

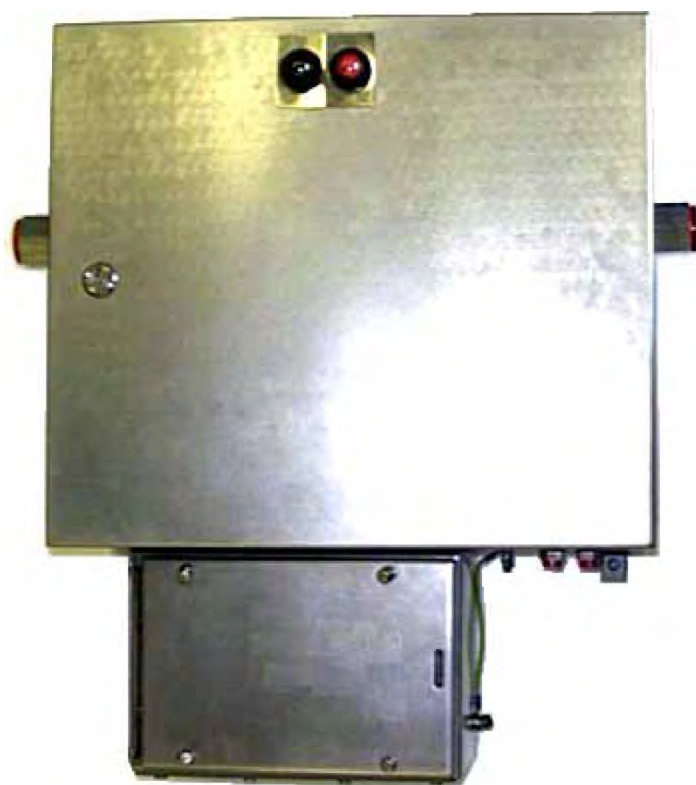


日煬科技有限公司
JD Auspice Co., Ltd



D771/ET MiniPurge® 手冊

ML 435



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重要注意事項

基於對安全性的慎重考量，安裝人員和 Expo 系統使用者都必須遵守以下指示：

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. D771 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
總吹掃流率	： 由客戶定義，包含補償洩漏的流量。
預估吹掃時間	： 由馬達製造商根據選擇的流率和馬達容積來決定。如有需要，也可透過吹掃測試來驗證預估時間。
外殼壓力	： 正常：10mbarg。(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。 ： 釋放閥開啟壓力，校準範圍 = 20 - 50 mbarg
外殼測試壓力	： 馬達測試壓力 = 釋放閥開啟壓力 x 1.5。

MiniPurge® 控制單元資料

型號	： 5XLC / ss / ET / IS / OV / PC 特別設計號碼：D771SYS
選擇碼	： IS = 本質安全電源和警報出線盒 OV = 出口閥為氣動作動 PC = 加壓外殼 (馬達) 壓力控制自動洩漏補償閥 (CLAPS 系統) ET = 經認證可用於危險地點的電子吹掃計時器
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
洩漏補償量	： 在 5 barg 入口壓力下為 1500 NI/min
洩漏過量補償量	： 額外增加正常外殼洩漏量的 40 % (最少)
外殼類型	： 不鏽鋼 316
安裝方法	： 壁掛吊帶和隔片。請參考組裝圖比對安裝孔以利安裝。
運作溫度	： -20°C 至 +55°C
供應壓力	： 乾淨、乾燥、無油的空氣或惰性氣體。壓力 5 - 16 barg (72 - 232 psig)。 備有 50 微米自動排水供應入口過濾器和 16 barg 調節器。
邏輯調節器和壓力計	： 有配備。設定為 2.3 barg (33 psig)。
處理接頭	： 吹掃供應和出口至馬達使用 1" NPT 母接頭。 最小供應管路 25 mm (1") 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) ： 系統吹掃中 (不亮 / 「黃光」)
手動 / 超控開關	： 無配備。
馬達互鎖開關	： 本質安全電路接頭的無電壓觸點
系統吹掃開關	： 本質安全電路接頭的無電壓觸點
警報觸點	： 本質安全電路接頭的無電壓觸點
中間開關	： 本質安全電路接頭的無電壓觸點
訊號接線盒	： 僅供本質安全電路使用。不鏽鋼、c/w 藍色端子、前存取蓋和下方可拆卸接頭板。
感知器 (-0, +0.7 mbar)	： 最低壓力校準範圍： 最低：0.5 mbarg 最高：5.0 mbarg 預設設定：1.5 mbarg
其他感知器 (-0, +10 %)	： 中間感知器校準範圍： 最低：2.0 mbarg 最高：10.0 mbarg 預設設定：5.0 mbarg ： 吹掃流正常設定為 6.4 mbarg ： CLAPS 感知器校準範圍： 最低：5.0 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保持 1.5 mbarg 的壓力差，而且中間感知器和 CLAPS 感知器校準點之間必須保持 2.5 mbarg 的壓力差。

例如：最低壓力 = 5 mbarg，中間壓力 = 6.5 mbarg，CLAPS 感知器 = 9 mbarg

吹掃時間：使用者可自行定義。最高可設定至 99 分鐘 (-0 +3 秒)
預設設定為 99 分鐘。

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
T_{amb} -20°C 至 +55°C

IECEX 證書： IECEX SIR07.0027X

Ex [px] ia IIC T6 Gb
Ex [p] ia IIIC T95°C Db
T_{amb} -20°C 至 +55°C

TUV INMETRO 證書： TÜV 12.1462X

Ex [px] ia IIC T6 Gb
Ex [pb] ia IIIC T95°C Db
T_{amb} -20°C 至 +55°C

若要了解使用限制和條件，請參閱本手冊頁末的適用證書。

重量

： 27kg (60lb)

釋放閥 (RLV) / 配備整合式火花抑制器的吹掃出口閥

類型	： ARV-1048-107
內徑	： 吹掃出口閥 Ø 104 mm，釋放閥 Ø 75 mm
釋放閥升起校準	： 最低 20.0 mbarg，(+0%，-20%) ： 最高 50.0 mbarg ： 預設值 30.0 mbarg
流率	： 出廠設定為 2000、3000、4000、5000 或 6000 NI/min。 ： 預設值 2000 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	： 請參考組裝圖安裝矩形斷流器並比對安裝孔以利安裝。
重量	： 7kg (15.4lb)

選配件

零件號碼	說明
KVP-N250-000	不鏽鋼關閉閥選配件，1" NPT 母接頭，散裝供貨。
/MO (盒裝)	外部手動超控開關，散裝供貨。(請參閱組裝圖 AGE-WC00-186)

2. 使用者快速指南

安裝

- 依照線路配置圖所示安裝吹掃系統。
- 務必依照本手冊「安裝系統」章節的所有指示安裝系統。
- 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。
- 強烈建議在連接至吹掃系統的空气供應上安裝局部隔離閥。

注意：大部分的故障都是起因於空氣供應受阻、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。

操作系統

- 正確安裝後就開啟空氣供應。

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

- 讓吹掃系統開始吹掃。
 - ◆ 吹掃空氣會進入外殼
 - ◆ 釋放閥內的吹掃出口閥會開啟
 - ◆ 接著空氣就會經由火花抑制器離開釋放閥外罩

指示燈	顏色	狀態
警報 / 已加壓	綠光	已加壓，外殼壓力已滿足
吹掃中	不亮	吹掃流流量太低

- 系統一旦測得足夠的吹掃空氣流，就會開始定時吹掃循環。
吹掃中指示燈閃爍「黃光」時就按下碼表。

指示燈	顏色	狀態
警報 / 已加壓	綠光	已加壓
吹掃中	黃光	吹掃流高於最低值

- 在設定的吹掃時間順利完成吹掃後，系統會顯示吹掃完成。吹掃中指示燈轉「不亮」時就停止碼表。

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

- 檢查實際記錄的吹掃時間是否符合或超過吹掃需求時間。
實際記錄的吹掃時間絕對「不可以」少於吹掃需求時間。
- 系統這時處於洩漏補償模式，並且正確運作。

如果系統沒有照預期運作，請徹底檢查安裝情況。請閱讀本手冊標題為「試運轉」的章節。

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。

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

MiniPurge® 系統的結構含有以下原料。如果周遭環境含有會對這些原料產生不良影響的物質，請諮詢 Expo 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. 操作說明和原理

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。

加壓法很簡單。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，使其內部壓力至少高於外部壓力 0.5 mbarg 以上。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就已進入外殼的可燃氣體。「吹掃中」就是使用已知無可燃氣體的空氣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，系統會自動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，來進行自動補償。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

空氣供應過濾器 / 調節器

這個單元附有一個 50 微米液體 / 粉塵過濾器元件作為預防措施。MiniPurge® 系統使用者務必確認空氣供應的品質，有確實達到安裝章節中之「空氣供應品質」段落所描述的標準。調節器的出廠設定值為 5 barg (75 psig)，其所能調節的空氣供應壓力範圍為 5 - 16 barg (75 - 240 psig) 之間。壓力計則是安裝在過濾器的下游。其上的讀數不應低於 5 barg (75 psig)。在吹掃的過程中，您可能發現到壓力降到 2.5 barg (36 psig)。

邏輯空氣供應調節器

本裝置能為系統提供持續運作的穩定邏輯壓力供應。壓力值的出廠設定值為 2.3 barg (33 psig)，這個數值可以使用總體壓力計來確認。只有在調節壓力的讀數不正確時，才需要調整這個裝置。

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：

最低壓力感知器

本裝置會持續監測 PE 的內部壓力。當壓力正確時（壓力高於最低安全操作壓力），感知器會輸出「已加壓」訊號，透過「紅光 / 綠光」視覺指示燈讓操作者了解是否可以操作。這個感知器已於出廠時經過調校，會在壓力於滿足或高於最低規定壓力的情況下降時作動。

吹掃流感知器

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（高於正確吹掃的最低吹掃流流量），感知器會傳送「吹掃中」訊號以啟動計時器開關。這個感知器已於出廠時經過調校，會在流率於滿足或高於最低規定吹掃流率的情況下降時作動。

電子吹掃計時器

當 PE 壓力正確且正確的吹掃流開始時，吹掃流感知器就會啟動計時器開關，開始電子計時器。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時間的流逝。計時指示燈的 LED 燈會在計時器計時的時候依序閃爍。LED1 會在經過時間的 0 - 25 % 時閃爍。LED2 則是經過時間的 25 - 50%。LED3 會在過程時間的 50 - 75% 時閃爍。LED4 會在經過時間的 75 - 100% 時閃爍。

計時器會在計時完成後激發本質安全電磁線圈「計時器閥」約 1 秒，進而向「吹掃完成」閥發出鎖存訊號。

「吹掃完成」閥

當吹掃計時器結束計時後，並且確認「已加壓」訊號也仍存在時，就會向「吹掃完成」閥傳送訊息。如果這兩個條件同時滿足，就會產生「吹掃完成」輸出訊號，並且傳送出去以執行以下功能：開啟加壓外殼的電力供應，關閉高吹掃流，並且開始「洩漏補償」模式。即便當吹掃計時器都已經重設完成，準備好隨時可以進行下一次的吹掃循環，「吹掃完成」閥也還是會發出等待訊號，讓系統維持在「洩漏補償」模式，並讓電源開關保持開啟。

「或」閘

這個裝置會為吹掃完成閘提供上述的等待功能。只要出現「逾時」訊號或「吹掃完成」訊號時，「或」閘就會讓引示訊號通過，使其能傳送至「吹掃完成」閘。

「只有警報」電路。

如果外殼壓力太低，系統通常就會切斷 PE 的電力。在某些當地作業規範允許的情況下，系統可以改成提供等待電路，維持加壓外殼的電力供應，另外還發出「壓力失效警報」。使用者聽聞警報作響務必有所反應，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。

馬達互鎖開關：

本開關 (250 V 4 A, DPNO Ex d) 為本質安全 (IS) 電路接頭用作簡易訊號設備的輔助開關。本開關位於同樣包含氣動作動活塞的邏輯歧管上。開關電纜末端接入「本質安全」接線盒。本開關為提供兩個獨立觸點的雙重斷路開關。這兩個觸點應以串聯連接，並且用以產生隔離電源的訊號。請參閱 D771-GA 組裝圖的系統開關位置。

警報 / 已加壓開關：

本開關 (250 V 4 A, SPNO Ex d) 為 IS 電路接頭用作警報 / 已加壓訊號設備的輔助開關。如同馬達互鎖開關一般，這個裝置同樣也由「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「本質安全」接線盒。請參閱 D771-GA 組裝圖的系統開關位置。

系統吹掃開關 (選購件)：

本開關為選購件，係由「吹掃流」訊號所作動的 250 V 4 A, SPNO Ex d 裝置，可以為遠端電力系統狀態指示燈提供顯示「系統吹掃中」(有時稱為吹掃處理中) 的功能。另外也是 IS 電路接頭用作簡易訊號設備的輔助開關；開關電纜末端接入「本質安全」接線盒。

中間開關：

本開關 (250 V 4 A, SPNO Ex d) 為 IS 電路接頭用作簡易訊號設備的輔助開關。這個「本質安全」電源開關位於邏輯歧管外部。開關電纜末端接入「本質安全」接線盒。

- 確保這些開關只在操作參數內操作是使用者的責任。
- 開始試運轉前，請先確認 I.S 出線盒是否清潔、所有連接是否適當街上、電纜是否已正確擺放，以及所有端子的螺絲是否都已牢固地鎖緊。
- 安全地使用這些開關是使用者的責任，並且所有的電氣設備都必須符合當地作業規範。

吹掃閘：

此閘控制是否允許吹掃空氣流入 PE。根據指定的空氣供應壓力範圍、最低規定吹掃出口流率再加 10 %，還有 PE 在吹掃期間的預期洩漏率而定，吹掃閘會調整其大小，讓吹掃期間流入外殼的空氣有足夠的流量。吹掃流節流器 (球形閘體) 閘安裝在吹掃閘的上游，可以將

流限縮至所需的最低流量。本吹掃流節流器經過出廠設定，但是使用者可以視需要於試運轉時自行重新調整。吹掃循環結束時，吹掃閥會在接收「吹掃完成」訊號後關閉，並且維持關閉位置直至下一次吹掃循環開始。吹掃閥的引示訊號管路內有控制節流器，可以在下一次吹掃循環開始時，減慢其重設的速度。

CLAPS 感知器：

本感知器會監測馬達內的壓力，然後向「CLAPS 洩漏補償閥」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運轉壓力，才能將 CLAPS 感知器設定成所需等級，進而控制 CLAPS 閥。

CLAPS 洩漏補償閥 (CLAPS LCV)：

本閥會在初始吹掃完成後，控制流入 PE 的空氣流。一開始應該要先將其設定為約 50 % 開啟。吹掃完成後應該要再次調整閥孔尺寸，使外殼壓力能坐落在期望範圍，並且使釋放閥 (RLV) / 吹掃出口閥關閉。

視覺指示燈：

視覺指示燈的安裝目的是要為操作者提供本機狀態資訊：

- 「警報 / 已加壓」指示燈有兩種狀態：
 - 紅光 = 「加壓警報」(外殼壓力太低)
 - 綠光* = 「已加壓」
- 「吹掃中」指示燈有兩種狀態：
 - 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」

* 綠光和不亮的組合代表初始吹掃流程後的 PE 正常運作過程已經結束。

釋放閥 (RLV) / 吹掃出口閥

- RLV 單元可以讓吹掃空氣經由內嵌式火花抑制器，從外殼安全地排出。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。
- 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。
- 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預設差壓來完成。
- 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最大值上升時，內部外殼的壓力不會超過 PE 的規定最大工作壓力。

「本質安全」出線盒：

「本質安全」的出線盒內含警報和互鎖電路的端子連接點。其上提供的所有觸點皆為無電壓式 (乾式)。電纜接入方法 (如：導管或接頭) 應符合 IEC / 歐洲或其他相關的當地規範，並且建議至少要維持 IP54 的異物防護等級。請參閱 AGE-WC00-164 組裝圖的端子配置。

6. 安裝系統

本設備是專為在一般工業的環境溫度條件、濕度條件以及震動條件下的使用所設計。如果處在會對本設備造成壓力的非一般工業環境條件下，請在安裝本設備之前先諮詢 Expo。MiniPurge® 系統應該要根據相關標準 (如：IEC / EN 60079-14) 和 / 或任何有效的當地作業規範來進行安裝。

空氣供應品質

MiniPurge® 系統應連接至適於吹掃和加壓的保護性氣體供應。MiniPurge® 的供應管路接頭為 1" NPT(F)，但是供應管路應根據空氣供應的最大輸入吹掃流率調整尺寸，並應將壓力調節為 6 barg。流至過濾系統的空氣供應必須為乾淨、非可燃性、來自非危險場所，並且無水無油才能符合 BS ISO 8573-1:2001 2.2.1 級或相關當地標準。這就是一般所謂的「儀器空氣品質」。儘管設備會處理較低品質的空氣，進而對系統的使用壽命造成不良的影響。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： $\leq$ 0.01 mg/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標示入口壓力。

使用惰性氣體作為吹掃系統的空氣供應時，請參閱氣體使用安全的早期預警。如果有造成窒息的風險時，請參閱「應用適宜性」章節以了解處理方式。

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。

安裝位置

MiniPurge® 控制單元 (CU) 應直接安裝於 PE 馬達上或附近位置。若非安裝在 PE 上，則應挑選盡可能靠近的安裝位置。安裝位置應符合系統指示燈和認證標籤能夠迅速觀測的要求。

釋放閥

為了有效率地進行吹掃，PE 的空氣入口點和出口點通常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) 的周圍應保持最低 300 mm (12") 的間隙。

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

序號

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

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。

多層外殼

本吹掃系統不適用於多重外殼。

準備和安裝警報裝置

這個系統擁有最低壓力設定為 0.5 mbar 的最低壓力感知器。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。然後 CU 上的相關指示燈就會從紅光轉變成「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」的情況。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：警報和電源自動跳脫。
- ATEX 第三類 (第二區) 設備：壓力或流量失效時只有警報，並且以手動的方式切斷電源。

電源供應和電源隔離

所有進入 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。

例外情況

適用於危險場所其他設備電源無需再使用 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® 系統之間除了許可的「手動超控」電路之外，不可安裝任何開關。

7. 試運轉

首次試運轉。

- 只有當外殼已安裝在其永久作業位置之後，最後才能設置「CLAPS 洩漏補償閥」。
- 確認系統有依照 Expo 的指示進行安裝。
- 斷開入口至 MiniPurge® 系統的供應管路，並且根據長度計算，每一公尺都吹入至少 10 秒的乾淨空氣，以清除任何碎片、油滴和凝結水珠。

試運轉。

操作程序如下：

- 確認所有的接頭和 RLV 都已正確安裝，並且吹掃排放暢通無阻。
- 關閉吹掃流節流器閥。
- 完全開啟外部供應關閉閥 (如有安裝)。
- 確認內部邏輯壓力計的讀數為 2.3 barg / 33 psig / 230 kPag。
- 確認主要空氣供應上的壓力計讀數為 5 barg / 75 psig / 500 kPag。吹掃流會隨即開始。
- 藉由斷開從入口上的隔板接頭至 MiniPurge® 的這一段最低壓力感知「綠色」管路，確認壓力釋放閥是否已正確安裝，如此會停用所有的壓力感知器。
- 使用 4 mm 尼龍管從最低壓力感知「綠色」管路的斷開處，將壓力計連接至隔板接頭。
- 關閉吹掃流節流器閥，並且開啟通往 MiniPurge® 的壓縮空氣。接著，以極慢的速度開啟吹掃流節流器，直到壓力釋放閥開啟為止，然後檢查開啟壓力是否坐落在校準範圍內。這項測試可以多次進行以確認符合性和再現性。如果釋放閥需要重新調校，請參閱維護系統章節。
- 關閉吹掃流節流器閥，並且關閉外部壓縮空氣供應。拆下壓力計並將最低壓力感知管路重新接回隔板接頭。
- 吹掃流率的設定。開啟通往 MiniPurge® 的壓縮空氣，然後緩慢地開啟吹掃流節流器閥，直到「不亮」/ 黃光指示燈轉變成不亮 / 「黃光 (閃爍)」為止，通常此時的馬達內部壓力應該約為 13 - 16 mbarg。黃光指示燈閃爍時，就代表此時的吹掃流率正確。
- 這時的「已加壓」指示燈應為「綠光」，而且「吹掃中」指示燈應為閃爍的「黃光」。
警告：開啟吹掃流節流器閥時，請確認馬達內的超壓不會超過壓力釋放閥的設定。
- 一旦「吹掃中」指示燈開始閃爍「黃光」，吹掃計時器就會開始計時。檢查指示燈從閃爍「黃光」(吹掃中) 到變回「不亮」之間的時間延遲，是否不少於吹掃 PE 所需的最短時間。延遲的時間可以超過吹掃 PE 所需的最短時間。
- 吹掃時間結束後，吹掃閥會關閉，並且 CLAPS LCV 會控制流入外殼的空氣流。50 % 開啟的初始設定可能太高或太低。若是設定太高，就會觀察到馬達外殼壓力不斷升降的現象，因為 CLAPS LCV 會自動關閉又恢復流量。此時就應逆時針轉動調整器螺絲，調整 CLAPS LCV 以降低流入馬達外殼的流量。

- 如果初始設定太低，則 **CLAPS LCV** 和 **CLAPS** 感知器一開始會供應過高流量至馬達，致使馬達在正常運轉期間沒有容納額外補償量的餘地。這時若要增加流入馬達外殼的流量，請順時針轉動調整器螺絲來調整 **CLAPS LCV**。
- **CLAPS** 感知器的設定已於出廠時調校成馬達內的預期正常工作壓力，通常為 **10 mbarg**。馬達內的壓力應該會穩定下來，並且盡可能地接近這個數字。

額外檢查

- 在證實系統能夠正常運作後，可能還需要檢查 **MiniPurge®** 控制單元內之壓力感知器的校準。試運轉時，將壓力計連接至 **MiniPurge®** 控制單元測試點（位於最低壓力感知器上方，拔起紅色插塞並使用 **4 mm OD** 尼龍管接上）就能完成這些測試。
- 壓力下降就要進行壓力感知器的調校。
- 關閉吹掃流節流器閥，然後再緩慢地逐漸打開，直到壓力高於最低壓力感知器設定為止，此時警報指示燈就會從紅光轉變成「綠光」。緩慢地關閉吹掃流調節器閥，直到指示燈恢復紅光為止，然後記錄此時的讀數。將這個讀數拿來和「測試表、檢查表以及設定表」比對。每一次的讀數都應等同或大於表上的設定。
- **MiniPurge** 控制單元內部的所有其他壓力感知器也能執行相同的測試。
- 當所有的測試都完成後，請重置吹掃流節流器閥，然後請重設 **MiniPurge** 系統。
- 如果壓力感知器需要重新調校，請參閱維護系統章節。

一般操作

開啟或關閉空氣供應閥以啟動或停止系統。在此之後的加壓和吹掃程序完全是自動進行的。

8. 維護系統

建議的系統維護包括了以下項目，再加上任何額外由當地作業規範所強制執行的當地規定項目。

Expo 建議視作業環境每 6 至 24 個月就要進行一次試運轉測試。此外，**Expo** 另外還建議執行試運轉測試時，同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。

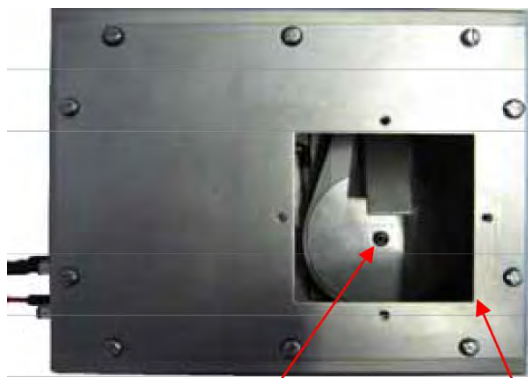
另外，**Expo** 也建議至少每兩年要額外檢查以下項目一次：

- 檢查設備是否還適用於危險地點
- 確認系統上沒有任何未經許可的修改
- 檢查空氣來源是否仍無污染
- 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就應更換一次，更換後也應進行試運轉測試。

重新調校壓力釋放閥 (如有必要)

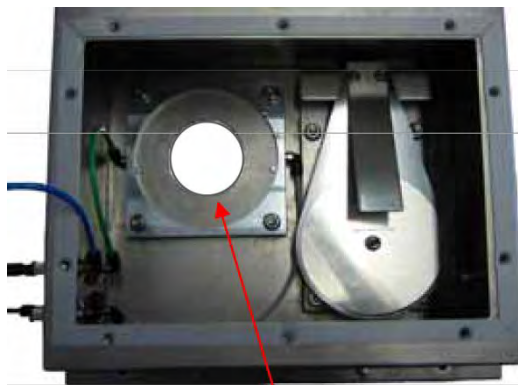
進行任何調整之前，請先確認壓力釋放閥座沒有污染或顆粒堆積的情況。若要調整超壓釋放閥的上升壓力，您會需要 8 mm 扳手和 2.5 mm 內六角扳手。先固定住中央內六角螺絲的位置，然後旋鬆固定螺帽。順時針調整內六角扳手可以增加上升壓力，而逆時針調整則可以降低上升壓力。這個調整本身非常敏感，在您熟悉這個裝置之前，建議您每次測試僅需轉動一圈半，應該就能發現明顯改變。每次測試之前，先固定調整螺絲的位置，然後重新鎖緊鎖定螺帽。

RLV 可搭配可選孔口板來設定流率。孔口板使用兩個小型 M3 螺絲安裝定位。只要拆下包含出口閥總成和螺絲的大型蓋板，就能夠輕鬆更換這個裝置。

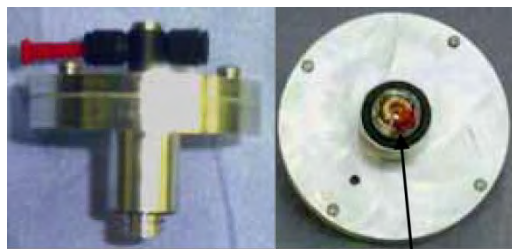


內六角螺絲和鎖定螺帽

拆下小型蓋板，然後設定
RLV 開啟壓力



孔口板



逆時針轉動拆下感知器。

黃銅噴嘴

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。這個調整本身非常敏感，在您了解調校的因果關係之前，建議轉動噴嘴僅 1 或 2 mm 即可。順時針轉動可以降低壓力設定。

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。以替換方式檢查組件，只有在確認必須更換才予以更換組件。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。

如同所有的氣動系統一般，應極力避免本系統接觸空氣中的水氣、油滴和塵土。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，塵土還是有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」章節所描述的程序就極其重要。若是沒有確實執行程序，可能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。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。

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 洩漏補償閥的設定太低，並且 PE 因為低壓而在吹掃後跳脫。

試著提高 CLAPS 洩漏補償閥的設定，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 正確運作，那麼故障位置大概就在 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，就可以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，也可以直接將手指洗插入安裝孔來達到密封的效果。這時應該就會作動閥，同時指示燈也應該轉成綠光。如果指示燈轉成綠光，就表示壓力感知器膜片很可能需要重新調校或進行更換。

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 洩漏補償閥過度開啟。請調整 CLAPS LCV。

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。

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。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。更換作業應交由受過訓練的維修工程師進行。

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。進行一次新的吹掃計時，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

S0015/026	適用 S0015/275 過濾器 / 調節器的過濾器組
S0191/025	極限開關 SPNO
S0191/026	極限開關 DPNO
S0030/606	吹掃流感知器，出廠設定值 6.4 mbarg
S0030/016	最低壓力感知器，出廠時必須設定為客戶系統測試和檢查表上的正確數值。
S0030/588	CLAPS 感知器，出廠時必須設定為客戶系統測試和檢查表上的正確數值。
ETM-IS31-001	適用於電子計時器模組的 IS 電池組

11. 組裝圖和示意圖

以下隨附的組裝圖適用於 D771 MiniPurge® 系統：

標題	組裝圖號碼
控制單元	D771-GA
典型線路配置	D771-HU
P 和 I 示意圖	D771-PI
電路圖	XBR-7TD0-038
出線盒配置	AGE-WC00-164
手動超控開關線路配置	AGE-WC00-186
尺寸 5 馬達吹掃 RLV	XBR-RTD0-009

12. 證書

請參閱附件的證書：

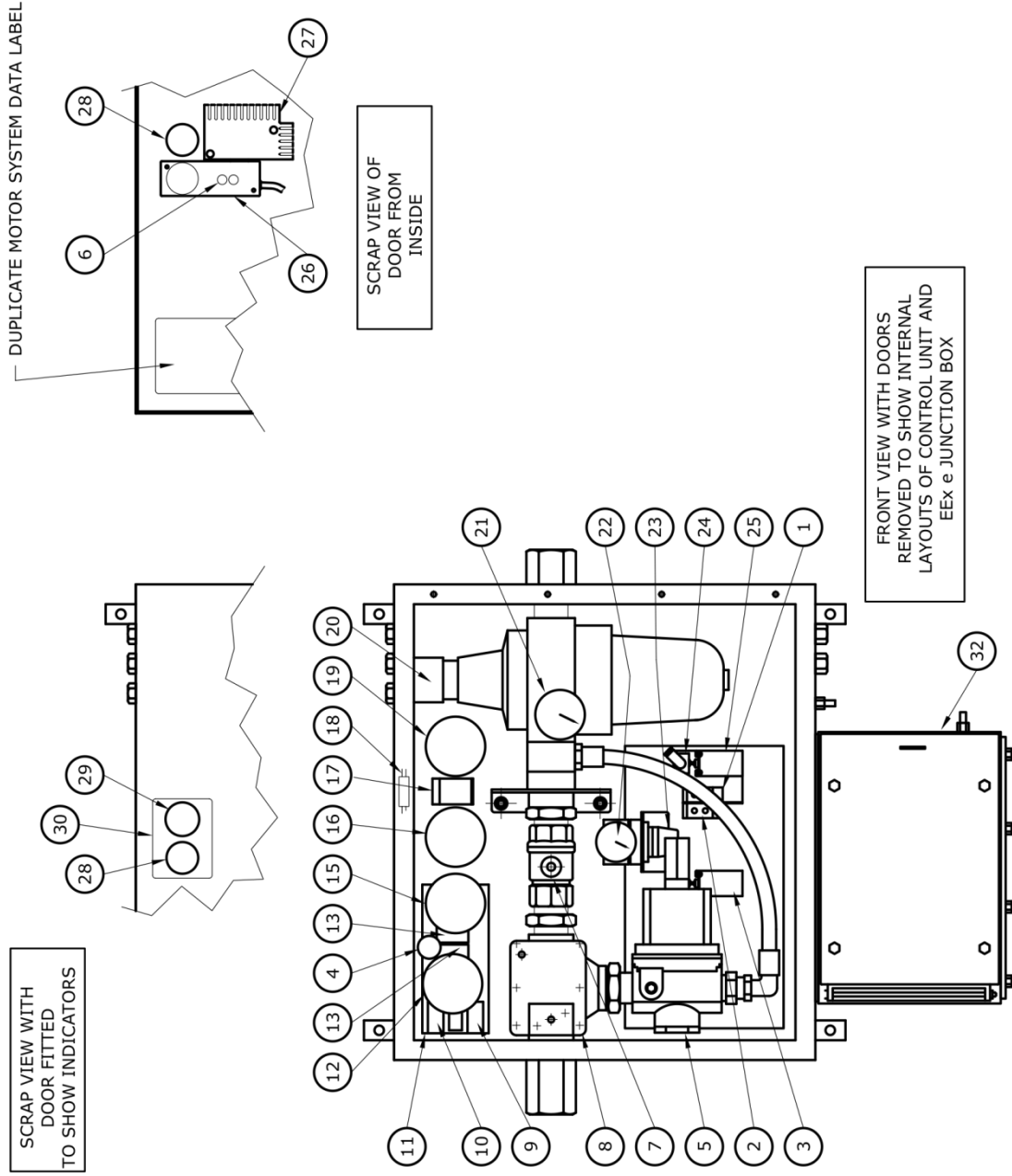
吹掃系統 IECEx 證書	IECEX SIR07.0027X
吹掃系統 ATEX 證書	SIRA 01ATEX1295X
吹掃系統 INMETRO	TÜV 12.1462X
Ex d 極限開關	IECEX PTB 07.0045X
Ex d 極限開關	PTB 00ATEX1093X + DoC No 01-2511-7C0001
電子計時器	IECEX FME 10.0001X
電子計時器	FM 10 ATEX0003X

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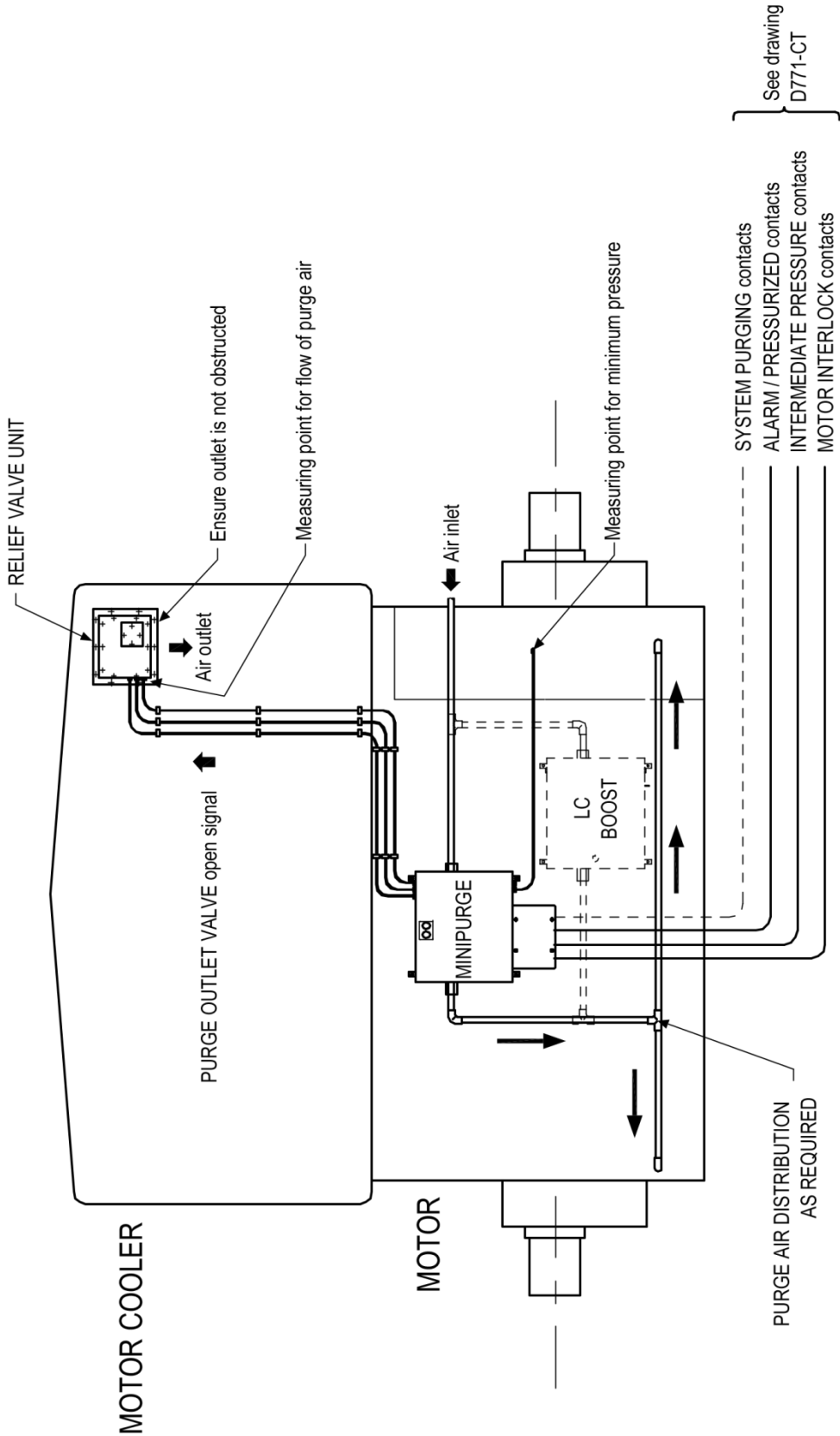


ALL BILL KHEAD FITTINGS: STAINLESS STEEL 304/316

APP'D	JpDb	ISSUE:	1	2	3	4
		MOD. No:	DRAWN	5108	5933	6238
CHK'D	JpDb	DATE:	25/2/10	14/12/10	18/9/13	9/12/14
		APPROVED:	JpDb	JpDb	SM	SM
DRWN	Nrb	DRAWING STATUS: CERT RELATED				
SEE DRAWING						
MATERIAL						
FINISH						
NROB						
TITLE						
SURREY TW16 5DB UNITED KINGDOM						
Expo Technologies Limited						
JOB No:						
(CUSTOMER:						
CONTROL UNIT						
D771-GA						
DRAWING No.						
SCALE						
NTS						
SHEET No. 1 OF 2						

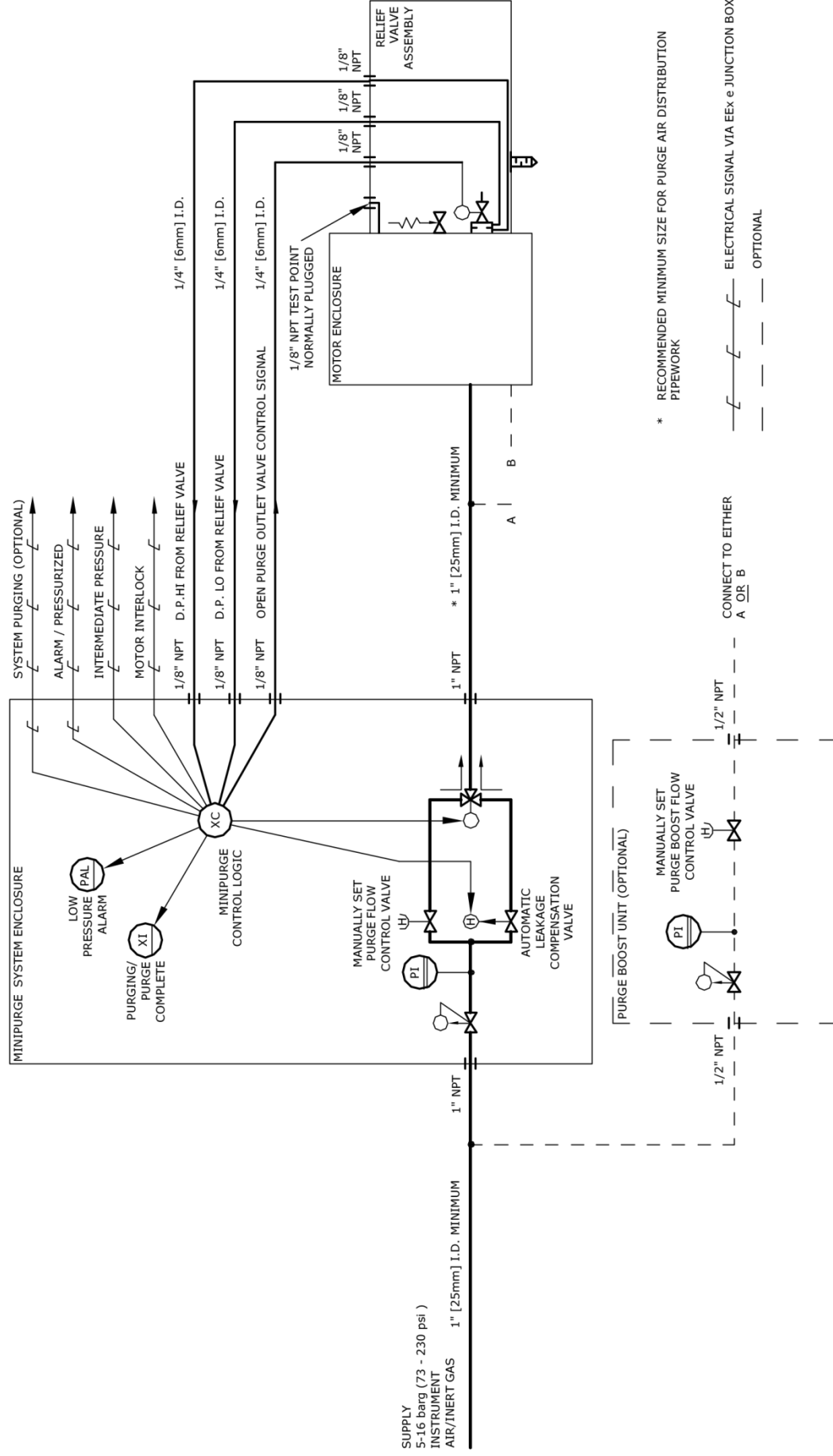


REF	PART NUMBER
1	PURGE OUTLET OPEN SIGNAL VALVE (1)
2	PURGE COMPLETE BOOST VALVE
3	SYSTEM PURGING SWITCH, 250V 4A, SPNO Ex d II (OPTIONAL)
4	TIMER SWITCH
5	LEAKAGE COMPENSATION, CLAPS VALVE
6	TIME SELECTOR SWITCHES
7	PURGE FLOW RESTRICTOR
8	PURGE VALVE
9	ALARM/PRESSURIZED SWITCH, 250V 4A, SPNO Ex d II
10	MOTOR INTERLOCK SWITCH, 250V 4A, DPNO Ex d II
11	LOGIC MANIFOLD
12	PURGE FLOW SENSOR
13	PURGE COMPLETE VALVE
14	TIMER VALVE
15	MINIMUM PRESSURE SENSOR
16	INTERMEDIATE PRESSURE SENSOR
17	PURGE OUTLET OPEN SIGNAL VALVE (2)
18	FLOW RESTRICTOR (CLAPS SENSOR SUPPLY)
19	CLAPS SENSOR
20	MAIN AIR SUPPLY FILTER/REGULATOR
21	GAUGE, MAIN AIR SUPPLY
22	GAUGE, LOGIC AIR SUPPLY
23	LOGIC AIR SUPPLY REGULATOR
24	INTERMEDIATE SWITCH ACTUATOR
25	INTERMEDIATE SWITCH, 250V 4A, SPNO Ex d II
26	ELECTRONIC TIMER
27	I.S. BATTERY PACK
28	INDICATOR, ALARM/PRESSURIZED
29	INDICATOR, SYSTEM PURGING
30	MINIPURGE DOUBLE INDICATOR LABEL
31	-
32	SIGNALS JUNCTION BOX IP64



NOTE
LC BOOST system is optional.

APP'D	JPdB	ISSUE:	1					MATERIAL	Expo Technologies Limited	SURREY KT7 0RH UNITED KINGDOM	SCALE	NTS		
	CHK'D	JP-dB	MOD. No:	DRAWN									FINISH	TITLE
		DR'WN	NRB	APPROVED:	JPdB									
DRAWING STATUS: CERT RELATED													DRAWING No. D771-HU	SHEET No. 1 OF 1
										JOB No:	CUSTOMER:			

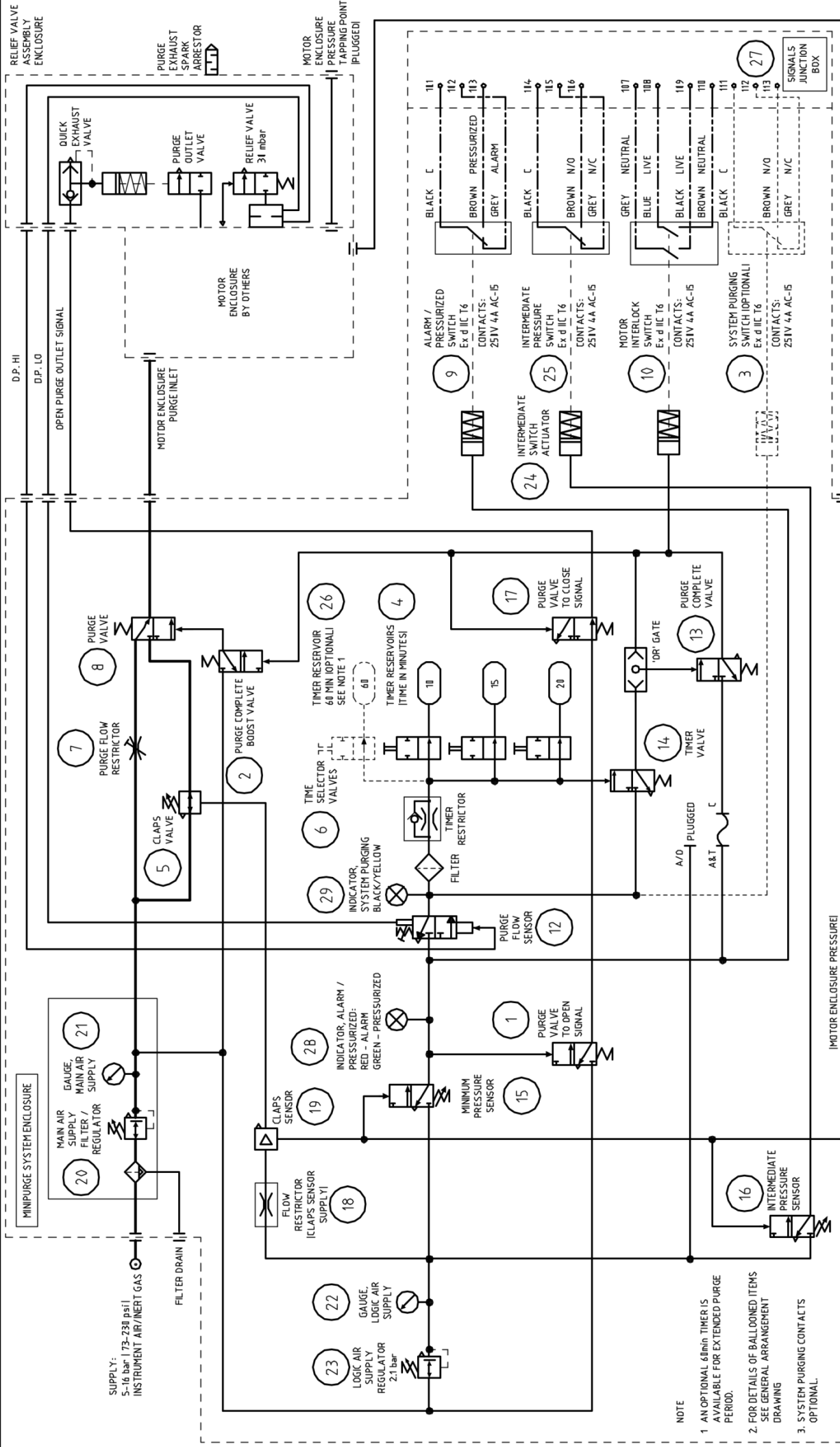
[illegible]

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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APPD	JPdB	ISSUE:	1	2	MATERIAL	SCALE
CHKD	JPdB	MOD. No:	DRAWN	4915		SURREY KIT ORH UNITED KINGDOM
DRWN	NRB	DATE:	24/2/10	4/3/10		
		APPROVED:	JPdB	JPdB		
		DRAWING STATUS:	CERT RELATED			
TITLE						CIRCUIT DIAGRAM
JOB No:						CUSTOMER:
DRAWING No.						XBR-7TD0-038
SHEET No.						1 OF 1

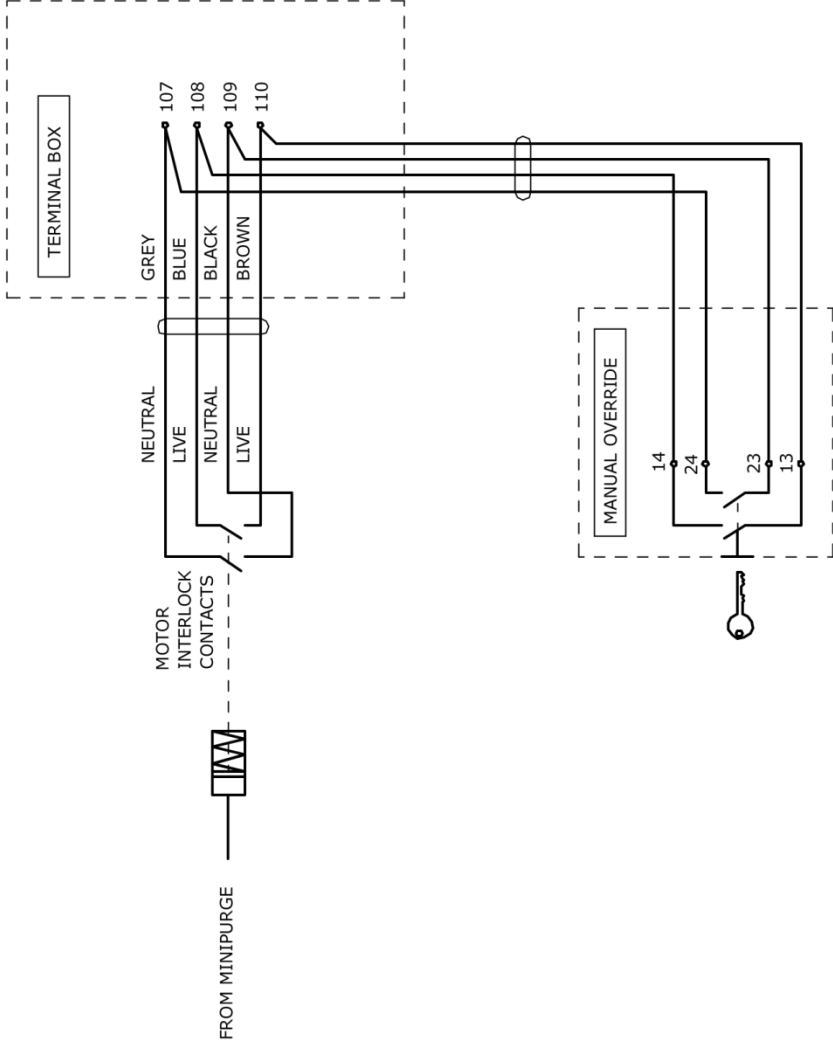


3rd ANGLE
PROJECTION

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

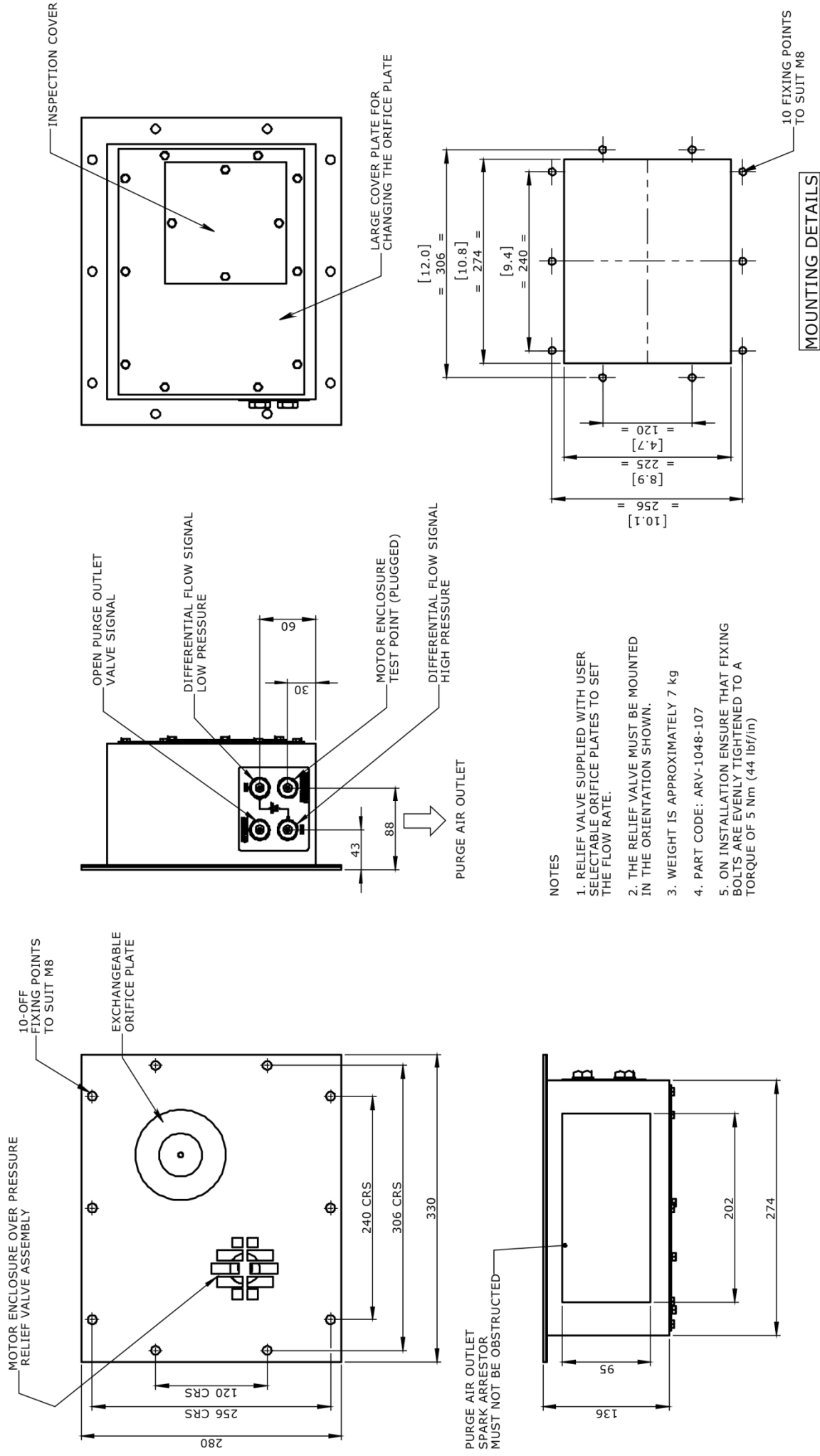
FOR USE ONLY AS PART OF AN INTRINSICALLY SAFE CIRCUIT

APP'D	JPdB	ISSUE:	1	MATERIAL	Expo Technologies Limited	SURREY KT7 0RH UNITED KINGDOM	SCALE	-
CHK'D	BRD	MOD. No:	DRAWN	FINISH	TITLE	MANUAL OVERRIDE SWITCH HOOK-UP (I.S.)	DRAWING No.	AGE-WC00-186
DRWN	NRB	DATE:	10/12/09		JOB No:		SHEET No.	1 OF 1
		APPROVED:	JPdB		CUSTOMER:			
		DRAWING STATUS:	CERT RELATED					



UNSPECIFIED	NO DEC PLACE ± 0.5
TOLERANCES	1 DEC PLACE ± 0.2
	2 DEC PLACE ± 0.1
	N 0.4mm OVER ANY 100mm LENGTH

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REV.	MOD NUMBER	APPROVED DATE	APPROVED	DRAWN DATE:	11/02/2009	MATERIAL	Expo Technologies Limited	SURREY KT7 0RH UNITED KINGDOM	SCALE 1:5	REV: 03	
	01	DRAWN	20/02/2009	JPdB	DRAWING STATUS:	production					STAINLESS STEEL 316L 1.6mm THK
		02	4666	17/04/2009	JPdB	CHK'D					
03	4793	16/10/2009	JPdB	JPdB	NRB	NAH	SIZE 5 MOTORPURGE RLV	JOB No:	CUSTOMER:	DRAWING No.	
XBR-RTD0-009											
SHEET No. 1 OF 1											



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 No.:

IECEx SIR 07.0027X

Issue No. 6

Status:

Current

Date of Issue:

2012-11-27

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 Purge Controller

Type of Protection:

Pressurised

Marking:

Standard versions:
(Ta -20°C to +55°C)

Ex [px] IIC T6 Gb
Ex [py] IIC T6 Gb
Ex [pl] IIC T85°C Db or
Ex [pz] Gc] IIC T6 Gb
Ex [p] Dc] IIC T85°C Db
Ex [px] Ia IIC T6 Gb
Ex [pl] Ia IIC T85°C Db
Ex [px] dem IIC T3 or T4 Gb
Ex [pl] IIC T200°C or T135°C Db
Ex [px] dem Ia IIC T3 or T4 Gb
Ex [pl] Ia IIC T200°C or T135°C Db

Standard/ET versions:
(Ta -20°C to +55°C)
Low temp. versions:
(Ta -50°C to +55°C)
Low temp./ET versions:
(Ta -50°C to +55°C)

Approved for issue on behalf of the IECEx
Certification Body:

C Ellaby

Position:

Deputy Certification Manager

Signature:
(for printed version)

Date:

2012-11-27

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:

SIRA Certification Service
Rake Lane
Eccleston
Chester
CH4 9JN
United Kingdom

sira
CERTIFICATION

Certificate No.:

IECEx SIR 07.0027X

Date of Issue:

2012-11-27

Issue No.: 6

Page 2 of 4

Manufacturer:

EXPO Technologies Ltd
Unit 2, The Summit
Hanworth Road
Sunbury on Thames
Surrey TW16 5DB
United Kingdom

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 60079-2 : 2007-02

Explosive Atmospheres - Part 2 Equipment protection by pressurized enclosure "p"

Edition: 5

IEC 61241-4 : 2001

Electrical apparatus for use in the presence of combustible dust - Part 4: Type of protection 'pD'

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/SIR/ExTR07.0046/00

GB/SIR/ExTR09.0021/00

GB/SIR/ExTR11.0304/00

GB/SIR/ExTR11.0003/00

Quality Assessment Report:

GB/SIR/QAR07.0012/00

GB/SIR/QAR07.0012/01

GB/SIR/QAR07.0012/04

GB/SIR/QAR07.0012/02

GB/SIR/QAR07.0012/05



IECEx Certificate of Conformity



IECEx Certificate of Conformity

Certificate No.:

IECEx SIR 07.0027X

Date of Issue:

2012-11-27

Issue No.: 6

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Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

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

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

See Annexes for more information.

CONDITIONS OF CERTIFICATION: YES as shown below:

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

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

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

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

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, 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. 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 SAJ**.

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, 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.



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 This equipment is 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:

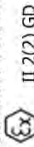
IEC 60079-0:2011 EN 60079-2:2007 EN 61241-4: 2006

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

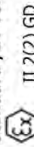


II 2(2) GD
Ex [px] IIC T6 Gb
Ex [py] IIC T6 Gb
Ex [p] IIC T85°C Db
(Ta -20°C to +55°C)



II 2(3) GD
Ex [pz Gc] IIC T6 Gb
Ex [p Dc] IIC 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 IIC T95°C Db
(Ta -20°C to +55°C)

Low temperature versions



II 2(2) GD
Ex [px] dem IIC T3 or T4 Gb
Ex [p] IIIC T200°C or T135°C Db
(Ta -50°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

13

DESCRIPTION OF EQUIPMENT

The Purge Controllers are pneumatically operated devices, which are intended to provide a given flow rate of purging gas for a predetermined time to 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

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

The MiniPurge option pD is for use in combustible dust.

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

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

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

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

Outlet Orifice - Three types of orifice are used:

- Threaded Orifices e.g. 1/4" NPT or 2" BSP with a built in spark arrestor. 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 SAJ**.

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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Model Number Designation for ATEX approved MiniPurge systems		Model Number:
a	Size or Capacity	1 X LC cs DS SS AA MO FM OA TW Key: a b cc mm Example option codes
1	Sub-MiniPurge	
2	MiniPurge	
3	Super-MiniPurge	
4	Super-MiniPurge 1800	
5	Super-MiniPurge 3500	
6	Super-MiniPurge 7000	
7	Super-MiniPurge xxxx	
b	Pressurization Type	
X	X Pressurization	
Y	Y Pressurization	
Z	Z Pressurization	
cc	Action after initial purging	
LC	Leakage Compensation only after initial High Purge	
CF	Continuous Flow (same flow rate during and after purging)	
CF2	Two Flow CF system with initial High Purge rate but only one orifice	
CFHP	Continuous (lower) Flow after initial High Purge	
DP	Dust Protection (pressurization only)	
mm	Material of the Control Unit Enclosure	
al	Aluminium alloy	
cs	Mild steel, painted	
ss	Stainless steel	
bp	Back Plate only	
co	Chassis only	
pm	Panel mounting	
nm	Non-Metallic	
Option codes (Added only if used)		
AA	Active Alarm output fitted.	
AC	Alarm cancellation circuit.	
AO	"Alarm Only" Action on Pressure or Flow Failure.	
AS	Alarm "Action on Pressure or Flow failure", Selector valve.	
CS	Containment System Monitor.	
DS	Door switch Power Interlock fitted.	
DT	Delayed Trip after Pressure or Flow failure.	
DXXX	Special design for specific flow rates	
ET	Electronic Timer	
FM	Flow Meter(s) fitted.	
HP	System LC or CF with High Pressure Sensor	
IS	Internal Switches suitable for Ex i circuits.	
MO	Manual Override fitted.	
MT	Mechanical Timer	
OA	On/Off switch controlling Protective gas and logic supply.	
OB	On/Off switch controlling logic supply only.	
OC	On/Off switch controlling Protective gas supply only.	
OS	Outlet (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:

- 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.

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

Old Name:
Expo Telektron Safety System Limited

New name:
Expo Technologies Limited

Variation 2 This variation introduced the following change:

- 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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Sira Certification Service

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SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE

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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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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.

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

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

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, CERTIFICATION

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, CERTIFICATION
Super-MiniPurge 1800/3500/7000/7000X

Applicant: EXPO Technologies Limited



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

Issue 5

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

Issue 6

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

Issue 7

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

Issue 8

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

This certificate and its schedules may only be reproduced in its entirety and without change.



Certificado de Conformidade

Certificate of Compliance • Certificado de Conformidad

Certificado n°: TÜV 12.1462 X

Certificate #/Certificado n°

Válido até: 28/09/2015

Validity Term/Fecha de Vencimiento

Produto:
Product/Producto

CONTROLADOR DE PURGA

Tipo / Modelo:
Type - Model/Tipo - Modelo

MiniPurge

Solicitante:
Applicant/Solicitante

EXPO TECHNOLOGIES LTD.
Summer Road, Thames Ditton
Surrey KT7 0RH - United Kingdom

Fabricante:
Manufacturer/Fabricante

EXPO TECHNOLOGIES LTD.
Summer Road, Thames Ditton
Surrey KT7 0RH - United Kingdom

Normas Técnicas:
Standards/Normas

**ABNT NBR IEC 60079-0:2008, ABNT NBR IEC 60079-2:2009,
ABNT NBR IEC 60079-11:2009 e ABNT NBR IEC 60529:2009.**

Laboratório de Ensaio:

Testing Laboratory/Laboratorio de Ensayo

N° do Relatório de Ensaio:

Test Report Number/N° del Informe de Ensayo

**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.**

Observações:

Notes/Observaciones

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.

Portaria:

Governmental Regulation/Regulación Oficial

INMETRO nº 179 de 18/05/2010.

Data de Emissão:

Date of Issue/Fecha de Otorgamiento

São Paulo, 28 de Setembro de 2012.

João Gustavo L. Junqueira
Gerente Técnico
Technical Manager / Gerente Técnico

Igor Moreno
Gerente de Certificação
Certification Manager / Gerente de Certificación



Certificado de Conformidade

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Especificações:

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

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

LC - Compensação de perda após purga inicial elevada;
CF - Fluxo contínuo (mesma vazão durante e após a purga);
CF2 - Dois sistemas de fluxo CF com uma taxa de purga inicial de alta apenas em um orifício;
CFHP - Fluxo (mais baixo) contínuo após purga inicial elevada.

Válvula de Alívio

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

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

Orifício de saída

Três tipos de orifício são utilizados:

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

- Furos planos no disco da válvula de alívio, dimensionados de acordo com a vazão necessária.
- Orifício substituível tipo SAU **.

Regra de formação do modelo:

Modelo: a b cc / mm / código de opções

a = Tamanho ou Capacidade
1 = Sub-MiniPurge
2 = MiniPurge
3 = Super-MiniPurge
4 = Super-MiniPurge 1800
5 = Super-MiniPurge 3500
6 = Super-MiniPurge 7000
7 = Super-MiniPurge xxxx

b = Tipo de pressurização
X = Pressurização X
Y = Pressurização Y
Z = Pressurização Z

Certificado de Conformidade

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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

xc = Ação após purga inicial
C = Compensação de perda após purga inicial
levada
F = Fluxo contínuo (mesma vazão durante
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
levada
JP = Proteção contra poeira (somente pressurização)

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.

Certificado de Conformidade

Certificate of Compliance • Certificado de Conformidade

Certificado nº: TÜV 12.1462 X

Certificate #/Certificado nº

Válido até: 28/09/2015

Validity Term/Fecha de Vencimiento

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 2 de 2	Outlet Valve Circuit N/O	2	15/03/2007
SD7531	1	Outlet Valve Circuit N/C	1	15/03/2007
SD7532	1	Minipurge type "Z" or "Y" Leakage Compensation	2	09/07/2007
SD7533	1	Minipurge type "Z" or "Y" Continuous Flow	1	15/03/2007
SD7535	4	Minipurge, Dust Protection schematic	2	14/11/2011
SD7535	1	RLV Configurations	1	05/07/2007
SD7536	1	Spark arrestor	1	15/03/2007
SD7538	1	Differential Flow Monitor	1	18/04/2007
SD7500	1	CF Outlet Orifice	1	27/03/2007
SD7537	3	Outlet Orifice Closure Device	1	25/04/2007
SD7536	2	Minipurge Fault Evaluation	1	20/02/2007
SD7282	2	Alternative Z&Y LC system	1	09/07/2007
SD7913	1	Minipurge data sheet	5	14/11/2011
SD7914	1	Minipurge electronic timer	2	17/12/2010
SD7914	1	Minipurge HP sensor	2	14/12/2010
SD7649	2	Minipurge TÜV Certification Label	6	26/09/2012
SD7652	12	Minipurge Portuguese Handbook Extracts	4	25/09/2012



Certificado de Conformidade

Certificate of Compliance • Certificado de Conformidade

Certificado nº: TÜV 12.1462 X
Certificate #/Certificado nº

Válido até: 28/09/2015
Validity Term/Validade de Vencimento

Marcação:

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

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

Versão com opção ET

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

Observações:

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



Certificado de Conformidade

Certificate of Compliance • Certificado de Conformidade

Certificado nº: TÜV 12.1462 X
Certificate #/Certificado nº

Válido até: 28/09/2015
Validity Term/Validade de Vencimento

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

Histórico:

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



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:

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:
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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/IECTR09.0016/00

Quality Assessment Report
DE/TUN/QAR06.0017/00



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):

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STANDARDS:

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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/ExTR09.0016/00

Quality Assessment Report:
DE/TUN/QAR06.0017/00



Attachment to Certificate
IECEx PTB 07.0045X



Applicant: BARTEC GmbH

Electrical Apparatus: Limit switch of types 07-2511-...../..... and 07-2581-...../.....

Description of equipment

The limit switch of types 07-2511-...../..... and 07-2581-...../..... 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.

Encapsulated cables are used for connection.

Technical data

Ambient temperature range: -X °C to Y °C

Leitung	
X	Y
-25	H05RN-F, A05RN-F, H07RN-F, A07RN-F, H05RR-F, A05RR-F
-40	H05VV-F, A05VV-F; 0,1 FLEX 100, 0,1 FLEX 100 CY, 0,1 FLEX 140, 0,1 FLEX 140 CY, 0,1 FLEX 160, 0,1 FLEX 160 CY, NYSLYO, NYSLYCY, LSTY, LSTCY
-10	+75 LAPP THERM 105
-25	+75 4GMF4G
-40	+75 H05GG-F
-55	+75 RADOX 125, RADOX 155

Temperature class: T6

Rated insulation voltage up to

400 V

(depending on connection cable used)

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

Rated operational voltage U_o

400 V

250 V

Rated current I_o max.

2 A

0,15 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, et cetera.

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 +49 531 592-3805



Attachment to Certificate
IECEX PTB 07.0045X



Rated thermal current:

Ambient temperature

Type 07-2511-..X0/...., 07-2581-..X0/.... (single-pole)

Type 07-2511-..XX/...., 07-2581-..XX/.... (two-pole)

≤ 60 °C
7 A
6 A

75 °C
3 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 (sheath 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 sequence is not defined	
	0 None 1 A 2 B 3 C 4 D 6	
	Code number and characteristics for variants without any effect on explosion protection	

Physikalisch-Technische Bundesanstalt (PTB)

Bundesallee 115, 38116 Braunschweig, Germany
Postfach 33 45, 38003 Braunschweig, Germany
Telephone +49 531 692-0, Telefax +49 531 592-5605



EC-TYPE-EXAMINATION CERTIFICATE

(Translation)

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

(3) EC-type-examination Certificate Number:

PTB 00 ATEX 1093 X

(4) Equipment: Limit switch, type 07-25.1-.../....

(5) Manufacturer: BARTEC Componenten und Systeme GmbH

(6) Address: D-97980 Bad Mergentheim

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

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

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

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

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

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

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

II 2 G EEx d IIC T6 or T5

Zertifizierungsstelle Explosionsschutz

Braunschweig, December 7, 2000

By order

Dr.-Ing. U. Klausmeyer

Regierungsdirektor

Sheet 1/4

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

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

SCHEDULE

(13)

(14) EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 1093 X

(15) Description of equipment

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

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

Technical data

Rated insulation voltage U_i up to 500 VRated operating voltage U_o Type 07-2511-.../.... and type 07-2581-.../....Rated current I_e max. 2 A 250 V 0.15 A

Related to utilization category AC-15 DC-13

Rated operating voltage U_o Type 07-2521-.../.... to 07-25221-.../....Rated current I_e max. 5 A 250 V 0.4 A

Related to utilization category AC-15 DC-13

Rated operating voltage U_o Type 07-2521-.../....Rated current I_e max. 2 A 250 V 0.4 A

Related to utilization category AC-15 DC-13

Rated operating voltage U_o Type 07-2521-.../....Rated current I_e max. 2 A 250 V 0.4 A

Related to utilization category AC-15 DC-13

Rated operating voltage U_o Type 07-2521-.../....Rated current I_e max. 2 A 250 V 0.4 A

Related to utilization category AC-15 DC-13

★ depending on connecting cable used

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

Sheet 2/4

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

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

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

Temperature class T6

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

Rated thermal current

7 A -- 3 A --

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

Rated thermal current

6 A -- 2 A --

Temperature class

T6 T5 T6 T5

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

Rated thermal current

5 A 8 A 3 A 3 A

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

Rated thermal current

5 A 6 A 2 A 2 A

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

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

Nominal conductor cross section 2 to 8 x 1.5 mm²

(16) Test report PTB Ex 00-10203

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 falsified copies shall not be used to support a claim by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

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(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. JIng. U. Klausmeier
Regierungsdirektor

Braunschweig, December 7, 2000

(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 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 falsified copies shall not be used to support a claim by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

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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.: 2

Status: Current

Issue No. 2 (2013-10-22)

Issue No. 1 (2013-1-30)

Issue No. 0 (2010-11-5)

Date of Issue: 2013-10-22

Page 1 of 5

Applicant: Expo Technologies Ltd

Unit 2, The Summit

Hamworth Road

Sunbury on Thames

TW16 5DB

United Kingdom

Electrical Apparatus: Electronic Timer Module

Optional accessory:

Type of Protection: Intrinsic Safety

Marking: Ex ia IIC T6 Ga

Ex iaD 20 T95°C

Ta= -20°C to +60°C

Approved for issue on behalf of the IECEx Certification Body: Mick Gower

Position: Certification Manager

Signature: _____

(for printed version)

Date: _____

1. This certificate and schedule may only be reproduced in full.

2. This certificate is not transferable and remains the property of the issuing body.

3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:



FM Approvals Ltd

1 Windsor Dials

SL4 1RS Windsor

United Kingdom



IECEx Certificate of Conformity

Certificate No.: IECEx FME 10.0001X

Issue No.: 2

Date of Issue: 2013-10-22

Page 2 of 5

Manufacturer: Expo Technologies Ltd

Unit 2, The Summit

Hamworth Road

Sunbury on Thames

TW16 5DB

United Kingdom

Additional Manufacturing location (s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and 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

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

<http://iecex.iec.ch/iecex/iecexweb.nsf/certificatesAjax/IECEx%20FME%2010.0001X...> 23/10/2013



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

Page 5 of 5

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



EC-TYPE EXAMINATION CERTIFICATE

- 1 Equipment or Protective systems intended for use in Potentially Explosive Atmospheres - Directive 94/9/EC
- 2 EC-Type Examination Certificate No: FM10ATEX0003X
- 3 Electronic Timer Module ETM-IS**-*
- 4 Name of Applicant: Expo Technologies Ltd
- 5 Address of Applicant: Unit 2, The Summit, Hanworth Road, Sunbury on Thames, TW16 5DB

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

7 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

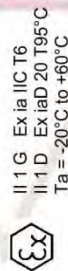
8 Compliance with the Essential Health and Safety Requirements, with the exception of those identified in Item 15 of the schedule to this certificate, has been assessed by compliance with the following documents:

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

9 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.

10 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.

11 The marking of the equipment or protective system shall include:



Mick Gower
certification manager, FM Approvals Ltd.
2013.10.22 13:08:47 +0100

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
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F ATEX 020 (May/12)

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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.

For light alloy enclosures, materials shall not contain, by mass, more than 7.5% in total of magnesium, titanium and zirconium. Where more than 10% in total of aluminium, magnesium, titanium and zirconium the user shall take special precautions to avoid ignition hazard due to impact or friction.

15 Essential Health and Safety Requirements:

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

16 Test and Assessment Procedure and Conditions:

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

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

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

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

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F ATEX 020 (May/12)

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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 25th 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 18th October 2013 Description of the Change: Addition of ETM-IS31-001 battery pack module. (This corresponds to a $\neq$3. No change to the model code.)

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

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F ATEX 020 (May/12)

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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