Bulletin

3087 PORTABLE HYBRID RECORDER

All-in-One

3000

Programmable 150mm recorder

- 12-channel analog/digital data printout and DMM capability
- Operates on external AC or DC (optional)

YOKOGAWA

Bulletin 3000L

A full line of powerful functions for almost unlimited application flexibility.

A multipoint recorder, data logger and digital multimeter... all in one: YEW Model 3087 is a compact, programmable recording instrument that accepts input of up to 12 channels and prints out analog traces in six distinct colors and digital data. The type of input can be selected from among DC voltage, seven common types of thermocouples, and resistance bulbs. Through the front-panel DMM terminals, it also accepts an input of DC voltage, AC voltage and resistance.

To speed up, and simplify complex measurements and analyses of multichannel data, Model 3087 accommodates a complete and flexible array of functions in a single, compact unit. Model 3087 responds to a variety of applications.

Convenient Features

- **12 channels plus DMM input**
- **A wide range of input types—DC V, 7 types of TC's and RTD**

Front-panel DMM terminals accept a single channel of DC V, AC V and Ω.

- **High-speed printout—12 channels in 5 seconds**

Clear, distinct six-color analog traces permit easy reading and data analysis.

- **Completely programmable for full-scale range, chart speeds, alarms, skip, clock, and more**
- **Digital printout of computed data, ΔT, alarms and program list**

In LOGGING mode, the computing function provides an automatic printout of maximum, minimum and average values at every scan.

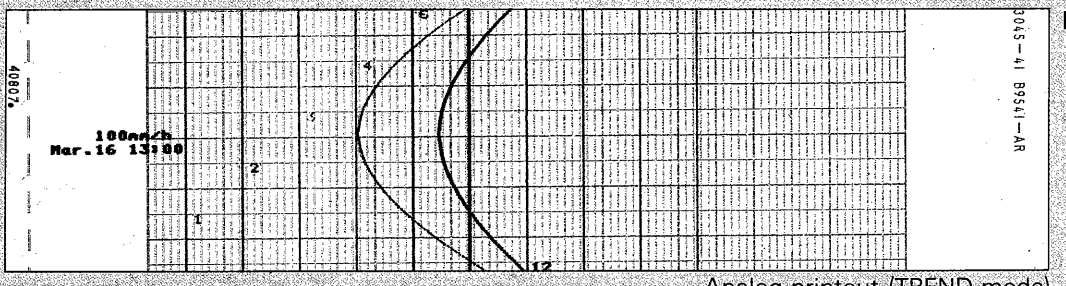
- **Simple-to-program and -operate keyboard**
- **Maintenance-free multi-color ribbon cassette**

A single cassette is usable for about six months of continuous work at a chart speed of 25 mm/h (SCAN AUTO).

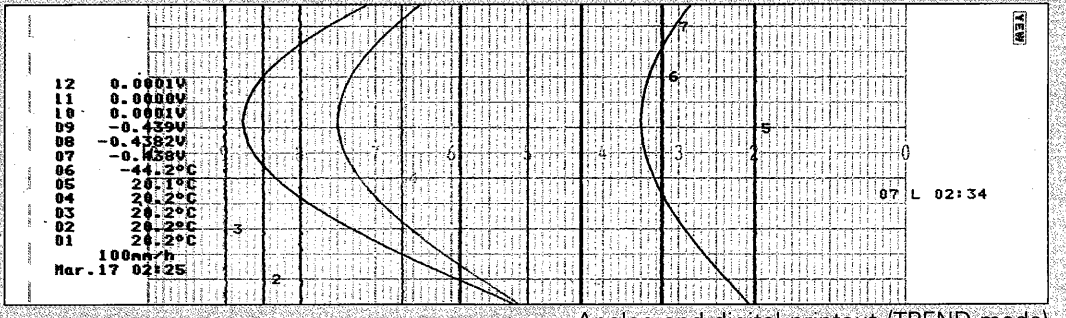
- **Compact and lightweight**
- **GPIB interface (optional)**
- **Low cost/channel**
- **External DC operation (optional)**

In addition to the AC line, Model 3087 can be operated from an external 12V DC source. This feature is valuable for on-site recording in diverse fields of industries such as automobile, construction and agriculture.

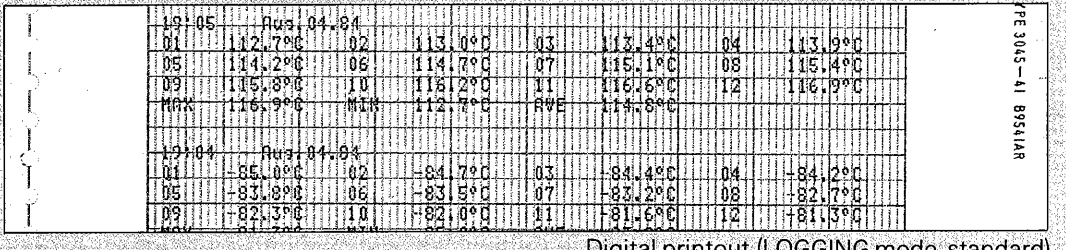
Examples of Printout



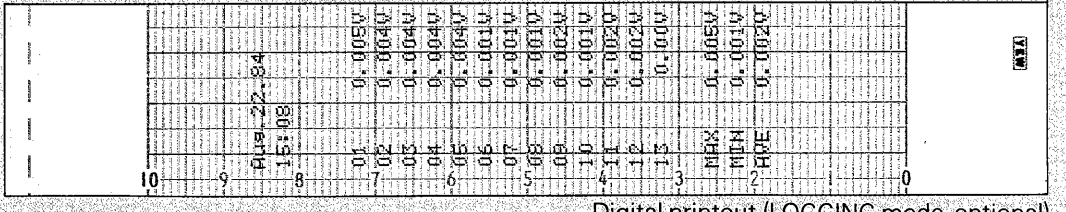
Analog printout (TREND mode)



Analog and digital printout (TREND mode)



Digital printout (LOGGING mode, standard)



Digital printout (LOGGING mode, optional)

Specifications

Printing Technique: Raster scan with a high-speed wire-dot printer and a six-color ribbon.
Number of Inputs: Up to 12 (plus 1 DMM input via front-panel terminals).
Effective Recording Span: 150 mm.
Basic Accuracy: ±0.3% of span.
Dead Band: Less than 0.1% of span.
Printing Mode: TREND...analog or analog plus digital data printout, LOGGING...digital (measured and *computed data) printout. *Computed data...maximum, minimum and average values are printed out at every scan (1st to 12th channels).
Print Cycle Time (SCAN): 5 s max., printing rate...12 channels/5 s on analog, or 4 s/line (70 characters/line) on digital (TREND.AUTO...scan interval is automatically changed in response to the programmed chart speed, TREND.FIX... scan interval is fixed at 5 s, LOGGING...scan interval is programmable from 1 min to 24 h in 1 min steps).
Chart: Z-fold chart (210 mm x 16 m), with calibrated width of 150 mm (100 uniform divisions).
Chart Speeds: 1 to 1,200 mm/h (selectable via keyboard).
Inputs: Rear-panel inputs...°C model;

Input Type	Measuring Range				Max. Sensitivity
DC V	±20mV, ±200mV, ±2V, ±20V, ±50V, 0 to 10mV, 1 to 5V, and 0 to 10V				5μV
TC	ANSI	JIS	DIN	.....model	–
	R	R	ANSI R	0 to 1,600°C	0.2°C
	S	S	PtRh-Pt	0 to 1,600°C	
	B	B	ANSI B	400 to 1,700°C	
	K	K	NiCr-Ni	−200 to 1,350°C	0.1°C
	E	E	ANSI E	−200 to 800°C	
	J	J	Fe-Konst	−200 to 900°C	
	T	T	Cu-Konst	−200 to 400°C	
	*N	*N	*N	−200 to 1,300°C	
	*W	*W	*W	0 to 1,600°C	0.2°C
RTD	Pt100Ω		Pt 100Ω	−200 to 550°C	0.1°C
	Pt 50Ω		(Pt 100Ω)	−200 to 550°C (−200 to 250°C)	

°F model;

Input Type	Measuring Range			
TC	ANSI	JIS	DIN	.....model
	R	R	ANSI R	32 to 2,912°F
	S	S	PtRh-Pt	32 to 2,912°F
	B	B	ANSI B	752 to 3,092°F
	K	K	NiCr-Ni	−328 to 2,462°F
	E	E	ANSI E	−328 to 1,472°F
	J	J	Fe-Konst	−328 to 1,652°F
	T	T	Cu-Konst	−328 to 752°F
	*N	*N	*N	−328 to 2,372°F
	*W	*W	*W	32 to 2,912°F
RTD	Pt100Ω		Pt 100Ω	−328 to 1,022°F
	Pt 50Ω		(Pt 100Ω)	−328 to 1,022°F (−328 to 482°F)

*Type N (Nicrosil-Nisil), Type W (W5%Re-W26%Re)..... not specified in ANSI, DIN and JIS.
DC V range corresponds to °C model.

Front-panel (DMM) input....ranging (display; automatic, printout; manual).

Input Type	Measuring Range	Max. Sensitivity
DC V	20mV, 200mV, 2V, 20V, 50V	5μV
AC V	2V, 20V, 200V, 250V	200μV
Ω	200Ω, 2kΩ, 20kΩ, 200kΩ, 2MΩ	50mΩ

Full-Scale Range Setting: Programmable via keyboard for each, 6 or 12 channels as a group.
Recording Colors: Analog data....

Channel Number	1,7	2,8	3,9	4,10	5,11	6,12
Color	Purple	Red	Green	Blue	Brown	Black

Digital data...LOGGING and program list (purple), alarm (red), channel identification numbering (the same color as those of analog data), digital data in TREND mode (black), DMM data...analog and digital (purple).
Input Impedance: More than 10 MΩ (less than 2 V) without voltage divider, approx. 1 MΩ (2 to 50 V) with divider.
Maximum Allowable Input Voltage (Continuous): 20 V DC for ranges of less than 2 V DC, or 100 V DC for ranges of 20 and 50 V DC (rear-panel inputs).
Thermocouple Burnout Protection: Upscale.
External Resistance: DC V and TC inputs...less than 2 kΩ, RTD input...less than 10 Ω/wire (Pt 100 Ω), or less than 5 Ω/wire (Pt 50 Ω).
Operating Position: Vertical.
Operating Temperature Range: 5 to 40°C (41 to 104°F).
Humidity Range: 20 to 80%, relative humidity.
Dielectric Strength: 1,500 V AC for one minute between power line and case, 500 V AC for one minute between input terminals and case.
Insulation Resistance: More than 20 MΩ at 500 V DC between terminals and case.
Power Requirements: 100, 115, 200 or 230 V AC (must be specified), 50 and 60 Hz.
Power Consumption: Approx. 40 VA.
Finish: Pale green.
Dimensions: Approx. 210 x 338 x 316 mm (8-1/4 x 13-3/8 x 12-1/2").
Weight: Standard...approx. 11 kg (24.3 lbs), optional DC-operated model...approx. 12 kg (26.5 lbs).
Accessories supplied at no extra cost: Power cord...1 set, chart...1 chart, six-color ribbon...1 pc., lubricating oil...1 bottle (2 cc), hex wrench...2 pcs., fuse...1 pc. each (0.3, 0.5, 1, 3A), alarm connector...1 pc., battery (SUM-2)...3 pcs.

DC-Operated Model (Optional)
Power Requirements: External 12 V (11 to 14 V) DC, and AC line (100, 115, 200 or 230 V AC...must be specified).
Maximum Current: 3A DC.
GPIB Interface: Optional.
Accessories supplied at no extra cost: DC input connector (female)...1 pc., fuse...1 pc. (3A).

3087
PORTABLE HYBRID RECORDER

Panel Layout and Control Functions

1 DMM Input Terminals
Accept a single channel of DC V, AC V and Ω. Measured data are displayed, and printed out in both analog and digital.

2 Digital Data Printout
In TREND mode, channel numbers and measured data are printed in digital in addition to multi-color analog traces. (Print interval is automatically selected in response to the programmed chart speed)

3 DMM and Function Selector Buttons

4 Alarm and REMOTE Indicators
Light up to indicate the alarm, fail, low battery, or out-of-chart conditions. REMOTE indicator lights up under remote control (GPIB interface, optional).

5 Digital Data Display
Clock, channel number, measured data, or setting values are displayed.

6 Printing, Display and Programmig Mode Indicators

7 Multi-Color Analog Traces
TREND mode produces high-quality analog traces with channel identification numbering in six distinct colors.

8 Programming Mode Selector Buttons

9 16-Key Programming Keyboard
Press to program and control Model 3087.

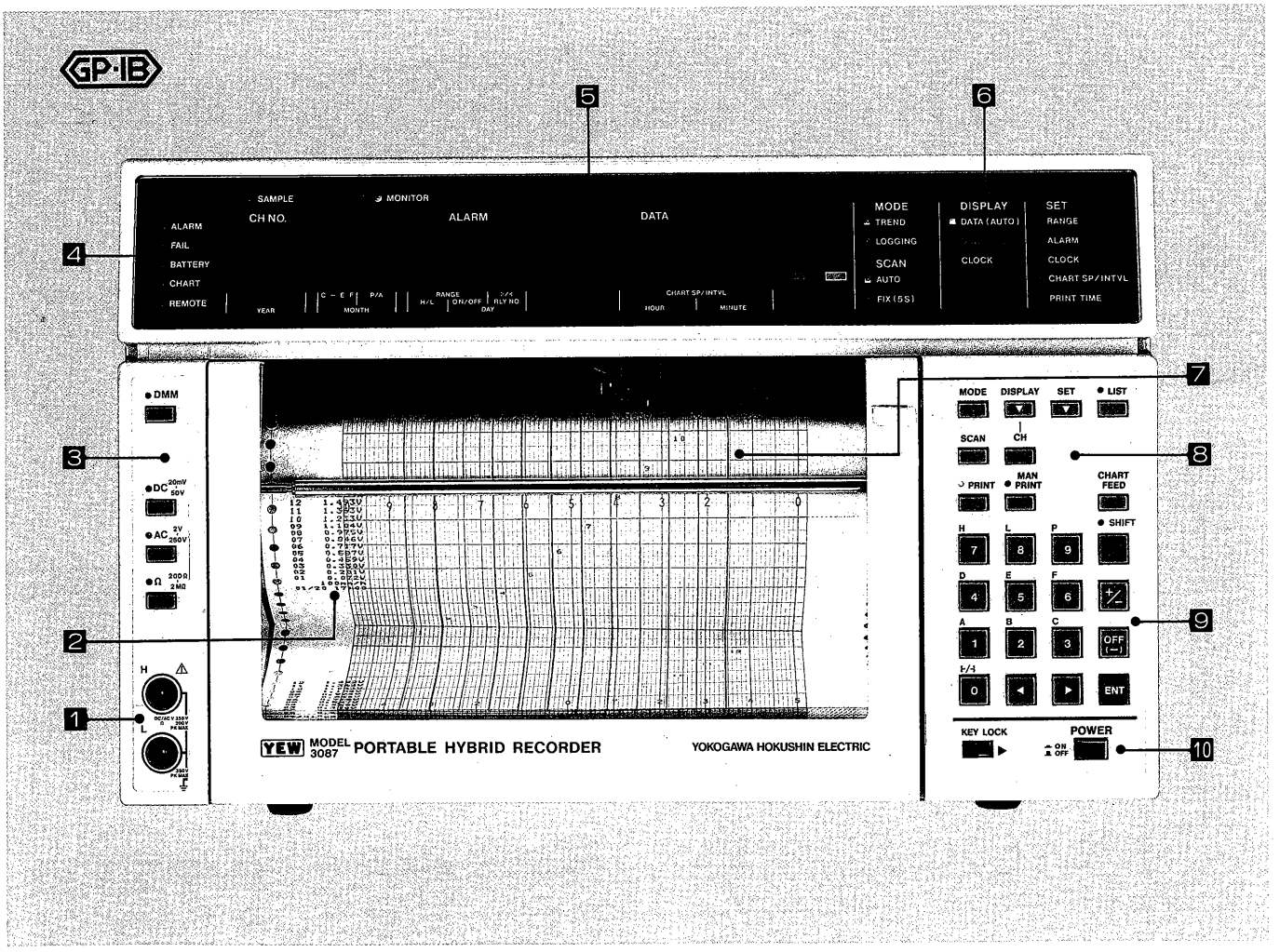
10 KEY LOCK and Power ON/OFF Selectors
All programming is key-protected by self-contained batteries.

Examples of Keyboard Programming

1st to 12th channels...Type K, 0 to 400°C full scale in analog and digital printout

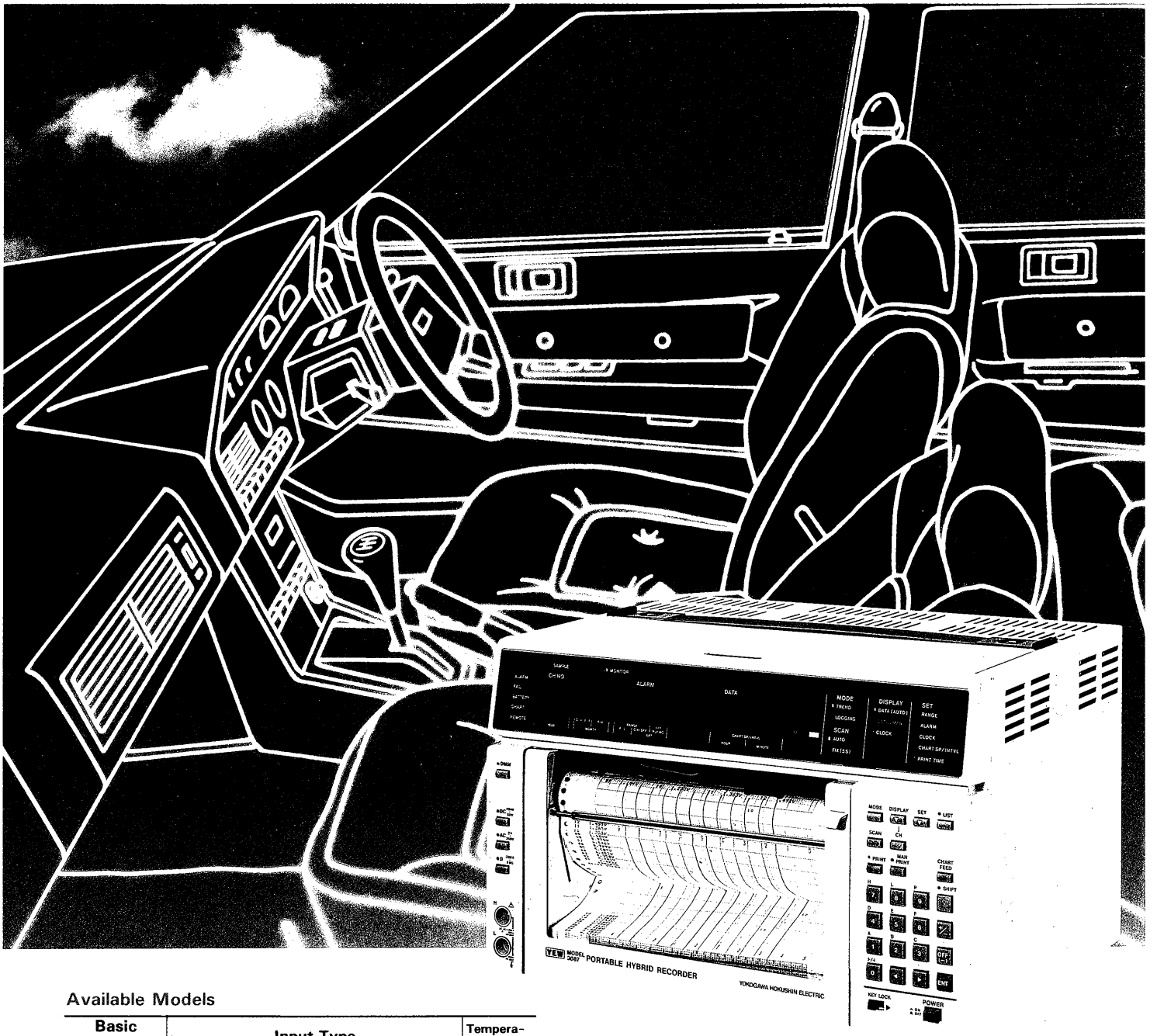
1) Push MODE button to indicate TREND (MODE indicator).
2) Push SET button to indicate RANGE (SET indicator).
3) Using programming keys, set each item in the sequence of light display.

Item	Setting	Meaning
CH NO	00	All(1st to 12th) channels as a group
SKIP	C	Absolute value
MODE	P	Analog plus digital printout
RANGE	13	Type K
SPAN	↑	0 to 400°C full scale
VALUE	+000.0	
Push ENT button		
SPAN	↓	
VALUE	+400.0	
Push ENT button		



DC-operated model for on-site data monitoring and recording.

3087
PORTABLE HYBRID RECORDER



Available Models

Basic Code	Input Type		Temperature Range
308721	DC V & TC(ANSI, JIS)	DMM input (front panel): DC V, AC V & Ω	°C
308722	RTD(JIS)		
308723	DC V, TC(ANSI, JIS) & RTD(6 points, JIS)		
308741	DC V & TC(DIN)		
308742	RTD(DIN)		
308743	DC V, TC(DIN) & RTD (6 points, DIN)		
308763	DC, V, TC(ANSI) & RTD (6 points, DIN)		
308764	DC V & TC(ANSI, JIS)		°F
308765	RTD(DIN)		
308766	DC V, TC(ANSI) & RTD (6 points, DIN)		
–1	100V AC (50 & 60 Hz)		
–3	115V AC (50 & 60 Hz)		
–5	200V AC (50 & 60 Hz)		
–7	230V AC (50 & 60 Hz)		

Optional Features

Option Code	Description
/GP-IB	General purpose interface bus(GPIB)
/DC	AC line & external 12V DC operation
/VPT	Specialized printing form (prints across chart in LOGGING mode)

Note: Optional features should always be ordered together with the mainframe of Model 3087

Spares

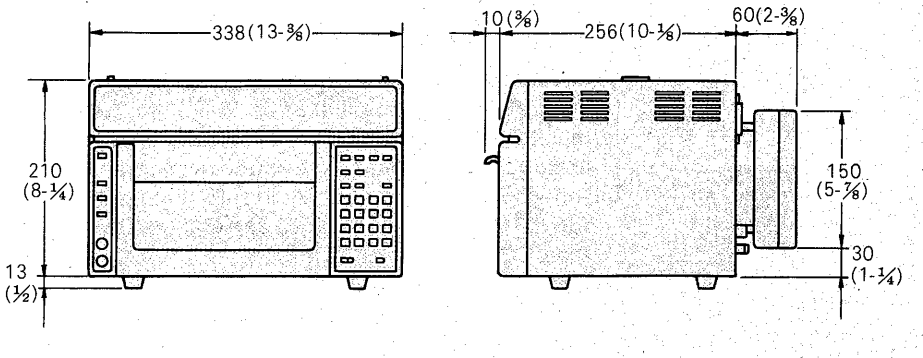
Name	Part No.	Description
Six-color ribbon	**B9541AT**	1 pc.
Z-fold chart	**B9541AR**	6 charts (100 uniform divisions)

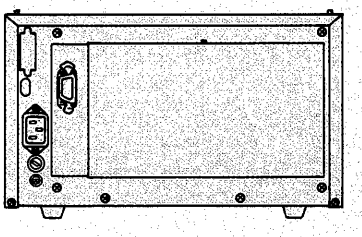
Standard Functions of Model 3087

Standard Function	Description
Full-scale range setting	Programmable via keyboard for each, 6 or 12 channels as a group.
Skip	Printout skips for the group programmed (each, 6 or 12 channels).
Selectable chart speeds	Selectable via keyboard from 1 to 1,200mm/h.
TREND/LOGGING modes (analog and digital data printout)	● TREND···analog or analog plus digital printout (channel numbers and measured data are printed out in digital in the left margin of the chart at a chart speed of 10 to 500mm/h.) ● LOGGING···digital (measured and computed data) printout.
Program list printout	Contents of entire program memory are listed on the chart.
Digital printout of alarm	At the time of out-of-limit occurrence, alarm conditions are printed out in digital (red) in the right margin of the chart.
ΔT measurement	Digital printout of temperature difference between the 1st (or 7th) and any other channel.

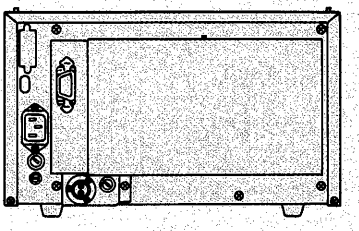
Standard Function	Description
Scaling	Scaling for data display on input ranges of 0 to 10mV, 1 to 5V, and 0 to 10V (±1,600 0).
Channel identification numbering	Channel identification numbering (up to 12 in six colors) is marked along the right of each trace (at a chart speed of 1 to 500mm/h).
DMM input and printout	A single channel of DMM input can be displayed, and printed.
Manual printout mode	Digital data of 1st to 12th channels are printed out at a push of MAN PRNT key.
Digital display	Clock, measured data, range, or setting values are displayed.
Chart END alarm	LED indicator lights up before out-of-chart conditions, and printing is automatically stopped after the chart advance of 60mm.
Battery-backup memory	Three 1.5V batteries maintain all programming when power is removed.
FAIL alarm	FAIL lamp lights up when the recorder is in fail condition.

Dimensions





Standard model



DC-operated model (optional)

Unit : mm (approx. inch)

YOKOGAWA

YOKOGAWA ELECTRIC CORPORATION
9-32, Nakacho 2-Chome, Musashino-shi, Tokyo 180, JAPAN
Phone: Tokyo 0422-54-1111, Telex: 02822-327 YEW MT J
TOKYO NO.2 SALES OFFICE: Shinjuku NS Bldg. (10F),
2-4-1 Nishi Shinjuku, Shinjuku-ku, Tokyo 163, JAPAN
Phone: 03-349-0601, Telex: J27473 YEWTOK

YOKOGAWA CORPORATION OF AMERICA
2 Dart Road, Shenandoah Industrial Park,
Newnan, GA 30265, U.S.A.
Phone: 404-253-7000, TWX: 230-244880 YCA SHEN

YOKOGAWA ELECTROFACT B.V.
Radiumweg 30, 3812 RA Amersfoort, THE NETHERLANDS
Phone: (0)33-641611, Telex: 79118 YEF NL

O2

Represented by:

8(D) Printed in Japan