Total resistance 100Ω to 999Ω: Approx. 0.5V Total resistance 1kΩ to 10kΩ: Approx. 5V
Allowable Lead Wire Resistance	10% or less of total resistance per wire. (The resistance of all three wires must be equal.)

OUTPUT SECTION

Output (Specify a code in the field [2].)	Output 1 / Output 2 ····· Code ■ 1–5V DC / 1–5V DC ····· V1 ■ 0–5V DC / 0–5V DC ····· V5 ■ 0–10V DC / 0–10V DC ····· V6 ■ 1–5V DC / 4–20mA DC ····· C1 Note: Combinations of two outputs are only available as shown above.
Allowable Output Load	Voltage output: 2mA max. Current output: 300Ω max.
Zero Adjustment	Approx. 0 to 30% of total resistance (Adjustable by front-accessible trimmer)
Span Adjustment	Approx. 70 to 100% of total resistance (Adjustable by front-accessible trimmer)

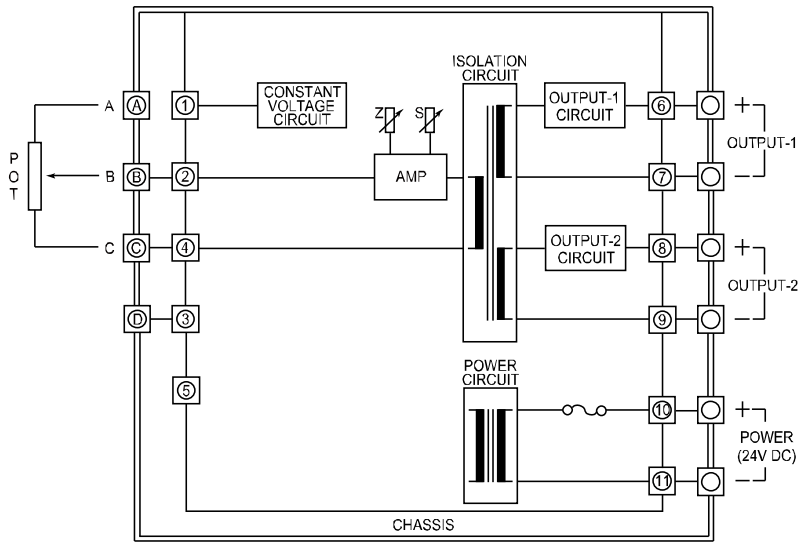
PERFORMANCE

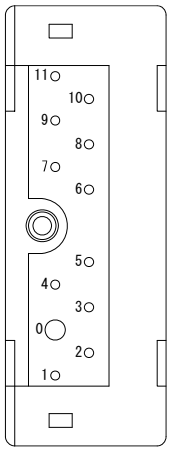
Accuracy Rating	Better than ±0.2% of span (at 25°C±5°C)
Temperature Effect	Better than ±0.2% of span per 10°C change in ambient.
Standard Response Time	Approx. 2Hz−3dB
Isolation	Isolation between input, output 1, output 2, and power.
Insulation Resistance	100MΩ min. (@ 500V DC) between input, output 1, output 2, and power.
Dielectric Strength	Input / [Output 1, Output 2, Power]: 1500V AC for 1 minute (Cutoff current: 0.5mA) Output 1 / Output 2 / Power: 500V AC for 1 minute (Cutoff current: 0.5mA)
Surge Withstand Capability	Tested as per ANSI/IEEE C37.90.1-1989.
Operating Environment	Ambient temperature: 0 to 55°C Humidity: 5 to 90% RH (non-condensing)
Storage Temperature	−10 to 60°C

PHYSICAL	
Installation	Mounted in an optional chassis (RC2900).
Wiring	Wired to an optional chassis (RC2900).
External Dimensions	W17.5 × H48 × D65 mm
Weight	70g max.

MATERIAL	
Housing	ABS resin (UL 94V-0)
PC Board	Glass fabric, epoxy resin (FR-4: UL 94V-0)
Potting Agent	Polyurethane

BLOCK DIAGRAM AND CONNECTION DIAGRAM





I/O PIN LAYOUT

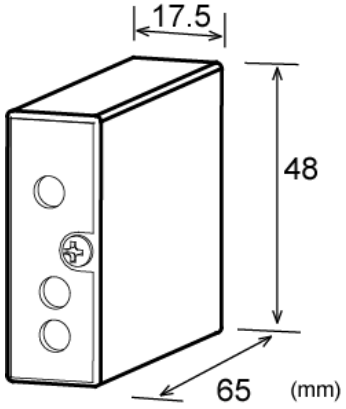
Product Specification Sheet Model: MS2916

Chassis-Mount First-Order Delay Signal Conditioner with Isolated Dual Output

DESCRIPTION

The MS2916 is a chassis-mount first-order delay signal conditioner that adds a first-order delay (time constant adjustable from 0.2 to 20 seconds) to DC input signals and converts them into mutually isolated dual channel DC output signals.

- ▽ A multi-slot chassis provides ease of maintenance and high-density mounting.
- ▽ Input, output 1, output 2, and power circuits are all isolated from each other.
- ▽ Equipped with a fuse on the DC power line as standard.



ORDERING INFORMATION

Ordering Code
MS2916-1□□ (□–□)-8□□ [1] [2] [3]

SPECIFICATIONS

POWER SECTION

Power Requirement	24V DC±10%
Power Sensitivity	Better than ±0.1% of span per 10% change in supply voltage
Power Line Fuse	2.2Ω 1/4W fuse resistor
Current Consumption	50mA max.

INPUT SECTION

Input (Specify a code in the field [1].)	■ 1–5V DC ····· V1 ■ 0–5V DC ····· V5 ■ 0–10V DC ····· V6 ■ 4–20mA DC ·····C1
Input Resistance	Voltage input: 1MΩ min. (10kΩ min. without power) Current input: 250Ω
Allowable Input Voltage	Voltage input: 30V DC max., continuous. Current input: 40mA DC max., continuous.
Time Constant Setting Range (Specify a range in the field [2].)	A time constant setting range should be specified between 0.2 and 20 seconds. Note that the maximum value should be not greater than 10 times the minimum value.
Time Constant Adjustment	Through the trimmer on the front panel.

OUTPUT SECTION

Output (Specify a code in the field [3].)	Output 1 / Output 2 ····· Code ■ 1–5V DC / 1–5V DC·····V1 ■ 0–5V DC / 0–5V DC·····V5 ■ 0–10V DC / 0–10V DC·····V6 ■ 1–5V DC / 4–20mA DC ·····C1 Note: Combinations of two outputs are only available as shown above.
Allowable Output Load	Voltage output: 2mA max. Current output: 300Ω max.
Zero Adjustment	Approx. ±2% of span (Adjustable by front-accessible trimmer)
Span Adjustment	Approx. ±2% of span (Adjustable by front-accessible trimmer)

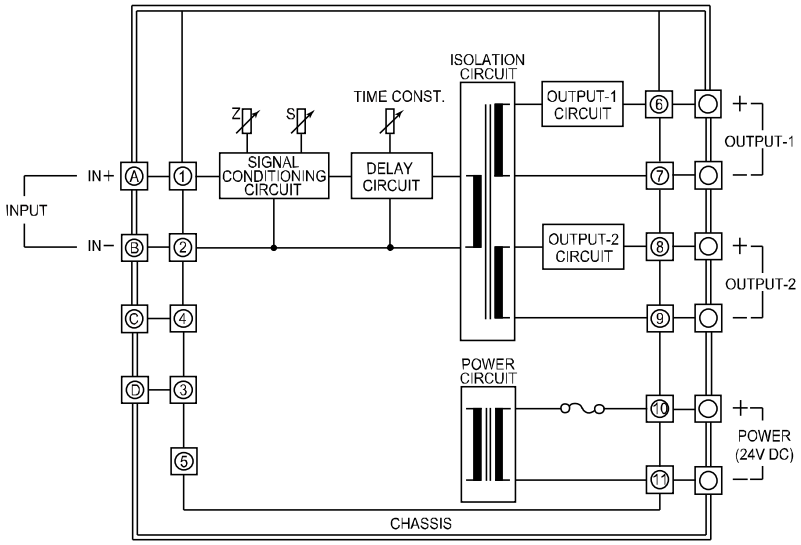
PERFORMANCE

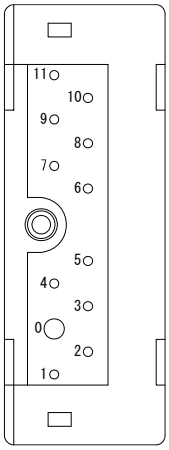
Accuracy Rating	Better than ±0.1% of span (at 25°C±5°C)
Temperature Effect	Better than ±0.2% of span per 10°C change in ambient.
Isolation	Isolation between input, output 1, output 2, and power.
Insulation Resistance	100MΩ min. (@ 500V DC) between input, output 1, output 2, and power.
Dielectric Strength	Input / [Output 1, Output 2, Power]: 1500V AC for 1 minute (Cutoff current: 0.5mA) Output 1 / Output 2 / Power: 500V AC for 1 minute (Cutoff current: 0.5mA)
Surge Withstand Capability	Tested as per ANSI/IEEE C37.90.1-1989.
Operating Environment	Ambient temperature: 0 to 55°C Humidity: 5 to 90% RH (non-condensing)
Storage Temperature	−10 to 60°C

PHYSICAL	
Installation	Mounted in an optional chassis (RC2900).
Wiring	Wired to an optional chassis (RC2900).
External Dimensions	W17.5 × H48 × D65 mm
Weight	Approx. 70g

MATERIAL	
Housing	ABS resin (UL 94V-0)
PC Board	Glass fabric, epoxy resin (FR-4: UL 94V-0)
Potting Agent	Polyurethane

BLOCK DIAGRAM AND CONNECTION DIAGRAM





I/O PIN LAYOUT

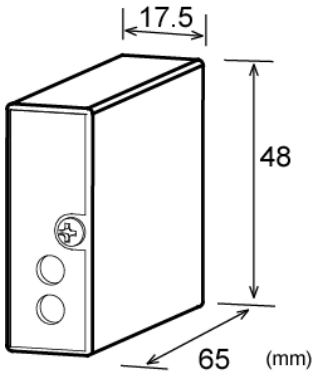
Product Specification Sheet Model: MS2920

Chassis-Mount CT Transmitter with Isolated Dual Output (RMS Calculation Type)

DESCRIPTION

The MS2920 is a chassis-mount CT transmitter that measures a load current flowing through power equipment and converts it into mutually isolated dual channel DC output signals.

- ▽ A multi-slot chassis provides ease of maintenance and high-density mounting.
- ▽ Input, output 1, output 2, and power circuits are all isolated from each other.
- ▽ Equipped with a fuse on the DC power line as standard.



ORDERING INFORMATION

Ordering Code
MS2920-1□□-8□□ [1] [2]

SPECIFICATIONS

POWER SECTION

Power Requirement	24V DC±10%
Power Sensitivity	Better than ±0.1% of span per 10% change in supply voltage
Power Line Fuse	200mA fuse
Current Consumption	50mA max.

INPUT SECTION

Input (Specify a code in the field [1].)	■ 1–5A AC, 50/60Hz ····· M1 ■ 0–5A AC, 50/60Hz ····· M2
Input Loss	0.5VA max.
Input Resistance	1A AC input: 25mΩ (shunt resistor) 5A AC input: 5mΩ (shunt resistor)
Allowable Input Current	Continuous: 120% of the rated input Instantaneous: 10 times the rated input (within 3 seconds)
Crest Factor	3 max.

OUTPUT SECTION

Output (Specify a code in the field [2].)	Output 1 / Output 2 ····· Code ■ 1–5V DC / 1–5V DC ····· V1 ■ 0–5V DC / 0–5V DC ····· V5 ■ 0–10V DC / 0–10V DC ····· V6 ■ 1–5V DC / 4–20mA DC ····· C1 Note: Combinations of two outputs are only available as shown above.
Allowable Output Load	Voltage output: 2mA max. Current output: 300Ω max.
Zero Adjustment	Approx. ±2% of span (Adjustable by front-accessible trimmer)
Span Adjustment	Approx. ±2% of span (Adjustable by front-accessible trimmer)

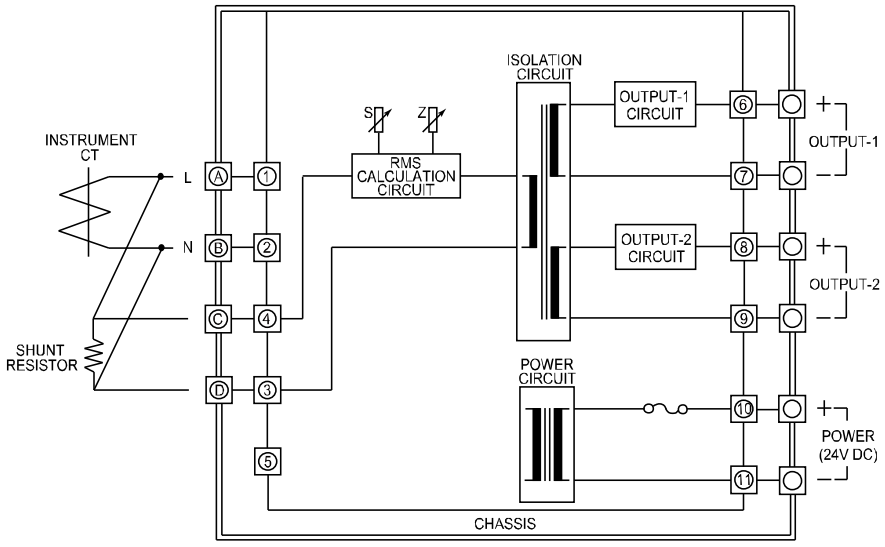
PERFORMANCE

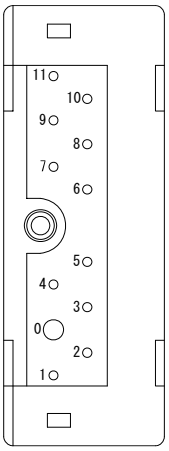
Accuracy Rating	Better than ±0.25% of span with at least 10% input (at 25°C±5°C)
Temperature Effect	Better than ±0.2% of span per 10°C change in ambient.
Response Time	Approx. 0.1s (0 to 63%)
Isolation	Isolation between input, output 1, output 2, and power.
Insulation Resistance	100MΩ min. (@ 500V DC) between input, output 1, output 2, and power.
Dielectric Strength	Input / [Output 1, Output 2, Power]: 1500V AC for 1 minute (Cutoff current: 0.5mA) Output 1 / Output 2 / Power: 500V AC for 1 minute (Cutoff current: 0.5mA)
Surge Withstand Capability	Tested as per ANSI/IEEE C37.90.1-1989.
Operating Environment	Ambient temperature: 0 to 55°C Humidity: 5 to 90% RH (non-condensing)
Storage Temperature	−10 to 60°C

PHYSICAL	
Installation	Mounted in an optional chassis (RC2900).
Wiring	Wired to an optional chassis (RC2900).
External Dimensions	W17.5 × H48 × D65 mm
Weight	Approx. 70g

MATERIAL	
Housing	ABS resin (UL 94V-0)
PC Board	Glass fabric, epoxy resin (FR-4: UL 94V-0)
Potting Agent	Polyurethane

BLOCK DIAGRAM AND CONNECTION DIAGRAM





I/O PIN LAYOUT

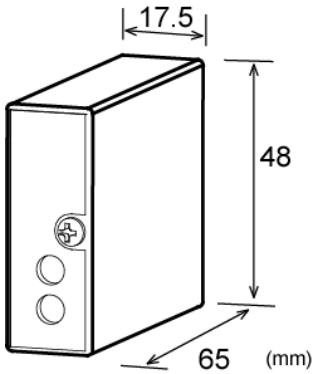
Product Specification Sheet Model: MS2921

Chassis-Mount PT Transmitter with Isolated Dual Output (RMS Calculation Type)

DESCRIPTION

The MS2921 is a chassis-mount PT transmitter that measures a supply voltage applied to power equipment and converts it into mutually isolated dual channel DC output signals.

- ▽ A multi-slot chassis provides ease of maintenance and high-density mounting.
- ▽ Input, output 1, output 2, and power circuits are all isolated from each other.
- ▽ Equipped with a fuse on the DC power line as standard.



ORDERING INFORMATION

Ordering Code
MS2921-1☐☐-8☐☐ [1] [2]

SPECIFICATIONS

POWER SECTION

Power Requirement	24V DC±10%
Power Sensitivity	Better than ±0.1% of span per 10% change in supply voltage
Power Line Fuse	200mA fuse
Current Consumption	50mA max.

INPUT SECTION

Input (Specify a code in the field [1].)	■ 0–110V AC, 50/60Hz ····· N1 ■ 0–150V AC, 50/60Hz ····· N2 ■ 0–250V AC, 50/60Hz ····· N3 ■ Other AC voltages, 50/60Hz ····· ····· NX (☐–☐) Specify an AC voltage range in parentheses. The maximum voltage must be 300V.
Input Loss	0.5VA max.
Input Resistance	1MΩ min. with or without power.
Allowable Input Current	Continuous: 120% of the rated input Instantaneous: 1.5 times the rated input (within 5 seconds)
Crest Factor	3 max.

OUTPUT SECTION

Output (Specify a code in the field [2].)	Output 1 / Output 2 ····· Code ■ 1–5V DC / 1–5V DC ····· V1 ■ 0–5V DC / 0–5V DC ····· V5 ■ 0–10V DC / 0–10V DC ····· V6 ■ 1–5V DC / 4–20mA DC ····· C1 Note: Combinations of two outputs are only available as shown above.
Allowable Output Load	Voltage output: 2mA max. Current output: 300Ω max.
Zero Adjustment	Approx. ±2% of span (Adjustable by front-accessible trimmer)
Span Adjustment	Approx. ±2% of span (Adjustable by front-accessible trimmer)

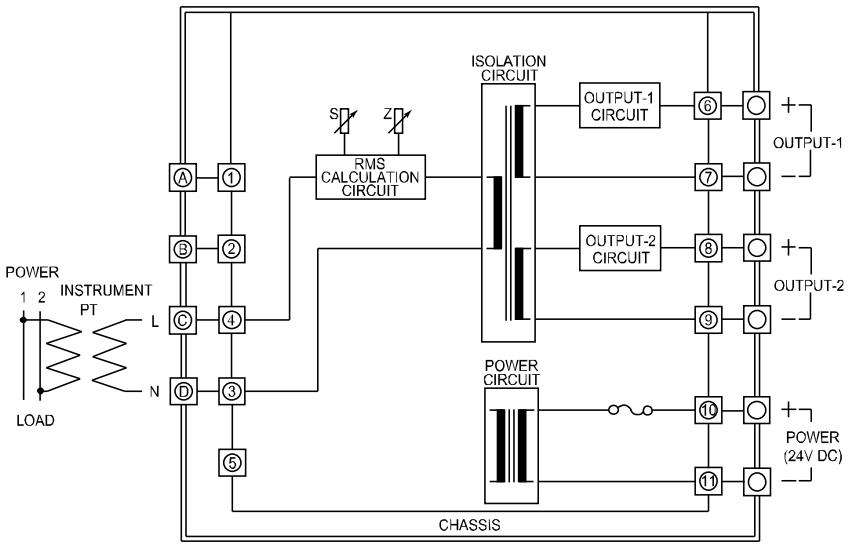
PERFORMANCE

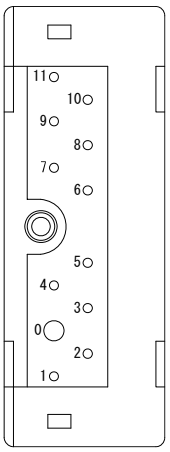
Accuracy Rating	Better than ±0.25% of span with at least 10% input (at 25°C±5°C)
Temperature Effect	Better than ±0.2% of span per 10°C change in ambient.
Response Time	Approx. 0.1s (0 to 63%)
Isolation	Isolation between input, output 1, output 2, and power.
Insulation Resistance	100MΩ min. (@ 500V DC) between input, output 1, output 2, and power.
Dielectric Strength	Input / [Output 1, Output 2, Power]: 1500V AC for 1 minute (Cutoff current: 0.5mA) Output 1 / Output 2 / Power: 500V AC for 1 minute (Cutoff current: 0.5mA)
Surge Withstand Capability	Tested as per ANSI/IEEE C37.90.1-1989.
Operating Environment	Ambient temperature: 0 to 55°C Humidity: 5 to 90% RH (non-condensing)
Storage Temperature	−10 to 60°C

PHYSICAL	
Installation	Mounted in an optional chassis (RC2900).
Wiring	Wired to an optional chassis (RC2900).
External Dimensions	W17.5 × H48 × D65 mm
Weight	Approx. 70g

MATERIAL	
Housing	ABS resin (UL 94V-0)
PC Board	Glass fabric, epoxy resin (FR-4: UL 94V-0)
Potting Agent	Polyurethane

BLOCK DIAGRAM AND CONNECTION DIAGRAM





I/O PIN LAYOUT

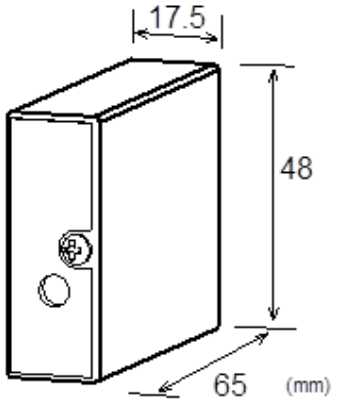
Product Specification Sheet Model: MS2937

Chassis-Mount Distributor with Non-Isolated Dual Output
(Non-Isolation between Input and Output)

DESCRIPTION

The MS2937 is a chassis-mount distributor that powers a two-wire transmitter and converts its 4–20mA signal into dual channel 1–5V DC output signals.

- ▽ A multi-slot chassis provides ease of maintenance and high-density mounting.
- ▽ Cost saving by eliminating the isolation between input and output.
- ▽ Equipped with a fuse on the DC power line as standard.



ORDERING INFORMATION

Ordering Code
MS2937

SPECIFICATIONS

POWER SECTION

Power Requirement	24V DC±10%
Power Sensitivity	Better than ±0.1% of span per 10% change in supply voltage
Power Line Fuse	2.2Ω 1/4W fuse resistor
Current Consumption	45mA max.

INPUT SECTION

Input	4–20mA DC from 2-wire transmitters
Input Resistance	250Ω
Transmitter Power Supply	Output voltage = Supply voltage – 1V Built-in overcurrent protection circuit; maximum current: approx. 40mA Note: Power for the transmitter is not supplied when the front-accessible push-button switch is turned off.
Transmitter Load Resistance	550Ω max.

OUTPUT SECTION

Output	1–5V DC
Output Impedance	250Ω
Allowable Load Resistance	250kΩ min.

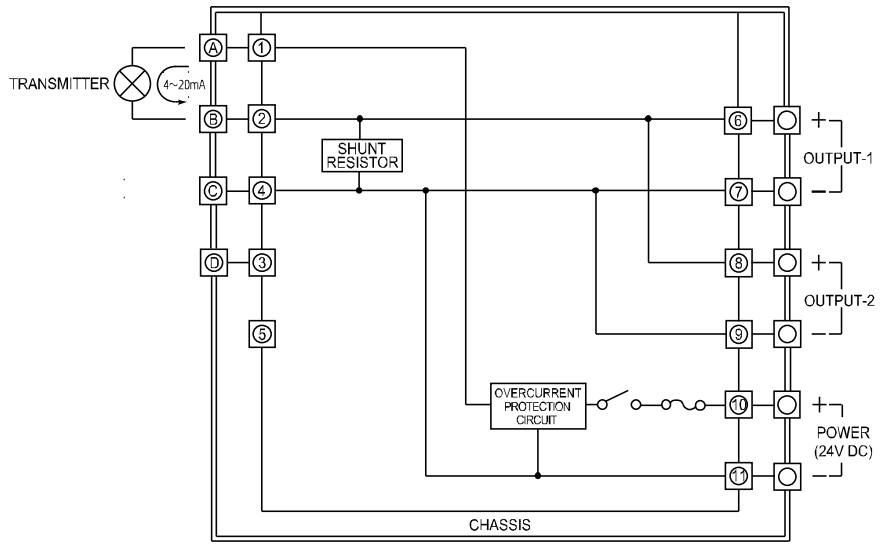
PERFORMANCE

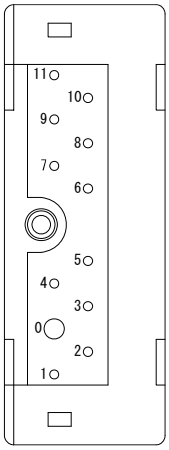
Accuracy Rating	±0.1% (accuracy of shunt resistor)
Temperature Effect	±25ppm/°C
Surge Withstand Capability	Tested as per ANSI/IEEE C37.90.1-1989.
Operating Environment	Ambient temperature: 0 to 55°C Humidity: 5 to 90% RH (non-condensing)
Storage Temperature	−10 to 60°C

PHYSICAL	
Installation	Mounted in an optional chassis (RC2900).
Wiring	Wired to an optional chassis (RC2900).
External Dimensions	W17.5 × H48 × D65 mm
Weight	Approx. 70g

MATERIAL	
Housing	ABS resin (UL 94V-0)
PC Board	Glass fabric, epoxy resin (FR-4: UL 94V-0)
Potting Agent	Polyurethane

BLOCK DIAGRAM AND CONNECTION DIAGRAM





I/O PIN LAYOUT

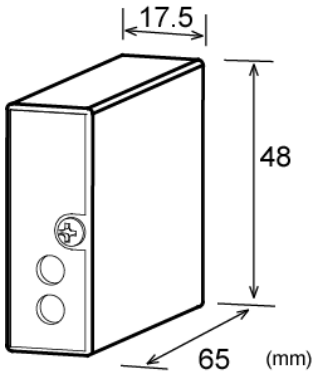
Product Specification Sheet Model: MS2954

Chassis-Mount High-Level Signal Conditioner with Isolated Single Output

DESCRIPTION

The MS2954 is a chassis-mount high-level signal conditioner (isolator) that converts high-level DC input signals into isolated single channel DC output signals.

- ▽ A multi-slot chassis provides ease of maintenance and high-density mounting.
- ▽ Input, output, and power circuits are all isolated from each other.
- ▽ Equipped with a fuse on the DC power line as standard.



ORDERING INFORMATION

Ordering Code
MS2954-1□□-8□□ [1] [2]

SPECIFICATIONS

POWER SECTION

Power Requirement	24V DC±10%
Power Sensitivity	Better than ±0.1% of span per 10% change in supply voltage
Power Line Fuse	300mA fuse
Current Consumption	45mA max.

INPUT SECTION

Input (Specify a code in the field [1].)	■ 4–20mA DC ·····C1 ■ 1–5V DC ····· V1 ■ 0–5V DC ····· V5 ■ 0–10V DC ····· V6
Input Resistance	Voltage input: 1MΩ min. (10kΩ min. without power) Current input: 250Ω
Allowable Input Voltage	Voltage input: 30V DC max., continuous. Current input: 40mA DC max., continuous.

OUTPUT SECTION

Output (Specify a code in the field [2].)	■ 1–5V DC ····· V1 ■ 0–5V DC ····· V5 ■ 0–10V DC ····· V6 ■ 4–20mA DC ·····C1
Allowable Output Load	Voltage output: 2mA max. Current output: 550Ω max.
Zero Adjustment	Approx. ±2% of span (Adjustable by front-accessible trimmer)
Span Adjustment	Approx. ±2% of span (Adjustable by front-accessible trimmer)

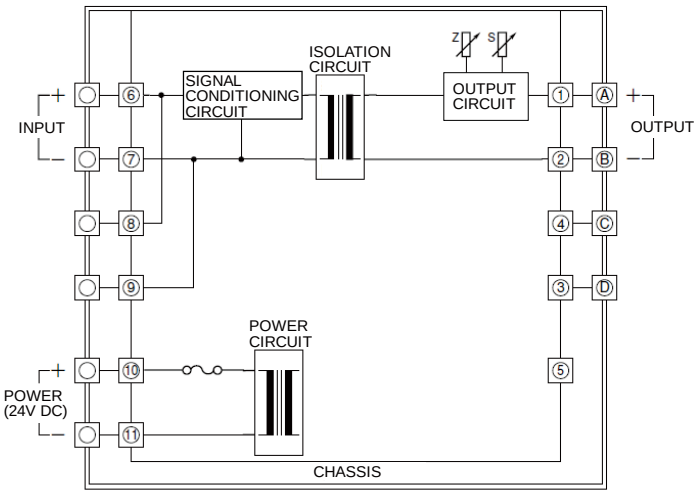
PERFORMANCE

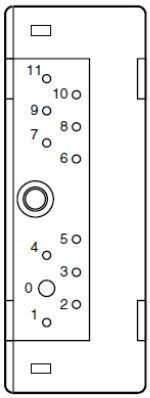
Accuracy Rating	Better than ±0.1% of span (at 25°C±5°C)
Temperature Effect	Better than ±0.2% of span per 10°C change in ambient.
Standard Response Time	Approx. 30Hz−3dB
Isolation	Isolation between input, output, and power.
Insulation Resistance	100MΩ min. (@ 500V DC) between input, output, and power.
Dielectric Strength	Output / [Input, Power]: 1500V AC for 1 minute (Cutoff current: 0.5mA) Input / Power: 500V AC for 1 minute (Cutoff current: 0.5mA)
Surge Withstand Capability	Tested as per ANSI/IEEE C37.90.1-1989.
Operating Environment	Ambient temperature: 0 to 55°C Humidity: 5 to 90% RH (non-condensing)
Storage Temperature	−10 to 60°C

PHYSICAL	
Installation	Mounted in an optional chassis (RC2900).
Wiring	Wired to an optional chassis (RC2900).
External Dimensions	W17.5 × H48 × D65 mm
Weight	70g max.

MATERIAL	
Housing	ABS resin (UL 94V-0)
PC Board	Glass fabric, epoxy resin (FR-4: UL 94V-0)
Potting Agent	Polyurethane

BLOCK DIAGRAM AND CONNECTION DIAGRAM





I/O PIN LAYOUT

DESCRIPTION

The RC2900 is a chassis that accommodates MS2900 series isolated signal conditioners. All wiring connections are made to the terminal blocks and/or connector on the chassis. Single power connection to the chassis permits power supply to all I/O modules mounted therein through its motherboard.

ORDERING INFORMATION

Ordering Code
RC2900-□□□□-□-□ [1] [2] [3] [4]

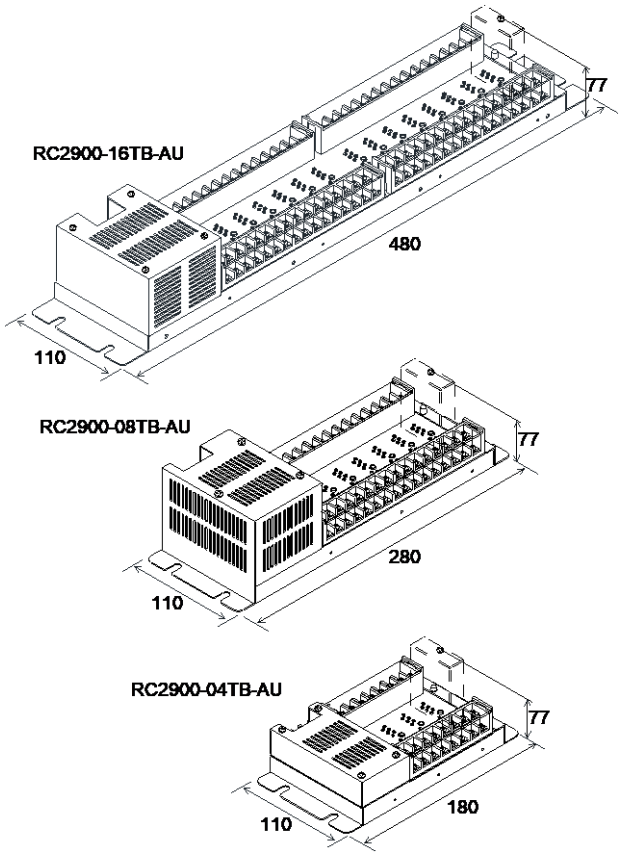
SPECIFICATIONS

GENERAL

Number of Modules Accommodated (Specify a code in the field [1].)	■ 16 ····· 16 ■ 8 ····· 08 ■ 4 ····· 04
Wiring (Specify a code in the field [2].)	M3.5 screw terminals, D-subminiature connector (See the table at right.)
Power Requirements (Specify a code in the field [3].)	■ 24V DC ····· D1 ■ 85–264V AC (47–63Hz) rated for 100–240V ····· AU
Installation (Specify a code in the field [4].)	■ Wall mounting····· Blank ■ DIN rail mounting (special order) ··· D Note: DIN rail mounting is only available with 16TB, 08TB, 08C1, and 04TB models. These are special order products, so please contact our sales representatives for pricing.

PHYSICAL

External Dimensions (with modules mounted)	RC2900-04TB-D1/AU: W180 × H95 × D77 mm RC2900-08TB-D1/AU: W280 × H95 × D77 mm RC2900-08C1-D1/AU: W280 × H88 × D77 mm RC2900-16TB-D1/AU: W480 × H95 × D77 mm RC2900-16C1-D1/AU: W480 × H88 × D77 mm



WIRING CONNECTIONS

Input Modules

Input Side	Output Side		Code
	Output 1	Output 2	
M3.5 screw terminals	M3.5 screw terminals	M3.5 screw terminals	TB
	37-pin D-subminiature connector (DDK: 17JE-13370-37) Connector fixing screw: M2.6	M3.5 screw terminals	C1

Output Modules

Output Side	Input Side	Code
M3.5 screw terminals	M3.5 screw terminals	TB
	37-pin D-subminiature connector (DDK: 17JE-13370-37) Connector fixing screw: M2.6	C1

PERFORMANCE

Insulation Resistance	100MΩ min. (@ 500V DC) between input, output, power, and FG.
Dielectric Strength	☐ Input Modules: Input / [Output 1, Output 2, Power, FG]: 1500V AC for 1 minute (Cutoff current: 0.5mA) Output 1 / Output 2 / [Power, FG]: 500V AC for 1 minute (Cutoff current: 0.5mA) Power / FG: 500V AC for 1 minute (Cutoff current: 5mA) Channel to channel: 200V AC for 1 minute (Cutoff current: 0.5mA) ☐ Output Modules: Output / [Input, Power, FG]: 1500V AC for 1 minute (Cutoff current: 0.5mA) Input / [Power, FG]: 500V AC for 1 minute (Cutoff current: 0.5mA) Power / FG: 500V AC for 1 minute (Cutoff current: 5mA) Channel to channel: 200V AC for 1 minute (Cutoff current: 0.5mA)
Operating Environment	Ambient temperature: 0 to 55°C Humidity: 5 to 90% RH (non-condensing)
Power Consumption	04TB-AU: ≤ 25VA (rated for 100V AC; fully loaded) ≤ 38VA (rated for 240V AC; fully loaded) 04TB-D1: ≤ 8W (rated for 24V DC; fully loaded) 08☐☐-AU: ≤ 35VA (rated for 100V AC; fully loaded) ≤ 50VA (rated for 240V AC; fully loaded) 08☐☐-D1: ≤ 16W (rated for 24V DC; fully loaded) 16☐☐-AU, 16C☐-WAU: ≤ 60VA (rated for 100V AC; fully loaded) ≤ 80VA (rated for 240V AC; fully loaded) 16☐☐-D1: ≤ 31.5W (rated for 24V DC; fully loaded)
Inrush Current	04TB-AU: ≤ 30A (240V AC @ 25°C) 04TB-D1: ≤ 5A (24V DC @ 25°C) 08☐☐-AU & 16☐☐-AU: ≤ 35A (240V AC @ 25°C) 08☐☐-D1 & 16☐☐-D1: ≤ 30A (24V DC @ 25°C) 16C☐-WAU: ≤ 35A (240V AC @ 25°C) per AC power unit
Storage Temperature	−10 to 60°C

MATERIAL

Case	SECC-JN
PC Board	Glass fabric, epoxy resin (FR-4: UL 94V-0)
Screw Terminal	Nickel-plated steel
Terminal Block	PBT resin

WEIGHT

Model Number	Weight
RC2900-16TB-AU	Approx. 1,500g
RC2900-16TB-D1	Approx. 1,150g
RC2900-16C1-AU	Approx. 1,350g
RC2900-16C1-D1	Approx. 1,050g
RC2900-08TB-AU	Approx. 950g
RC2900-08TB-D1	Approx. 700g
RC2900-08C1-AU	Approx. 850g
RC2900-08C1-D1	Approx. 650g
RC2900-04TB-AU	Approx. 530g
RC2900-04TB-D1	Approx. 450g

RC2900-01TB-D1

Ordering Code
RC2900-01TB-D1

SPECIFICATIONS

PERFORMANCE

Power Requirement	24V DC±10%
Insulation Resistance	100MΩ min. (@ 500V DC) between input, output 2, and power.
Dielectric Strength	Input / [Output 2, Power]: 1500V AC for 1 minute (Cutoff current: 0.5mA) Output 2 / Power: 500V AC for 1 minute (Cutoff current: 0.5mA)
Operating Environment	Ambient temperature: 0 to 55°C Humidity: 5 to 90% RH (non-condensing)
Storage Temperature	−10 to 60°C

PHYSICAL

Number of Modules Accommodated	1
Installation	DIN rail mounting DIN/EN50045 (15×5) DIN/EN50022 (35×7.5) DIN/EN50035 (G32)
Wiring	Multipolar screw terminal connection
External Dimensions (with modules mounted)	W22.5 × H77 × D92 mm
Weight	Approx. 35g

MATERIAL

Housing	Polyamide
PC Board	Glass fabric, epoxy resin (FR-4: UL 94V-0)

Note: Only Output 2 signal is available on the output terminals. Output 1 signal is not obtainable.

RS2900

Ordering Code
RS2900-□-01TB-□ [1] [2]

SPECIFICATIONS

GENERAL

Installation (Specify a code in the field [1].)	■ DIN Rail mounting, DIN/EN5022 (35×7.5) ····· D ■ Wall mounting····· R
Power Requirements (Specify a code in the field [2].)	■ 24V DC ·····D1 ■ 85–264V AC (48–62Hz) rated for 100–240V ·····A1

PERFORMANCE

Insulation Resistance	100MΩ min. (@ 500V DC) between input, output 1, output 2, power, and FG.
Dielectric Strength	Input / [Output 1, Output 2, Power, FG]: 1500V AC for 1 minute (Cutoff current: 0.5mA) Output 1 / Output 2 / [Power, FG]: 500V AC for 1 minute (Cutoff current: 0.5mA) Power / FG: 1500V AC for 1 minute (Cutoff current: 5mA)
Operating Environment	Ambient temperature: −5 to 55°C Humidity: 5 to 95% RH (non-condensing)
Storage Temperature	−10 to 60°C

PHYSICAL

Number of Modules Accommodated	1
Wiring	M3.5 screw terminal connection (with power terminal block cover)
External Dimensions (with modules mounted)	DIN rail mounting: W23.5 × H99 × D107.5 mm Wall mounting: W23.5 × H99 × D120 mm

MATERIAL

Housing	PBT resin (UL 94V-0)
Screw Terminal	Terminals #1 - #10: Nickel-plated steel Terminal FG: Nickel-plated brass
PC Board	Glass fabric, epoxy resin (FR-4: UL 94V-0)

WEIGHT

Model Number	Weight
RS2900-D-01TB-A1	Approx. 110g
RS2900-D-01TB-D1	Approx. 100g
RS2900-R-01TB-A1	Approx. 110g
RS2900-R-01TB-D1	Approx. 100g