



GLACIÄR MIDI

EN 378 COMPLIANCE GUIDE

Use for compliance with EN 378:2016+A1:2020,
Refrigerating Systems and Heat Pumps Safety and Environmental Requirements

SIMPLY RELIABLE REFRIGERANT GAS DETECTORS

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GLACIÄR MIDI



Depending on the gas used, the dangers presented by leaking refrigerant can include asphyxiation, oxygen depletion, flammability and toxicity. Measures to mitigate these risks are defined within refrigeration safety standards. In Europe, the standard to follow is EN 378, Refrigerating Systems and Heat Pumps – Safety and Environmental Requirements. Of the four parts of EN 378, the one detailing the requirements around refrigerant gas detection is EN 378-3:2016+A1:2020, Installation Site and Personal Protection.

What does EN 378 state?	How do we apply GLACIÄR MIDI?
<p>EN 378-1, Section 3.7.9, defines the practical limit:</p> <p><i>“Concentration used for simplified calculation to determine the maximum acceptable amount of refrigerant in an occupied space”</i></p> <p>This is generally the level at or under which refrigerant gas detectors must trigger an alarm.</p> <p>The practical limits for each refrigerant are defined in EN 378-1 Annex E.</p>	<p>GLACIÄR MIDI is designed for refrigeration applications and has sensors available for refrigerants that can detect at levels below the practical limit.</p>
<p>EN 378-1, Annex C, deals with the allowable charge in refrigeration or air-conditioning system based on toxicity, flammability, and oxygen displacement. The standard sets limits that can only be exceeded, according to Section C.3.2.1, if measures are taken:</p> <p><i>“The appropriate measure shall be ventilation (natural or mechanical), safety shut-off valves and safety alarm, in conjunction with a gas detection device.”</i></p>	<p>Gas detection is specifically called out as a requirement for systems with a large charge of refrigerant that could leak into an enclosed space.</p> <p>GLACIÄR MIDI has sensors available that can detect toxic refrigerants, flammable refrigerants, and other refrigerants that can displace oxygen and cause a risk of asphyxiation. It is suitable for all refrigeration applications.</p>

What does EN 378 state?	How do we apply GLACIÄR MIDI?
<p>Section 9.1 of EN 378-3 states that:</p> <p><i>"When the concentration of the refrigerant can exceed the practical limit in accordance with EN 378-1:2016+A1:2020, Annex C, detectors shall at least actuate an alarm and in the case of a machinery room the emergency mechanical ventilation."</i></p>	<p>Detectors are configured with pre-set alarm thresholds that are below the practical limit for the target gas.</p> <p>GLACIÄR MIDI has multiple outputs (relays dedicated to the alarm thresholds, Modbus, analogue output) that are easily integrated so they can be used to actuate 3rd-party alarms directly or via control systems. These outputs can be also used to actuate mechanical ventilation.</p>
<p>Section 9.2 of EN 378-3 states that:</p> <p><i>"At least one detector shall be installed in each machinery room, or the occupied space being considered."</i></p>	<p>GLACIÄR MIDI has an IP67-rated enclosure, and an operating temperature range of -40°C - +50°C. This means it is suitable for installation in all typical refrigeration applications and locations.</p> <p>Airflow should be considered when selecting where to install the detector(s), along with proximity to the most likely source of a leak.</p>
<p>EN 378-3, Section 9.3.1, states:</p> <p><i>"Any suitable detector may be used and shall give an electrical signal at the pre-set value of the refrigerant or oxygen concentration (the pre-set value) that activates the shut-off valves, the alarm system, the mechanical ventilation or other emergency controls."</i></p>	<p>GLACIÄR MIDI has multiple outputs (relays dedicated to the alarm thresholds, Modbus, analogue output) that are easily integrated so into control systems, allowing the to be used to activate shut-off valves, alarm systems, mechanical ventilation, and other emergency controls.</p>
<p>EN 378-3, Section 8.3, states:</p> <p><i>"The alarm system shall warn both audibly and visibly such as both a loud (15db(A) above the background level) buzzer and a flashing lamp. For a machinery room the alarm system shall warn both inside and outside the machinery room. The alarm outside the machinery room may be installed in a supervised location. For an occupied space, the alarm shall warn at least inside the occupied space."</i></p>	<p>GLACIÄR MIDI includes high-intensity LEDs to provide a visual alarm indication.</p> <p>The on-board outputs (relays dedicated to the alarm thresholds, Modbus, analogue output) can be used to actuate audible alarms.</p> <p>Connectivity to control systems allows for an alarm to be actuated at a supervised location.</p>
<p>EN 378-1, Section 5.1, categorises locations and determines where the regulations apply.</p>	<p>Although EN 378-1, Section 5.1.1 states that machinery rooms shall not be classified as an occupied space, machinery rooms are clearly called out in the text on EN 378-3 as requiring refrigerant detectors.</p> <p>Cold rooms are explicitly highlighted in EN 378-1, Section 5.1.1, within Access Category C - Authorised Access.</p> <p>This clarifies that both machinery rooms and cold rooms have a requirement for refrigerant leak detection where the practical limit could be surpassed.</p> <p>GLACIÄR MIDI is suitable for use in both environments.</p>

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<p>EN378-3, Section 9.3.1, states:</p> <p><i>"Detectors shall be continuously monitored for functioning. In the case of a detector failure, the emergency sequence should be activated as if refrigerant had been detected."</i></p>	<p>GLACIÄR MIDI has a dedicated fault relay. This relay is standardly configured as fail-safe. In the event of any failure or issue with correct functioning, this can be used to trigger the emergency sequence.</p>
<p>EN 378-3, Section 9.3.1, states:</p> <p><i>"An appropriate maintenance period shall be established for each type of detector used."</i></p>	<p>GLACIÄR MIDI has a service counter that will provide an indication - via the dedicated app or digitally via Modbus - when service and maintenance is required.</p>
<p>EN 378-3, Section 9.3.1, states:</p> <p><i>"Oxygen deprivation sensors shall not be used for indicating refrigerant leaks."</i></p>	<p>Refrigerants are directly detected by GLACIÄR MIDI, there is no reliance on oxygen deprivation.</p>
<p>EN 378-3, Section 9.4, states:</p> <p><i>"The installation of the detector shall allow access for checking, repair or replacement by an authorized person."</i></p> <p><i>"The detector shall be installed so its function can be verified easily."</i></p> <p><i>"The detector shall be protected to prevent tampering or unauthorised resetting of the pre-set value."</i></p>	<p>GLACIÄR MIDI is designed for easy maintenance. A self-test function allows for a simple check of all functions.</p> <p>Calibration can be easily performed via Bluetooth® with the dedicated app, or via Modbus, with the appropriate calibration gas.</p> <p>Sensor modules can be easily replaced as an alternative to performing calibration, or when a sensor's lifetime has expired.</p> <p>Pluggable screw terminals are easily removed for a straightforward manual check of all connections.</p> <p>GLACIÄR MIDI has no open-access HMI, restricting the ability to tamper or re-set alarm thresholds.</p>

More information
about **GLACIÄR MIDI**

