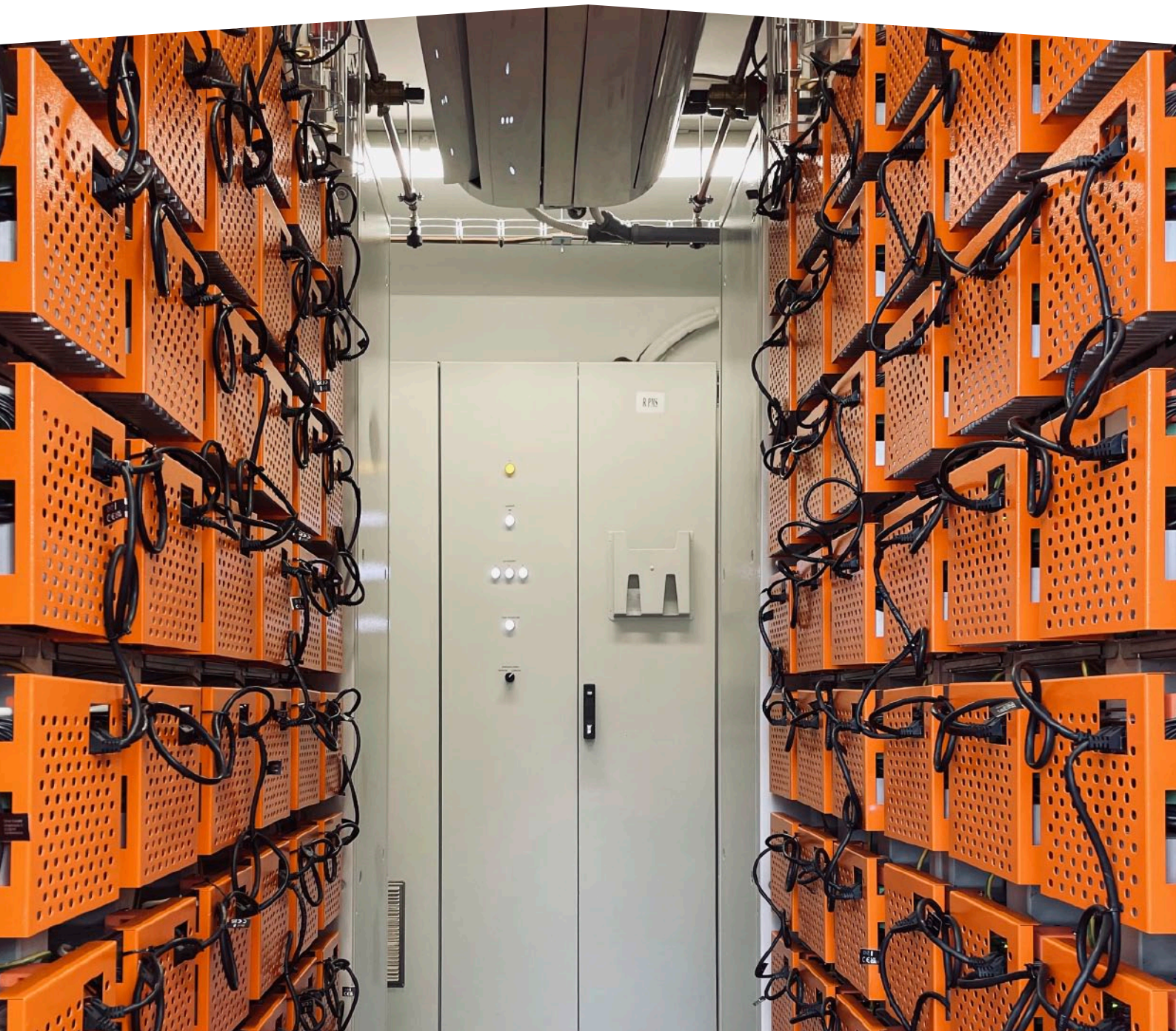


MEDIUM ENERGY STORAGE



MES Universal Container Storage

AERS

ADVANCED ENERGY STORAGE

MES Universal Container Storage

ALL IN ONE | 96–576 kWh | 150kW | INTEGRATED TRANSFORMER | ISLAND MODE | UPS FUNCTION

Economic benefits

- ❖ Decreasing the value of reserved capacity
- ❖ Using the difference of prices in various time periods (SPOT)
- ❖ Providing maximum level of energy self-sufficiency
- ❖ Smoothing out consumption peaks (e.g. when charging electric vehicles)
- ❖ Optimizing energy costs

Possible financing by subsidies



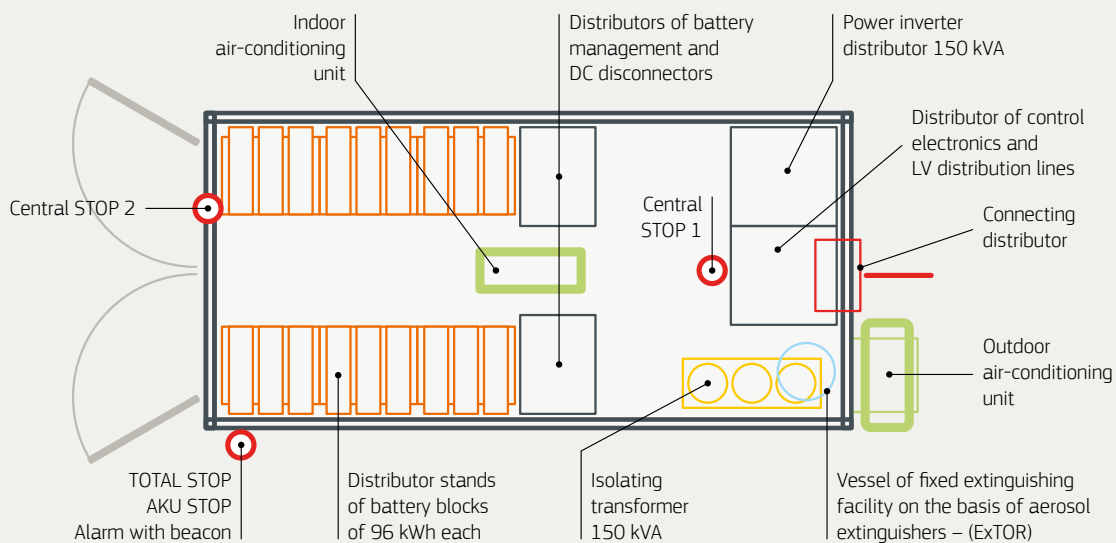
Universal concept of MES energy storage aims to:

- ❖ Provide strong and stable source of electrical energy
- ❖ Enable effective storage and subsequent utilization of energy from renewable sources
- ❖ Address emerging challenges of electromobility and enables fast charging
- ❖ Cover consumption peaks of entire buildings (industrial and residential)
- ❖ Create backup energy source in so-called UPS mode
- ❖ Integrated algorithm for the use of spot prices of electricity

Applied accumulator technology:

- ❖ battery EX-L135D ELERIX
- ❖ Battery chemistry: Lithium iron phosphate – LiFePO4
- ❖ Cell capacity: 135 Ah
- ❖ Energy density: 164 Wh/kg
- ❖ No toxic chemicals
- ❖ High level of safety

CONTAINER LAYOUT



Power supply 3+PE+N 230 V / 400V 50Hz TN-C-S

Protection against hazardous contact with dead parts by automatic disconnection from the source as per ČSN 33 2000-4-41

Algorithm for the use of spot prices

The MES Universal Container Storage takes advantage of the price differential in the electricity day-ahead spot market using a proprietary algorithm. The algorithm optimizes the site's behaviour based on:

- predicted consumption,
- predicted photovoltaic production, and
- day-ahead hourly electricity prices.

It plans the behaviour of the storage for the following day with the aim to achieve optimum economic result. By applying this approach, the return on investment is shortened significantly.



Price levels CZ-OTE

< 28.2. (Wedn.) >

Description of levels | Instructions for download



Daily price prediction

	Initial	After change
Purchase price:	1789.12 CZK	2388.69 CZK
Sales price:	0 Kč	0 Kč
Total price:	1789.12 CZK	2388.69 CZK

[Change levels](#)

The course of spot prices with indicated times for battery charging (green) and load compensation (red).

Prediction model

< 28.2. (Wedn.) >

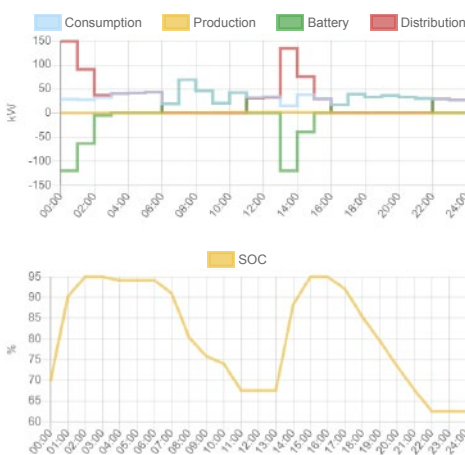


Chart – prediction model of MES storage behaviour including consumption, production, and grid usage with forecasted battery state of charge (SOC).

SMOOTHING OF CONSUMPTION PEAKS

ENERGY BACKUP OF THE BUILDING

OPTIMIZATION OF RESERVED POWER

ACCUMULATION IN THE PERIODS OF SURPLUS

SUPPORT FOR ELECTROMOBILITY

USE OF RENEWABLE SOURCES

WHAT DOES ENERGY STORAGE OPERATION ENTAIL?

- ❖ **How much space does the storage need? Do we have to prepare the underlay?** The unit's footprint is 2.5×5 m, weight of up to 13 t (with capacity of 576 kWh). Requirements for location are minimal, underlay should be reinforced adequately to minimum bearing capacity of 1,000 kg per m². Sufficient space for installation of electricity meter and supply protection needs to be provided in the main distribution panel.
- ❖ **How much is the Energy Storage?** Its price depends primarily on required storage capacity and power requirements of the station. However, we are all about our Energy Storage being ranked among the best offers on the market providing best value for money. The return of investment depends on the manner of use and possible financing from available subsidies; it can be as low as 5 years.
- ❖ **What is included in the price? What is not included?** Price includes delivery of complete MES, including control SW and proprietary algorithm, on Ex Works basis. The price does not include installation, point of interconnection adjustments, project works, transport, and energy assessment of locality.
- ❖ **What about maintenance? How much is maintenance?** Fire revision must be performed by a specialized technician every six months. Further maintenance is included in service packages that are set individually.
- ❖ **What is the warranty duration and expected service life of the batteries?** Standard warranty of ELERIX EX-L135D batteries is 10 years.
- ❖ **Can subsidies be used for financing?** Several different subsidy titles provided by the Ministry of Industry and Trade, the Ministry of the Environment, and the Ministry of Transport can be used individually for financing of MES. If you are interested, we can help you select relevant subsidy titles.
- ❖ **Can the facility be rented?** Battery storage can be purchased as well as rented.
- ❖ **Can Medium Energy Storage be used as a backup energy source?** Yes, the MES unit can work in island mode that provides energy backup in case of electric power outage.

TECHNICAL SPECIFICATIONS

General information

Number of ESS units	1 pc
Rated power (long-term)	150 kVA*
Peak power (1-minute)	175 kVA*
Overload for apparent power (30 s)	15 %
Rated capacity	96 to 576 kWh
Rated voltage (AC)	400 V
Voltage range (AC)	348 to 440 V
Rated frequency (AC)	50 Hz
Frequency range (AC)	47 to 53 Hz
Power factor $\cos \varphi$	-1.0 to 0.95
Support for island operation	optional
Support for black start	optional
Protection degree	IP 54
Operation outdoor temperature	-15 to +40 °C
Operation outdoor temperature in the version with air-conditioning	-25 to +50 °C
Humidity	<90 % non-condensing
Altitude	< 2000 m above sea level
Dimensions (W×L×H)	2.5×5×3 m
Weight	up to 13 t (576 kWh)

* power is limited in some MES versions with lower capacity

Transformer

Type	encapsulated, dry
Placement	indoor installation
Number of	1
Voltage (primary/secondary)	400/350 V
Connection type	Dyn5

Inverter

Type	two-way island operation 4-quadrant operation 3-phase
Cooling	air
Number of units	1
Rated power (long term)	150 kVA
Peak power (minute)	175 kVA
Overload for apparent power (30 s)	15 %
Rated voltage (AC)	350 V
Voltage range (DC)	630 to 800 V
Efficiency	>97.5 %

Battery system

Battery manufacturer	Elerix
Battery chemistry	LiFePo4
Number of blocks	up to 6; 96 kWh each
Number of cycles (with DOD <60 %, In <0.5C)	6000

Safety

Manufacturer of BMS	AERS
Safety concept	passive and active elements
Temperature sensors	yes
Smoke sensors	yes
Fire sensors	yes
Fire insulation	yes
Extinguishing system	yes
Autonomous fixed extinguishing system with a switchboard; container is a certified fire zone	

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