

Measure, analyze, and optimize

A connected solution dedicated to improving
refrigeration installation performance

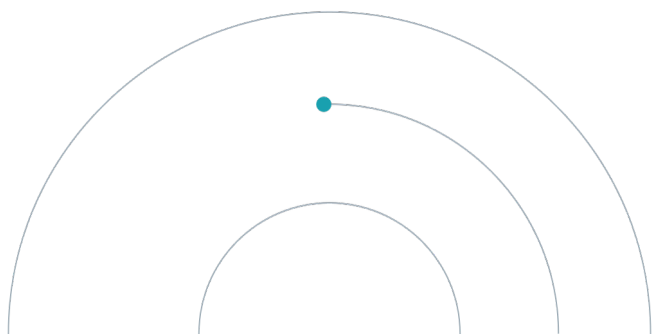
Version 2 - Oct 2025

Matelex Comprehensive Supervision



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Who are we ?

Matelex is one of the latest acquisitions of the DEHON group, which has been operating in the refrigeration sector for over 150 years. Matelex offers a remote monitoring solution dedicated to improving the performance and reducing the environmental impact of refrigeration installations.

A solution for monitoring and optimizing your refrigeration systems

Matelex solutions transform the management of your refrigeration systems thanks to an integrated, intelligent approach.

Our innovative duo of PolarBox and PolarVisor offers advanced real-time supervision of your equipment. PolarBox accurately collects and reports operating data, while PolarVisor, via its dedicated web platform, gives you access to a complete view of your plant's performance, including instant alerts in the event of a detected refrigerant leak and customized recommendations for optimizing efficiency.

This combination not only enables you to monitor your installations remotely, but also to analyze every parameter in detail, so as to anticipate potential problems and maximize the durability of your refrigeration systems.



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The Matelex range

Our range

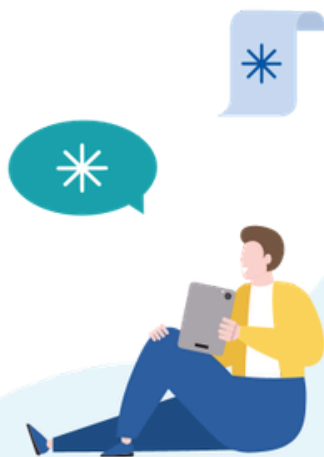
Thanks to remote supervision, you can monitor the operation of your installations, their energy consumption and detect leaks on your entire equipped fleet.

Matelex equipment is among the so-called "expert" systems, capable of learning the normal operation of a refrigeration plant, based on the IOT principle, in order to then identify potential drifts.

The internet of things (IoT) is based on the principle of collecting, exchanging and analyzing data using sensors, software and other integrated technologies. With measurements taken every 5 seconds, our systems provide complete, continuous monitoring, enabling plants to be controlled according to their actual operation, adjusting settings in real time and monitoring performance for optimum efficiency.

THE MATELEX SOLUTION CONSISTS OF 3 ESSENTIAL ELEMENTS :

- **The PolarBox**, which completes your refrigeration system and enables measurements to be taken and transmitted.
 - **The PolarVisor supervision platform** : used to view data originating from the equipment (level curves, alerts, reminders, advice), and remotely manage the equipment.
 - **A services package** including tailored training modules, to support you from setting up the solution to operating it. Our support services are available to refrigeration engineers as well as our end users.
-  The **DNI**, the first generation of on-site measurement equipment, is no longer available for sale. However, we continue to provide the relevant after-sales service. Please note: DNI units are compatible with the PolarVisor remote monitoring system and must be connected to it.



Equipment: monitoring installations

Measuring for better management: that's the underlying principle of the Matelex solution, by providing information on how the refrigeration units are actually running, to optimise their operation

Suitable for all types of HP fluid tanks (vertical, horizontal, inclined, etc.), Matelex equipment goes beyond mere monitoring: it provides guidance, alerts and operator advice for improving performance, and reducing the environmental impact of the refrigeration installations.



PolarVisor Web App



Energy modules



PolarBox

Remote monitoring and leak detection

PolarBox: new-generation equipment

The PolarBox is a remote monitoring system including a leak detection module using indirect measurement methods. This expert system analyzes and understands the operation of refrigeration plants, particularly variations in refrigerant level, and then alerts you in the event of an anomaly. A column dedicated to tank level measurement, coupled with pressure and temperature measurements, enables the equivalent of 24 leak detections per day.

Tested in supermarkets and hypermarkets, the Matelex solution delivered refrigerant savings of up to 80%* compared with traditional methods.

Two types of alarms for quick reaction and curves for investigation :

- **Statistical alarm:** a reference level is set after a learning period. Real-time analysis then triggers an alarm as soon as the fluid level falls below this level. Sensitivity is remotely adjustable.
- **Low level alarm:** set by the operator according to the low level in operation, it is triggered automatically if the fluid level falls below the set threshold for a set period of time.
- **Email alert** when an alarm is triggered, with estimated leak rate and remaining quantities.
- Detailed and historical **level curves** in web mode, with customized filters.

Connectivity :



Ready-to-use connection
Independent of site network



PolarBox

Where applicable, installing a leakage detection system such as the PolarBox can halve the frequency of periodic leak checks, in accordance with Regulation (EU) 2024/573.

*Savings made possible by early detection of the algorithm, Ademe study of 6 negative and positive refrigeration plants in supermarkets over 6 months.



Remote monitoring and leak detection

PolarBox: a new generation of equipment

The PolarBox is the new generation of Matelex equipment dedicated to remote monitoring and optimization of refrigeration plant operation. With increased computing power and new functionalities, the PolarBox simplifies the management of a fleet of installations.



The PolarBox offers the following new features :

- Option of monitoring up to 4 refrigeration units with one piece of equipment
- Single outdoor temperature measurement via wireless unit
- Simplified RJ45 wiring, and POE power supply
- New remote configuration graphic interface, in real time
- Built-in 4G connectivity, independent from the customer network, remote antenna for isolated environments
- Tablet type mobile screen usable on any PolarBox
- Adjustable electronics, boosted computing power
- Additional data acquisition (heat recovery, condenser cooling, temperature, pressure, overheating, discharge, LP, etc.)

Connecting the [PolarBox](#) to [PolarVisor](#) gives you access to data from your equipment, as well as alerts, tips and reminders.



Hardware

List of hardware supplied by Matelex, and information on additional components to provide.

PolarBox

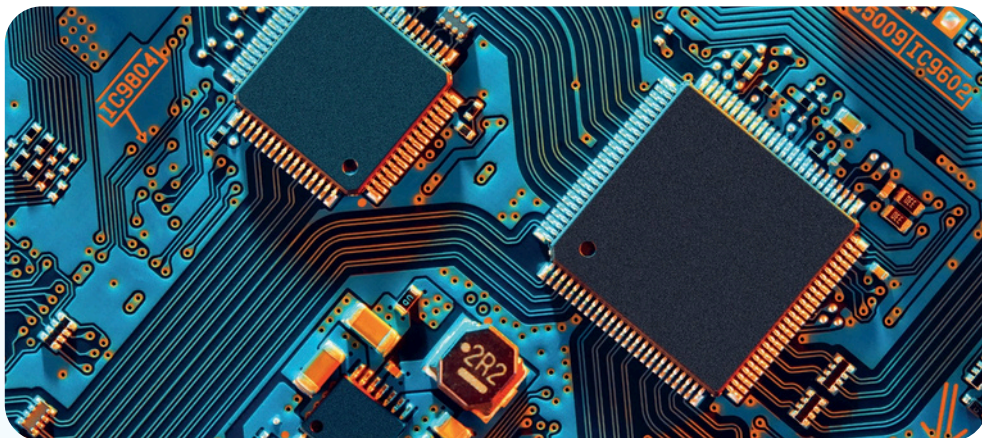
- Controller
- Strain Gauge
- Measurement card
- GPIO/relay module
- Switch + power supply
- HP and LP transmitters
- Temperature sensors

Monitor energy and COP

- Energy module
- Intensity transformers

Customize your solution

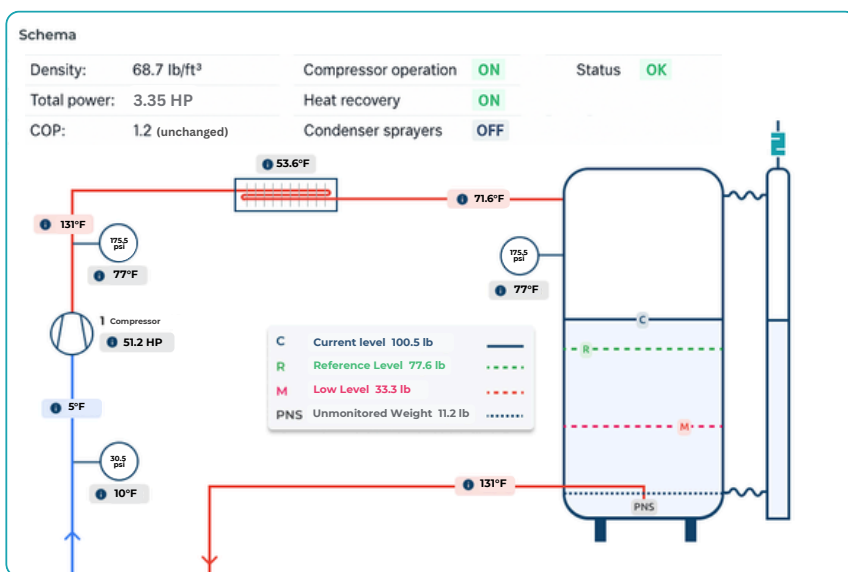
- Display
- Outdoor temperature sensor
- Remote tank sensor
- 5-metre remote antenna



ADDITIONAL INFORMATION TO BE PROVIDED

Our system requires the manufacture of a liquid column adapted to the installation geometry. Its manufacture is entrusted to the installer, who must provide the following items (non-exhaustive list) :

- 2 m of copper tube, $\varnothing$ 1" 5/8 copper plugs, $\varnothing$ 1" 5/8
- 1 collar, $\varnothing$ 1" 5/8
- 2 x 1/4" or 3/8" hoses (length according to layout – at least 50 cm)
- 2 brazed connectors for connecting the hoses
- Various connectors for connecting the hoses to the tank
- 1.5 mm² stainless steel cable



COMPLETE INSTALLATION MANUAL

In order to make the electrical connections required to operate the PolarBox, the installer must check the size of the cables used and the conformity of the electrical installation.

A FULL INSTALLATION MANUAL IS AVAILABLE ON THE MATELEX WEBSITE



[Download installation manual](#)

This instruction manual has been designed to help you install and commission our solutions professionally and independently. Following the steps described in this manual is essential for optimum PolarBox operation.



Energy monitoring

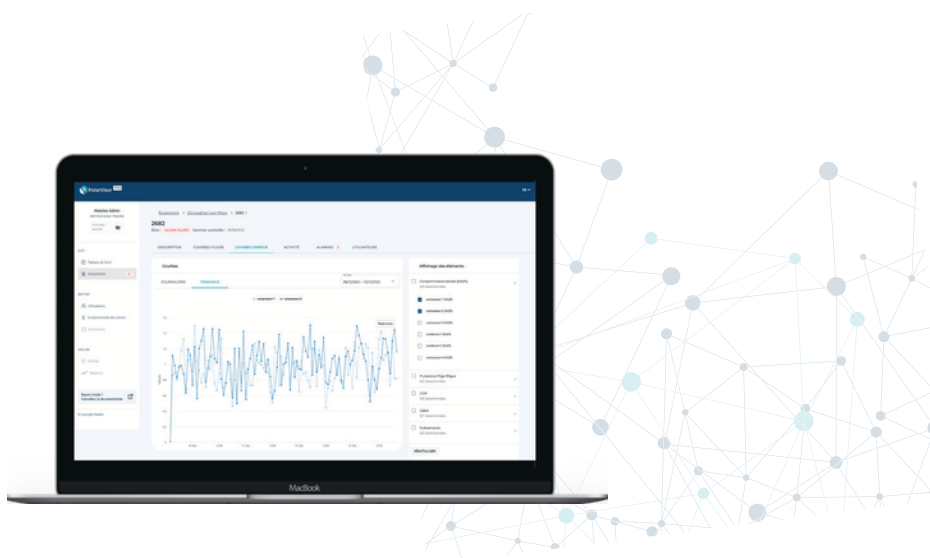
Refrigeration installations are big energy consumers. Their consumption can be reduced primarily by monitoring the operation of the installation's motors.

To better understand these consumption levels, Matelex provides installation operators and owners with monitoring curves, plotted using data measured by the energy module. These curves, with their histories, are accessible from the PolarVisor web interface.

Custom filters can be used to monitor daily consumption, or over a set period, and display the cooling capacity, as well as the actual performance coefficients measured.

This information is rounded off by alerts and advice, thereby making it simple to reduce installations' energy consumption.

In France, the energy module addresses the ambitious challenges of the French Tertiary Sector Decree, which as of 2030 imposes a 40% energy reduction on buildings measuring more than 1000 m².



Installations underfilled with refrigerant are more energy-consuming. The right fluid charge helps ensure optimal unit operation.

Energy modules

The Energy Module measures the electrical power consumed by compressor(s) and condenser fans, as well as by circulation pumps for indirect systems.

The energy module is configurable from the PolarBox, and it is possible to connect up to 36 inputs. These power measurements can be used to calculate the installation's actual COP, as well as its instantaneous cooling capacity.

If connected to PolarVisor, PolarBox and its energy module can provide a set of alerts and advice dedicated to optimising installation performance.

- ✓ Energy consumption monitoring with trend curves
- ✓ Energy drift alerts
- ✓ Compressor operation monitoring: start-up frequency, running time (short cycles)
- ✓ Compressor failure alerts
- ✓ Technical alerts and configuration
- ✓ Real-time enthalpy diagram



THE COMPLETE "ENERGY MODULE" PRODUCT SHEET
IS AVAILABLE ON THE MATELEX WEBSITE

[View product data sheet](#)



PolarVisor web Interface

A supervision web platform in your pocket.

Connect your installations and remotely monitor them, wherever you are.

PolarVisor analyses the data originating from the equipment, and gives you access to new indicators: alerts, reminders, advice, etc. Prioritise your operations, and avoid wasted journeys, the Matelex web platform monitors your installations, and more.

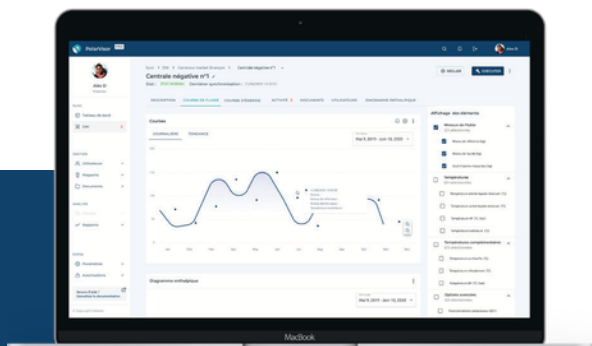
- Remote monitoring web platform, accessible 24/7, on PC, tablet or smartphone
- **Dashboard for the supervised fleet**, helping you prioritise operations
- **Alerts** : leak, energy deviation, risk of compressor failures, technical failures, etc.
- Access fluid level curves, histories and custom filters
- Complete installation log, including incidents
- **Remote alarm management** : sensitivity setting, clearance, recalculating the reference level, etc
- Advice: improving performance and optimisation
- Automatic updates and **secure back-ups** (FR hosted)
- Full technical support, with remote video guidance
- **Easy access** to annual inspection certificates and online help

PolarVisor keeps an eye on your installations, and makes managing them simpler!

Connect your PolarBox :



Ready-to-use connection
Independent of site network



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Using PolarBox

Alarm operation

The PolarBox is an expert system capable of learning the normal operation of a plant, and then identifying potential deviations. This learning process determines a reference level. If the fluid falls below this reference level, a **statistical alarm** is sent by e-mail.

A **low-level alarm** is also available. It is triggered as soon as the fluid level falls below the set threshold.

Alarm management

As soon as a leak is detected, PolarVisor alerts the operator by e-mail, notification or SMS, providing an estimate of the current leak flow rate and information on the applicable requirements.

The alarm management and sensitivity settings are made from the PolarVisor interface. The **Standard sensitivity values are :**

- -5 for above-zero units
- -3 for below-zero units



IF YOU WISH TO CHANGE THESE SENSITIVITIES,
PLEASE CONTACT TECHNICAL SUPPORT

[Contact technical support](#)

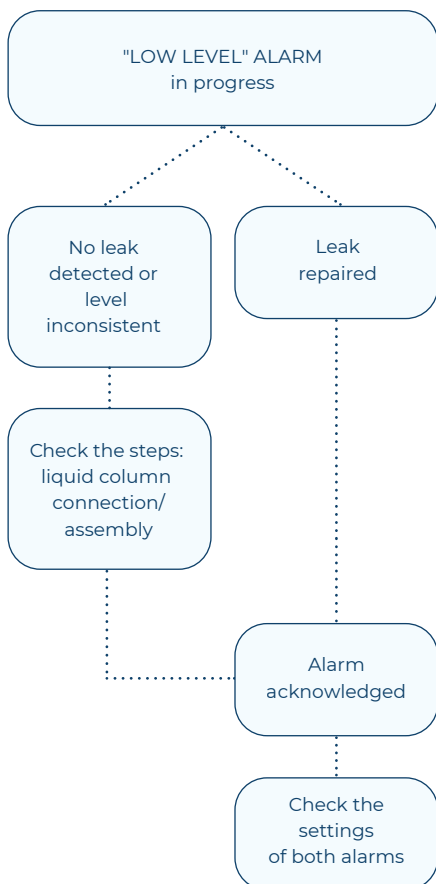
Events, including alarm details and trend curves, are available on PolarVisor



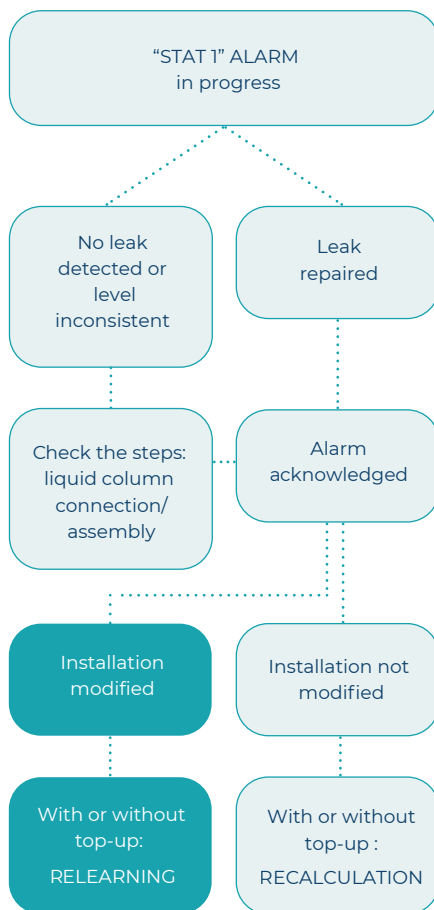
How to react to an alarm ?



LOW LEVEL ALARM



STATISTICAL ALARM



Reminder: any suspected refrigerant leak should be followed by a leak search using a direct method (portable detector, foaming product, etc.), in line with applicable national requirements (in France, within 12 or 24 hours depending on the charge).

Where applicable, installing a leakage detection system such as the PolarBox can halve the frequency of periodic leak checks, in accordance with Regulation (EU) 2024/573.



Good practice

- Regularly check the reference level and low level on PolarVisor; they should be fairly close to the refrigerant level in order to better identify leaks (it is advisable not to exceed a 10% difference).
 - The low level alarm must be set to avoid false alarms when the level is too high. However, if the level is too low, leaks may not be detected in time.
 - Similarly, the delay time must be short enough to trigger the alarm quickly in the event of a leak. However, it must not be too short to avoid false alarms.
- ✓ Choose a higher alarm level with a longer delay to avoid false alarms while ensuring rapid leak detection.
- Alarms can be acknowledged remotely or directly from the PolarBox.
- Refills can be reported on PolarVisor or directly from the equipment.
- A minimum charge of 30% of the tank volume is required to ensure the proper functioning of the installations and optimize leak detection.

Ensure the long-term reliability of your installation: annual inspection and updates

Matelex's teams are responsible for monitoring and improving the features in PolarBox and energy module. These connected smart systems must be regularly updated and undergo an annual inspection, in accordance with current regulations.



Leak sensors annual inspection

For equipment subject to Article 6 of Regulation (EU) 2024/573, leakage detection systems must be checked at least once every 12 months to ensure their proper functioning.

To perform this annual inspection :

→ **Solution's measurement chain replaced by the refrigeration engineer.**

Matelex offers a maintenance kit ensuring the precision of the measurements taken and analysed by the PolarBox, comprising:

- *A strain gauge*
- *An installation procedure*
- *A measurement card*

The annual inspection kit supplied to you was calibrated by the Matelex workshop. Replacement of old measurement chain components by the calibrated kit follows the standard exchange principle. So your package contains a **return slip valid for two months**, enabling you to return replaced components. For unreturned components, you will be charged a non-return fee.

[Look up the procedure](#)

What are the risks in case of missing an annual inspection ?

The annual inspection of permanent leak detection systems is an integral part of the installation owner's obligations. Operators must be able to demonstrate that the required inspections have been carried out and that the systems are functioning properly.

Failure to comply with these requirements may result in enforcement measures by the relevant national authorities.



Equipment not connected to the PolarVisor interface : some information

There are several connection options available. If none of these options are suitable, the hardware will operate locally and in restricted mode without Internet connection.

Using non-connected equipment will limit your alarms reception and management, and will entail rigorous on-site monitoring to carry out repairs within the times set by the regulations.

In addition, not having a connection to PolarVisor will deprive you of any option of real-time remote supervision of your installed fleet.

You can connect your hardware to PolarVisor at any time, following the procedure available from the [Matelex resources centre](#)

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Matelex Support

Matelex support

Matelex offers a collaborative approach going beyond supplying the hardware, supporting its partners throughout the solution's life cycle.

On-site Technical Days combining theory & practice

Newly recruited or promoted technicians require a skills transfer based on the solutions, which may prove complex to organise, depending on current workload. So Matelex has developed a one-day training package to enable these players to upskill quickly, and in a focused way

Open for up to 8 participants, this day will cover the following themes:

- > Intro to the solution: main principles
- > Step-by-step installation and commissioning :
 - *Determining the branches to use, manufacturing the column, connecting the column*
 - *How to tare, installing and calibrating temperature sensors*
 - *Wiring, alarm settings*
- > Working and optimising with the solution:
 - *Presentation of PolarVisor*
 - *Connecting to PolarVisor, connecting and configuring the energy modules*
 - *How to react to an alarm, or connection loss*
 - *Annual maintenance*



The training material will be issued at the end of the session.



Remote technical support for repairs

While the solutions are supplied with the documentation required for repairs to run smoothly, depending on the operative's expertise, some additional support may prove necessary. Hence MATELEX has developed a remote assistance package for guiding and supporting operatives step-by-step, all the way to acceptance of the repair.

This step-by-step guide covers the following steps:

- Assembling and connecting the column
- Electrical connection
- Calibration of temperature probes, pressure transmitters, and strain gauges
- Configurations (sensitivity, alarms)
- Physical and technical verification of the installation, based on the information available on PolarVisor
- Support for handling operations
- Validation of equipment commissioning and connection to the PolarVisor platform



The technical hotline
available **5d/7d** offers
additional support on:

01 43 98 76 63

info@matelex.dehon.com

Specific further training modules (remote)

Matelex solutions are above all designed to assist the refrigeration engineer partner in their everyday work. They provide real-time access to a set of information, processing which will help improve the installation performance, but also facilitate its organisation.

To help its partners maximise the benefits obtained from employing its solutions, Matelex offers 2-hour further training modules, which are

on a pick-and-choose basis, and on the following themes:



Installation, configuration and commissioning



Alarm management and use



Interpreting data reported on PolarVisor to improve installation diagnostics



Manage a fleet of installations with PolarVisor: prioritize and prepare site interventions

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Regulations

Regulations

Regulatory obligations: operators and owners of installations

Refrigeration systems are pressure vessels containing refrigerants, some of which are fluorinated greenhouse gases. They are subject to regulations at both European and national level.

Definition: method of indirect measurement

European regulations provide a common regulatory framework, while additional requirements may be defined at national level. In France, for example, the Order of 17 July 2019 amending the Order of 29 February 2016 defines indirect leak detection based on measurement. [Article 3 states that “An indirect leak detection method is based on the analysis of at least one of the following parameters:](#)

- a) Pressure
- b) Temperature
- c) Compressor current
- d) Fluid levels
- e) The volume of the replenished quantity. »

What are the benefits?

Indirect measurements enable continuous monitoring of facilities by analysing several parameters in real time. This approach complements periodic checks with constant monitoring, thereby offering a more rapid response in the event of a problem. It minimises the risk of business disruption or financial loss by quickly detecting anomalies and enabling a swift response.

Furthermore, thanks to connectivity with online platforms such as PolarVisor, they facilitate remote monitoring whilst complying with regulatory requirements. Where applicable, installing a leakage detection system doubles the interval between periodic leak checks, in accordance with Regulation (EU) 2024/573. Real-time trend graphs and detailed historical data also help the user monitor whether the installation remains leak-free and complement, remotely, the verification of repairs, which must still be carried out by a certified person.

Matelex equipment analyses operating pressures, temperatures, liquid levels and the volume of the replenished quantity using the replenishment reports and level curves available on PolarVisor. The Energy module measures the current drawn by the compressors, as well as their start-up frequency and operating time.



Leakage checks and regulatory requirement: 500 tonnes of CO₂ equivalent

Installing a fixed leak detection system doubles the interval between periodic leak checks, in accordance with European Regulation (EU) 2024/573 (F-Gas III), applicable since 11 March 2024.

Stationary refrigeration, air-conditioning and heat pump equipment containing 500 tonnes of CO₂ equivalent or more of fluorinated greenhouse gases listed in Annex I, or 100 kg or more of fluorinated greenhouse gases listed in Section 1 of Annex II (e.g. HFOs), must be fitted with a permanent leak detection system.

Periodic leak checks must be carried out by certified personnel. Their frequency depends on the refrigerant charge (in tonnes of CO₂ equivalent, or in kilograms for gases listed in Section 1 of Annex II) and on whether a leak detection system is installed.

Refrigerant category	Refrigerant charge	Inspection frequency	
		With a permanent leak detection system	Without a permanent leak detection device
HFC, PFC, SF6 HFC-HFO blends	5 t CO ₂ eq. ≤ charge < 50 t CO ₂ eq.	24 months	12 months
	50 t CO ₂ eq. ≤ charge < 500 t CO ₂ eq.	12 months	6 months
	500 t CO ₂ eq. ≤ charge	Permanent leak detection system mandatory 6 months	3 months
Unsaturated HFCs → HFOs (e.g.: 1234yf, 1234ze ...)	1 kg ≤ charge < 10 kg	24 months	12 months
	10 kg ≤ charge < 100 kg	12 months	6 months
	100 kg ≤ charge	Permanent leak detection system mandatory 6 months	3 months



Compliance and Best Practices

To comply with European regulations:

- Operators must ensure that applicable equipment is regularly checked for leaks,
- Leaks must be repaired without undue delay,
- Repairs must be verified by a certified person no earlier than 24 hours of operation and no later than one month after the repair,
- Where required, leakage detection systems must be checked at least every 12 months to ensure their proper functioning,
- Operators must keep records of the equipment, refrigerant quantities, leak checks and repairs

Smart monitoring tools can support continuous monitoring of installations, facilitate remote follow-up after repairs and help operators maintain the records required by applicable regulations.

The leak must be repaired without undue delay, with verification testing carried out in accordance with applicable European requirements.

→ The level curves on the PolarVisor web platform can be used to check that leaks have been repaired correctly.

! In the event of a leak, the reference level must be recalculated.



MORE INFO

Find more information on the regulations applicable to indirect measurement detectors on the Matelex website

[Matelex web Site](#)

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Your package

Your package

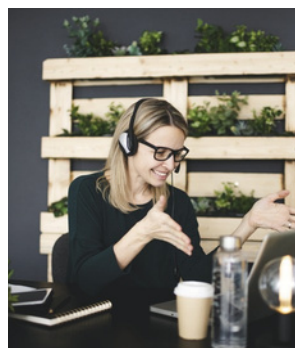
Simplify managing an installation fleet

- 1 **Select your supervision solution**
New-generation remote monitoring and leak detection PolarBox
- 2 **Supplement your solution with energy monitoring**
- 3 **Sign up to the PolarVisor web platform**
- 4 **Look up the services and training packages according to my needs**

→ And learn about the real environmental and financial impact of your refrigeration systems on your business with our [impact simulator](#).

[Request a quote](#)





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