INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS ABTECH SSD ENCLOSURES - IECEx INE 14.0061X

Control, check, signal, automation, interruption and/or protection components in explosion proof enclosure type SSD

1. Marking

1.1 Example

(Manufacturer)	**Abtech Limited**
	Sheffield, S9 2QJ, UK
(type)	**SSD …/…/.**
(serial) /(year)	**@@@@ / @@**
(certificate)	**IECEx INE 14. 0061X**
(type of protection)	**Ex d IIB** or **IIB+H_2 T(☼) Gb IP (☼☼)**
	Ex tb IIIC T (☼☼☼) °C Db IP (☼☼)
ambient temperature	**Tamb** -20°C ÷ +60°C
leave blank if Tamb -20°C ÷ +40°C	
(electrical parameters)	… V … Hz … A
Tmax of cable	**@@@ °C**
WARNING:	**DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT**
	IDENTIFICATION OF CABLE ENTRY: SEE OPERATING INSTRUCTION

Note : (☼☼)See Legend of marking data, (☼☼☼) See par. 8 for max surface temperature
: X = See par. 8: special condition for safe use

Marking Data Matrix

Type	***Symbol***	***Description***
Manufacturer	Abtech Limited Sheffield, S9 2UA, UK	Name and address of manufacturer
Type	SSD …/…/.	Model or type of electrical equipment
Serial/Year	/	Serial number and year of manufacturing
Certificate no.	**IECEx INE 14.0061X**	Certificate number from Notified Body. X = special condition for safe use, see instructions
Type of protection	Ex d	Equipment protection by flameproof enclosures "d"
	Ex d[i]	Equipment protection by flameproof enclosures "d" with intrinsically safe associated apparatus inside of [ia/ib/ic] type
	Ex tb	Equipment dust ignition protection by enclosure "t"
	I	Gas group I (mining) equipment
	IIA	Gas group IIA equipment
	IIB	Gas group IIB equipment
	IIB+H_2	Gas group IIB plus Hydrogen equipment
	IIIA	combustible flyings
	IIIB	non-conductive dust
	IIIC	conductive dust
	T °C or °C	Temperature class or maximum surface temperature. Note: in case of Mb the temperature indication may be omitted below 150 °C
	T °C	Maximum external surface temperature for dust ignition protection by enclosure "t"
	Gb	EPL marking for equipment designed for applications other than mines with a level of protection 'high' that does not produce ignition sources in case of normal operation and expected faults with the presence of flammable gas(es).
	Db	EPL marking for equipment designed for applications other than mines with a level of protection 'high' that does not produce ignition sources in case of expected faults with the presence of combustible dust.
	IP	Protection degree (ref. IEC/EN 60529).
Ambient Temp.	Tamb -20°C ÷ + ºC	Ambient temperature range. For Tamb -20 °C to +40 °C the specific temperature may be omitted.
Electrical Parameters	V Hz A W	Max Electrical parameters for safe use..
Cable Temp.	Tmax of cable	Maximum surface cable temperature specifications
Warning	Warnings for safe use of the enclosure	DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT IDENTIFICATION OF CABLE ENTRY: SEE OPERATING INSTRUCTION

1.2 IMPORTANT – READ CAREFULLY

Control, signal, automation, interruption and/or protection units in explosion proof enclosures SSD…/. series must be installed in conformance with IEC 60079-14 (current edition) and maintenance operations must be conducted in conformance with IEC 60079-17 (current edition). It is also the responsibility of the user to be knowledgeable regarding the risks due to the electrical characteristics of the apparatus and the chemical and physical characteristics of the gas and/or vapours and/or dust present in the plant or area surrounding the apparatus.
The Quality System of Abtech has been evaluated and approved by a Notified Body ensuring the quality and conformance of the apparatus at every stage of manufacture.
Abtech hold a recognised quality assurance system to ensure conformance with the directive and product specifications throughout the manufacturing process.
Abtech assures and guarantees the product, provided that it is installed and maintained in accordance with these instructions, the requirements of the applicable type test certificate and any national and/or local laws which may be applicable.

Any modifications or alterations to the apparatus, not specifically authorised by Abtech, will cause invalidation of the relative EIECEx Type Examination Certificate and any contractual guarantee.

2 Type of protection Ex "d" - Flameproof enclosures

2.1 In this type of protection, the electric equipment is placed in an enclosure which can withstand the pressure developed during an internal explosion and which prevents the transmission of the explosion to the explosive atmosphere surrounding the enclosure.

2.2 The integrity of the enclosure must not be compromise with; unauthorised holes or drilling(s), incorrectly installed lid, or cable entry/holes which have not been closed or fitted with appropriate cable glands, conduit or stopping devices.

2.3 Unused holes and/or cable entries must be equipped with suitable certified accessories such as Ex d plugs, Ex d cable glands, Ex d three pieces unions, etc.
The accessories must have the same thread of cable entry and guarantee a number of threads engaged ≥ 5.

2.4 The enclosure must not be subjected to any mechanical stresses or conditions that were not intended during design and manufacture (i.e. exposure to excessive mechanical impact, exposure to corrosive agents, possibility of internal short circuits with power dissipation greater than the declared level for each enclosure size).

2.5 Ensure correct closing of body-lid coupling screws according to the values shown in Table 1.

Table 1 – Screws tightening torque

Screw	M6	M8	M10	M12	M14	M20
Torque (Nm)	5-7	10-20	20-30	34-60	53-80	83-140

2.6 When connected with conduit, a suitable stopping device must be fitted within a maximum distance of 450 mm from the enclosure.

2.7 Cable entries must be fitted with certified cable glands, appropriate for the cable being fitted and the type of protection and in accordance with IEC 60079-14, and any special condition imposed by cable gland certificate.

3 Installation

3.1 Before installation, it is the Users responsibility to ensure that the apparatus is suitable for the intended application.

3.2 Verify that the certified apparatus is suitable for the hazardous area classification.

3.3 Verify that the gas or dust group of the certified apparatus is suitable for any gases, vapours or combustible dust hazard that may be present.

3.4 Verify that the temperature class and/or the maximum surface temperature of the certified apparatus is suitable for any flammable gases, vapours or combustible dust hazards that may be present.

3.5 The certified apparatus must be installed and operated within the service limits specified for which it was built (voltages, current, mechanical impact, and ambient temperature specified in the rating/certification plate and thermal dissipation given in Table 4).

3.6 Ensure all electrical and mechanical connections are securely made.

3.7 Verify the integrity and the continuity of earth protection or equipotential bonding.

3.8 Ensure no modification(s) not authorized by Abtech, that compromise the electrical and/or mechanical structure and functionality of the certified apparatus have been made. (e.g. the alteration of the content of certified enclosures with the addition of further equipment or components).

3.9 Ensure that all electrical protection measures are fully functioning.

4 Maintenance

4.1 The maintenance of the SSD enclosure range is critical to the performance and safe operation of the apparatus. The maintenance operations must be made carried out in accordance with IEC 60079-17 (Edit in force).

4.2 It is imperative that a routine maintenance programme is carried out at a regular intervals, the timing of which must be made by the responsible person and taking into account, environmental conditions and ambient temperatures that the apparatus is subjected to. In any case, the equipment must be inspected at least every 2 (two) years.

4.3 The maintenance is necessary to guarantee the safe operation of the apparatus within the hazardous area and strict adherence to the apparatus certificate and these maintenance instructions is essential.

4.4 The maintenance operations must only be performed by competent personnel, whose training has included instructions on the characteristics of the apparatus and the protection type employed.

4.5 Any repairs or modifications to the equipment, not using Abtech spare parts, must be agreed in writing with Abtech to ensure compliance with the certificate and to ensure any additional tests or verification that may be required.

4.6 All the maintenance operations must be performed with the electrical apparatus isolated or when an explosive atmosphere is not present.

4.7 When reassembling flameproof enclosures, the user must verify that the flameproof joints are not damaged; all joints must be thoroughly cleaned and lightly smeared with a suitable not hardening grease to prevent corrosion and enhance environmental protection. It is imperative that extreme care should be exercised in the selection and application of the grease to ensure non-hardening grease is used, this will aid subsequent separation of the flameproof joints.

4.8 Only not metallic brushes and not corrosive cleaning fluids must be used to clean flameproof joints and paths.

4.9 Anti condensation devices, such as thermal probes, breathing, draining or heating elements, must be checked periodically to ensure correct operation (if installed).

4.10 If the certified apparatus is subject to vibration, verify that the clamping screws, internal connections and conduit and/or cable entries are securely and properly fitted.

4.11 If the user must replace the body-lid-closing screws, it is imperative that screws having the same or superior mechanical characteristics are used.

5 Special condition for safe use

5.1 The gap between the lid and the enclosure is less than the values specified in the tables of IEC 60079-1 standard.

5.2 For enclosure size 111 up to size 626 inclusive, steel screws of 8.8 class are used, from size 626 up to size 678 steel screws of 12.9 class are used.

5.3 The apparatus with type of protection Ex d, must only be used in an ambient temperature from -20°C to +40°C, or -20°C to +55°C or -20°C to +60°C

5.4 The apparatus with type of protection Ex d [ia] or Ex d [ib] must only be used to an ambient temperature from -20°C to +40°C, or -20°C to +55°C or -20°C to +60°C.

5.5 The temperature class for SSD enclosures with IS associated apparatus [i.] inside must be T6/T85°C

5.6 When intrinsically safe terminals are fitted, only intrinsically safe circuits must be connected to these terminals and the user must ensure that the connections are compatible within the limitations of use.

5.7 When enclosures contain non-intrinsically safe devices and intrinsically safe devices together, the enclosure must be fitted with an internal thermostat. The thermostat connected with a suitable device, must de-energize the circuit when the internal temperature reaches +55 °C or +60 °C in relation to the maximum operating temperature.

5.8 When installing equipment, care shall be exercised to prevent the opening of the flameproof flange joints being sited closer than the distance specified in Table 2 to any solid obstacle which is not part of the equipment, such as steelwork, walls, weather guards, mounting brackets, pipes or other obstacle that has been tested at a smaller distance of separation and has been documented

Table 2 – Minimum distance of obstruction from the flameproof flange joints related to the gas group of the hazardous area

Gas group	Minimum distance mm
IIB	20
IIB + H_2	30

6 Maximum painting thickness

Table 3 – Limitation of thickness of non-metallic layer

Gas group	Minimum thickness mm
IIB	2
IIB + H_2	0.2

7 Parameters relating to safety

7.1 Maximum electrical specifications

DC voltage	120 V
AC voltage	660 V
Frequency	50 / 60 Hz
Dissipated Power	see values in Tables 5 and 6
Current per contact	≤ 600 A
IS associated voltage	Um ≤ 250 V

The electrical specification of intrinsic safety circuits are marked on the IS associated apparatus.

7.2 Enclosures of EPL Gb having type of protection Ex d, have a temperature class (T rating) according to Table 4. Enclosures of EPL Gb Db in addition to the temperature class have a maximum surface temperature rating according to Table 4.

7.3 Enclosures having type of protection Ex d [i.] are designated by the category of the associated apparatus [ia] or [ib], following the requirements of IEC 60079-14 for the installation and the safety distances.

7.4 Cables: maximum service temperature of cables according to Table 4.

Table 4 – Maximum service temperature with respect to the Temperature Class and/or Maximum surface temperature and EPL's

EPL	Temperature Class and Maximum surface Temperature	Maximum service temperature of cable
Gb	T6	80 °C
	T5	80 °C
	T4	90 °C
	T3	110 °C
Db	T85	80 °C
	T100	80 °C
	T120	90 °C
	T135	90 °C
	T200	110 °C

The Buyer and/or the User must use a connection cable having a maximum service temperature not lower than indicated in Table 4

7.5 The degree of protection is indicated in marking data. In order to ensure the above degree of protection all installed accessories and components must have the same or superior, degree of protection.

TABLE 5: Maximum dissipated power for SSD (Made in carbon steel and/or stainless steel)

SSD		Maximum dissipated power according to the temperature class (W)			
Model	Surface [cm²]	T6/T85°C	T5/T100°C	120°C	T4/T135°C T3/T200°C
111	563	13	18	25	29
112	660	15	21	29	34
113	787	18	25	35	41
114	959	22	31	42	50
121	720	17	23	32	37
122	832	19	27	37	43
123	979	23	31	43	51
124	1178	27	38	52	61
211	728	17	23	32	38
212	845	20	27	37	44
213	999	23	32	44	52
214	1207	28	39	53	63
221	928	22	30	41	48
222	1059	25	34	47	55
223	1233	29	39	54	64
224	1469	34	47	65	76
231	1192	28	38	52	62
232	1344	31	43	59	70
233	1544	36	49	68	80
234	1816	42	58	80	94
323	1579	37	51	69	82
324	1863	43	60	82	97
325	2249	52	72	99	117
333	1579	46	63	87	102
334	1863	53	73	101	119
335	2249	63	87	120	141
343	2491	58	80	110	130
344	2861	66	92	126	149
345	3361	59	81	110	132
423	2044	47	65	90	106
424	2395	56	77	105	125
425	2870	67	92	126	149
426	3510	62	84	115	138
433	2534	59	81	112	132
434	2921	68	93	129	152
435	3444	61	83	113	135
443	3199	56	77	105	125
444	3635	64	87	119	142
445	4225	74	101	139	166
446	5020	88	120	165	197
453	4095	72	98	134	161
454	4597	81	110	151	180
455	5276	93	127	173	207
456	6192	109	149	203	243
524	3113	55	75	102	122
525	3708	65	89	122	145

SSD		Max dissipable power according to the temperature class (W)			
Model	Surface [cm²]	T6/T85°C	T5/T100°C	120°C	T4/T135°C T3/T200°C
526	4511	79	108	148	177
527	5572	98	134	183	218
528	7034	124	169	231	276
534	3778	66	91	124	148
535	4422	78	106	145	173
536	5290	93	127	174	207
537	6438	113	155	211	252
538	8020	141	192	263	314
544	4681	82	112	154	183
545	5391	95	129	177	211
546	6348	112	152	208	249
547	7614	134	183	250	298
554	5897	165	225	307	367
555	6697	104	142	193	231
556	7774	118	161	220	263
557	9199	137	187	255	305
558	11163	162	221	302	361
564	7540	196	268	366	438
565	8460	133	181	247	296
566	9700	149	203	277	332
567	11340	171	233	318	380
568	13600	200	272	372	445
624	4089	239	326	446	533
625	4848	72	98	134	160
626	5870	85	116	159	190
627	7224	103	141	193	230
628	9088	127	173	237	283
634	4942	160	218	298	356
635	5750	87	119	162	194
636	6838	101	138	189	225
637	8278	120	164	224	268
638	10263	146	199	272	324
644	6101	181	246	337	402
645	6975	107	146	200	239
646	8153	123	167	229	273
647	9711	143	196	267	320
648	11858	171	233	319	381
654	7663	209	285	389	465
655	8626	135	184	251	300
656	9924	152	207	283	338
657	11642	175	238	326	389
658	14008	205	279	382	456
664	9772	247	336	459	549
665	10856	172	235	321	383
666	12316	191	261	356	426
667	14248	217	296	404	483
668	16911	251	342	467	559
674	12638	222	303	415	495
675	13885	244	333	455	544
676	15567	274	374	511	610
677	17791	313	427	584	697
678	20855	367	501	684	818