

# Model 5100e

## Specification sheet

### TECHNICAL SPECIFICATION (Recorder)

#### Standard features

Inputs	Six universal input channels
Outputs	One changeover relay
Archiving	Onto 3.5 inch floppy disk
Communications standard	Ethernet

#### Environmental Performance

Temperature limits	Operation: 5 to 40 °C; Storage: - 20 to + 50 °C	
Humidity limits	Operation/Storage: 20% to 80% RH(non-condensing)	
Protection	Bezel and display:	IP65
	Sleeve:	IP20
Shock	BS EN61010	
Vibration (10 to 150 Hz)	2g peak	
Altitude	<2000 metres.	

#### Electromagnetic compatibility (EMC)

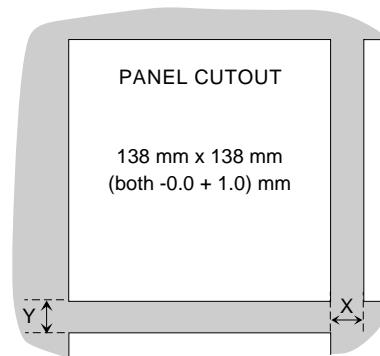
Emissions and immunity	BS EN61326
------------------------	------------

#### Electrical safety

BS EN61010 (Installation cat. II; Pollution degree 2)
---

#### Physical

Panel mounting	DIN43700
Bezel size	144 x 144 mm.
Panel cutout dimensions	138x138 (both - 0 + 1 mm)
Depth behind bezel rear face	
With terminal cover:	248 mm
Without terminal cover:	213 mm
Weight	3 kg. max.
Panel mounting angle	up to $\pm 15^\circ$ from vertical



Minimum recommended spacing		
Side clamp mounting	Top/bottom clamp mounting	Four-clamp mounting
X = 15 mm Y = 10 mm	X = 10 mm Y = 15 mm	X = 15 mm Y = 15 mm

#### Operator interface

Type	Colour STN LCD with cold cathode backlighting. Fitted with resistive, analogue, toughened touch-panel
Size and resolution	1/4VGA (320 x 240 pixels)

#### Power requirements

Line voltage	47 to 63 Hz:	85 to 265V
Power (Max)		60VA (Inrush current 36A)
Fuse type		None
Interrupt protection		Holdup >200msec at 240V ac, with full load.

#### Back-up battery

Type	Poly-carbonmonofluoride/lithium (BR2330)
Support time	A fully charged new battery supports the real-time clock for a minimum of 1 year with the recorder unpowered.
Replacement period	3 years.

#### Ethernet communications

Electrical standard	10Mbs Ethernet. 10BaseT.
Transport protocol	TCP/IP. Provision for File Transfer Protocol (FTP)

#### INSTALLATION CATEGORY II

The rated impulse voltage for equipment on nominal 230V mains is 2500V.

#### POLLUTION DEGREE 2

Normally, only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation shall be expected.

## TECHNICAL SPECIFICATION (Input board)

### General

Input types	dc Volts, dc millivolts, dc milliamps (with shunt), Thermocouple, 2 / 3-wire RTD Contact closure (not chan. 1) >60 ms
Input type mix	Freely configurable.
Maximum number of inputs	6
Input ranges	See Table1 and Table 3 below.
Termination	Edge connector / terminal block
Noise rejection (48 to 62 Hz)	Common mode: >140dB (channel to channel and channel to ground). Series mode: >60dB.
Maximum common mode voltage	250 Volts continuous
Maximum series mode voltage	45 mV at lowest range; 12 Volts peak at highest range.
Isolation†	Channel to channel: 300V RMS or dc (double insulation) Channel to common electronics: 300V RMS or dc (double insulation) Channel to ground: 300V RMS or dc (basic insulation)
Dielectric strength (BS EN61010)	(1 minute type tests) Channel to channel 2300 Vac Channel to ground 1350 Vac
Insulation resistance	>10 MΩ at 500 V dc
Input impedance	38mV, 150 mV, 1 V ranges: >10 MΩ; 10 V range: 68.8 kΩ
Over voltage protection	50 Volts peak (150V with attenuator)
Open circuit detection	± 57 nA max.
Recognition time	500 msec
Minimum break resistance	10 MΩ

### Update/archive rates

Input/Relay-output sample rate	8 Hz
Display update	1 Hz
Archive sample-value	Latest value at archive time
Trend/Display value	Latest value at display update time

### DC Input ranges

Shunt	Externally mounted resistor modules
Additional error due to shunt	0.1% of input
Additional error due to attenuator	0.2% of input
Performance	See table 1

Low Range	High Range	Resolution	Maximum error (Instrument at 20°C)	Worst case temperature performance
-38 mV	38 mV	1.4 μV	0.085% input + 0.051% range	80ppm of input per deg C
-150 mV	150 mV	5.5 μV	0.084% input + 0.038% range	80ppm of input per deg C
-1 V	1 V	37 μV	0.084% input + 0.029% range	80ppm of input per deg C
-10 V	10 V	370 μV	0.275% input + 0.030% range	272ppm of input per deg C

Table 1 DC performance

### Relay output

Termination	3-way connector
Maximum switching power*	500VA or 60W
Maximum breaking current*	2 Amps within above power ratings
Maximum contact voltage*	250V within above power ratings
Isolation†	Contact to ground: 300V RMS or dc (basic insulation)
Estimated life*	30,000,000 operations

\* With resistive loads. With inductive loads, derate according to the graph, in which:  
Contact life = resistive life x F1 or F2 where  
F1 = measured on representative examples and  
F2 = typical values according to experience.

†All isolation figures are: DC to 65Hz; BS EN61010 Installation category II; Pollution degree 2

## Input board specification (Cont.)

### Thermocouple data

Temperature scale	ITS 90
Bias current	0.05 nA
Cold junction types	Off, internal, external
CJ error	1°C max with inst. at 25°C
CJ rejection ratio	50:1 minimum
Remote CJ	Via any user-defined channel
Upscale / downscale drive	High, low or none selectable for each thermocouple channel
Types and ranges	See table 2

T/C Type	Overall range (°C)	Standard	Maximum linearisation error
B	0 to + 1820	IEC584.1	0 to 400°C: 1.7°C 400 to 1820°C: 0.03°C
C	0 to + 2300	Hoskins	0.12°C
D	0 to + 2495	Hoskins	0.08°C
E	-270 to + 1000	IEC584.1	0.03°C
G2	0 to + 2315	Hoskins	0.07°C
J	-210 to + 1200	IEC584.1	0.02°C
K	-270 to + 1372	IEC584.1	0.04°C
L	-200 to + 900	DIN43700:1985 (To IPTS68)	0.20°C
N	-270 to + 1372	IEC584.1	0.04°C
R	-50 to + 1768	IEC584.1	0.04°C
S	-50 to + 1768	IEC584.1	0.04°C
T	-270 to + 400	IEC584.1	0.02°C
U	-200 to + 600	DIN43710:1985	0.04°C
NiMoNiCo	-50 to +1410	ASTM E1751-95	0.06°C
Platinel	0 to +1370	Engelhard	0.02°C

Table 2 Thermocouple types and ranges

### Resistance inputs

Ranges (including lead resistance)	0 to 150 Ω, 0 to 600 Ω, 0 to 6k Ω
Influence of lead resistance	Error = negligible; Mismatch = 1 Ω/Ω
Temperature scale	ITS90
Accuracy and resolution	See table 3

Low Range	High Range	Resolution	Maximum error (Instrument at 20°C)	Worst case temperature performance
0Ω	150Ω	5mΩ	0.045% input + 0.110% range	35ppm of input per deg C
0Ω	600Ω	22mΩ	0.045% input + 0.065% range	35ppm of input per deg C
0Ω	6kΩ	148mΩ	0.049% input + 0.035% range	35ppm of input per deg C

Table 3 Resistance ranges - accuracy and resolution

RTD Type	Overall range (°C)	Standard	Max linearisation error
Cu10	-20 to + 400	General Electric Co.	0.02 °C
JPT100	-220 to + 630	JIS C1604:1989	0.01 °C
Ni100	- 60 to + 250	DIN43760:1987	0.01 °C
Ni120	-50 to + 170	DIN43760:1987	0.01 °C
Pt100	-200 to + 850	IEC 751	0.01 °C
Pt100A	-200 to + 600	Eurotherm Recorders SA	0.09 °C
Pt1000	-200 to + 850	IEC 751	0.01 °C

Table 4 RTD types and ranges

