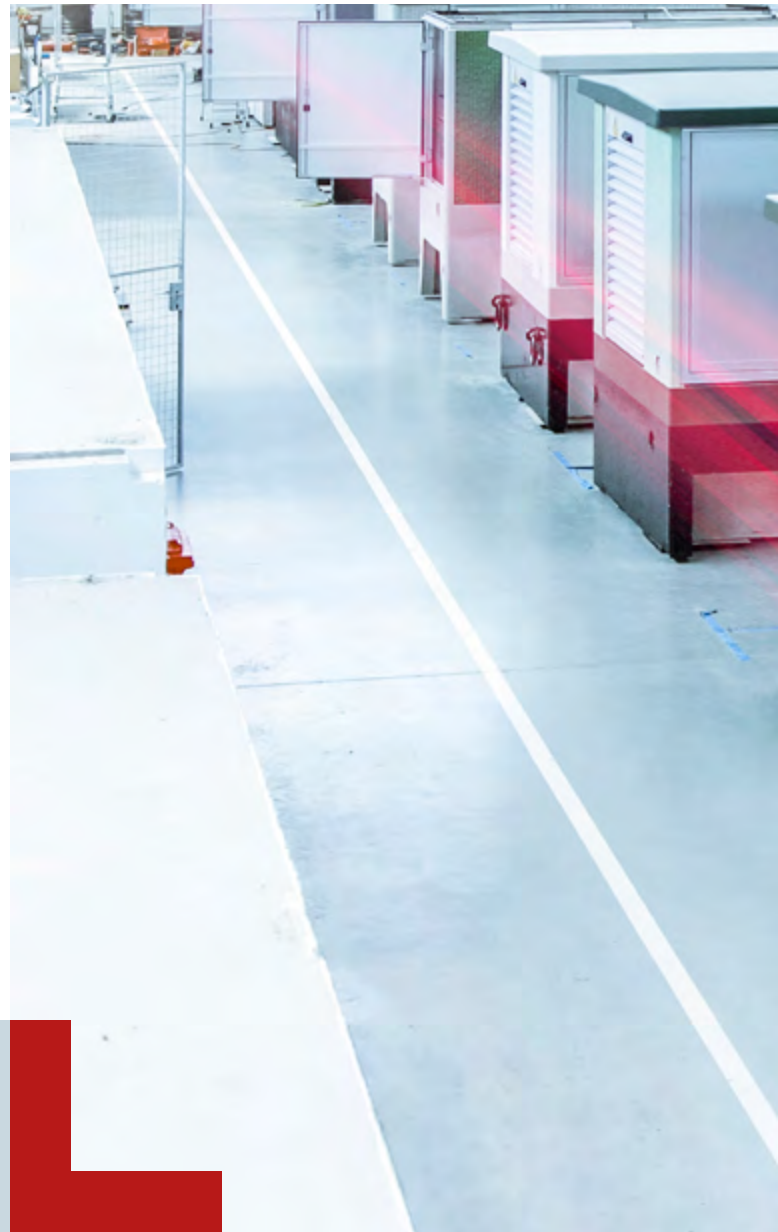


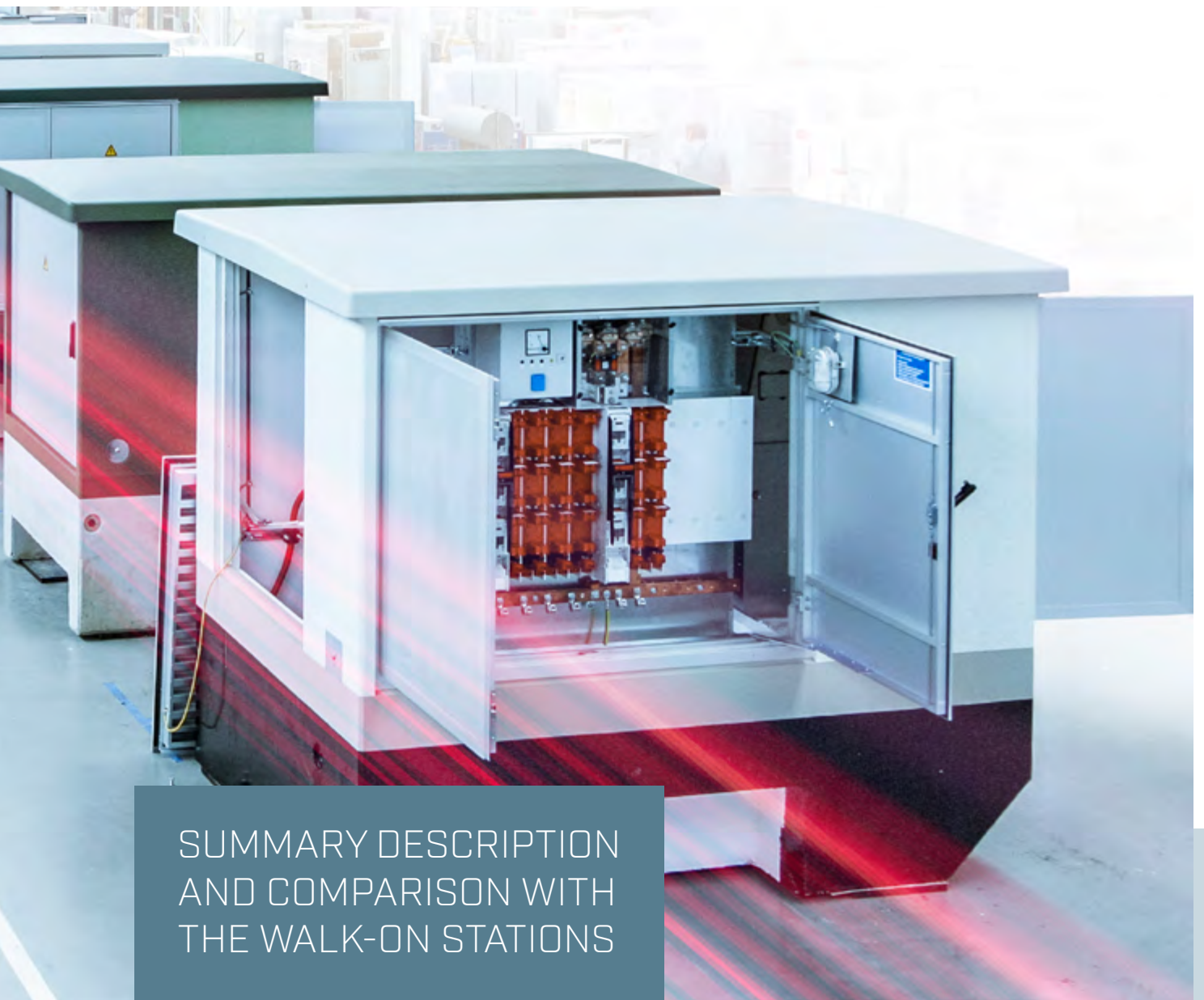
# COMPACT TRANSFORMER STATIONS



### **BETONBAU compact transformer stations**

represent an ideal solution for situations where an uncluttered, unobtrusive design is desirable in public places or where only limited usable space exists. They feature very modest height and a minimum footprint. They are a non walk-in design, accessible from outside for the operating personnel. As a rule, 630kVA transformers are used to fit these stations, and up to 2.5MVA for special projects.





## SUMMARY DESCRIPTION AND COMPARISON WITH THE WALK-ON STATIONS

STATION TYPE AND CODE	COMPACT	WALK-ON
BETONBAU model series code	UK	UF
Operator access	non walk-in	walk-in
Height from ground	approx. 1.5m, less than 1m for underground [or, half-buried] stations	approx. 2.8m
Footprint	approx. 3-6m <sup>2</sup>	approx. 6-25m <sup>2</sup>
Weight, equipment exclusive	7-13t	13-50t
Transport	common road truck	oversize load
Transformer output power	normally 630kVA, up to 2.5MVA depending on project	up to 4.8MVA, or more depending on project
Transformer placed on	transformer station floor	rails
Transformer replacement	following roof dismantling	through door
HV switchgears	common compact design, insulated with SF6 gas, air or vacuum	insulated with SF6 gas or air, up to 38kV, both compact and modular



# BETONBAU

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We are a leading European manufacturer of technical buildings for the power and water management sectors. We develop and make precast reinforced concrete buildings, and fit them using system components from our in-house machine shop, along with installing technologies according to their use. We are serious about integrating every building into its surrounding environment and therefore we offer a range of surface finishes and technologies.

Widely used in the power and water management sectors, our product applications include

- + transformer stations,
- + switching stations,
- + transformer enclosures,
- + natural gas regulator stations,
- + water tanks,
- + sewage treatment plants etc.

You can rely on

- + **comprehensive service:** from design and implementation to maintenance and modernisation,
- + **history and experience:** since 1993 in the Czech Republic and since 1963 in Germany,
- + **custom products and solutions:** we make every effort to meet our customer requirements and to design optimum solutions for their projects,
- + **long service life:** reliable solutions in compliance with standards,
- + **human dimension:** individual approach to our customers and a sensitive way of integrating technical buildings into their surroundings.

## ELECTRICAL TECHNOLOGIES

All compact stations are as standard prepared for installation of transformers up to 630kVA (inclusive). We examine case by case special projects for transformers up to 2.5MVA, their ventilation dimensioning being a key focus.

**The transformer space** is set up as an oil retention pit and, given the watertight and oiltight features of the applied concrete, it provides the required level of environmental protection, without any additional waterproof coatings necessary.

In most cases, we install compact, SF6 gas insulated **HV switchgears** in the compact transformer stations. For individual projects, we may apply air switchgears and an HV measurement field.

**The LV switchgears** from various manufacturers are adjusted to the limited dimensions of the transformer station space. A consumption and balancing meter may be also mounted to take official or indicative readouts.

The integrated **cable compartment** of the station serves also as the station base.

Robust, patented **cable grommets** are placed in the underground part of the station and serve as pass-throughs for all standardised cables used in the power engineering industry.

Compact transformer stations may be operated from four, three, two or just one side.



# BUILDING AND STRUCTURAL SOLUTION

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## BETONBAU CONCRETE PRODUCTS

**The body** of a station is comprised of 4 external, 10cm thick walls and a 12cm thick bottom. We precast the body using the “bell casting” method, as a single seamless casting. The manufacturing method gives the following features to the body:

- + exceptional mechanical resistance. The body is a self-supporting box type element and, as a result, the single cell needs no rigid foundation. We lay it upon the ballast bed as is standard,
- + perfect tightness; the cast-in-place, seamless concrete body is watertight, serving at the same time as an impermeable pit to catch oil in case of a transformer accident,
- + easy transportability, based again on the mechanical stability of the body itself,
- + long service life and reliability.

We make the body, roof and partition walls from impermeable concrete of C35/45 strength class and XC4 and XF1 exposure classes compliant to ČSN EN 206-1.

**The roof** is executed as a separate roof slab with a 2% slope. A loose laid arrangement is applied within the station, with the conductive interconnection supported by massive hot-dip galvanised angles. Such execution provides for the easy dismantling of the roof and technology installation, or as the case may be, replacement in future years.

**The partition walls** are 8cm thick and may be reduced to fit the doorsill height.

**The raised floor** is executed either from concrete or using an extruded aluminium shape system. The concrete raised floor is fire safe, while the aluminium shape system offers a high degree of flexibility. We mount the aluminium shapes on the adjustable galvanised steel supports. The tread layer is of plywood with self-extinguishing surface treatment. The floor panels are fitted with a key operated latch preventing their accidental lifting.

## METALLBAU IRONMONGERY PRODUCTS

We make the doors and ventilation elements from anodized aluminium in our in-house METALLBAU machine shop. The material is corrosion resistant and its durability is on a par with that of the concrete used for the construction body.

Our ironmongery products use a patented, highly efficient ventilation system. The system has been optimised for an airflow factor corresponding to IP 33 rating, while it prevents insect and rodent infestations of the station.

A ventilation element may be detachable, fixed or built into the door.

The doors and hinges are highly stable and resistant to an arcing fault impact within the station.





# COMPACT TRANSFORMER STATION TYPES AND DIMENSIONS

COMPACT TRANSFORMER STATION	EXTERNAL WIDTH [m]	EXTERNAL LENGTH [m]	HEIGHT FROM GROUND [m]	TOTAL HEIGHT [m]
UK 1250-20	1.45	2.03	1.56	2.22
UK 1250-25	1.45	2.51	1.56	2.22
UK 1250-34	1.45	3.44	1.56	2.22
UK 1250-36	1.45	3.60	1.56	2.22
UK 1700-15	1.90	1.58	1.65	2.40
UK 1700-23	1.90	2.30	1.65	2.40
UK 1700-28	1.90	2.80	1.65	2.40
UK 1700-42	1.90	4.21	1.65	2.40
UK 2536	2.50	3.58	1.685	2.565
UK 2548	2.50	4.78	1.685	2.565
UK 3015	3.00	1.50	1.64	2.39
UK 3024	3.00	2.38	1.68	2.56
UK 3048	3.00	4.78	1.685	2.565
UK 3119	3.15	1.92	1.695	2.395

More types and dimensions are possible.

## IMPLEMENTATION

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For the sake of accelerating construction works, we install the electrical technologies in the station already at the production plant.

Self-standing stations are placed on a prepared bal-  
last course without foundations.

We haul compact stations by common road trucks and use a crane to place them. The weight, equipment exclusive, ranges from 7 to 13t.

The engineering structure user provides for the base course preparation and for external cabling and earthing execution.



# SAFETY

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Our priority is to protect health and assets. Our products conform to all requirements placed on them by the standards and regulations. Thanks to our innovative solutions, we stand ready to provide even stronger protection and safety levels upon request.

## ELECTRICAL EQUIPMENT SAFETY

- + Minimum protection rating IP 23 DH, optionally IP 34 D or IP 44 D under ČSN EN 60529
- + Arcing fault protection conforming to ČSN EN 62271-202
- + Temperature-rise and IP rating test conforming to ČSN EN 62271-202
- + Electromagnetic field (EMC) protection conforming to Government Order no. 291/2015 Coll., and ČSN EN 50499

## FIRE PROTECTION

The concrete body provides EI 90 fire rating, and up to EI 120 upon request. Subject to the site plan and project, we install also fire protection gratings, fully separate the transformer space from the rest of station parts, apply firestop packing, or, set up ventilation cupolas on the station roof.

## NOISE CONTROL

We manufacture walls, doors and ventilation openings with high to very high sound attenuation levels. Upon request, we are able to make double walls panelled from inside with perforated sheet metal and sound insulation, as well to install a double door. We use sound-proof sheet metal ducts or concrete ducts with built-in damper frames. The stations may be placed into a slope or underground.

## UNDERGROUND WATER PROTECTION

The seamless concrete body prevents potential transformer oil penetration into the subsoil.

## BREAK-IN SECURITY

We offer special doors and ventilation elements, doors with concealed hinges and RC2 or RC3 burglar resistance classes compliant to ČSN EN 1627, as well as fitted with a mechanical or electronic three-point locking system with an emergency exit feature. The mortise cylinder is shielded with a steel cylinder guard.

## TECHNICAL CERTIFICATES

Upon request we issue declarations of conformity, technical certificates and product certificates for the Czech market.



# DESIGN AND APPEARANCE

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We are committed to providing you with an option to modify the appearance of the technical buildings as part of the implementation process. We wish for our products to blend in well with their settings, while standing out at the same time. To that end, we offer numerous face surface finishes, roof and roofing types, as well as convenient options of integrating the building into the terrain.

- + Face plastering colour options
- + Architectural concretes, facing bricks, Klinker facing bricks or stone facing
- + Building faces clad with planks, and a choice of cladding panels
- + (Semi)flat and sloped, saddle and hip roofs
- + Clad and sheet metal roofing, decorative ballast and green roofs
- + Situating the building on a slope, half-buried solutions or integration within a fence

# OPERATIONAL AND POST-WARRANTY SUPPORT SERVICES

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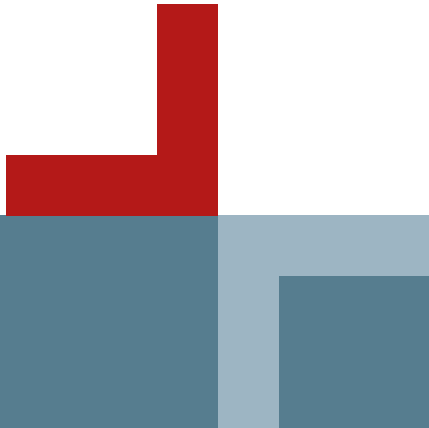
We offer comprehensive support services with our transformer stations at maintenance, rehabilitation and modernisation.

Upon request, we will provide

- + electrical equipment checks and reviews,
- + scheduled inspections,
- + cleaning, rehabilitation and repairs,
- + building adaptations,
- + relocations
- + and much more.

For detailed information, please, read the Operational and Post-warranty Support Services leaflet or contact our sales representative.





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