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Tavazon Sanat Paydar

مقدمه Introduction

شرکت فنی مهندسی توازن صنعت پایدار با نام اختصاری TSP با سال‌ها تجربه و با هدف خدمت به صنعت برق کشور و تلاش در جهت خودکفایی صنعتی، کمک به بهبود فضای کسب و کار شرکت‌های دیگر، تاسیس و فعالیت خود را در زمینه طراحی و ساخت انواع تابلو برق‌های فشار ضعیف (LV) و فشار متوسط (MV)، تابلوهای اصلاح ضریب قدرت (خازنی)، انجام پروژه‌های EPC (برق، ابزار دقیق و اتوماسیون) و همچنین پروژه‌های صنعتی و اقتصادی نظیر پروژه‌های نیروگاهی، نفت، گاز، پالایشگاهی و پتروشیمی، سیستم‌های تامین و تصفیه آب و فاضلاب، فولاد، مس، معادن، عمرانی، ورزشگاهی و دیگر پروژه‌های زیرساختی با بهترین کیفیت و بهره‌گیری از تکنولوژی روز دنیا متمرکز نموده



خط مشی

هدف شرکت فنی مهندسی توازن صنعت، جلب رضایت مشتریان گرامی با تضمین کیفیت تولیدات خود و تکیه بر دانش فنی و مهندسی با کادری مجرب، بر مبنای استانداردهای معتبر ملی و بین المللی می باشد. امید است در جهت نیل به این هدف و سرافرازی میهن عزیزمان در همه زمینه ها بخصوص در زمینه خودکفایی صنعتی، گام موثری برداریم.

حوزه فعالیت

- ارائه خدمات طراحی و مهندسی
- مهندسی ساخت انواع تابلو برق فشار ضعیف (LV) و متوسط (MV)
- راه اندازی، تست و پیکربندی رله های حفاظتی
- ارائه خدمات تامین کالا و بازرگانی
- انجام پروژه های EPC (مهندسی، تامین تجهیزات و اجرا)
- تولید سینی کابل و نردبان کابل
- انجام پروژه های انرژی نو (خورشیدی، بادی و...)
- اتوماسیون و راه اندازی ماشین آلات صنایع مختلف

Company Work Process

روند کاری

شرکت فنی و مهندسی توازن صنعت آمادگی کامل برای انجام خواسته‌هایتان را بدون در نظر گرفتن حجم و پیچیدگی تابلوهای شما داراست. طراحی و ساخت ما به شکلی است که بهینه‌ترین استفاده از فضای داخلی کابینت با در نظر گرفتن محل نصب آن‌ها مطابق با بالاترین استانداردهای بین‌المللی ممکن شود.

در شرکت توازن صنعت به جهت ایجاد کالایی با کیفیت تمامی پروژه‌ها از زمان آغاز پروژه و در هر مرحله قابلیت ردیابی و پایش را دارد. مراحل ساخت تابلو بعد از تاییدیه از سوی کارفرما به شرح ذیل می‌باشد:



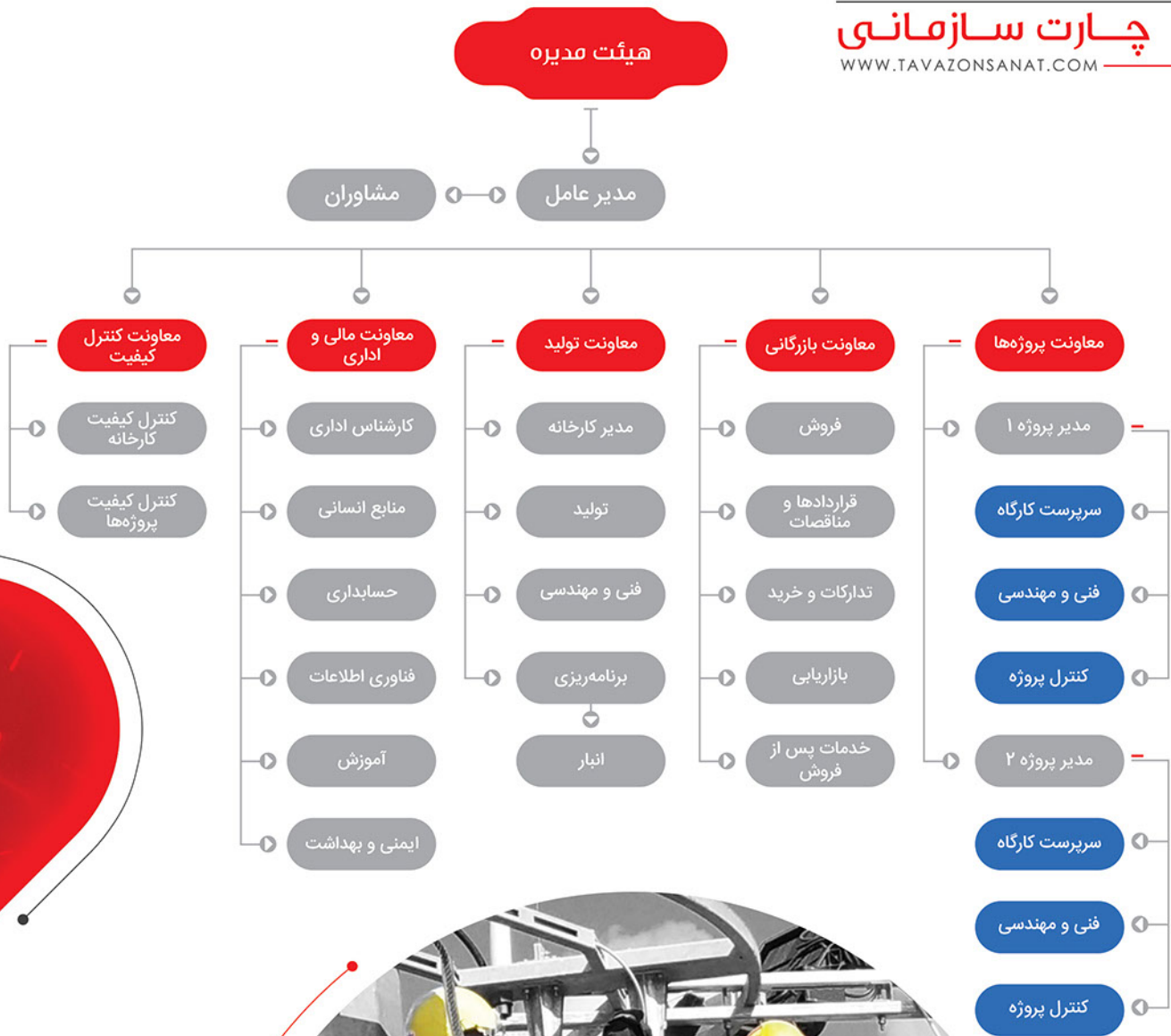
- طراحی و مهندسی
- ساخت تابلو در واحد فلزکاری
- نقاشی
- مونتاژ و وایرینگ
- تست و تحویل در کارخانه
- بسته‌بندی و ارسال

به محض آماده شدن تابلو برق‌های شما، شرکت ما آمادگی ارسال با بسته‌بندی مناسب به محل پروژه را دارا می‌باشد. به همراه همه تابلوها، مدارک بازرسی و تست، همچنین دستورالعمل نصب و راه‌اندازی تابلوها ارسال خواهد شد. در صورت نیاز مشتری، تیم مجرب نصب و راه‌اندازی ما آماده خدمت‌رسانی به شما عزیزان می‌باشد.

VISION
tavazon sanat paydar

چشم انداز

ما می‌خواهیم که با بهره‌گیری از تعهد، نوآوری، استفاده از تکنولوژی‌های روز دنیا، تخصص و سختکوشی کارکنان خود و همچنین سرمایه‌گذاری مشترک با شرکت‌های مطرح جهانی، محصولات و خدمات خود را از لحاظ کمی و کیفی ارتقا داده و به عنوان ارائه‌دهنده برتر خدمات در بازار برق و انرژی‌های نو ایران، خاورمیانه و کشورهای در حال توسعه شناخته شویم.



MISSION



ماموریت

شرکت فنی مهندسی توازن صنعت پایدار نامی آشنا در صنعت برق کشور می‌باشد که همواره رسالت خود را چنین میداند:



طراحی و تولید با کیفیت‌ترین و اصولی‌ترین تابلو برق‌ها با به‌کارگیری تکنولوژی روز دنیا ارائه بهترین خدمات و محصولات به مشتریان و القای حس اطمینان خاطر به موجب انتخاب ایشان داشتن پل ارتباطی مداوم با مشتریان
ایجاد محیطی برای پرورش نیروهای متخصص و کارآمد و فضایی که نوآوری و خلاقیت در آن اهمیت داده می‌شود
بوجود آوردن حس دوستی و تعامل در بین کارکنان و ایجاد حس رضایتمندی آنها و خانواده‌هایشان با ارزش نهادن به مسائل شخصی و رفاهی
در کنار هم قرار دادن سه اصل کیفیت، مشتری‌مداری و تعالی خدمات، برای ایجاد ارتباط برد-برد با مشتریان، تامین کنندگان و همکاران تجاری

PRODUCTS

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محصولات

محصولات فشار ضعیف LV SWITCHGEARS

تابلو برق‌های کشویی توزیع تا سطح ۷۴۰۰ آمپر

تابلو برق‌های کشویی

تابلوهای حفاظت و کنترل پست های برق

تابلو برق‌های اصلاح ضریب قدرت (خازنی)

تابلو برق‌های کنترل انواع موتور و پمپ

تابلو برق‌های تاسیساتی و ساختمانی

تابلو برق‌های میز فرمان (پیانویی)

تابلو برق‌های قابل نصب در فضای آزاد با کلاس حفاظتی بالا

تابلو برق‌های اضطراری (حفاظت و کنترل دیزل ژنراتور)

تابلو برق‌های استیل ضد زنگ (STAINLESS STEEL) مخصوص صنایع غذایی

تابلو برق‌های لاجیکی (PLC)

تابلو برق‌های سیستم مدیریت هوشمند ساختمان (BMS)

محصولات فشار متوسط MV SWITCHGEARS

تابلو برق با کلید گازی فیکس و کشویی

تابلو برق با کلید هوایی خلا فیکس و کشویی

MV CABLE TARYS & LADDERS

سینی کابل و نردبان کابل

LV SWITCHGEARS
MV SWITCHGEARS
MV CABLE TARYS &
LADDERS

Tavazon Sanat Paydar

تابلوهای فشار متوسط (فیکس)

این تابلوها از نقطه نظر حفاظتی اهمیت بالایی دارند. در مواقع ایجاد خطا کلیدهای قابل قطع، زیر بار عمل نموده و شبکه بینهایت را از محل خطا جدا می‌نمایند. از سوی دیگر وجود این کلیدها برای انجام عملیات تعمیر و نگهداری ضروری می‌باشند. تابلوهای فشار متوسط فیکس این شرکت در مواردی که قطع موقت برق پیامدهای مخرب چندانی را به بار نیاورد و یا قابل جبران سازی با ژنراتورهای داخلی باشند بسیار مناسب است.

تابلوهای فشار متوسط (کشویی)

تابلوهای کشویی با عایق هوا در مواقعی که قطع طولانی مدت برق اثرات جبران ناپذیری را به بار می‌آورد مورد استفاده قرار می‌گیرد. کلیه تابلوهای کشویی در مدت کوتاهی قابل تعویض بوده و از این حیث دارای اهمیت می‌باشد.

سینی کابل

سینی کابل جهت عبور و ساماندهی کابل‌های کنترل و قدرت مورد استفاده قرار می‌گیرد. سینی‌های کابل به صورت مشبک (پانچ شده) و غیر مشبک (بدون پانچ) با رعایت استانداردهای ملی و بین المللی طراحی و ساخته می‌شوند و بر اساس اصول فنی و مهندسی و با نرم افزارهای مدل سازی کامپیوتری مبتنی بر المان محدود و نهایتاً آزمایشهای نمونه‌ای ضمن بهره‌گیری از تجارب موجود، سطوح سینی، تعداد و اندازه‌ها برای تحمل بار مورد نیاز محاسبه و طراحی می‌گردد.

نردبان کابل

کابل‌های قدرت با جریان بالا در اثر عبور الکتریسیته تولید گرما می‌کنند و باید با هوای محیط بیشتر در تماس باشند تا انتقال حرارت به آسانی صورت پذیرد توصیه می‌شود برای عبور این نوع کابل‌ها از نردبان کابل استفاده شود.

ISO

CERTIFICATES

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LIBEROASSURANCE

Certificate

This is to certify that the
Quality Management System of:

Tavazon Sanat Paydar Co.
No. 27, Zandeh Industrial Town, Imam Hossein Sq., Shahr-e Qods, Tehran, Iran

Has been assessed and registered under the certification and inspection scheme of
LiberoAssurance for the following international standards:

ISO 9001:2015

The management system is applicable to:

Design and Construction of electrical panels, Contracting and maintenance in the field of power and automation systems including cabling, equipment installation, testing and pre commissioning/commissioning

Issued 31/03/2022 at PIRAEUS, GREECE
(Date of issue) (Place of issue of certificate)

Expiry 04/02/2025
(Expiration date)

For the Issuing Organisation
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Document ID: WP_3320

ISO 9001:2015

LIBEROASSURANCE

Certificate

This is to certify that the
Integrated Management System of:

Tavazon Sanat Paydar Co.
No. 27, Zandeh Industrial Town, Imam Hossein Sq., Shahr-e Qods, Tehran, Iran

Has been assessed and registered under the certification and inspection scheme of
LiberoAssurance for the following international standards:

**ISO 9001:2015
ISO 14001:2015
ISO 45001:2018**

The management system is applicable to:

Design and Construction of electrical panels, Contracting and maintenance in the field of power and automation systems including cabling, equipment installation, testing and pre commissioning/commissioning

Issued 31/03/2022 at PIRAEUS, GREECE
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IMS

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Certificate

This is to certify that the
Environmental Management System of:

Tavazon Sanat Paydar Co.
No. 27, Zandeh Industrial Town, Imam Hossein Sq., Shahr-e Qods, Tehran, Iran

Has been assessed and registered under the certification and inspection scheme of
LiberoAssurance for the following international standards:

ISO 14001:2015

The management system is applicable to:

Design and Construction of electrical panels, Contracting and maintenance in the field of power and automation systems including cabling, equipment installation, testing and pre commissioning/commissioning

Issued 31/03/2022 at PIRAEUS, GREECE
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ISO 14001:2015

LIBEROASSURANCE

Certificate

This is to certify that the
Occupational Health and Safety Management System of:

Tavazon Sanat Paydar Co.
No. 27, Zandeh Industrial Town, Imam Hossein Sq., Shahr-e Qods, Tehran, Iran

Has been assessed and registered under the certification and inspection scheme of
LiberoAssurance for the following international standards:

ISO 45001:2018

The management system is applicable to:

Design and Construction of electrical panels, Contracting and maintenance in the field of power and automation systems including cabling, equipment installation, testing and pre commissioning/commissioning

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ISO 45001:2018





Tavazon Sanat Paydar

- ساخت تابلوهای هواساز پروژه فولاد قائنات (کارفرما: هوا فیلتر)
- طراحی و ساخت تابلوهای LV پروژه رزلب کیش (کارفرما: ایتوک)
- طراحی و اجرای تابلو برقهای پروژه پاساژ طلا وطن (چیتگر)
- تنظیمات رلههای VAMP پروژههای ذوب و فولاد خوزستان و برنامه نویسی ATS مربوط به ذوب و گندله سازی
- طراحی، ساخت و برنامه نویسی اولین ژنراتور نیتروژن ساز ساخت داخل (پیش از این تابلو کنترل، خارج ایران تامین میگردد)
- نصب، کابل کشی، تامین متریال و تست ابزار دقیق پتروشیمی تخت جمشید ماهشهر
- نصب و تست ابزار دقیق پالایشگاه تهران واحد ازت
- نظارت بر نصب و تست ابزار دقیق پتروشیمی کردستان واحد نیتروژن مایع همراه شرکت کرایوتیک آلمان
- تهیه مدارک برق، ابزار دقیق و کنترل، پیش راه اندازی و راه اندازی پالایشگاه تهران
- برنامه ریزی رلههای حفاظتی و تست تابلوهای فشار متوسط مس کرمان
- به روز رسانی تابلوهای کنترل و برق پالایشگاه ماهشهر (طراحی، اجرا و تحویل)
- تست تجهیزات ابزار دقیق و مشارکت در راه اندازی سیستم کرایوتیک پتروشیمی کردستان (به همراه وندور آلمانی)
- برنامه نویسی تابلوهای پکیج کمپرسورهای گندله سازی سیرجان کرمان
- طراحی، اجرا و راه اندازی پروژه تصفیه خانه فاضلاب غرب تهران (فیروز بهرام)
- طراحی، نصب و اجرا تابلو برقهای وزارت اطلاعات کشور (LV, MV, PLC)
- طراحی و نصب پایههای روشنایی و چراغهای محوطه وزارت اطلاعات کشور
- طراحی، تهیه مدارک مهندسی، برنامه نویسی لاجیک و تست تابلوهای فشار متوسط سازند اراک
- اجرا و نصب تجهیزات ابزار دقیق پروژه خطوط لوله و مخابرات شهر ری (کارفرما: دانیال پترو)
- نصب و تست تجهیزات ابزار دقیق ایستگاه تقویت فشار گاز دهق (کارفرما: ایتوک)
- نصب و تست تجهیزات ابزار دقیق ایستگاه تقویت فشار گاز پل کله اصفهان (کارفرما: ایتوک)
- پروژه برج سایه هواران
- پروژه برج صدف چیتگر
- ساختمان مرکزی تأسیسات دریایی
- فاضلاب غرب تهران (کوژو) کابل کشی، نصب و راه اندازی
- فاز 14 عسلویه پروژه هواساز پروژه هیوا صنعت
- پالایشگاه شهر ری (بخش و پالایش)
- کابل کشی و راه اندازی تابلو ها پروژه NGL3100 دشت عباس (اندیمشک)
- ساخت، نصب و راه اندازی شرکت آرتا گاز شهرک صنعتی اشتهارد
- ساخت و نصب و راه اندازی تابلو MV20 Kv شرکت ستاره فولاد آسیا بینالود
- ساخت تابلو خازنی شرکت کویر پرنور
- ساخت تابلو خازنی شرکت دومینو
- ساخت تابلو و راه اندازی تابلو پمپ آب رسانی فرودگاه مهرآباد
- ساخت تابلو فشار متوسط (mn) پولاد نورو
- ساخت تابلو روشنایی هتل قو
- ساخت تابلو کنترل و قدرت سیستم غبارگیر فولاد قائنات
- ساخت تابلو کنترل و قدرت سیستم غبارگیر کارخانه کنسانتره سنگ آهن شرکت صنایع معدنی عصر نوین
- ساخت تابلو کنترل و قدرت سیستم غبارگیر کارخانه فولاد گل گهر
- ساخت تابلو کنترل و قدرت سیستم غبارگیر کارخانه فولاد کویر دامغان
- ساخت تابلوها تلمبه خانه شرکت نفت عسلویه (4 بازت)

پروژه‌ها

- برنامه‌ریزی رله‌های حفاظتی و تست تابلوهای فشار متوسط شرکت مس کرمان
- کابل کشی ، نصب و تست تجهیزات ابزار دقیق و راه‌اندازی پمپاژ آب روستایی چابهار
- راه‌اندازی تابلوهای تهویه شرکت سبلان گستر در فاز ۱۹ عسلویه
- نظارت بر نصب و سربندی کابل‌های ورودی و خروجی تابلوهای سیستم تهویه، راه‌اندازی و برق‌دار نمودن تابلوهای فاز ۱۲ عسلویه (کارفرما: کیسون)
- طراحی و راه‌اندازی تابلوهای تقویت فشار گاز دهق و پل کله اصفهان
- سنکرون کردن تابلوهای فشار متوسط خط اصفهان به شهر کرد
- اصلاح (طراحی و مدارات فرمان و قدرت)
- تابلوهای LV در نیروگاه خورشیدی و سیکل ترکیبی یزد (کارفرما: توسعه نیرو)
- راه‌اندازی تابلوهای LV مربوط به پتروشیمی دماوند (کارفرما: مکو)
- نظارت بر نصب و راه‌اندازی تابلوهای ۶.۶kV فشار متوسط پروژه مس چهل کوره زاهدان و تست میگر و های پات کابل‌ها، تابلوها و موتورهای سنگ شکن
- Config رله‌های حفاظتی SPAM M۸۱/M۴۱/M۲۰/M۴۲/A۱۰ شرکت صنایع مس ایران
- راه‌اندازی موتورهای ۱۳۲kw و Config رله حفاظتی ۳UF پتروشیمی رازی
- راه‌اندازی تابلوهای LV و شبکه تلفن تونل نیایش کردستان
- نظارت بر نصب و راه‌اندازی تابلوهای LV مربوط به پروژه فولاد شادگان با شرکت MME
- و نظارت بر نصب ترانس‌های ۲۰kV
- نظارت بر نصب و اجرای کامل سیستم برق مربوط به خط ۲۰kV شهر ری و راه‌اندازی سیستم برق، تلفن و ابزار دقیق
- تعویض و Config رله‌های حفاظتی در تابلوهای ۲۰kV & ۶۳ شرکت خطوط لوله و مخابرات شهر ری
- برنامه‌نویسی تابلو کنترل تصفیه خانه فاضلاب جنوب تهران (کارفرما: شرکت ژرف کار جم)
- راه‌اندازی تابلوهای پروژه قطار شهری اصفهان در کلیه ایستگاه‌ها
- راه‌اندازی تابلوهای ۶.۶kV نیروگاه بندر عباس و تحویل سیگنال‌ها به DCS (کارفرما: شرکت توسعه یک مپنا)
- برق‌دار نمودن ترانس ۲۰/۰.۴kV و تابلوهای خازنی و وصل کردن آن به شبکه در پروژه پخش و پالایش جنوب تهران (کارفرما: شرکت نیرو آرا اندیش و شرکت پخش پالایش)
- نصب دیزل ژنراتور و ترانس ۲۰/۰.۴kV . کابل کشی برق و ابزار دقیق مخازن، پمپ، سیستم کنترل و راه‌اندازی لاجیک ۳ از ۵ پروژه انبار نفت بندرعباس (شهید رجایی) به صورت EPC (کارفرما: پترو آموت پویا)

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Paydar***

Introduction

Tazwan Sanat Taybar technical engineering company with the abbreviation TSP with years of experience and with the aim of serving the electricity industry of the country and striving towards industrial self-sufficiency, helping to improve the business environment of other companies, established and operating in the field of design and construction. All kinds of low pressure (LV) and medium pressure (MV) switchboards, power factor (capacitance) correction panels, carrying out EPC projects (electricity, instrumentation and automation) as well as industrial and economic projects such as power plant projects, oil, Gas, refinery and petrochemical, water and wastewater supply and treatment systems, steel, copper, mines, construction, sports and other infrastructure projects with the best quality and using the world's latest technology are concentrated.



Policy :

The goal of Tawazun Sanat Technical Engineering Company is to satisfy our valued customers by guaranteeing the quality of our products and relying on technical and engineering knowledge with experienced staff, based on valid national and international standards. It is hoped that we will take an effective step towards achieving this goal and making our beloved country proud in all fields, especially in the field of industrial self-sufficiency.

Areas of Activity :

- Providing design and engineering services
 - Construction engineering of low voltage (LV) and medium voltage (MV) switchboards
 - Setting up, testing and configuring protection relays
- Providing goods supply and trading services
- Carrying out EPC projects (engineering, provision of equipment and implementation)
 - Production of cable trays and cable ladders
- Carrying out new energy projects (solar, wind, etc.)
- Automation and start-up of machines of various industries



01

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ACTIVITY

Company Work Process

Work process:

Tazwan Sanat Technical and Engineering Company is fully prepared to fulfill your wishes regardless of the size and complexity of your panels. Our design and construction is in such a way that the most optimal use of the interior space of the cabinet is possible considering the location of their installation in accordance with the highest international standards.

In Tawazun Sanat company, in order to create a quality product, all projects can be tracked and monitored since the beginning of the project and at every stage. The steps of making the board after the approval from the employer are as follows:



- • design and engineering
- • Making a panel in the metalworking unit
- • Painting
- • Assembly and wiring
- • Testing and delivery at the factory
- • Packaging and shipping



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As soon as your switchboard is ready, our company is ready to send it to the project site with proper packaging. Along with all the boards, inspection and test documents, as well as instructions for installing and operating the boards will be sent. If the customer needs, our experienced installation team is ready to serve you dear ones.

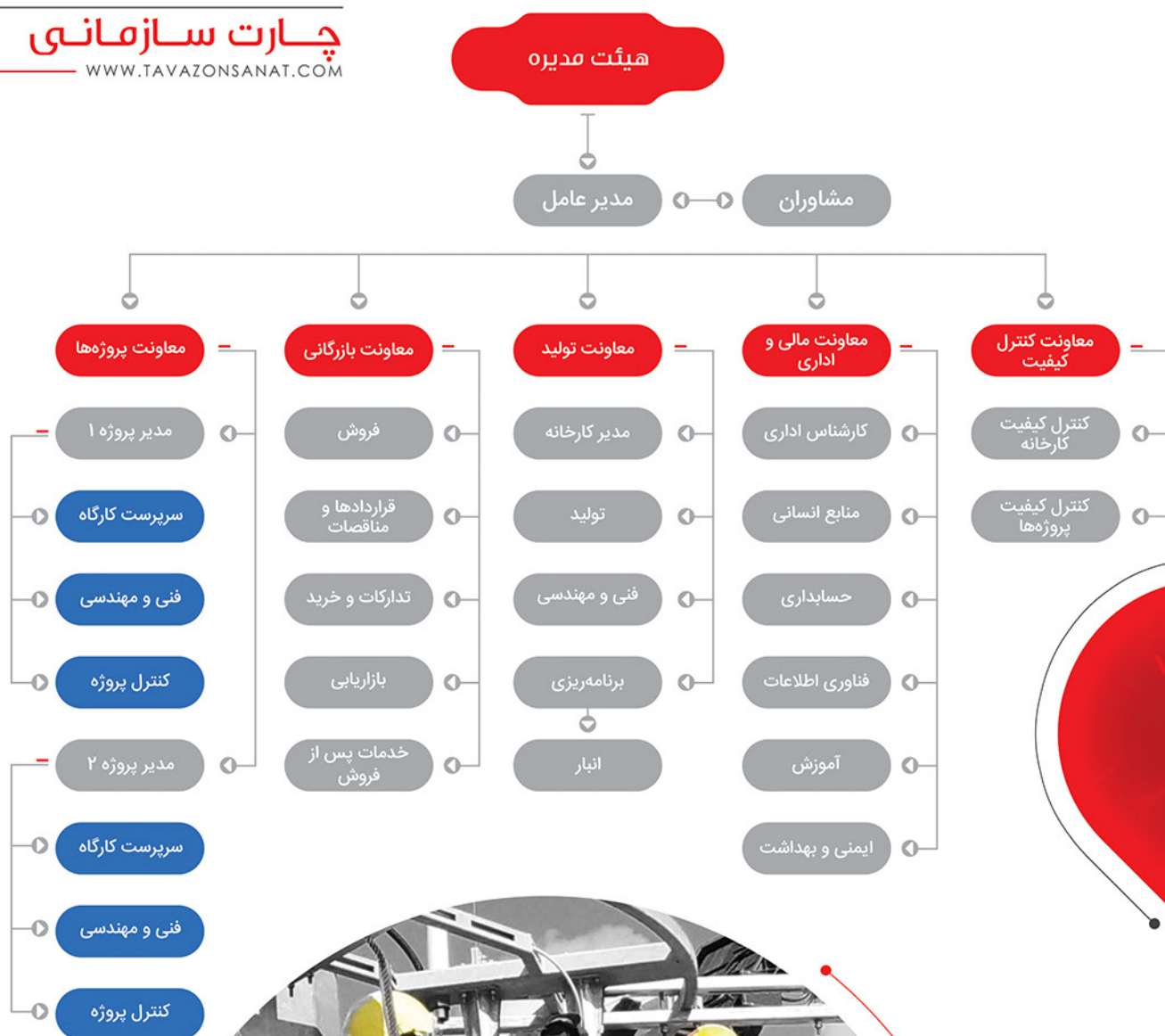
VISION

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Vision:

We want to improve our products and services quantitatively and qualitatively by taking advantage of the commitment, innovation, use of world-class technologies, expertise and hard work of our employees as well as joint investment with prominent global companies. To be known as the best service provider in the electricity and new energy markets of Iran, the Middle East and developing countries.

03



MISSION



Mission:

Tazwan Sanat Padayar Technical Engineering Company is a well-known name in the electricity industry of the country, which always sees its



- . Designing and producing the most high-quality and basic electrical panels using the latest technology in the world
- . Providing the best services and products to customers and instilling a sense of confidence through their choice
- . Having a continuous communication bridge with customers
- . Creating an environment for cultivating expert and efficient forces and an environment where innovation and creativity are given importance
- . Creating a sense of friendship and interaction among employees and creating a sense of satisfaction



PRODUCTS

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Products

Low pressure products LV SWITCHGEARS

- . Distribution sliding switchboards up to the level of 7400 amperes
- . Sliding switchboards
- . Protection and control panels of electric substations
- . power factor correction switchboards (capacitance)
- . Control panels for all types of motors and pumps
- . Installation and construction switchboards
- . Das hboard electrical panels (piano)
- . Switchboards that can be installed in open space with high protection class
- . Emergency switchboard (diesel generator protection and control)
- . Stainless steel switchboards for the food industry
- . Logical control panel (PLC)
- . Electrical panels of the intelligent building management system (BMS)

MV SWITCHGEARS medium pressure products

- . Electrical panel with fixed and sliding gas switch
- . Electrical panel with vacuum fixed and sliding switch

MV CABLE TARYS & LADDERS

- . Cable tray
- . Cable ladder

LV SWITCHGEARS
MV SWITCHGEARS
MV CABLE TARYS &
LADDERS

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Medium pressure panels (Fix):

These signs are very important from the point of view of protection.

When an error occurs, the disconnectable keys operate under load and separate the infinite network from the error location. On the other hand, the existence of these keys is necessary to carry out maintenance operations.

Fix medium pressure panels of this company are very suitable in cases where temporary power outages do not cause much damage or can be compensated with internal generators.

Medium pressure panels (sliding):

Sliding panels with air insulation are used when long-term power outages have irreparable effects. All sliding panels can be replaced in a short period of time and it is important in this respect.

Cable tray:

The cable tray is used to pass and organize control and power cables. Cable trays are designed and manufactured in the form of mesh (punched) and non-mesh (without punch) in compliance with national and international standards and based on technical and engineering principles and with computer modeling software based on finite elements and finally tests. A sample is calculated and designed while taking advantage of existing experiences, tray levels, number and sizes to bear the required load.

Cable ladder:

Power cables with high current generate heat due to the passage of electricity and must be in contact with the ambient air more so that heat transfer can be done easily. It is recommended to use a cable ladder to pass these types of cables.

TEST EQUIPMENT

Routine Tests Facilities

Insulation Test :

Voltage test by 250/5000 VDC on L.V. switchgears with adjustable time (1s - up to 30 min) and printable report by 5000/75000 VDC on M.V. switchgears with adjustable time (MEGGER Test)

Power frequency Test :

Withstanding voltage test by 250/5000VAC on L.V. switchgears with - adjustable time. (HIPOT Test)

- **Primary Current**

injection :

primary current injection up to 4000 A on protection relays and circuit breakers. Measuring earth leakage current for electrical equipments up to 25 A.- Electrical and mechanical function test according to IEC standard.-

- **AC TEST SYSTEMS (170kV)**

AC test systems consist of modular transformers units able to be cascaded up to three stages to get higher voltages ranging from 100kV. Our AC test systems can be provided with low or high power ratings.

Small AC test systems with low power are mainly suitable to perform dielectric tests. Whereas large systems with high power can be used to carry out additional tests such as high power voltage withstand test.

- **IMPULSE TEST SYSTEMS (170kV)**

Impulse test systems are based on the Marx generator. They provide the standard lightning and switching impulses to test various test objects such as transformers, bushings, cables, insulators, switchgears, etc.

- **DC TEST SYSTEMS (170kV)**

DC test systems are based on voltage multipliers, in which an AC voltage transformer charges HV capacitor with DC voltage through HV diodes and resistors. They provide DC high voltage HVDC facilities, long AC cables, capacitors, etc.



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MV SWITCHGEAR

Rated voltage	kV	12	17.5	24
Rated insulation voltage	kV	12	17.5	24
Test voltage at power frequency	kV 1min	28	38	50
Impulse withstand voltage	kV	75	95	125
Rated frequency	Hz	50-60	50-60	50-60
Rated short-time withstand current	kA 1s	...50	...50	...25
Peak current	kA	...125	...125	...63
Rated short-time withstand current	kA 3s	...40	...40	...25
Peak current	kA	...100	...100	...63
Internal arc withstand current	kA 1s kA 0.5s	...40 ...50	...40 ...50	...25
Main busbar rated current	A	...4000	...4000	...2500
Rated current of the branch connections	A	630	630	630
		1250	1250	1250
		1600	1600	1600
		2000	2000	2000
		2500	2500	2500
		3150	3150	-
Rated current of the branch connections with forced ventilation	A	3600	3600	2500
		4000	4000	-

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Sivacon type



it's ideal for :

- Main Switchboards
- Distribution switchboards
- Motor Control Centers (MCC)
- Fixed or Fully Withdrawable
- Power Factor Correction Centers
- UPS Applications

Key Features :

- Modular system based on 200mm grid
- Smooth powder coated finish
- Suitable for extreme climate conditions
- High strength, low weight
- Design Verified and type tested up to 7100A
- IP55 is standard

CHARACTERISTICS OF UNISAFE TYPE SWITCHGEAR

- Metal-clad air-insulated switchboard
- Studied for medium voltage distribution
- Factory-tested for installations inside rooms
- Guaranteed arc-proof units
- Compartments segregated by means of metallic partitions openly connected to earth
- Limited use of insulating materials
- Complete with mechanical safety interlocks
- Structure made of pre-galvanized sheet
- Putting into service, maintenance and service operations can be carried out from the front
- Complete set of apparatus: gas and vacuum circuit breakers, contactors and switch disconnectors
- Equipped with conventional instrument trans- formers or new generation sensors
- Wide range of functional units for any all installation solutions
- Easy-to-assemble modular structure

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13 LV SWITCHGEAR

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SIM ARIS DESIGN & ESTIMATION STEPS

The first step in designing a successful distribution or motor control center is planning with simaris .

- Basic information

First, enter the information about the customer & project .
Then the numbers & sizes of incoming breakers , outgoing
Breakers & internal componets .

- Cost calculation

The software will now automatically generate a panel .
Cost calculation will tell the exact price for the complete package .

- Part List

The system will give you all information about Sivacon
Item , as well as electrical items . Our software engineers
are constantly updating with new products .

- Technical info

Drawing generated in 2D .
Temperature rise calculations & diagrams .



Features & Applications

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The ABB MNS system is a low voltage switchgear assembly. Its design is verified in accordance with IEC 61439-1/-2. The consistent application of the modular principle both in electrical and mechanical design as well as the use of standardized components allows its flexible and compact design. Depending on operating and environmental conditions different design levels are available.

Notable system advantages with regard to design aspects:

- Optimum protection for personnel and plant
- Design verified by testing (type-tested) including arc fault containment
- High operational reliability and availability
- Earthquake-, vibration- and shock-proof designs are available
- Maintenance-free busbar and frame construction
- Simple retrofitting procedures
- Compact, space-saving design
- Simplified project implementation utilizing ABB's dedicated engineering tool

Thus MNS proves to have the approved solution for the following industries:

- Oil & Gas, on and off shore
- Chemical/Petrochemical
- Pharmaceutical
- Power Stations
- Paper
- Water treatment
- Mining
- Steel
- Food

as well as for infrastructure requirements:

- Data centers
- Airports
- Office buildings
- Shopping centers
- Hospitals
- Rail



Flexible Solutions for Power Distribution and Motor Control

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Functional Compartments and Segregation

The assembly is divided into compartments thus separating different functional areas.

Incoming circuit breaker solution

1 Equipment compartment

The equipment compartment is divided into 3 sub sections, each sub section having its own door. The center sub section accommodates the circuit breaker and associated equipment in fixed or withdrawable design. Depending upon the option for cable entry, for example with top entry solution access to incoming connections is via the door in the upper sub section, the auxiliary compartment is then located behind the door in the lower sub section. For bottom entry the configuration is vice versa.

2 Busbar compartment

Contains the MNS main busbar system. Connection to the main bus is via a 'Partition Plate' with gas sealed connections.

Outgoing solution

1 Equipment compartment

All equipment, including the motor starter modules in withdrawable design, is situated therein. The compartment can be divided into horizontal and vertical* sub compartments.

2 Cable compartment

Contains control cables and terminals, as well as power cables and connection units. Cable entry may be top or bottom.

3 Busbar compartment

Contains the MNS main busbar system. The distribution bars are embedded in the multifunction wall (MFW) which is located between the equipment.



OUTGOING MODULES



- **Withdrawable Modules**

The withdrawable technique has proved to be the appropriate solution for use in industrial applications where requirements for high availability are a must particularly in Motor Control Centers (MCC).

Modules can be easily exchanged under operational conditions thus assuring maximum flexibility.

- **Small modules**

Withdrawable technique is distinguished by its compact design where, with the smallest 8E/4 module it is possible to physically define a maximum of 36 modules in the equipment compartment. This modularity enables the assembly to maximize the usage of the available space, which in turn reduces the overall footprint of the switchgear. The condaptor unit enables the horizontal distribution of power from the vertical distribution bars, this allows 2 modules (8E/2) or 4 modules (8E/4) to be located adjacently within the same horizontal position in the cubicle. Condaptors are available in 3 or 4 pole options. Cable connections for main and auxiliary circuits are integrated into the condaptor and are accessible from the cable compartment.



MNS SWITCHGEAR OVERVIEW

TECHNICAL DATA

STANDARDS		LOW VOLTAGE SWITCHGEAR AND CONTROLGEAR ASSEMBLIES – VERIFICATION BY TESTING*	IEC 61439-1/-2
TEST CERTIFICATES		ASTA, GREAT-BRITAIN (RESIST. TO ACCIDENTAL ARCS ACC. TO IEC 61641 AND IEC 60298, APPENDIX AA) DLR GERMAN RESEARCH INSTITUTE FOR AEROSPACE E. V. JÜLICH, EARTHQUAKE TEST FOR SECURITY AREAS INNUCLEAR POWER STATIONS IABG INDUSTRIEANLAGEN BETRIEBSGESELLSCHAFT, VIBRATION AND SHOCK TESTS COMPLYING WITH GERMANISCHER LLOYD, HAMBURG	
ELECTRICAL DATA	RATED VOLTAGES	RATED INSULATION VOLTAGE UI	1000 V 3~, 1500 V- **
		RATED OPERATING VOLTAGE UE	690 V 3~, 750 V- **
		RATED IMPULSE WITHSTAND VOLTAGE	UIMP 6 / 8 / 12 KV **
		OVERVOLTAGE CATEGORY	II / III / IV **
		DEGREE OF POLLUTION	3
		RATED FREQUENCY	UP TO 60 HZ
	RATED CURRENT	COPPER BUSBARS:	
		RATED CURRENT IE	UP TO 6300 A
		RATED PEAK WITHSTAND CURRENT IPK	UP TO 250 KA
		RATED SHORT-TIME WITHSTAND CURRENT ICW	UP TO 100 KA
		COPPER DISTRIBUTION BARS:	
		RATED CURRENT IE	UP TO 2000 A
		RATED PEAK WITHSTAND CURRENT IPK	UP TO 176 KA
		RATED SHORT-TIME WITHSTAND CURRENT ICW	UP TO 100 KA
	ARC FAULT CONTAINMENT	RATED OPERATIONAL VOLTAGE	UP TO 690 V
		PROSPECTIVE SHORT-CIRCUIT CURRENT	UP TO 100 KA
		DURATION	300 MS
		CRITERIA (IEC 61641)	1 TO 7
	FORMS OF SEPARATION		UP TO FORM 4
	MECHANICAL CHARACTERISTICS	DIMENSIONS CUBICLES AND FRAME	DIN 41488
		RECOMMENDED HEIGHT	2200 MM
		RECOMMENDED WIDTH	400, 600, 800, 1000, 1200 MM
		RECOMMENDED DEPTH	400, 600, 800, 1000, 1200 MM
		BASIC GRID SIZE	E = 25 MM ACC. TO DIN 43660
	DEGREES OF PROTECTION	ACCORDING TO IEC 60529	EXTERNAL FROM IP 30 TO IP 54 INTERNAL FROM IP 2X
	STEEL COMPONENTS	FRAME, INCL. INTERNAL SUBDIVISIONS	2.0 / 2.5 MM
		CLADDING, INTERNAL	1.5 / 2.0 MM
		CLADDING, INTERNAL	1.5 MM
	SURFACE PROTECTION/PAINT	FRAME, INCL. INTERNAL SUBDIVISIONS	ZINC OR ALU-ZINC COATED
		CLADDING, INTERNAL	ZINC OR ALU-ZINC COATED
		CLADDING, EXTERNAL	ZINC OR ALU- ZINC COATED AND POWDER COATED RAL 7035 (LIGHT GREY)
	PLASTIC COMPONENTS	HALOGEN-FREE, SELF-EXTINGUISHING, FLAME RETARDANT, CFC-FREE	IEC 60707, DIN VDE 0304 PART 3
OPTIONAL EXTRAS, AVAILABLE ON REQUEST	BUSBAR SYSTEM	BUSBARS	FULLY INSULATED WITH HEAT SHRINKABLE SLEEVING SILVER PLATING TIN PLATING
	SPECIAL QUALIFICATION	TEST CERTIFICATES	SEE TEST CERTIFICATES LISTED ABOVE
	PAINT	ENCLOSURE	SPECIAL COLOURS ON REQUEST

* DESIGN VERIFICATION BY TESTING: WHERE AN ASSEMBLY HAS PREVIOUSLY BEEN TESTED IN ACCORDANCE WITH IEC 60439-1, AND THE RESULTS FULFIL THE REQUIREMENTS OF IEC 61439-1/-2, THE VERIFICATION OF THESE TESTS NEED NOT BE REPEATED.

** DEPENDING ON THE ELECTRICAL EQUIPMENT

Busbar System

Main Busbars

The MNS main busbar system is arranged in the rear of the switchgear. This assures a maximum distance between the busbars and the operator and maintenance staff. The main busbar system is fully separated from the equipment compartment as well as from the cable compartment.

The busbar system is a maintenance free construction as a result of utilizing thread locking ESLOK screws together with conical spring washers. This technology remains relatively unchanged since the introduction of MNS, and has been extensively supplied into the most demanding industries.

The busbar system and all associated parts are manufactured from copper in accordance with DIN 40500. Options are available for silver plating and/or a fully insulated solution utilizing heat shrinkable sleeving.



OUTGOING MODULES

Plug-in Modules

MNS offer numerous alternatives for plug-in modules. When utilizing the multifunction wall, all modules have the ability to be exchanged without de-energizing the switchgear, should maintenance procedures allow. The flexibility of the system allows power distribution and motor control to be offered in the most economical Form 2 solution. From this as a basis, options exist for internal/ external operation and separation to Form 4. The Slimline switch disconnecter offers ABB's most compact form of fused energy distribution, and is available in 3 or 4 pole options. This design is available in standard modules sizes with a maximum rating of 630 A.



Operation is performed via the handle on the front of the module which has an inbuilt padlocking facility and mechanical open/closed indication.

The following options are available:

- Ammeter
- Auxiliary contacts
- Fuse blown indication

The Slimline is also available as Intelligent Tier Switch enabling the following information to be sent via its fieldbus connection:

- Switch status
- Fuse indication
- Current

Air-insulated

- From power stations down to distribution substations, ABB provides a reliable, high quality solutions for products, systems and services. As a single source partner, ABB is the world's largest and most complete supplier of switchgear and systems for electric power transmission and distribution applications. ABB substations, cables, transformers, control systems and switchgear enable our customers to make efficient and effective use of electric power.

As a world-leading company in research, development and innovation, ABB is able to provide the most comprehensive and suitable range of solutions to meet the present and future needs of producers, distributors and users of electric power. Medium voltage switchgear is one of the most important links in the electric distribution chain and ABB has developed the UniGear ZS2 switchgear with the aim of satisfying all requirements. UniGear ZS2 combines consolidated solutions and innovative components, based on ABB's leading-edge technology.

UniGear ZS2 is medium voltage metal-clad switchgear with a metal enclosure, suitable for indoor installations. Metal partitions segregate the compartments from each other and the live parts are air-insulated. The switchgear is modular and this provides a coordinated approach that enables the ideal solution for each installation to be built up by placing standardised units side by side.

The switchgear is simple to configure and selection of the correct apparatus and instruments for specific applications does not require dedicated solutions.

The functional units of the switchgear are guaranteed arc proof in accordance with the IEC 62271-200 Standards, appendix AA, class A accessibility, criteria 1 to 5. All the startup, maintenance and service operations can be carried out from the front of the unit. The switchgear and the earthing switches are operated from the front with the door closed. The switchgear can be wall-mounted. The range of apparatus available for UniGear ZS2 switchgear is the most complete on the market, including vacuum and gas circuit-breakers. All this apparatus is interchangeable inside the same switchgear unit. This makes it possible to offer a single switchgear user interface, with the same service and maintenance procedures and operations. The switchgear can be fitted with conventional (transformers and releases) or innovative (sensors and multi-purpose unit) measurement and protection components. Apart from the traditional functional units, the UniGear ZS2 switchgear is fitted with double busbar systems. The use of these units allows extremely efficient use of space.

Standards

The switchboard and main apparatus it contains comply with the following Standards:

- IEC 62271-1 for general purposes.
- IEC 62271-200 for the switchgear.
- IEC 62271-102 for the earthing switch.
- IEC 60071-2 for the insulation coordination.
- IEC 62271-100 for the circuit-breakers.
- IEC 60529 for degree of protection.

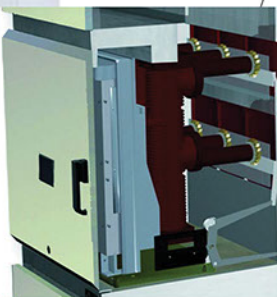
Normal service conditions

The rated characteristics of the switchgear are guaranteed under the following ambient conditions:

- Minimum ambient temperature: -5°C
- Maximum ambient temperature: $+40^{\circ}\text{C}$
- Ambient humidity:
 - Maximum 24h average of relative humidity 95% RH
 - Maximum 24h average of water vapour pressure 2.2 kPa
 - Maximum monthly average of relative humidity 90% RH
 - Maximum monthly average of water vapour pressure 1.8 kPa
- The normal operation site altitude is up to 1000 m above sea level.

Presence of normal, non-corrosive and uncontaminated atmosphere.

Electrical characteristics		
Rated voltage kV	[kV]	36
Rated insulation voltage	[kV]	36
Rated power frequency withstand voltage	kV 1min	70
Rated lightning impulse withstand voltage	kV	170
Rated frequency	Hz	50-60
Rated short time withstand current	kA 3	...31.5
Peak current	kA	...80
Internal arc withstand current	kA 1 s	...31.5
Main busbars rated current	A	1250 1600 2000 2500 3150
Branch connections rated current	A	1250 1600 2000
Branch connection rated current with forced ventilation with fan	A	2500
Branch connection rated current with forced ventilation with fans (available only with VD4 vacuum Circuit Breaker)	A	3150



The electrical characteristics of the switchboard can vary for ambient conditions other than described in the previous section and also if a higher degree of protection is used.

Degrees of protection

The degrees of protection of the switchgear conform with IEC 60529 Standards.

UniGear ZS2 switchgear is normally supplied with the following standard degrees of protection:

- IP4X for the enclosure.
 - IP2X for the partition between compartments.
- On request, the external housing can be supplied with a higher degree of protection; in this case please contact your ABB sales representative.

Colour of the external surfaces

RAL7035 - light grey (front doors).
Other colours available on request.

1. UNIGEAR ZS2

IEC CLASSIFICATION

With the release of the IEC 62271-200 standard, new definitions and classifications of Medium Voltage switchgear have been introduced. One of the most significant changes is that classification of switchgear into metal-clad, compartmented and cubicle types has been abandoned. The revision of switchgear classification rules has been based on the user's point of view, in particular on aspects like service and maintenance of the switchgear, according to the requirements and expectations for proper management, from installation to dismantling. In this context, Loss of Service Continuity (LSC) has been selected as a fundamental parameter for the user. According to the IEC 62271-200, UniGear ZS2 switchgear can be defined as follows.

1. LSC-2B

The busbars, circuit-breaker and cable compartments are physically and electrically segregated. This is the category that defines the possibility of accessing the circuit-breaker compartment with the busbars and cables energized.

2. Partition Class

Switchgear providing continuous metallic partitions and shutters, intended to be earthed between opened accessible compartments and live parts of the main circuit. Metallic partitions and shutters or metallic parts of them shall be connected to the earthing point of the switchgear.

3. Interlock-controlled accessible compartment Compartment containing high-voltage parts, intended to be opened for normal operation and/or normal maintenance, in which access is controlled by the integral design of the switchgear.

4. Tool-based accessible compartment

Compartment containing high-voltage parts, that may be opened, but not for normal operation and maintenance. Special procedures are required. Tools are necessary for opening.

Compartments

Each switchgear unit consists of three power compartments: circuit-breaker, busbars and cables. Each unit is fitted with a low voltage compartment, where all the auxiliary instruments are housed. Arc-proof switchgear is optionally provided with a duct for evacuation of the gases produced by an arc; different types of gas ducts are available. All the compartments are accessible from the front and maintenance operations can be correctly carried out with the switchgear installed up against a wall. The compartments are segregated each other by metallic partitions.

Main busbars

The busbar compartment contains the main busbar system connected to the upper isolating contacts of the circuitbreaker by means of branch connections. The main busbars are made of electrolytic copper. For ratings up to 2000A, the busbars are tubular bars; while for currents between 2500A and 3150A, a flat busbar is used. The busbars are covered with insulating material. There is a single busbar compartment along the whole length of the switchgear, which optionally can be divided into compartments.

Feeder connections

The cable compartment contains the branch system for connection of the power cables to the lower contacts of the circuit-breaker. The feeder connections are made of electrolytic copper and they are round busbars for the whole range of currents. They are covered with insulating material.

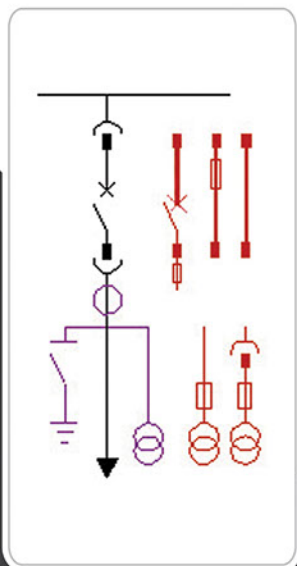
Earthing switch

Each cable compartment can be fitted with an earthing switch for cable earthing. The same device can also be used to earth the busbar system (measurements and bus-tie units). The earthing switch has short-circuit making capacity. Control of the earthing switch is from the front of the switchgear with manual operation. The position of the earthing switch can be seen from the front of the switchgear by means of a mechanical coupled indicator.

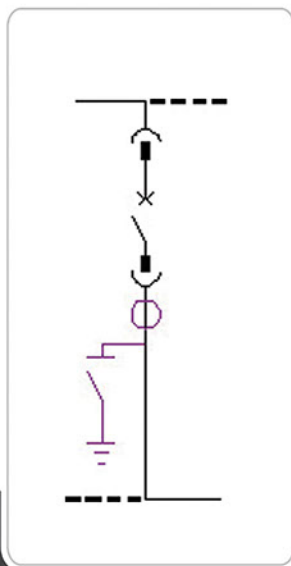


1. UniGear ZS2

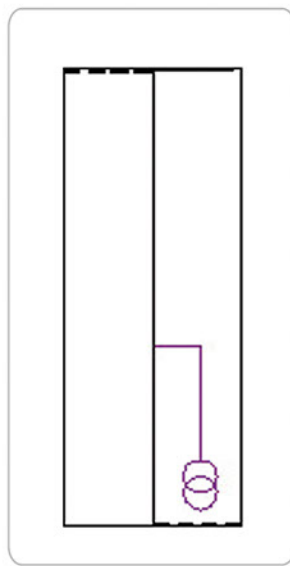
Typical units and technical data Single-line diagram of typical units



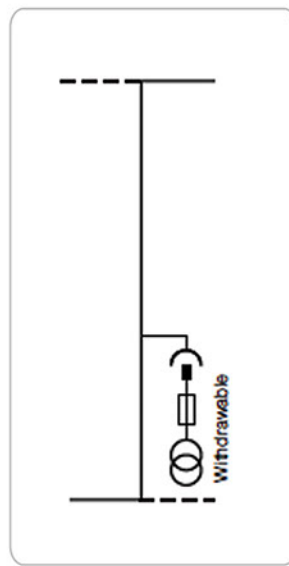
IF - Incoming/outgoing feeder



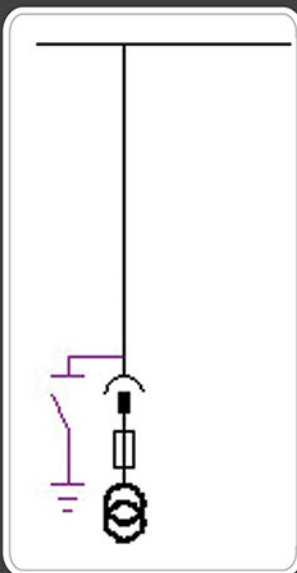
BT - Bus-tie



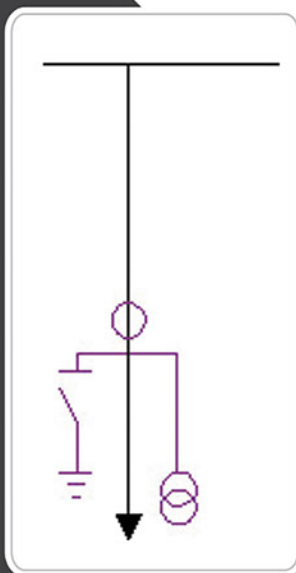
R - Riser



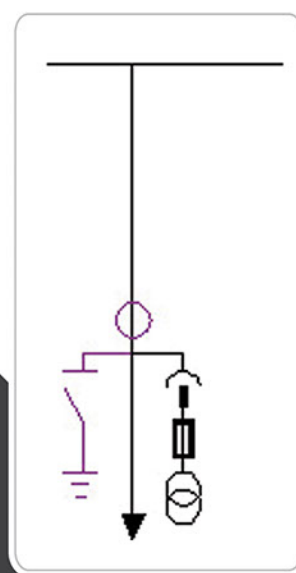
RM - Riser with measurements



M - Measurements



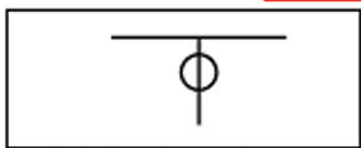
IFD - Direct incoming/outgoing feeder



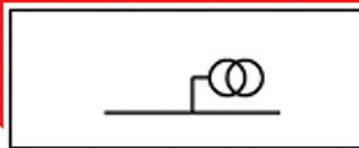
IFDM - Direct incoming/ outgoing feeder with measurements

Earthing switch position will be between circuit breaker and current transformers for units up to 31.5 kA 1 sec due to usage of ST US 36. For 31.5 kA 3 sec EK6 type earthing switch will be used on cable side of units as shown in above illustrations.

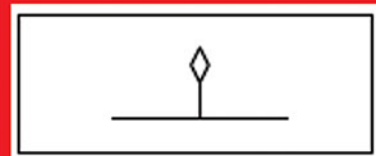
Single-line diagram of the busbar applications



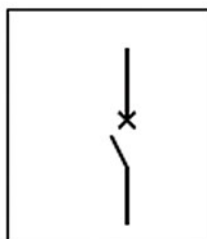
Current transformers



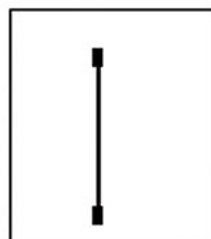
Voltage transformers



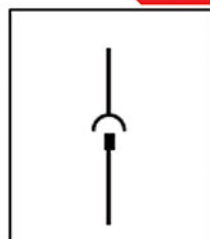
Duct entry



Circuit-breaker



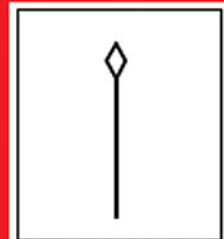
Isolating bar



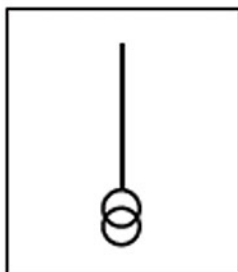
Socket and plug



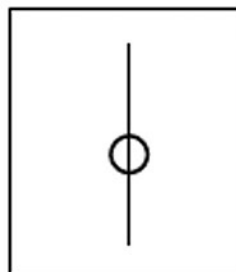
Cable entry



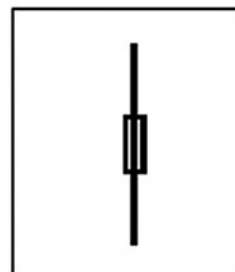
Busbar entry



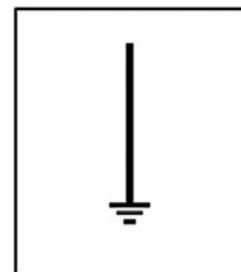
Voltage transformers



Current transformers



Fuse



Earth

UNISWITCH MEDIUM VOLTAGE SWITCHGEAR

WWW.TAVAZONSANAT.COM

kV, 17.5 kV, 24 kV, 630 A 12



Tavazon Sanat Paydar

UniSwitch Design Philosophy UniSwitch, need to say more?

UniSwitch, the light flexible switchgear developed as a modular, simple to apply design, with fewer components, providing a high reliable, quality and safe product for you, our Customer.

- By reducing the number of components, utilising modern materials correctly, we have developed an environmentally and user friendly product. The simple design and construction of UniSwitch will stand the test of time for generations to come. UniSwitch is an air insulated (AIS), metal enclosed, switchgear cubicle design of the next generation developed through continuous innovation and vision to meet the changing market needs.
- UniSwitch provides long-term technical solutions for various applications. Safety, user friendliness and environmental concerns have been the driving force in the development of the new switchgear. UniSwitch switchgear is a compact solution for a fully automated power distribution network. Supported by sensor technology and the latest in protection relays, it meets even the most demanding requirements in hospitals and airports.
- UniSwitch is a worldwide switchgear development utilising the global experience of ABB to incorporate the needs of Customers from all over the world. UniSwitch switchgear is available from the ABB worldwide network of Companies. This univer product is manufactured in 8 ABB factories.



28 UNISWITCH MARKET SEGMENT

WWW.TAVAZONSANAT.COM

UniSwitch

- Light compact distribution switchgear Ring Main Unit for applications like:
Residential suburban
Electrical distribution
Compact secondary substation



Ring main unit

- Switchgear for electricity distribution application such as:

Secondary substations
Manufacturing industry
Shopping centres
Airports
Metro
Windmills
Small/medium size power plants
Hospitals
Sportcenters
Etc.



- Heavy switchgear for demanding applications including:
Primary substations
Power plants
Railways
Marine



Heavy switchgear

- UniSwitch product provides our Medium Voltage Customer with the best solution for heavy duty switchgear in a size only a little than a single tank Ring Main Unit while including:
 - the flexibility in meeting our Customers specification and accomodating on future change and upgrading
 - the options include complete control, measuring and protection systems



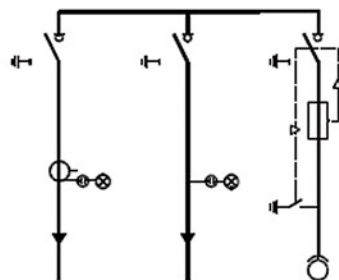
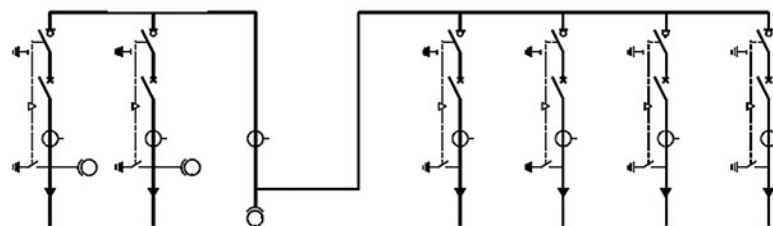
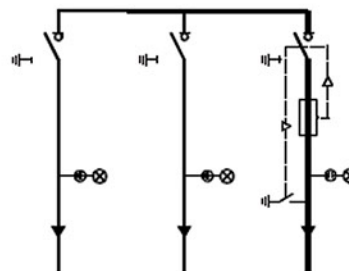
Utility



Power Plants,
Diesel /gas engine
(built by Wärtsilä)



Windmills





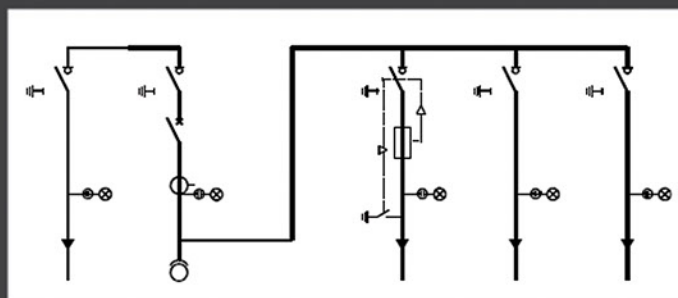
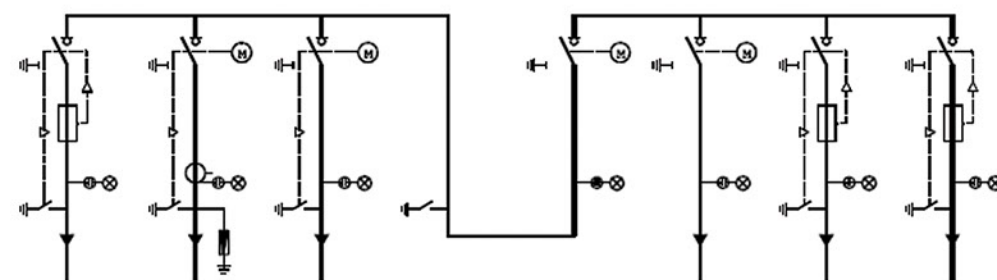
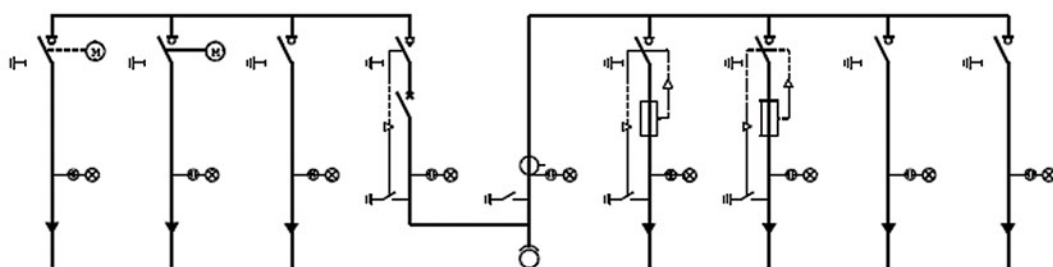
Hospital



Airport



Metro





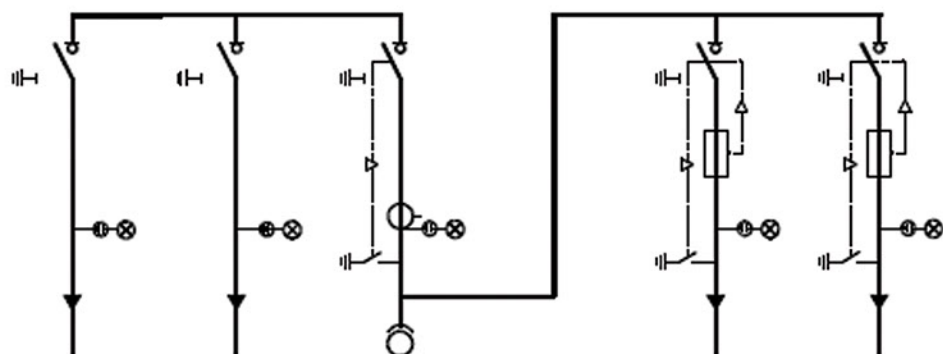
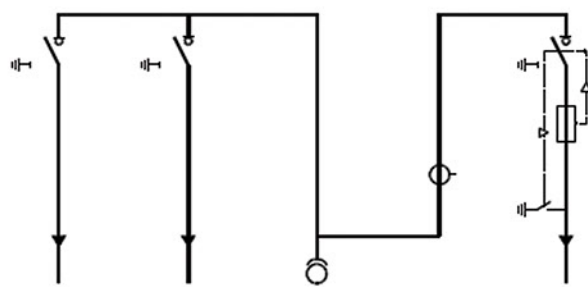
Shopping center

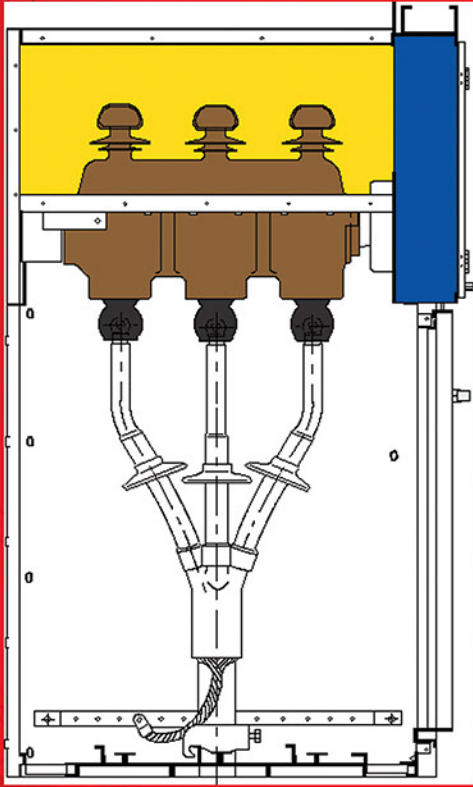


Sports center
(Botnia Hall, Vaasa)



Industry





- 1 Busbar compartment
- 2 Switching compartment
- 3 Cable compartment
- 4 Mechanism, interlocking and low voltage compartment

1. Busbar compartment

The busbar compartment is located on the top of the cubicle. This compartment contains the main busbars that interconnect between switchgear cubicles.

2. Switching compartment

A 3-position SF6 switch-disconnector with epoxy cast resin housing is provided with inspection windows and available also with gas density indicator.

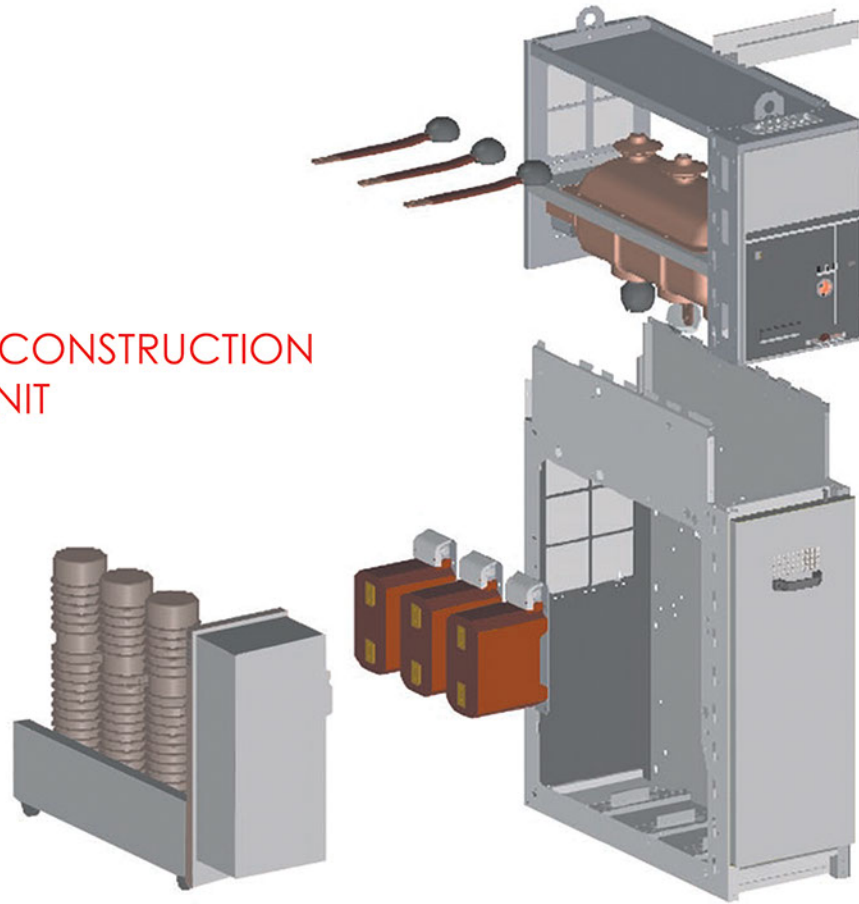
3. Cable compartment

85 % of the space in the switch-disconnector cubicle is reserved for power cable connection making it possible to use both 1- and 3-phase cables with most simple unscreened terminations. Space is also adequate for cubicle accessories such as surge arresters, current transformers, second earthing switch etc. The door has an inspection window and safety interlocking as standard. For cable entry there are 3 individual cable gland plates in the bottom with support for a suitable dimensioned cable clamp. The bottom and the threshold of the cubicle can be removed for ease of cable installation.

4. Mechanism, Interlocking and Low Voltage compartment

Behind a hinged door (which serves as control panel) are located the spring operating mechanism with position indicator and the mechanical interlocking unit. There are also facilities for cubicle accessories such as: auxiliary contacts, tripping coil, emergency tripping mechanism, capacitive voltage indicator, key interlocks and motor operating device. Space is also provided for control circuits and measuring instruments as well as a protection relay. In the 750 wide cubicles there is also a second identical compartment for further accessories. The upper part of the cubicle, including the busbar compartment, the switch-disconnector and the mechanism and LV compartment is separated from the lower part and the cable compartment. Because of this it is possible to carry out maintenance, repair and upgrading of the unit in the lower module while the switchgear is in service.

SWITCHGEAR CONSTRUCTION
OPERATING UNIT



1 Top unit

- . 3-position switch-disconnector SFG
- . Operating mechanism with mechanical position indication
- . Enclosure of busbar compartment Integrated low voltage compartment for secondary components
 - . Interlocking unit
 - . Busbars
 - . Control cable ducts

2 Bottom unit

- . Enclosure
- . Circuit breaker
- . Current transformers
- . Earthing switches
- . Voltage transformers
- . Cable entry with cable support

• Switch-Disconnecter Cubicle, type SDC



Width: 375 or 500 mm
Height: 1635 or 1885 mm



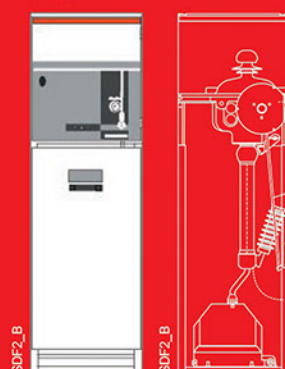
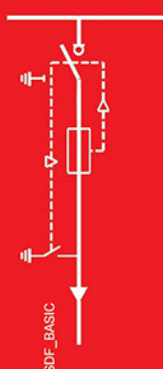
Width: 500 mm
Height: 1635 or 1885 mm



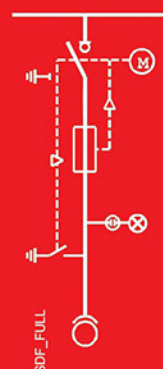
• Switch-Disconnecter with fuse Cubicle, type SDF



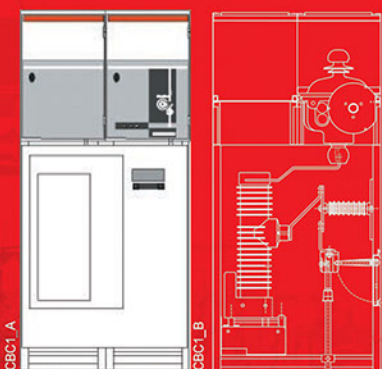
Width: 375 or 500 mm
Height: 1635 or 1885 mm



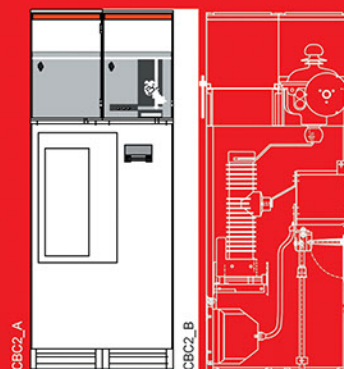
Width: 500 mm
Height: 1635 or 1885 mm



• Circuit Breaker Cubicle, type CBC



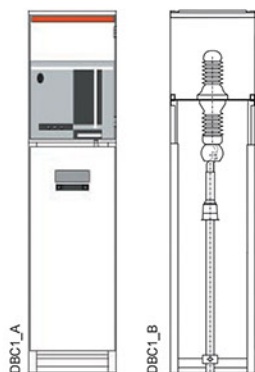
Width: 750 mm
Height: 1635 or 1885 mm



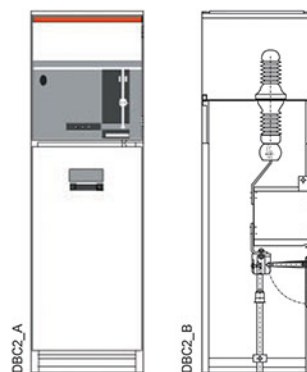
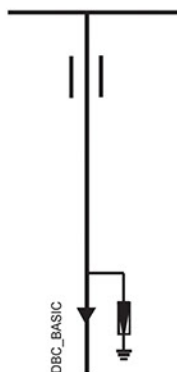
Width: 750 mm
Height: 1885 mm



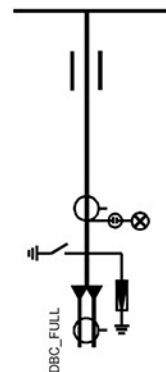
• Direct Busbar connection Cubicle, type DBC



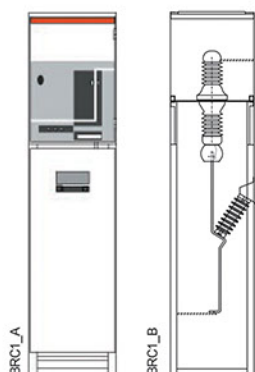
Width: 375 or 500 mm
Height: 1635 or 1885 mm



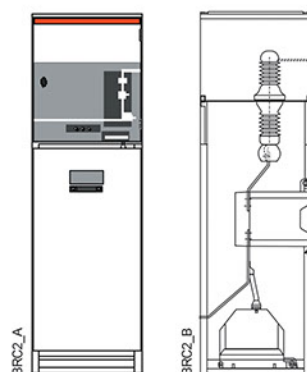
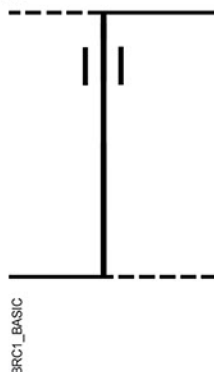
Width: 500 mm
Height: 1635 or 1885 mm



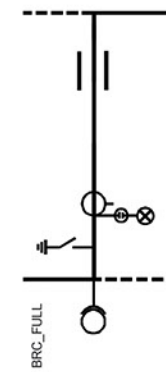
• Bus Riser Cubicle, type BRC



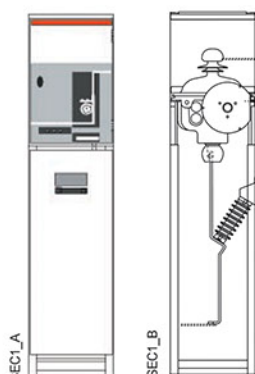
Width: 375 or 500 mm
Height: 1635 or 1885 mm



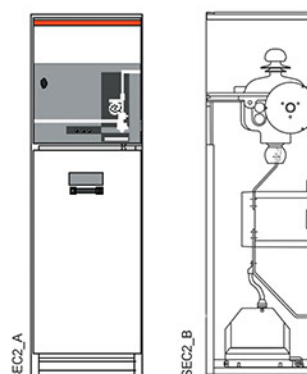
Width: 500 mm
Height: 1635 or 1885 mm



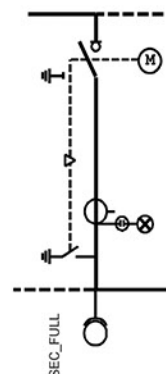
• Sectionalizing Cubicle, type SEC



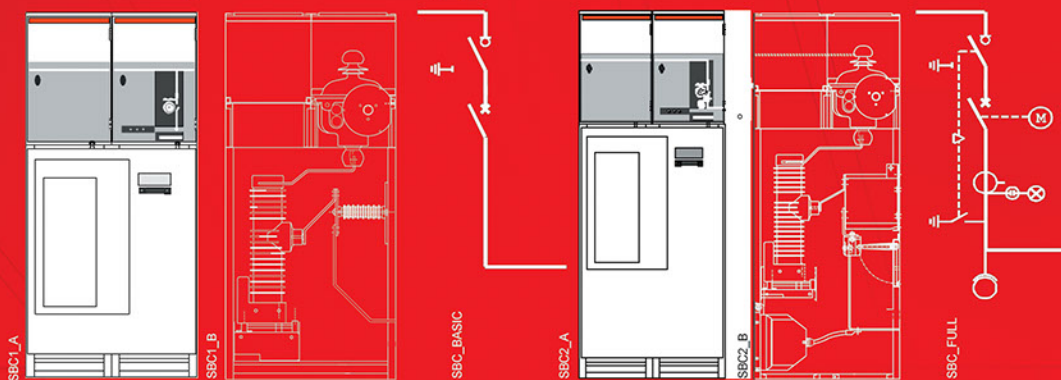
Width: 375 or 500 mm
Height: 1635 or 1885 mm



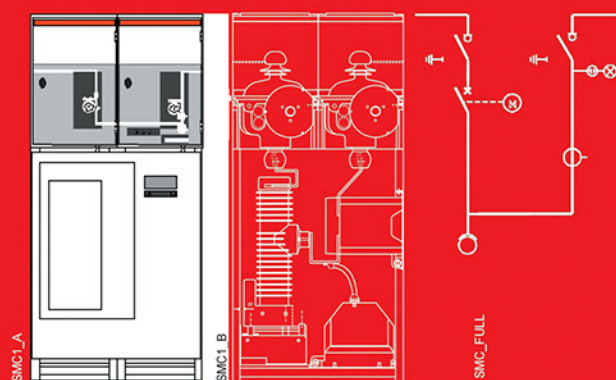
Width: 500 mm
Height: 1885 mm



Sectionalizing Breaker Cubicle, type SBC

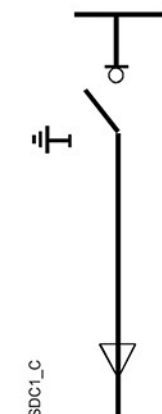
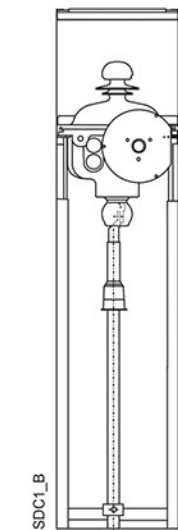


Sectionalizing Metering Cubicle, type SMC



Width: 750 mm
Height: 1635 or 1850 mm

CUBICLE TYPES



Switch-Disconnecter Cubicle type SDC

Switch-disconnector cubicle type SDC, is mainly used as an incoming, ring or branch cubicle. The basic unit is equipped with an SF6-insulated, 3-position switch-disconnector type SFG with its operation mechanism. The 3-position switch-disconnector may be in one of three positions, "closed", "open" or "earthed", therefore preventing incorrect operation. Access to the cable compartment is possible in earthed position. The position indicator of the switch-disconnector (SFG) fulfils the requirements of the standards IEC 129 A2 (1996), which determine the requirements for such an indicator. "Open" and "earthed" positions are "visible" through the inspection windows placed behind the low voltage compartment door. Inspection of cable connections and fault indicators, when used, is easily carried out through the front-door window.

For safe cable testing a unique interlocking mechanism is included as standard feature.

Basic equipment

Top unit, including

- 3-position switch-disconnector
- operating mechanism with mechanical position indication
- enclosure of busbar compartment
- integrated low voltage compartment
- interlocking unit
- busbars
- earthing bar

Bottom unit, including

- enclosure of cable compartment
- cable entry with cable support

Cubicle Accessories

- integrated voltage indicators or socket interface for portable indicators
- auxiliary contacts for each position, 2NO+2NC
- gas density indication with alarm contact
- motor operation device
- current transformers
- arc-gas channel
- channel for control cables
- surge arresters
- anti condensation heater
- through-going earthing bar
- apparatus earthing bar

Data SDC

Rated voltage	[kV]	12	17,5	24
Rated current	[A]	630	630	630
Rated short-time withstand current	[kA]	25	20	20
Rated duration of short circuit	[s]	1/2	1/3	1/3
Cubicle dimensions				
- width	[mm]	375/500	375/500	375/500
- depth	[mm]	940+60	940+60	940+60
- height	[mm]	1635/1885	1635/1885	1635/1885



Switch-Disconnecter Cubicle, with fuse type SDF

Fused switch-disconnector cubicle type SDF, is primarily used for transformer protection voltage metering. The cubicle is equipped with a SF6-insulated, 3-position switch-disconnector and with earthing switch. For fuse earthing, the integrated earthing switch operates on the upstream side and separate earthing switch operates on the downstream side of the fuses. The mechanism used is a double spring mechanism with automatic fuse-tripping. Access to cable compartment is possible in earthed-position. The position indicator of the switch-disconnector (SFG) fulfils the requirements of the standards IEC 129 A2 (1996), which determine the requirements for such an indicator. "Open" and "earthed" positions are "visible" through inspection windows placed behind the low voltage compartment door. Inspection of cable connections and fault indicators when used, is easily carried out through the front-door window.

Basic equipment

Top unit, including

- 3-position switch-disconnector
- operating mechanism with mechanical position indication
- enclosure of busbar compartment
- integrated low voltage compartment
- interlocking unit
- fuse tripping with indication
- busbars
- earthing bar

Bottom unit, including

- earthing switch type EF
- fuse base
- enclosure of cable compartment
- cable entry with cable support

Cubicle Accessories

- integrated voltage indicators or socket interface for portable indicators
- auxiliary contacts for each position, 2NO+2NC
- gas density indication with alarm contact
- emergency tripping
- tripping coil
- motor operation device
- voltage transformers
- arc-gas channel
- channel for control cables
- anti condensation heater
- through-going earthing bar
- apparatus earthing bar

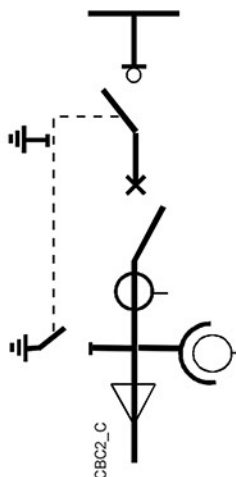
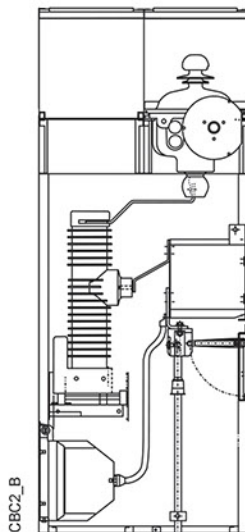
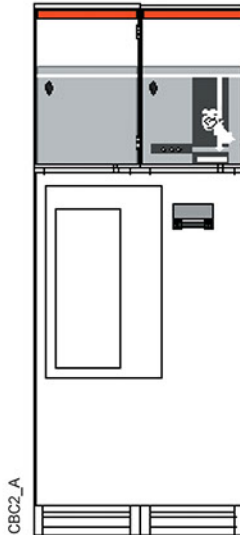
Data SDF

Rated voltage	[kV]	12	17,5	24
Rated current (max fuse)	[A]	125	100	80
Rated short-time withstand current	[kA]	25	20	20
Rated duration of short circuit	[s]	1/2	1/3	1/3
Fuse length	[mm]	292/442	292/442	442
Cubicle dimensions				
- width	[mm]	375/500	375/500	375/500
- depth	[mm]	940+60	940+60	940+60
- height	[mm]	1635/1885	1635/1885	1635/1885

CUBICLE TYPES

Circuit Breaker Cubicle type CBC

The circuit breaker cubicle, type CBC is designed for control and protection of distribution lines, networks, motors, transformers, capacitor banks, etc. The cubicle can be equipped with a vacuum or a SF6 circuit breaker. The breaker is rail mounted and fixed to the busbars. To achieve the disconnecting function a 3-position switch-disconnector with an earthing switch is mounted between the breaker and busbars. The door is mechanically interlocked with the switch-disconnector's earthing position to provide personal safety. The cubicle is designed to be equipped with CTs and VTs (Standard DIN size, see item 5.9).



Basic equipment

- Top unit on right hand side, including
 - 3-position switch-disconnector
 - operating mechanism with mechanical position indication
 - enclosure of busbar compartment
 - interlocking unit
 - busbars
 - earthing bar
- Top unit on left hand side, including
 - integrated low voltage compartment for secondary components
 - enclosure of busbar compartment
- Bottom unit, including
 - earthing switch type EM
 - enclosure of cable compartment
 - cable entry with cable support

Cubicle Accessories

- circuit breaker, vacuum- or SF6-type
- integrated voltage indicators or socket interface for portable indicators
- current transformers
- voltage transformers
- cable core transformer
- auxiliary contacts for each position, 2NO+2NC
- gas density indication with alarm contact for switch-disconnector
- motor operation device
- arc-gas channel
- channel for control cables
- anti condensation heater
- through-going earthing bar
- apparatus earthing bar

Data CBC

Rated voltage	[kV]	12	17,5	24
Rated current	[A]	630	630	630
Rated short-time withstand current	[kA]	25	20	20
Rated duration of short circuit	[s]	1/2	1/3	1/3
Cubicle dimensions				
- width	[mm]	750	750	750
- depth	[mm]	940+215	940+215	940+215
- height	[mm]	1635/1885	1635/1885	1635/1885

Direct Busbar Cubicle type DBC

To connect cables to the busbars, a busbar connection cubicle is available. This cubicle is equipped with connection lugs for fixing the cables. CT's can be installed in the 500 mm cubicle.

The front door is fixed and can only be opened with a tool when earthing switch is not included.

Basic equipment

Top unit, including

- busbar supports
- enclosure of busbar compartment
- interlocking unit, but only when using earthing switch (EM)
- integrated low voltage compartment
- busbars
- earthing bar

Bottom unit, including

- enclosure of cable compartment
- parallel cable connection possibility
- cable entry with cable support

Cubicle Accessories

- integrated voltage indicators or socket interface for portable indicators
- current transformers
- earthing switch for CT's (EM)
- arc-gas channel
- channel for control cables
- surge arresters
- anti condensation heater
- through-going earthing bar



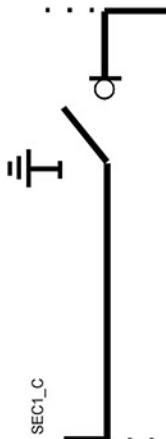
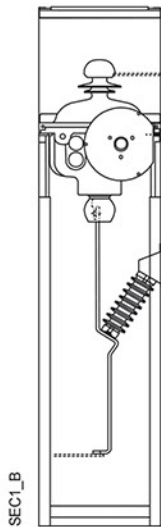
Data DBC

Rated voltage	[kV]	12	17,5	24
Rated current	[A]	1250	1250	630
Rated short-time withstand current	[kA]	25	20	20
Rated duration of short circuit	[s]	1/2	1/3	1/3
Cubicle dimensions				
- width	[mm]	375/500	375/500	375/500
- depth	[mm]	940+60	940+60	940+60
- height	[mm]	1635/1885	1635/1885	1635/1885

CUBICLE TYPES

Sectionalizing Cubicle
type SEC

The sectionalizing cubicle is always used together with the bus riser cubicle. The standard version with 375 mm width is equipped with a SF6-insulated, 3-position switch-disconnector for sectionalizing the busbars. Earthing facility is provided always as a standard. Sectionalizing cubicle with 750 mm width can be supplied also with circuit breaker.

**Basic equipment**

Top unit, including

- 3-position switch-disconnector
- operating mechanism with mechanical position indication
- enclosure of busbar compartment
- integrated low voltage compartment
- interlocking unit
- earthing bar

Bottom unit, including

- enclosure with sectionalizing busbars

Cubicle Accessories

- circuit breaker, vacuum- or SF6-type
- integrated voltage indicators or socket interface for portable indicators
- auxiliary contacts for each position, 2NO+2NC
- gas density indication with alarm contact
- motor operation device
- current transformers
- arc-gas channel
- channel for control cables
- anti condensation heater
- through-going earthing bar
- apparatus earthing bar

Data SEC

Rated voltage	[kV]	12	17,5	24
Rated current	[A]	630	630	630
Rated short-time withstand current	[kA]	25	20	20
Rated duration of short circuit	[s]	1/2	1/3	1/3
Cubicle dimensions				
- width	[mm]	375/500	375/500	375/500
- depth	[mm]	940+60	940+60	940+60
- height	[mm]	1635/1885	1635/1885	1635/1885

Bus Riser Cubicle type BRC

Bus riser cubicle, type BRC, connects the busbar to the bottom of a sectionalizing cubicle with circuit breaker or switch-disconnector. This 500 mm width cubicle can be used as a metering cubicle with space for 3 CTs and 3 VTs. The front cover is fixed to the cubicle and has to be released with a tool. The front door has a window for inspection.

Basic equipment

Top unit, including

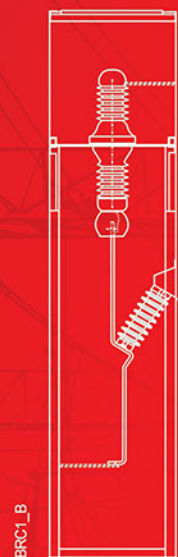
- switch substitute
- enclosure of busbar compartment
- integrated low voltage compartment
- earthing bar

Bottom unit, including

- enclosure with bus riser bars
- bottom cover

Cubicle Accessories

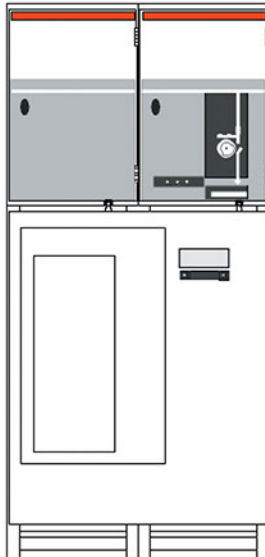
- current transformers
- voltage transformers
- earthing switch with position indication
- auxiliary contacts for earthing switch, 2NO+2NC
- arc-gas channel
- channel for control cables
- anti condensation heater
- through-going earthing bar



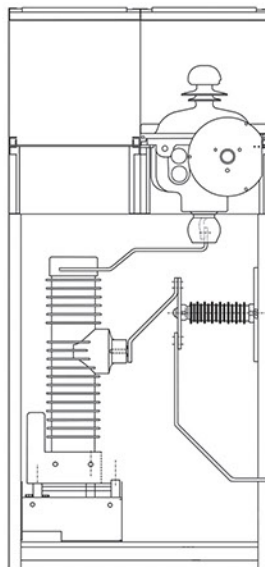
Data BRC

Rated voltage	[kV]	12	17,5	24
Rated current	[A]	630/1250	630/1250	630/1250
Rated short-time withstand current	[kA]	25	20	20
Rated duration of short circuit	[s]	1/2	1/3	1/3
Cubicle dimensions				
- width	[mm]	375/500	375/500	375/500
- depth	[mm]	940+60	940+60	940+60
- height	[mm]	1635/1885	1635/1885	1635/1885

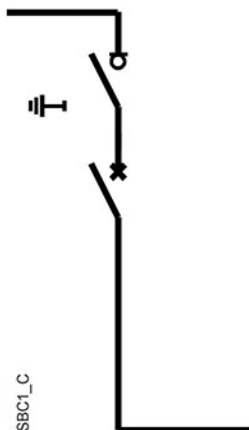
CUBICLE TYPES



SBC1_A



SBC1_B



SBC1_C

Sectionalizing Breaker Cubicle type SBC

Sectionalizing breaker cubicle is always used together with the bus riser cubicle. The standard cubicles are equipped with a SF6 insulated 3-position switch-disconnector in series with a circuit breaker for sectionalizing the busbar. The cubicle is equipped with a vacuum or a SF6 circuit breaker. The breaker is rail mounted and fixed to the busbars. Earthing facility on the switch-disconnector is always included. The door is mechanically interlocked with the switch-disconnector's earthing position to give personal safety. The cubicle is designed to be equipped with CTs and VTs (Standard DIN size, see item 5.9).

Basic equipment

Top unit on right hand side, including

- 3-position switch-disconnector
- operation mechanism with mechanical position indication
- enclosure of busbar compartment
- interlocking unit
- busbars
- earthing bar

Top unit on left hand side, including

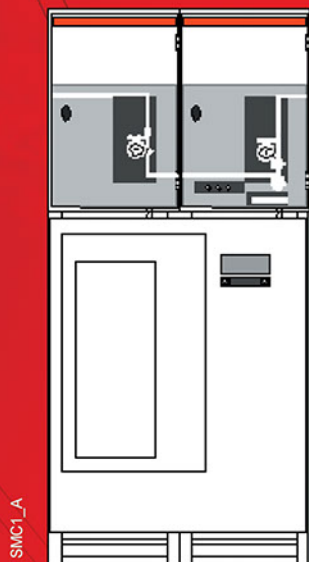
- integrated low voltage compartment for secondary components
- enclosure of busbar compartment

Cubicle Accessories

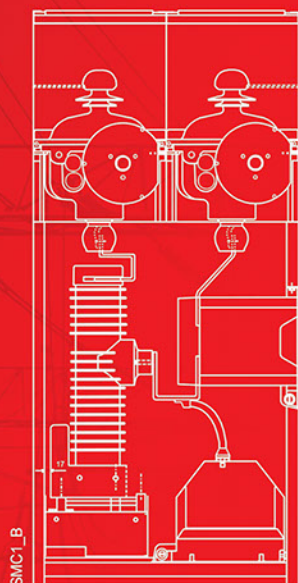
- circuit breaker, vacuum- or SF6-type
- integrated voltage indicators or socket interface for portable indicators
- current transformers
- voltage transformers
- auxiliary contacts for each position, 2NO+2NC
- gas density indication with alarm contact for switch-disconnector
- motor operation device
- arc-gas channel
- channel for control cables
- earthing switch type EM
- anti condensation heater
- through-going earthing bar
- apparatus earthing bar

Sectionalizing Metering Cubicle type SMC

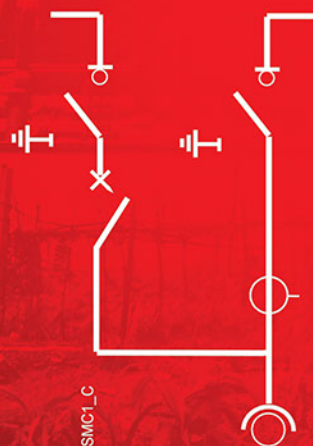
Sectionalizing metering cubicle, type SMC, is mainly used when medium voltage metering is required. Cubicle is based on operation of one rail mounted circuit breaker and two separately operated 3-position, SFG type switch-disconnectors. Switch-disconnectors are located at both ends of the sectionalized busbar with the circuit breaker in between, after left hand side switch-disconnector. DIN size VT's and CT's are available on right hand side of circuit breaker, in previously mentioned order. 3-position switch-disconnectors are interlocked with cubicle front door and access into cable compartment is possible only when both switch-disconnectors are in earthed-position.



SMC1_A



SMC1_B



SMC1_C

Basic equipment

Top unit on left hand side, including

- 3-position switch-disconnector
- operation mechanism with mechanical position indication
- integrated low voltage compartment
- interlocking unit
- busbars
- earthing bar

Top unit on right hand side, including

- 3-position switch-disconnector
- operation mechanism with mechanical position indication
- integrated low voltage compartment
- interlocking unit
- busbars

Bottom unit, including

- enclosure of busbar compartment

Cubicle Accessories

- circuit breaker, vacuum- or SF6-type
- integrated voltage indicators or socket interface for portable indicators
- auxiliary contacts for each position, 2NO+2NC
- gas density indication with alarm contact for switch-disconnector
- current transformers
- voltage transformers
- channel for control cables
- arc channels
- anti condensation heater
- through-going earthing bar
- apparatus earthing bar

Data SMC

Rated voltage	[kV]	12	17,5	24
Rated current	[A]	630	630	630
Rated short-time withstand current	[kA]	25	20	20
Rated duration of short circuit	[s]	1/2	1/3	1/3
Cubicle dimensions				
- width	[mm]	750	750	750
- depth	[mm]	940+215	940+215	940+215
- height	[mm]	1635/1885	1635/1885	1635/1885

Certificate

This is to certify that the
Integrated Management System of:

Tavazon Sanat Paydar Co.
No. 27, Zandeh Industrial Town, Imam Hossein Sq., Shahr-e Qods, Tehran, Iran

Has been assessed and registered under the certification and inspection scheme of LiberoAssurance for the following international standards:

**ISO 9001:2015
ISO 14001:2015
ISO 45001:2018**

The management system is applicable to:

Design and Construction of electrical panels, Contracting and maintenance in the field of power and automation systems including cabling, equipment installation, testing and pre commissioning/commissioning

Issued 31/03/2022 at PIRAEUS, GREECE
(Date of issue) (Place of issue of certificate)

Expiry 04/02/2025
(Expiration date)

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Efthymios Liberoopoulos

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IMS

Certificate

This is to certify that the
Quality Management System of:

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Has been assessed and registered under the certification and inspection scheme of LiberoAssurance for the following international standards:

ISO 9001:2015

The management system is applicable to:

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Issued 31/03/2022 at PIRAEUS, GREECE
(Date of issue) (Place of issue of certificate)

Expiry 04/02/2025
(Expiration date)

For the Issuing Organisation
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ISO 9001:2015

Certificate

This is to certify that the
Occupational Health and Safety Management System of:

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ISO 45001:2018

Certificate

This is to certify that the
Environmental Management System of:

Tavazon Sanat Paydar Co.
No. 27, Zandeh Industrial Town, Imam Hossein Sq., Shahr-e Qods, Tehran, Iran

Has been assessed and registered under the certification and inspection scheme of LiberoAssurance for the following international standards:

ISO 14001:2015

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Document ID: WP_3320

ISO 14001:2015



Tavazon ***Sanat Paydar***



Projects:

- Construction of ventilation panels for Foulad Qaenat project (employer: Hava Filter)
- Designing and manufacturing of LV panels of Rezlab Kish project (Employer: Itok)
- Design and implementation of electrical panels of Tala Vatan Passage project (Chitgar)
- VAMP relay settings of Khuzestan smelting and steel projects and ATS programming related to smelting and pelletizing
- Designing, building and programming the first domestic nitrogen generator (before this control panel was supplied outside Iran)
- Installation, cabling, supply of materials and testing of precision petrochemical instruments in Takht Jamshid, Mahshahr
- Installation and testing of precision instruments of Tehran Refinery, Nitrogen Unit
- Supervising the installation and testing of Kurdistan petrochemical precision instruments of the liquid nitrogen unit with the German Cryotic company.
- Preparation of electrical documents, instrumentation and control, pre-measurement and commissioning of Tehran Refinery
- Planning of protective relays and testing of Kerman copper medium pressure panels
- Updating the electrical and control panels of Mahshahr Refinery (design, implementation and delivery)
- Testing of instrumentation equipment and participation in the start-up of Kurdistan's petrochemical cryogenic system (together with the German vendor)
- Programming the boards of the package of compressors for candle making, Sirjan Kerman
- Design, implementation and start-up of West Tehran wastewater treatment plant project (Firouz Bahram)
- Designing, installing and implementing electrical panels of the Ministry of Information (LV, MV, PLC)
- Design and installation of lighting bases and lights in the area of the Ministry of Defense

47 PROJECTS

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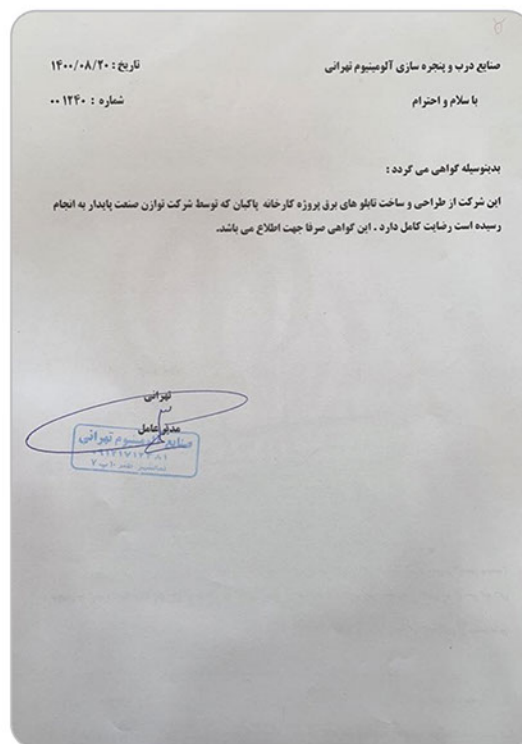
Projects:

- Supervising the installation and commissioning of LV switchboards related to the Shadgan steel project with MME company and supervising the installation of 20KV transformers
- Designing, preparation of engineering documents, logic programming and testing of medium pressure panels of Shazand Arak
- Implementation and installation of instrumentation equipment of Ray Shahr pipeline and telecommunications project (Employer: Daniyal Petro)
- Installation and testing of instrumentation equipment of Dehagh gas pressure boosting station (Employer: Itok)
- Installation and testing of instrumentation equipment at the gas pressure boosting station of Kalle Bridge, Isfahan (Employer: Itok)
- Planning of protection relays and testing of medium pressure panels of Kerman copper company
- Cabling, installation and testing of instrumentation equipment and commissioning of rural water pumping in Chabahar
- Installation of diesel generator and 20/0.4KV transformer. Electric cabling and instrumentation for tanks, pumps, logic control and commissioning system 3 out of 5 Bandar Abbas oil storage project (Shahed Rajaei) as EPC (Employer: Petro Amut Poya)
- Installation of ventilation panels of Sablan Gostar company in phase 19 of Asaluye
- Supervising the installation and termination of the input and output cables of the ventilation system panels, commissioning and electrification of the phase 12 panels of Assalouye (employer: Kisson)
- Designing and setting up the gas pressure booster panels of Dehgh and Kalle bridge in Isfahan
- Synchronization of medium pressure panels of Isfahan line to Kord city
- Modification (design and control and power circuits) of LV panels in solar and combined cycle power plant in Yazd (Employer: Power Development)
- Setting up LV panels related to Damavand Petrochemical (Employer: Meko)
- Supervising the installation and commissioning of 6.6KV medium pressure switchboards of the Zahedan Copper Furnace project and testing the Migger and Hi-Pot cables, switchboards and crusher motors.
- Config SPAM protection relays M81/M41/M20/M42/A10 Iran Copper Industry Company
- Setting up 132KV motors and 3UF protective relay Config of Razi Petrochemical
- Setting up LV panels and telephone network of Niyash Kurdistan tunnel
- Supervising the installation and commissioning of LV switchboards related to the Shadgan steel project with MME company and supervising the installation of 20KV transformers
- Electrifying the 0.4/20 KV transformer and capacitor panels and connecting it to the network in the transmission and refining project in South Tehran (Employer: Niro Ara Andish Company and Refinery Broadcasting Company)
- Supervising the installation and complete implementation of the electrical system related to the 20KV line in Shahr Ray and the commissioning of the electrical system, telephone and instrumentation
- Replacement and configuration of protective relays in 20 & 63 KV switchboards of Shahr Ray Pipelines and Telecommunications Company
- Programming the control panel of the wastewater treatment plant in South Tehran (Employer: Deep Kar Jam Company)
- Setting up of Isfahan city train project signs in all stations
- Setting up the 6.6KV switchboards of Bandar Abbas power plant and delivering the signals to DCS (Employer: One Mapna Development Company)\

Tavazon
Sanat
Paydar

48





Date: 1400-03-23
No: 1043MV - 9903 - 01

SAMA KAVAN ALBORZ Co.
(LTD)

با سلام

احتراماً، بدینوسیله به استحضار می‌رساند گروه صنعتی آواژ صنعت پایداری در تعدادی از پروژه‌های این شرکت در زمینه کابل‌کشی، نصب و تست ایزر دقیق فعالیت داشته و عملکرد شرکت مذکور در اجرای پروژه دانش فنی و تجربه کاری مورد تأیید است. این گواهی صرفاً جهت اطلاع بوده و ارزش قانونی ندارد.



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Basiri St., Shariati St., Tehran, Iran.
E-mail: info@samakavan.com
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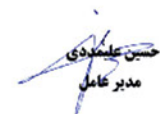
Tel: (+98 21) 22635248 - 9
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شماره: ۰۶۱۵-۰۶۱۰
تاریخ: ۱۴۰۰/۰۹/۱۴
پیوست: ندارد

ایتوک ایران
IRAN ITOK

بدینوسیله گواهی می‌گردد:

شرکت توازن صنعت پایدار تابلوهای برق، کنترل و ابزار دقیق مربوط به پروژه کیش این شرکت را به اتمام رسانیده و راه اندازی نموده است که از عملکرد آن کمال رضایت حاصل است.


مدیر عامل

تلفن: ۰۲۱-۲۲۲۲۲۲۲۲ - ۰۲۱-۲۲۲۲۲۲۲۲
پست: تهران، خیابان ولیعصر، پلاک ۱۶، واحد ۱۶
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ISO 9001 : 2015
ISO TS 29001 : 2018
ISO 14001 : 2015
OHSAS 18001 : 2007




آواژ هوا صنعت ساز

با سلام و احترام

بدینوسیله اعلام می‌گردد این شرکت از ساخت و طراحی تابلوهای کنترل پروژه هفت ساله که توسط گروه صنعتی توازن صنعت پایداری به اتمام رسیده است رضایت کامل دارد. این گواهی صرفاً جهت اطلاع می‌باشد.



تلفن: ۰۲۱-۲۲۲۲۲۲۲۲
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E-mail: info@azanhasanat.com - azanhasanat@azanhasanat.com

Date: 1400-03-23
No: 1043MV - 9903 - 01
Enclosure: ندارد

خاکریشه
Khakrیشه

با سلام و احترام

احتراماً، بدینوسیله به استحضار می‌رساند شرکت توازن صنعت پایداری در تعدادی از پروژه‌های این شرکت در زمینه کابل‌کشی، نصب و تست ایزر دقیق فعالیت داشته و عملکرد شرکت مذکور در اجرای پروژه دانش فنی و تجربه کاری مورد تأیید است.

این نامه بنا به درخواست نامبرده تهیه شده است و ارزش دیگری ندارد.


با احترام مجدد
شرکت فنی مهندسی خاکریشه

تلفن: ۰۲۱-۲۲۲۲۲۲۲۲ - ۰۲۱-۲۲۲۲۲۲۲۲
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ISO 14001 : 2015
OHSAS 18001 : 2007

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GALLERY

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