March 2024

Advancing Safety and Sustainability Standards with Trane® Technologies

The HKSAR Government plans to introduce an Ozone Layer Protection (Amendment) Bill in 2024, phasing down hydrofluorocarbons (HFCs) due to safety and environmental concerns. In parallel, Trane is revolutionizing the operational excellence of chiller plants by utilizing its innovative TruSense® RMWH Refrigerant Monitor, to enhance chiller safety and sustainability.

Government Initiatives to Safeguard the Earth and Chiller Operations

The Government of the Hong Kong Special Administrative Region (HKSAR) intends to introduce into the Legislative Council a bill to amend the Ozone Layer Protection Ordinance (Cap. 403) through its Environmental and Ecology Bureau (EEB) in 2024. The purpose is to regulate and phase down the production and consumption of HFCs in Hong Kong. Commonly used as refrigerants in air-conditioning and refrigeration equipment, HFCs are a category of greenhouse gases that can cause climate change, with global warming potential (GWP) of up to 14,800 times that of carbon dioxide.

Previously, as part of the local government's heightened effort to protect the Earth that we all live in, the EEB had filed a Consultation Document to Regulate and Phase Down Hydrofluorocarbons last July, stating that any person who allows or causes any scheduled refrigerant to be released into the atmosphere without valid due diligence defense is criminal and may face a fine of up to HK$100,000.

Internationally, Standard 15 of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) requires that each refrigeration machinery room shall contain a refrigerant leak detector that can actuate an alarm and mechanical ventilation. Accordingly, the Architectural Services Department of Hong Kong issued in 2022 a General Specification for government buildings, stipulating that any plant room with central refrigeration facilities must have a detection and alarm system.

Revolutionizing Plant Safety Inspections with Trane® Technologies

In line with the HKSAR Government's regulatory initiatives, Trane Hong Kong, a climate innovator and leading provider of heating, ventilation, and air-conditioning (HVAC) systems, offers TruSense® RMWH Refrigerant Monitor leveraging innovative Trane® technologies, for the Hong Kong market.

- **Continuous Auto-Monitoring of Leakage for Safety**

The TruSense® RMWH Refrigerant Monitor is a smart auto-monitoring system that continuously tracks the content of designated gases in the air to detect leaks of refrigerants in a mechanical room, including those that are harmful to the environment and costly to replace. By providing early warning alarms, the monitor enables chiller operators to react promptly and prevent further loss and potential harm.

Fully compliant with ASHRAE's Standard 15 safety requirements, our TruSense® RMWH monitor can trigger visual and audible alarms both inside and outside of the refrigeration machinery room, activating mechanical ventilation, and minimizing risks to people and the environment. This thus helps maintain a safe and healthy indoor environment for chiller plants. The monitor's advanced features make it an essential tool for chiller plant operators who value safety, efficiency, and sustainability.

- **Unparalleled Reliability, Sensitivity, and Versatility**

TruSense® RMWH is exceptionally reliable and sensitive. It utilizes a photoacoustic infrared sensing technology to continuously monitor and detect refrigerant concentrations down to 1 part per million (ppm) in the surrounding air, well below the threshold perceptible to humans.

Moreover, the monitor is remarkably versatile, featuring a comprehensive library that covers not only traditional refrigerants, such as R22, R123, R134a, R410A, and R407C, but also new-generation low-GWP refrigerants including R514A, R1233zd, etc. Our monitor is field-selectable, allowing for simultaneous real-time monitoring of up to six different refrigerants.

The release of high-GWP refrigerants poses hazards not only to the environment but also to human safety, as these colorless and odorless gases in high concentrations can cause health problems such as breathing difficulties, headaches, loss of consciousness, or even death. Therefore, implementing a highly reliable and efficient refrigerant monitor that can quickly identify and eliminate potential safety hazards is essential for ensuring a safe workplace and protecting the environment.

- **Superior Connectivity with BASs and User-Friendly Design**

TruSense® RMWH Refrigerant Monitor can activate mechanical ventilating systems while triggering alarms in case of a refrigerant leak. During this process, it can seamlessly integrate with building automation systems (BASs), through the BACnet, Modbus, or 4-20 mA Analog communications protocol, to ensure the utmost safety and communication efficiency.

The RMWH monitor is compact and user-friendly, designed for easy installation and integration into existing chiller plants. Its 7” touch screen interface displays real-time refrigerant sampling status and provides access to calibration mode, event logs, settings, and diagnostics. The monitor has a green LED operation indicator that lights up when powered on, confirming proper function.

Application of TruSense® RMWH Monitor in Hong Kong

Trane’s TruSense® RMWH Refrigerant Monitor has gained recognition and adoption in various iconic buildings in Hong Kong, such as Landmark, Alexandra House, and St. George’s Building in Central, as well as Tuen Mun Hospital and The Hong Kong University of Science and Technology, to name a few. With these buildings having adopted the best industry practices for prioritizing the safety of both chiller plant operators and building occupants, the stakeholders of many other buildings are set to follow suit.

The buildings mentioned above have chosen our TruSense® RMWH monitor mainly for its capabilty of simultaneously safeguarding multiple chillers that adopt different types of refrigerants. Moreover, by implementing our highly reliable and sensitive TruSense® RMWH monitor, the building owners can also effectively avoid penalties associated with refrigerant leaks and asphyxiation hazards.

In conclusion, by launching the ASHRAE-compliant TruSense® RMWH Refrigerant Monitor, the ideal solution for attaining the utmost safety and sustainability of air-conditioning and refrigeration systems, Trane fully supports the local government in protecting the environment and chiller plant safety.

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2024 年 3 月

特靈®科技提升安全及可持續發展標準

香港特區政府擬於 2024 年度引入《保護臭氧層（修訂）條例草案》，旨在減少製冷劑氫氟碳化物（HFC）的使用，以應對有關的安全及環保問題。於此同時，特靈憑藉其創新的 TruSense® RMWH 製冷劑監測儀幫助業界提升冷水機的安全性及可持續運作，從而全面改革並達致冷水機房的卓越營運。

政府的環保及冷水機安全保障措施

香港特別行政區（特區）政府環境及生態局計劃於 2024 年向立法會提交條例草案以修訂《保護臭氧層條例》（第 403 章），務求管制和削減 HFC 在香港的生產與使用。HFC 常用作空調及製冷設備的製冷劑，是一類會導致氣候變化的溫室氣體，其全球變暖潛能值（GWP）可比二氧化碳高 14,800 倍。

此外，環境及生態局早前於 2023 年 7 月提交了一份有關管制及削減氫氟碳化物的諮詢文件，此乃本港政府為全力保護人類共同生活的地球而採取的另一措施。該文件建議任何人若容許或令致任何受管制製冷劑釋放至大氣中，而沒有有效的盡職免責辯護，即屬違法，最高可處罰款 100,000 港元。

在國際上，美國供暖、製冷及空調工程師學會（ASHRAE）所發布的「標準 15」要求每個製冷設備機房均應安裝可啟動警報及機械通風的製冷劑檢漏儀。據此，香港建築署於 2022 年發出適用於政府物業的《一般規範》，當中規定任何中央製冷機房必須配備偵測及警報系統。

以特靈®科技革新機房安全巡檢

為了與香港特區政府的規管措施看齊，作為溫控系統創新者及供暖、通風和空調（HVAC）系統的領先供應商，特靈香港已於本港市場推出採用創新特靈®科技的 TruSense® RMWH 製冷劑監測儀。

- **持續自動監控洩漏以確保機房安全**

TruSense® RMWH 製冷劑監測儀是一個智能自動監測系統，可透過持續檢測空氣中指定氣體的含量，偵測出機房內製冷劑（包括對環境有害及昂貴的製冷劑）發生洩漏的情況，並透過觸發早期警報，使冷水機組操作員能夠迅速採取應對措施，防止產生進一步的損失及潛在危害。

我們的製冷劑監測儀完全符合 ASHRAE「標準 15」內的安全規定，可觸發機房內外的視像及聲音警報，並啟動機械通風，將對人員及環境的風險降至最低。因此，該監測儀有助維持安全健康的室內冷水機房環境，它的先進功能使其成為重視安全、效率及可持續性的冷水機房營運者的必備工具。

- **無可比擬的可靠性、靈敏度及多用途**

TruSense® RMWH 監測儀的可靠性及靈敏度相當出色。它使用光聲紅外感測技術，能夠連續監察並探測到周圍空氣中濃度低至百萬分之一（ppm）的製冷劑，而這遠低於人類可以感知的閾值。

此外，該監測儀有多種用途，全面支持不同的製冷劑，除了傳統的製冷劑（例如 R22、R123、R134a、R410A 及 R407C），還可以監測新一代低 GWP 製冷劑，包括 R514A 及 R1233zd 等。我們的監測儀允許同時及實時監控多達六種不同的製冷劑，用戶可因應現場需要而選擇。

釋放 GWP 高的製冷劑對環境及人類安全均有害，原因是這些無色無味的氣體在高濃度下可引致呼吸困難、頭痛、昏迷甚至死亡。因此，安裝可靠、高效的製冷劑監測儀以便快速識別及消除潛在安全隱患，對於確保工作場所安全及保護環境而言至關重要。

- **卓越的 BAS 連接及用戶友好型設計**

TruSense® RMWH 製冷劑監測儀可啟動機械通風系統，並在製冷劑氣體洩漏時觸發警報。在此過程中，它可以透過 BACnet、Modbus 或 4-20 mA 模擬通信協定，與樓宇自動化系統（BAS）無縫連接，以確保實現最高的安全性及通訊效率。

RMWH 監測儀在設計上的特點是外形小巧且對用戶友好，可輕鬆安裝並與現有冷水機房連接。7 英寸的觸控式顯示屏可即時顯示製冷劑採樣狀態，方便用戶進入校準模式、事件日誌、設置及診斷介面。監測儀上面的綠色 LED 操作指示燈在通電時會亮起，確認功能正常。

TruSense®監測儀在本港的應用

特靈 TruSense® RMWH 製冷劑監測儀已獲得業界認可，並應用於香港多個標誌性建築，例如位於中環的置地廣場、歷山大廈和聖佐治大廈，以及屯門醫院和香港科技大學等等。隨著這些建築物採用了業界最佳實踐來優先保障冷水機房營運者及建築物使用者的安全，許多其他建築物持分者亦準備仿效。

上述各建築物之所以選擇我們的 TruSense® RMWH 監測儀，主要因為它能夠同時守護採用不同類別製冷劑的多台冷水機。此外，透過安裝特靈可靠性及靈敏度極高的 TruSense® RMWH 監測儀，建築物業主們亦能有效地避免遭致與製冷劑洩漏及窒息危險有關的處罰。

因此，特靈透過推出符合 ASHRAE 標準的 TruSense® RMWH 製冷劑監測儀，這個可最大程度提升空調及製冷系統安全性及可持續性標準的理想方案，全力支持香港政府實行環保及冷水機房安全措施。

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