



PASSIVE EDGE
THERMAL BATTERY
Boost Heat Energy Storage Capacity

LAUNCH **10X**
ENERGY STORAGE

PCM ENERGY CAPSULE INSTRUCTION

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PASSIVE EDGE TECH

A PRODUCT RESEARCH AND DEVELOPMENT BY
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WHAT IS PCM?

PHASE CHANGE MATERIAL (PCM) is capable of absorbing and releasing large amount of thermal energy to maintain a consistent temperature. When the external temperature drops, the PCM transitions into its liquid phase and releases the previously absorbed heat. Simultaneously, the PCM solidifies, resulting in a warming effect.

1 Introduction

Welcome to the comprehensive manual for **PCM ENERGY CAPSULES**, a cutting-edge technology designed to revolutionize your heating system. These operating instructions cover the installation, operation, and maintenance of our **PCM ENERGY CAPSULES**.

These instructions are intended exclusively for qualified technicians authorized to work in their respective fields. It is imperative that these technicians possess the necessary specialist knowledge and are well-informed about the relevant accident prevention regulations. Safety is paramount in any installation or maintenance procedure, and our manual is here to guide you through the process, ensuring that your equipment remains undamaged due to correct handling.

Disregarding the safety information provided in this manual can have severe consequences, potentially leading to personal injury, material damage, or environmental harm. Therefore, we urge you to carefully read these instructions in conjunction with any safety information and guidelines for assembly and commissioning before commencing any work.

Please be aware that the information and recommendations contained in this manual do not claim to be exhaustive. It is your responsibility to adhere to all relevant directives, standards, and regulations when carrying out assembly work and operating a heating system. Compliance with industry standards is essential to ensure the efficient and safe operation of your **PCM ENERGY CAPSULES**.

For specific terms and conditions related to our products, please refer to the applicable version of the General Terms and Conditions provided. It is essential to

review these terms and conditions to understand your rights and responsibilities when using our products.

2 Intended Use

The **PCM ENERGY CAPSULE** series is a versatile solution suitable for integration into both existing and new heating and cooling systems. These capsules are exclusively designed to enhance the storage capacity within heat accumulators and cold accumulators. With their innovative design and advanced phase change materials, they offer an efficient way to optimize energy storage and contribute to more sustainable heating and cooling solutions.

Avoid direct contact with domestic water.

Utilize indirect heat exchange within a hot water tank to prevent direct contact with water intended for drinking or washing. Any use that deviates from the intended purpose or unauthorized alterations to the assembly type, procedure, or design will result in the forfeiture of any liability and warranty claims.

3 Important Notes

! Risk of burns and scalding

Do not touch hot components.

! Risk of unavailability

Do not unwrap, including bottle caps and aluminum foil seals

PCM ENERGY CAPSULES are engineered in compliance with cutting-edge technology and approved safety regulations. Nevertheless, their operation carries

inherent risks of injury, including potentially fatal harm to the operator and/or third parties, as well as the potential for damage to the product and other property.

It is imperative that these capsules are exclusively operated while in a technically flawless condition. In the event of any safety-related malfunctions, it is essential to promptly cease operation of the product and engage the services of a qualified technician to rectify the issue.

4 Warranty Conditions

We are committed to providing a reliable and high-quality product. Below, you will find our Guarantee and Warranty Conditions:

- **Product Guarantee:**

The **PCM ENERGY CAPSULE** is covered by a warranty ensuring its freedom from defects in materials and workmanship from the date of purchase.

- **Warranty Coverage:**

During the warranty period, **PCM ENERGY CAPSULE** will be repaired or replaced at no cost to you if it is found to be defective in accordance with the terms and conditions of this warranty.

- **Warranty Exclusions:**

This warranty does not cover damages or defects resulting from:

- Improper installation, handling, or storage.
- Unauthorized modifications or repairs.
- Use of **PCM ENERGY CAPSULE** in applications or environments not recommended in the product documentation.
- Normal wear and tear.
- Acts of nature or force majeure events.

- **Warranty Claim Procedure:**

To initiate a warranty claim, please reach out to our authorized dealer (the company from which you purchased the product). Provide them with proof of purchase and a detailed description of the issue.

- **Resolution of Warranty Claims:**

PCM ENERGY CAPSULE will, at its discretion, either repair or replace the defective product. The repaired or replaced product will continue to be covered by the remaining warranty period from the original purchase date.

Users are required to regularly inspect for any damage.

5 Installation Instructions

Installation personnel must not only adhere to this installation guide but also strictly comply with the relevant European regulations and standards to ensure the safe operation of **PCM ENERGY CAPSULES**.

- **Central Water Heating Systems (EN 12831):** European standards covering the design of heating systems in buildings to ensure efficient central heating.
- **Water Heaters and Water Heating Installations for Drinking Water and Service Water (EN 806 Series):** Encompasses requirements for heating, hot water, and service water installations to ensure safe and efficient water supply.
- **Installation of Gas, Water, and Drainage Pipework Inside Buildings (BS 6891, BS 6700):** British standards governing the installation of gas, water, and drainage pipelines inside buildings.
- **Water Supply - Specification for Indirectly Heated Unvented (Closed) Storage Water Heaters (BS 7206):** Specifies requirements for indirectly heated unvented storage water heaters.

- **Thermal Solar Systems and Components (EN 12975, EN 12976 Series):** European standards relating to thermal solar systems and components, ensuring their design, performance, and safety.
- **Avoidance of Damage in Hot Water Heating Systems:** Standards aimed at ensuring the reliability of hot water heating systems and preventing damage. Specific standards may vary by country.
- **Heating and Drinking Water Piping Systems (EN 806 Series):** Covers requirements for heating and drinking water piping systems to ensure safe water supply and hygiene.
- **Technical Rules for Drinking Water Installations (TrinkwV):** The German technical rules for drinking water installations ensure the supply and hygiene of drinking water.

These standards and regulations are designed to ensure uniform technical requirements are followed in the design, installation, and operation of buildings and water supply systems across Europe, prioritizing the safety of installation personnel. However, it is important to note that specific applicable standards and regulations may vary by country and region. Therefore, it is advisable to consult with local regulatory authorities for each specific project to ensure compliance.

6 Transport and Storage

6.1 Transport

When transporting **PCM ENERGY CAPSULES**, it is essential to adhere to the following guidelines:

1. **Packaging Instructions:** Follow the instructions provided on the packaging when handling and opening the capsules for transport.
2. **Immediate Inspection:** Upon delivery, thoroughly inspect the goods to ensure correctness, completeness, and integrity.

3. Transport Damage: In the unfortunate event of transport damage, take the following steps:

- Notify Carrier Immediately: Inform the carrier immediately if any damage is discovered.
- Preserve Original Condition: Maintain both the packaging and the capsules in their original condition until an agent of the carrier can inspect the damage.
- Document Damage: Make a note of any damage directly on the delivery note, ensuring accurate record-keeping.

6.2 Storage

To ensure the quality and performance of **PCM ENERGY CAPSULES** during storage, please consider the following recommendations:

1. Indoor Storage: Avoid storing latent storage capsules outdoors. Store them exclusively in indoor environments.
2. Dry and Frost-Free Environment: Choose storage rooms that are dry and frost-free to prevent any adverse effects on the capsules.
3. Ventilation: Maintain adequate ventilation in the storage area to ensure a stable storage environment.
4. Avoid Physical Impact: Prevent scratches, knocks, and blows to the latent storage capsules, as these can compromise their integrity and performance.

By following these transport and storage guidelines, you can safeguard the quality and effectiveness of your **PCM ENERGY CAPSULES**, ensuring they perform optimally when integrated into your thermal energy storage system.

7 Ranges of Application / Technical Data

PCM Energy Capsule	
Dimensions	Φ30 x 170 mm
Weight	134g±1%
Volume	0.08L±1%
Max Installation Volume Ratio	80%
Quantity per 100L of storage volume	max 665 pcs
Installation	1 ½" standard sleeve
Operating temperature	< 80°C
Ambient medium	Water-glycol mixtures
expansion volume	max 5 %

8 Technical Requirements for the Storage Tank

When considering the storage of PCM Energy Capsules, it is imperative to adhere to specific technical requirements to ensure optimal performance and safety. Please take the following guidelines into account:

- **Interior Smoothness:** The interior of the accumulator, where PCM Energy Capsules will be stored, must be entirely free of any sharp edges or protrusions. This is crucial to prevent any damage to the capsules during storage or retrieval.
- **Material Compatibility:** Given that PCM Energy Capsules are packaged in PP (Polypropylene), it is essential to ensure that the storage tank or accumulator is constructed from materials that are compatible with PP. Compatibility includes resistance to corrosion, chemical interactions, and temperature variations that may affect the capsules.
- **Temperature Control:** Maintain the storage tank within the recommended temperature range suitable for PCM Energy Capsules. Extremes in temperature can impact the effectiveness of the capsules, so precise temperature control is necessary to maximize their thermal energy storage capacity.
- **Accessibility:** Design the storage tank with easy access points for inspection, maintenance, and capsule replacement if required.

- **Safety Protocols:** Implement safety protocols for handling and storing PCM Energy Capsules, including guidelines for personnel training and emergency response procedures in case of any unforeseen incidents.
- **Compliance:** Comply with all relevant industry standards and regulations for thermal energy storage systems and materials handling to guarantee the safety and efficiency of the storage tank.

9 Operation

9.1 Setting and monitoring the storage tank temperature

Set the target storage tank temperature below 80 degrees

! Risk of damage

! Attention

The PCM ENERGY CAPSULES must not be overheated(over 80 degrees).If this is not kept, there will be no phase change

9.2 Checking the system

- Inspect for any leaks.
- Verify temperature plausibility by attaching a temperature recording device.
- Monitor operating pressures and pressure fluctuations.

10 Overhauling and Maintenance

Before proceeding with maintenance and overhaul, it is imperative that you thoroughly review this guide to ensure you possess the requisite knowledge and tools for executing these critical tasks. Proper maintenance of **PCM ENERGY CAPSULES** is essential for extending their lifespan, enhancing performance, and ensuring safe operation.

We strongly recommend conducting regular inspections of your **system or storage tank** to ensure its reliable operation during critical moments. While doing so, please also pay attention to checks related to the PCM ENERGY CAPSULES. Should you encounter any challenges or require further guidance during any maintenance or overhaul tasks, please reach out to our local service partner or customer support team. We are dedicated to assisting you and ensuring that all components, including your PCM ENERGY CAPSULES, are in optimal condition.

Measure	Interval
Checking the leakage in the system	Yearly
Checking the setting temperature and inside temperature of the system ($\leq 80^{\circ}\text{C}$)	Yearly

11 Environmental Protection and Disposal

All packaging materials utilized are eco-friendly and recyclable

11.1 Environmental Protection and Disposal of content -PCM

PCM, as a thermal energy storage material, offers several environmental benefits:

- Reusability: PCM can undergo multiple phase change cycles, making it reusable without a significant decrease in performance.
- Low Pollution: The production and use of PCM typically do not generate harmful emissions.
- Resource Efficiency: PCM is often produced from renewable resources, contributing to resource sustainability.

When disposing of PCM waste, local environmental regulations should be followed. If feasible, discarded PCM should be recycled and reused to minimize its environmental impact.

11.2 Environmental Protection and Disposal of packing materials-PP

Polypropylene(PP), exemplifying sustainable plastic material, emphasizes environmental responsibility in its characteristics and treatment methods:

- **Recycled Material:** The **PP used in our products** is sourced from recycled materials, showcasing our commitment to sustainability and reducing our ecological footprint.
- **Recyclability:** A prominent feature of **PP we used** is its recyclability, enabling its reintroduction into the production cycle and fostering a circular economy.

When handling PP products, it's crucial to comply with local waste management regulations, emphasizing proper sorting and recycling to mitigate any environmental risks.

When dealing with waste from **PCM ENERGY CAPSULE**, always adhere to local and national environmental regulations to ensure the safe handling and eco-friendly disposal of waste. Prioritize recycling and reuse to reduce resource wastage and avoid improper disposal methods that may harm the environment.

Please note that specific environmental protection and disposal methods may vary by region and regulations, so it is advisable to consult with local environmental authorities or professional organizations for compliance.

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Passive Edge

We Create Sustainability

ADVANCED MATERIAL INSIDE



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