



 **Moduls**

**Prefabricated Engine Room**

Efficiency to real estate construction  
by enhancing engine room building

## Prefabricated Engine Room

- **Simplifies the construction**
- **Reduces the space requirements**
- **Applies the latest energy-saving solutions**
- **Hardware can be customized**
- **Assembly in factory conditions**

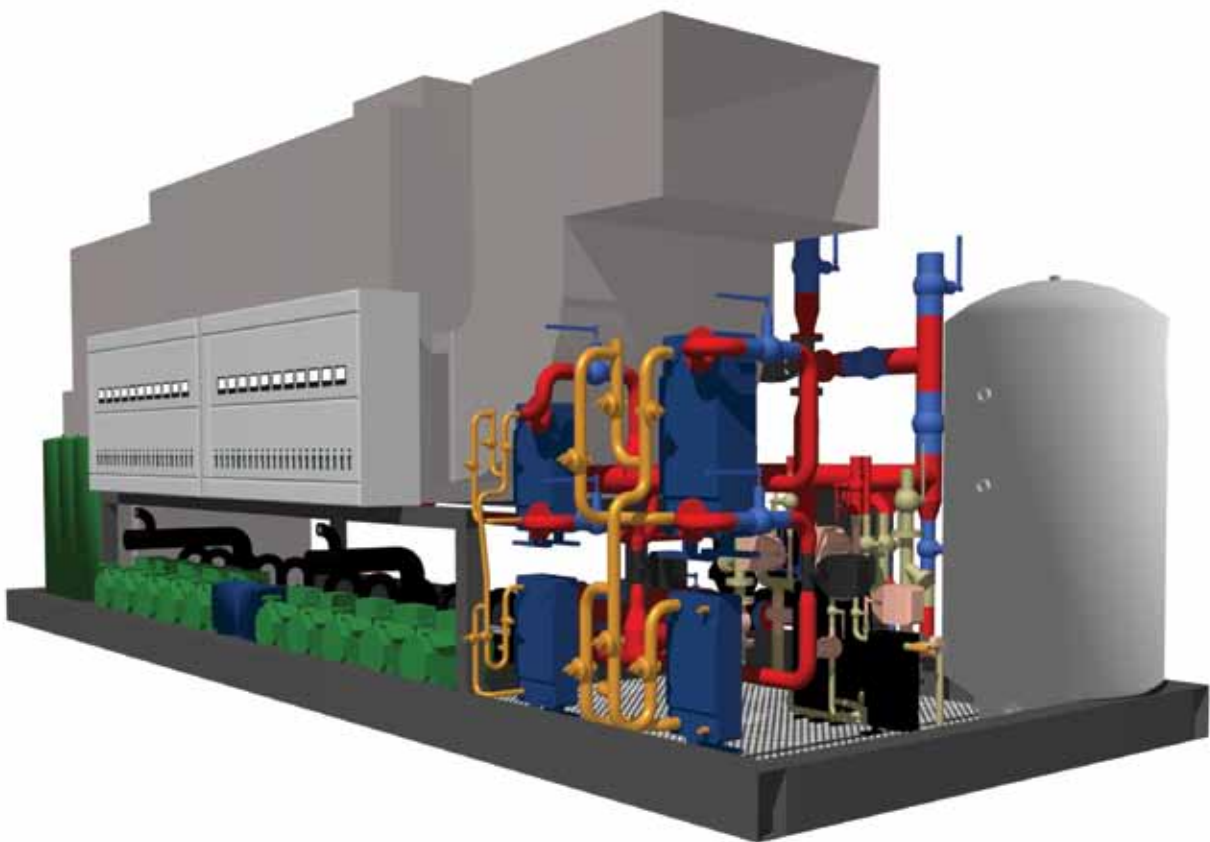
**Moduls is a new patented, prefabricated engine room solution. Moduls has been created as a result of a long cooperation with the S-group.**

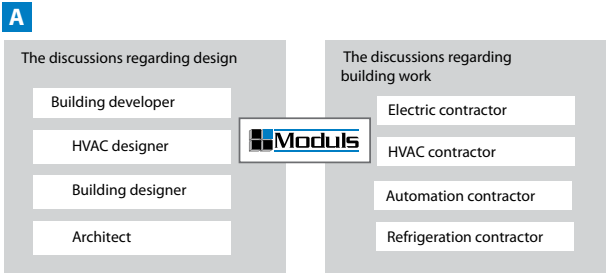
**We are able to apply the latest energy-saving solutions. Furthermore, the various components can be tailored to the needs of the devices.**

The Moduls engine room is built separate from the building location. The manufacturing and testing take place in the factory. After this it is moved to the building to its reserved place. Separate building process facilitates coordination of the work.

Modular construction reduces crucially the construction completion schedule, seamless integration of technology represents significant energy savings for the property. In addition, use and maintenance of the devices is facilitated.

The new method guarantees high quality of technical solutions and reliability of the equipment. The prefabricated engine room enhances the building process, facilitates keeping to the schedule, enables a faster building process and enhances the life-cycle affordability.





The idea of Moduls is to place all of the market's technical devices, e.g. heat distribution and recovery system, refrigeration appliances, automation and control devices as well as the technical solutions associated with electricity and water supply, inside a single steel frame.

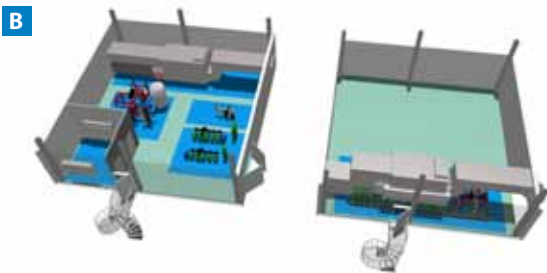
Moduls is built entirely under factory conditions and is then moved to a place reserved for it as one Modul. Moduls can be installed next to the real estate, on the roof or inside. The engine room is ready to be used right after it is activated.

### Keeping to the schedule

Moduls enables the building process of the engine room to be commenced earlier, in which case delivery can be agreed upon in good time, and be applicable to the rest of the building process. This will also shorten the overall duration.

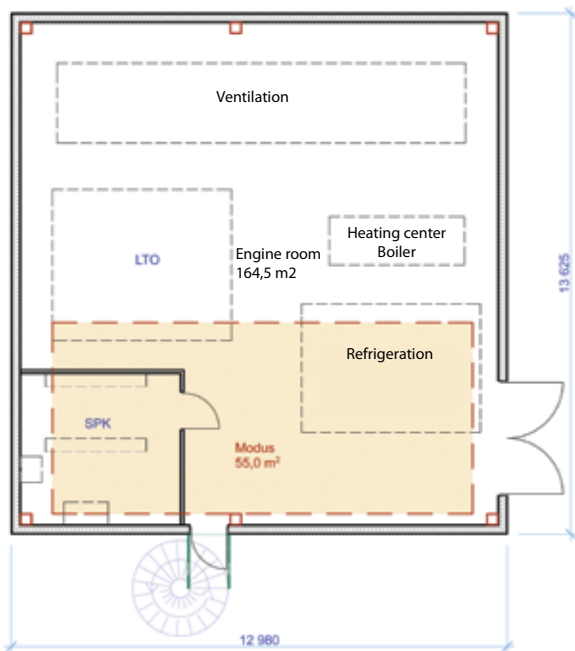
### Coordination of work

Designing and coordinating work is easily implemented along side the Moduls engine room. The designers get the information they need in good time, which speeds up the design. (Picture A)



### Saving space

The need for space and the building costs will decrease. In a traditional engine room every component needs its own maintenance area. With the Moduls engine room, the need for space is reduced crucially because you only need one maintenance area. The smaller size also reduces the capital costs. (Picture B. The space required for Moduls is about 40-60% of the size required for an engine room built on site. The example in the picture is of a Moduls which was about 30% of the size of the designed engine room.)



### Quality of work

Moduls is built in factory conditions taking advantage of the 3D-model. With the help of prefabrication around 600 working hours are moved from the construction site to the factory. The working conditions in the factory are always steady; the installation environment is dry, warm and spacious. The 3D-model ensures a functional placement of components into the Moduls. These factors ensure a high quality of work and reduced labor time.

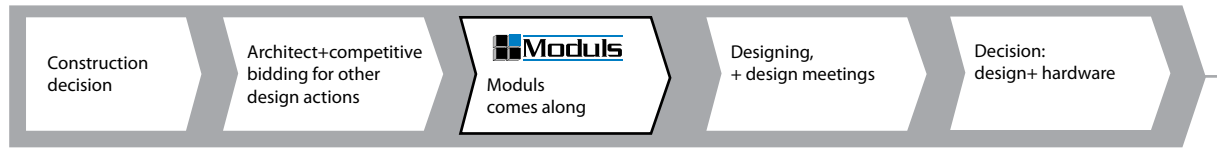


# Designing and Building Moduls

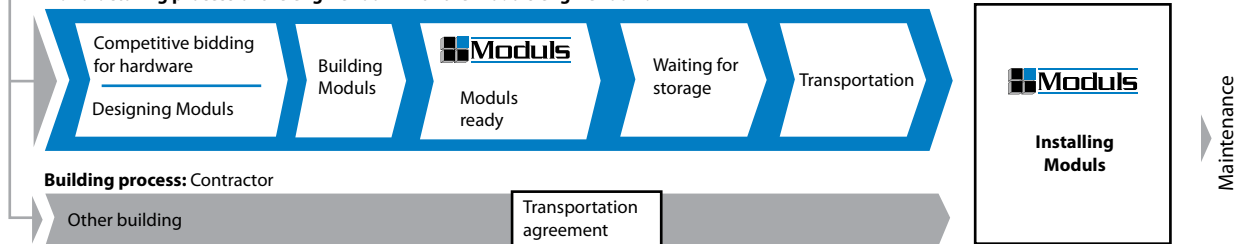
## Construction process graph from the perspective of Moduls

**A** Process graph

**Preparation process:** Building developer + other reference groups



**Manufacturing process of the engine room with the Moduls engine room:**



The building process graph (Picture A) shows, in which stage of the designing Moduls needs to be taken into consideration.

The designing of Moduls always takes place in 3D-form (Picture B). In this case, you are able to ensure the space every component needs, and the all over functionality of the components.

After the design is ready the various components are combined to the Moduls (Picture C).

Once the unit is completed, the engine room can easily be lifted on a truck and be transported to the agreed place at the agreed time (Picture D).

On the site, Moduls is lifted to the agreed place (Picture E). Installing the device is very simple and there is a lot of space reserved for maintenance (Picture F).

The use and maintenance of machinery is facilitated. Furthermore, the smooth integration of technology represents significant energy savings for the store.







Heating components

The engine room is composed of these components and is tested in the factory – around 600 working hours are moved from the construction site to the factory.



Electrical components



Air conditioning units



Heat recovery



Refrigeration compressors

# Example projects with Moduls

**As of today, Moduls has been built to over 15 locations.**

The first location was S-Market Hirvensalmi in 2003. The locations have been stores and service stations, their size ranging from 450 m<sup>2</sup> to 3500 m<sup>2</sup>. The hardware has been chosen according to the client's needs.

## **Case 1: Service station, floor area about 3500 m<sup>2</sup>**

Dimensions of the Moduls steel frame: width 2000 mm, length 7250 mm and height 2700 mm. Refrigeration units have been installed to the Moduls serving store needs (plus unit 108 kW and a freezer unit 21 kW) as well as three cooling agent capacitors 100 l/piece. For the real estate's kitchen an air-conditioner (3,5 m<sup>3</sup>/s) and a main circuit unit.

For the whole real estate a DHW (1000 l), cooling and heating for the air-conditioner, pipes for the radiators and pump groups as well as four heat exchangers for the floor heating, 100 kW/piece.

These heat exchangers enable energy recirculation, which is then used in the air-condition unit as well as in DHW and floor heating.

## **Case 2: Store, floor area about 1200 m<sup>2</sup>**

Dimensions of the Moduls steel frame: width 2700 mm, length 7000 mm and height 2350 mm.

Refrigeration units have been installed to the Moduls (plus unit 125 kW and a freezer unit 16 kW), as well as three cooling agent capacitors 100 l/piece. The real estate's air-conditioning (2,8 m<sup>3</sup>/s) and a district heating unit as well as a main circuit unit.



## Moduls also for Office and Industrial Buildings

This building process innovation can easily be used in different locations. Moduls is suited also to be a technical area for office and industrial buildings.

Into the engine room can be included some technical functions of the building according to the preferences of the customer. These include e.g. ventilation, heating, heat recovery, automation and control technology.

Three compact Moduls were assembled in spring 2008 to Varkauden Taitotalo Navitas, and in addition four were assembled to Vähälä Terminal in Vaajakoski.



***Iiro Siponen, Commercial Director, S-group:***

***"The building process went really well. We were able to cut the schedule in half."***

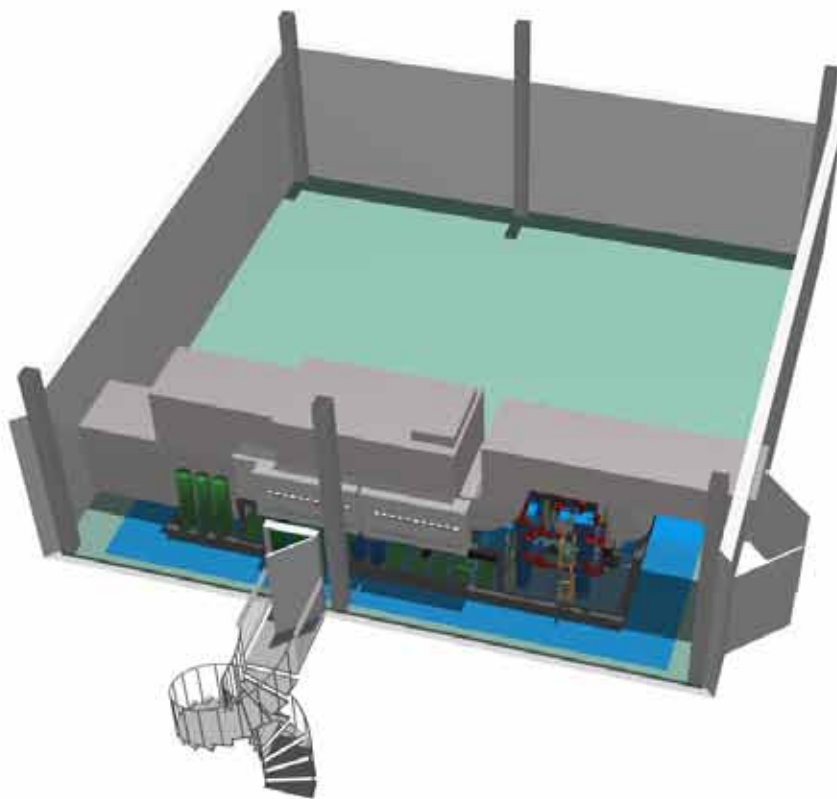
***"Moduls reduces work site meetings as well as supplementary and alteration work."***

***"Moduls has performed impeccably."***

### References

- S-Market - Hirvensalmi (2003)
- S-Market - Sulkava (2004)
- ABC - Mikkeli (2006)
- ABC - Pieksämäki (2006)
- Sale - Pukkila (2006)
- Sale - Pertunmaa (2006)
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- Sale - Lapinjärvi (2009)
- K-Supermarket - Mertala (2011)
- Vähälän terminaali - Vaajakoski (2011)
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