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JD Auspice Co., Ltd



D758/ET MiniPurge[®] 手冊

ML 434



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重要注意事項：

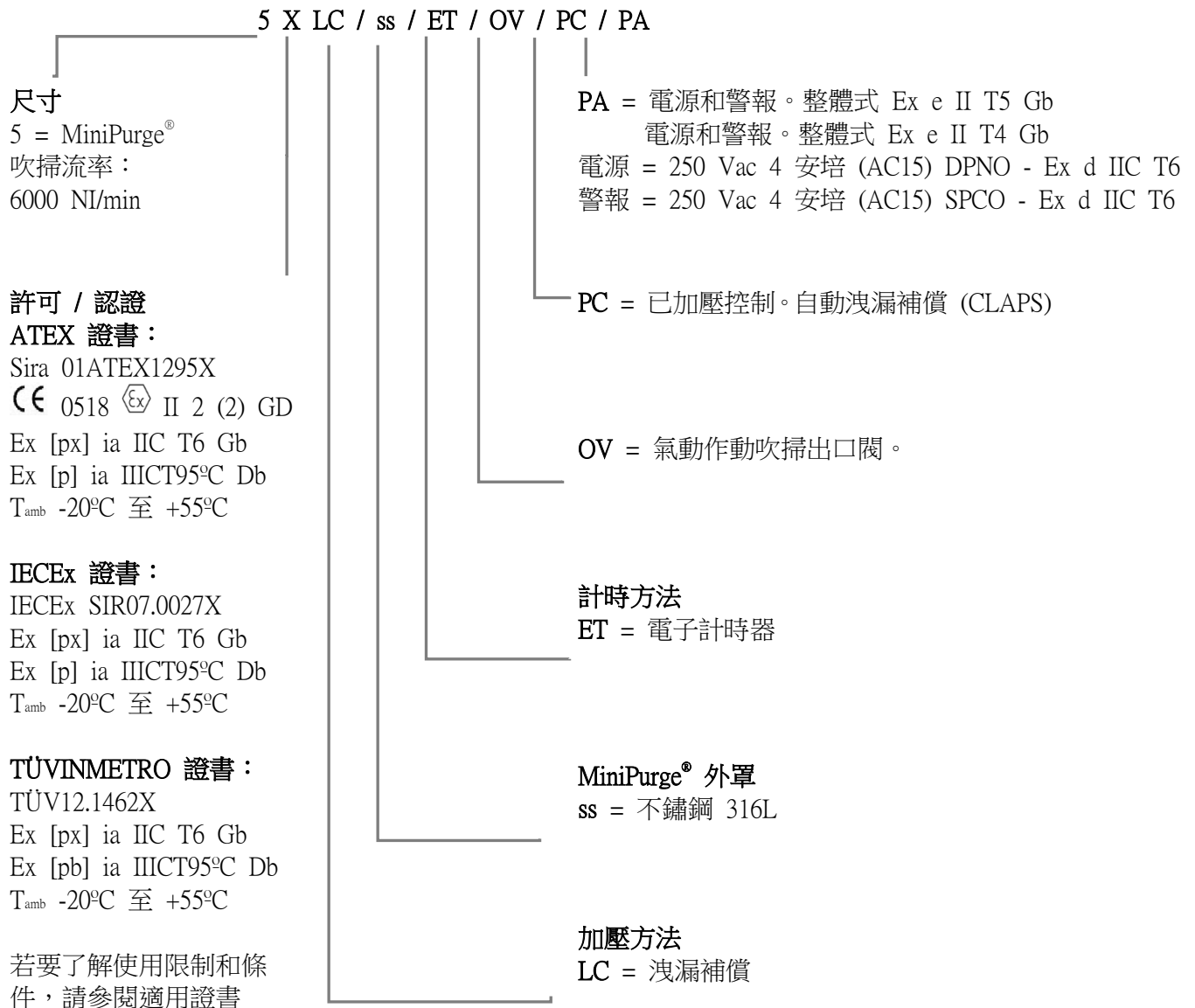
基於對安全性的慎重考量，安裝人員和 Expo 系統使用者都必須遵守這些指示。

請參閱標準的原則和定義。

這些指示僅適用於加壓系統，加壓馬達外殼製造商須為外殼提供指示。

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第 1 節：系統規格



MiniPurge® 控制單元資料

壓力失效時的動作：	警報和跳脫 (隔離加壓外殼的電源)，使用者可調整成「只有警報」。
運作類型：	使用封閉迴路自動加壓系統 (CLAPS 系統) 的自動洩漏補償。
洩漏補償量	1000 NI/min 的初始最大加壓外殼洩漏。 洩漏增加時則變更最大值為 1900 NI/min。
外殼材質：	不鏽鋼 316L。
安裝方法：	壁掛吊帶。請參考組裝圖比對安裝孔以利安裝。
溫度限制：	-20°C 至 +55°C
壓縮空氣供應：	乾淨、乾燥、無油的空氣或惰性氣體。請參閱安裝系統的空氣供應品質章節。
供應壓力：	5 至 16 barg (73 至 232 psi)。
主要調節器：	起始設定為 5 barg，40 微米自動排水供應入口過濾器。
邏輯調節器和壓力計：	已安裝並且設定為 2.3 barg (33 psi)。
處理接頭：	吹掃供應和出口至加壓外殼使用 1" NPT 母接頭。 最小供應管路 25 mm (1") ID 管，入口須根據流率調整成適當大小。 參考點和參考訊號使用 1/8" NPT 母接頭，最少要使用 6 mm 管路。
視覺指示燈：	警報 (紅光 ) / 已加壓 (綠光 )。 系統吹掃：4 顆 LED 燈會依序閃爍來顯示時間的流逝 (不執行吹掃時為不亮)。
/PA 出線盒：	不鏽鋼，Ex e IIC T5 Gb IP66 T _{amb} ：端子、前檢修蓋和下方可拆卸接頭板為 -20°C 至 +55°C。 不鏽鋼，Ex e IIC T4 Gb IP66 T _{amb} ：端子、前檢修蓋和下方可拆卸接頭板為 -20°C 至 +60°C。
電源互鎖開關：	DPNO 開關，觸點額定值 250 Vac 4 安培 (AC-15) / 24V DC 4A，Ex d IIC T6 IP66。
警報開關：	SPCO 開關，觸點額定值 250 VAC 4 安培 (AC-15) / 24V DC 4A，Ex d IIC T6 IP66。
中間開關：	SPCO 開關，觸點額定值 250 VAC 4 安培 (AC-15) / 24V DC 4A，Ex d IIC T6 IP66。
系統吹掃開關 (選購件)：	SPCO 開關，觸點額定值 250 VAC 4 安培 (AC-15) / 24V DC 4A，Ex d IIC T6 IP66。
最低壓力感知器：	最低：0.5 mbarg。 最高：5.0 mbarg。 預設設定：1.5 mbarg。 公差 -0, +0.7 mbarg。
中間感知器：	最低：2.0 mbarg。 最高：10 mbarg。 預設設定：5.0 mbarg。 公差：-0, +10%
注意：最低壓力感知器和中間感知器之間一定要有 1.5 mbarg 的壓力差。	
吹掃流感知器：	起始設定為 6.4 mbarg (公差：-0, +10%)。
CLAPS 感知器：	最低：5.0 mbarg。 最大值：15 mbarg。 預設設定：10 mbarg。 公差：-0, +10%

注意：中間感知器和 CLAPS 感知器校準點之間一定要有 2.5 mbarg 的壓力差。
舉例來說：最低壓力 = 5 mbarg，中間壓力 = 6.5 mbarg，CLAPS 感知器 = 9 mbarg。

吹掃時間：使用者最高可以 1 分鐘為間隔設定至 99 分鐘 (公差 -0，+3 秒)。
預設設定為 99 分鐘。

重量：27 kg (60lb)。

釋放閥單元和配備整合式火花抑制器的吹掃出口閥

類型：RLV104/ss/FS，設計編號 D758RLV。

內徑：吹掃出口閥 Ø 104 mm，釋放閥 Ø 75 mm。

釋放閥上升壓力：最低：20 mbarg。
最高：50 mbarg。
預設值：30 mbarg (+0，-20%)。

流率：範圍：2000、3000、4000、5000 或 6000 NI/min。
預設值：2000 NI/min。

原料：外罩：不鏽鋼 316L。
墊圈：聚矽氧發泡材。
火花抑制器：不鏽鋼網。

安裝方法：請參考組裝圖安裝矩形斷流器並比對安裝孔以利安裝。

重量：7 kg (15.4 lb)

第 2 節：使用者快速指南

安裝

The MiniPurge® 系統務必交由適任的工程師，根據相關標準 (如：IEC / EN 60079-14) 和任何當地作業規範來進行安裝。

- 依照線路配置圖安裝吹掃系統。
- 確保完全依照本手冊「安裝系統」章節的指示來安裝系統。
- 將管路連接至吹掃系統或加壓外殼前，務必確認所有管路的清潔，不能有塵土、凝結水珠和碎片。
- 強烈建議在吹掃系統的空氣供應上游安裝局部隔離閥。

注意：大部分的故障都是起因於空氣供應受阻、供應配管不足，或是吹掃過程中的空氣供應壓力下降。

操作系統

系統正確安裝後就開啟空氣供應。請參閱試運轉章節。

指示燈	顏色	狀態
警報 / 已加壓	紅光 	低壓警報 (外殼壓力太低)
吹掃中	不亮 	吹掃流太低，或是不在吹掃模式

吹掃系統開始吹掃循環：

- 吹掃空氣會進入外殼。
- 加壓外殼會獲得正壓。

- 釋放閥單元內的吹掃出口閥會開啟。
- 接著空氣就會經由火花抑制器離開釋放閥單元外罩。

指示燈	顏色	狀態
警報 / 已加壓	綠光 	已加壓 (已滿足最低外殼壓力)
吹掃中	不亮 	吹掃流流量太低

開啟吹掃流節流器閥，直到空氣流達到所需流率為止；然後系統就會啟動定時吹掃循環。吹掃中指示燈閃爍黃光時就按下碼表。

指示燈	顏色	狀態
警報 / 已加壓	綠光 	已加壓
吹掃中	連續閃爍黃光 	吹掃流率高於最低值

在指定時間長度的吹掃循環順利結束，系統會顯示吹掃結束。吹掃中指示燈停止閃爍時再次按下碼表。

指示燈	顏色	狀態
警報 / 已加壓	綠光 	已加壓，並且處於洩漏補償模式。
吹掃中	不亮 	不處於吹掃模式

檢查碼表的讀數，確認實際吹掃時間是否等同或大於所需的吹掃時間。

注意：記錄的吹掃時間絕對不可以少於所需的吹掃時間。

系統現在會在洩漏補償模式下正常運作。

如果系統沒有如預期般運作，請徹底檢查安裝，確認安裝過程是否有依照指示執行。

如有發現未載明在表內且無解決方法的明顯問題，請依照**故障排除**章節的程序處理。

如果已經執行過所有的檢查，但是系統仍沒有如預期地運作，請洽詢經銷商或 Expo Technologies 尋求幫助。

第 3 節：應用適宜性

MiniPurge® 系統 已通過認證，可於非礦業（地表作業）的危險地點（含可燃氣體、蒸氣或粉塵的環境）使用。根據型號而定，系統分別可用於第二類的 IECEx 和第三類的 ATEX 第一區（第二十一區）與第二區（第二十二區）。

MiniPurge® 系統可用於任何瓦斯類別的危險地點。有一些 MiniPurge® 系統的相關設備，如：本質安全的發訊電路，以及含開關裝置的防火外殼等，可能還是被限制歸類在其瓦斯類別內。務必要確認所有這類裝置隨附的證明文件，以確保裝置的適用性。

本系統主要是使用壓縮空氣進行操作。在操作其他惰性壓縮氣體（如：氮氣）的場所作業時，作業人員必須採取適當的預防措施，以避免累積的惰性氣體對健康造成危害。請參閱操作氣體的控制有害健康物質 (COS HH) 資料表。若是在有窒息風險的場所作業，請務必在加壓外殼 (PE) 上貼上警告標籤。

MiniPurge[®] 系統的結構含有以下原料。如果周遭環境含有會對這些原料產生不良影響的物質，請諮詢 Expo Technologies 以了解處理方式。

結構原料		
不鏽鋼	鋁	丙烯酸
軟 (碳) 鋼	尼龍	聚矽氧
黃銅	聚氨酯	氯丁二烯橡膠
ABS	聚碳酸酯	聚酯 (玻璃纖維填充)

第 4 節：操作說明和原理

MiniPurge[®] 系統使用氣動方式作動，並且備有電子界面。

吹掃和加壓是一種用在第一區 (第二十一區) 和第二區 (第二十二區) 危險地點使用的保護方法，可以確保外殼的內部沒有可燃氣體。再加上 MiniPurge[®] 系統就能讓外殼內的電氣設備可以安全地使用在危險地點。

吹掃和加壓的原理如下：

- 從非危險地點抽取乾淨的壓縮空氣或惰性氣體。
- 然後吹入加壓外殼內，排除任何危險氣體或粉塵。
- 導入加壓外殼的空氣能夠讓內部壓力常態性地高於外部壓力 0.5 mbarg。
- 一旦內部經過加壓，環境中的可燃氣體就無法進入外殼內。

開啟電氣設備的電源之前務必吹掃外殼，清除任何可能在加壓之前就已進入外殼的可燃氣體。吹掃就是排除受汙染的空氣和置換已知無可燃氣體之空氣（或惰性氣體）的過程。吹掃流程的持續時間一般是透過執行吹掃測試來確認。

吹掃循環結束時，系統會自動切換成洩漏補償模式。吹掃出口閥會關閉，然後空氣流會減弱到僅足以補償外殼空氣洩漏的程度，同時又維持最低限度的超壓狀態。

萬一加壓外殼內部發生壓力失效的情況，系統就會以視覺指示燈和透過無電壓觸點發送訊號的形式（視系統規格而定）發出警報。加壓壓力損失的預設動作為警報和自動電源斷開 (A&T - 警報和跳脫)。客戶可自行將其變更為「只有警報」(AO)，請參閱標題為「主要組件」章節。

MiniPurge[®] 系統含有封閉迴路自動加壓系統 (CLAPS)。這使得系統能夠偵測外殼內部壓力的起伏，並且根據情況調整洩漏補償率。造成壓力變化的原因較有可能是由於突然啟動大型轉動電機，但也有可能是運轉溫度變化所致。本系統經過特別設計，能夠維持外殼內部的穩定內壓。

使用內含 CLAPS 系統的 MiniPurge[®] 系統時，加壓外殼在吹掃和加壓期間的壓力特性：



第 5 節：主要組件

空氣供應過濾器 / 調節器

這個單元附有一個 40 微米液體 / 粉塵過濾器元件作為預防措施。MiniPurge® 系統使用者務必確認空氣供應的品質，有確實達到安裝系統章節中之「空氣供應品質」段落所描述的標準。調節器的出廠設定值為 5 barg (75 psig)，其所能調節的空氣供應壓力範圍為 5 至 16 barg (73 至 232 psig) 之間。壓力計則是安裝在過濾器的下游，其上的讀數不應少於 5 barg (73 psig)。吹掃循環期間可以從壓力計的讀數了解是否有壓力下降的情形。

邏輯空氣供應調節器

本裝置能協助系統為邏輯系統提供穩定的空氣供應壓力，並維持穩定運作。壓力值的出廠設定值為 2.3 barg (33 psig)，這個數值可以使用總體壓力計來確認。

最低壓力感知器

這個感知器會監測加壓外殼內部的壓力。當壓力低於安全運作的最低需求時，壓力感知器就會使系統重設，並且讓警報 / 已加壓指示燈轉為紅光●。這個感知器已於出廠時經過調校，會在壓力於滿足或高於最低規定壓力的情況下降時作動。

吹掃流感知器

吹掃流感知器會透過吹掃出口閥來觀察流量。當吹掃流流率正確時 (高於啟動吹掃的最低流率)，感知器就會傳送啟動吹掃計時器的訊號。這個感知器已於出廠時經過調校，會在吹掃流率於滿足或高於最低規定吹掃流率的情況下降時作動。

中間感知器

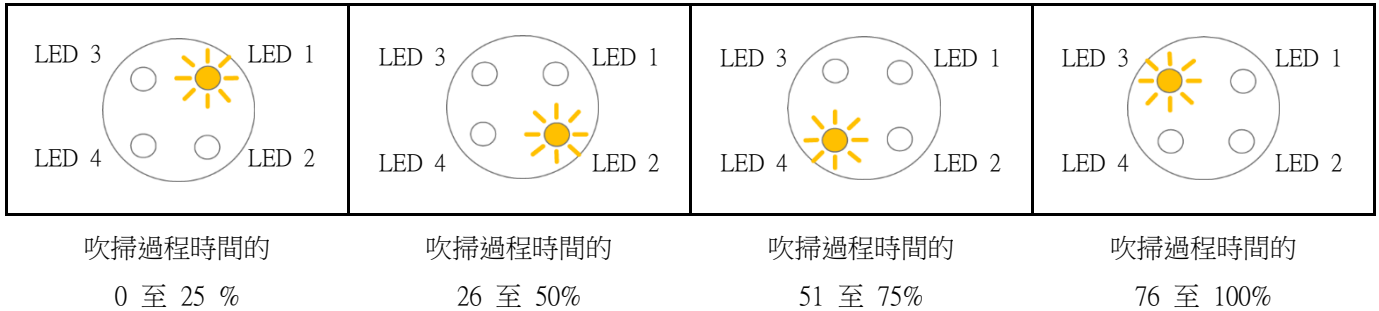
這個感知器會監測加壓外殼內部的壓力。這個感知器會感測到壓力的下降，並且會在低壓感知器致使系統跳脫之前發出預警。使用者可自行決定中間感知器的設定。

電子吹掃計時器

當外殼壓力和吹掃流率同時正確時，吹掃流感知器就會啟動計時器，然後電子計時器就會開始計時。使用者可自行使用安裝在計時器模組上的開關選擇計時階段。

注意：如果將計時器設定為 00 分鐘，將會使吹掃過程沒有終止時間；吹掃循環會因而無法完成。

在計時的過程中，吹掃循環的完成百分比顯示，是藉由四顆會在計時過程中依序閃爍的 LED 燈來表現。



電子計時器含有需要定期更換的本質安全電池組。請參閱試運轉章節。

吹掃完成閥

吹掃完成閥會從吹掃計時器接收吹掃循環完成的訊號，並且會驗證加壓訊號是否仍存在。若是兩項條件同時滿足，吹掃完成閥就會發出吹掃完成的訊號。這個訊號有兩個功能：開啟加壓外殼的電力供應，並且降低洩漏補償模式的高吹掃流率。即便當吹掃計時器都已經重設完成，準備好隨時可以進行下一次的吹掃循環，吹掃完成閥也還是會發出等待訊號，讓系統維持在洩漏補償模式，並讓電源開關保持開啟。

或閥

這個裝置會為吹掃完成閥提供前述的等待功能。只要出現逾時訊號或吹掃完成訊號時，或閥就會讓引示訊號通過，使其能傳送至吹掃完成閥。

只有警報電路 (AO)

如果加壓外殼內的壓力太低，系統通常就會切斷加壓外殼的電力。在某些當地作業規範允許的情況下，系統可以改成提供等待電路，維持加壓外殼的電力供應，另外還發出壓力失效警報。使用者聽聞警報作響應當有所反應，可恢復加壓外殼的壓力，或是保護設備的安全（如：關閉電力供應）。使用者必須自行承擔選擇使用只有警報功能的責任，並且也要為所允許的非已加壓操作時間長度負責。

警告：當已知危險地點內有潛在爆炸性危險氣體或粉塵時，若於未加壓的情況下去激發加壓外殼，就會有潛在的危險性。

電源互鎖開關

本防火電源開關是由吹掃完成閥的訊號所啟動。防火電源開關啟動後，就能用來開啟加壓外殼的電力供應。開關電纜末端接入/PA 出線盒。

警報 / 已加壓開關

本防火開關由已加壓訊號作動。這個訊號能夠讓遠端電力系統狀態指示燈顯示已加壓或壓力失效警報。開關電纜末端接入/PA 出線盒。

系統吹掃開關 (選購件)

本開關由吹掃流訊號作動，這個訊號另外可讓遠端電力系統狀態指示燈顯示系統吹掃中 (有時稱為吹掃處理中)。開關電纜末端接入/PA 出線盒。

中間開關

這是由中間感知器訊號啟動的防火開關。開關電纜末端接入/PA 出線盒。

吹掃閥

這個轉換閥會在吹掃空氣流或洩漏補償之間作選擇。為了讓吹掃期間有足夠的空氣能夠進入外殼，閥體尺寸會根據以下條件進行調整：指定的空氣供應壓力範圍、最低規定吹掃出口流率再加 10 %，以及加壓外殼的預期洩漏率。吹掃循環結束時，吹掃閥會在接收「吹掃完成」訊號後關閉，並且維持關閉位置直至下一次吹掃循環開始。

CLAPS 感知器

本感知器會監測加壓外殼內的壓力，並且會傳送控制訊號至 CLAPS 調節器。系統啟動之前一定要先決定正常的運轉壓力，才能將 CLAPS 感知器設定成需求等級，進而控制 CLAPS 調節器。

CLAPS 調節器

這是在吹掃完成後，控制流入外殼之洩漏補償空氣流的調節器。節流器會適當增加或減少流入外殼的空氣流以維持穩定的運轉壓力。CLAPS 調節器必須在試運轉時設定。

視覺指示燈

視覺指示燈的安裝目的是要為操作者提供狀態資訊。

警報 / 已加壓指示燈

綠光* 	已加壓
紅光 	壓力警報 (外殼壓力太低)

系統吹掃中指示燈

不亮* 	吹掃流太低 (或是不在吹掃模式)
黃光 (閃爍) 	吹掃中 (流量高於最低值)

* 綠光  / 不亮  的組合代表初始吹掃循環後的加壓外殼正常運作已經結束。

釋放閥單元

釋放閥單元可以讓吹掃空氣經由內嵌式火花抑制器，從外殼安全地排放出去。火花抑制器是用以避免加壓外殼內部噴射出電弧、火花和發光粒子。

吹掃空氣會流經釋放閥單元，而穿越適當孔口所產生的預設差壓可以確保吹掃流感知器，會在選定的吹掃流流量滿足之後啟動。

在吹掃循環過程中，氣動汽缸會作動吹掃出口閥，讓外殼內的空氣經由釋放閥單元排放出去。當系統變換成洩漏補償模式時，吹掃出口閥會關閉，而且外殼也會密封。

釋放閥單元擁有內嵌式釋放閥。釋放閥可調整閥口的尺寸，以確保如果空氣供應壓力從規定最大值上升時，內部外殼的壓力不會超過加壓外殼的規定最大工作壓力。

IPA 出線盒

安全性增加

Ex e IIC T5 Gb	Ex e IIC T4 Gb
Ex tb IIIC T100°C Db IP66	
Tamb -20°C 至 +55°C	Tamb -20°C 至 +60°C

出線盒通過安全性增加 (Ex e) 認證，內含警報和互鎖開關的端子連接點。其上提供的所有觸點皆為無電壓式 (乾式)。

電纜接入方法 (如：導線或電纜接頭) 一定要通過 IECEX、ATEX 或 INMETRO 標準的認證。主要的規定是依據使用的密封或墊圈類型，必須提供 IP66 (或更佳) 的異物防護等級。

第 6 節：安裝系統

MiniPurge® 是專為在一般工業的環境溫度條件、濕度條件以及震動條件下的使用所設計。如果處在會對本設備造成壓力的非一般工業環境條件下，請在安裝本設備之前先諮詢 Expo。The MiniPurge® 系統務必交由適任的人員，根據相關標準 (如：IEC / EN 60079-14) 和任何當地作業規範來進行安裝。

MiniPurge® 控制單元應直接安裝於加壓外殼上或附近位置。MiniPurge® 控制單元應如此安裝，系統指示燈和認證標籤才會在視線範圍內。

系統的所有零件都有一個共通的序號。若同時裝有一個以上的系統，請確保每一個安裝的系統都保有各自的專屬共通性。

釋放閥單元

為了有效吹掃，加壓外殼的空氣入口點和出口點通常都應位於外殼的兩端。RLV 單元必須垂直安裝，並且火花抑制器 (吹掃出口) 的周圍應保持最低 300 mm (12") 的間隙。

務必要保持火花抑制器內部和外部的清潔，並且要避免碎片堆積，否則可能會影響裝置的校準。特別是火花抑制器的外部，不應粉刷油漆或是有任何阻塞。

空氣供應品質

MiniPurge® 系統應連接至適於吹掃和加壓的保護性氣體供應。

MiniPurge® 的供應管路接頭為 2" NPT(F)，但是入口管路的尺寸應該要適合空氣供應的最大輸入吹掃流率。

空氣供應的壓力必須調節至低於最大標示入口壓力。

空氣供應必須為：乾淨、非可燃性，並且來自非危險地點。空氣供應必須符合 BS ISO 8573-1: 2001 2.2.1 級或同級當地標準。這就是一般所謂的儀器空氣品質。儘管設備會處理較低品質的空氣，進而對系統的使用壽命造成不良的影響。

而受 MiniPurge® 保護的設備可能也會因為糟糕的空氣品質而受到不良影響。

儀器空氣品質

固體顆粒	$0.5 \mu\text{m} < \text{顆粒尺寸} \leq 1 \mu\text{m}$ ，最大值為 $1000 \text{ 顆粒} / \text{m}^3$
濕度	$-40 \text{ }^\circ\text{C}^*$ 壓力露點
含油量	$\leq 0.01 \text{ mg} / \text{m}^3$ 所有油類的合計濃度

* 如需在 $T_{\text{amb}} \leq 0 \text{ }^\circ\text{C}$ 的環境下使用機器，則空氣供應應為 2.1.1 級，並且為 $-70 \text{ }^\circ\text{C}$ 壓力露點的濕度。

使用惰性氣體供應吹掃系統時，會有造成窒息的風險。請參閱**應用適宜性**章節。

將空氣供應連接至吹掃系統之前，應先使用儀器品質空氣吹入供應配管，掃除任何可能殘留在管路中的碎片。每一公尺的供應管路都務必吹入至少 10 秒的空氣。

除非 MiniPurge® 系統有安裝供應關閉閥，否則安裝人員應該為其安裝螺紋尺寸等同或大於控制單元入口接頭的外部關閉閥，以防止吹掃流受阻。

應使 MiniPurge® 控制單元的吹掃空氣經由管路吹入加壓外殼，確保能夠吹掃潛在的空氣死點。

配管

MiniPurge® 若非直接連接至加壓外殼，則將連接控制單元至加壓外殼的配管和接頭應為金屬材質，或是適用安裝環境的材質，才可以接入系統安裝的位置。連接控制單元至加壓外殼的任何訊號管路都不可安裝任何閥。配管的安裝必須符合相關的當地作業規範。

多層外殼

本系統適用於主要加壓外殼的吹掃與加壓作業和其相關的出線盒。

準備和安裝警報裝置

當加壓外殼內的壓力高於最低值時，最低壓力感知器就會回覆正（**已加壓**）訊號，使得控制單元上的警報指示燈從**紅光**轉變成**綠光**。

當壓力降到最低允許值以下時，正（**已加壓**）訊號就會被清除。此訊號消失就表示進入**低壓警報**的情況，這會使得控制單元上的警報指示燈從**綠光**轉變成**紅光**。

遠端使用的出線盒內有無電壓（乾式）觸點。

根據壓力或流動失效時的應變動作的當地作業規範，使用者必須使用這個警報功能。大多數的規範都包括了以下建議：

- **第一區設備**：警報和電源自動跳脫。
- **第二區設備**：壓力或流量失效時只有警報，並且以手動的方式切斷電源。

電源供應和電源隔離

所有進入加壓外殼的電源都應進行隔離處理。這項規定同樣也適用於所有連接至設備的外部電源，如：加壓外殼內的無電壓（乾式）觸點。一般都是使用電源互鎖開關來進行隔離處理。

電源互鎖開關

本開關是雙極常開的雙重斷路開關：這個開關提供兩個應以串聯連接，並且用以隔離電源的獨立觸點。使用開關裝置或其他合適的切換裝置就能建立觸點。這些是端接觸點，使用者可在 Ex e 出線盒中存取。

確保開關只在適當的技術極限內操作是使用者的責任。

當主要電路內發生任何短路時，務必更換開關；開關是一件封裝設備，而且嚴格來講是不可能檢查觸點狀態的。不可對開關進行技術修改。

開始試運轉前，請先確認 Ex e 出線盒是否清潔、所有連接是否適當接上、電纜是否正確擺放，以及所有端子的螺絲是否都已鎖緊。

在任何情況下都必須利用電源互鎖訊號，透過 MiniPurge[®] 系統來控制電源的輸送和隔離。

電源開關和 MiniPurge[®] 系統之間除了許可的手動超控電路之外，不可安裝任何開關。

安全地使用本開關是使用者的責任，並且所有的電氣設備都必須符合當地作業規範。

例外情況

適用於危險地點的設備電源無需再使用 MiniPurge[®] 系統進行隔離。

第 7 節：試運轉

系統試運轉

注意：步驟 11 和步驟 15 至 21 詳述了試運轉測試

以下設備需要進行這個流程：

- 導通性測試器
- 壓力計 (0 至 200 mbarg)
- 差壓計

若是試運轉後，系統並沒有如預期地運作，請參閱故障排除章節。

請依照以下內容執行步驟：

1. 檢查所有的接頭，並確認釋放閥單元已正確安裝，同時連接到吹掃排放的管路暢通無阻。
2. 關閉吹掃流節流器閥。
3. 完全開啟外部供應關閉閥（如有安裝）。
4. 確認內部邏輯壓力計的讀數為 2.3 barg / 33 psi / 230 kPag。
5. 確認主要空氣供應上的壓力計讀數為 5 barg / 73 psig / 500 kPag。
6. 藉由斷開從入口上隔板接頭至 MiniPurge[®] 的這一段最低壓力感知管路，來確認壓力釋放閥是否已正確安裝。斷開之後會使所有的壓力感知器停用。

- 使用 4 mm 尼龍管從最低壓力感知管路的斷開處，將壓力計連接至隔板接頭。
- 以極慢的速度開啟吹掃流節流器閥，直到壓力釋放閥開啟為止。
- 確認開啟壓力是否坐落在校準範圍內。
- 這項測試可以多次執行以確認再現性和符合性。

釋放閥如需重新調校，請參閱維修系統章節。

7. 關閉吹掃流節流器閥。
8. 拆下壓力計並重新將最低壓力感知管路接回隔板接頭。
9. 拔起最低壓力感知器頂端的紅色插塞並接上壓力計。
10. 在流量感知器的測試點上接上差壓計。

11. 檢查感知器校準

- 加壓外殼的內部壓力一定要低於釋放閥上升壓力並高於 CLAPS 壓力。
- 此時的已加壓指示燈應為「綠光」。
- 緩慢地開啟吹掃流節流器閥，直到吹掃中指示燈閃爍黃光為止。

注意：若是處理量大的話，可能需要一段時間吹掃流才會開始。

- 以極慢的速度關閉吹掃流節流器閥，直到吹掃中指示燈停止閃爍黃光為止。
- 然後記錄壓力計的讀數。

12. 設定吹掃流率：

- 開啟通往 MiniPurge® 的壓縮空氣。
- 緩慢地開啟吹掃流節流器閥，直到不亮 / 黃光指示燈轉變成黃光 (閃爍) 為止。
- 指示燈閃爍黃光代表流率正確。
- 差壓應大於 6.4 mbarg
- 釋放閥可以搭配多種指定流率的孔口板。本孔口板使用兩個 M3 螺絲固定位置，並且只要拆下出口閥總成、螺絲和大型蓋板就能輕鬆更換。

警告：開啟吹掃流節流器閥時，請確認加壓外殼內的超壓不會超過壓力釋放閥的設定。

13. 一旦吹掃中指示燈開始閃爍黃光，吹掃計時器就會開始計時。檢查指示燈從變成黃光 (閃爍) 到變回不亮之間的時間延遲，是否不少於加壓外殼完整吹掃所需的最短時間。延遲的時間可以超過吹掃加壓外殼所需的最短時間。
14. 吹掃結束後，吹掃閥會關閉，並且 CLAPS 調節器會控制流入外殼的空氣流。初始設定可能太高或太低。
15. 緩慢地逆時針轉動 CLAPS 調節器可以降低外殼壓力。
16. 調降調節器，直到中間感知器開啟觸點為止。
17. 檢查最低壓力感知器上的壓力計。
18. 持續調降 CLAPS 調節器來測試最低壓力感知器。
19. 若要檢查最低壓力感知器的運作，請直接讀取壓力計的讀數即可，因為系統會在到達最低壓力時自動進行重新吹掃。
20. 系統進行重新吹掃時，請將 CLAPS 調節器恢復初始設定。
21. 如果最低壓力低於設定值，請參閱重新調校章節以了解如何進一步處理。

22. 若是設定太高，就會觀察到外殼壓力不斷升降的現象，因為 CLAPS 調節器會自動關閉又恢復流量。此時就應逆時針轉動調整器螺絲，調整 CLAPS 調節器以降低流入馬達外殼的流量。
23. 若是初始設定太低，CLAPS 調節器可能就無法提供足夠的空氣流，進而導致外殼壓力漸漸流失。這時若要增加流入加壓外殼的流量，就要順時針轉動調整器螺絲來調整 CLAPS 調節器釋放閥。
24. 如要測試 CLAPS 的設定，請拆下一支螺栓，或是旋鬆一個接頭板以製造 15 mm 的小孔，主動為系統製造洩漏。測試結束後請記得將螺栓裝回去，或是重新鎖緊接頭板。
25. CLAPS 感知器的設定已於出廠時調校成加壓外殼內的預期正常工作壓力，通常為 10 mbarg。加壓外殼內的壓力應該會穩定下來，並且盡可能地接近這個數字。檢查最低壓力感知器的壓力計就能確定壓力是否穩定。
26. 移除系統的空氣供應，然後拆下所有的測試設備，並且裝回所有的插塞。

一般操作

在系統的一般操作方面，只要試運轉執行完畢，就能夠開啟或關閉空氣供應閥來啟動或停止系統。在此之後，吹掃和加壓程序都會自動執行。

第 8 節：維護系統

一般維護

除了本手冊所述的維護系統內容外，還應遵守所有相關當地作業規範。

依照 IEC / EN 60079-17 的規定，視作業環境每 6 至 36 個月就應執行以下檢查。

- 測試方式請參閱*試運轉細節*章節。
- 進行任何調整之前，請先確認釋放閥單元沒有受到任何汙染。確認方法為：
 - 使用 8 mm 扳手（一種扳手）拆下大型蓋板。
 - 檢查其內部和所有組件是否清潔無汙染。
 - 裝回大型蓋板。
- 檢查空氣供應過濾器元件的情況。如有必要，請進行清潔或更換。

另外也建議至少每 3 年額外檢查以下項目一次：

請確認：

- 檢查設備適用於危險地點。
- 系統上沒有任何未經許可的修改。
- 空氣供應無汙染。
- 互鎖和警報功能正確運作。
- 許可標籤清晰可見並且完整無缺。
- 廠內備有足夠的備件。
- 壓力失效時的動作正確。

維護電子計時器

每 3 年務必執行一次。

- 執行維護時應更換電子計時器的本質安全電池組，並且執行試運轉測試。

- 計時階段結束後，電池可在不影響 MiniPurge® 系統運作的情況下，於危險地點中熱插拔更換。

重新調校釋放閥單元

警告

釋放閥單元不正確調整可能造成嚴重超壓，進而導致外殼受損。

若是壓力已達已達最大壓力設定，請停止調整並降低壓力。

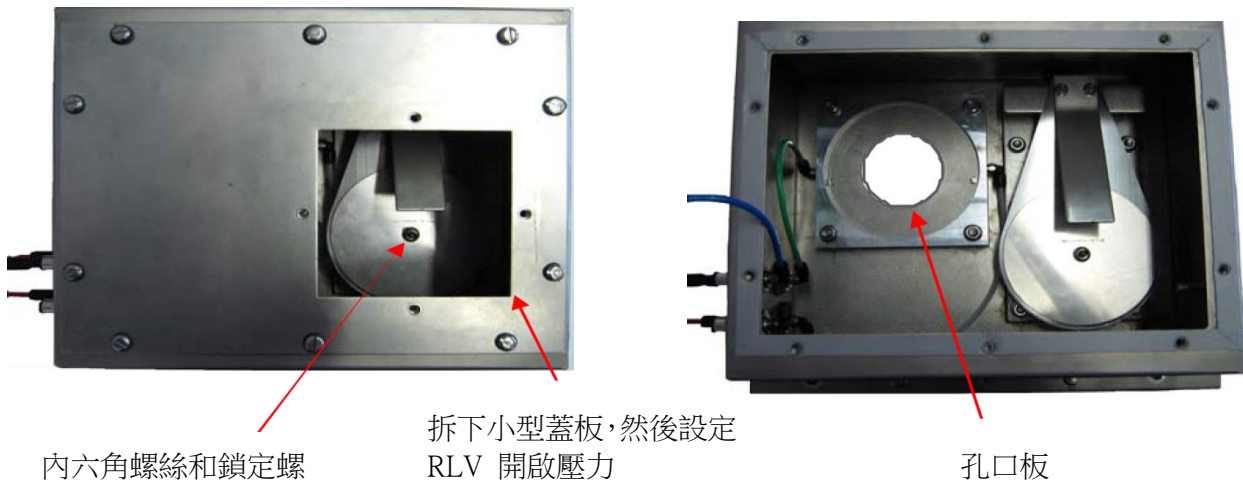
執行以下調整需要用到 8 mm 扳手（一種扳手）和 2.5 mm 內六角扳手。

進行任何調整之前，請先確認釋放閥單元沒有受到任何汙染。確認方法為：

- 使用 8 mm 扳手（一種扳手）拆下大型蓋板。
- 檢查其內部和所有組件是否清潔無汙染。
- 裝回大型蓋板

調整釋放閥上升壓力的方法為：

- 依照試運轉章節的說明接上測試設備。
- 拆下小型蓋板。
- 先使用內六角扳手固定住中央調整螺絲的位置，然後旋鬆固定螺帽。
- 順時針調整內六角扳手以增加上升壓力；或逆時針調整以降低上升壓力。
- 在測試之前，先固定調整螺絲的位置，重新鎖緊鎖定螺帽。
- 調整後請執行試運轉測試，以確認釋放閥的設定是否正確。
- 這個調整本身非常敏感，建議每一次的測試都僅轉動 1/4 圈（最多）即可。



重新調校壓力感知器

感知器上的黃銅噴嘴使用 Loctite 螺紋密封劑來密封定位。如果發現螺紋卡死，請先將移到安全地區並稍微加熱軟化，再進行任何調整。這樣可以避免對噴嘴的黃銅部位造成損壞。

- 從感知器斷開包含感知器下方管路的配管。
- 逆時針轉動拆下感知器。
- 噴嘴的位置位於感知器下方。
- 這個調整本身非常敏感，每一次僅轉動噴嘴 1/8 圈即可。
- 順時針轉動可以降低壓力設定，而逆時針轉動則可以增加壓力設定。
- 將感知器裝回原位，然後順時針鎖上螺絲。
- 重新接回所有的配管。

第 9 節：故障排除

一般資訊

如果遇到使用下述方法仍無法解決的問題，請電洽 Expo 或供應商尋求解決方法。如果系統機齡少於 12 個月，則保固期內的零件應送回 Expo 進行調查。零件送回時應隨附完整的故障報告和系統序號。

MiniPurge® 系統的問題通常是因為空氣供應受到油滴、水氣或塵土污染所導致。為了避免發生這些問題，空氣供應務必裝有粉塵過濾器和水氣過濾器。這麼做可以確保空氣供應達到儀器品質，並且可以同時保護吹掃系統本身以及欲吹掃的設備。本過濾系統並非由 Expo 提供，請務必向非 Expo 廠商採購。

汙染可能透過數種方式進入系統。因此為了避免發生汙染，在首次使用系統之前，落實安裝章節所描述的程序就極其重要。執行這些程序時也應遵守所有的配管斷開和重新連接規定。若是沒有確實執行這些程序，可能對系統造成不屬於保固範圍內的損壞。

本系統的設計易於進行故障排除，同時許多安裝的組件皆為內嵌式或是直接安裝於底盤上。只有在確認必要性之後，才依是否需要更換檢查組件。

執行故障排除程序之前，請先確認：

- 系統和馬達吹掃系統的主要空氣壓力以及邏輯歧管的調節壓力都符合設定表上的規定。
- 吹掃過程中的空氣壓力沒有降到最低供應壓力以下；大多數回報的故障都是起因於吹掃循環過程的空氣供應不足。

系統已正確執行吹掃，但是吹掃時間結束時卻發生跳脫，並且自動重新進行吹掃。

這是由於加壓外殼內部的壓力低於最低壓力感知器的設定。只要使用壓力計就能檢查內部的壓力。本問題最常見的原因請參閱以下內容：

故障位置	原因	解決方法
加壓外殼	釋放閥盤面上有因為磁鐵而吸附住的碎片。	• 清除碎片並確保 RLV 盤的清潔。
	外殼過度洩漏。	• 確認所有的門和蓋都已關閉，並且確認所有的導線和電纜接頭都以正確密封。 • 堵住所有的洩漏。
	壓力感知管受損。	• 將管更換。
CLAPS 調節器	CLAPS 調節器設定太低。	• 調升 CLAPS 調節器的設定，提高吹掃後的加壓外殼壓力。 • 調升方法為順時針轉動。
MiniPurge® 控制單元	最低壓力感知器的設定已經漂移高過 CLAPS 的設定。	最低壓力感知器需要進行重新調校。 • 請參閱維護章節的壓力感知器重新調校。

釋放閥開啟 (持續性開啟或間歇性開啟)

故障位置	原因	解決方法
加壓外殼	CLAPS 調節器過度開啟導致外殼壓力過高。	調整 CLAPS 調節器。
釋放閥單元	釋放閥盤上有碎片，使得空氣從閥洩漏出去。	拆下釋放閥蓋然後清潔閥盤。

系統已開始吹掃，但是吹掃指示燈沒有亮起。

故障位置	原因	解決方法
空氣供應	空氣供應壓力不足導致吹掃流不足。會發生這種情況時常是因為供應管路的壓力下降。	吹掃過程一定要維持 5 barg 的靜態壓力。 - 檢查入口至控制單元的空氣供應壓力。 - 確保供應管路內徑符合流率的需求。
加壓外殼	加壓外殼過度洩漏。	- 在吹掃過程中檢查加壓外殼的周圍。 - 吹掃出口閥的總洩漏量不應超出吹掃流感知器設定量的 10 %。 - 檢查電纜或導線下方是否有洩漏的情況。
配管	釋放閥流量感知點的管路沒有氣密。	- 確保接頭螺帽都已鎖緊。 - 檢查管路是否受損。 - 視情況進行維修。
電池組	本質安全電池組已完全放電。	視情況進行更換。
釋放閥單元	吹掃過程中釋放閥開啟。	確認啟動時的外殼壓力低於釋放閥上升壓力。
MiniPurge 控制單元	流量感知器設定不正確。	確認流量感知器上的壓力讀數正確。

第 10 節：備件清單推薦

零件號碼	說明
KFL-AO1N-001	適用 S0015/275 過濾器 / 調節器的過濾器組
S0030/606	吹掃流感知器，出廠設定值 6.4 mbarg
S0030/016	最低壓力感知器，出廠時必須設定為客戶測試和檢查表上的數值。
S0030/478	中間壓力感知器
S0030/588	CLAPS 感知器，出廠時必須設定為客戶測試和檢查表上的數值。
S0015/018	壓力計 (空氣供應壓力)，0 - 10 barg，
S0015/135	小型壓力計 (邏輯壓力)，0 - 4 barg
ETM-IS31-001	適用於電子計時器模組的 IS 電池組

第 11 節：術語表

縮寫	說明
A&T	警報和跳脫
AO	只有警報
CLAPS	封閉迴路自動加壓系統
CU	控制單元
ET	電子計時器
FCV	流量控制閥
IS	本質安全
LC	洩漏補償
PA	電源和警報
RLV	釋放閥單元

第 12 節：組裝圖和示意圖

標題	組裝圖號碼	頁數
D758 控制單元 - 電子計時器	D758MOTORSYS-E	2
典型 D758 線路配置	D758-HU	1
D758-3 P 和 I 示意圖	D758-PI	1
D758 電路圖	AGM-PA00-021	1
D758 Ex e 出線盒配置	AGE-WC00154	1
手動超控開關線路配置	AGE-WC00-117	1
尺寸 5 馬達吹掃 RLV	XBR-RTD0-009	1
MiniPurge® X LC 安裝順序示意圖	XBR-7TD0-040	1
系統狀態指示燈	TP-518-058-wd	1

第 13 節：認證

證書可於 www.expoworldwide.com/downloads 下載

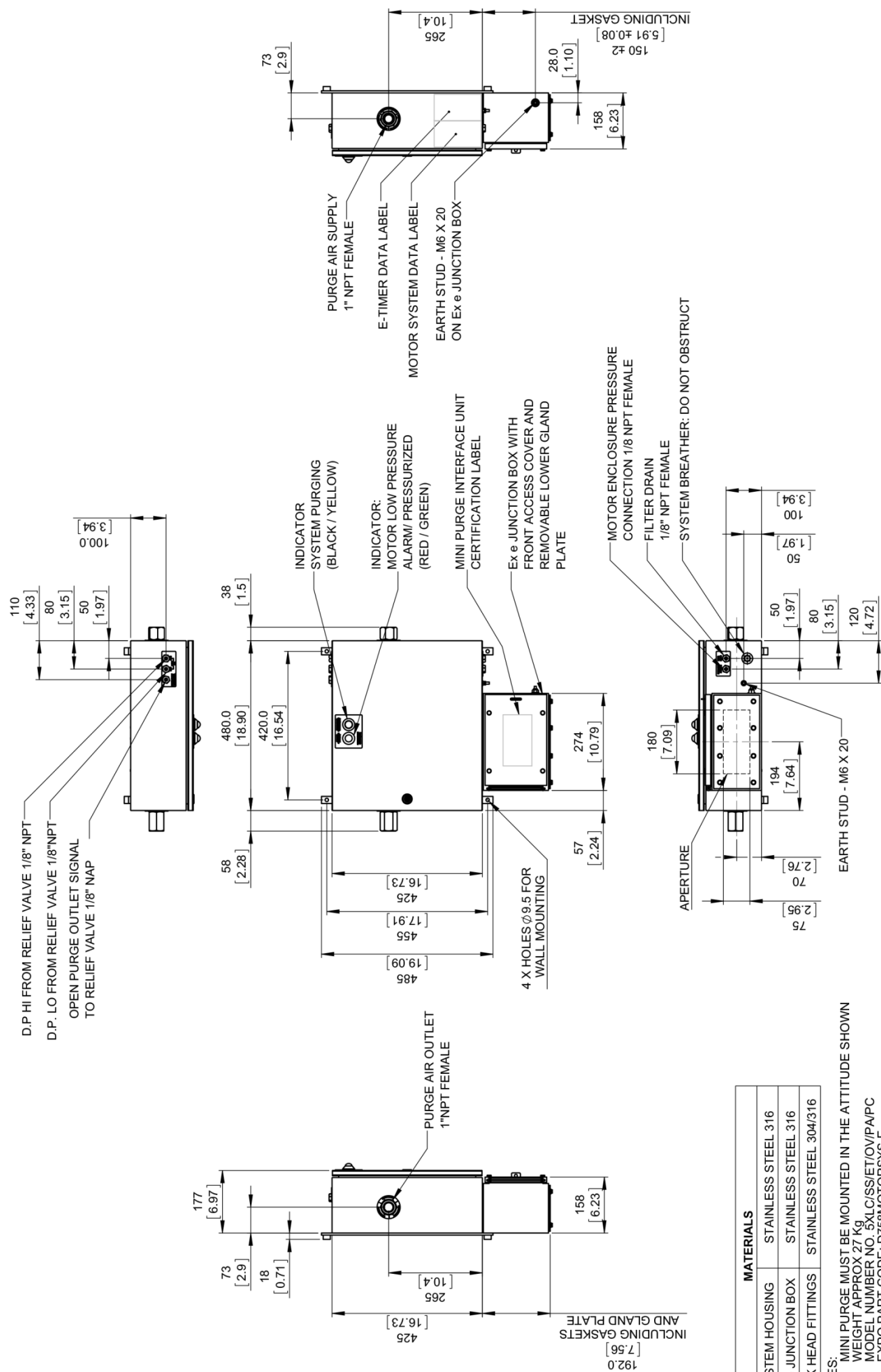
組件	證書	認證號
吹掃系統	ATEX 證書	SIRA 01ATEX1295X
	IECEX 證書	IECEX SIR07.0027X
	INMETRO/TÜV 證書	TÜV 12.1462X
MIU/e Ex e 出線盒	ATEX 證書	ITS 10ATEX37092X
	IECEX 證書	IECEX ITS 10.0003X
	INMETRO/TÜV 證書	TÜV 12.1463
電子計時器	ATEX 證書	FM 10 ATEX0003X
	IECEX 證書	IECEX FME 10.0001X
電子開關	Ex d 極限開關	IECEX PTB 07.0045X
	Ex d 極限開關	PTB 00ATEX1093X

DIMENSIONS IN mm

DO NOT SCALE

TOLERANCE $\pm$ 5 UNLESS STATED OTHERWISE

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MATERIALS

SYSTEM HOUSING	STAINLESS STEEL 316
Ex e JUNCTION BOX	STAINLESS STEEL 316
BULK HEAD FITTINGS	STAINLESS STEEL 304/316

NOTES:

- NOTES:
1. MINI PURGE MUST BE MOUNTED IN THE ATTITUDE SHOWN
 2. WEIGHT APPROX 27 Kg
 3. MODEL NUMBER NO. 5XLC/SS/ET/OV/PA/PC
 4. EXPO PART CODE: D758MOTOR/SYSE

REV.	MOD NUMBER	APPROVED DATE	APPROVED
01	DRAWN	10/06/2015	MLC

DRAWN DATE:	02/04/2015	
DRAWING STATUS:	Controlled	
DRAWN	CHECKED	APPROVED
JG	NW	MLC

MATERIALS - SEE NOTES	Expo Technologies Limited SURREY TW16 5DB UNITED KINGDOM	
N/A	TITLE D758 CONTROL UNIT - ELECTRONIC TIMER	
	JOB No:	CUSTOMER:

SCALE	1:10	REV:	01
DRAWING No. D758MOTORSYS-E			
SHEET No. 1 OF 2			

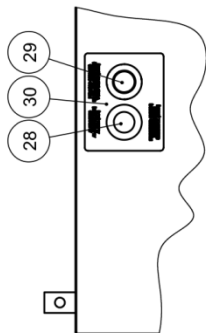


DIMENSIONS IN mm

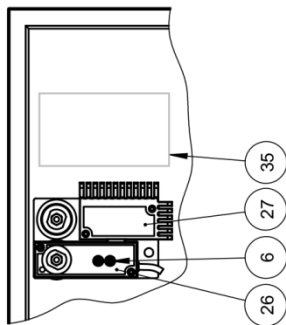
DO NOT SCALE

TOLERANCE : 5 UNLESS STATED OTHERWISE

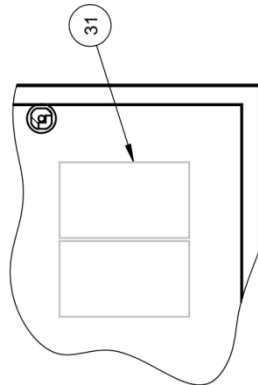
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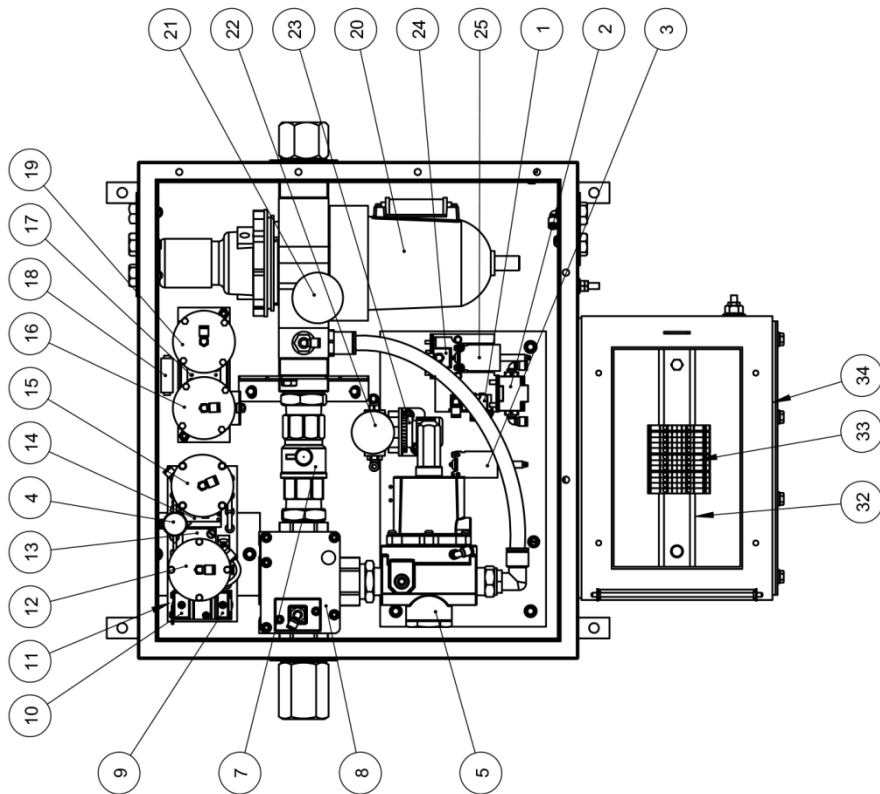
SCRAP VIEW WITH DOOR FITTED TO SHOW INDICATORS



SCRAP VIEW OF DOOR FROM INSIDE



SCRAP VIEW OF DOOR FROM INSIDE



FRONT VIEW WITH DOORS REMOVED TO SHOW INTERNAL LAYOUTS OF CONTROL UNIT AND Ex e JUNCTION BOX

ITEM NO.	PART DESCRIPTION
1	PURGE OULET OPEN SIGNAL VALVE (1)
2	PURGE COMPLETE BOOST VALVE
3	SYSTEM PURGING SWITCH, 250V 4A, SPNO Ex d II (OPTIONAL)
4	TIMER SWITCH
5	CLAPS REGULATOR
6	TIME SELECTOR SWITCHES
7	PURGE FLOW RESTRICTOR
8	PURGE VALVE
9	ALARM / PRESSURIZED SWITCH, 250V 4A, SPNO Ex d II
10	POWER INTERLOCK SWITCH, 250V 4A, DPNO Ex d II
11	LOGIC MANIFOLD
12	PURGE FLOW SENSOR
13	PURGE COMPLETE VALVE
14	TIMER VALVE
15	MINIMUM PRESSURE SENSOR
16	INTERMEDIATE PRESSURE SENSOR
17	PURGE OULET OPEN SIGNAL VALVE (2)
18	FLOW RESTRICTOR (CLAPS SENSOR)
19	CLAPS SENSOR
20	AIR SUPPLY FILTER / REGULATOR
21	GAUGE - MAIN AIR SUPPLY
22	GAUGE - LOGIC AIR SUPPLY
23	REGULATOR - LOGIC AIR SUPPLY
24	INTERMEDIATE SWITCH ACTUATOR
25	INTERMEDIATE SWITCH, 250V 4A, SPNO Ex d II
26	ELECTRONIC PURGE TIMER
27	I.S BATTERY PACK
28	INDICATOR ALARM / PRESSURIZED
29	INDICATOR - SYSTEM PURGING
30	MINI PURGE DOUBLE INDICATOR LABEL
31	MINI PURGE CERTIFICATION LABEL (FITTED INSIDE DOOR)
32	TERMINAL RAIL
33	TERMINALS Ex COMPLIANT
34	/PA TERMINAL BOX
35	ELECTRONIC TIMER LABEL

DRAWN DATE: 02/04/2015		MATERIALS - SEE NOTES		Expo Technologies Limited		SURREY TW16 5DB UNITED KINGDOM		SCALE 1:10	REV: 01
DRAWING STATUS: Controlled		N/A		TITLE		D758 CONTROL UNIT - ELECTRONIC TIMER		DRAWING No. D758MOTORSYS-E	
DRAWN JG	CHECKED NW	APPROVED MLC		JOB No:		CUSTOMER:		SHEET No. 2 OF 2	



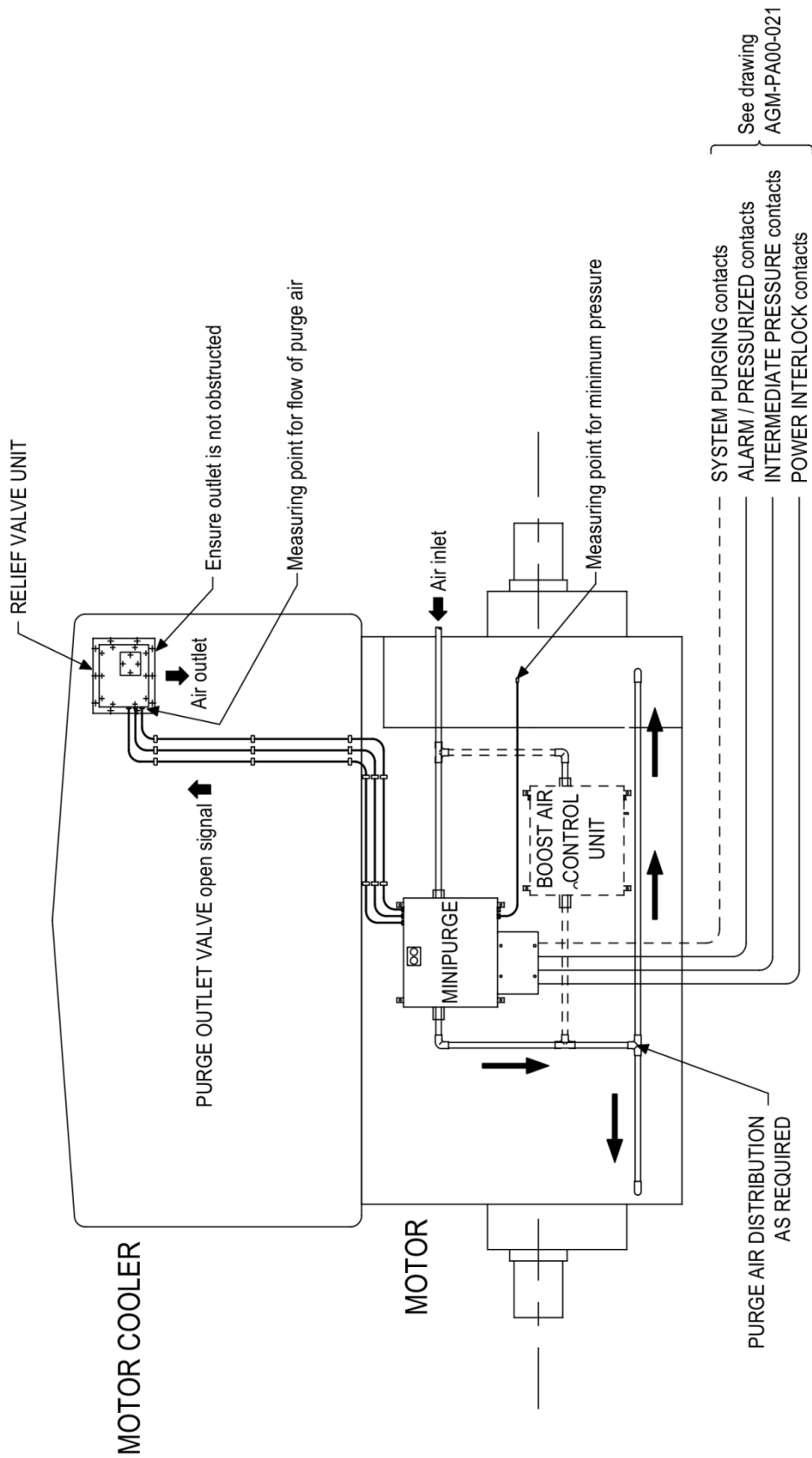


3rd ANGLE
PROJECTION

DIMENSIONS IN mm
DO NOT SCALE

UNSPECIFIED NO DEC PLACE ± 0.5
TOLERANCES 1 DEC PLACE ± 0.2
2 DEC PLACE ± 0.1
FLATNESS TO BE LESS THAN 0.4mm OVER ANY 100mm LENGTH

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APP'D		JPdB		ISSUE:		1		2		3		MATERIAL		Expo Technologies Limited		SURREY KT7 0RH UNITED KINGDOM		SCALE		NTS	
CHK'D		MLC		MOD. No:		DRAWN		4667		5402						TITLE		D758 H00K-UP		DRAWING No.	
DRWN		NRB		APPROVED:		JPdB		JPdB		JPdB		FINISH		JOB No:		CUSTOMER:		SHEET No.		1 OF 1	
				DRAWING STATUS:																	



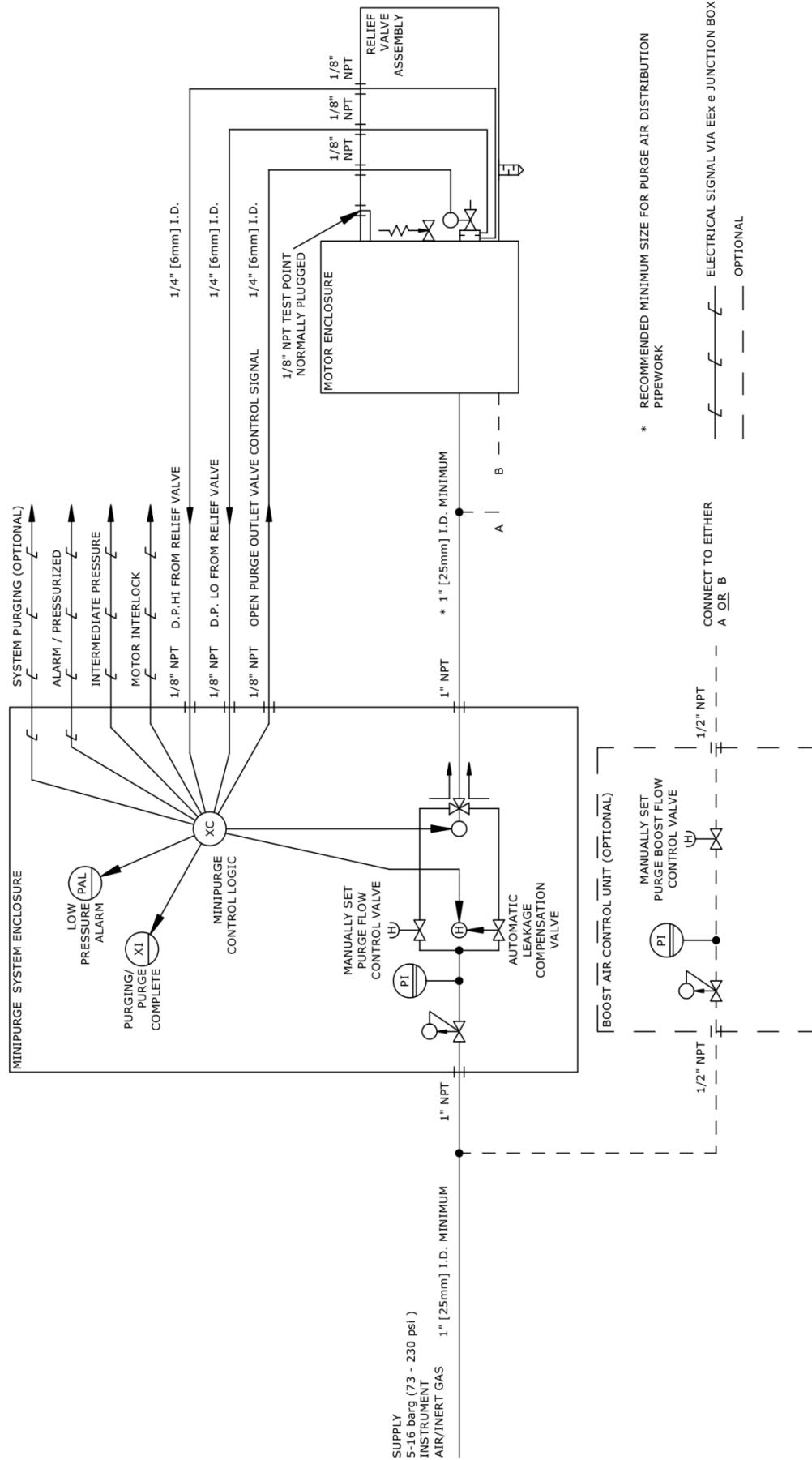
3rd ANGLE
PROJECTION

DIMENSIONS IN mm

DO NOT SCALE

UNSPECIFIED NO DEC PLACE ± 0.5
TOLERANCES 1 DEC PLACE ± 0.2
2 DEC PLACE ± 0.1
FLATNESS TO BE LESS THAN 0.4mm OVER ANY 100mm LENGTH

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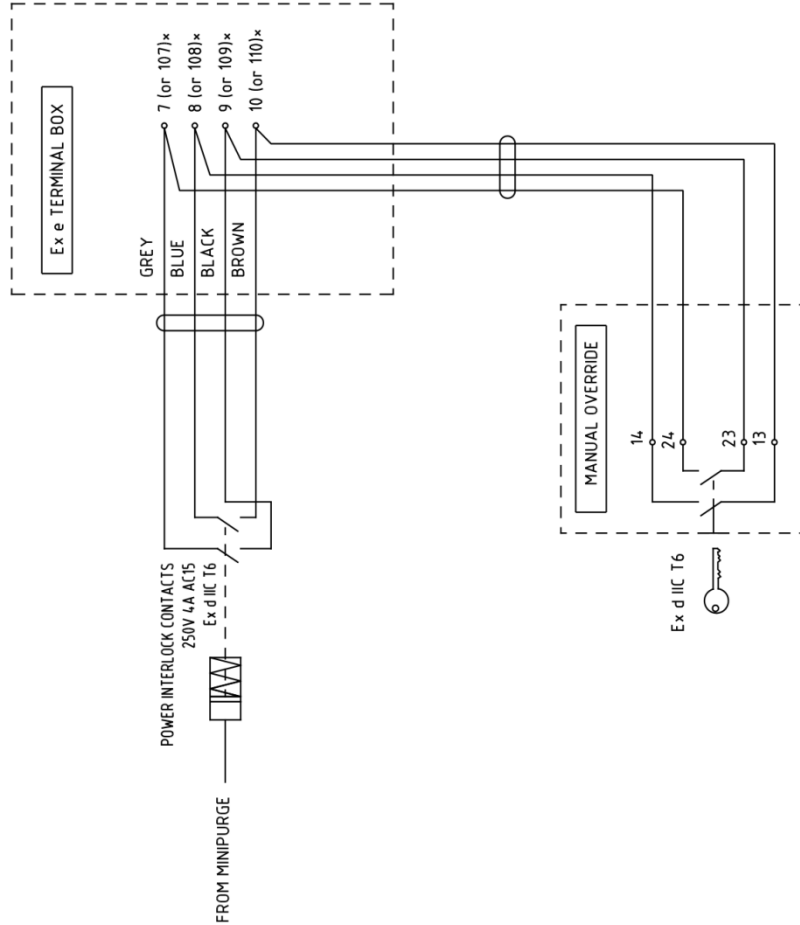


* RECOMMENDED MINIMUM SIZE FOR PURGE AIR DISTRIBUTION PIPEWORK

--- ELECTRICAL SIGNAL VIA EEx e JUNCTION BOX
--- OPTIONAL

APP'D	JPdB	ISSUE:	1	7	8	9	MATERIAL	Expo Technologies Limited			SCALE	NTS
CHK'D	MLC	MOD. No:	DRAWN	4,686	4,763	54,02		SURREY KT7 0RH UNITED KINGDOM			DRAWING No.	
DRWN	NRB	DATE:	10/1/08	01/07/09	11/8/09	18/11/11	FINISH	D758 P AND I DIAGRAM				
APPROVED:			JPdB	JPdB	JPdB	JPdB		CUSTOMER:				
DRAWING STATUS:										D758-PI		
										SHEET No. 1 OF 1		

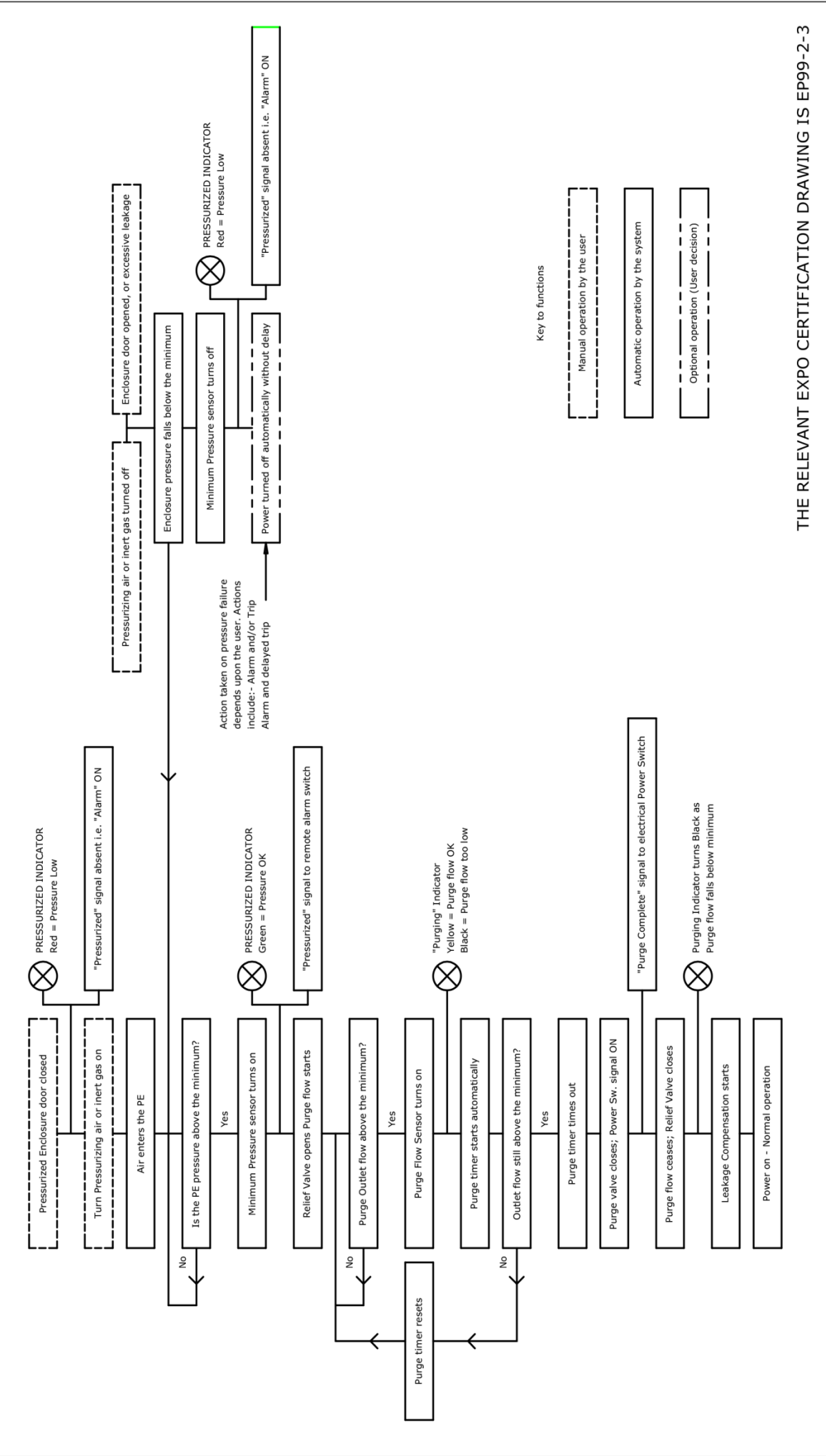
3rd ANGLE PROJECTION DIMENSIONS IN mm DO NOT SCALE										UNSPECIFIED TOLERANCES NO DEC PLACE ±0.5 1 DEC PLACE ±0.2 2 DEC PLACE ±0.1 FLATNESS TO BE LESS THAN 0.4mm OVER ANY 100mm LENGTH										The contents of this drawing / document are Copyright © Expo Technologies Limited. They are to be treated as confidential and are returnable upon request. They are not to be copied or communicated in part or in whole without written consent from Expo Technologies Limited, neither are they to be used in any way against our interests.																													
SEE CIRCUIT DIAGRAM ALARM/ PRESSURISED CONTACTS INTERMEDIATE PRESSURE CONTACTS POWER INTERLOCK CONTACTS										SEE CIRCUIT DIAGRAM ALARM/ PRESSURISED CONTACTS INTERMEDIATE PRESSURE CONTACTS POWER INTERLOCK CONTACTS SYSTEM PURGING CONTACTS										TERMINAL LAYOUT FOR SYSTEM FITTED WITH "SYSTEM PURGING" CONTACTS																													
NOTES 1 EXTRA TERMINALS MAY BE FITTED. THE NUMBER OF TERMINALS MUST NOT EXCEED THE MAXIMUM SPECIFIED IN THE TERMINAL BOX CERTIFICATE - CONSULT EXPO TECHNOLOGIES. 2 ALL TERMINALS MUST BE Ex e CERTIFIED KEMA 98 ATEX1683U, IECEx ULD 05.0008U. 3 DOUBLE LINES SHOW THE POSITION OF TERMINAL END PLATES 4 MAXIMUM PER TERMINAL AT 55°C: 250V 4A (AC-15)										Expo Technologies Limited SURREY KT7 0RH UNITED KINGDOM										SCALE NTS																													
APPD JPdB										ISSUE: 1 5 6 7 MATERIAL										TITLE D758 Ex e TERMINAL BOX LAYOUT										DRAWING No. AGE-WC00-154																			
CHK'D MLC										MOD. No: 5131 5199 5402										JOB No: CUSTOMER:										SHEET No. 1 OF 1																			
DR'WN JPdB										APPROVED: JPdB JPdB JPdB										DRAWING STATUS: CERT RELATED										Expo Technologies Limited SURREY KT7 0RH UNITED KINGDOM										AGE-WC00-154									



MANUAL OVERRIDE SWITCH SUPPLIED LOOSE.
GLAND PLATE IN PURGE SYSTEM IS UNDRILLED.
CABLE GLANDS ARE NOT SUPPLIED.

* TERMINAL NUMBER ACCORDING TO MOTOR SYSTEM

APPD	P0	ISSUE:	1	8	9	10	MATERIAL	Expo Technologies Limited SURREY KT7 0RH UNITED KINGDOM		SCALE	N.T.S				
CHK'D	P0	MOD. No:	DRAWN	4657	54.00	54.02	TITLE			MANUAL OVERRIDE SWITCH HOOK-UP	DRAWING No.	AGE - WC00 - 117			
DRWN	NRB	DATE:	01/07/03	2/4/09	18/11/11	18/11/11					FINISH	JOB No:	CUSTOMER:	SHEET No.	1 OF 1
		APPROVED:	P0	JPdB	JPdB	JPdB									
DRAWING STATUS: CERT RELATED															



REV.	MOD NUMBER	APPROVED DATE	APPROVED	DRAWN DATE	DRAWN STATUS	MATERIAL	Expo Technologies Limited	SURREY KT7 0RH UNITED KINGDOM	SCALE	REV:
01	DRAWN	23/06/2010	JpDb	APP'D	CHK'D	DR'WN	TITLE	MINIPURGE X LC SEQUENCE DIAGRAM	1:1	02
02	5434	20/12/2011	JpDb	JPdB	PSC	BRD	JOB No:	CUSTOMER:	DRAWING No.	
									XBR-7TD0-040	
									SHEET No.	1 OF 1

THE RELEVANT EXPO CERTIFICATION DRAWING IS EP99-2-3

SYSTEM STATUS	INDICATORS	Ex e HOUSING
DURING PURGE	GREEN YELLOW	BLACK GREY BROWN 101 102 103 BLACK GREY BROWN 104 105 106 BLACK BLUE BLACK 107 108 109 110 BROWN BLACK BLUE BLACK 107 108 109 110



EC TYPE-EXAMINATION CERTIFICATE

1 Equipment intended for use in Potentially Explosive Atmospheres Directive 94/9/EC

2 Certificate Number: **Sira 01ATEX1295X** Issue: **8**

3 Equipment: **Purge Controllers: Sub-MiniPurge, MiniPurge, Super-MiniPurge, Super-MiniPurge 1800/3500/7000/7000X**

4 Applicant: **EXPO Technologies Limited**

5 Address: Unit 2, The Summit, Hanworth Road, Sunbury on Thames, Surrey TW16 5DB UK

6 This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

7 Sira Certification Service, notified body number 0518 in accordance with Article 9 of Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

8 The examination and test results are recorded in the confidential reports listed in Section 14.2.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:

10 IEC 60079-0:2011 EN 60079-2:2007 EN 61241-4: 2006

11 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

12 This EC type-examination certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

The marking of the equipment shall include the following:

Standard versions



II (2) GD

Ex [px] IIC T6 Gb

Ex [py] IIC T6 Gb

Ex [p] IIIC T85°C Db

(Ta -20°C to +55°C)



II (2) GD

Ex [pz Gc] IIC T6 Gb

Ex [p Dc] IIIC T85°C Db

(Ta -20°C to +55°C)



II (2) GD

Ex [px] Ia IIC T6 Gb

Ex [p] Ia IIIC T95°C Db

(Ta -20°C to +55°C)



II (2) GD

Ex [px] dem Ia IIC T3 or T4 Gb

Ex [p] Ia IIIC T200°C or T135°C Db

(Ta -50°C to +55°C)



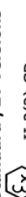
II (2) GD

Ex [px] dem Ia IIC T3 or T4 Gb

Ex [p] Ia IIIC T200°C or T135°C Db

(Ta -50°C to +55°C)

Standard / ET versions



II (2) GD

Ex [px] dem Ia IIC T3 or T4 Gb

Ex [p] Ia IIIC T200°C or T135°C Db

(Ta -50°C to +55°C)



II (2) GD

Ex [px] dem Ia IIC T3 or T4 Gb

Ex [p] Ia IIIC T200°C or T135°C Db

(Ta -50°C to +55°C)



II (2) GD

Ex [px] dem Ia IIC T3 or T4 Gb

Ex [p] Ia IIIC T200°C or T135°C Db

(Ta -50°C to +55°C)

Low temperature / ET versions



II (2) GD

Ex [px] dem Ia IIC T3 or T4 Gb

Ex [p] Ia IIIC T200°C or T135°C Db

(Ta -50°C to +55°C)



II (2) GD

Ex [px] dem Ia IIC T3 or T4 Gb

Ex [p] Ia IIIC T200°C or T135°C Db

(Ta -50°C to +55°C)



II (2) GD

Ex [px] dem Ia IIC T3 or T4 Gb

Ex [p] Ia IIIC T200°C or T135°C Db

(Ta -50°C to +55°C)

Project Number 29097

C Ellaby
Deputy Certification Manager

C. Ellaby

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Rake Lane, Eccleston, Chester, CH4 9JN, England

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Form 9400 Issue 1

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SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE

Sira 01ATEX1295X
Issue 8

13

DESCRIPTION OF EQUIPMENT

The Purge Controllers are pneumatically operated devices, which are intended to provide a given flow rate of purging gas for a predetermined time to unsparged Ex p protected electrical equipment. The MiniPurge Control Units provide one of the following four methods of purge operation.

LC-Leakage compensation only after initial high purge

CF-Continuous flow (same flow rate during and after purging)

CF2-Two flow CF-system with initial high purge rate only at one orifice

CFHP-Continuous (lower) flow after initial high purge

The MiniPurge control unit may be supplied within a heated enclosure to permit the use of the system within an ambient temperature down to -50°C.

The MiniPurge option pD is for use in combustible dust

Relief Valve - The MiniPurge controller is supplied with an optional overpressure relief valve, which is to be fitted to the Ex p protected apparatus to prevent an internal overpressure above the maximum overpressure rating of the apparatus. There are 14 models of relief valve; the designation of each relief valve refers to its nominal bore in mm, as follows:

RLV3, RLV6, RLV9, RLV12, RLV19, RLV25, RLV26, RLV36, RLV75, RLV104, RLV125, RLV150 and RLV200.

The outlet of each relief valve is fitted with a spark arrestor, of which there are four optional types:

- Metal foam
- Tortuous path with at least 4 x 90° or 2 x 180° bends
- Multi-layer stainless steel mesh
- Knitted mesh

Outlet Orifice - Three types of orifice are used:

- Threaded Orifices e.g. 1/4" NPT or 2" BSP with a built in spark arrester. These are selected to maintain a desired back pressure within the Ex p protected apparatus when used with the Continuous Flow options. The designation of each outlet orifice indicates the nominal inlet diameter. The designations are as follows: SA3, SA6, SA9, SA12, SA19, SA25, SA32, SA38 and SA50.
- Plain holes in the Relief Valve disk, sized according to the flow rate required.
- Replaceable orifice type SAU**.

High Pressure Sensor for CF Systems (HP code) - If the pressure in the pressurized enclosure rises above the setting of the High Pressure sensor, the controller resets cutting the power to the enclosure. On detecting the overpressure an optional facility is available for the generation of an alarm or indicator. On systems with a High Pressure sensor, the relief valve may be omitted.

High Pressure Sensor for LC Systems (HP code) - If the pressure in the pressurized enclosure rises above the setting of the High Pressure sensor, the purge gas flow is isolated from the pressurised enclosure. The valve isolates both the leakage compensation and the purge streams. On detecting the overpressure, an optional facility is available for the generation of an alarm or indicator. On systems with a High Pressure sensor, the relief valve may be omitted.

Pneumatically Operated Outlet Valve - The pneumatically operated outlet valve is used to positively open or close the outlet of the purged enclosure by means of a spring return pneumatic cylinder. Systems fitted with the Pneumatically Operated Outlet Valve will carry the option OV.

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SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE

Sira 01ATEX1295X
Issue 8

Model Number Designation for ATEX approved MiniPurge systems		Model Number:
a	Size or Capacity	1 X LC cs DS SS AA MO FM OA TW Key: a b cc mm Example option codes
1	Sub-MiniPurge	
2	MiniPurge	
3	Super-MiniPurge	
4	Super-MiniPurge 1800	
5	Super-MiniPurge 3500	
6	Super-MiniPurge 7000	
7	Super-MiniPurge xxxx	
b	Pressurization Type	
X	X Pressurization	
Y	Y Pressurization	
Z	Z Pressurization	
cc	Action after initial purging	
LC	Leakage Compensation only after initial High Purge	
CF	Continuous Flow (same flow rate during and after purging)	
CF2	Two Flow CF system with initial High Purge rate but only one orifice	
CFHP	Continuous (lower) Flow after initial High Purge	
DP	Dust Protection (pressurization only)	
mm	Material of the Control Unit Enclosure	
al	Aluminium alloy	
cs	Mild steel, painted	
ss	Stainless steel	
bp	Back Plate only	
co	Chassis only	
pm	Panel mounting	
nm	Non-Metallic	
	Option codes (Added only if used)	
AA	Active Alarm output fitted.	
AC	Alarm cancellation circuit.	
AO	"Alarm Only" Action on Pressure or Flow Failure.	
AS	Alarm "Action on Pressure or Flow failure", Selector valve.	
CS	Containment System Monitor.	
DS	Door switch Power Interlock fitted.	
DT	Delayed Trip after Pressure or Flow failure.	
DXXX	Special design for specific flow rates	
ET	Electronic Timer	
FM	Flow Meter(s) fitted.	
HP	System LC or CF with High Pressure Sensor	
IS	Internal Switches suitable for Ex I circuits.	
MO	Manual Override fitted.	
MT	Mechanical Timer	
OA	On/Off switch controlling Protective gas and logic supply.	
OB	On/Off switch controlling logic supply only.	
OC	On/Off switch controlling Protective gas supply only.	
OS	Outlet (Office) Selector valve.	
OV	Outlet valve, pneumatically operated.	
PA	"Ex" switch(es) built-in, with/without "Ex" junction box.	
PC	PE Pressure Control Leakage Compensation Valve (CLAPS System.)	
PO	Pneumatic Output signals for Power and Alarm control.	
SP	Secondary Pressurization supply options.	
SS	Separate Supply for Protective gas and Logic air.	
TW	Twin (or more) outputs for two or more separate pressurized enclosures purged in parallel	

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SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE

Sira 01ATEX1295X
Issue 8

Variation 1 This variation introduced the following changes:

- i. The purge controller to be fitted inside an additional, heated, stainless steel enclosure that allows it to be used down to -50°C.

The heater (500 W maximum) is manufactured by Intertec-Hess GmbH and coded Ex d m IIC T3 (max) under PTB 02ATEX1041X. If the outer enclosure is reduced in size the power of the heater may be reduced in proportion to the reduction in surface area. Other alternative heaters may be used as a replacement if they are suitably certified, carry the same or greater ambient temperature range, occupy the same or smaller physical space, have the same certification code and have the same or more restrictive Temperature Class.

The enclosure is made from 1.5mm or 2.5 mm thick stainless or mild steel painted and the lid is made from 1.5 mm thick stainless steel, lined with 38 mm thick insulation, or other materials with equivalent insulating properties. The purge inlet, purge outlet and pressure sensing lines are similarly insulated. The door may optionally be hinged with quick release catches, these will be fitted with a padlock. An enclosure breather tube is fitted to help prevent condensation. A plastic clear viewing window may optionally be fitted to the door.

RTDs are fitted to the air inlet pipe-work and inside the purge controller enclosure.

An Ex e terminal box is provided within the main enclosure for connection of the heater leads. This polyester box is manufactured by Bartec and coded Ex e II T6 under BAS 98ATEX3008X. Other alternative ATEX terminal boxes may be used as a replacement if they are suitably certified, carry the same or greater ambient temperature range, occupy the same or smaller physical space, have the same certification code and have the same Temperature Class.

Any suitably ATEX, Category 2 approved cable gland may be used, if it can be used with the ambient temperature range.

- ii. A change of the Applicant's name on the certificate and the substitution of the new name for the old name on the approved label affixed to the purge controllers:

Old Name: Expo Telektron Safety System Limited
New name: Expo Technologies Limited

Variation 2 This variation introduced the following change:

- i. To permit the pressurisation of enclosures for the exclusion of combustible dusts in accordance with IEC61241-4:2001 and modification of the marking to include one of the following:

[Ex pD] II T200°C 21 (Ta = -20°C to +55°C) - (used with the low temperature versions)

[Ex pD] II T85°C 21 (Ta = -20°C to +55°C) - (used with the standard temperature versions)

The ATEX coding is modified to: II 2(2) G D

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SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE

Sira 01ATEX1295X
Issue 8

Variation 3

- This variation introduced the following changes:
- Following appropriate re-assessment to demonstrate compliance with the requirements of the EN 60079 series of standards, the documents originally listed in section 9, EN 50014:1997 (amendments A1 to A2) and EN 50016:1995, were replaced by EN 60079-0:2006; EN 60079-1:2004; EN 61241-0:2006 and EN 61241-1:2006, the markings in section 12 were updated accordingly.
 - The removal of special conditions for safe use that were not specifically associated with the equipment covered by this certificate.

Variation 4

- This variation introduced the following changes:
- To permit the inclusion of the following coding for the Low Temperature MiniPurge Enclosure:
Ex [p] dem IIC T4
Ex pD II 21 T135°C
(Ta -50°C to +55°C)

Variation 5

- This variation introduced the following changes:
- The introduction of the /ET version, an alternative to the pneumatic or mechanical timer system, this incorporates an Electronic Timer Module ETM-IS*-*** in the Mini Purge; the certification includes 'ia' marking when the ETM is fitted.
 - The dust marking was changed to be consistent with the marking for gases and vapours.
 - The introduction of a high pressure sensor for the LC option.

Variation 6

- This variation introduced the following changes:
- Following appropriate re-assessment to demonstrate compliance with the requirements of the latest EN 60079 series of standards, the documents previously listed in section 9, EN 60079-0:2006 and EN 60079-2:2004 were replaced by those currently listed (EN 61241-0:2006 was removed as this is incorporated into the current version of 60079-0), the markings in section 12 were updated accordingly and a new condition of certification was added.

Variation 7

- This variation introduced the following changes:
- The recognition of the Applicant's address change from Summer Road, Thames Ditton, Surrey KT7 0RH to Unit 2, The Summit, Hanworth Road, Sunbury on Thames, Surrey TW16 5DB.

14

DESCRIPTIVE DOCUMENTS

14.1

Drawings

Refer to Certificate Annexes.

14.2

Associated Sira Reports and Certificate History

Issue	Date	Report no.	Comment
0	3 July 2002	R53A7169A	The release of prime certificate.
1	29 March 2004	R53V11342A	The introduction of Variation 1.
2	30 September 2004	R51A11080A	The introduction of Variation 2.
3	19 September 2006	R51A15629A	The re-issue of Variation 2 to include the changes described in report number R51A15629A.

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SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE

Sira 01ATEX1295X
Issue 8

Issue	Date	Report no.	Comment
4	7 June 2007	R51L15966B	This Issue covers the following changes: - All previously issued certification was rationalised into a single certificate, Issue 4, Issues 0 to 3 referenced above are only intended to reflect the history of the previous certification and have not been issued as documents in this format. - The introduction of Variation 3.
5	18 February 2009	R51L19695A	The introduction of Variation 4.
6	22 December 2010	R23665A/00	This Issue covers the following changes: - This certificate history was modified to recognise that that Variation 2 was re-issued, subsequent Variations have therefore been re-numbered. - The introduction of Variation 5.
7	07 December 2011	R25983A/00	The introduction of Variation 6.
8	05 October 2012	R29097A/00	The introduction of Variation 7.

15 SPECIAL CONDITIONS FOR SAFE USE

- (denoted by X after the certificate number)
- 15.1 When using the AO, AS and DT options, the recommendations for the additional requirements of Ex p apparatus contained within EN 60079-14 shall be applied.
- 15.2 The installer/user shall ensure that the MiniPurge Control Unit is installed in accordance with the equipment certificate that covers the combination of the pressurised enclosure(s) and MiniPurge Control Unit.
- 15.3 The values of the safety parameters shall be set in accordance with the equipment certificate that covers the combination of the pressurised enclosure(s) and MiniPurge Control Unit.
- 15.4 This MiniPurge Control Unit shall be incorporated into equipment and the appropriate Conformity Assessment Procedures applied to the combination as defined by Directive 94/9/EC. This certificate does not cover the combination.
- 15.5 The purge controller, low temperature version, shall be protected by a safety related system that ensures that it cannot be energised if the temperature of the air inlet or purge controller falls below -20°C. This system shall utilise the RTDs that are fitted to the purge controller to provide the appropriate level of system integrity, i.e. a level of operational safety of Cat 3 according to EN 954-1 for ATEX Category 2 (Zone 1) applications; note that these RTDs have not been assessed as a safety related device in accordance with EHSR 1.5 of Directive 94/9/EC.
- 16 **ESSENTIAL HEALTH AND SAFETY REQUIREMENTS (EHSRs)**
- The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed reports listed in Section 14.2.
- 17 **CONDITIONS OF CERTIFICATION**
- 17.1 The use of this certificate is subject to the Regulations Applicable to Holders of Sira Certificates.
- 17.2 Holders of Type Examination Certificates are required to comply with the production control requirements defined in Article 8 of directive 94/9/EC.

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Certificate Annexe

Certificate Number: **Sira 01ATEX1295X**

Equipment: **Purge Controllers
Sub-MiniPurge, MiniPurge, Super-MiniPurge,
Super-MiniPurge 1800/3500/7000/7000X**

Applicant: **EXPO Technologies Limited**

EC TYPE-EXAMINATION CERTIFICATE

**Sira 01ATEX1295X
Issue 8**

17.3 The switches incorporated in the PA option shall be suitably certified for Category 2.

17.4 The following routine tests shall be performed by the manufacturer:

Verification of Minimum Overpressure Cut Off

An overpressure loss shall be simulated whilst the MiniPurge Control Unit is cycling, it shall be verified that the controller provides the appropriate output and resets.

Verification of Purge Failure Protection

A purge failure shall be simulated whilst the MiniPurge Control Unit is cycling, it shall be verified that the controller provides the appropriate output and resets.

Verification of Air Supply Failure Protection

An air supply failure shall be simulated whilst the MiniPurge Control Unit is cycling, it shall be verified that the controller provides the appropriate output and resets.

Verification of Purging Overpressure protection

Where the HP is specified an overpressure shall be simulated whilst the MiniPurge Control Unit is cycling, it shall be verified that the controller provides the appropriate output and resets.

17.5 The products covered by this certificate incorporate previously certified devices, it is therefore the responsibility of the manufacturer to continually monitor the status of the certification associated with these devices, and the manufacturer shall inform Sira of any modifications of the devices that may impinge upon the explosion safety design of the products.

17.6 The certification code that is appropriate to Purge Controllers low temperature version shall appear in the product marking applied to outer stainless steel enclosure.

17.7 The Purge Controllers: Sub-MiniPurge, MiniPurge, Super-MiniPurge, Super-MiniPurge 1800/3500/7000/7000X shall not be marked as suitable for use in explosive dust atmospheres when a non-metallic or painted housing is used.

SCHEDULE

Issue 0 (The drawings associated with this issue were replaced by those listed in Issue 4)

Number	Sheet	Rev.	Date	Description
SD7281	1 of 4	3	02 Jul 02	MiniPurge ATEX Certification Labelling
SD7282	1 to 2	2	21 May 01	MiniPurge ATEX Certification Type Numbering Scheme
EP/99-2-17	1 of 1	1	21 Sep 00	MiniPurge, Continuous Flow with /HP Sensor –Schematic diagram
EP99-7-7	1 of 1	1	21 Sep 00	RLV, outlet orifice
EP99-7-9	1 of 1	1	21 Sep 00	Outlet Valve Control Circuit Diagram

Issue 1 (The drawings associated with this issue were replaced by those listed in Issue 4)

Number	Sheet	Rev.	Date	Description
SD7448	1 of 1	3	22 March 04	Low Temperature Housing - General Arrangement

Issue 2 (The drawings associated with this issue were replaced by those listed in Issue 4)

Number	Sheet	Rev.	Date	Description
SD7281*	1 to 5	4	17 Dec 03	Certification label
SD7449	1 of 1	1	18 Dec 03	Low temperature housing wiring certification drawing.

* Modified by Sira 30 September 2004

Issue 3 (The drawings associated with this issue were replaced by those listed in Issue 4)

Number	Sheet	Rev.	Date	Description
SD7281	1 to 5	5	30 Aug 06	Certification label

Issue 4

Number	Sheet	Rev.	Date	Description
EP99-3-1	1 of 1	02	15 Mar 07	MiniPurge Control Unit – General Assembly
EP99-2-1	1 of 1	03	09 Jul 07	Schematic - Type x Leakage Compensation
EP99-2-3	1 of 1	02	15 Mar 07	Sequence Diagram - Type x Leakage Compensation
EP99-2-2	1 of 1	02	15 Mar 07	Schematic - Type x Continuous Flow
EP99-2-7	1 of 1	02	15 Mar 07	Schematic – Separate Supply and Mechanical Timer
EP99-2-8	1 of 1	02	15 Mar 07	Schematic – Delay Before Trip and On/Off
EP99-2-9	1 of 1	02	15 Mar 07	Schematic – Twin Output and Manual Override
EP99-2-10	1 of 1	03	15 Mar 07	Schematic – Pressure Control Leakage Compensation
EP99-2-11	1 of 1	03	15 Mar 07	Internal "IS" Switches
EP99-2-12	1 of 1	02	15 Mar 07	Schematic – Containment System and Secondary pressurisation
EP99-2-14	1 of 1	02	15 Mar 07	Schematic – Continuous Flow with 2 Flow Rates
EP99-2-17	1 of 1	02	15 Mar 07	Schematic – Continuous Flow with High Pressure
EP99-2-16	1 of 1	02	15 Mar 07	Schematic – Outlet Valve Control
SD7533	1 of 1	01	15 Mar 07	Schematic – Dust Protection
SD7535	1 of 1	01	15 Mar 07	Spark Arrestor
SD7536	1 of 1	01	18 Apr 07	Differential Flow Monitor
SD7538	1 of 1	01	27 Mar 07	Continuous Flow Outlet Orifice
SD7449	1 of 1	02	15 Mar 07	Wiring Diagram – Low temperature
SD7500	1 of 1	01	25 Apr 07	Outlet Orifice Closing Device
SD7448	1 of 1	04	15 Mar 07	Low Temperature Housing
SD7281	1 to 2	06	20 Feb 07	Certification Label Details
SD7282	1 to 2	03	20 Feb 07	MiniPurge Data Sheet

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Certificate Annexe

Certificate Number: Sira 01ATEX1295X

Equipment:

Purge Controllers
Sub-MiniPurge, MiniPurge, Super-MiniPurge, CERTIFICATION
Super-MiniPurge 1800/3500/7000/7000X

Applicant: EXPO Technologies Limited



Number	Sheet	Rev.	Date	Description
SD7537	1 to 3	01	20 Feb 07	Fault Evaluation
EP99-7-9	1 of 2	02	15 Mar 07	Outlet Valve Circuit N/O
EP99-7-9	2 of 2	01	15 Mar 07	Outlet Control Valve N/C
SD7531	1 of 1	02	09 Jul 07	Schematic – Type Z or Y leakage compensation
SD7532	1 of 1	01	15 Mar 07	Schematic Type Z or Y Continuous Flow
EP99-2-4	1 of 1	02	15 Mar 07	Sequence Diagram – Type X Continuous Flow
EP99-2-5	1 of 1	02	15 Mar 07	Schematic – Alarm only and Alarm Action Selector
EP99-2-6	1 of 1	02	15 Mar 07	Schematic – Door Switch Active Alarm and Alarm Cancel
SD7555	1 to 4	01	05 Jul 07	RLV Configurations
SD7556	1 of 2	01	09 Jul 07	Alternative Z&Y LC System
SD7556	2 of 2	01	09 Jul 07	Alternative Z&Y LC System

Issue 5

Number	Sheets	Rev.	Date (Sira stamp)	Description
SD7281	1 to 2	7	12 Feb 09	Minipurge ATEX/IECEx Certification Label
SD7448	1 of 1	05	12 Feb 09	Minipurge Low temperature Housing

Issue 6

Number	Sheets	Rev.	Date (Sira stamp)	Description
SD7281	1 to 2	8	23 Dec 10	Minipurge ATEX/IECEx Certification Label
SD7282	1 to 2	4	21 Dec 10	Minipurge Data Sheet
SD7913	1 of 1	2	21 Dec 10	Minipurge electronic timer
SD7914	1 of 1	2	21 Dec 10	Minipurge HP sensor

Issue 7

Number	Sheets	Rev.	Date (Sira stamp)	Description
SD7448	1 of 1	6	23 Nov 11	Minipurge Low Temperature Housing
SD7282	1 & 2	5	23 Nov 11	Minipurge Data Sheets
SD7281	1 to 3	9	23 Nov 11	Minipurge ATEX/IECEx Certification Label
SD7533	1 of 1	2	23 Nov 11	Minipurge Dust Protection Schematic

Issue 8

Number	Sheets	Rev.	Date (Sira stamp)	Title
SD7281	1 to 3	10	05 Oct 12	Minipurge Certification Label

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GB/SIR/QAR07.0012/02
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IECEx Certificate of Conformity

Certificate No.:

IECEX SIR 07.0027X

Date of Issue:

2012-11-27

Issue No.: 6

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Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The Purge Controllers are pneumatically operated devices, which are intended to provide a given flow rate of purging gas for a predetermined time to unspecified Ex p protected electrical equipment. The MiniPurge Control Units provide one of the following four methods of purge operation.

- * LC-Leakage compensation only after initial high purge
- * CF-Continuous flow (same flow rate during and after purging)
- * CF2-Two flow CF system with initial high purge rate only at one orifice
- * CFHP-Continuous (lower) flow after initial high purge

See Annexes for more information.

CONDITIONS OF CERTIFICATION: YES as shown below:

- 1 When using the AO, AS and DT options, the recommendations for the additional requirements of Ex p apparatus contained within IEC 60079-14 shall be applied.
- 2 The installer/user shall ensure that the MiniPurge Control Unit is installed in accordance with the equipment certificate that covers the combination of the pressurised enclosure(s) and MiniPurge Control Unit.
- 3 The values of the safety parameters shall be set in accordance with the equipment certificate that covers the combination of the pressurised enclosure(s) and MiniPurge Control Unit.
- 4 This MiniPurge Control Unit shall be incorporated into equipment and the appropriate Conformity Assessment Procedures applied to the combination. This certificate does not cover the combination.
- 5 The purge controller, low temperature version, shall be protected by a safety related system that ensures that it cannot be energised if the temperature of the air inlet or purge controller falls below -20°C. This system shall utilise the RTDs that are fitted to the purge controller to provide the appropriate level of system integrity (Note: These RTDs have not been assessed as a safety related device).



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Certificate No.:

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2012-11-27

Issue No.: 6

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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

Issue 1 – this issue introduced the following changes:	
1	To permit the inclusion of the following codings for the Low Temperature Minipurge Endosure Ex [p] dem IIC T4 Ex pD II 21 T135°C (Ta -50°C to +55°C)
Issue 2 – this issue introduced the following changes:	
1	The introduction of the /ET version, an alternative to the pneumatic or mechanical timer system, this incorporates an Electronic Timer Module ETM-IS*,*** in the Mini Purge, the certification includes 'ia' marking when the ETM is fitted.
2	The dust marking was changed to be consistent with the marking for gases and vapours.
3	The introduction of a high pressure sensor for the LC option.
Issue 3 – this issue introduced the following changes:	
1	The marking section was amended to add information that had been omitted in error.
Issue 4 – this issue introduced the following changes:	
1	Following appropriate re-assessment to demonstrate compliance with the requirements of the latest IEC 60079 series of standards, the documents previously listed IEC 60079-0: 2004 Ed 4.0, and IEC 60079-2: 2001 Ed 4 were replaced by those previously listed IEC 61241-0: 2004 Ed 1 was removed as this is incorporated into the current version of IEC 60079-0, the markings were updated accordingly and a new condition of certification was added
Issue 5 – this issue introduced the following changes:	
1	The recognition of the Applicant's address change from Summer Road, Thames Ditton, Surrey KT7 0RH to Unit 2, The Summit, Hanworth Road, Sunbury on Thames, Surrey TW16 5DB.
Issue 6 – this issue introduced the following changes:	
1	Issued to allow GB/SIR/ExTR12.0251/00 to be replaced by GB/SIR/ExTR12.0251/01

Model Number Designation for ATEX approved MiniPurge systems	
a	Size or Capacity
1	Sub-MiniPurge
2	MiniPurge
3	Super-MiniPurge
4	Super-MiniPurge 1800
5	Super-MiniPurge 3500
6	Super-MiniPurge 7000
7	Super-MiniPurge xxxx
b	Pressurization Type
X	X Pressurization
Y	Y Pressurization
Z	Z Pressurization
cc	Action after initial purging
LC	Leakage Compensation only after initial High Purge
CF	Continuous Flow (same flow rate during and after purging)
CF2	Two Flow CF system with initial High Purge rate but only one orifice
CFHP	Continuous (lower) Flow after initial High Purge
DP	Dust Protection (pressurization only)
mm	Material of the Control Unit Enclosure
al	Aluminium alloy
cs	Mild steel, painted
ss	Stainless steel
bp	Back Plate only
co	Chassis only
pm	Panel mounting
nm	Non-Metallic
	Option codes (Added only if used)
AA	Active Alarm output fitted.
AC	Alarm cancellation circuit.
AO	"Alarm Only" Action on Pressure or Flow Failure.
AS	Alarm "Action on Pressure or Flow failure", Selector valve.
CS	Containment System Monitor.
DS	Door switch Power Interlock fitted.
DT	Delayed Trip after Pressure or Flow failure.
DXXX	Special design for specific flow rates
ET	Electronic Timer
FM	Flow Meter(s) fitted.
HP	System LC or CF with High Pressure Sensor
IS	Internal Switches suitable for Ex i circuits.
MO	Manual Override fitted.
MT	Mechanical Timer.
OA	On/Off switch controlling Protective gas and logic supply.
OB	On/Off switch controlling logic supply only.
OC	On/Off switch controlling Protective gas supply only.
OS	Outlet (Orifice) Selector valve.
OV	Outlet valve, pneumatically operated.
PA	"Ex" switch(es) built-in, with/without "Ex" junction box.
PC	PE Pressure Control Leakage Compensation Valve (CLAPS System.)
PO	Pneumatic Output signals for Power and Alarm control.
SP	Secondary Pressurization supply options.
SS	Separate Supply for Protective gas and Logic air.
WW	Twin (or more) outputs for two or more separate pressurized enclosures purged in parallel.

Model Number:

1 X LC CS DS SS AA MO FM OA TW

Key:

a b cc mm Example option codes

Sira Certification Service
Rake Lane, Eccleston, Chester, CH4 9JN, England

Tel: +44 (0) 1244 670900
Fax: +44 (0) 1244 681330
Email: info@siracertification.com
Web: www.siracertification.com

The outlet of each relief valve is fitted with a spark arrestor, of which there are four optional types:

- Metal foam
- Tortuous path with at least 4 x 90° or 2 x 180° bends
- Multi-layer stainless steel mesh
- Knitted mesh

Outlet Orifice - Three types of orifice are used:

- Threaded Orifices e.g. 1/4" NPT or 2" BSP with a built in spark arrester. These are selected to maintain a desired back pressure within the Ex p protected apparatus when used with the Continuous Flow options. The designation of each outlet orifice indicates the nominal inlet diameter. The designations are as follows: SA3, SA6, SA9, SA12, SA19, SA25, SA32, SA38 and SA50.
- Plain holes in the Relief Valve disk, sized according to the flow rate required.
- Removable orifice type SA1**.

High Pressure Sensor for CF Systems (HP code) - If the pressure in the pressurized enclosure rises above the setting of the High Pressure sensor, the controller resets cutting the power to the enclosure. On detecting the overpressure an optional facility is available for the generation of an alarm or indicator. On systems with a High Pressure sensor, the relief valve may be omitted.

High Pressure Sensor for LC Systems (HP code) - If the pressure in the pressurized enclosure rises above the setting of the High Pressure sensor, the purge gas flow is isolated from the pressurised enclosure. The valve isolates the purge gas flow from the pressurised enclosure. On detecting the overpressure, an optional facility is available for the generation of an alarm or indicator. On systems with a High Pressure sensor, the relief valve may be omitted.

Pneumatically Operated Outlet Valve - The pneumatically operated outlet valve is used to positively open or close the outlet of the purged enclosure by means of a spring return pneumatic cylinder. Systems fitted with the pneumatically operated Outlet Valve will carry the option OV.

Conditions of Manufacture

- 1 The switches incorporated in the PA option shall be suitably certified for Zone 1.
- 2 The following routine tests shall be performed by the manufacturer:

Verification of Minimum Overpressure Cut Off

An overpressure loss shall be simulated whilst the MiniPurge Control Unit is cycling, it shall be verified that the controller provides the appropriate output and resets.

Verification of Purge Failure Protection

A purge failure shall be simulated whilst the MiniPurge Control Unit is cycling, it shall be verified that the controller provides the appropriate output and resets.

Verification of Air Supply Failure Protection

An air supply failure shall be simulated whilst the MiniPurge Control Unit is cycling, it shall be verified that the controller provides the appropriate output and resets.

Verification of Purging Overpressure protection

Where the HP is specified an overpressure shall be simulated whilst the MiniPurge Control Unit is cycling, it shall be verified that the controller provides the appropriate output and resets.

- The products covered by this certificate incorporate previously certified devices, it is therefore the responsibility of the manufacturer to continually monitor the status of the certification associated with these devices, and the manufacturer shall inform Sira of any modifications of the devices that may impinge upon the explosion safety design of the products.
- The certification code that is appropriate to Purge Controllers low temperature version shall appear in the product marking applied to outer stainless steel enclosure.
- The Purge Controllers: Sub-MiniPurge, MiniPurge, Super-MiniPurge, Super-MiniPurge 1800/3500/7000/7000X shall not be marked as suitable for use in explosive dust atmospheres when a non-metallic or painted housing is used.



Certificado de Conformidade

Certificate of Compliance • Certificado de Conformidade

Certificado nº: TÜV 12.1462 X

Certificate #/Certificado nº

Válido até: 28/09/2015

Validity Term/Fecha de Vencimiento

Produto:

Product/Producto

Tipo / Modelo:
Type - Model/Tipo - Modelo

Solicitante:

Applicant/Solicitante

Fabricante:

Manufacturer/Fabricante

Normas Técnicas:

Standards/Normas

Laboratório de Ensaio:

Testing Laboratory/Laboratorio de Ensayo

Nº do Relatório de Ensaio:

Test Report Number/Nº del Informe de Ensayo

Observações:

Notes/Observaciones

Portaria:

Governmental Regulation/Regulación Oficial

Data de Emissão:

Date of Issue/Fecha de Otorgamiento

João Gustavo L. Junqueira

Gerente Técnico

Technical Manager / Gerente Técnico

Igor Moreno

Gerente de Certificação

Certification Manager / Gerente de Certificación

CONTROLADOR DE PURGA

MiniPurge

EXPO TECHNOLOGIES LTD.

Summer Road, Thames Ditton
Surrey KT7 0RH - United Kingdom

EXPO TECHNOLOGIES LTD.

Summer Road, Thames Ditton
Surrey KT7 0RH - United Kingdom

ABNT NBR IEC 60079-0:2008, ABNT NBR IEC 60079-2:2009,

ABNT NBR IEC 60079-11:2009 e ABNT NBR IEC 60529:2009.

SIRA Certification Service.

GB/SIR/EXTR07.0046/00 de 08/09/2007;

GB/SIR/EXTR09.0021/00 de 12/02/2009;

GB/SIR/EXTR11.0003/00 de 12/2010;

GB/SIR/EXTR11.0304/00 de 11/2011.

Certificado emitido com base no Modelo com Avaliação do Sistema de Gestão da Qualidade do Fabricante e Ensaio no Produto, conforme cláusula 6.1 do Regulamento de Avaliação da Conformidade, anexo à Portaria nº 179 do INMETRO, publicada em 18 de maio de 2010.

INMETRO nº 179 de 18/05/2010.

São Paulo, 28 de Setembro de 2012.



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Especificações:

Os controladores de purga modelo MiniPurge são dispositivos pneumáticos, destinados a fornecer uma determinada vazão de gás de purga por um tempo predeterminado para equipamentos elétricos com o tipo de proteção Ex p. Esse controlador de purga possui também uma unidade de interface onde estão instalados os contatos para a verificação do status da pressurização (Certificado de Conformidade AEX-13099).

As unidades de controle MiniPurge fornecem um dos seguintes quatro métodos de operação de purga.

LC - Compensação de perda após purga inicial elevada;

CF - Fluxo contínuo (mesma vazão durante e após a purga);

CF2 - Dois sistemas de fluxo CF com uma taxa de purga inicial de alta apenas em um orifício;

CFHP - Fluxo (mais baixo) contínuo após purga inicial elevada.

Válvula de Alívio

O controlador de purga MiniPurge é fornecido com uma válvula de alívio de sobrepressão, para ser instalada no equipamento Ex p para evitar uma sobrepressão interna acima da sobrepressão máxima do equipamento. Os 14 modelos existentes de válvula estão relacionados às suas dimensões nominais em mm, de RLV3 a RLV200.

A saída de cada válvula de alívio é equipada com uma barreira contra centelhas, que existem em quatro tipos opcionais como segue: Espuma metálica formando caminhos tortuosos com curvas de pelo menos 4 x 90° ou 2 x 180°, malha de aço inoxidável com multi-camadas e malha tricotada.

Orifício de saída

Três tipos de orifício são utilizados:

- Orifícios roscados (ex.: 1/4" NPT ou 2" BSP) com uma uma barreira contra centelhas embutida. Estes são selecionados para manter a pressão desejada dentro do equipamento Ex p quando utilizado com as opções de fluxo contínuo. A designação de cada orifício de saída indica o diâmetro nominal de entrada. As denominações são as seguintes: SA3, SA6, SA9, SA12, SA19, SA25, SA32, SA38 e SA50.

- Furos planos no disco da válvula de alívio, dimensionados de acordo com a vazão necessária.

- Orifício substituível tipo SAU **.

Regra de formação do modelo:

Modelo: a b cc / mm / código de opções

a = Tamanho ou Capacidade

1 = Sub-MiniPurge

2 = MiniPurge

3 = Super-MiniPurge

4 = Super-MiniPurge 1800

5 = Super-MiniPurge 3500

6 = Super-MiniPurge 7000

7 = Super-MiniPurge xxxx

b = Tipo de pressurização

X = Pressurização X

Y = Pressurização Y

Z = Pressurização Z



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cc = Ação após purga inicial
LC = Compensação de perda após purga inicial elevada
CF = Fluxo contínuo (mesma vazão durante e após a purga).
CF2 = Dois sistema de fluxo CF com uma taxa de purga inicial de alta apenas em um orifício.
CFHP = Fluxo (mais baixo) contínuo após purga inicial elevada
DP = Proteção contra poeira (somente pressurização)

mm = Material do invólucro da unidade de controle
al = Liga de alumínio

cs = Aço carbono, pintado

ss = Aço inoxidável

bp = Somente placa traseira

co = Somente chassis

pm = Montagem em painel

nm = Não metálico

Código de opções (Adicionado somente se utilizado)

AA = Equipado com saída de alarme ativa	AC = Circuito de cancelamento de alarme
AO = "Somente Alarme" em falha de fluxo ou pressão	AS = "Alarme" falha de fluxo ou pressão, válvula seletora
CS = Monitor do sistema de contenção	DS = Equipado com sensor de intertravamento para abertura da porta
DT = Temporizador de desligamento (Delayed Trip) depois de uma falha de pressão ou fluxo	DXXX = Projeto especial para as taxas de fluxo específico
ET = Temporizador eletrônico	FM = Equipado com medidor(es) de vazão
HP = Fluxo contínuo com sensor de pressão alta	IS = Chaves internas adequadas para circuitos Ex i
MO = Equipado com chave manual de by-pass	MT = Purga mecânica ou temporizador de atraso
OA = Chave liga/desliga controlando o gás de proteção e suprimento de ar da unidade de controle	OB = Chave liga/desliga para controlar o suprimento de ar da unidade de controle
OC = Chave liga/desliga controlando somente o fornecimento de gás de proteção	OS = Saída (Orifício), válvula seletora
OV = Válvula de saída, acionamento pneumático	PA = Switch(es) "Ex" embutido(s), com/sem caixa de ligação "Ex"
PC = Válvula de controle para compensação de perda (CLAPS System.)	PO = Sinais de saída pneumáticos para controle de alimentação e alarme
SP = Pressurização secundária, opções de alimentação	SS = Alimentação separada para o sistema de controle lógico e para gás de proteção do invólucro
TW = Duas (ou mais) saídas para dois ou mais invólucros pressurizados purgados em paralelo	-

Análise e ensaios realizados:

As análises e os ensaios realizados encontram-se no relatório técnico nº AEX-13098.

Documentação descritiva do produto:

- Relatório de ensaios Sira nº GB/SIR/EXTR07.0046/00 de 06/09/2007;
- Relatório de ensaios Sira nº GB/SIR/EXTR09.0021/00 de 12/02/2009;
- Relatório de ensaios Sira nº GB/SIR/EXTR11.0003/00 de 12/2010;
- Relatório de ensaios Sira nº GB/SIR/EXTR11.0304/00 de 11/2011.



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Documento	Pág.	Descrição	Rev.	Data
EP99-3-1	1	Minipurge Control Unit - GA	2	15/03/2007
EP99-2-1	1	Schematic - Type "X" Leakage Compensation	3	09/07/2007
EP99-2-3	1	Sequence Diagram - Minipurge Type X LC systems	2	15/03/2007
EP99-2-2	1	Minipurge Type "X" Continuous Flow	2	15/03/2007
EP99-2-4	1	Sequence Diagram - Minipurge Type X CF systems	2	15/03/2007
EP99-2-5	1	Alarm Only "AO" and Alarm Action Selector "AS"	2	15/03/2007
EP99-2-6	1	Door switch "DS", Active Alarm "AA" and Alarm cancel "AC"	2	15/03/2007
EP99-2-7	1	Separate Supply "SS" and Mech Timer "MT"	2	15/03/2007
EP99-2-8	1	Delay before trip "DT" and On/Off controls	2	15/03/2007
EP99-2-9	1	Twin Output "TW" and Manual Override "MO"	2	15/03/2007
EP99-2-10	1	Pressure Control Leakage Compensation "PC"	3	15/03/2007
EP99-2-11	1	Internal Ex switches "IS"	3	15/03/2007
EP99-2-12	1	Options "CS" and "Sp"	2	15/03/2007
EP99-2-14	1	Minipurge CF2 and CFHP	2	15/03/2007
EP99-2-16	1	Outlet Selector Valve, Option "OS"	2	15/03/2007
EP99-2-17	1	Minipurge Continuous Flow with HP sensor	2	15/03/2007
EP99-7-9	1 de 2	Outlet Valve Circuit N/O	2	15/03/2007
EP99-7-9	2 de 2	Outlet Valve Circuit N/C	1	15/03/2007
SD7531	1	Minipurge type "Z" or "Y" Leakage Compensation	2	09/07/2007
SD7532	1	Minipurge type "Z" or "Y" Continuous Flow	1	15/03/2007
SD7533	1	Minipurge, Dust Protection schematic	2	14/11/2011
SD7555	4	RLV Configurations	1	05/07/2007
SD7535	1	Spark arrestor	1	15/03/2007
SD7536	1	Differential Flow Monitor	1	18/04/2007
SD7538	1	CF Outlet Orifice	1	27/03/2007
SD7500	1	Outlet Orifice Closure Device	1	25/04/2007
SD7537	3	Minipurge Fault Evaluation	1	20/02/2007
SD7556	2	Alternative Z&Y LC system	1	09/07/2007
SD7282	2	Minipurge data sheet	5	14/11/2011
SD7913	1	Minipurge electronic timer	2	17/12/2010
SD7914	1	Minipurge HP sensor	2	14/12/2010
SD7649	2	Minipurge TUV Certification Label	6	26/09/2012
SD7652	12	Minipurge Portuguese Handbook Extracts	4	25/09/2012



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Marcação:

O controlador de purga modelo MiniPurge foi aprovado nos ensaios e análise, nos termos das normas adotadas, devendo receber a marcação, levando-se em consideração o item observações.

Ex [px] IIC T6 Gb
Ex [py] IIC T6 Gb
Ex [p] IIIC T85 °C Db
Ex [pz Gc] IIC T6 Gb
Ex [p Dc] IIIC T85 °C Db
-20 °C ≤ T_a ≤ +55 °C

Versão com opção ET
Ex [px] Ia IIC T6 Gb
Ex [pb] Ia IIIC T95 °C Db
-20 °C ≤ T_a ≤ +55 °C

Observações:

1. O número do certificado é finalizado pela letra X para indicar as seguintes restrições no uso:
Quando o controlador de purga MiniPurge é incorporado a um equipamento, as implicações da operação dos indicadores e/ou sinais opcionais de alarme e a aplicação das etiquetas apropriadas de aviso e identificação devem ser incluídas na avaliação do equipamento.
O instalador/usuário deve garantir que o controlador de purga MiniPurge seja instalado de acordo com o certificado do equipamento que cobre a combinação do invólucro pressurizado com o controlador de purga MiniPurge.
Os valores dos parâmetros de segurança devem ser ajustados de acordo com o certificado do equipamento que cobre a combinação do invólucro pressurizado e do controlador de purga MiniPurge.
Ao utilizar as opções AO, AS e DT, as recomendações para os requisitos adicionais do equipamento Ex p contido na ABNT NBR IEC 60079-14 devem ser aplicadas.
2. Este Certificado de Conformidade é válido para os produtos de modelo e tipo idêntico ao protótipo ensaiado. Qualquer modificação de projeto ou utilização de componentes e materiais diferentes daqueles descritos na documentação deste processo, sem autorização prévia da TÜV Rheinland, invalidará o certificado.
3. Os produtos devem ostentar, na sua superfície externa e em local visível, a Marca de Conformidade e as características técnicas da mesma de acordo com as especificações da ABNT NBR IEC 60079-0 / ABNT NBR IEC 60079-2 / ABNT NBR IEC 60079-11 e Regulamento de Avaliação da Conformidade, anexo à Portaria nº 179 do INMETRO, publicada em 18 de maio de 2010. Esta marcação deve ser legível e durável, levando-se em conta possível corrosão química.



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4. As atividades de instalação, inspeção, manutenção, reparo, revisão e recuperação dos produtos são de responsabilidade do usuário e devem ser executadas de acordo com os requisitos das normas técnicas vigentes e com as recomendações do fabricante.

Histórico:

28/09/2010 – Certificação inicial – Efetivação;
25/04/2012 – Adequação do certificado AEX-13098-X à Portaria nº 179.

MiniPurge Interface Unit MIU/e User Instruction Manual



Manufacturer:
Model Type & Rating:

Expo Technologies Ltd, Unit 2 The Summit, Sunbury on Thames. UK.

MIU/e1	MIU/e2	MIU/e1/MO
400V / 7A	400V / 7A	400 V / 2A

Certificates:

Hazardous Area Marking
Code:

IECEX ITS10.0003X	ITS 10ATEX37092X	TUV 12.1463
Ex e IIC T5 Gb Ex tb IIIC T100°C Db IP66 Tamb -20°C to +55°C	Ex II 2 G D Ex e IIC T5 Gb Ex tb IIIC T100°C Db IP66 Tamb -20°C to +55°C	Ex e IIC T5 Gb Ex tb IIIC T100° Db IP66 Tamb -20°C to +55°C
Ex e IIC T4 Gb Tamb -20°C to +60°C	Ex II 2 G D Ex e IIC T4 Gb Tamb -20°C to +60°C	

APPLICATION SUITABILITY

The MiniPurge Interface Units – MIU/e are certified for use in Hazardous Areas where the Hazardous Area is non-mining (i.e. above ground) and the hazard is caused by flammable gasses or vapours. The systems may be used in ATEX/IECEX Gas Zones 1 & 2, Gas Groups IIA, IIB & IIC and in Dust Zones 21 & 22, Dust Groups IIIA, IIIB & IIIC.

The following materials are used in the construction of MIU/e: Stainless Steel, Steel, Brass, Copper, Polyamide, Silicone. If substances that will adversely affect any of these materials are present in the surrounding environment, please consult Expo Technologies for further guidance. This equipment is designed for use under normal industrial conditions of ambient temperature, humidity and vibration. Please consult Expo Technologies before installing this equipment in conditions that may cause stresses beyond normal industrial conditions.

WARNING - Only install, commission, inspect, maintain or fault find when safe to do so.

INSTALLATION

The MIU/e shall be installed in accordance with relevant standards, such as EN 60079-14 and any local codes of practice that are in force. Cable glands or other cable entry devices shall be appropriately certified and suitable for the cable and the conditions of use and be installed in accordance with the manufacturer's instructions.

The MIU/e shall be connected to the Purge and Pressurization system in accordance with the instructions given in the handbook supplied with the pressurization system.

The external earth connection of the MIU/e shall be connected to earth using minimum 4mm² conductor.

TERMINALS

MIU/e may be fitted with a combination of:

WDU2.5 terminals certified to KEMA 98ATEX1683U & IECEX ULD05.0008U

SAK2.5 terminals certified to KEMA 98ATEX1798U & IECEX KEM06.0014U

WPE2.5 Earth terminals certified to KEMA 98ATEX1683U & IECEX ULD05.0008U

For all type of terminals:

Tightening torque range: 0.4 to 0.8 Nm (WDU & WPE) & 0.4 to 0.6 Nm (SAK)

Conductor cross section maximum 2.5 mm², minimum 1.5 mm²

Type of connection is screwed - Solid copper conductors to be used.

Stripping length shall be 10 mm.

Only one conductor is allowed at each side of a terminal. Multiple conductors shall be crimped together before screwed into the terminal.

Maximum number of terminals:

For Model MIU/e1 – Up to 18 current carrying terminals

For Model MIU/e2 – Up to 33 current carrying terminals

For Model MIU/e1/MO – Up to 13 current carrying terminals

COMMISSIONING

The installation of the cable glands, electrical and earth connections shall be inspected for correct installation before the unit is put into service. The lid shall be correctly fitted.

MAINTENANCE

The condition of enclosure and associated cable glands shall be inspected for damage every six months. The terminals shall be inspected for tightness and gaskets inspected for damage.

FAULT FINDING

When wiring or signal fault occurs, check each terminated wire, terminals for tightness and gaskets for damage.

External faults such as broken switches within the Control Unit may also require investigation.

1. **EC-TYPE EXAMINATION CERTIFICATE**2. **Equipment or Protective System Intended for use in Potentially Explosive Atmospheres Directive 94/9/EC**3. **EC-Type Examination Certificate Number:** ITS10ATEX37092X Issue 34. **Equipment or Protective System:** MiniPurge Interface Units5. **Manufacturer:** EXPO TECHNOLOGIES LIMITED6. **Address:** Unit 2, The Summit, Hanworth Road, Sunbury on Thames, Surrey, TW16 5DB

7. This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8. Intertek Testing and Certification Limited, notified body number 0359 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

9. The examination and test results are recorded in confidential Intertek Report Ref 10046284 dated September 2010 and Intertek Report Ref G101279915 dated February 2014.

10. Compliance with the Essential Health and Safety Requirements has been assured by compliance with standards EN 60079-0:2012, EN 60079-7:2007 and EN 60079-31:2009 except in respect of those requirements referred to at item 16 of the Schedule.

11. If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

12. This EC Type examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

The marking of the equipment or protective system shall include the following:-

MIU/e1 and MIU/e2



II 2 G D Ex e IIC T5 Gb
Ex tb IIIC T100°C Db IP66
-20°C ≤Ta ≤+55°C
Ex e IIC T4 Gb
-20°C ≤Ta ≤+60°C

MIU/e1/MO



II 2 G D Ex e IIC T5 Gb
Ex tb IIIC T100°C Db IP66
-20°C ≤Ta ≤+55°C

Intertek Testing & Certification Limited
Intertek House, Cleeve Road, Leatherhead, Surrey, KT22 7SB
Tel: +44 (0)1372 370900 Fax: +44 (0)1372 370977
www.intertek.com

Registered No 3272281 Registered Office: Academy Place, 1-9 Brook Street, Brentwood, Essex, CM14 5NQ.
This certificate may only be reproduced in its entirety and without any change, schedule included and is subject to Intertek Testing and Certification's Conditions for Granting Certification.

Sheet 1 of 3

SCHEDULE

EC-TYPE EXAMINATION CERTIFICATE NUMBER ITS10ATEX37092X Issue 3

13. **Description of Equipment or Protective System**

The Minipurge Interface Units are part of a series of enclosures that are used as junction boxes. The construction of the boxes has been assessed under component certificate IECEX ITS 08.0043U. A permitted terminal box is specified on drawing SD7823. The current rating and maximum voltage for each Three types of boxes have been covered by this report:

MIU/e1 - 7A, 400V, assembly drawing SD7851
MIU/e2 - 7A, 400V, assembly drawing SD7850
MIU/e1/MO - 2A, 400V, assembly drawing SD7861

14. **Report Number**

Intertek Report Ref 10046284 dated September 2010 and Intertek Report Ref G101279915 dated February 2014.

15. **Conditions of Certification**

(a). Special Conditions for safe use

- Cable glands, breathers, drains and plugs shall be appropriately ATEX certified types, suitable for the cable and conditions for use and installed in accordance with their manufacturer instructions. They shall maintain the IP66 rating of the enclosure.

(b). Conditions of Manufacture

- None

16. **Essential Health and Safety Requirements (EHSR's)**

The relevant EHSR's have been identified and assessed in Intertek Report Ref 10046284 dated September 2010.

17. **Drawings and Documents**

Title	Drawing No.:	Rev. Level:	Date:
Minipurge Interface Unit	SD7850	1	02/08/2010
Minipurge Interface Unit	SD7851	1	02/08/2010
MIU with Manual Override	SD7861	1	02/08/2010
MIU/e Permitted Contents	SD7823	1	19/08/2010
MIU IECEX & ATEX Certificate Label	SD7824	1	18/08/2010
MIU User Instructions	SD7844	1	18/08/2010

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Sheet 2 of 3

SCHEDULE

EC-TYPE EXAMINATION CERTIFICATE NUMBER ITS10ATEX37092X Issue 3

Revisions

Original Certificate Issued September 8, 2010

Certificate Issue 2 issued May 7, 2013

To permit the following Changes:-

Change of Manufacture address

Certificate Issue 3 issued February 6, 2014

To permit the following Changes:-

1. ATEX updates to existing product as per previous certificate ITS10ATEX37092X using latest applicable standards EN 60079-0: 2012, EN 60079-7:2007 and EN 60079-31:2009.
2. To include ambient temperature range -20°C ≤Ta ≤+60°C for MiniPurge MIU/e1 and MIU/e2 with temperature class dropped from T5 to T4.
3. Current rating for MIU/e1/IMO dropped down to 2A from 6A.
4. Changes to appropriate documents to reflect the above changes.

Title	Drawing No.:	Rev. Level:	Date:
MIU IECEX & ATEX Certificate Label (2 Sheets)	SD7624	3	06/02/14
MIU User Instructions (2 Sheets)	SD7644	2	06/02/14
MINIPURGE INTERFACE UNIT	SD7850	2	10/12/13
MINIPURGE INTERFACE UNIT	SD7851	2	10/12/13
MIU WITH MANUAL OVERRIDE	SD7861	2	10/12/13
MIU/e Permitted Contents	SD7623	1	02/08/10

This Certificate is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Certificate. Only the Client is authorized to permit copying or distribution of this Certificate and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek.

Intertek Testing & Certification Limited
Intertek House, Cleeve Road, Leatherhead, Surrey, KT22 7SB
Tel: +44 (0)1372 370900 Fax: +44 (0)1372 370977
www.intertek.com

Registered No 3272281 Registered Office: Academy Place, 1-9 Brook Street, Brentwood, Essex, CM14 5NQ.

This Certificate is the property of Intertek Testing and Certification Ltd and is subject to Intertek Testing and Certification's Conditions for Granting Certification.

Sheet 3 of 3

IECEx Certificate of Conformity



INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate history:
Issue No. 2 (2014-2-19)
Issue No. 1 (2013-5-10)
Issue No. 0 (2010-8-26)

Certificate No.: IECEx ITS 10.0003X Issue No.: 2

Status: Current

Date of Issue: 2014-02-19 Page 1 of 4

Applicant: **Expo Technologies Ltd**
Unit 2, The Summit
Hanworth Road,
Sunbury on Thames,
Surrey, TW16 5DB
United Kingdom

Electrical Apparatus:
Optional accessory: **MiniPurge Interface Unit**

Type of Protection: **Increased Safety**

Marking: **MIU/e1 and MIU/e2**
Ex e IIC T5 Gb
Ex tb IIC T100°C Db IP66
-20°C ≤Ta ≤+55°C
Ex e IIC T4 Gb
-20°C ≤Ta ≤+60°C
MIU/e1/MO
Ex e IIC T5 Gb
Ex tb IIC T100°C Db IP66
-20°C ≤Ta ≤+55°C

Approved for issue on behalf of the IECEx
Certification Body: **A T Austin**

Position: **Certification Officer**

Signature: 
(for printed version)

Date: **2014-02-19**

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:
Intertek Testing & Certification Limited
ITS House, Cleeve Road,
Leatherhead,
Surrey, KT22 7SB
United Kingdom

Intertek



IECEx Certificate of Conformity

Certificate No.: IECEx ITS 10.0003X

Date of Issue: **2014-02-19** Issue No.: 2
Page 2 of 4

Manufacturer: **Expo Technologies Ltd**
Unit 2, The Summit
Hanworth Road,
Sunbury on Thames,
Surrey, TW16 5DB
United Kingdom

Additional Manufacturing location
(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2011 Explosive atmospheres - Part 0: General requirements
Edition: 6.0
IEC 60079-31 : 2008 Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure 't'
Edition: 1
IEC 60079-7 : 2006-07 Explosive atmospheres - Part 7: Equipment protection by increased safety 'e'
Edition: 4

This Certificate does not indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:
GB/ITS/EXTR10.0029/01

Quality Assessment Report:
GB/SIR/QAR07.0012/05



IECEx Certificate of Conformity



IECEx Certificate of Conformity

Certificate No.:

IECEX ITS 10.0003X

Date of Issue:

2014-02-19

Issue No.: 2

Page 3 of 4

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The MiniPurge Interface Units are part of a series of enclosures used as junction boxes. The construction of the boxes is as per component certificate IECEX ITS 08.0043U. The content of the terminal boxes is specified on drawing SD7623. The current rating is specified on the rating label.

MiniPurge Interface Units include three terminal boxes models:

MIU/e1

MIU/e2

MIU/e1/MO

The terminal boxes are rated with maximum voltage of 400V.

Maximum number of current carrying terminals inside terminal box:

MIU/e1 is 18

MIU/e2 is 33

MIU/e1/MO is 13.

Maximum current rating for terminal box (per terminal):

MIU/e1 is 7A

MIU/e2 is 7A

MIU/e1/MO is 2A.

CONDITIONS OF CERTIFICATION: YES as shown below:

Cable glands, breathers, drains and plugs shall be appropriately IECEx certified types, suitable for the cable and conditions for use and installed in accordance with their manufacturer instructions. They shall maintain the IP66 rating of the enclosure.

Certificate No.:

IECEX ITS 10.0003X

Date of Issue:

2014-02-19

Issue No.: 2

Page 4 of 4

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

Certificate Issue no. 1:

Change of manufacturer's address

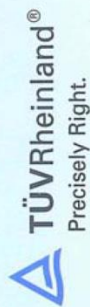
Change of QAR number

Certificate Issue No. 2: under IECEX Report No. GB/ITS/EXTR10.0029/01, Intertek ref Project No. G101279915 IECEX updates to existing product as per previous certificate IECEX ITS 10.0003X using latest applicable standards IEC 60079-0: 2011, IEC 60079-7:2007 and IEC 60079-31:2008.

To include ambient temperature range -20°C ≤Ta ≤+60°C for MiniPurge MIU/e1 and MIU/e2 with temperature class dropped from T5 to T4.

Current rating for MIU/e1/MO dropped down to 2A from 6A.

Changes to appropriate documents to reflect the above changes.



Certificado de Conformidade

Certificate of Compliance • Certificado de Conformidad

Certificado nº: TÜV 12.1463

Certificate #/Certificado nº:

Válido até: 28/09/2015

Validity term/fecha de vencimiento

Marcação:

As unidades de interface MiniPurge modelo MIU/e foram aprovadas nos ensaios e análise, nos termos das normas adotadas, devendo receber a marcação, levando-se em consideração o item observações.

Ex e IIC T5 Gb
Ex tb IIIC T100 °C Db
IP66
-20 °C ≤ T_a ≤ +55 °C
U_i = (conforme modelo)
I_n = (conforme modelo)

Observações:

1. Este Certificado de Conformidade é válido para os produtos de modelo e tipo idêntico ao protótipo ensaiado. Qualquer modificação de projeto ou utilização de componentes e materiais diferentes daqueles descritos na documentação deste processo, sem autorização prévia da TÜV Rheinland, invalidará o certificado.
2. É de responsabilidade do fabricante assegurar que os produtos estejam de acordo com as especificações do protótipo ensaiado, através de inspeções visuais e dimensionais.
3. Os produtos devem ostentar, na sua superfície externa e em local visível, a Marca de Conformidade e as características técnicas da mesma de acordo com as especificações da ABNT NBR IEC 60079-0 / ABNT NBR IEC 60079-7 / IEC 60079-31 e Regulamento de Avaliação da Conformidade, anexo à Portaria nº 179 do INMETRO, publicada em 18 de maio de 2010. Esta marcação deve ser legível e durável, levando-se em conta possível corrosão química.
4. Os produtos devem ostentar, em lugar visível e de forma indelével, a seguinte advertência:
"ATENÇÃO – NÃO ABRA QUANDO ENERGIZADO"
5. Os prensa-cabos e os bujões para fechar as aberturas não utilizadas devem ser certificados e compatível com o grau de proteção da unidade de interface, adequados para as condições de uso e corretamente instalados.
6. As atividades de instalação, inspeção, manutenção, reparo, revisão e recuperação dos produtos são de responsabilidade do usuário e devem ser executadas de acordo com os requisitos das normas técnicas vigentes e com as recomendações do fabricante.

Histórico:

28/09/2010 – Certificação inicial – Efetivação;
25/04/2012 – Adequação do certificado AEX-13099 à Portaria nº 179.

TÜV Rheinland do Brasil Ltda. - Avenida Paulista, 302 - 4º andar - 01310-000 - São Paulo - SP - Brasil
CNPJ 01.950.467/0001-65 - Tel. 55 11 3638.5700 - Fax. 55 11 3638.5835 - www.tuvbrasil.com.br

3/3

FO-00-01



EC-TYPE EXAMINATION CERTIFICATE

- 1
- 2 Equipment or Protective systems intended for use in Potentially Explosive Atmospheres - Directive 94/9/EC
- 3 EC-Type Examination Certificate No: FM10ATEX0003X
- 4 Equipment or protective system: Electronic Timer Module ETM-IS**.*
- 5 Name of Applicant: Expo Technologies Ltd
- 6 Address of Applicant: Unit 2, The Summit
Sunbury Road
TW16 5DB
- 7 This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and documents therein referred to.
- 8 FM Approvals Ltd, notified body number 1725 in accordance with Article 9 of Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.
- 9 The examination and test results are recorded in confidential report number:
3036907EC dated 12th November 2010
- 10 Compliance with the Essential Health and Safety Requirements, with the exception of those identified in item 15 of the schedule to this certificate, has been assessed by compliance with the following documents:
EN60079-0:2006, EN 60079-11:2007, EN 61241-0:2006 and EN 61241-11:2006
- 11 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.
- 12 This EC-Type Examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.
- 13 The marking of the equipment or protective system shall include:



II 1 G Ex ia IIC T6
II 1 D Ex iaD 20 T95°C
Ta = -20°C to +60°C



Mick Gower
Certification Manager, FM Approvals Ltd.

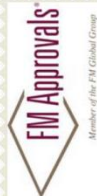
Issue Date: 08th December 2014

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

FM Approvals Ltd, 1 Windsor Dials, Windsor, Berkshire, UK, SL4 1RS
T: +44 (0) 1753 750 000 F: +44 (0) 1753 888 700 E-mail: alex@fmapprovals.com www.fmapprovals.com

F ATEX 020 (May/12)

Page 1 of 3



SCHEDULE

to EC-Type Examination Certificate No. FM10ATEX0003X

13 Description of Equipment or Protective System:

The ETM-IS is a powered electronic timer module. The Timer module is designed to be supplied from either a self contained battery pack or an IS certified Power Supply. The battery pack contains a non-rechargeable battery together with current limiting resistors. The timer settings are controlled by two BCD switches located on the main part of the timer. Connections from the timer to a solenoid valve and switch are also provided. The solenoid is supplied as part of the timer circuit. Four LED's are used to indicate the status of the timer circuit.

The Timer module and Solenoid Valve are designed to be installed within another enclosure.

Electronic Timer Module ETM-ISab-cde

a = sub module

1 = Timer Module powered by Expo Battery Pack

3 = Expo IS Battery Pack

4 = Expo IS remote Battery Pack

b = Mounting Style

1 = Plate mounted

2 = Panel mounted

c = LED connection

1 = LED's on Timer surface

2 = LED's on flying leads

d = Reference Value 1 to 9

e = Multiplying digit 1, 2, 3 or 4

de = Maximum Time

The input parameters for the power supply option are:

Ui = 11.1V Ii = 340 mA Pi = 2.613 W (non linear)

14 Specific Conditions of Use:

1. The Electronic Timer shall not be used where UV light or radiation may impinge the Electronic Timer System.
2. The Electronic Timer shall be installed within an enclosure which provides protection against impact.
3. The Enclosure shall be metallic providing a minimum IP20.
4. For light alloy enclosures, materials shall not contain, by mass, more than 7.5% in total of magnesium, titanium and zirconium. Where more than 10% in total of aluminium, magnesium, titanium and zirconium the user shall take special precautions to avoid ignition hazard due to impact or friction.

15 Essential Health and Safety Requirements:

The relevant EHSRs that have not been addressed by the standards listed in this certificate have been identified and assessed in the confidential report identified in item 8.

16 Test and Assessment Procedure and Conditions:

This EC-Type Examination Certificate is the result of testing of a sample of the product submitted, in accordance with the provisions of the relevant specific standard(s), and assessment of supporting documentation. It does not imply an assessment of the whole production.

Whilst this certificate may be used in support of a manufacturer's claim for CE Marking, FM Approvals Ltd accepts no responsibility for the compliance of the equipment against all applicable Directives in all applications.

This Certificate has been issued in accordance with FM Approvals Ltd's ATEX Certification Scheme.

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

FM Approvals Ltd, 1 Windsor Dials, Windsor, Berkshire, UK, SL4 1RS
T: +44 (0) 1753 750 000 F: +44 (0) 1753 888 700 E-mail: alex@fmapprovals.com www.fmapprovals.com

F ATEX 020 (Apr/14)

Page 2 of 3

SCHEDULE

to EC-Type Examination Certificate No. FM10ATEX0003X

17 Schedule Drawings

A list of the significant parts of the technical documentation is annexed to this certificate and a copy has been kept by the Notified Body.

18 Certificate History

Details of the supplements to this certificate are described below:

Date	Description
12 th November 2010	Original Issue.
30 th January 2013	Supplement 1: Report Reference: 3036906rev130109 dated 25 th January 2013. Description of the Change: 1. Change of address 2. Addition of IS power Supply option.
22 nd October 2013	Supplement 2: Report Reference: 3049400 dated 18 th October 2013 Description of the Change: Addition of ETM-IS31-001 battery pack module. (This corresponds to a =3. No change to the model code.)
08 th December 2014	Supplement 3: Report Reference: 3036907rev141016 dated 04 th December 2014 Description of the Change: Change to Valve part number and update of Valve certificate number (DEKRA 11ATEX0273X).

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

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F ATEX 020 (Apr14)

Page 3 of 3

Blueprint Report Expo Technologies, Ltd (1000002806)

Class No 3610

Original Project I.D. 3036907

Certificate I.D. FM10ATEX0003X

Drawing No.	Revision Level	Drawing Title	Last Report	Electronic Drawing
EPC-8000-114	1	Electronic Timer Timer Main PCB Layout	3049400	Yes (msw8)
EPC-8000-115	1	Electronic Timer Battery Main PCB Layout	3036907	Yes (pdf)
EPC-8000-116	1	Electronic Timer Battery Connector PCB Layout	3036907	Yes (pdf)
EPC-8000-117	1	Electronic Timer BCD PCB Layout	3049400	Yes (msw8)
EPC-8000-147	1	Electronic Timer Battery Pack PCB	3049400	Yes (zip_html)
EPC-8BMO-010	1	Timer Module Parts List	3036907	Yes (pdf)
EPC-8BMO-011	1	Battery pack Parts List	3049400	Yes (msw8)
EPC-8BMO-015	1	ETM-IS31-001 Battery Pack Parts List.doc	3049400	Yes (msw8)
SD7607	2	Electronic Timer Schematic	3049400	Yes (pdf)
SD7608	2	Electronic Timer - Design Document.doc	3049400	Yes (msw8)
SD7610	1	Timer Module Schematic	3049400	Yes (pdf)
SD7611	4	Electronic Timer ELECTRONIC TIMER - BLOCK DIAGRAM	3049400	Yes (pdf)
SD7616	3	Electronic Timer ATEx / IECEx CERTIFICATION LABEL	3049400	Yes (msw8)
SD7620	3	Electronic Timer - FM (USA, Canada) Label	3049400	Yes (msw8)
SD7621	4	Electronic Timer - Manual Extracts	3049400	Yes (msw8)
SD7622	1	Electronic Timer Model Number Designation	3049400	Yes (msw8)
SD7642	4	Electronic Timer Installation	3049400	Yes (pdf)
SD7835	1	Electronic Timer Assembly	3036907	Yes (pdf)
SD7841	3	Electronic Timer Interconnection	3049400	Yes (pdf)
SD7842	2	Electronic Timer - Encapsulation	3049400	Yes (msw8)
SD7848	3	Electronic Timer	3049400	Yes (pdf)
SD7898	1	Electronic Timer System Certification Label.doc	3049400	Yes (msw8)
SD8085	1	Electronic Timer Assembly.pdf	3049400	Yes (pdf)
Timer Module	1	Gerber files of Timer PWB	3036907	Yes (zip_html)



IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx FME 10.0001X
Status: Current
Date of Issue: 2014-12-08
Applicant: Expo Technologies Ltd
Unit 2, The Summit
Hanworth Road
Sunbury on Thames
TW16 5DB
United Kingdom
Issue No: 3
Page 1 of 5
Certificate history:
Issue No. 3 (2014-12-08)
Issue No. 2 (2013-10-22)
Issue No. 1 (2013-01-30)
Issue No. 0 (2010-11-05)

Electrical Apparatus: Electronic Timer Module

Optional accessory:

Type of Protection:

Intrinsic Safety

Marking:

Ex ia IIC T6 Ga
Ex iaD 20 T95°C
Ta= -20°C to +60°C

Approved for issue on behalf of the IECEx
Certification Body:

Mick Gower

Position:

Certification Manager

Signature:

(for printed version)

Date:

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

FM Approvals Ltd
1 Windsor Dials
SL4 1RS Windsor
United Kingdom



IECEx Certificate of Conformity

Certificate No: IECEx FME 10.0001X
Date of Issue: 2014-12-08
Issue No: 3
Page 2 of 5

Manufacturer: Expo Technologies Ltd
Unit 2, The Summit
Hanworth Road
Sunbury on Thames
TW16 5DB
United Kingdom

Additional Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2004

Edition: 4.0

Electrical apparatus for explosive gas atmospheres - Part 0: General requirements

IEC 60079-11 : 2008

Edition: 5

Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "I"

IEC 61241-0 : 2004

Edition: 1

Electrical apparatus for use in the presence of combustible dust - Part 0: General requirements

IEC 61241-11 : 2005

Edition: 1

Electrical apparatus for use in the presence of combustible dusts - Part 11: Protection by intrinsic safety 'ID'

This Certificate does not indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:

GB/FME/EXTR10.0006/00

GB/FME/EXTR10.0006/02

GB/FME/EXTR10.0006/03

GB/FME/EXTR10.0006/01

Quality Assessment Report:

GB/SIR/QAR07.0012/05



IECEx Certificate of Conformity

Certificate No:

IECEX FME 10.0001X

Issue No: 3

Date of Issue:

2014-12-08

Page 3 of 5

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The ETM-IS is battery powered electronic timer module. The Timer module is designed to be supplied from a self contained battery pack or separately certified AIS power supply. This battery pack contains a non-rechargeable battery together with current limiting resistors. The timer settings are controlled by two BCD switches located on the main part of the timer. Connections from the timer to a solenoid valve and switch are also provided. The solenoid is supplied as part of the timer circuit. Four LED's are used to indicate the status of the timer circuit. The Timer module and Solenoid Valve are designed to be installed within another enclosure.

CONDITIONS OF CERTIFICATION: YES as shown below:

1. The Electronic Timer shall not be used where UV light or radiation may impinge the Electronic Timer System.
2. The Electronic Timer shall be installed within an enclosure which provides protection against impact.
3. The Enclosure shall be metallic providing a minimum IP20.
4. For light alloy enclosures, materials shall not contain, by mass, more than 7.5% in total of magnesium, titanium and zirconium. Where more than 10% in total of aluminium, magnesium, titanium and zirconium the user shall take special precautions to avoid ignition hazard due to impact or friction.



IECEx Certificate of Conformity

Certificate No:

IECEX FME 10.0001X

Issue No: 3

Date of Issue:

2014-12-08

Page 4 of 5

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

Update to SMC Valve details.



IECEx Certificate of Conformity

Certificate No: IECEx FME 10.0001X Issue No: 3
Date of Issue: 2014-12-08 Page 5 of 5

Additional Information:

Electronic Timer Module ETM-ISab-cde

- a = sub module
- 1 = Timer Module powered by Expo Battery Pack
 - 2 = Timer module powered by IS power supply
 - 3 = Expo IS Battery Pack
 - 4 = Expo IS remote Battery Pack
- b = Mounting Style
- 1 = Plate mounted
 - 2 = Panel mounted
- c = LED connection
- 1 = LED's on Timer surface
 - 2 = LED's on flying leads
- de = Maximum Time
- d = Reference Value 1 to 9
 - e = Multiplying digit 1, 2, 3 or 4

IECEX Certificate of Conformity



INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx PTB 07.0045X
Status: Current
Date of issue: 2010-10-06
Applicant: BARTEC GmbH
Max-Eyth-Straße 16
97980 Bad Mergentheim
Germany

Certificate history:
Issue No. 1 (2010-10-6)
Issue No. 0 (2009-2-26)

Issue No.: 1

Page 1 of 4

Limit switch type 07-25.1.../.../...

Electrical Apparatus:
Optional accessory:

Type of Protection: Flameproof enclosure "d"

Marking: Ex d IIC Gb T6, T5 resp. Ex db IIC T6, T5

Approved for issue on behalf of the IECEx
Certification Body: Dr.-Ing. Martin Thedens

Position: Head of Section "Flameproof Enclosures"

Signature:
(for printed version)

Date:

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

Physikalisch-Technische Bundesanstalt (PTB)
Bundesallee 100
38116 Braunschweig
Germany



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IECEX Certificate of Conformity

Certificate No.: IECEx PTB 07.0045X

Date of issue: 2010-10-06

Issue No.: 1

Page 2 of 4

Manufacturer:

BARTEC GmbH
Max-Eyth-Straße 16
97980 Bad Mergentheim
Germany

Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identifying documents, was found to comply with the following standards:

IEC 60079-0 : 2007-10 Explosive atmospheres - Part 0: Equipment - General requirements

Edition: 5

IEC 60079-1 : 2007-04 Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"

Edition: 6

This Certificate does not indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:

DE/PTB/IEXTR10.0061/00

Quality Assessment Report:

DE/TUN/QAR06 0017/00

IECEX Certificate



of Conformity

Certificate No.: IECEx PTB 07.0045X
Date of Issue: 2010-10-06
Issue No.: 1
Page 3 of 4

Schedule

EQUIPMENT:
Equipment and systems covered by this certificate are as follows:
The limit switch, type 07-25.1-.../... is used as an auxiliary switch for signal and control circuits.
Encapsulated cables are used for connection.

CONDITIONS OF CERTIFICATION: YES as shown below:

The limit switch has to be mounted in such a way that it is protected against impact energies according to IEC 60079-0 clause 26.4.2.
The quality of the connecting cable shall satisfy the thermal and mechanical requirements within the functional range.

IECEx Certificate



of Conformity

Certificate No.: IECEx PTB 07.0045X
Date of Issue: 2010-10-06
Issue No.: 1
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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

- 1) The name of the manufacturer changed.
- 2) The standards were adapted.
- 3) The EPL marking was added.
- 4) Material name changed.
- 5) An additional casting resin material was added.
- 6) Additional cable tails were added.
- 7) Added design variation with lateral resp. dual connection cable.

(1) **EC-TYPE-EXAMINATION CERTIFICATE**

(Translation)

(2) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres - Directive 94/9/EC

(3) EC-type-examination Certificate Number:

PTB 00 ATEX 1093 X(4) Equipment: Limit switch, type 07-25.1-.../...
(5) Manufacturer: BARTEC Componenten und Systeme GmbH

(6) Address: D-97980 Bad Mergentheim

(7) This equipment and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) The Physikalisch-Technische Bundesanstalt, notified body No. 0102 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.

The examination and test results are recorded in the confidential report PTB Ex 00-10203.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
EN 50014:1997
EN 50018:1994

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-type-examination Certificate relates only to the design and construction of the specified equipment in accordance with Directive 94/9/EC. Further requirements of this Directive apply to the manufacture and supply of this equipment.

(12) The marking of the equipment shall include the following:

II 2 G EEx d IIC T6 or T5

Zertifizierungsstelle Explosionsschutz

Braunschweig, December 7, 2000

By 
 Dr.-Ing. U. Klausmeyer
 Regierungsdirektor

sheet 1/4

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

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SCHEDULE

{13}

(14) **EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 1093 X**(15) **Description of equipment**

The limit switch of type 07-25.1-.../... is used as an auxiliary switch for signal and control circuits. It will comprise one or two interrupting chambers and housings differing in their thermal resistance.

Connection is provided by means of an encapsulated connecting cable (open ended line).

Technical data

Rated insulation voltage U_i up to	500 V
Rated operating voltage U_o	Type 07-2511-.../... and type 07-2581-.../... 400 V 250 V
Rated current I_e max.	2 A 0.15 A
Related to utilization category	AC-15 DC-13
Rated operating voltage U_o	Type 07-2521-...1./... to 07-25221-...4./... 250 V 250 V
Rated current I_e max.	5 A 0.4 A
Related to utilization category	AC-15 DC-13
Rated operating voltage U_o	Type 07-2521-...6./... 250 V 250 V
Rated current I_e max.	2 A 0.4 A
Related to utilization category	AC-15 DC-13
Rated operating voltage U_o	Type 07-2521-...7./... 400 V 250 V
Rated current I_e max.	2 A 0.4 A
Related to utilization category	AC-15 DC-13
Rated operating voltage U_o	Type 07-2521-...8./... 500 V 250 V
Rated current I_e max.	2 A 0.4 A
Related to utilization category	AC-15 DC-13

* depending on connecting cable used

Provided the making and breaking capacity complies with the relevant conditions, rated values other than those specified above are accepted and will be defined by the manufacturer on the basis of the operating mode, utilization category, etc.

sheet 2/4

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

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Contacts depending on switching module 1 or 2 changeover contacts or
1 break and/or 1 make contact,
1 or 2 break contacts with positive opening operation

Temperature $\leq 60^{\circ}\text{C}$ 70 °C 75 °C 90 °C

Temperature class T6

Type 07-2511-...X0/... and 07-2581-...X0/...

Rated thermal current

7 A -- 3 A --

Type 07-2511-...XX/... and 07-2581-...XX/...

Rated thermal current

6 A -- 2 A --

Temperature class

T6 T5 T6 T5

Type 07-2521-...X0/...

Rated thermal current

5 A 8 A 3 A 3 A

Type 07-2521-...XX/...

Rated thermal current

5 A 6 A 2 A 2 A

The limit switches of type 07-2511- and 07-2581- are designed for a temperature resistance of -55°C to 100°C .

The limit switch of type 07-2521- is designed for a temperature resistance of -20°C to 115°C .

Nominal conductor cross section 2 to 8 x 1.5 mm²

(16) Test report PTB Ex 00-10203

(17) Special conditions for safe use

The limit switch shall be installed so as to provide for mechanical protection against impact energy in accordance with EN 50014 section 23.4.3.1.

The quality of the connecting cable shall satisfy the thermal and mechanical requirements within the functional range.

This EC type-examination certificate as well as any future supplements thereto shall at the same time be regarded as supplements to Certificate of Conformity PTB No. Ex-91.C.1083 X.

(18) Essential health and safety requirements

The tests and the favourable results these have produced reveal that the limit switch meets the requirements of directive 94/9/EC as well as those of the standards quoted on the cover sheet.

Zertifizierungsstelle Explosionsschutz

By order:


Dr. Jrg. U. Klausmeyer
Regierungsdirektor

Braunschweig, December 7, 2000

1st SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 1093 X

(Translation)

Equipment: Limit switch, type 07-25.1-.../....

Marking:  II 2 G EEx d IIC T6 resp. T5

Manufacturer: BARTEC GmbH

Address: Max-Eyth-Straße 16, 97980 Mergentheim, Germany

Description of supplements and modifications

The limit switch of type 07-25.1-.../.... is used as an auxiliary switch for signal and control circuits.

Description of changes:

- 1) The name of the manufacturer changed.
- 2) The standards were adapted.
- 3) The EPL marking was added.
- 4) Material name changed.
- 5) An additional casting resin material was added.
- 6) The name of a connection cable changed.
- 7) Additional connection cables were added.
- 8) Added design variation with lateral resp. dual connection cable.

Applied standards

EN 60079-0:2009, EN 60079-1:2007

Applying the above standards will change the marking, as follows:

 II 2 G Ex d IIC T6, T5 Gb resp. Ex db IIC T6, T5Assessment and test report: PTB Ex 10-10255

Zertifizierungssektor Explosionsschutz

On behalf of PTB:



EC-type-examination certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extraneous alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

Sheet 1/1

Erklärung der Konformität
Declaration of Conformity
Attestation de conformité

N° 01-2511-7C0001

BARTEC
BARTEC GmbH
Max-Eyth-Straße 16
97980 Bad Mergentheim
Germany

W/r

We

Nous

BARTEC GmbH,

erklären in alleiniger Verantwortung, dass das Produkt
declare under our sole responsibility that the product

attestons sous notre seule responsabilité que le produit

CE**Endschalter****Limit switch****Fin de course**

Typ 07-2511-.../....; 07-2581-.../....

auf das sich diese Erklärung bezieht den Anforderungen der folgenden Richtlinien (RL) entspricht

se référant à cette attestation correspond aux dispositions des directives (D) suivantes

ATEX-Richtlinie
94/9/EGATEX-Directive
94/9/ECATEX-Directive
94/9/CEEMV-Richtlinie
2004/108/EGEMC-Directive
2004/108/ECCEM-Directive
2004/108/CE.Maschinen-Richtlinie
2006/42/EGMachinery Directive
2006/42/ECDirective Européenne
de l'Equipment
2006/42/CE

und mit folgenden Normen oder normativen Dokumenten übereinstimmt

and is in conformity with the following standards or other normative documents

EN 60079-0:2006
EN 60079-1:2007EN 61241-0:2006
EN 61241-1:2004EN 60947-1:2007
EN 60947-5-1:2004**Kennzeichnung****Marking****Marquage**

II 2G Ex d IIC T6

II 2D Ex tD A21 IP66 T80°C

Verfahren der EG-Baumusterprüfung /
Benannte StelleProcédure of EC-Type Examination /
Notified BodyProcédure d'examen
CE de type /
Organisme Notifié

PTB 00 ATEX 1093 X

IBExU 01 ATEX 1007 X

0102 PTB, Bundesallee 100, 38116 Braunschweig, D
0637 IBExU, Fuchsmühlenweg 7, 09599 Freiberg, D**CE 0044**

Bad Mergentheim, den 27.04.2010

ppa. Ewald Warnuth

Geschäftsleitung / General Manager



符合性 EC-聲明

符合歐洲

指令

Expo Technologies Ltd
Unit 2, The Summit, Hanworth Road
Sunbury on Thames TW16 5DB, UK

本證書聲明：吹掃控制器類型「MiniPurge」係依照以下歐洲
指令和標準生產製造：

電磁兼容性指令 2004/108/EG

類型號碼中有 /PO 後綴的 MiniPurge 系統為非電氣系統，不在 EMC 指令的範圍內。

後綴為 /PA 或 /IS 的 MiniPurge 系統含有一個或以上的無電壓（「乾式」）觸點，可在第三方廠商指定的電路中作業。這些電路在正常運作下為「良性」，因此可以不貼 CE 標記。

配備電子計時器（選購件 /ET）之 MiniPurge 系統的設計符合 EMC 指令、EN 61000-6-4:2007 以及 EN 61000-6-2:2005 (Intertek Report EM10048000)。

低電壓指令 2006/95/EC

MiniPurge 系統的用途是在有潛在爆炸性氣體（危險場所）的環境下使用，因此不適用低電壓指令。

壓力設備指令 97/23/EC

根據本指令第 9 條規定，MiniPurge 系統的分類不高於第一類；此外，MiniPurge 系統的用途是在有潛在爆炸性氣體（危險場所）的環境下使用，因此不適用高壓設備指令。

ATEX 指令 94/9/EC

MiniPurge 系統的設計符合 ATEX 指令，並且遵守：

EN 60079-0 : 2012 + A11:2013 EN 60079-2 : 2007 EN 61241-4 : 2006

根據 EC Type-Examination Certificate SIRA 01ATEX1295X 的規定，MiniPurge 系統通過了 SIRA Certification Service、Rake Lane、Eccleston、Chester CH4 9JN 和英國的認證，並遵守：

IEC 60079-0 : 2011 EN 60079-2 : 2007 EN 61241-4 : 2006

根據型號而定，MiniPurge 系統已通過分類，應該標示為：

MiniPurge, X 和 Y 型號	類別 II 的 2G 和 2G 類	 II 2(2) GD
MiniPurge, Z 型號	類別 II 的 3G 和 3D 類	 II 2(3) GD

MiniPurge 系統是根據驗證機構第 0518 號 SIRA Certification Service 所發布，製程品質保證公告的 SIRA 99 ATEX M043 所製造。

John Paul de Beer
常務董事

日期：2014 年 2 月 9 日
機密評估檔案參考 SC004

S:\Files\QA\CERTS\C-OF-C\Minipurge CE SC004 Issue