

D808/ET MiniPurge® 手冊

ML 501



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以下指示：
請參閱標準的原則和定義。

(附註：這些指示僅適用於加壓系統。加壓馬達外殼製造商需為外殼提供適當指示。)

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1. D808 MiniPurge® - 一般系統規格

加壓馬達外罩

加壓馬達外罩	: 電動馬達外罩系列
分級	: 第一區類別 IIC
流量 (公升)	: 種類眾多, 由馬達製造商決定系統設定。
總吹掃流率	: 由客戶提供, 包含洩漏補償的流量。
預估吹掃時間	: 由吹掃測試結果決定。
外殼內容	: 電動馬達。
檢修蓋	: 1/4 轉動緊固件, 附鑰匙。
外殼壓力	: 正常: 10 mbarg。(可改變設定值) 這同時也是自動洩漏補償壓力感知器 (CLAPS 感知器) 的設定值。
外殼測試壓力	: 馬達測試壓力 = 釋放閥開啟壓力 x 1.5

MiniPurge® 控制單元 (CU) 資料

型號	: 7XLC / ss / ET / OV / PA / PC	特別設計號碼: D808SYS
選購件代碼	: ET = 電子吹掃計時器	
	: OV = 氣動作動出口閥	
	: PA = 整合式 Ex e 電源和警報出線盒	
	: PC = 加壓外殼 (馬達) 壓力控制自動洩漏補償閥 (CLAPS 系統)	
壓力失效時的動作	: 警報和跳脫 (隔離電源 / 馬達) 使用者可調整成「只有警報」	
系統類型	: ThinMani MiniPurge® 系統	
運作類型	: 使用「封閉迴路自動加壓系統」(CLAPS) 的自動洩漏補償	
吹掃流量	: 4.2 barg 入口壓力時, 最高可達 14,000 NI/min	
洩漏補償容量	: 最高可達 5100 NI/min	
外殼類型	: 不鏽鋼 316	
安裝方法	: 壁掛架和隔片。安裝孔請參閱配置圖 D808-GA。	
運作溫度	: -20°C 至 +55°C 環境溫度。	
空氣供應	: 乾淨、乾燥、無油的空氣或惰性氣體。壓力 4.2 - 8 barg。	
	最低流率 = (吹掃流 + 馬達洩漏) + 15 %	
邏輯調節器和壓力計	: 出廠預設值 2.3 barg。	
CLAPS 調節器和壓力計	: 根據系統需求設定	
處理接頭	: 吹掃供應和出口至馬達: 2" NPT 母接頭。	
	最小供應管路 50mm (2") I.D. 管	
	參考點和訊號: 1/8" NPT 母接頭	
視覺指示燈	: 警報 / 已加壓 (紅光 / 綠光)	
	: 中低壓力 (紅光 / 綠光)	
	: 系統吹掃中 (不亮 / 4 x 黃光 LED 表示經過時間)	
吹掃完成開關	: DPNO 電開關, 觸點額定值 AC-15 250 Vac 4 安培, Ex d IIC T6	
低壓開關	: SPCO 電開關, 觸點額定值 AC-15 250 Vac 4 安培, Ex d IIC T6	
中間開關	: SPCO 電開關, 觸點額定值 AC-15 250 Vac 4 安培, Ex d IIC T6	
吹掃處理中開關 (選購件):	: SPCO 電開關, 觸點額定值 AC-15 250 Vac 4 安培, Ex d IIC T6	
高壓開關 (選購件):	: SPCO 電開關, 觸點額定值 AC-15 250 Vac 4 安培, Ex d IIC T6	
訊號出線盒	: 不鏽鋼, Ex e IIC T5 Gb (T _{amb} : -20°C 至 +55°C) IP66 / Ex e IIC T4 Gb (T _{amb} : -20°C 至 +60°C) IP66, 安裝於 D808 系統 c/w 端子內側, 前檢修蓋和接頭板位於 D808 系統底部。	
感知器 (-0, +0.7 mbar)	: 低壓校準範圍:	最低: 1.5 mbarg 最高: 5.0 mbarg 預設設定: 1.5 mbarg

其他感知器 (-0 , +10 %)	: 中間壓力校準範圍。	最低:	3.0 mbarg
		最高:	6.0 mbarg
		預設設定:	4.0 mbarg
其他感知器 (-10 , +0%)	: 高壓校準範圍。	最低:	20 mbarg
		最高:	35 mbarg
		預設設定:	32 mbarg
	: 吹掃流正常設定值	提供所需吹掃流率的出廠預 設定	
	: CLAPS 感知器校準範圍	最低:	10.0 mbarg
		最高:	15.0 mbarg
		預設設定:	10.0 mbarg

注意:

最低壓力感知器和中間感知器之間必須有 **1.5 mbarg** 的壓力差，而且 **RLV** 上升值和 **CLAPS** 感知器之間必須有 **5.0 mbarg** 的壓力差 (範例: 最低壓力 = 3.0 mbarg , 中間壓力 = 5.0 mbarg , **CLAPS** 感知器 = 10 mbarg , **RLV** 上升壓力 = 20 mbarg。)

吹掃時間 : 使用者最高可以 1 分鐘為累計單位設定至 99 分鐘 (-0 , +3 秒)。
預設設定為 99 分鐘

重量 : 70 kg (154 lb)

認可 : **ATEX 證書:** **Sira 01ATEX1295X**

0518  II 2 (2) G D 

Ex [px] ia IIC T6 Gb
Ex [p] ia IIIC T95°C Db
環境溫度 -20°C +55°C

IECEX 證書: **IECEX SIR07.0027X**

Ex [px] ia IIC T6 Gb
Ex [p] ia IIIC T95°C Db
環境溫度 -20°C +55°C

INMETRO - TUV 證書: **TÜV 12.1462X**

Ex [px] ia IIC T6 Gb
Ex [pb] ia IIIC T95°C Db
環境溫度 -20°C 至 +55°C

若要了解適用證書的使用限制和條件，請參閱本手冊頁末的第 13 節。

壓力釋放閥 (RLV) / 配備整合式火花抑制器的吹掃出口閥

類型	: RLV200/ss/FS
內徑	: 吹掃中 Ø 188mm , 釋放閥 Ø 150 mm
釋放閥上升校準 (+0 , -20%)	: 最低 20 mbarg
	: 最高 35 mbarg
	: 預設值 30 mbarg
流率	: 出廠預設值 6000 至 15000 NI/min
原料	: 外罩: 不鏽鋼 316L
	: 墊圈: 氯丁二烯橡膠
	: 火花抑制器 不鏽鋼網
安裝方法	: 矩形斷流器和安裝孔請參閱配置圖。
重量	: 23 kg (50.6 lb)

2. 使用者快速指南

2.1 安裝

2.1.1 依照線路配置圖安裝吹掃系統。

2.1.2 務必依照本手冊「安裝系統」一節的所有指示安裝系統。

2.1.3 將管路連接至吹掃系統或外殼前，務必確認所有管路的清潔，不能有塵土或碎片。

2.1.4 強烈建議在連接至吹掃系統的空氣供應上安裝局部隔離閥。

2.1.5 注意：大部分的故障都是起因於空氣供應受阻、安裝空氣供應配管太小，或是吹掃期間的空氣供應壓力下降。

2.2 操作系統

注意：請參閱 D808-GA 表 2 的支架數量參考

2.2.1 正確安裝後，請開啟空氣供應。

指示燈	顏色	狀態
低壓 (8)	紅光	壓力警報，外殼壓力太低
中間壓力 (9)	紅光	壓力警報，外殼壓力太低
吹掃完成 (31)	不亮	吹掃流太低 (或是不在吹掃模式)

2.2.2 讓吹掃系統開始洩漏補償。

2.2.2.1 當 CLAPS 調節器 (29) 調整成增加外殼壓力時，請開啟吹掃流調整器 (25)，吹掃空氣將會進入外殼

2.2.2.2 釋放閥單元內的吹掃出口閥將會開啟

2.2.2.3 接著空氣會流經火花抑制器，離開釋放閥外罩

指示燈	顏色	狀態
低壓 (8)	綠光	壓力警報，外殼壓力太低
中間壓力 (9)	綠光	壓力警報，外殼壓力太低
吹掃完成 (31)	不亮	吹掃流太低 (或是不在吹掃模式)

2.2.3 系統一旦測得足夠的吹掃空氣流，就會開始定時吹掃循環。

吹掃中指示燈 (31) 閃爍「黃光」時，請按下碼表

指示燈	顏色	狀態
低壓 (8)	綠光	已加壓
中間壓力 (9)	綠光	已加壓
吹掃完成 (31)	黃光 (閃爍)	吹掃流高於最低值

2.2.4 在設定的吹掃時間順利完成吹掃後，系統將會顯示吹掃完成。吹掃中指示燈 (31) 轉為「不亮」時，請停止碼表。

指示燈	顏色	狀態
低壓 (8)	綠光	已加壓，並且處於洩漏補償模式。
中間壓力 (9)	綠光	已加壓
吹掃完成 (31)	不亮	不再處於吹掃模式

2.2.5 確認所測得的吹掃時間是否等於或大於吹掃測試所計算出的吹掃時間。
實際記錄的吹掃時間「不得」少於吹掃需求時間。

2.2.6 依照步驟 7.3.5，檢查 / 設定 CLAPS 感知器。

2.2.7 系統這時處於洩漏補償模式，並且正確作業

如果系統沒有照預期作業，請檢查徹底安裝情況。請閱讀本手冊第 7 節「試運轉」的內容

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」章節的檢查方法進行檢查。

如果已經進行過檢查，但是系統仍無法正確運作，請洽詢經銷商或 Expo 以尋求幫助。

3. 應用適宜性

MiniPurge® 系統已通過認證，可於非礦業（地表作業）的危險場所（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。但是有一些 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。

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 以了解處理方式。

結構原料：

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

4. 操作說明

4.1 操作原理

MiniPurge® 系統使用氣動方式作動，並且備有電子介面。

「加壓」是一種用在第一區和第二區危險地點使用的保護方法，可以確保電外殼的內部（如：馬達外罩）沒有可燃氣體。只要利用 Expo MiniPurge® 系統，就能在危險環境下安全地使用馬達。

4.2 操作順序

使用非危險場所的乾淨無污染壓縮空氣，或是惰性氣體吹入馬達外殼，使其內部壓力高於外部壓力。外部可燃氣體無法在其已加壓狀態下進入外殼內。

在開啟電源之前務必「吹掃」外殼，清除任何可能在加壓之前進入外殼的可燃氣體。「吹掃中」是指使用已知無可燃氣體的空氣，來取代外殼內空氣的動作。「吹掃中」過程所需時間一般是透過在電動馬達上執行「吹掃測試」來確認。

「吹掃中」循環結束時，系統將會切換成洩漏補償模式。吹掃出口閥會關閉，並且吹掃空氣流會減弱到僅足以補償外殼空氣洩漏，但同時又維持最低限度超壓狀態的程度。系統內建介面觸點，可為馬達控制齒輪提供互鎖功能。

萬一馬達外罩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。MiniPurge® 針對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」章節中的「只有警報」電路。

馬達 MiniPurge® 系統內含「封閉迴路自動加壓系統」（CLAPS），讓系統能夠偵測馬達內部壓力的升降，並且可以透過增加或減少進入馬達的洩漏補償流率，進行自動補償。本系統經過特別設計，可在壓力洩漏或頻繁降壓的情況下，或是壓力因運轉溫度變化而改變的情況下，於馬達啟動時維持穩定的內部馬達壓力。

5. 主要組件

注意：請參閱 D808-GA 表 2 的支架數量參考

5.1 空氣供應過濾器 (1)：

這個單元附有一個 50 微米液體 / 粉塵過濾器元件，可作為預防措施。MiniPurge® 系統使用者務必確認空氣供應的品質，有確實達到安裝一節中之「空氣供應品質」段落所描述的標準。

5.2 調節器：

5.2.1 邏輯空氣供應調節器 (27)：

本裝置能為系統提供持續運作所需的穩定邏輯壓力。其出廠設定壓力值為 2.3 barg，這個數值可以使用整合式壓力計來確認。只有在調節壓力的讀數不正確時，才需要進行調整。

5.2.2 吹掃流調節器 (25)：

本調節器控制著流經系統的吹掃空氣流量。吹掃空氣流量可於試運轉（請參閱 7.3.6 節）期間，視使用者的需要調整，使其提供所需的吹掃空氣流。

5.2.3 CLAPS 調節器 (29)：

於正常運作期間，CLAPS 調節器控制流入馬達的空氣流。空氣流應於試運轉期間檢查 / 設定（請參閱第 7.3.5 節）

5.3 邏輯歧管：

這個黑色區塊包含了系統內大部分的邏輯組件，可以將其想成氣動印刷電路板。邏輯歧管有內部通道，可使用外部歧管項目的接頭功能讓組件互連。邏輯歧管包含以下主要項目：

5.3.1 低壓感知器 (16)：

這些裝置會持續監測加壓外殼內部的壓力。當壓力正確時（壓力高於安全操作的最低壓力），感知器會輸出視覺化的「已加壓」訊號（如：透過本機的紅光 / 「綠光」視覺指示燈顯示）。這個感知器出廠時經過調校，會在壓力滿足或高於最低規定壓力時，於壓力下降時作動。

5.3.2 吹掃流感知器 (12)：

本裝置會監測流經釋放閥 (RLV) / 吹掃出口閥的吹掃流。當吹掃流流量正確時（即流量高於正確吹掃的最低吹掃流），感知器會輸出「吹掃中」訊號，以啟動計時器開關。這個感知器出廠時經過調校，會在流率滿足或高於最低規定流率時，於流率下降時作動。

5.3.3 CLAPS 感知器 (21)：

本感知器會監測馬達內的壓力，然後向「CLAPS 調節器」發送比例控制訊號，藉以增加或減少流入馬達外殼的空氣流，從而維持穩定的運轉壓力。系統啟動之前一定要先決定正常的馬達運轉壓力，才能將 CLAPS 感知器設定成所需等級，進而控制 CLAPS 閥。

5.3.4 吹掃計時器 (32)：

當加壓外殼壓力正確，並且正確的吹掃流開始時，吹掃流感知器將會啟用計時器開關，啟動電子計時器。透過操作安裝在計時器模組上的可預先設定開關，可以決定所要延遲的時間。在計時的過程中，會有 4 個 LED 燈以視覺的方式顯示經過時間。計時指示燈的 LED 燈將在計時器計時的時候依序閃爍。LED1 將在經過時間的 0 - 25 % 時閃爍。而 LED2 將從經過時間的 25%-50 %時閃爍。LED3 將在經過時間的 50 - 75% 時閃爍。而 LED4 將從經過時間的 75% - 100% 時閃爍。

計時器會在計時完成後，使本質安全電磁線圈「計時器閥」通電約 1 秒，以向「吹掃完成」閥發出鎖存訊號。

5.3.5 「只有警報」電路。如果外殼壓力太低，系統通常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，系統可以改成提供保持電路，維持加壓外殼的電力供應，同時發出「壓力失效警報」。使用者聽聞警報作響務必有所反應，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，並且也要為允許外殼於未加壓情況下的運作時間長度負責。

警告：

當已知場所內有潛在爆炸性危險氣體時，若於未加壓的情況下去讓加壓馬達外殼通電，就會有潛在的危險性。

5.4 吹掃完成 (馬達互鎖) 開關 (10)：

防火「Ex d IIC」電源開關和氣動作動活塞位於邏輯歧管隔壁的板子上。開關電纜末端接入「Ex e II T100°C (T_{amb} -20°C 至 +55°C) IP66」出線盒。額定電壓 / 電流：250Vac，4A (AC-15)

5.5 警報 / 已加壓低壓開關 (11)：

如同馬達互鎖開關一般，這個「Ex II」裝置同樣也由「已加壓」訊號作動，並且有遠端電力系統狀態指示燈的功能，可以顯示「已加壓」或「壓力失效警報」。開關電纜末端接入「Ex e II T100°C (T_{amb} -20°C 至 +55°C) IP66」出線盒。額定電壓 / 電流：250Vac，4A (AC-15)

5.6 中間壓力開關 (15)：

防火「Ex d IIC」電源開關和氣動作動活塞位於邏輯歧管隔壁的板子上。開關電纜末端接入「Ex e II T100°C (T_{amb} -20°C 至 +55°C) IP66」出線盒。額定電壓 / 電流：250Vac，4A (AC-15)

5.7 視覺指示燈：

MiniPurge® 控制單元裝有視覺指示燈，可讓操作者提供本機狀態資訊：

5.7.1 「低壓」指示燈 (8) 有兩種狀態：

- 紅光 = 「加壓警報」(外殼壓力太低)
- 綠光* = 「已加壓」

5.7.2 「中間壓力」指示燈 (9) 有兩種狀態：

- 不亮* = 「加壓警報」(外殼壓力太低)
- 綠光 (閃爍) = 「已加壓」

5.7.3 「吹掃完成」指示燈 (31) 有兩種狀態：

- 不亮* = 「吹掃流太低」(或是不在吹掃模式)
- 黃光 (閃爍) = 「吹掃流高於最低值」

* 指示燈的組合代表初始吹掃流程後，加壓外殼的正常運作過程已經結束。

5.8 釋放閥 (RLV) / 吹掃出口閥：

- 5.8.1 RLV 單元可以讓吹掃空氣流經內嵌式火花抑制器，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因正常運作或發生電氣故障，而噴射出電弧、火花和發光粒子。
- 5.8.2 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 RLV 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。
- 5.8.3 吹掃空氣會流經 RLV，而正確選擇的孔口板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。這個過程是由穿越孔口時所產生的差壓來完成。
- 5.8.4 RLV 單元擁有內嵌式可調整尺寸的釋放閥，可以確保如果空氣供應壓力從規定的最大正常作業壓力上升時，內部外殼的壓力不會超過 PE 的規定最大作業壓力。

5.9 /PA 出線盒

安全性增加

Ex e IIC T5 Gb Ex tb IIIC T100°C Db IP66 環境溫度 -20°C 至 +55°C	Ex e IIC T4 Gb 環境溫度 -20°C 至 +60°C
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出線盒通過「安全性增加」(Ex e) 認證，內含警報和互鎖電路的端子連接點。所有提供的觸點皆為無電壓式 (乾式)。

電纜接入方法 (如：導管或接頭) 應符合 IEC / 歐洲或其他相關的當地規範。主要的規定是必須使用密封或墊圈，提供 IP54 或 IP66 (用於防粉塵) 以上的異物防護等級。如果電纜接頭為非金屬材質，則必須通過「Ex」認證才能使用。

6. 安裝系統

本設備是專為在一般工業的環境溫度、濕度以及震動條件下使用所設計。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**。

MiniPurge® 系統的安裝，應符合相關標準 (如：IEC / EN 60079-14) 和 / 或任何有效的當地作業規範。

6.1 空氣供應品質

MiniPurge® 系統應連接至適合吹掃和加壓的保護性氣體。MiniPurge® 的供應管路接頭為 2" NPT 母接頭，但是供應管路應根據空氣供應的最大輸入吹掃流率 (也要將馬達洩漏率納入考量) 調整尺寸，並應將壓力調節至 6 barg。送往過濾系統的空氣必須為乾淨、非可燃性、來自非危險場所，並且不含水氣和油氣，才能符合 BS ISO 8573-1：2001 2.2.1 級或相關當地標準。這就是一種所謂的「儀器空氣品質」。儘管設備能使用較低品質的空氣，不過這會對系統的使用壽命造成不良的影響。受保護的設備可能也會因此而受到不良空氣品質的影響。

固體顆粒： 0.5 μm < 顆粒尺寸 $\leq$ 1 μm ，最大值為 1000 顆粒 / m^3

濕度： -40 °C* 壓力露點

含油量： $\leq$ 0.01mg / 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，同時濕度為：-70 °C 壓力露點。

空氣供應的壓力必須調節至低於最大規定入口壓力。

將空氣供應連接至吹掃系統之前，請使用空氣吹入供應配管，掃除所有可能在安裝期間進入配管的碎片。每一公尺的供應管路都應吹入至少 10 秒的空氣。

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

應使 MiniPurge® CU 的吹掃空氣經由管路吹入 PE，確保能夠吹掃潛在的空氣死點。

警告：正確的邏輯供應壓力對於系統的可靠性和校準極其重要，因此不應調整其數值。

6.2 安裝位置

MiniPurge® 控制單元 (CU) 應直接安裝於馬達加壓外殼上或附近位置。若非安裝在 PE 上，則應挑選盡可能靠近的安裝位置。安裝位置應該要適當，以便迅速觀測系統指示燈和認證標籤。

6.3 釋放閥：為了有效率地進行吹掃，通常加壓外殼的空氣入口點和出口點都應位於外殼的兩端。RLV 必須垂直安裝，並且火花抑制器 (吹掃出口) 的周圍應保持至少 600mm (24") 的間隙。

務必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。尤其是火花抑制器的外部不應塗漆，或是有任何的阻塞。

6.4 序號任何系統的所有零件都有一個共通的序號。若同時安裝一個以上的系統，請確保每個設備本身的共通性獨立於其他設備。

6.5 管路除非是 MiniPurge® 直接連接至 PE，否則連接 CU 至 PE 的任何管線、導管和接頭都應使用金屬或是適用系統安裝環境的材質，才可以接入系統安裝的位置。CU 連接至 PE 的任何管路都不可安裝任何閥。不論任何時候都應格外注意當地作業規範。

6.6 多層外殼本吹掃系統不適用於多重外殼。

6.7 準備和安裝警報裝置 這個系統有最低壓力感知器，其壓力設定至少為 1.5 mbar。當 PE 的壓力高於此設定值時，感知器就會產生正「已加壓」訊號。CU 上的相關指示燈會從紅光轉變成「綠光」。當外殼壓力降到感知器的設定值以下時，「已加壓」訊號就會被移除；也就是說當這個訊號消失時，就表示系統進入「低壓警報」的狀態。CU 上的指示燈會從綠光轉變成「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：

ATEX 第二類（第一區）設備：警報和電源跳脫自動。

ATEX 第三類（第二區）設備：壓力或流量失效時只有警報，並且得以手動的方式切斷電源。

6.8 電源供應和電源隔離 所有進入 PE 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：PE 內的「無電壓」（乾式）觸點。而馬達的電源則通常是由「馬達互鎖開關」提供。

6.9 吹掃完成（馬達互鎖）開關

本開關為雙重斷路開關，其上提供兩個獨立觸點。這兩個觸點應以串聯連接，並應用於隔離進入馬達的電源。使用接觸器或是其他適用於隔離電源的開關裝置，就能隔離進入馬達的電源。確保開關只在適當的技術極限內操作是使用者的責任，換句話說，輸入的電流和電壓不應超過額定值。

開關的這兩個觸點為端接觸點，使用者可在出線盒中檢修。如果主要電路發生過任何短路，請務必更換開關。本開關是一件封裝設備，因此無法檢查觸點的狀態。禁止對開關進行任何技術性修改。

開始試運轉前，請先確認出線盒是否保持乾淨、所有連接是否適當接上、電纜是否已正確鋪設，以及所有端子的螺絲是否都已牢固地鎖緊。

安全地使用本開關是使用者的責任。所有的電氣設備必須符合當地作業規範。

例外情況：若其他設備已經有適用於危險場所的供電，則無需使用 MiniPurge® 系統進行隔離。在任何情況下都必須利用「馬達互鎖」訊號，透過 MiniPurge® 系統來控制電源的輸送和隔離。電氣設備必須符合當地作業規範。

電源開關和 MiniPurge® 系統之間除了授權的「手動超控」電路之外，不可安裝任何開關。

7. 試運轉

注意：請參閱 D808-GA 表 2 的支架數量參考

7.1 首次試運轉。

- 7.1.1 只有當外殼已安裝在其永久運作位置之後，最後才能放置「CLAPS 調節器 (29)」。
- 7.1.2 確認系統的安裝符合 Expo 的指示。
- 7.1.3 斷開入口至 MiniPurge® 系統的供應管路，並且每一公尺的管路都要吹入至少 10 秒的乾淨空氣，以清除任何碎片、油滴和凝結水珠。
- 7.1.4 如果任何壓力感知器或 RLV 已偏離校準，可依照第 8 節維護系統的指示進行重設。

7.2 低壓檢查

7.2.1 準備

- 7.2.1.1 拆下紅色插塞，然後將壓力計接上低壓感知器 (16)
- 7.2.1.2 將電子計時器 (32) 設為 1 分鐘的吹掃時間
- 7.2.1.3 開啟主要空氣供應
- 7.2.1.4 此時可能需要調升 CLAPS 調節器的設定，直到滿足最低壓力為止。一旦滿足最低壓力，系統將會緩緩開始循環，進入下一個步驟。
- 7.2.1.5 緩慢開啟吹掃流調節器 (25)，直到吹掃處理中指示燈 (31) 開始閃爍為止。
- 7.2.1.6 讓系統完成「短吹掃」循環，並且進入洩漏補償模式

7.2.2 壓力設定值檢查

看著接在低壓感知器 (16) 上的壓力計，緩緩調降 CLAPS 調節器 (29)。

7.2.2.1 中間感知器 (23)

注意中間壓力指示燈 (9) 從綠光轉成紅光時的壓力

7.2.2.2 低壓感知器 (16)

繼續慢慢地調降外殼壓力，並且注意低壓指示燈 (9) 從綠光轉成紅光時的壓力

注意 1：CLAPS 調節器調升至再次高於低壓感知器設定值之前，系統都會維持在這種情況。一旦到達這個設定值之後，系統將會重新進入吹掃順序。

這時感知器檢查已經完成，請從低壓感知器 (9) 拆下壓力計，並請插回在步驟 7.2.1.1 拆下的堵塞。重設電子計時器 (31)，並且輸入正確的吹掃時間。

7.3 驗證超壓

以下順序將會隔離所有的 **MiniPurge** 防護機制。執行這些步驟時，請務必格外小心謹慎。

7.3.1 準備

7.3.1.1 確認隔離閥已關閉

7.3.1.2 確認吹掃流調節器 (25) 已關閉。逆時針轉動  直到轉緊為止

7.3.1.3 確認 CLAPS 調節器 (29) 已關閉。逆時針轉動 ，直到把手自由轉動為止

7.3.1.4 慢慢開啟隔離閥。系統應該會在沒有空氣進入馬達的情況下開始加壓。若是系統沒有開始加壓，請重複步驟 7.3.1.1 至 7.3.1.3。

7.3.1.5 利用 Expo 零件 KRV-0000-005 (另售)，密封火花抑制器的 RLV 出口

7.3.1.6 拆下接在外殼壓力埠 [A] 上的綠色管路，然後接上壓力計



警告：此時系統上的所有防護機制都已被隔離！

7.3.2 超壓測試

7.3.2.1 極度緩慢地順時針轉動把手，慢慢調升 CLAPS 調節器 (29)

7.3.2.2 馬達中的壓力將會開始上升，而且能從所需外殼壓力計算出洩漏率

7.3.2.3 在這個階段也能同時進行超壓測試，以及變形壓力測試

7.3.2.4 一旦測試完成後，請逆時針轉動 CLAPS 調節器 (29)，再次降低外殼壓力

7.3.3 高壓感知器 (24)

7.3.3.1 將上述步驟 10 中所拆下來的綠色管路，重新接上外殼壓力埠 [A]。

7.3.3.2 拆下低壓感知器 (16) 的綠色管路，然後將壓力計接上管路

7.3.3.3 極度緩慢地順時針轉動把手，慢慢調升 CLAPS 調節器 (29)

7.3.3.4 當高壓感知器 (24) 隔離氣態吹掃流時，請注意外殼壓力。外殼壓力在此階段會出現驟降的情況。請注意，系統在這時將會進入吹掃和跳脫之間的循環。

7.3.3.5 一旦測試完成後，請逆時針轉動 CLAPS 調節器 (29)，再次降低外殼壓力

7.3.4 釋放閥

7.3.4.1 拆下於上述步驟中，安裝上去的 RLV 密封支架

7.3.4.2 拆下接在高壓感知器 (24) 上的綠色管路，並且使用快速接頭蓋住管路

7.3.4.3 極度緩慢地順時針轉動把手，慢慢調升 CLAPS 調節器 (29)

7.3.4.4 請注意 RLV 開啟時的外殼壓力。外殼壓力在此階段會出現驟降的情況。

7.3.5 CLAPS 感知器 (21)

7.3.5.1 逆時針轉動 CLAPS 調節器 (29)，將外殼壓力降到 CLAPS 設定值以下

7.3.5.2 此時緩慢地調升外殼壓力，直到達到 CLAPS 設定值為止。請緊固後螺帽，鎖定調節器此時的設定

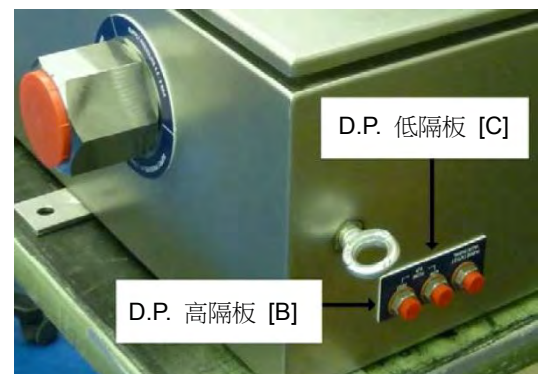
高壓測試此時已經完成；請重新連接高壓感知器 [(24)，步驟7.3.4.2] 和低壓感知器 [(16)，步驟7.3.3.2]。重新接回低壓感知器 (16) 後，系統將會嘗試吹掃外殼。

7.3.6 驗證流量

將壓力計的 (+) 埠接上 D.P. 高隔板 [B]，然後將 (-) 埠接上 D.P. 低隔板 [C]

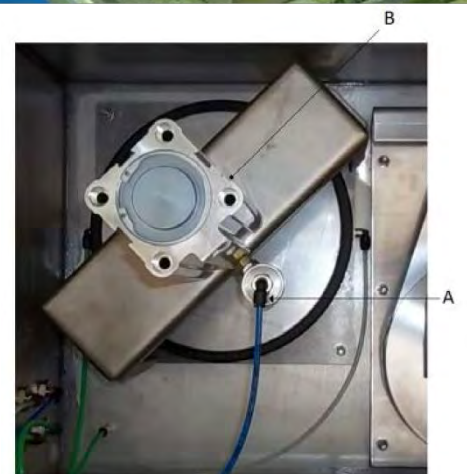
7.3.6.1 慢慢地調升吹掃流調節器 (25)，直到吹掃完成指示燈 (31) 從不亮轉為黃光為止。

7.3.6.2 此時慢慢地調降吹掃流調節器 (25)，直到吹掃完成指示燈從黃光轉為不亮為止。壓力計上讀取到的壓力差應該大於 6.4 mbar。



7.3.7 驗證計時器

一旦吹掃中指示燈 (31) 開始閃爍「黃光」，吹掃計時器就會開始計時。測量指示燈轉為不亮所需的時間，此時間不得少於吹掃外殼所需要的時間。



7.4. 變更流率

Expo 已預先為系統配置了指定流率的孔口板，可供選擇的流率有 7000、8000、10000、12000 和 14000 NI/min。

流率可視需要藉由變更孔口板來改變，只要執行以下步驟，就能在原地使用 RLV 改變流率：

7.4.1 – 沿著 RLV 邊緣鬆開 10 支螺絲，然後拆下後檢修板

7.4.2 – 從柱塞體的接頭上拆下塑膠管 (A)

7.4.3 – 鬆開將柱塞機構緊固在 RLV 上的所有四個螺帽，然後將整個總成 (B) 拆下

7.4.4 – 鬆開四個緊固螺絲，然後拆下孔口板

7.4.5 – 每個孔口板都有打印對應的流率，請選擇合適的孔口板並進行安裝

7.4.6 – 重新安裝柱塞總成 (提醒：從柱塞體上的接頭 (A) 吹入足量的空氣，使柱塞回縮，如此將有助於安裝)

7.4.7 – 重新接回步驟 8.2 中斷開的管路

7.4.8 – 重新安裝後檢修板

8. 維護系統

建議的系統維護包括以下項目，再加上由當地作業規範所強制執行，必須增添的任何額外項目。**Expo** 建議根據作業環境而定，每 6 至 24 個月請進行一次試運轉測試。此外，**Expo** 建議執行試運轉測試時，也要進行以下檢查：

- 檢查 RLV 和所有其他火花抑制器。清除所有碎片或鏽蝕情況，或是使用備件更換新品。
- 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，**Expo** 建議至少每兩年額外檢查以下項目一次：

- 檢查設備是否還適用於危險地點
- 系統上沒有任何未經許可的修改
- 檢查空氣來源是否仍無汙染
- 檢查互鎖和警報功能是否能正確運作
- 檢查許可標籤是否清晰可見，並且完整無缺
- 是否還備有足夠的備件
- 檢查壓力失效時的動作是否正確

本質安全電池組至少每三年應更換一次，更換後也應進行試運轉測試。計時階段結束後，電池可在不影響 **MiniPurge Ex px** 系統運作的情況下，於危險環境中「熱插拔」更換。

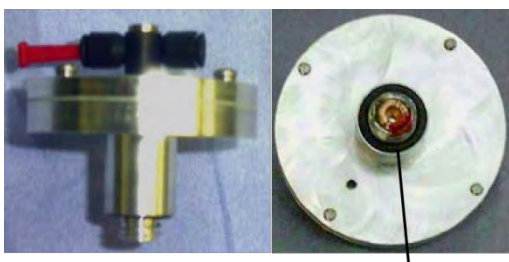
8.1 重新調校壓力釋放閥 (如有必要)

進行任何調整之前，請先確認壓力釋放閥座沒有汙染，或是顆粒堆積的情況。若要調整超壓釋放閥的上升壓力，您將需要 8 mm 扳手和 2.5 mm 內六角扳手。先固定住中央內六角螺絲的位置，然後旋鬆固定螺帽。順時針調整內六角扳手可以增加上升壓力；逆時針調整則可以降低上升壓力。「壓力釋放閥對於這個調整非常敏感，在您熟悉這個裝置之前，建議您每次測試僅需轉動一圈半，應該就能發現明顯改變。」每次測試之前，先固定調整螺絲的位置，然後重新鎖緊鎖定螺帽。



內六角螺絲和鎖定螺帽

8.2 重新調校壓力感知器 (如有必要)



黃銅噴嘴使用 **Loctite** 螺紋密封劑來密封定位。進行任何調整之前，可能需要稍微加熱軟化質地偏軟的黃銅噴嘴，以避免對其造成傷害。壓力感知器對於這個調整非常敏感，在您了解調校的因果關係之前，建議僅略微轉動噴嘴即可。順時針轉動可以降低壓力設定。

噴嘴

9. 故障排除

如果系統沒有如上述般地運作，就表示系統發生故障。以下說明將說明有些常見的故障。如果依照以下所列的程序操作後仍無法解決問題，請電洽 **Expo (24 小時接聽)** 或是供應商尋求解決方法。

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。只有在確認檢查的必要性後，才以更換組件的方式予以檢查。如果系統機齡少於 **12 個月**，則保固期內的零件應連同完整的故障報告和系統序號一起送回 **Expo** 進行調查。

就像所有的氣動系統一樣，空氣供應如果有水氣、油滴和塵土，很容易造成系統損壞。基於這個原因，空氣系統務必備有粉塵和水氣過濾器，才能確保儀器空氣品質。這不僅能保護吹掃系統，同時還能常態性吹掃設備。過濾器必須由第三方廠商提供。但是，塵土還是可能以其他方式進入系統，因此，在首次使用系統之前，或是在每次斷開配管之後，落實「安裝方法」一節所描述的程序極其重要。若是沒有確實執程序，可能對系統造成不屬於保固範圍內的損壞。

進行以下檢查之前，請先確認送往 **MiniPurge®** 系統的主要空氣供應壓力，以及送往邏輯調節器的調節壓力，是否都符合系統規格表的規定。

另外也要確認吹掃期間的空氣供應壓力，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，整個吹掃循環過程的空氣供應不足。

9.1 系統已正確執行吹掃，但是結束時警報指示燈卻亮起，並且會再次進行吹掃循環。

原因 1：

CLAPS 調節器的設定太低，並且 **PE** 因為低壓而在吹掃後跳脫。

試著提高 **CLAPS** 洩漏補償引導壓力的設定，以提高 **PE** 於吹掃結束時的壓力。

原因 2：外殼故障？

- 「實際」**PE** 壓力是否低於最低壓力感知器的設定？請使用壓力計進行確認。
- **RLV** 盤面上是否因為可能有磁鐵而吸附任何碎片？
- **PE** 門 / 蓋是否已關閉？所有的導管 / 電纜接頭是否都已密封？
- **PE** 是否洩漏過度？
- 壓力感知管是否有受損和洩漏的情況？

原因 3：系統故障？

如果以上檢查結果顯示 **PE** 正確作業，那麼故障位置大概在 **CU**。旋開拆下直徑 **60 mm** 的膜片外罩，然後密封閥模組頂端的 **12 mm** 螺紋安裝孔，接著請檢查最低壓力感知器的基本運作。使用橡膠塊塞住螺紋安裝孔，即可達到密封的效果。此時閥應會作動，同時指示燈也應轉為「綠光」。如果指示燈轉為「綠光」，表示壓力感知器膜片很可能需要重新調校或進行更換。

9.2 釋放閥開啟 (持續性開啟或間歇性開啟)

原因 1：**PE** 壓力太高。

CLAPS 洩漏補償引導壓力太高。請調整 **CLAPS LC** 引導壓力。

原因 2：因為 RLV 盤上有碎片，使得空氣從閥洩漏出去。請拆下 RLV 蓋，然後清潔閥盤。

9.3 吹掃期間的「吹掃中」指示燈沒有閃爍黃光

原因 1：因為空氣供應壓力不足而導致吹掃流不足。請在吹掃過程中，檢查流向 CU 的入口空氣供應壓力。供應管路壓力過度下降是這個問題非常常見的原因。管路內徑的尺寸務必至少等同於 CU 入口接頭的尺寸。

原因 2：PE 過度洩漏。請在吹掃過程中檢查 PE 的周圍。如有發現任何明顯的洩漏，則必須進行處理。是否已完成洩漏測試？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。

原因 3：RLV 流量感知點至吹掃流感知器的管路沒有氣密，原因可能為接頭螺帽未鎖緊，或是管路受損。視情況進行檢查和維修。

原因 4：本質安全電池組可能已經完全放電，並且需要進行更換。

原因 5：確認「系統吹掃中」的氣動或開關輸出訊號是否存在。如果訊號存在，則故障原因可能是電子計時器電路。有鑑於本產品的重要本質，我們建議在這種情況下請安裝新的計時器。更換作業應交由受訓過的維修工程師進行。

9.4 吹掃時間結束後，系統無法在馬達互鎖開關關閉的情況下運作嗎？

原因 1：是否有電源？電源隔離器是否已關閉？保險絲或斷路器是否正常？

原因 2：系統故障？計時器無法暫停？

- 「吹掃中」指示燈是否在吹掃時間全程閃爍「黃光」？
- 邏輯壓力計的設定是否正確？
- 計時器的設定可於測試時調降至 01 分鐘。進行一次新的吹掃時間，然後檢查計時器的運作。如果結果正常，請將時間重設回原先的設定。最後將吹掃計時器恢復完整設定，然後再次重新檢查。

10. 備件清單推薦

HF1-A03X-002	HF1-A03X-001 專用過濾器備件，1.5" 和 2" BSP 埠過濾器
S0030/016*	低壓、中間壓力和吹掃流感知器
HS3-2XX0-001*	CLAPS 控制感知器
S0191/025	E x d IIC T6 限制開關 SPNO
S0191/026	E x d IIC T6 限制開關 DPNO

* 必須依照客戶系統測試和檢查表，將出廠預設值設為正確數值。

11. 工具清單推薦

Expo 供應的門鑰匙
平頭螺絲起子
8 mm 扳手
2.5 mm 內六角扳手

12. 配置圖和示意圖

以下為附加的配置圖：

標題	配置圖號碼	頁數
MiniPurge D808 GA	D808-GA	第 1 頁和第 2 頁 / 共 2 頁
尺寸 7 馬達吹掃釋放閥	XBR-RTD0-007	第 1 頁 / 共 1 頁
配備 KMP-1SP0-008 的 D808 電路	AGM-PA00-039	第 1 頁 / 共 1 頁

13. 證書

系統隨附的手冊 (ML497) 內附證書

吹掃系統：

ATEX 證書

IECEX SIR07.0027X

IECEX 證書

SIRA 01ATEX1295X

INMETRO

TÜV 12.1462X

MIU/e Ex e 出線盒：

ATEX 證書

ITS 10ATEX37092X

IECEX 證書

IECEX ITS 10.0003X

INMETRO

TÜV 12.1463

電開關：

Ex d 極限開關

IECEX PTB 07.0045X

Ex d 極限開關

PTB 00ATEX1093X + DoC No 01-2511-7C0001

電子計時器：

ATEX 證書

FM 10 ATEX0003X

IECEX 證書

IECEX FME 10.0001X



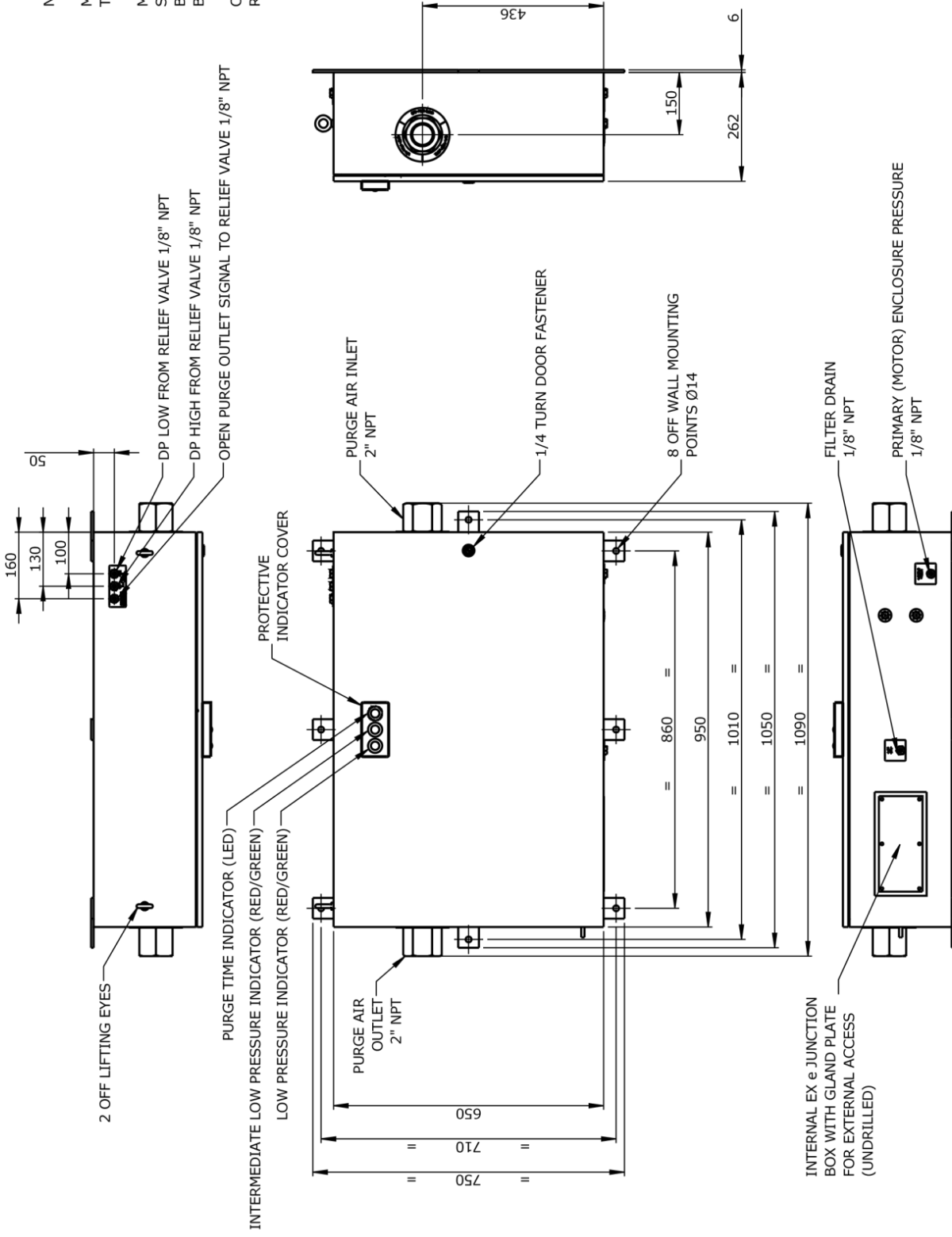
FLATNESS TO BE LESS THAN 0.4mm OVER ANY 100mm LENGTH

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MINIPURGE MUST BE MOUNTED IN THE POSITION SHOWN.

MATERIALS:
SYSTEM HOUSING, Ex e JUNCTION
BOX AND FLANGES: STL ST 316.
BULKHEAD FITTINGS: STL ST 304/316.

CONTROL UNIT WEIGHT: 70KG
RELIEF VALVE WEIGHT: 23KG



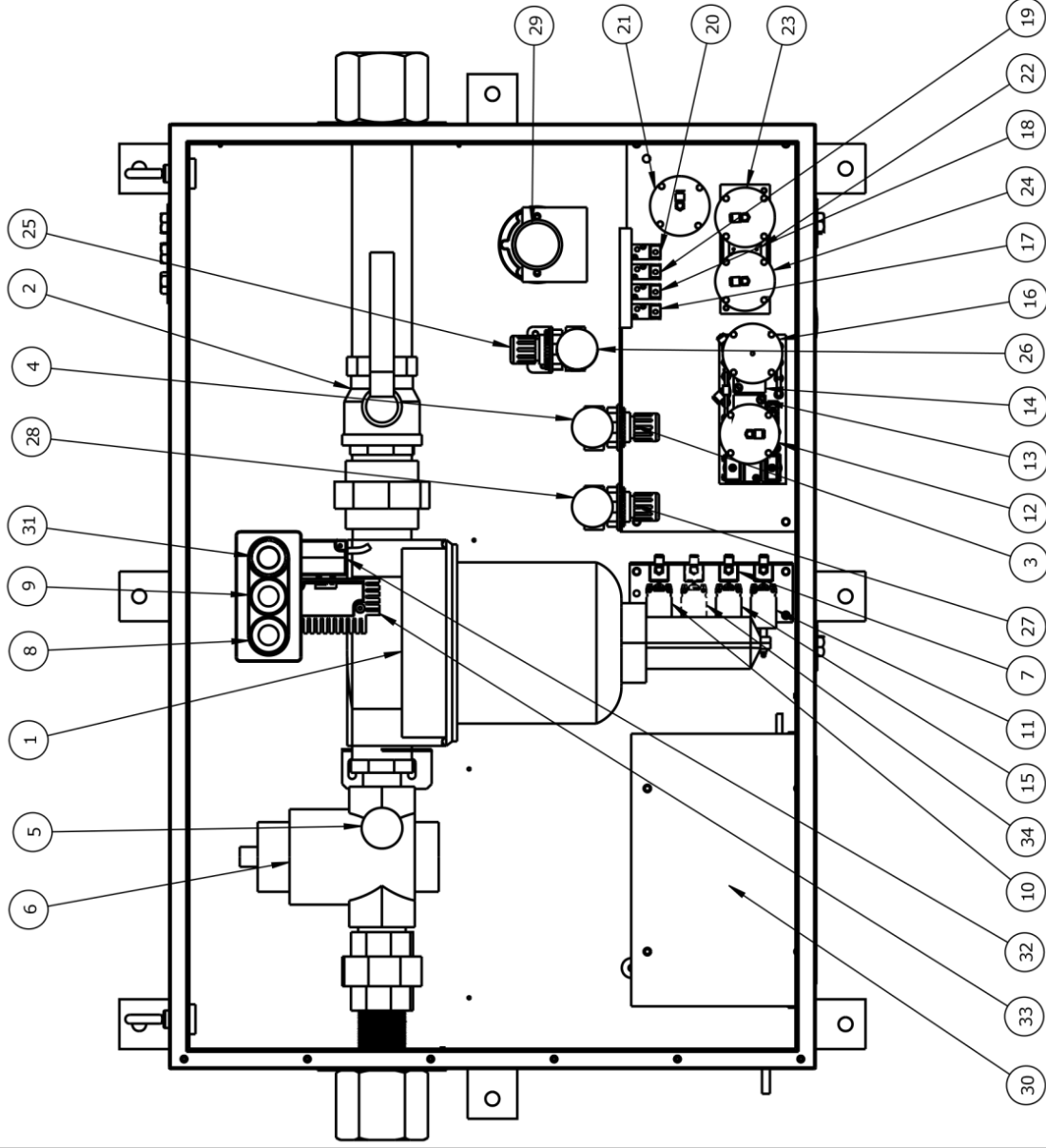
REV.			MOD NUMBER			APPROVED DATE			APPROVED			DRAWN DATE: 03/11/2011			MATERIAL STAINLESS STEEL 316L 1.5mm THK			TITLE			SURREY TW16 8DB UNITED KINGDOM			SCALE 1:10			REV:		
03			5928			16/09/2013			JPd8			DRAWING STATUS: production						D808MOTORSYS			D808-GA			DRAWING No.			05		
04			5929			17/09/2013			JPd8			APP'D			CHK'D			WN			FINISH NROB ON ALL EXTERNAL SURFACES			JOB No:			CUSTOMER:		
05			5970			19/11/2013			JPd8			SM			DM			Nigel						SHEET No 1 OF 2					

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			

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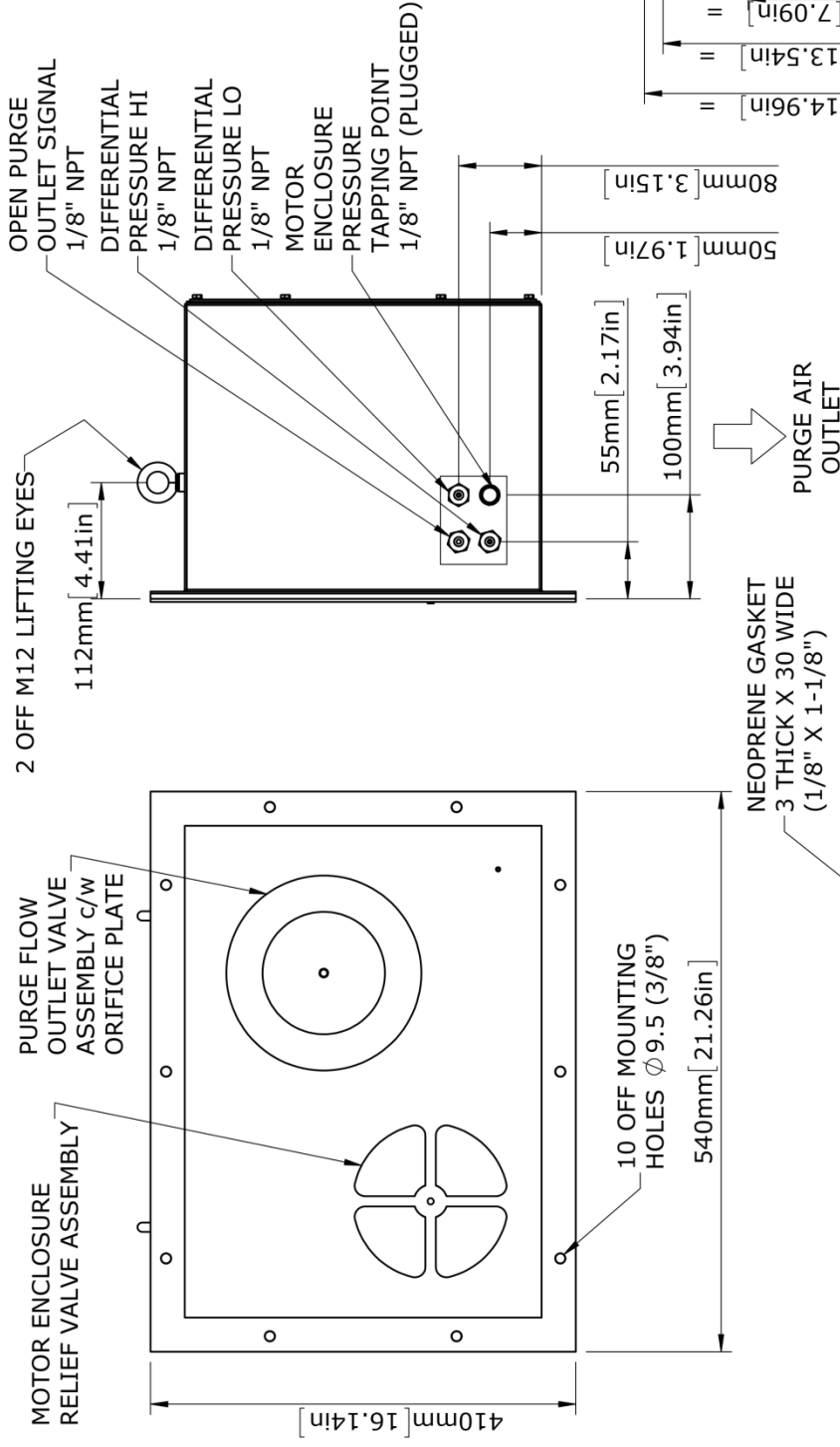
DRAWN DATE: 03/11/2011		MATERIAL STAINLESS STEEL 316L 1.5mm THK		Expo Technologies Limited SURREY KT7 0RH UNITED KINGDOM		SCALE NTS REV: 05	
DRAWING STATUS: production		FINISH NROB ON ALL EXTERNAL SURFACES		TITLE D808MOTORSYS		DRAWING No. D808-GA	
APP'D	CHK'D	DR'WN		JOB No:		SHEET No. 2 OF 2	
JPdB	DM	DR		CUSTOMER:			

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	ANY 100mm LENGTH N 0.4mm OVER
------------------------	------------------------	-----------------------	-----------------------	----------------------------------

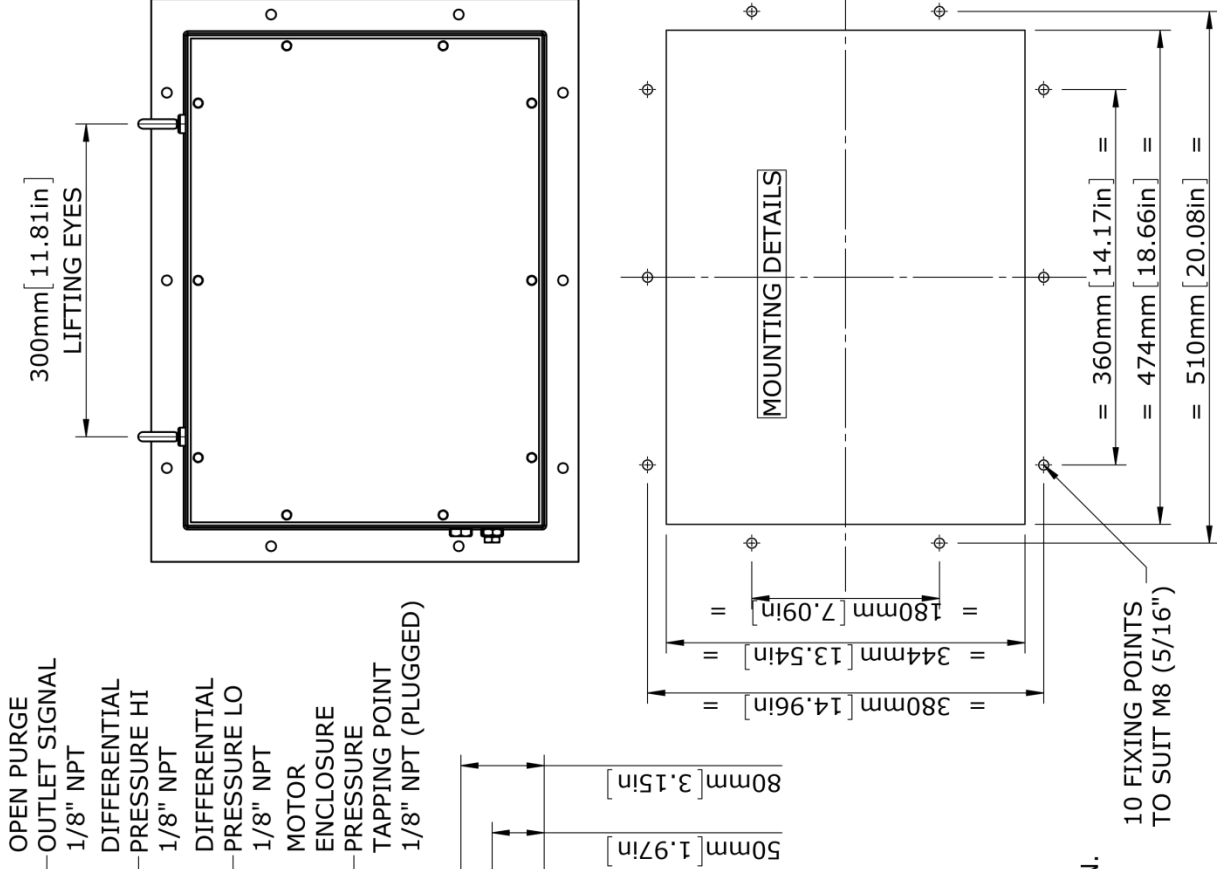
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SPARK ARRESTOR MESH
MUST NOT BE OBSTRUCTED

NOTES

- 1 THE RELIEF VALVE MUST BE MOUNTED IN THE ATTITUDE SHOWN.
- 2 WEIGHT IS APPROX. 23kg (51lb)
- 3 THE PART CODE IS ARV-2008-100



REV.	MOD NUMBER	APPROVED DATE	APPROVED	DRAWN DATE:	26/09/2007		MATERIAL
	04	5047	JPdB	DRAWING STATUS:	production		
05	5360	14/10/2011	JPdB	APP'D	CHK'D	DR'WN	FINISH
06	5877	12/07/2013	JPdB	JPdB	PSC	SB	

Expo Technologies Limited				SURREY KT7 0RH UNITED KINGDOM			
TITLE				SIZE 7 MOTORPURGE RELIEF VALVE			
JOB No:				CUSTOMER:			
SCALE 1:5		REV: 06					
DRAWING No.		XBR-RTD0-007					
SHEET No. 1		OF 1					

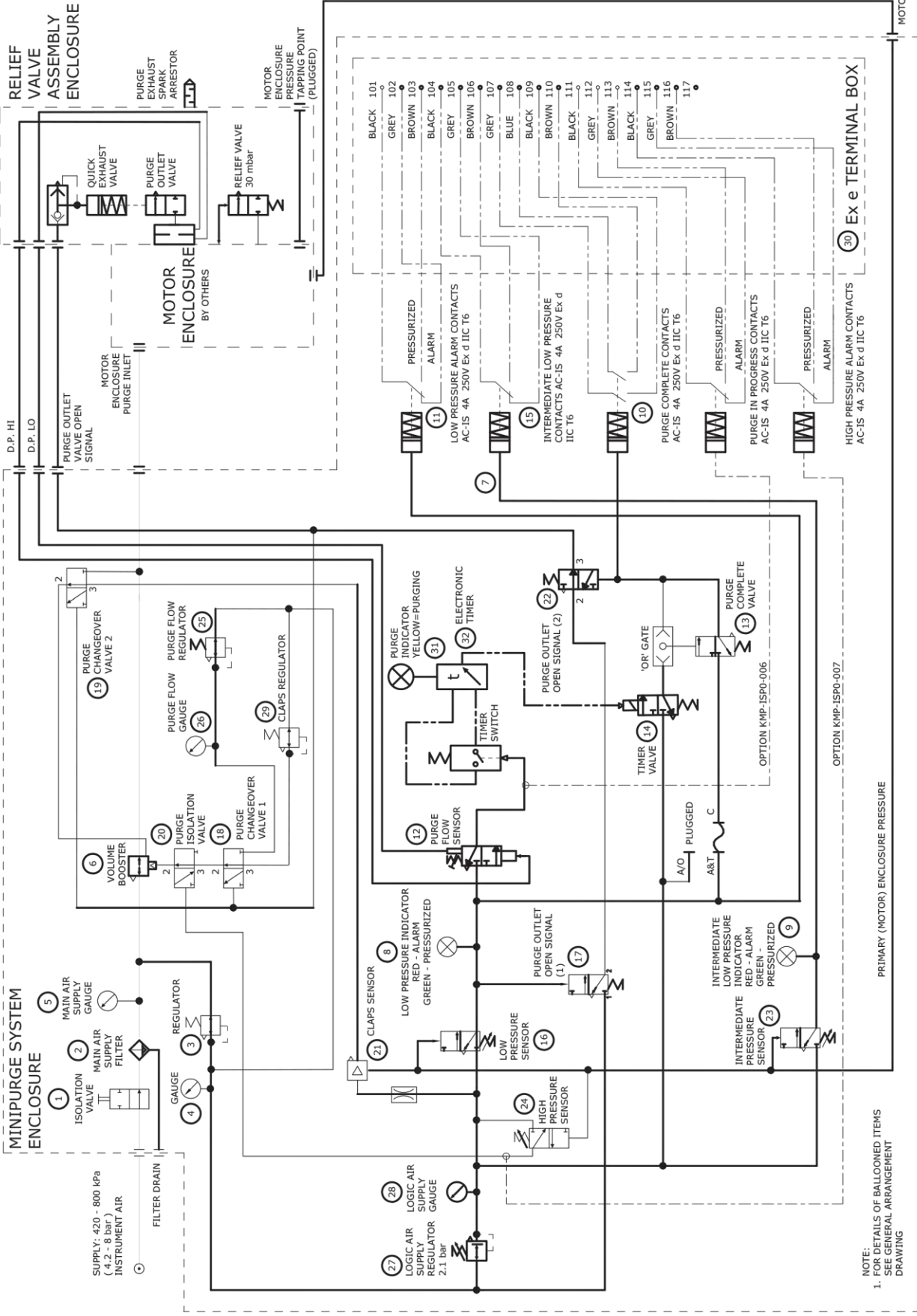


3rd ANGLE
PROJECTION

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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NOTE:
1. FOR DETAILS OF BALLOONED ITEMS
SEE GENERAL ARRANGEMENT
DRAWING

APP'D	SB	ISSUE:	1	2	MATERIAL
CHK'D	BRD	MOD. No:	DRAWN	6372	
DRWN	DR	DATE:	21/12/2012	17/7/15	FINISH
		APPROVED:	SB	SMD	
		DRAWING STATUS:			

Expo Technologies Limited		SURREY TW16 5DB UNITED KINGDOM	
TITLE		D808 CIRCUIT WITH KMP-ISP0-008	
JOB No:		CUSTOMER: SIEMENS	

SCALE	NTS
DRAWING No.	AGM-PA00-039
SHEET No.	1 OF 1



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

Certificate history:

27)

Issue No. 4 (2011-12-9)

Issue No. 2 (2011-1-12)
Issue No. 1 (2009-3-16)

Issue No. 0 (2007-9-20)

b
C Db
Gb
35°C Db

4

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Eccleston
Chester
CH4 9JN
United Kingdom



GB/SIR/QAR07.0012/02
GB/SIR/QAR07.0012/05



IECEx Certificate of Conformity

Certificate No.: IECEx SIR 07.0027X
Date of Issue: 2012-11-27

Issue No.: 6
Page 3 of 4

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 Annex 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).



IECEx Certificate of Conformity

Certificate No.: IECEx SIR 07.0027X
Date of Issue: 2012-11-27

Issue No.: 6
Page 4 of 4

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 Enclosure Ex [p] dem IIC T4 Ex pD II 21 T1 35°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

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 po is for use in combustible dust

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.
DI	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.
TW	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

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, RLV52, RLV75, RLV104, RLV125, RLV150 and RLV200.

The outlet of each relief valve is fitted with a spark arrester, 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. ¼" 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.

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.

- 3 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.

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

- 5 The Purge Controllers: Sub-MiniPurge, 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.

Date: 07 November 2012

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Form 9530 Issue 1

Sira Certification Service

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Date: 07 November 2012

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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:

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

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. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

12 The marking of the equipment shall include the following:

Standard versions

II 2(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(3) GD
Ex [pz Gc] IIC T6 Gb
Ex [p Dc] IIIC T85°C Db
(Ta -20°C to +55°C)

Standard /ET versions

II 2(2) GD
Ex [px] Ia IIC T6 Gb
Ex [p] Ia IIIC T95°C Db
(Ta -20°C to +55°C)

Low temperature /ET versions

II 2(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

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SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE

Sira 01ATEX1295X
Issue 8

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 unspecific 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
CHP-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, RLV52, 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

a	Size or Capacity	Model Number:
1	Sub-MiniPurge	1 X LC cs DS SS AA MO FM OA TW
2	MiniPurge	Key:
3	Super-MiniPurge	a b cc mm Example option codes
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.	
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 Teletron 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: **Ex** II 2(2) G D

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SCHEDULE

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Sira 01ATEX1295X
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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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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)

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.

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.

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.

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.

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

The use of this certificate is subject to the Regulations Applicable to Holders of Sira Certificates.

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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SCHEDULE

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.

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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

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, 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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Certificado de Conformidade

Certificate of Compliance • Certificado de Conformidade

Certificado n°: TÜV 12.1462 X
Certificate #/Certificado n°

Válido até: 28/09/2015
Validity Term/Fecha de Vencimiento

Produto:

Producto/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

N° do Relatório de Ensaio:

Test Report Number/N° 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 determinado 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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xc = Ação após purga inicial
C = Compensação de perda após purga inicial elevada
F = Fluxo contínuo (mesma vazão durante e após a purga).
F2 = Dois sistema de fluxo CF com uma taxa de purga inicial de alta apenas em um orifício.
FHP = Fluxo (mais baixo) contínuo após purga inicial elevada
P = 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 - Minip 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 - Minip 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:

- 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.
- 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.
- 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.



Certificado de Conformidade

Certificate of Compliance • Certificado de Conformidade

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- 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.



EC-TYPE EXAMINATION CERTIFICATE

- Equipment or Protective System Intended for use in Potentially Explosive Atmospheres Directive 94/9/EC
- EC-Type Examination Certificate Number: ITS10ATEX37092X Issue 3
- Equipment or Protective System: MiniPurge Interface Units
- Manufacturer: EXPO TECHNOLOGIES LIMITED
- Address: Unit 2, The Summit, Hanworth Road, Sunbury on Thames, Surrey, TW16 5DB
- This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.
- 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.
- The examination and test results are recorded in confidential Intertek Report Ref 10046284 dated September 2010 and Intertek Report Ref G101279915 dated February 2014.
- 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.
- 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.
- 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/IMO
 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
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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 the label and the general assembly drawings.

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/IMO - 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	SD7623	1	19/08/2010
MIU IECEX & ATEX Certificate Label	SD7624	1	18/08/2010
MIU User Instructions	SD7644	1	18/08/2010

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SCHEDULE

EC-TYPE EXAMINATION CERTIFICATE NUMBER ITS10ATEX37092X Issue 3

18.

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 ≤T_a ≤+60°C for MiniPurge MIU/e1 and MIU/e2 with temperature class dropped from T5 to T4.
3. Current rating for MIU/e1/MO 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

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IECEX Certificate of Conformity



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: **MIUe1 and MIUe2**
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
MIUe1/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



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



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.

IECEx Certificate
of Conformity



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 OAR number

Certificate Issue No. 2: under IECEx Report No. GR/ITS/EXT/10.0029/01, Intertek ref Project No. G101279915

IECEx updates to existing product as per previous certificate IECEx ITS 10.0003X using latest applicable standards IEC

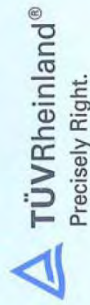
60079-0:2011, IEC 60079-7:2007 and IEC 60079-31:2008.

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

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

UNIDADE DE INTERFACE MINIPURGE

MIU/e

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 60079-7:2008,
IEC 60079-31:2008 e ABNT NBR IEC 60529:2009.

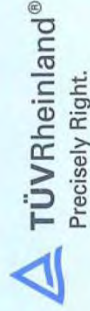
Intertek Testing & Certification Ltd.

GB/ITS/ExTR10.0029/00 de 26/08/2010.

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, 19 de Setembro de 2012.



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

Especificações:

As unidades de interface MiniPurge modelo MIU/e fazem parte de uma série de invólucros utilizados como caixas de ligação fabricados em aço inoxidável ou aço carbono modelo PE2E pela Expo Technologies Ltd (Certificado de conformidade IECEx ITS 08.0043U). O conteúdo das caixas de ligação está especificado no desenho SD7623.

As unidades de interface MiniPurge incluem três modelos de caixas de ligação:

MIU/e1
MIU/e2
MIU/e1/MO

A tensão máxima das caixas de ligação é de 400 V.

O número máximo de conectores dentro da caixa terminal:

MIU/e1 é de 18
MIU/e2 é de 33
MIU/e1/MO é de 13.

A corrente máxima para a caixa de ligação (por conector):

MIU/e1 é 7 A
MIU/e2 é 7 A
MIU/e1/MO é 6 A

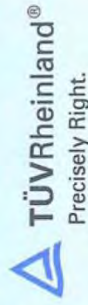
Análise e ensaios realizados:

As análises e os ensaios realizados encontram-se no relatório técnico nº AEX-13099.

Documentação descritiva do produto:

— Relatório de ensaios Intertek nº GB/ITS/ExTR10.0029/00 de 26/08/2010.

Documento	Descrição	Rev.	Data
SD7850	Minipurge Interface Unit	1	02/08/2010
SD7851	Mininuroe Interface Unit	1	02/08/2010
SD7861	MIU with Manual Override	1	02/08/2010
SD7623	MIU/e Permitted Contents	1	19/08/2010
SD7624	MIU IECEx & ATEX Certificate Label	1	18/08/2010
SD7644	MIU User Instructions	1	18/08/2010
SD7648	MIU/e TUV Certification Label	4	21/08/2012
SD7653	MIU/e Portuguese Handbook Extracts	3	21/08/2012



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_n = (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 indelevel, 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.



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 Issue No.: 0

Status: Current

Date of Issue: 2009-02-26 Page 1 of 3

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

Electrical Apparatus: Limit switch type 07-2511-.../... and type 07-2581-.../...
Optional accessory:

Type of Protection: Flameproof enclosure "d"

Marking: Ex d IIC T6

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

Position: Head of Section "Flameproof Enclosures"

Signature: (for printed version)

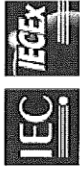
Date:

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



Downloaded from:
<http://iecex.iec.ch/iecexweb/iecexweb.nsf/certificatesAjax/IECEx20PTB2007.0045X>
The page at <http://iecex.iec.ch> says: 1. Certificates shown on this site are not required to be signed by the issuing Certifying Body because Certificates availability here is evidence of the Certifying Body's approval.



IECEx Certificate of Conformity

Certificate No.: IECEx PTB 07.0045X

Date of Issue: 2009-02-26 Issue No.: 0

Page 2 of 3

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 identified documents, was found to comply with the following standards:

IEC 60079-0 : 2004 Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
Edition: 4.0
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/EXTROS.0016/00
Quality Assessment Report:
DE/TUN/QAR06.0017/00



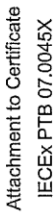
BARTEC GmbH
Max-Eyth-Straße 16
97980 Bad Mergentheim
Germany

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.

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:

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

DE/TUN/QAR06.0017/00

 $-X^{\circ}\text{C}$ to $Y^{\circ}\text{C}$

X	Y	Leitung
-25	+60	H08RN-F, A058RN-F, H07RN-F, A077RN-F, H058RN-F, A058RN-F
-40	+70	H05RN-F, A05RN-F, 0LFLEX 100, 0LFLEX 100 CY, 0LFLEX 140, 0LFLEX 140 CY, 0LFLEX 180, 0LFLEX 180 CY, NYSLYO, NYSLYO CY, LSY, LSYCY
-10	+75	LAPTHERM 105
-25	+76	4GMHG
-40	+75	H08GGF
-55	+75	RAOXX 125, RAOXX 155

T6

400 V
(depending on connection cable used)

Type 07-2511-...../....., type 07-2581-...../.....

2A 0,15 A

AC-15 DC-13

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, et cetera.

contacts provided	1 resp. 2 changeover contact(s) or
contacts provided	1 resp. 2 changeover contact(s) or

1 break contact and/or 1 make contact

1 resp. 2 break contact(s) with positive opening operation

Physikalisch-Technische Bundesanstalt (PTB)

Bundesallee 100, 38116 Braunschweig, Germany

Postfach 33 45, 38023 Braunschweig, Germany
Telephone +49 531 592-0, Telefax +49 531 592-3605



Attachment to Certificate
IECEX PTB 07.0045X



Rated thermal current:

Ambient temperature

Type 07-2511-..X0/.... (single-pole)

Type 07-2511-..XX/.... (two-pole)

≤ 60 °C 75 °C
7 A 3 A
6 A 2 A

Nomenclature

Model/type code

0 7 - 2 5 - 1 - /

Code number for range Basic range ExCo	
Code number for product area / type of construction Limit switch with protected connections (sheathed lead)	
Code number for enclosure / type of connection 1 = Width 25.5 mm; enclosure thermoplast, contact spacing 2 x ≥ 0.3 mm 8 = Width 25.5 mm; enclosure thermoplast, contact spacing 2 x ≥ 1.5 mm	
Code number for type of design 1 = Ex switch	
Code number for application features Version of contact material	
Code number for length of line 0 = Special length 1 = 1m to 9 = 9 m	
Code number for type of contact for chamber I 1 = N/C contact 2 = N/O contact 3 = Change-over contact 4 = N/C contact and N/O contact at the same voltage potential 6 = Contact with positive opening operation	
Code number for type of contact for chamber II Switching sequence Switching not defined sequence is defined	
	0 None 1 A N/C contact 2 B N/O contact 3 C Change-over contact 4 D N/C contact and N/O contact at the same voltage potential 6 Contact with positive opening operation
Code number and characteristics for variants without any effect on explosion protection	



EC-TYPE-EXAMINATION CERTIFICATE

(Translation)

- (1) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres - Directive 94/9/EC
- (2) EC-type-examination Certificate Number: **PTB 00 ATEX 1093 X**
- (3) Equipment: Limit switch, type 07-25.1-.../....
- (4) Manufacturer: BARTEC Componenten und Systeme GmbH
- (5) Address: D-97980 Bad Mergentheim
- (6) This equipment and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.
- (7) 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.
- (8) 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.

Dr.-Ing. U. Klausmeyer
Regierungsdirektor

SCHEDULE

- (13) 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_n	max.	2 A 0.15 A
Related to utilization category	AC-15 DC-13	
Rated operating voltage U_o	Type 07-2521-.../.... to 07-25221-.../....	250 V 250 V
Rated current I_n	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_n	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_n	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_n	max.	2 A 0.4 A
Related to utilization category	AC-15 DC-13	

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.

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	≤60 °C	70 °C	75 °C	90 °C
-------------	--------	-------	-------	-------

Temperature class	T6			
-------------------	----	--	--	--

Type 07-2511-...X0/... and 07-2581-...X0/...	7 A	--	3 A	--
--	-----	----	-----	----

Rated thermal current	6 A	--	2 A	--
-----------------------	-----	----	-----	----

Type 07-2511-...XX/... and 07-2581-...XX/...	T6	T5	T6	T5
--	----	----	----	----

Rated thermal current	5 A	8 A	3 A	3 A
-----------------------	-----	-----	-----	-----

Type 07-2521-...X0/...	5 A	6 A	2 A	2 A
------------------------	-----	-----	-----	-----

Rated thermal current				
-----------------------	--	--	--	--

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.

sheet 3/4

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.

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • D-38116 Braunschweig

(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. Jürg. U. Klausmaier
Regierungsdirektor

Braunschweig, December 7, 2000

sheet 4/4

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.

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • D-38116 Braunschweig

Wir

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



Endschalter

Limit switch

Fin de course

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

auf das sich diese Erklärung bezieht den Anforderungen der folgenden

Richtlinien (RL)

entspricht

**ATEX-Richtlinie
94/9/EG**

to which this declaration relates is in accordance with the provision of the following

directives (D)

**ATEX-Directive
94/9/EC**

se référant à cette attestation correspond aux dispositions des

directives (D) suivantes

**ATEX-Directive
94/9/CE**

**EMV-Richtlinie
2004/108/EG**

**EMC-Directive
2004/108/EC**

**CEM-Directive
2004/108/CE.**

**Maschinen-Richtlinie
2006/42/EG**

**Machinery Directive
2006/42/EC**

**Directive 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

et est conforme aux normes ou documents normatifs ci-dessous

**EN 60079-0:2006
EN 60079-1:2007**

**EN 61241-0:2006
EN 61241-1:2004**

**EN 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 Stelle**

**Procedure of EC-
Type Examination /
Notified Body**

**Procédure 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 Warmuth

Geschäftsleitung / General Manager



EC-TYPE EXAMINATION CERTIFICATE

Equipment or Protective systems intended for use in Potentially

Explosive Atmospheres - Directive 94/9/EC

EC-Type Examination Certificate No: FM10ATEX0003X

Equipment or protective system: Electronic Timer Module ETM-IS**_***

(Type Reference and Name)

Name of Applicant: Expo Technologies Ltd

Address of Applicant: Unit 2, The Summit
Hanworth Road
Sunbury on Thames
TW16 5DB

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

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.

The examination and test results are recorded in confidential report number:

3036907EC dated 12th November 2010

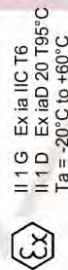
Compliance with the Essential Health and Safety Requirements, with the exception of those identified in item 15 of the schedule to this certificate, has been assessed by compliance with the following documents:

EN60079-0:2006, EN 60079-11:2007, EN 61241-0:2006 and EN 61241-11:2006

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.

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:



Mick Gower
Examination and Test Engineer
mick.gower@fmapprovals.com
2010.03.22 13:04:51 01/07

Mick Gower
Certification Manager, FM Approvals Ltd.

Issue Date: 22nd October 2013

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 868 700 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
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

d = Reference Value 1 to 9

e = Multiplying digit 1, 2, 3 or 4

The input parameters for the power supply option are:

UI = 11.1V li = 340 mA Pi = 2.613 W (non linear)

14 Special Conditions for Safe 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.

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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.)

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IEC		IECEX	
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	Issue No.:	
Status:	Current		
Date of Issue:	2013-10-22		Page 1 of 5
Applicant:	Expo Technologies Ltd Unit 2, The Summit Hanworth Road Sunbury on Thames TW16 5DB United Kingdom		
Electrical Apparatus: Optional accessory:	Electronic Timer Module		
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: 2013-10-22
 Issue No.: 2
 Page 2 of 5

Manufacturer: **Expo Technologies Ltd**
 Unit 2, The Summit
 Hanworth Road
 Slough 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 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 : 2004	Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
Edition: 4.0	
IEC 60079-11 : 2006	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition: 5	
IEC 61241-0 : 2004	Electrical apparatus for use in the presence of combustible dust - Part 0: General requirements
Edition: 1	
IEC 61241-11 : 2005	Electrical apparatus for use in the presence of combustible dusts - Part 11: Protection by intrinsic safety "ID"
Edition: 1	

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/EXTR10.0006/01	GB/FME/EXTR10.0006/02
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Quality Assessment Report:

GB/SIR/QAR07 001205



IECEx Certificate of Conformity

Certificate No.: IECEx FME 10.0001X

Date of Issue: 2013-10-22

Issue No.: 2

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Schedule

EQUIPMENT:
Equipment and systems covered by this certificate are as follows:

The ETM-1S 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

Date of Issue: 2013-10-22

Issue No.: 2

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

Addition of a new battery pack module, ETM-IS31-001. No change to the model code or protection method.



IECEx Certificate of Conformity

Certificate No.: IECEx FME 10.0001X
Date of Issue: 2013-10-22
Issue No.: 2
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Additional Information:

Electronic Timer Module ETM-ISub-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



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 Issue6.doc