

TECHNICAL SPECIFICATION (Recorder)

Standard features

Inputs	Six universal input channels
Outputs	One form C 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	<2000m

Electromagnetic compatibility (EMC)

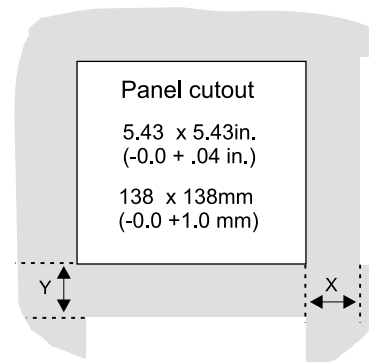
Emissions and immunity	BS EN61326
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Electrical safety

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

Physical

Panel mounting	DIN43700
Bezel size	5.67" x 5.67" (144mm x 144mm)
Panel cutout dimensions	5.43" x 5.43" [(138x138) (both - 0 + 1 mm)]
Depth behind bezel rear face	
With terminal cover:	9.76" (248mm)
Without terminal cover:	8.39" (213mm)
Weight	1.36 lb (3kg) max
Panel mounting angle	up to ±15 ° from vertical



Operator interface

Type	Color STN LCD with cold cathode backlighting Fitted with resistive, analog,
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toughened touch-panel

Size and resolution	1/4VGA (320 x 240 pixels)
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Model	A X B	Minimum recommended spacing	
		Side clamps	Top/bottom clamps
5100	138 x 138 (-0.0 + 1)mm	X = 15mm Y = 10mm	X = 10mm Y = 15mm
5180	281 x 281 (-0.0 + 1)mm	X = 25mm Y = 12.5mm	X = 12.5mm Y = 25mm

Power requirements

Line voltage	47 to 63 Hz:	85 to 265V
Power (Max)		60VA (Inrush current 36A)
Fuse type		None
Interrupt protection		Holdup >200ms 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	10Mbps 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.

**Model
5100e
Specification
Sheet**

TECHNICAL SPECIFICATION (Input board)

General

Input types	dc Volts, dc millivolts, dc milliamps (with shunt), Thermocouple, 2/3-wire RTD
Input type mix	Freely configurable
Maximum number of inputs	6
Input ranges	See Table 1 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	250V continuous
Maximum series mode voltage	45mV at lowest range; 12V 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	> 10MΩ at 500 V dc
Input impedance	38mV, 150 mV, 1 V ranges: > 10Ω; 10V range: 68.8kΩ
Over voltage protection	50V peak (150V with attenuator)
Open circuit detection	± 57nA max
Recognition time	500ms
Minimum break resistance	10MΩ

Update/archive rates

Input/Relay-output sample rate	8 Hz
Display update	1Hz
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

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

Table 1 DC performance

Relay outputs

Termination	3-way connector
Maximum switching power*	500VA or 60W
Maximum breaking current*	2A within above power ratings
Maximum contact voltage*	250V within above power ratings
Isolation†	Contact to contact: 300V RMS or dc (double insulation) 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	0.05nA
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

T/C Type	Overall range (°C)	Standard	Max linearization error
B	0 To +1820	IEC 584.1	0 to 400°C: 1.7° 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	IEC 584.1	0.03°C
G2	-0 to +2315	Hoskins	0.07°C
J	-210 to +1200	IEC 584.1	0.02°C
K	-270 to +1372	IEC 584.1	0.04°C
L	-200 to +900	DIN43700:1985 (To IPTS68)	0.20
N	270 to +1300	IEC 584.1	0.04°C
R	-50 to +1768	IEC 584.1	0.04°C
S	-50 to +1768	IEC 584.1	0.04°C
T	-270 to +400	IEC 584.1	0.02°C
U	-200 to +600	DIN43710:1985	0.08°C
Ni/NiMo	0 to +1406	Ipsen	0.14°C
Platinum	0 to +1370	Engelhard	0.02°C

Table 2 Thermocouple types and ranges

Resistance inputs

Rangenclosing lead resistance)	0 to 150 Ω, 0 to 600 Ω, 0 to 6k Ω
Influence of lead resistance	Error = negligible; Mismatch = 1Ω/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	IEC751	0.01°C
Pt100A	-200 to + 600	Eurotherm Recorders SA	0.09°C
Pt1000	-200 to + 850	IEC751	0.01°C

Table 4 RTD types and ranges

