

APPLICATION NOTE

mV & Thermocouple Input (IA01 & IA02)

The IA01 signal conditioning card (Model EM1*B) allows a mV input from -50 to +150mVDC. The minimum input span is 10mVDC and the maximum is 100mVDC. This option is used only in specialized applications where a low level mVDC signal is received from an external device.

The thermocouple card (Model ET5*B/YS) is the most widely used direct input option. This is a microprocessor-based card that can accept the most commonly used thermocouples.

The thermocouple type is configured in the SC MAINT menu. The selections are B/E/J/K/T/R/S or N. The engineering units are selected: °C, F or K. The zero and span of the thermocouple are configured, as well as upscale or downscale burn-out, if required.

The thermocouple card assembly includes two wires connected to a small connector. This connector must be installed onto the mating connector (CN6) on the main circuit card to allow a reference temperature reading. If this connection is NOT made, the temperature reading will have an ambient temperature offset and incorrect reading.

Resistance Temperature Detector (RTD) Input (IA03)

YS1000 Series instruments can accept one 100Ω platinum RTD input by ordering the IA03 option (Model ER5*B). The on-board microprocessor allows easy configuration for DIN/ANSI PT or JPT (Japanese Standard) RTD's.

As with the T/C input, the engineering units (°C, F, or K), zero and span, and upscale/downscale burn-out require configuration. The menu-driven SC MAINT display is easy-to-use and allows fast configuration of this direct input card.

Potentiometer Input (IA04)

In applications where the final control element is a motorized valve, it is desirable to have a valve position input to the control instrument. Most motorized valve positioners have a potentiometric (slidewire) device that can be directly connected to a YS1700 by using the IA04 option (Model ES1*B). This input permits valve position to be shown on the YS1700 front panel display as the MV (control) output.

Using the SC MAINT menu, the total potentiometer resistance is configured into the instrument. A potentiometer up to 30KΩ total resistance can be used, but the general specification for total span is 100Ω to 2KΩ.

Input Isolator (IA05)

This optional card is used only if an analog input signal is non-isolated. The YS1000 Series instruments have all analog inputs (4 to 20mA DC or 1 to 5VDC) referenced to signal common. If a non-isolated signal is introduced, a ground loop current may be present, providing an input offset and error.

The IA05 card (Model EH1*B) provides the necessary optical isolation to eliminate any potential ground loop currents. Most field transmitters provide this necessary isolation, but some older two-wire or four-wire (110VAC powered) transmitters may not incorporate this feature.

No YS1000 Series instrument configuration is required. Refer to the wiring diagram on the first page for field terminations.

Two-Wire Input Isolation (IA06)

Option IA06 (Model EA5*B) provides optical isolation and a 24Vdc loop power supply for one two-wire transmitter. The power supply is *isolated* from the field transmitter and has current limiting. The signal input terminals (Terminals 20 & 21) provide an internal 250Ω precision resistor. As with the IA05 option, isolation may be required to prevent the introduction of ground loop currents within the electrical connections from the field device.

This popular direct input option is used for non-isolated transmitters. No YS1000 configuration is required. Zero and span potentiometers are accessible from the circuit card to permit calibration using a precision voltage source and voltmeter.

Non-Isolated Two-Wire Transmitter Input (IA07)

This option card provides a 24VDC loop power supply for a two-wire transmitter, as with Option IA06. The card was originally designed for the Yokogawa μXL Distributed Control System. It was carried into the YS1000 family with the other signal conditioning cards described herein. YS1000 series instruments have an integral 24VDC loop power supply that can provide power to **TWO** transmitters as a standard feature. This option card is **NOT** required for loop power and should rarely be used.

INSTALLATION

I. OVERVIEW

The Yokogawa YS100 series control room instruments include a family of micro-processor-based single and dual loop PID controllers. The model numbers include:

- ◆ YS150 Multi-function Loop Controller
- ◆ YS170 Dual Loop Programmable Controller

This installation/operation manual is attended to assist the user in the installation of the instrument and wiring of field devices. A description of the various displays that can be observed from the front panel is presented. The basic setup for process operation is included. More detailed information is available in the instruction manual and any technical information manuals referenced herein.

1.0 Model and Suffix Codes

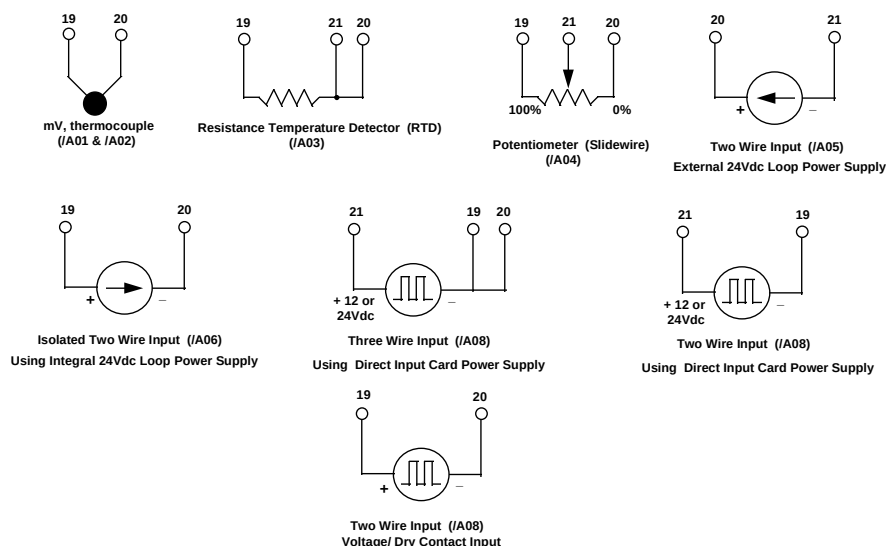
YS100 SERIES INSTRUMENTS	
MODEL	DESCRIPTION
YS150	Multifunction Loop Controller
YS170	Dual Loop Programmable Controller
POWER REQUIREMENTS	
-011	80-138 VAC, 47-63 Hz, 20-130 VDC
-012	138-264 VAC, 47-63 Hz, 120-340 VDC
INPUT OPTIONS (SELECT ONE ONLY)	
/A01	mV input
/A02	Universal thermocouple input
/A03	RTD input
/A04	Potentiometer input (slidewire resistance)
/A05	Isolated input (four-wire transmitter)
/A06	Two-wire transmitter input (isolated)
/A07	Two-wire transmitter input (non-isolated)
/A08	Frequency input
COMM. OPTIONS (SELECT ONE ONLY)	
/A31	RS-485 communication
/A32	DCS communication (Centum-XL or μ XL)
/A33	YS-Net, Peer-to-Peer communication

ELECTRICAL INTERCONNECTIONS

2.2.5 Direct Input

YS100 series instruments can optionally be provided with a direct input from a mV source, thermocouple, RTD, potentiometer, frequency source, etc. The signal wiring from these devices are connected to terminals 19, 20, and/or 21 at the rear of the instrument. Actual assignments depend upon the type of signal. Refer to the drawing below.

Direct Input Interconnections (Options /A01 - /A08)



NOTE: The direct input signal is converted to a 1-5VDC signal on terminals 9 and 10. These terminals must be hard wired to the process variable input of the YS150, terminals 1 and 2. YS170 does not require the installation unless the direct input is the process variable and the PV is assigned to terminals 1 and 2 in the custom program.

FRONT PANEL & DISPLAY

Those microprocessor-based cards needing configuration are:

- ◆ /A01 Model EM1*B mV input
- ◆ /A02 Model ET5*B Universal thermocouple input
- ◆ /A03 Model ER5*B RTD input
- ◆ /A04 Model ES1*B Potentiometer input
- ◆ /A08 Model EP3*A Frequency input

Press the **M** button next to the → symbol to highlight SET. Press the **▲** button until ENBL appears to the right of SET. Press the **C** button next to MNU to communicate with the signal conditioning card. A “communicating” prompt appears at the bottom of the display and the model number will appear.

The **A** button next to PRM allows communication to the signal conditioning card. Each time the button is pressed, the parameters listed below are read and shown. If a change to a parameter is desired, press the **M** button next to the → symbol to highlight the desired location. Press the **▲** or **▼** buttons to select the desired number or character. After making a change, the PF button next to the ENT symbol must be pressed twice to write the change to the signal conditioning card.

Model Name The model number of the signal conditioning card installed.

Tag Number Up to 16 alphanumeric characters are shown and can be assigned as the tag number using the B01 – B02 parameters described below.

Self Chk Performs self-diagnostics on the circuit card. Results are GOOD or ERROR. If ERROR is shown, replacement is required.

Input Value (A01) Input value in engineering units.

Output Value (A02) Output value of the card in percentage.

Status (A03) No configuration required.

Rev. No. (A04) Software revision level of the signal conditioning card.

Tag No. 1 (B01) First eight alphanumeric characters of a tag name assigned to the card.

Tag No. 2 (B02) Last eight characters of a tag number assigned to the card.

Comments 1 (B03) First eight alphanumeric characters of a description which may be applied to identify the functionality of the card.

Comments 2 (B04) Last eight alphanumeric characters of a description which may be applied to identify the functionality of the card.

RTD Type (B05) Model ER5*B ONLY. Configures the RTD type, PT-100 (ANSI or DIN) or JPT-100. Pressing the **▲** button allows selection of PT-100.

T/C Type (B06) Model ET5*B ONLY. Selects the type of thermocouple input. Pressing the **▲** or **▼** buttons allows selection of B,E,J,K,T,R,S or N inputs.

FRONT PANEL & DISPLAY

Freq. Low	(B07) Model EP3*A ONLY. Selects the low cutoff for the frequency input in HZ. Pressing the ▲ or ▼ buttons allows selection. Pressing the M button next to the → symbol changes the location of the highlighted area to the right.
Resist	(B08) Model ES1*B ONLY. Total resistance of the slidewire resistance input from a motorized valve positioner or similar device. Up to six positions can be configured, XXXXX.X Ω. Pressing the ▲ or ▼ buttons allows selection. Pressing the M button next to the → symbol changes the location of the highlighted area to the right.
Unit	(B09) Model ET5*B ONLY. Selects the engineering units of the thermocouple input card. Pressing the ▲ or ▼ buttons allows selection of degrees C/F/K.
Zero	(B10) Selects the zero point of the input range, up to six digits including + or – sign. An example is –0050.0 degrees F. Pressing the ▲ or ▼ buttons allows selection. Pressing the M button next to the → symbol changes the location of the highlighted area to the right.
Span	(B11) Selects the span of the input, up to six digits including + or – sign. Span is the upper input range minus the zero point. For example, the range required is –500.0 to 250.0. The span setting is 750.0. Pressing the ▲ or ▼ buttons allows selection. Pressing the M button next to the → symbol changes the location of the highlighted area to the right.
Burn Out	(B12) Upscale or downscale burnout is provided. Selections are OFF, UP or DOWN. Pressing the ▲ or ▼ buttons allows selection.
Out 0%	(C01) Output compensation zero bias for the signal conditioning card. Compensates for offset in the D/A converter. Range is ±10%.
Out 100%	(C02) Output compensation span for the signal conditioning card. Compensates for offset in the D/A converter. Range is ±10%.
Wiring R	(C03) Model ET5*B ONLY. Compensates for errors incurred with high T/C wire and BURN OUT current.
Zero Adj.	(C04) Models EM1*B, ET5*B & ER5*B ONLY. Increase, decrease or reset input compensation for the A/D converter.
Span Adj.	(C05) Models EM1*B, ET5*B & ER5*B ONLY. Increase, decrease or reset input compensation for the A/D converter.
Zero Adj.	(C06) Model ES1*B ONLY. Input a resistance value to compensate or an RTD zero offset. Pressing the ▲ or ▼ buttons allows selection. Pressing the M button next to the → symbol changes the location of the highlighted area to the right.
Span Adj	(C07) Model ES1*B ONLY. Input a resistance value to compensate or an RTD span offset. Pressing the ▲ or ▼ buttons allows selection. Pressing the M button next to the → symbol changes the location of the highlighted area to the right.



GLOBAL INDUSTRIAL AUTOMATION SOURCING

Ready to source this part?

Ask for availability, pricing and delivery options.

Request a fast quote

Include the product title and any required part number or quantity.

EMAIL

info@apterpower.com

PHONE

+86 18106909650

[CHAT ON WHATSAPP >](#)



[SCAN TO CHAT ON WHATSAPP](#)

PRODUCT: ET5*B / Yokogawa Universal Thermocouple Input Card

The enclosed manufacturer pages are reproduced without alteration to technical content.

Apter Power is not an authorized distributor, reseller or representative of the products featured.

Product names, trademarks, brands and logos remain the property of their respective owners.