

TECHNICAL SPECIFICATION (Recorder)

Board types and hardware options

- Six-channel universal input
 - Model 5180V: Six boards (36 channels) max
 - Model 5100V: Two boards (12 channels) max
- Three Change-over relay output board
 - Model 5180V: Four boards (12 outputs) max
 - Model 5100V: Two boards (six outputs) max
- 3.5 inch floppy disk, or PC Card (ATA flash or hard disk)

Environmental Performance

- Temperature limits PC Card option: Operation: 0 to 50°C; Storage: - 25 to 70°C
- Floppy disk drive option: Operation: 5 to 40°C ; Storage: - 20 to + 50°C
- Humidity limits PC Card option: Operation: 8% to 85% RH; Storage: 8% to 90% (both non-condensing)
- Floppy disk drive option: Operation: 20% to 80% RH; Storage: 8% to 80% (both non-condensing)
- Protection Bezel and display IP65
- Shock BS EN61010
- Vibration (10 to 150Hz) 2g peak
- Altitude <2000m

Electromagnetic compatibility (EMC)

- Emissions BS EN50081-2
- Immunity BS EN50082-2

Electrical safety

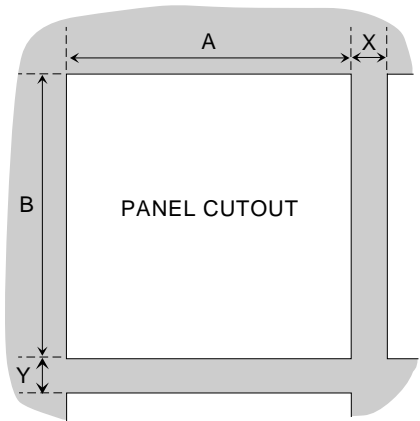
(BS EN61010) Installation cat. II; Pollution degree 2

Physical (Model 5100V)

- Panel mounting DIN43700
- Bezel size 5.67" (144mm) x 5.67" (144mm)
- Panel cutout dimensions 5.43" (138mm) x 5.43" (138mm)
[both - 0 + .04" (1mm)]
- Depth behind bezel rear face 9.76" (248mm)
- Weight 1.4lb (3kg)
- Panel mounting angle
 - Recorders with hard disk: Vertical panel only
 - Recorders with floppy disk: ± 15°
 - Other 5100V recorders: ± 45°

Physical (Model 5180V)

- Panel mounting DIN43700
- Bezel size 11.3" (288mm) x 11.3" (288mm)
- Panel cutout dimensions 11.1" (281mm) x 11.1" (281mm)
[(both - 0 + .04" (1mm)]
- Depth behind bezel rear face 12" (305mm)
- Weight 3.4" (7.5kg)
- Panel mounting angle
 - Recorders with hard disk: Vertical panel only
 - Recorders with floppy disk: ± 15°
 - Other 5180V recorders: ± 45°



Model	A x B	Minimum recommended spacing	
		Side clamps	Top/bottom clamps
5100	138 x 138 (-0.0 + 1) mm	X = 15 mm Y = 10 mm	X = 10 mm Y = 15 mm
5180	281 x 281 (-0.0 + 1) mm	X = 25 mm Y = 12.5 mm	X = 12.5 mm Y = 25 mm

Operator interface

Type Colour TFT LCD with cold cathode backlighting.
Fitted with resistive, analogue, toughened touch-panel

Size and resolution

- Model 5100V: 1/4 VGA (320 x 240 pixels)
- Model 5180V: SVGA (800 x 600 pixels)

Power requirements

- Line voltage 47 to 63Hz 85 to 265V
- Power (Max) 60VA (Inrush current 36A)
- Fuse type None

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.

TECHNICAL SPECIFICATION (Input board)

General

Input types	dc V, dc mV, dc mA (with shunt), Thermocouple, 2/3-wire RTD Contact closure (not chan. 1) >60ms
Input type mix	Freely configurable
Maximum number of inputs	6 per board
Input ranges	See Table 1 and Table 3 below
Termination	Edge connector/terminal block
Noise rejection (48 to 62Hz)	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 (dc to 65 Hz; BS EN61010)	Installation cat II; Pollution degree 2
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, 150mV, 1 V ranges: > 10MΩ; 10V range: 68.8kΩ
Over voltage protection	50V peak (150V with attenuator)
Open circuit detection	± 57nA max
Recognition time	500msec
Minimum break resistance	10MΩ

Update/archive rates

Input/Relay-output sample rate	8Hz
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

Low Range	High Range	Resolution	Maximum error (Instrument at 20 C)	Worst case temperature performance
-8 mV	38mV	1.4μV	0.085% input + 0.073% range	80ppm of input per deg C
-30 mV	150mV	5.5μV	0.084% input + 0.053% range	80ppm of input per deg C
-0.2 Volt	1 Volt	37μV	0.084% input + 0.037% range	80ppm of input per deg C
-2 Volts	10 Volts	370μV	0.275% input + 0.040% range	272ppm of input per deg C

Table 1 DC performance

Relay outputs

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
Additional error:	0.01°C (typ.) if high or low selected

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 150Ω, 0 to 600Ω, 0 to 6kΩ
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

