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Applicable Product :

● **YS100 SERIES Electronic Control System**

Revision History :

Date	Edition	Contents
December, 1991	First Edition	New Publication
December, 1994	2nd Edition	Item on enhanced functions added.
June, 1995	3rd Edition	YS - net communication and YS170 peer - to - peer communication added. Program steps changed to 400 steps.
April, 1996	4th Edition	Description of the conformity to some standards added.
February, 1997	5th Edition	Items on enhanced functions added.

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YS100 Series Document Map

Document Class	Document No.	Title	Usage (◎ : Essential, ○ : For Reference)				
			Programming for YS170	Engineering for function selections and parameter settings	Tuning	Normal Operation	Installation and Maintenance
Technical Information	TI 1B7A1-01E	YS100 SERIES Information	○	◎		◎	
	TI 1B7C0-01E Note 2	YS100 SERIES Intelligent Self-tuning Controllers			◎		◎
	TI 1B7C1-01E	YS150, YS170 Single-loop Controller Control Functions	◎	◎	◎	◎	
	TI 1B7C2-03E Note 3	YS170 Programmable Functions	◎		○		
	TI 1B7C8-03E Note 1	YS100 SERIES Communication Functions		◎		◎	
	TI 1B7C8-04E Note 5	YS-net Peer-to-peer Communication Functions		◎			
	TI 1B7C8-05E Note 5	YS-net Personal Computer Communication Functions		◎		◎	
Instruction Manual	IM 1B7C1-01E	YS150 Single-loop Multi-function Controller YS170 single-loop Programmable Controller	○	◎	◎	◎	◎
	IM 1B7C8-01E	YSS10 YS100 SERIES Programming Package	◎				
	IM 1B7C8-03E Note 1	YS100 SERIES RS-485 Communication Functions (/A31) DCS-LCS Communication Functions (/A32)		◎		◎	◎
	IM 1B7C8-04E Note 5	YSS50 YS-net Parameter Definition File		◎			◎
	IM 1B7D2-01E	YS131 Indicator with Alarm		◎	◎	◎	◎
	IM 1B7D3-01E	YS135 Auto/Manual Station for SV Setting		◎	◎	◎	◎
	IM 1B7D4-01E	YS136 Auto/Manual Station for MV Setting		◎	◎	◎	◎
	IM 1B7D5-01E Note 4	YS110 Standby Manual Station				◎	

Note 1 : Only when used with supervisory communication functions

Note 2 : Only when using self-tuning functions

Note 3 : Only for YS170 programmable controllers

Note 4 : The YS110 can be a standby station only for the YS150, YS170, or YS136

Note 5 : Only when using YS-net communication functions

Features of YS100 SERIES (1)

◇ Futuristic Man-Machine Interface

- High resolution graphic LCD display
- Multi-panel display functions (25)
- Monitoring dual loops on the panel
- Trend recording of up to 45 hours
- Selection of inverse display
- Front-panel operation

◇ Direct Interface with Field Sensors

- Signal conditioning card
- Supports mV, TC, RTD, 2W, and pulse inputs

◇ Computer Interface

- YS-net communication functions
- General-purpose RS-485 interface (multi-drop)
- Communicates with supervisory systems

◇ Easy Retrofit

- DIN size (72 (W) × 144 (H) mm)
- Depth 320mm, Weight 2.6kg
- YEW SERIES 80 mounting version available

YS100 SERIES

TI 1B7A1-01E

- YS100 Series conforms to the following safety requirements.
IEC1010-1 : 1990
EN61010-1 : 1992
- There are options for the following conformity.
CE marking
CSA non-incendive certification.

Features of YS100 SERIES (2)

◇ Proven Control Functions

- User can select basic, cascade or autoselector control functions
- Programmable controller can handle two independent loops
- Control period : Standard 0.1 sec, Fast 0.05 sec

◇ Peer-to-Peer Communication Between YS170 Controllers

- When more input / output points of instruments are needed, data of other YS170 can be accessed
- Input / output module can be connected via this communication function
- By sharing control computation among two or more YS170s, multiple control systems can be configured

◇ Easy User Programming

- Same simple programming language as YS80
- Create programs on a PC, download using communication functions

◇ Manual Backup Provided as Standard

- Analog output backup operates if CPU is abnormal
Manual operation in backup mode

YS100 SERIES

TI 1B7A1-01E

- Input/output modules via peer-to-peer communication can be purchased from Yokogawa Corporation of America.
Phone: 1-770-253-7000
Fax: 1-770-251-2088

TI 1B7A1-01E

Line-up of YS100 SERIES

YS100 SERIES <Line-up of Hardware>	
YS150	Single-Loop Multifunction Controller
YS170	Single-Loop Controller Programmable Type
YS131	Indicator with Alarm
YS135	Auto / Manual Station (for SV Setting)
YS136	Auto / Manual Station (for MV Setting)
YS110	Standby Manual Station

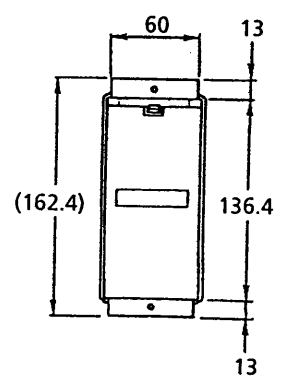
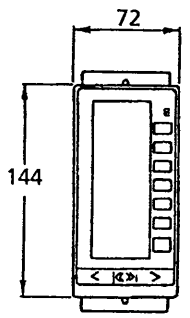
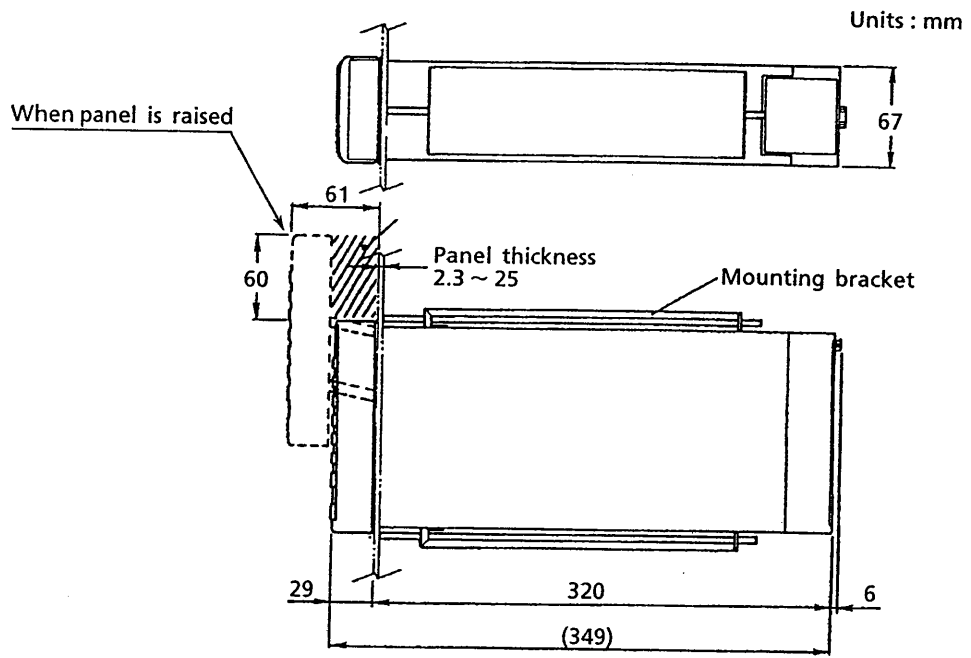
YS100 SERIES <Line-up of Software Packages>	
YSS10	YS100 SERIES Programming Package
YSS50	YS - net Parameter Definition File

YS100 SERIES

TI 1B7A1-01E

- **YS150 Single-Loop Multi-Function Controller**
A controller with built-in basic control functions for PID control, to be selected by the user as necessary. Built-in functions include feedforward computation and other computations required for the input signal such as square root computation and 10-segment characterizer, as well as STC and SVF functions. Cascade control and autoselector control are possible.
- **YS170 Single-Loop Programmable Controller**
A programmable controller to construct control and computations with a simple programming language. It can output two 4 mA to 20 mA signals using two loops of PID control computation. It can be used as a multi-function (preset function type) controller the same way as the YS150.
- **YS131 Indicator with Alarm**
An indicator with alarm with 2 inputs and dual loop display. For both inputs, high/low limit and high-high/low-low limit alarms are available. Total six output contacts are available after taking AND or OR logic of any alarms.
- **YS135 Auto / Manual Station (for SV Setting)**
A station to output setpoint signals to indicators manually. The standard type is equipped with the operation mode selector switch [Cascade (C) or Manual (M)], operation mode selector functions by status input, and operation mode identification status output.
- **YS136 Auto / Manual Station (for MV Setting)**
A station to output the manipulated signal at the operation terminal manually. The standard type is equipped with the operation mode selector switch [Cascade (C) or Manual (M)], operation mode selector functions by status input, and operation mode identification status output.
- **YS110 Standby Manual Station**
A station to continuously maintain the manipulated output of the controller.

External Dimensions of YS100 SERIES Controller

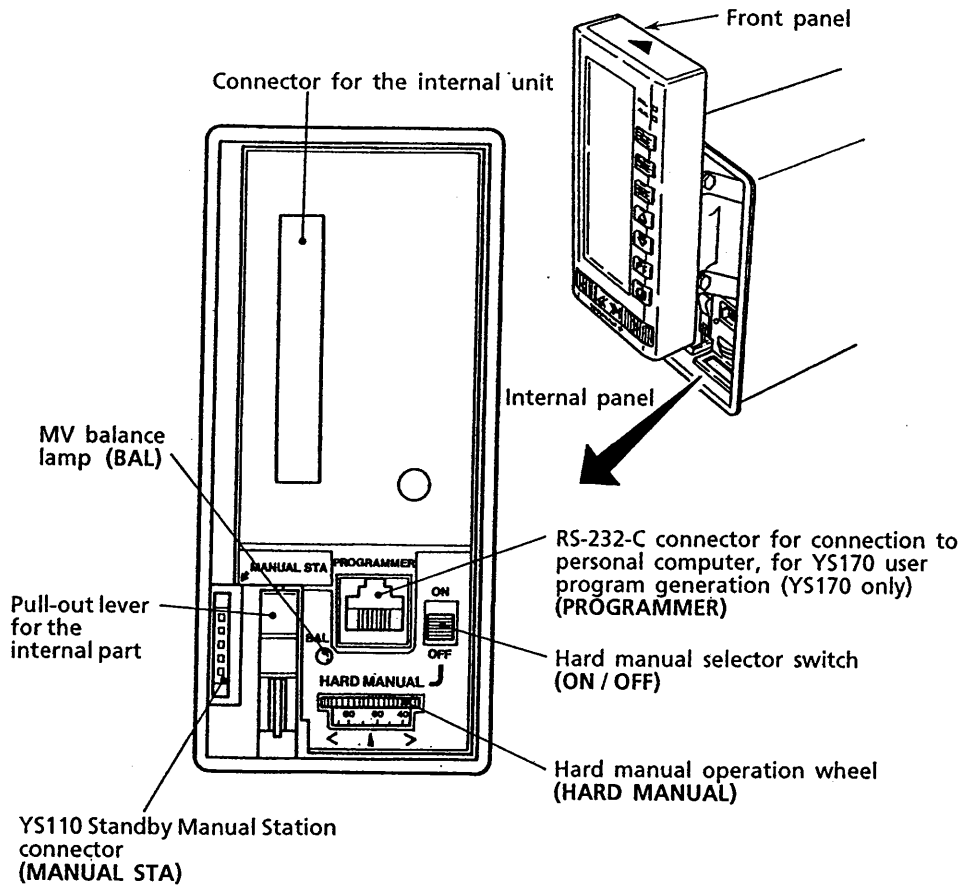


Weight : 2.6 kg

YS100 SERIES

TI 1B7A1-01E

Front Part of the YS100 SERIES Controller (YS170, YS150, YS136)



YS100 SERIES

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- The internal panel can be seen by swinging up the front panel.
- For YS170 and YS150 controllers and YS136 auto / manual station, when CPU is not normal, turn the hard manual operation wheel to adjust the output to the manipulated current output. When the output is adjusted appropriately, the MV balance lamp lights up. Setting the hard manual selector switch to ON selects the manipulated output from the hard manual control.

YS170 / YS150 Specifications List

Spec. Item	YS170	YS150
Front panel display	Back-lit bit-map LCD (non-glare) (Bar graph, alphanumeric displays)	
Tuning	From front panel	
Analog Inputs	5 points of 1 to 5V of which 1 point can be direct input: mv, thermocouple, RTD, potentiometer, input isolator, 2-wire transmitter, frequency	4 points of 1 to 5V of which 1 point can be direct input: mv, thermocouple, RTD, potentiometer, input isolator, 2-wire transmitter, frequency
Analog outputs	4 to 20 mA 2 points 1 to 5V 1 point	4 to 20 mA 2 points 1 to 5V 1 point
Contact input	Total I/O 6 points	1 point
Contact output		5 points
Fail contact output		1 point
Control functions	Single PID Cascade Autoselector Two independent loops	Single PID Cascade Autoselector
STC functions	Exists	
SVF functions	Exists	
Computation functions	36 types	MV input calculation SV input calculation Ext. input calculation
Program steps	Max. 400 steps* (YS170-□1□) Max. 200 steps (YS170-□0□)	—
Control period	0.05, 0.1, 0.2 seconds	0.1 seconds
Communication	DCS-LCS (Communication with μ XL or CENTUM-XL) RS-485 YS-net (Communication with personal computer)	
Peer - to - peer communication	Exists* (For YS170-□1□ equipped with YS-net)	
Power supply	100V version : DC drive/24-120V DC \pm (±10%), no polarity AC drive/100-120V AC \sim (±10%), 50/60Hz (±3Hz) 220V version : DC drive/135-190V DC \pm (±10%), no polarity AC drive/220-240V AC \sim (±10%), 50/60Hz (±3Hz)	
Size, Weight		
Front panel	72×144 mm	
Depth	320 mm	
Weight	2.6 kg	

STC : Self Tuning
SVF : SV Filtering

* When combined with YSS10-□1□ Program Generation Package

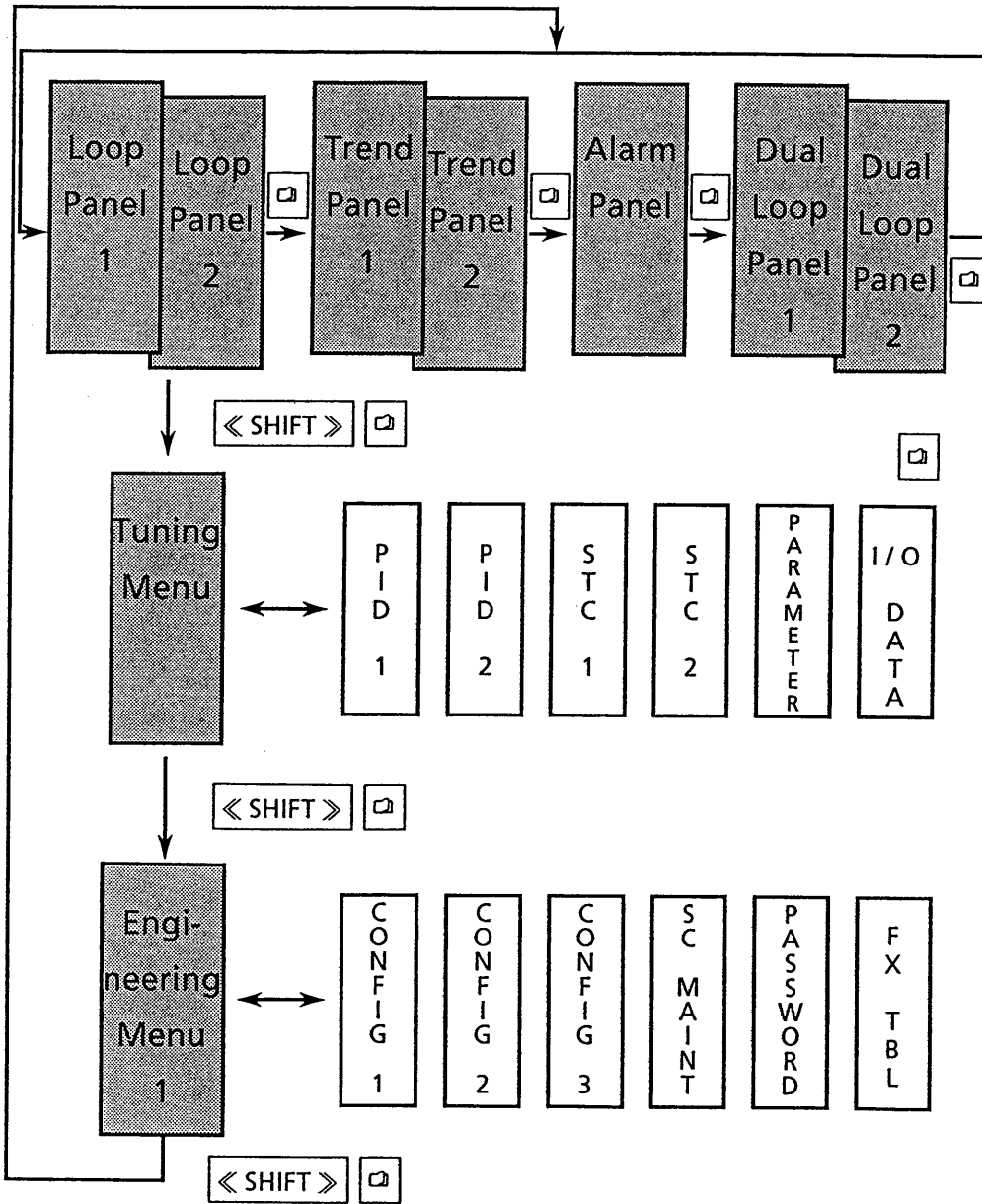
YS100 SERIES

TI 1B7A1-01E

- One of the analog current output points of the YS170 can be used for the voltage output point (1V to 5V).

TI 1B7A1-01E

YS150 Panel Groups and Panel Switching

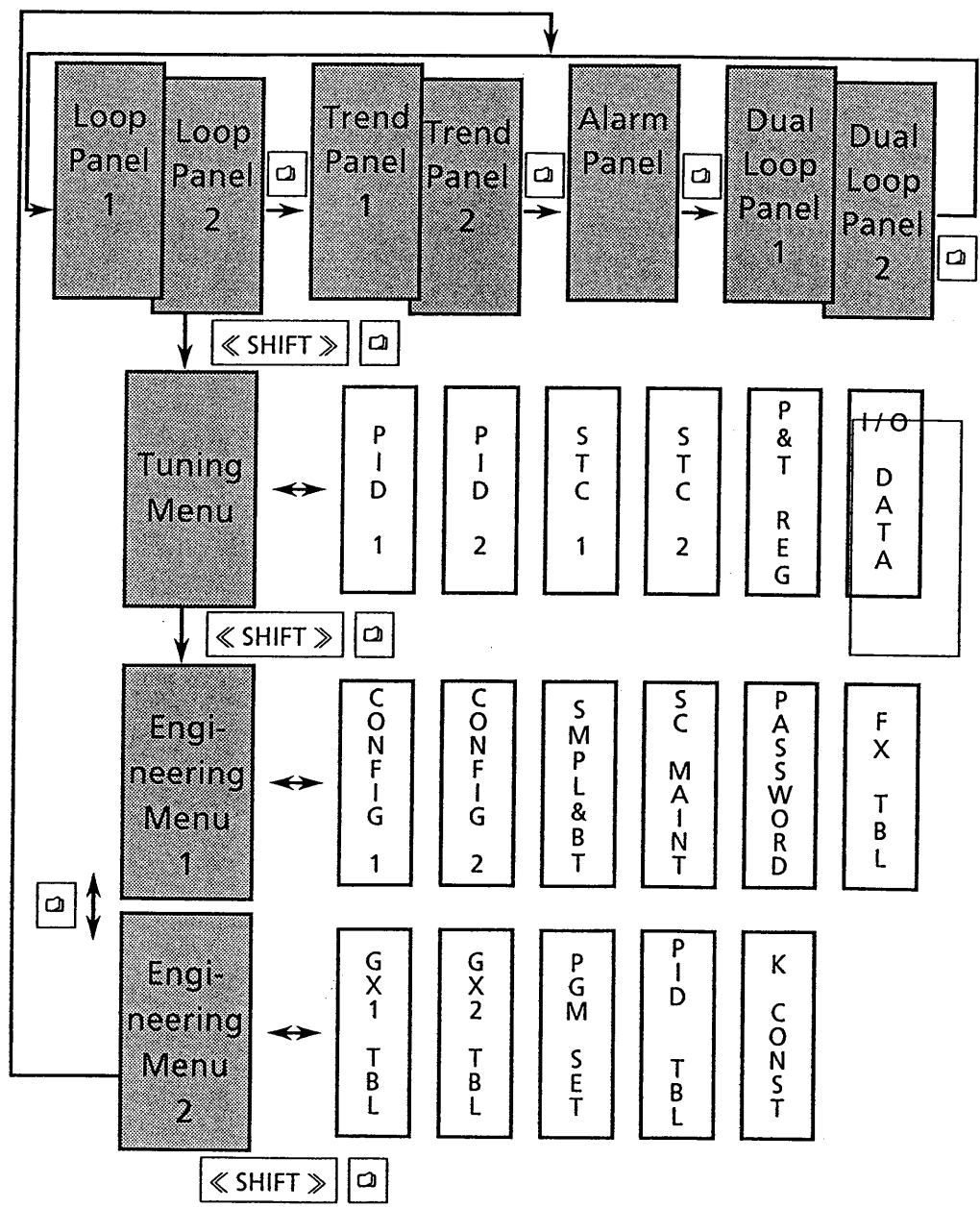


YS100 SERIES

TI 1B7A1-01E

- There are three panel levels: operation; tuning; engineering.
- Ample precautions have been taken to prevent misoperation of panel switching and data setting.
- The operation level can limit the panels to be displayed to the desired one only. (For example, if desired, only Loop Panel 1 need to be displayed.)

YS170 Panel Groups and Panel Switching

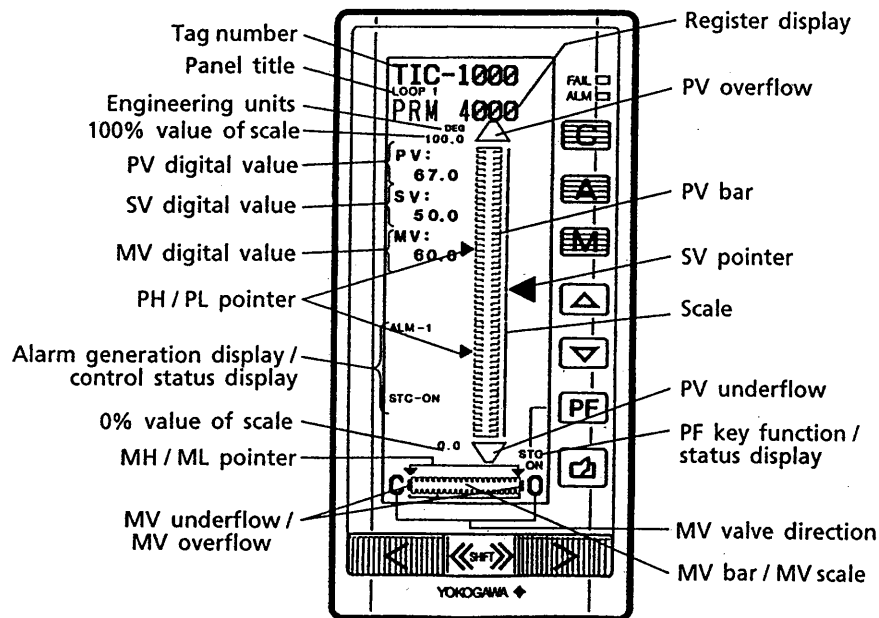


YS100 SERIES

TI 1B7A1-01E

- The panel level configuration is similar to that of the YS150.
- There are two engineering menu panels, either of which can be selected using the page key.
- With programming, changing displayed panels among operation panel group (Loop Panel 1, Loop Panel 2, Trend Panel 1, Trend Panel 2, and Alarm Panel) by contact inputs or a key on the faceplate is possible.

Loop Panel



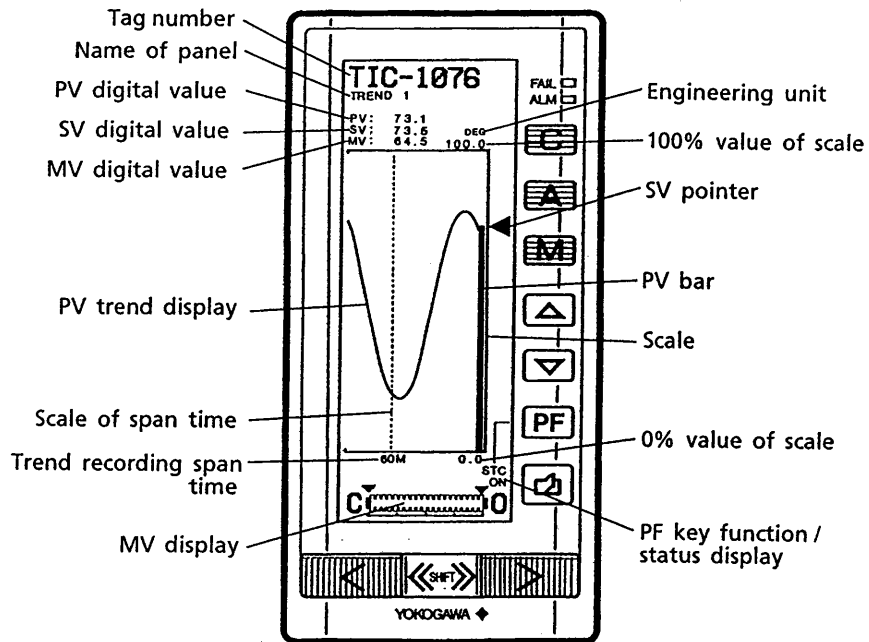
YS100 SERIES

TI 1B7A1-01E

- Selection of control modes, change of setting values, and control of manipulated variable are possible.
- Process variable (PV) is displayed with a bar graph as numeric values of engineering unit.
- When an alarm is generated, the lamp at the top right lights up, and the alarm status is displayed on the screen.
- Register display: Applies only to the YS170 programmable controller.

It can be displayed independently on both Loop Panel 1 and Loop Panel 2. As the value of the internal register used in the program is displayed in any 3 character parameter names, it can be used in the ratio displays in ratio control.

Trend Panel and Trend Recording Specifications



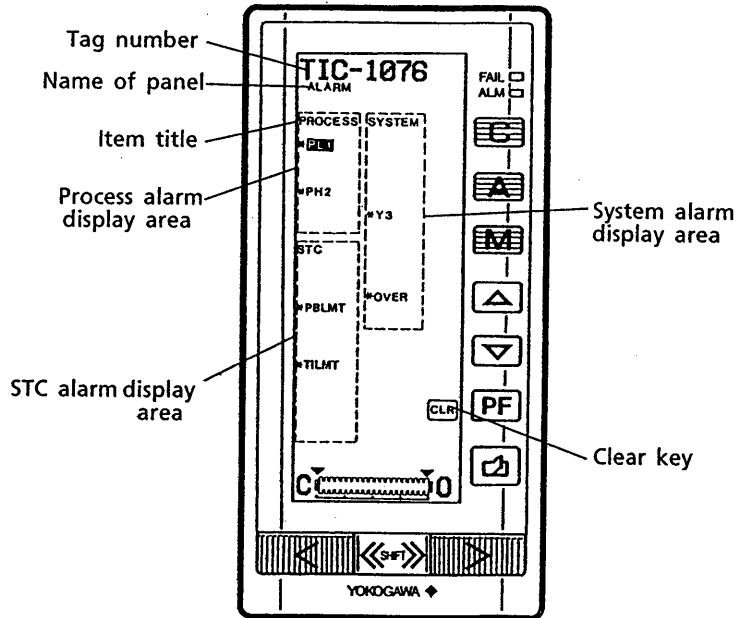
Scan Rate	1 sec	5 sec	10 sec	30 sec	1 min	5 min	10 min	30 min
Recording Span	1.5 min	7.5 min	15 min	45 min	1.5 hr	7.5 hr	15 hr	45 hr

YS100 SERIES

TI 1B7A1-01E

- Effective for checking process characteristics for tuning and checking the controllability for normal operation.
- Possible operations are similar to those of loop panels.

Alarm Panel



Note 1 : * means alarm not acknowledged (use clear key to delete).

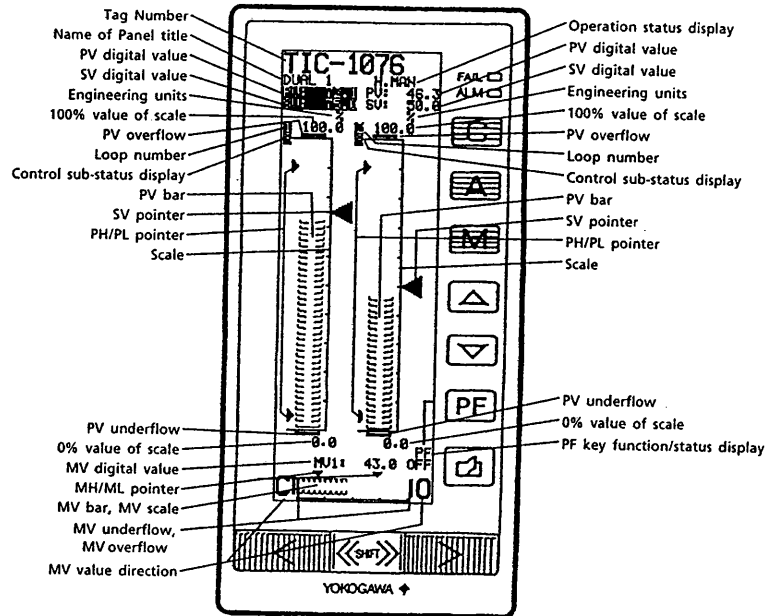
Note 2 : Inverse display (PL1) indicates that an alarm has generated.
Alarm display returns to normal when alarm status recovers.

YS100 SERIES

TI 1B7A1-01E

- Manual operation of manipulated output is possible. (Only for the primary loop when two independent loops are controlled.)

Dual Loop Panel



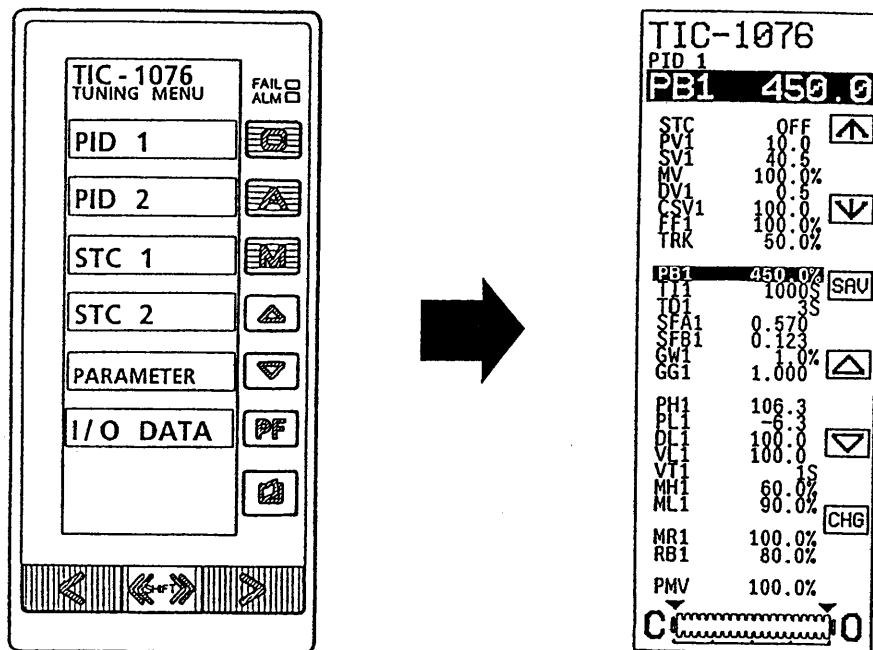
YS100 SERIES

TI 1B7A1-01E

- In this panel the information on both loops is displayed (loop 1 on the left side and loop 2 on the right side).
- There are two dual loop panels. One is for loop 1 operation and the other for loop 2 operation, and changing operation mode, SV setting, or MV output is possible for each loop. To make it easy to differentiate two dual loop panels the PV and SV digital value for operatable loop is displayed in the inverse mode. The function of each key is the same as that of the "single" loop panels.

TI 1B7A1-01E

Tuning Menu Panel Switching Example



YS100 SERIES

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- Pressing the software key on the right of the desired menu item displays the detailed panel.
- In the detailed panel, the selected item is enlarged and displayed on the top of the screen.
- To prevent misoperation immediately after panel switching, even when the increase/decrease key is pressed, data cannot be changed. The increase/decrease key only becomes effective after selecting the desired item using the cursor key.
- Pressing the SAV key writes the data displayed on the screen to the nonvolatile memory in the controller.
- While holding down the CHG key, the loop panel of the corresponding loop or the trend panel is displayed. During this period, operation is possible.

