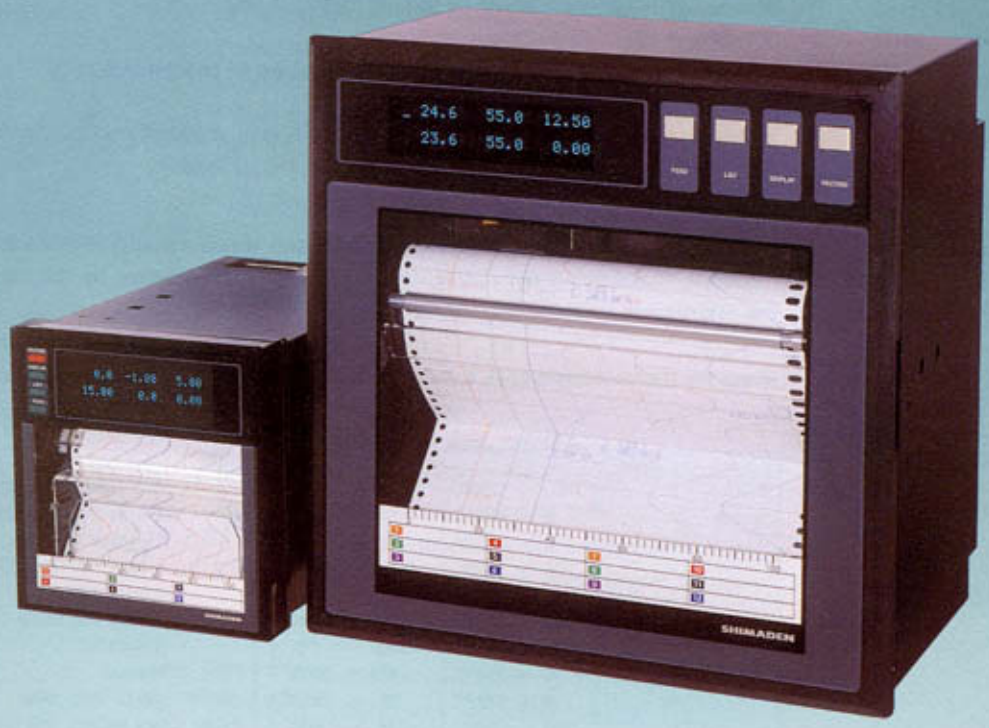
Shimaden, Temperature and Humidity Control Specialists

℃
%RH
SHIMADEN

SERIES SR106A/SR186A
SHIMADEN HYBRID RECORDER



A Revolution in Recorder Technology

The Slimmest and Lightest Recorder in the World with a Thickness of Only 199mm

Weight : SR106A (2.8kg)
SR186A (6.0kg)

CE approved

BASIC FEATURES

- ***Compact Housing***
- ***High-Quality Ink Jet Clear Recording***
- ***Fully Configurable Input***
- ***Varied Digital Printing***
- ***Menu Driven Easy Operation***
- ***Chart Paper Illumination Available (Option)***
- ***Communication Interface RS-485 Available (Option)***

Performance and Characteristics

Input resistance:	Thermocouple: > 10MΩ ±50mV: > 10MΩ ±500mV: Approx. 100kΩ ±5V and ±50V: Approx. 1MΩ
Insulation resistance:	100MΩ (between each terminal and earth, at 500V DC)
Dielectric strength:	Input terminal-input terminal: 500V AC, 1min. Power supply terminal-ground: 2000V AC, 1min. Input terminal-ground: 500V AC, 1min. Power supply terminal-input terminal: 2000V AC, 1min. Alarm terminal-alarm terminal: 750V AC, 1min.
Reference junction compensation accuracy:	K, E, J, T, N, L, U, PN・・・・±0.5℃ R, S, B, W・・・・・・・・・・・・・・±1℃

Recording System

Writing system:	Ink jet system, 6 colors
Chart width:	SR106A: 100mm, SR186A: 180mm
Chart paper:	SR106A: Z-fold 15m long, SR186A: Z-fold 20m long
Chart speed:	SR106A: Continuous recording type 10～400mm/h, continuous recording 401～1500mm/h, intermittent recording Dot recording type 10～1500mm/h Each can be set in 1mm/h steps. SR186A: Continuous recording type 10～300mm/h, continuous recording 301～1500mm/h, intermittent recording Dot recording type 10～1500mm/h Each can be set in 1mm/h steps.
Recording cycle:	Dot recording・・・30 sec./all points Continuous recording・・・Depends on chart speed <Calculation equation> SR106A: Recording cycle (sec.) $= \frac{400}{\text{Chart speed (mm/h)}}$ (Recording cycle is more than 2 sec.) SR186A: Recording cycle (sec.) $= \frac{450}{\text{Chart speed (mm/h)}}$ (Recording cycle is more than 3 sec.)
Measuring cycle:	Input 1 to 3 points・・・160ms Input 6 or 12 points・・・320ms
Service life of ink:	(Depends on operating condition) SR106A: About 6 months for 6 points of linear recording at 20mm/h of chart speed. SR186A: About 6 months for 6 points of linear recording at 25mm/h of chart speed.

Printing System

Periodic data printing:	Measured value, Unit, Date, Time, Time line, Chart speed, Channel no.
List printing:	(1) Measured value list (Date, Time, Channel no., Measured value, Unit) (2) Parameter list (Date, Time, Channel no., Recording range, Scaling, Unit, Alarm set value, Chart speed, Tag no.) (3) Test pattern (all characters and color patterns)
Alarm printing:	Channel no., alarm type (HH, H, L, LL), output relay no., on/off time
Burnout printing:	Burnout channel no. and time
Other:	Ink shortage message, automatic range selection mark, recording start mark, chart speed change mark SR106A: Printing is not possible above 401mm/h (continuous recording) or 51mm/h (dot recording) . SR186A: Printing is not possible above 301mm/h (continuous recording) or 51mm/h (dot recording) .

Alarm

Number of alarms:	Max. 4 levels (H, L, HH, LL) for each channel
Alarm action indication:	Kind of alarm and output relay no. are indicated for each channel upon occurrence of alarm.
Printing:	Channel no., kind of alarm, output relay no. and on/off time are printed on chart paper.
Output:	See optional specifications.
Hysteresis:	Approx. 0.5% of recording span

Operating Environmental Influence

Power supply variation influence:	Voltage variation: SR106A・・・85～150V AC or 150～300V AC (50 or 60Hz) SR186A・・・85～300V AC (50 or 60Hz) 100V AC basic, Change in indication・・・±(0.1%+1 digit) max. Change in recording ・・・±0.2% of recording span max. Frequency variation ・・・47～63Hz (100V AC), 50Hz basic Change in indication・・・±(0.1%+1 digit) max. Change in recording ・・・±0.2% of recording span max.
Input signal source resistance or wiring resistance influence:	Thermocouple・・・10μV per 100Ω Voltage input・・・Variation of 0.1% change of resistance Change in indication・・・±(0.1%+1 digit) max. Change in recording・・・±0.2% of recording span max. R. T. D. ・・・Variation of resistance with changes in 10Ω per wire Change in indication・・・±(0.1%+1 digit) max. Change in recording・・・±0.2% of recording span, max. (3 wires should be balanced.)
Temperature influence:	Change in indication・・・±(0.3%+1 digit)/10℃, max. Change in recording・・・±0.5%/10℃ max.
Mounting position influence:	Inclination within 30° Change in indication・・・±(0.1%+1 digit) max. Change in recording・・・±0.2% of recording span max.
Vibration influence:	Linear vibration with 10～60Hz of frequency and 0.02G of acceleration is applied to each of 3 directions for 2 hours. Change in indication・・・± (0.1%+1 digit) max. Change in recording・・・±0.2% of recording span max.
Common mode noise rejection:	120dB at 50, 60Hz±0.1Hz
Series mode noise rejection:	30dB at 50, 60Hz±0.1Hz
Chart paper influence:	Standard temperature/humidity: 20℃, 65% RH Expansion at 85%RH・・・・0.4% max. Contraction at 35%RH・・・0.5% max.

Applicable Standards

Safety standards: IEC1010-1 (1990)
EMC standards: EN50081-1 (1992),EN50082-1 (1992)

Power Requirement

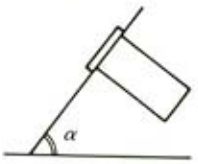
Supply voltage: SR106A: 100～120V AC or 200～240V AC
SR186A: 100～240V AC
Frequency: 50/60Hz
Power consumption: SR106A: About 20VA, 100V AC, without option
About 26VA, 100V AC, with option
SR186A: About 22VA, 100V AC, without option
About 37VA, 100V AC, with option

Transportation/Storage

Temperature limit: 0～50℃
Humidity limit: 20～80%RH, non-condensing is required (temperature × humidity < 3200)
Vibration: 10～60Hz, 0.02G

Physical Data

Mounting method: Panel flush mounting
$\alpha = 90 \sim 60^{\circ}$



Weight: SR106A: Approx. 2.8kg (without option)
Approx. 3.3kg (with option)
SR186A: Approx. 6kg (without option)
Approx. 7kg (with option)
External dimensions: SR106A: 144 × 144 × 199mm (H × W × D)
SR186A: 288 × 288 × 199mm (H × W × D)
Panel cutout: SR106A: 137 × 137mm
SR186A: 281 × 281mm

Optional Specifications

Chart illumination: Cold cathode fluorescent
Alarm output/3-point external control:
(1) Alarm output (DO):
SR106A: 6 points relay contact output (1a)
SR186A: 6 or 12 points relay contact output (1a)
Note : Individual channel operation or common operation available
Relay contact capacity: 240V AC, 3A (resistive load) 30V DC, 3A (resistive load)
(2) External control (DI):
The following control is possible with external contact signal.
- Recording start/stop:
Recording start/stop is effected by a contact signal. Recording is started when the contact is closed and stopped when it is open.
- Chart speed change:
Selection between normal and remote chart speeds is effected by a contact signal. Remote chart speed is selected when the contact is closed and normal when the contact is open.
- Measured value printing:
Measured value list printing (date, time, channel no., measured value, unit) is effected by a contact signal. Printing is started when the contact is closed.

Note: For external control, use a dry contact.
Contact capacity: 12V DC, 0.05A, N.O.(1a) contact

Interface function: RS-485 interface for transmitting measured value and receiving the condition of setting.

Communication system	Half-Duplex Bit Serial
Synchronizing type	Start-stop synchronizing
Code	Binary Data length: 8 bits Parity: odd number/even number/none Stop bit: 1 or 2
Communication speed	2400, 4800, 9600, 19200 bps
Number of units connected	Max. 31 units
Communication distance	Max. 1km

ORDERING INFORMATION

ITEM	CODE	SPECIFICATIONS
SERIES	SR106A-	Hybrid recorder, DIN 144 × 144
RECORDING SYSTEM	1	1 Continuous recording
	2	2 Continuous recording
	3	3 Continuous recording
	6	6 Continuous recording
	7	6 Dot recording
INPUT	1	Thermocouples B, R, S, K, E, J, T, N, W, L, U, PN
	2	R.T.D (Pt100)
	3	±50mV, ±500mV, ±5V, ±50V DC 4 ~ 20mA DC Available with shunt resistor (option)
MENU INSTRUCTION	J	Japanese
	E	English
POWER SUPPLY	84-	100 ~ 120V AC, 50/60Hz
	85-	200 ~ 240V AC, 50/60Hz
CHART PAPER ILLUMINATION	0	Without
	1	With
ALARM OUTPUT/EXTERNAL CONTROL	0	Without
	1	6-point alarm output/3-point external control
INTERFACE FUNCTION	0	Without
	5	RS-485
REMARKS	0	Without
	9	With (Please consult before ordering.)

■ Spare and Optional Parts

Item	Type	Remarks
Chart paper (50 divisions) × 6 charts/box	SRX00DL-5000S	
Recording head ×1	SRZH1001 (PHZH1001)	
Alarm output/external control unit	SRZK1601	6-point alarm output/3-point external control
Chart paper illumination lamp	SRZL1001	With cable connector
Shunt resistor 10Ω ±0.1%	SRZT1101	For 4 ~ 20mA or 10 ~ 50mA input
Interface unit	SR7D6467CI	RS-485

● Standard Range (Factory-set when shipped)

Code	Input	Standard/Rating	Range
1	Thermocouple	K	0 ~ 1200℃
2	R.T.D.	Pt100	0 ~ 500℃
3	DC voltage	-5 ~ 5V	0 ~ 100

ORDERING INFORMATION

ITEM	CODE	SPECIFICATIONS
SERIES	SR186A-	Hybrid recorder, DIN 288 × 288
RECORDING SYSTEM	1	1 Continuous recording
	2	2 Continuous recording
	3	3 Continuous recording
	6	6 Continuous recording
	7	6 Dot recording
	8	12 Dot recording
INPUT	1	Thermocouples B, R, S, K, E, J, T, N, W, L, U, PN
	2	R.T.D. (Pt100)
	3	±50mV, ±500mV, ±5V, ±50V DC 4 ~ 20mA DC Available with shunt resistor (option)
MENU INSTRUCTION	J	Japanese
	E	English
POWER SUPPLY	86-	100 ~ 240V AC, 50/60Hz
CHART PAPER ILLUMINATION	0	Without
	1	With
ALARM OUTPUT/EXTERNAL CONTROL	0	Without
	1	6-point alarm output/3-point external control
	2	12-point alarm output/3-point external control
INTERFACE FUNCTION	0	Without
	5	RS-485
REMARKS	0	Without
	9	With (Please consult before ordering.)

■ Spare and Optional Parts

Item	Type	Remarks
Chart paper (100 divisions) × 6 charts/box	SRX00BL-1000R	
Recording head × 1	SRZH8001 (PHZH8001)	
Alarm output/external control unit	SRZK8601	6-point alarm output/3-point external control
Alarm output/external control unit	SRZK8201	12-point alarm output/3-point external control
Chart paper illumination lamp	SRZL8001	With cable connector
Shunt resistor 10Ω ±0.1%	SRZT8101	For 4 ~ 20mA or 10 ~ 50mA input
Interface unit	SR7D0834C2	RS-485

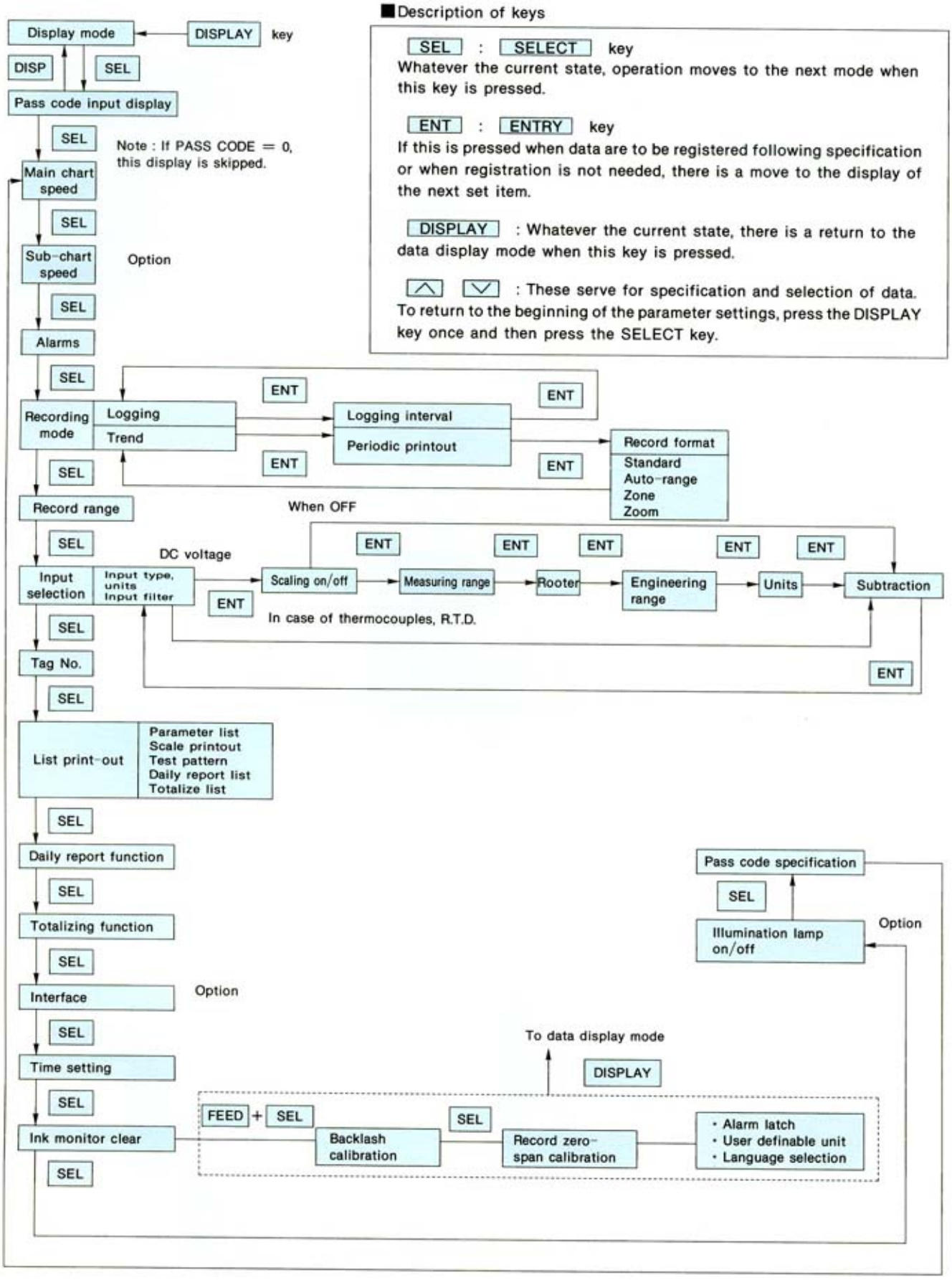
● Standard Range (Factory-set when shipped)

Code	Input	Standard/Rating	Range
1	Thermocouple	K	0 ~ 1200℃
2	R.T.D.	Pt100	0 ~ 500℃
3	DC voltage	-5 ~ 5V	0 ~ 100

FUNCTIONS

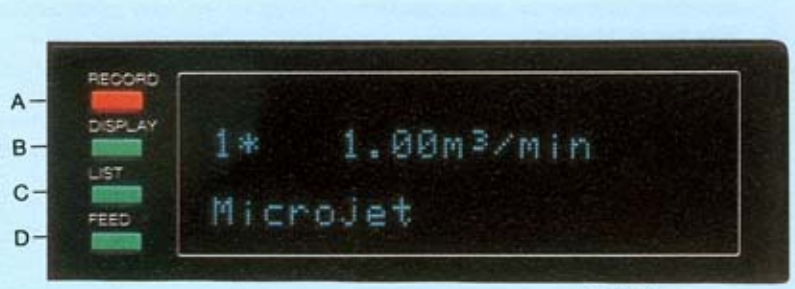
Function		Description
Range setting		Recording range can be set for each channel.
Input setting		Any input can be set for each channel.
Skip function		Used to skip recording, indication and alarm at any measuring point.
List printing function	Measured value list	Date, time, and measured value unit can be printed.
	Parameter list	Date, time, recording range, scaling, unit, kind of input, alarm set value, chart speed, and tag no. can be printed.
	Test pattern	All characters and color patterns can be printed.
Periodic data printing function		Time, date, chart speed, measured value and unit can be printed at fixed intervals. Printing can be enabled/disabled from keyboard.
Alarm printing function		Time, channel no., kind of alarm, and output relay no. can be printed when alarm is on or off.
Unit indication		Engineering units such as °C, °F, %, mV, mA, kg/cm², ℓ, etc., are indicated (setting from keyboard).
Scaling function		Scaling with DC voltage input is possible. (Setting of decimal point is also possible within range of −32767～32767).
Subtract function		Difference between any channels is recorded (channel is set from keyboard).
Auto-range recording		Recording range is automatically changed for recording in event of overrange or underrange (setting with keyboard). This function is not available for combination of zone recording and expansion/contraction recording.
Zone recording		Recording area is divided into max. of 3 (SR106A) and 4 (SR186A) zones for recording. This function is not available for combination of automatic range selection and expansion/contraction recording.
Enlarged/reduced recording		A Part of recording area of each channel is expanded or contracted for recording. This function is not available for combination of automatic range selection and zone recording.
Square-root extraction function		Square-root extraction of DC voltage input is possible.
Daily report function		Measured value of every hour for a day (24 data) in each channel is stored for printing. Max., min., and average values are also printed at same time. ON-OFF operation, ON-OFF of each channel and operation start time can be set from keyboard.
Data sum function		Integrated value of every hour for a day (24 data) in each channel is stored for printing (integration in 1 sec. steps). Total value for a day is also printed at same time. ON-OFF operation, ON-OFF of each channel and operation start time can be set from keyboard.
Memory backup		Set data and clock function are protected by built-in lithium battery (expected battery life is approx. 10 years under normal temperature).
Input filter		Response is delayed according to sudden changes in input of each channel (1st order lag filter). Time constant setting range: 0 to 900 sec. (setting from keyboard)
Burnout function		When thermocouple or R. T. D. input is disconnected, it is deflected 100%. Also, it is indicated and printed at same time.
Passcode		4-digit pass code security is available.
Language		English, German, or French can be selected for display and printing.

OUTLINE OF PROCEDURE FOR SETTING PARAMETERS



NAMES & FUNCTIONS

4-key operation (with door closed)



SR106A

SR186A

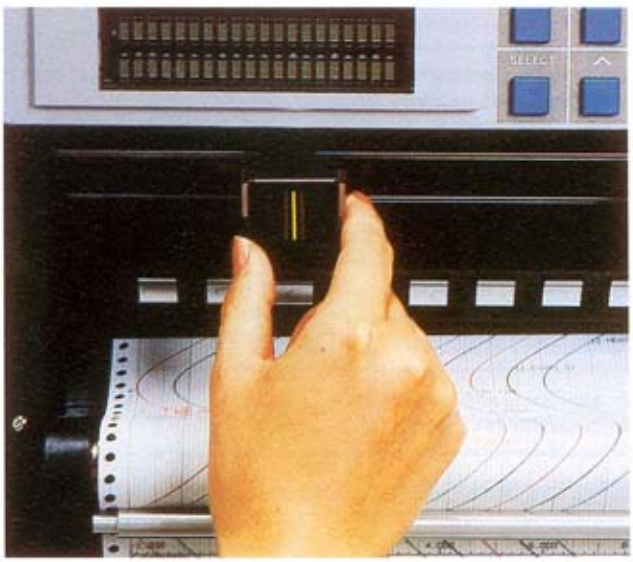
A. Record start/stop key
B. Display select key
C. Measured value print key
D. Chart feed key

4-key configuration (with door open)

SR106A

SR186A

E. Select key
F. Up key
G. Down key
H. Data entry key



The ink cartridge and chart paper can easily be replaced without removing the internal unit of the recorder.