

6180 AeroDAQ

MODEL



Secure Graphic Recorder for AMS2750D

Specification Sheet

The 6180 AeroDAQ is designed to meet the specifications of the aerospace industry. Automated scheduling of TUS (Temperature Uniformity Survey), SAT (System Accuracy Test), and instrument calibration is handled by the AeroDAQ based on furnace class and instrument type as per the relevant tables of AMS2750D. A Service Page clearly displays the number of days until the next activity is due with messages to alert that the due date is approaching. Additionally, the AeroDAQ also monitors control thermocouple life for number of days used, and load thermocouples for both number of days used and number of uses. A pre-batch thermocouple life check will indicate the availability of the thermocouples for the next batch returning either OK or Will Fail with the reason (either days or uses will expire). Data is stored in a tamper-resistant binary format that can be used for secure, long term records of your process. The high accuracy, low drift input boards enable the AeroDAQ to meet the requirements of AMS2750D for Class 1 Furnace.

- Colour touchscreen display
- USB 'plug & play'
- 6 universal Inputs
- 32MB non-volatile flash memory
- 125ms parallel sampling
- Compact Flash
- Modbus RTU
- Ethernet TCP/IP
- Web server

Available features*	6180 AeroDAQ
Display	12.1" XGA
Channels	6
Relays	3
Groups	6 standard
Auditor features	Audit trail
Virtual channels**	36
Timers	Fitted as standard
Alarms	4 per channel
Batch	Standard
Bridge- remote viewing software	Full as standard
Screen builder	Standard
Modbus Master	Standard
Security	Unlimited unique user names with configurable access permissions and passwords
Configuration software	Standard
Review/Quickchart Lite software	Standard
Standard views	Vertical and horizontal trending, Vertical and horizontal bargraphs, Circular trend and numeric values

* Standard AeroDAQ features shown. Additional options available as per ordering code

** Virtual channels can be configured as maths, totalisers, counters or comms

Data logging and archiving

The AeroDAQ has internal Flash memory for secure data storage. They are also able to accept various removable media types (Compact Flash or USB memory stick). Data stored within the internal memory can be archived to the removable media on demand or at preset intervals. The AeroDAQ will give indication of how long its internal memory and that of the removable media installed will last according to the configuration of the recorder.

The AeroDAQ has Ethernet capability. It can be configured to archive to the removable media and/or over Ethernet. Archiving files over Ethernet effectively gives a secure, infinite archiving capacity.

Approximate duration for continuous recording of one group of six channels, high compression:

Archive media	Sample rate						
	0.125s	0.5s	1s	5s	10s	30s	60s
32Mb Internal Flash (approx. 4 million samples)	2.83 days	11.3 days	22.6 days	113 days	226 days	1.86 yrs	3.7 yrs
64Mb CF/SD Card or USB memory stick (approx. 8 million samples)	5.66 days	22.6 days	45.3 days	226 days	1.2 yrs	3.7 yrs	7.4 yrs
256Mb CF/SD Card or USB memory stick (approx. 32 million samples)	22.6 days	90.6 days	181 days	2.4 yrs	4.9 yrs	14.8 yrs	20 yrs
1Gb CF/SD Card or USB memory stick (approx. 125 million samples)	88 Days	354 days	1.9 yrs	9.6 yrs	19 yrs	58 yrs	116 yrs
Ethernet (FTP Server)				Infinite			

Time synchronisation (SNTP)

The AeroDAQ supports Simple Network Time Protocol which, when enabled, updates the instrument time every 15 minutes from the configured SNTP server. The unit can also act as a Unicast SNTP server on the network, allowing client instruments to synchronise with the AeroDAQ to a resolution of one millisecond.

Batch recording

Up to ten user-defined fields can be used to enter batch specific data.

Field descriptor	Operator entered batch information
– up to 20 characters	– up to 60 characters

The user can choose to log any number of the given fields on start and / or stop of a batch. The information will appear on the chart as a message and cannot be separated from the process data to which it relates.

Audit trail

Standard on the AeroDAQ is a time stamped audit trail. This allows all actions taken on the recorder including all user logins, batch start and stop, TUS, SAT and calibration reset, and any configuration changes to be shown on the “chart” as well as becoming a permanent part of the history file. The audit trail information can be seen in historic views of the data.

Modbus master

Allows users to view data from multiple instruments connected either by a local Network connection using Modbus TCP, or a Serial connection using Modbus RTU.

ASCII printer output (reports)

Fitted as standard the ASCII text printer option provides the AeroDAQ with the ability to generate up to 10 simple reports that can be directed to a Serial ASCII text printer. Reports, triggered by an event/job can be configured to contain parameters such as time and date, batch names, process values and user defined messages.

Dynamic Host Configuration Protocol (DHCP)

Dynamic Host Configuration Protocol, the successor to BootP, allows an AeroDAQ host to obtain Network parameters, such as IP address, Subnet Mask, default gateway and DNS server address dynamically. The implementation of DHCP on the AeroDAQ significantly reduces the overhead for maintaining a network of instrumentation.

SPECIFICATION

Recorder

Environmental performance

Temperature limits Operation: 0 to +50°C
Storage: –20 to 60°C
Humidity limits Operation: 5% to 80% RH
Storage: 5% to 90% RH

Protection Bezel and display: IP66
Sleeve: IP20

Shock: BS EN61010
Vibration (10 to 150Hz): BSEN60873, Section 9,18
Altitude: <2000 metres

Approvals

Electromagnetic compatibility CE, cUL (EMC)

UL file number: e57766
Emissions and immunity: BS EN61326

Electrical safety

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

INSTALLATION CATEGORY II

The rate 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

Physical

Panel mounting: DIN43700
Panel mounting angle: ±45°
Dimensions Bezel size: 292 x 292mm
Panel cutout: 281 x 281mm (both –0/+1mm)
Depth behind bezel rear face: 261mm
Weight: 7kg max.

Operator interface

Type: Colour TFT LCD with cold cathode backlight, fitted with resistive, analogue, Touch-Panel
Size and resolution: XGA (1024 x 768 pixels) 12.1”

Power requirements

Supply voltage Standard: 85 to 265V ac; 47 to 63Hz or 110 to 370V dc
Power (Max): 50W
Fuse type: None
Interrupt protection Standard: Holdup >200msec, at 240V ac, with full load

Back-up battery

Type: Poly-carbonmonofluoride/lithium (BR2330) Part No. PA261095
Support time (RTC): 1 year min. with recorder unpowered
Replacement period: 3 years
Stored data: Time; date; values for totalisers, counters and timers; batch data; Fvalue, Rolling average, Stopwatch etc.

Ethernet communications

Type: 10/100baseT Ethernet. (IEEE802.3)
Protocols: TCP/IP, FTP, DHCP, BOOTP, SNTP, MODBUS, SMTP, ICMP
Cable Type: CAT5
Maximum length: 100 metres
Termination: RJ45

Serial communications option

No of ports: 2
Protocol: ASCII (typical applications: Input of ASCII string inputs from Barcode readers, Credit card readers etc.)
ASCII printer support
Modbus RTU Master and Slave
Isolation (dc to 65Hz BS EN61010): Installation category II; Pollution degree 2
50V RMS or dc (basic insulation)
Terminals to ground: EIA232 or EIA485 (software selectable)
Transmission standard:

Input Board

General

Input types:	dc Volts, dc millivolts, dc milliamps (with shunt), Thermocouple, 2/3-wire RTD Contact closure (not Channels 1, 7, 13, 19, 25, 31, 37, 43) >60 ms
Input type mix:	Freely configurable.
Maximum number of inputs:	6 per board
A/D conversion method:	>16 bits, 2nd order delta sigma
Input ranges:	See Table 1 and Table 2 below
Termination:	Edge connector / terminal block
Noise rejection (48 to 62Hz):	Common mode: >140dB (channel to channel and channel to ground). Series mode: >60dB
Max common mode voltage:	250V continuous
Max series mode voltage:	45mV at lowest range; 23.74 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:	2500V ac
Channel to ground:	1500V ac
Insulation resistance:	>10MΩ at 500V dc
Input impedance:	38mV, 150mV, 1V ranges: >10MΩ; 20V range: 65.3kΩ
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
Trend update:	8Hz maximum
Archive sample-value:	Latest value at archive time
Display value:	Latest value at display update time (8Hz)

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
Long term drift:	Meets the requirements of AMS2750D for Class 1 Furnace Requires an Input Adjust be performed to meet the requirements of AMS2750D

Low Range	High Range	Resolution	Typical error (instrument at 20°C) Range	Maximum error (instrument at 20°C) Range	Worst case temp Performance Input per °C
-38mV	38mV	1.4µV	0.013% I/P + 0.031%	0.030% I/P + 0.052%	25ppm
-150mV	150mV	5.5µV	0.013% I/P + 0.028%	0.029% I/P + 0.039%	25ppm
-1V	1V	37µV	0.013% I/P + 0.024%	0.029% I/P + 0.029%	25ppm
-20V	20V	720µV	0.075% I/P + 0.027%	0.393% I/P + 0.033%	388ppm

Table 1 Voltage ranges - accuracy and resolution

Low Range	High Range	Resolution	Typical error (instrument at 20°C) Range	Maximum error (instrument at 20°C) Range	Worst case temp Performance Input per °C
0Ω	150Ω	5mΩ	0.027% I/P + 0.034%	0.037% I/P + 0.077%	30ppm
0Ω	600Ω	22mΩ	0.027% I/P + 0.035%	0.037% I/P + 0.057%	30ppm
0Ω	5KΩ	148mΩ	0.030% I/P + 0.034%	0.040% I/P + 0.041%	30ppm

Table 2 Resistance ranges - accuracy and resolution

Thermocouple data

Temperature scale:	ITS 90
Bias current:	0.05nA
Cold junction types:	Off, internal, external, remote
CJ error:	1°C max with inst. at 25°C
CJ rejection ratio:	50:1 minimum
Upscale/downscale drive:	High, low or none selectable for each thermocouple channel
Types and ranges:	Additional error: 0.01°C (typ.) if high or low selected See Table 3

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 2
RTD types and ranges:	See Table 4

T/C Type	Overall range (°C)	Standard	Max linearisation error
B	0 to +1820	IEC 584.1	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	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	DIN43710:1985 (To IPTS68)	0.02°C
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
NiMo/NiCo	-50 to +1410	ASTM E1751-95	0.06°C
Ni/NiMo	0 to +1406	Ipsen	0.14°C
Platinel	0 to +1370	Engelhard	0.02°C
Pt20%Rh/ Pt40%Rh	0 to +1888	ASTM E1751-95	0.07°C

Table 3 Thermocouple types and ranges

RTD Type	Overall range (°C)	Standard	Max linearisation error
Cu10	-20 to +400	General Electric Co.	0.02 °C
Cu53	-70 to ± 200	RC21-4-1966	<0.01°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

Relay Output Board

General

Maximum number of relay boards	9 (max no of relay outputs = 36)
Number of relays per board	3 per C/O 4 per N/C 4 per N/O
Estimated mechanical life	30,000,000 operations
Update rate	See 'Update rates' in 'Recorder Specification' above

AC load ratings

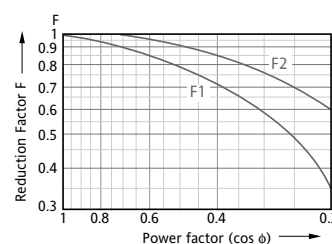
Derating	The figures give below are for restive loads. For reactive or inductive loads, de-rate in accordance with Graph 1, in which
	F1 = Actually measured results on representative samples
	F2 = Typical values according to experience
	Contact life = Resistive contact life x reduction factor
Maximum switching power	500VA
Maximum contact voltage	250V providing this does not cause the maximum switching power (above) to be exceeded
Maximum contact current	2 Amps providing this does not cause the maximum switching power (above) to be exceeded

DC load ratings

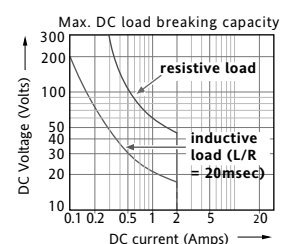
Maximum switching power	See Graph 2 for operating volt/amp envelope
Maximum contact voltage/Current	See Graph 2 for examples

Safety isolation

Isolation (dc to 65Hz; BS EN61010)	Installation category II; Pollution degree 2
Relay to Relay:	300V RMS or dc (double insulation)
Relay to ground:	300V RMS or dc (basic insulation)

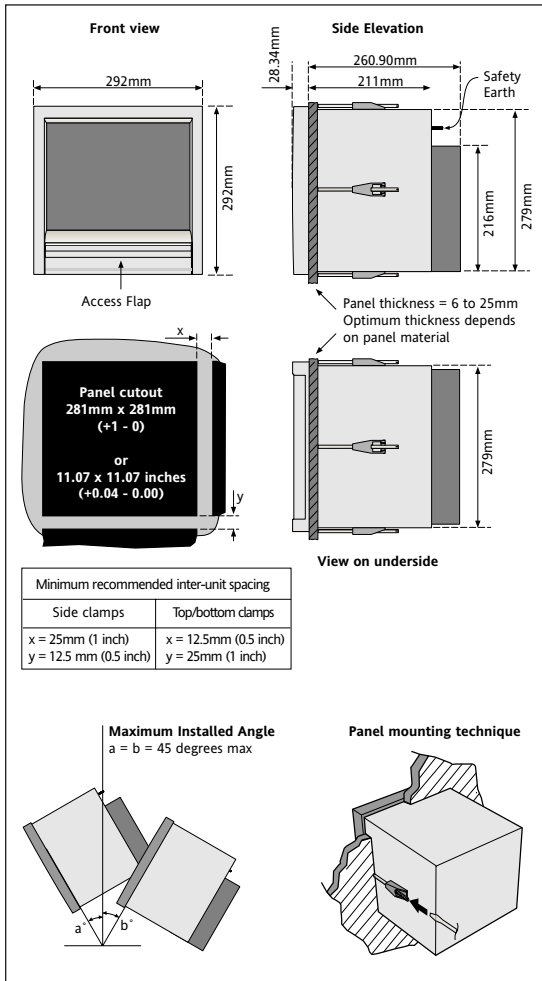


Graph 1 Derating curves for ac loads

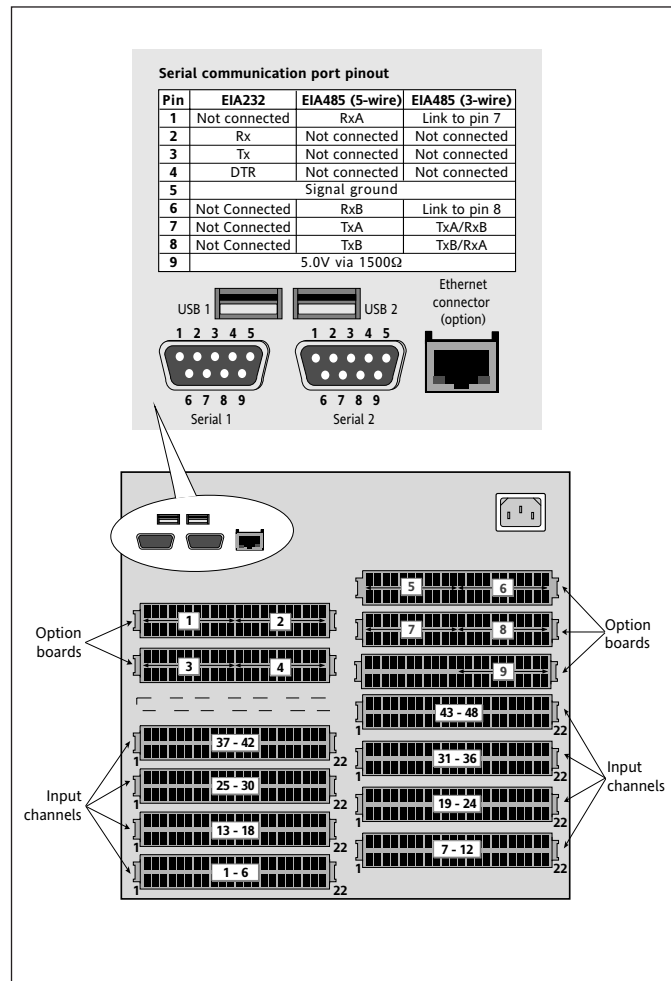


Graph 2 DC load switching curves

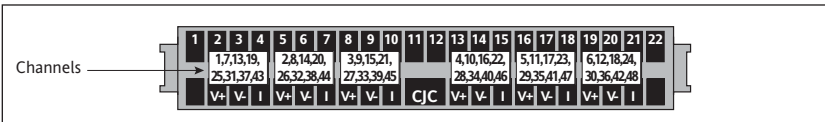
Mechanical installation



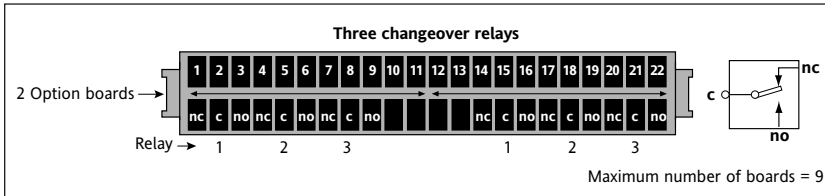
Rear terminal connections



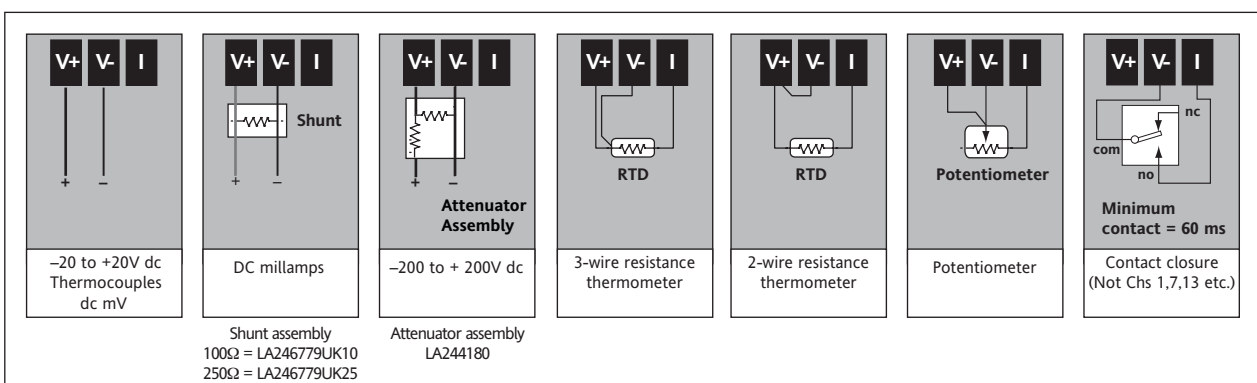
Input board wiring



Relay board wiring



Input board signal wiring



Ordering code

0	1	2	3	4	5	6	7	8	9	10	11	12	13
6180A													
14	15	16	17	18	19	20	21	22	23	24	25	26	27
28	29	30	31	32	33	34							

0 Model	6180A 180mm TFT XGA Display	6180A	
1 Number of channels	6 Input Channels	U06	
	12 Input Channels	U12	
	18 Input Channels	U18	
	24 Input Channels (6180A only)	U24	
	30 Input Channels (6180A only)	U30	
	36 Input Channels (6180A only)	U36	
	42 Input Channels (6180A only)	U42	
	48 Input Channels (6180A only)	U48	
2 Industry variant		AERODAQ	
3 Case options	Panel mounting	PANEL	
	Carry handle (Bezel colour silver)	CH	
4 Lock	Media lock not fitted	.NOLCK	
	Electronic lock fitted	.LOCK	
5 Bezel colour	Silver including portable options	.SLV	
	Eurotherm Green	.GRN	
	Black	.BLK	
6 Power supply	90- 264 Vac (110-370Vdc) 47 –63 Hz	.VH	
	20 – 42 Vac (20 – 54Vdc)	.VL	
	Not used	.XXXXX	
8 Non standard	Non Standard Option	.XXXXXX	
9 Internal memory	32M Byte for history – approximately 4 million samples	.032M	
	96M Byte for history – approximately 12 million samples	.096M	
10 Removable media	Compact Flash and Front USB port	.CF	
	Secure Digital and Front USB port	.SD	
11 Memory card size (CF or SD, dependant on removable media type)	Not fitted	.NOMC	
	128M byte Card	.128M	
	256M byte Card	.256M	
	512M byte Card	.512M	
	1Gbyte Card (CF or SD, dependant on removable media type)	.001G	
12 USB Memory stick size	Not fitted	.NOMS	
	64M byte USB Memory Stick	.064MMS	
	256M byte USB Memory Stick	.256MMS	
	512M byte USB Memory Stick	.512MMS	
	1G byte USB Memory Stick	.001GMS	
13 Rear USB	No rear USB ports	.0RUSB	
	Two USB ports at rear of product	.2RUSB	
14 Serial communication ports	Not fitted	.0SRL	
	Two EIA 232/422/485 Serial Ports	.2SRL	
15 Not used		.XXXX	
16 Calibration certificates	Not required	.NOCAL	
	Calibration certificate	.CAL	
17 Changeover relays	Not fitted	.00	
	3 changeover relays (1 option board)	.03	
	6 changeover relays (2 option boards)	.06	
	9 changeover relays (3 option boards)	.09	
	12 changeover relays (4 option boards)	.12	
	15 changeover relays (5 option boards, 6180A only)	.15	
	18 changeover relays (6 option boards, 6180A only)	.18	
	21 changeover relays (7 option boards, 6180A only)	.21	
	24 changeover relays (8 option boards, 6180A only)	.24	
	27 changeover relays (9 option boards, 6180A only)	.27	
18 Normally closed relays	Not fitted	.00	
	4 Normally Closed relays (1 option board)	.04	
	8 Normally Closed relays (2 option boards)	.08	
	12 Normally Closed relays (3 option boards)	.12	
	16 Normally Closed relays (4 option boards)	.16	
	20 Normally Closed relays (5 option boards, 6180A only)	.20	
	24 Normally Closed relays (6 option boards, 6180A only)	.24	
	28 Normally Closed relays (7 option boards, 6180A only)	.28	
	32 Normally Closed relays (8 option boards, 6180A only)	.32	
	36 Normally Closed relays (9 option boards, 6180A only)	.36	
19 Normally open relays	Not fitted	.00	
	4 Normally Open relays (1 option board)	.04	
	8 Normally Open relays (2 option boards)	.08	
	12 Normally Open relays (3 option boards)	.12	
	16 Normally Open relays (4 option boards)	.16	
	20 Normally Open relays (5 option boards, 6180A only)	.20	
	24 Normally Open relays (6 option boards, 6180A only)	.24	
	28 Normally Open relays (7 option boards, 6180A only)	.28	
	32 Normally Open relays (8 option boards, 6180A only)	.32	
	36 Normally Open relays (9 option boards, 6180A only)	.36	
20 Event inputs	Not fitted	.00	
	06 Event Inputs (1 board)	.06	
	12 Event Inputs (2 boards)	.12	
	18 Event Inputs (3 boards)	.18	
	24 Event Inputs (4 boards)	.24	
21 Analogue outputs	None	.00	
	2 Analogue Outputs (1 option board)	.02	
	4 Analogue Outputs (2 option boards)	.04	
	6 Analogue Outputs (3 option boards)	.06	
	8 Analogue Outputs (4 option boards)	.08	
22 Quantity of shunts	Enter quantity required		
23 Shunt value	Not required	.NOS	
	100 ohm shunts	.100	
	250 ohm shunts	.250	
24 Quantity of attenuators (100:1)	Enter quantity required	_ _	
25 Warranty	Standard warranty	.XXXXX	
	Extended warranty	.WL005	
26 Bridge	Bridge Lite (supplied as standard)	.BLITE	
	Bridge Full	.BFULL	
27 Review and quickchart	Review and Quickchart Lite (supplied as standard)	.RLITE	
	Review and Quickchart Full	.RFULL	
28 Auditor	Not required	.NOADT	
	Audit Trail	.ALITE	
	Auditor Full	.AFULL	
29 Security manager	Not required	.NOSM	
	Security Manager	.SECMAN	
30 Groups	6 Groups (supplied as standard)	.06GROUP	
	12 Groups	.12GROUP	
31 Maths, totalisers and counters	Not required	.MTC00	
	36 Virtual Channels	.MTC36	
	96 Virtual Channels	.MTC96	
	128 Virtual Channels	.MTC128	
32 Batch	Not required	.NOBTCH	
	Batch	.BATCH	
33 Screen builder	Not required	.NOSB	
	Advanced screen builder	.ADSB	
34 Master communications	Not required	.NOMSTR	
	Modbus Master Comms for 16 slaves	.MSTR16	
	Modbus Master Comms for 32 slaves	.MSTR3223	

Standard AeroDAQ Ordering code

6180A/U06/AERODAQ/NOLCK/SLV/VH/XXXXX/XXXXX/032M/CF/NOMC/NOMS/0RUSB/2SRL/XXXX/NOCAL/03/00/00/00/00/00/NOS/00/XXXXX/BFULL/RLITE/ALITE/NGSM/06GROUP/MTC36/BATCH/ADSB/MSTR16

0	Model 6180A 180mm TFT XGA Display	.6180A	18	Normally closed relays Not fitted	.00
1	Number of channels 6 Input Channels	.U06	19	Normally open relays Not fitted	.00
2	Industry variant	.AERODAQ	20	Event inputs Not fitted	.00
3	Case Options Panel mounting	.PANEL	21	Analogue outputs None	.00
4	Lock Media lock not fitted	.NOLCK	22	Quantity of shunts Enter quantity required	__
5	Bezel colour Silver including portable options	.SLV	23	Shunt value Not required	.NOS
6	Power supply 90- 264 Vac (110-370Vdc) 47 –63 Hz	.VH	24	Quantity of attenuators (100:1) Enter quantity required	__
7	Not used	.XXXXX	25	Warranty Standard warranty	.XXXXX
8	Non standard Non Standard Option	.XXXXXX	26	Bridge Bridge Full	.BFULL
9	Internal memory 32M Byte for history – approx 4 million samples	.032M	27	Review and quickchart Lite (supplied as standard)	.RLITE
10	Removable media Compact Flash and Front USB port	.CF	28	Auditor Audit Trail	.ALITE
11	Memory card size Not fitted	.NOMC	29	Security manager Not required	.NOSM
12	USB Memory stick size Not fitted	.NOMS	30	Groups 6 Groups (supplied as standard)	.06GROUP
13	Rear USB No rear USB ports	.0RUSB	31	Maths, totalisers and counters 36 Virtual Channels	.MTC36
14	Serial communication ports Two EIA 232/422/485 Serial Ports	.2SRL	32	Batch Batch	.BATCH
15	Not used	.XXXX	33	Screen builder Advanced screen builder	.ADSB
16	Calibration certificates Not required	.NOCAL	34	Master communications Modbus Master Comm 16 slaves	.MSTR16
17	Changeover relays 3 changeover relays (1 option board)	.03			

Eurotherm: International sales and service

Understanding and providing local support is a key part of Eurotherm's business. Complementing worldwide Eurotherm offices are a whole range of partners and a comprehensive technical support team... to ensure you get a service you will want to go back to.

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