

Product Specification Sheet

Model: MS3771

MS3700

Slim Plug-In Programmable Thermocouple Temperature Transmitter with Isolated Single/Dual Output

DESCRIPTION

The MS3771 is a slim, plug-in programmable thermocouple temperature transmitter that converts input signals from a thermocouple into commonly used DC signals and provides isolated single or dual output. The input and/or output settings of the unit can be easily configured using configuration software running on a personal computer.

ORDERING CODE

Input (Measuring Temperature Range)

K: Type K thermocouple (-200 to 1200°C)

E: Type E thermocouple (-200 to 800°C)

J: Type J thermocouple (0 to 750°C)

T: Type T thermocouple (-200 to 350°C)

B: Type B thermocouple (600 to 1700°C)

R: Type R thermocouple (0 to 1600°C)

S: Type S thermocouple (0 to 1600°C)

N: Type N thermocouple (-200 to 1200°C)

W97: W97Re3-W75Re25 (ASTM E988) (0 to 2000°C)

W95: W95Re5-W74Re26 (ASTM E988) (0 to 2000°C)

* For any other special specifications, consult MTT.

Output -

Single Output Model

A: 4 to 20mA DC *1

4: 0 to 10V DC *2

5: 0 to 5V DC *2

6: 1 to 5V DC *2

Dual Output Model

A1: 4 to 20mA DC / 1 to 5V DC *1

A2: 4 to 20mA DC / 4 to 20mA DC *1

4W: 0 to 10V DC / 0 to 10V DC *2

5W: 0 to 5V DC / 0 to 5V DC *2

6W: 1 to 5V DC / 1 to 5V DC *2

*1: Fixed output(s). The output range cannot be changed.

*2: The output range can be changed.

Options

No code: None (Upscale burnout protection will apply if no option is specified.)

/U: Upscale burnout protection

/D: Downscale burnout protection

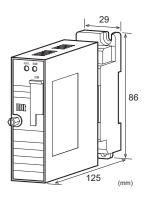
/L: Dual current output with high output load

(OUT-1: 750Ω / OUT-2: 550Ω)

/H: Polyurethane conformal coating

/X: Others (Special order)

* For non-standard options, ask MTT for availability.



ORDERING INFORMATION

To place an order, please use the ordering code format as shown on the left. Also specify a measuring temperature range*.

(e.g.) MS3771-A-K4W (0 to 500°C)

* Note that the temperature range should be specified in °C within the range listed below.

Input Code	Measuring Temperature Range	Code shown on Configuration Window
K	-200 to 1200°C	K
Е	-200 to 800°C	Е
J	0 to 750°C	J
T	-200 to 350°C	T
В	600 to 1700°C	В
R	0 to 1600°C	R
S	0 to 1600°C	S
N	-200 to 1200°C	N
W97	0 to 2000°C	W3Re/W25Re
W95	0 to 2000°C	W5Re/W26Re

Note: The measuring temperature range should be equivalent to an input span of 3mV or greater.

SPECIFICATIONS

●POWER SECTION				
Power	100 to 240	V AC: 85 to	264V AC (47	
Requirements	to 63Hz)	to 63Hz)		
	24V DC: 2	24V DC: 24V DC±10%		
	100 to 240V DC: 85 to 264V DC			
Power Sensitivi	ty Better than $\pm 0.1\%$ of span for each			
	power supply range.			
Power Line Fus	er Line Fuse 160mA fuse is installed (standard).			
Power Consumption				
Power	100-240V AC 24V DC 100-240V I		100-240V DC	
Single Output	5.0VA max	1.1W max	4.8W max	
Dual Output	5.0VA max	1.5W max	6.0W max	

OINPUT SECTION

Input Resistance	1MΩ min. (Without power: $1MΩ$ min. at rated input.)
Burnout	Selectable from upscale, downscale
Protection	and no burnout protection.
	(Detection current: Approx. 25nA)

Burnout Drive Time	20s max.
Allowable Input Voltage	25V DC, continuous.
Cold Junction Compensation	Cold junction compensation sensor, stuck to the input terminal of the supplied socket.
Cold Junction Compensation Error	±0.5°C max. (25°C±15°C)
Factory Default Settings	The factory default settings are as follows: Input code: K Measuring temperature range: 0 to 1200°C Burnout protection: Upscale

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TOUTPUT SECTION				
Allowable Output Load				
Voltage Output (DC) 2mA max.				
Current Output (DC)	4-20mA single output	750Ω max.		
	4-20mA dual output	Output 1:		
	•	550Ω max.		
		Output 2:		
		350Ω max.		
Zero Adjustment	Approx. ±4% of span.			
	(Adjustable by PC via RS-232C.)			
Span Adjustment	Approx. ±4% of span.			
(Adjustable by PC via RS-232C.)		RS-232C.)		
Factory Default				
Settings voltage output models are as follow		re as follows:		
-	Single output model:			
	Output code: 6 (1 to 5V DC)			
	Dual output model:			
	Output code: 6W (1 to 5V DC / 1 to			
	5V DC)			

SOFTWARE CONFIGURATION PARAMETERS

Configurable	- Thermocouple type
Parameters	- ADC range (Input range)
	 Measuring temperature range
	- Burnout protection
	- Output range
	- Zero/Span adjustment
	(Approx. $\pm 4\%$ of span)
	- PAUSE status
	(All of the above are configurable by
	PC via RS-232C.)

Note: Any ADC range setting should satisfy:

Electromotive force value* × 1.1 < ADC range (Example)

If the thermocouple is type K and the temperature range is from 0 to 100° C:

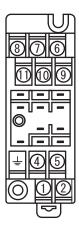
 $41276\mu V \times 1.1 = 45403\mu V$ (= Approx. 46mV) Therefore, the ADC range selection should be set to

Therefore, the ADC range selection should be set to "80 mV".

 * For the electromotive force of thermocouples (type K - type N), refer to the EMF Table of JIS C 1602.

Accuracy Rating	(Input accuracy + Output accuracy)		
* Refer to the table	e on page 3.		
Temperature Effect	100ppm/°C max.		
Response Time	260ms max. (0 to 90%) with a step input at 100%.		
CMRR	100dB min. (500V AC, 50/60Hz)		
Isolation	4-way isolation between input, output 1, output 2, and power.		
Insulation	100MΩ min. (ω 500V DC) between		
Resistance	input, output 1, output 2, power, and ground.		
Dielectric	[Input, RS-232C Port] / [Output 1,		
Strength	Output 2] / [Power, Ground]: 2000V AC for 1 minute (Cutoff current:		
	0.5mA) Power / Ground: 2000V AC for 1		
	minute (Cutoff current: 5mA)		
	Output 1 / Output 2: 500V AC for 1		
	minute (Cutoff current: 0.5mA)		
	Input / RS-232C Port: 50V DC for 1		
Curao Mithatara	minute (Cutoff current: 1.0mA)		
Surge Withstand Capability	Tested as per ANSI/IEEE C37.90.1-1989.		
Operating	Ambient temperature: -5 to 55°C		
Environment	Humidity: 5 to 90% RH (non-condensing)		
Storage	-10 to 60°C		
Temperature	-10 to 00 C		
●PHYSICAL			
Installation	Wall/DIN rail mounting		
Wiring	M3.5 screw terminal connection (with a power terminal block cover & drop-proof screws)		
Screwing Torque	0.8 to 1.0 [Nm] * Recommended		
External	W29 × H86 × D125 mm		
Dimensions	(including the mounting screw and		
	socket)		
Weight	Main unit: 120g max. Socket: 80g max.		
•MATERIAL			
Housing	ABS resin (UL 94V-0)		
Terminal Block	PBT resin (UL 94V-0)		
Terminal Block Cover	PC resin (UL 94V-2)		
DIN Rail Stopper	PP resin (UL 94HB)		
Screw Terminal	Nickel-plated steel		
Contacts Material and Finish	Brass with 0.2μm gold plating		
Printed Circuit	Glass fabric, epoxy resin		
Board	(FR-4: UL 94V-0)		

TERMINAL ASSIGNMENTS



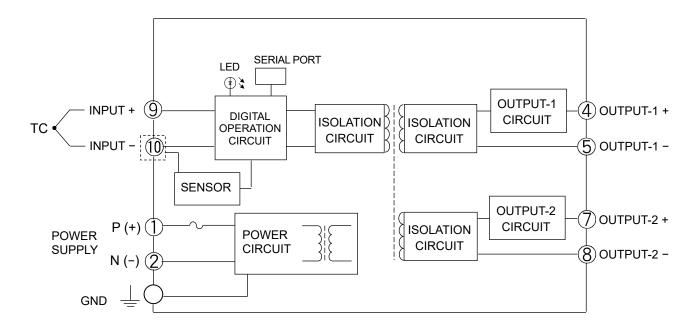
1	P (+) POWER
2	N (-)
ᆣ	GND
4	+ OUTPUT 1
5	- OUTPUT 1
6	N.C.
7	+ OUTPUT 2
8	- OUTPUT 2
9	TC +
10	TC -
(1)	N.C.

ACCURACY RATING

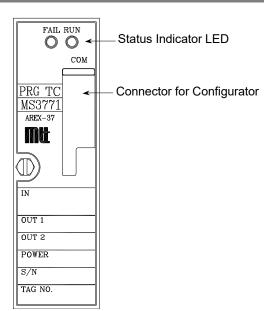
Thermocouple	Input Accuracy	Output Accuracy
K	1400°C (Fixed) / Input span (Measuring temperature range) × ±0.02%	$\pm 0.04\%$ max.
E	1000°C (Fixed) / Input span (Measuring temperature range) × ±0.02%	$\pm 0.04\%$ max.
J	750°C (Fixed) / Input span (Measuring temperature range) × ±0.02%	±0.04% max.
T	550°C (Fixed) / Input span (Measuring temperature range) × ±0.03%	$\pm 0.04\%$ max.
R	1600°C (Fixed) / Input span (Measuring temperature range) × ±0.04%	$\pm 0.04\%$ max.
S	1600°C (Fixed) / Input span (Measuring temperature range) × ±0.04%	$\pm 0.04\%$ max.
В	1100°C (Fixed) / Input span (Measuring temperature range) × ±0.06%	$\pm 0.04\%$ max.
N	1400°C (Fixed) / Input span (Measuring temperature range) × ±0.02%	$\pm 0.04\%$ max.
W97Re3-W75Re25	2000°C (Fixed) / Input span (Measuring temperature range) × ±0.03%	$\pm 0.04\%$ max.
W95Re5-W74Re26	2000°C (Fixed) / Input span (Measuring temperature range) × ±0.03%	$\pm 0.04\%$ max.

Note: The measuring temperature range should be equivalent to an input span of 3mV or greater.

BLOCK DIAGRAM



FRONT VIEW



CONNECTOR

●COM (CONNECTOR FOR CONFIGURATOR)

The COM port is used to connect the transmitter to a personal computer through serial communication (RS-232C).

An optional communication cable, MTT's MS-CBL01 (with a 9-pin D-subminiature female connector for PC connection) is required for the connection.

If the USB port is used, it is recommended that a USB conversion adapter, REX-USB60F (made by RATOC Systems) be used with the MS-CBL01.

Connector Pin Assignments

Pin No.	Signal Name
1	DVdd
2	SHDN
3	N.C.
4	N.C.
5	TX
6	RX
7	ISOCOM
8	ISOCOM

LED STATUS INDICATORS

OINDICATOR PATTERNS

Module	Description	LED		D d
Status	Description	Blue (RUN)	Red (FAIL)	Remarks
INIT		•	•	
RUN		•	-	
PAUSE	Common to all commands.	0	-	Blink pattern: •••••
ERROR	ADC error	-	0	Blink pattern:
	DA output error	-	0	Blink pattern:
	Burnout	-	0	Blink pattern:
	Power error	-	0	Blink pattern:
HALT	WDT	-	•	May fail to turn ON.
	Memory	-	•	May fail to turn ON.
	Power error	-	•	May fail to turn ON.

Notes:

1. OFF: - or ○, ON: ●, Blink: ◎

2. Each of the circle symbols (O, ●) shown in the Remarks column indicates a duration of 0.25 s.