

YOUR TRUSTED PARTNER
FOR
COMPLETE ELECTRICAL SOLUTION UNDER ONE ROOF



 **federal
transformers** Co. LLC
(Switchgear Division)

www.federalswitchgear.com



ABOUT US

Federal switchgear was established in the year 2005 to cater to the increasing demand for switchgear products utilizing the potential of the middle east as a manufacturing base. The company is a part of Zubair Corporation, Oman a diversified group with almost 50 wholly-owned companies, subsidiaries and associates in the sultanate of Oman, the rest of the Middle East, India, Far East, and Europe and in the USA.

Federal Switchgear is one of the few fully manufacturers in the Middle East with capabilities from product design, system design up to the routine test and dispatches all under one roof at its factory in Abu Dhabi. With its continued investment in advanced technology, Federal Switchgear is able to provide state-of-the-art manufacturing and testing facilities. This enhances the company's efficiency in generating good quality, safe and reliable products.

VISON & MISSION

To be an active player in the vibrant electric power sector of the MENA region by offering high-quality electrical switchgear, busways and allied products for the power sector.

We are constantly investing in cutting edge machinery, equipment and training process at our advanced 15000 square meter manufacturing factory in Abu Dhabi I CAD-2 and even more, So in those behind the solution.

PRODUCT RANGE

• LOW VOLTAGE PRODUCTS

LV Panel, MDB, SMDB (Standard and Customized),
DB's (Row Type and Way Type), Capacitor Bank,
ATS Panel, MCC Panel (Motor Control Center),
HVAC Panel, LCP Panel, LVDB

• UTILITY PRODUCTS

LV AC Distribution Board/ Feeder Pillars up to 3000A
Flange connected feeder Pillars up to 3000A, Feeder
pillar, Service Cabiner, Smart Layer, Control Cabinet

• ENCLOSURE'S (Type Tested and Non-Type Tested)

Customized Sizes, PSS Sub Station.

PACKAGE - FLUSH TYPE	- DB'S
SURFACE TYPE	- DB'S
SMDB'S	- ENCLOSURE
L V PANEL	- ENCLOSURE
METER CABINET	- ENCLOSURE
PSS	- ENCLOSURE

APPROVALS

- ADWEA - Abu Dhabi Electricity & Water Authority
- ADDC - Abu Dhabi Distribution Company
- AADC - Al Ain Distribution Company
- ADM - Abu Dhabi Municipality
- DEWA - Dubai Electricity & Water Authority
- FEWA - Federal Electricity & Water Authority
- KAHRAMAA - Qatar General Electricity & Water Corporation
- PEC - Public Electricity Corporation YEMEN
- EWA - Electricity & Water Authority BAHRAIN
- SWEA - SHARJAH Electricity & Water Authority





Application: Building & Industrial Sector
Operational Conditions: Indoor
Degree of Protection: IP 43 / IP 54
Form of Construction: Form 2/ Form 4B,
Fixed or with drawables
Construction: With Front & Rear/ Front
access option
Rating UP TO: 4000A

Rated Short Circuit Rating: 50kA for 1 sec.
at ambient Temp.

Incomer: Air Circuit Breaker

Outgoing: Air Circuit Breaker / Moulded Case
Circuit Breakers

MAIN DISTRIBUTION BOARD

Power Distribution is a system, consisting of the Main Distribution Board (MDB), Sub Main Distribution Boards (SMDBs) and Final Distribution Boards, by which the electrical energy is transmitted via branches to reach the exact end user.

An MDB is a panel or enclosure that houses the fuses, circuit breakers and ground leakage protection units where the electrical energy, which is used to distribute electrical power to numerous individual circuits or consumer points, is taken in from the transformer or an upstream panel. An MDB typically has single or multiple incoming power sources and includes main circuit breakers and residual current or earth leakage protection devices. An MDB is comprised of a free-standing enclosure, a bus bar system, MCCB's, metering and support equipment and required current transformers. Panels are assembled in a systematic manner such as incomer section and outgoing section.



LV PANEL

In an electric power system, switchgear is the combination of electrical disconnect switches, fuses or circuit breakers used to control, protect and isolate electrical equipment. Switchgear is used both to de-energize equipment to allow work to be done and to clear faults downstream. This type of equipment is directly linked to the reliability of the electricity supply.

The earliest central power stations used simple open knife switches, mounted on insulating panels. Power levels and voltages rapidly escalated, making opening manually operated switches too dangerous for anything other than isolation of a de-energized circuit. Oil-filled equipment allowed arc energy to be contained and safely controlled. By the early 20th century, a switchgear line-up would be a metal-enclosed structure with electrically operated switching elements, using oil circuit breakers. Today, oil-filled equipment has largely been replaced by air-blast, vacuum, or SF6 equipment, allowing large currents and power levels to be safely controlled by automatic equipment.

Typically, switchgear in substations is located on both the high- and low-voltage sides of large power transformers. The switchgear on the low-voltage side of the transformers may be located in a building, with medium-voltage circuit breakers for distribution circuits, along with metering, control, and protection equipment. For industrial applications, a transformer and switchgear line-up may be combined in one housing, called a unitized substation.

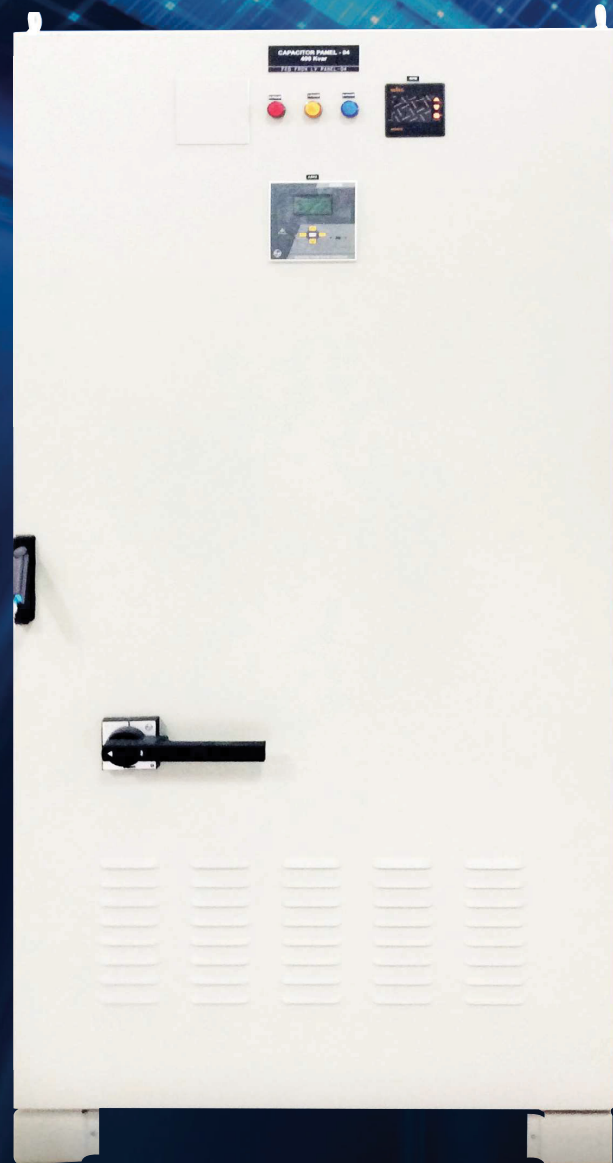
One of the basic functions of switchgear is protection, which is an interruption of shortcircuit and overload fault currents while maintaining service to unaffected circuits. Switchgear also provides isolation of circuits from power supplies. Switchgear is also used to enhance system availability by allowing more than one source to feed a load.

CAPACITOR BANK

is primarily used to improve the power factor in the network. They also improve voltage stability and reduce network losses. Improving the power factor also means a higher power transmission capability and increased control of the power flow in electric power distribution, capacitors are used for power factor correction. Such capacitors often come as three capacitors connected as a three-phase Electrical load. Usually, the values of these capacitors are given not in farads but rather as a reactive power in volt-amperes reactive (VAr).

The purpose is to counteract inductive loading from devices like Induction motor, electric motors and transmission lines to make the load appear to be mostly resistive. Individual motor or lamp loads may have capacitors for power factor correction, or larger sets of capacitors (usually with automatic switching devices) may be installed at a load center within a building or in a large utility electrical substation. In high-voltage direct current transmission systems, power factor correction capacitors may have tuning inductors to suppress harmonic currents that would otherwise be injected into the AC power system.

Harmonic Filter Panels. The basic purpose here is centralized Reactive Power Compensation with Harmonic Mitigation. Automatic control is provided using Automatic Power Factor Control Relays. The switching of individual steps is through contactors or thyristors. Harmonics are unwanted electrical components that are most often spoken about in power quality parameters and cause problems when they exist over the limits set by the standards in the electrical system. In systems where harmonics are present, harmonic filter reactors are connected in series to the capacitors. The main purpose is to prevent the harmonic current flowing in the capacitor and to prevent the resonance of the system.



The harmonic filter (Detuned) reactor is a fixed impedance load in the structure of the coil calculated according to certain calculations. The harmonic filter (Detuned) is to limit the flow of harmonic current from non-linear loads on the reactor to the fixed impedance loads (eg. capacitor). Detuned Reactors prevent harmonic amplification caused due to RESONANCE and avoid the risk of overloading capacitors, thereby significantly reducing voltage and current harmonic distortion in the network.

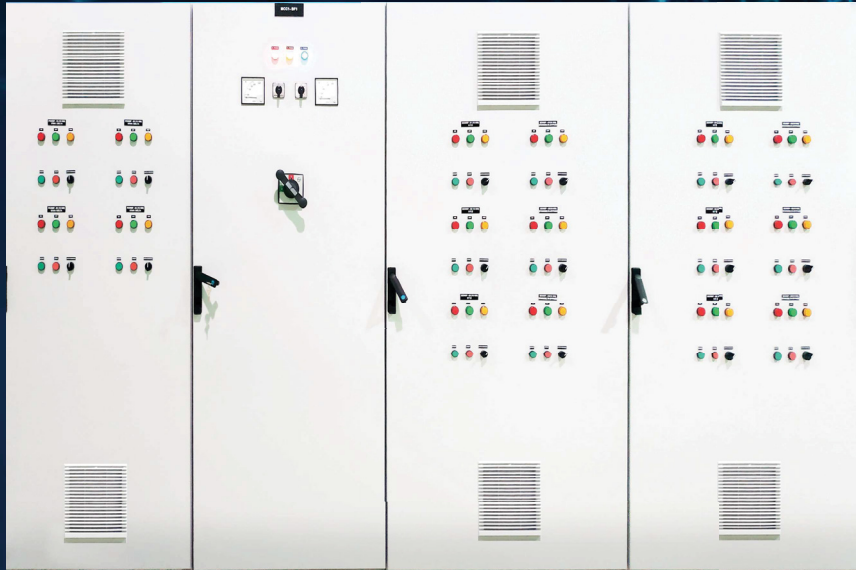


Application: Building & Industrial Sector
Operational Conditions: Indoor
Rating: Up to 250A
Mounting: Wall mounted
Form of Construction: Form 2
Rated Short Circuit Rating: 20kA for 0.2 sec.
Type: Row type & VTPN
Incomer: Isolator / MCCB
Outgoings: Miniature Circuit Breakers

DISTRIBUTION BOARD

A distribution board (also known as panel board, breaker panel, or electric panel) is a component of an electricity supply system that divides an electrical power feed into subsidiary circuits while providing a protective fuse or circuit breaker for each circuit in a common enclosure. Normally, the main switch, and in recent boards, one or more residual-current devices (RCD) or residual current breakers with over current protection (RCBO), are also incorporated. If distribution board designed for domestic installations is known as a consumer unit
Flush and Surface mounting type Index of

protection: IP 41 & IP 55 as per IEC 60529
Row type distribution, pan assembly Sheet steel enclosure for Three-phase distribution
- **Split pan assembly** • Designed as per new standard: IEC 61439 • ASTA certified withstand short circuit: 18kA for 0.2sec • Flush and surface mounting design with IP42 protection • Colour: As standard RAL 7035, other colors available upon request incomer options: Isolator / MCB / RCDs • Removable front covers • Complete with earth and neutral bars • Enclosure thickness: 1.2mm • Lock: as a standard metal lock with two keys.
Specifications Ordering & Dimensions (mm).



MOTOR CONTROL CENTER PANEL

A motor control center (MCC) is an assembly to control some or all-electric motors in a central location. It consists of multiple enclosed sections having a common power bus and with each section containing a combination starter, which in turn consists of a motor starter, fuses or circuit breaker, and power disconnect. Motor control centers are simply physical groupings of combination starters in one assembly. A combination starter is a single enclosure containing the motor starter, fuses or circuit breaker, and a device for disconnecting power. Other devices associated with the motor, such as pushbuttons and indicator lights may also be included. These usually comprise of incoming Air Circuit Breakers, main horizontal and vertical bus bars, outgoing starter modules with MCCB / Switch Fuse Unit, overload relays, contractors, etc. with adequate space for connection of cable and are easily extendable on either side and have excellent short circuit withstand performance of Bus Bars comprised of bolted/riveted modular construction.

TYPES OF MOTOR STARTER

There are following starters for induction motor:-

- Direct Online Starters
- Star-Delta Starters
- Soft Starters
- VFD Starters

Direct-On-Line (DOL) Starter

This is the simplest method to start the small induction motor up to 5-10 kilowatt. In this method rated supply voltage is directly applied to the motor. But starting current would be very large, up to 5 to 7 times of rated current. The starting torque is likely to be 1.5 to 2.5 times the full load torque.

Star-Delta Starter

This is a starting method that reduces the starting current and starting torque. This method is used for the large size of the induction motor of more than 10 kilowatts. The starter design consists of three contactors, an overload relay and a timer for setting the time in star connection to delta connection. In this method, the motor should be connected in Delta for the normal run. For starting, star connection used for normal run Delta connection used in the motor windings. When the stator winding is Star connected, the voltage over each phase in the motor will be reduced by a factor one by $\sqrt{3}$ of that would be for Delta connected windings. The starting torque will be $1/3$ times that it will be for delta-connected windings.

Soft Starting Method

A soft starter is another form of reduced voltage starter of AC induction motors. The soft starter employees the solid state devices to control the current flow and therefore the

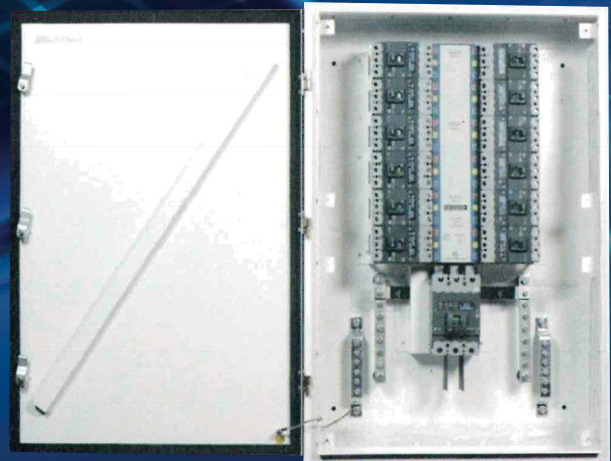
voltage applied to the motor. These solid-state switches are phase controlled in a similar manner to a light dimmer. The average voltage is controlled by varying the conduction angle of the switches. Increase the conduction angle will increase the average output voltage. The power dissipation in the starter during start will be less than 1% of Power dissipated by the primary resistance starter. The solid-state devices used with A.C electric motors to ramp up the voltage and torque on the motor during startup. This ramp-up reduces mechanical stress on the motor and shaft, as well as the electrodynamic stresses on the attached power cables and electrical distribution network. The soft starters extend the lifespan of your system and reduce maintenance cost.

- Improved efficiency
- Controlled startup
- Controlled acceleration
- Low cost and size

Variable Frequency Drive

This is actually a speed control method for motors but can be used for starting also. In this incoming, electrical supply of fixed frequency and voltage into a variable frequency and variable voltage that is output to the motor with a corresponding change in the motor speed and torque. The motor speed can be varied from zero rpm through to 100- 120% of its full rated Speed. The motor may be operated in either direction. The first step in this process is to convert the AC supply voltage into DC by the use of the rectifier. DC power contains voltage ripples which are smoothed using filter capacitors. This section of the VFD is often referred to as the DC link. This DC voltage is then converted back into AC. This conversion is typically achieved through the use of power electronics such as IGBT the power transistor using a technique called pulse width modulation. The output voltage is turned on and off a high frequency.

- Smooth acceleration
- Low inrush current
- High flexibility in starting characteristics.
- Deceleration and speed control is possible



Application: Building & Industrial Sector
Operational Conditions: Indoor
Degree of Protection: IP 30 / IP 43
Rating: Up to 800A
Mounting: Wall mounted up to 630A
Form of Construction: Form 2
Rated Short Circuit Rating: 36kA for 1 sec.
No. of Ways: 4, 8, 12
Metering: Available as per requirement
Incomer & Outgoings: Moulded Case Circuit Breakers

SUB MAIN DISTRIBUTION BOARD

The MDB then feeds SMDBs, which is installed generally at the point where a large distribution cable terminates and several smaller sub circuits start. These are the switchboards that although similar construction, is larger than a final distribution board circuit. The boards are installed midway through the power distribution system, at the point in a large distribution cable ends, and several smaller starting sub-circuits.

Form 2a Separation of the busbars from the functional units, with terminals for external conductors not separated from the busbars.

Form 2b Separation of the busbars from the functional units, with terminals for external conductors, separated from the busbars.



METER CABINET

An electricity meter, electric meter, electrical meter, or energy meter is a device that measures. Possible locations include on a utility pole serving the property, in a street-side cabinet (meter box) or inside the premises adjacent to the meter box supply a range of metal meter boxes We supply internal and external meter boxes.

IP 65 ENCLOSURE

Sl.No	Item Code	Description
01	FENCL 604020----	Encl. WP 600x400x200
02	FENCL 605020 ----	Encl. WP 600x500x200
03	FENCL 606020----	Encl. WP 600x600x200
04	FENCL 705020----	Encl. WP 700x500x200
05	FENCL 806020----	Encl. WP 800x600x200
06	FENCL 806025 ----	Encl. WP 800x600x250
07	FENCL 808020 ----	Encl. WP 800x800x200
08	FENCL 808025 ----	Encl. WP 800x800x250
09	FENCL 1006020 ----	Encl. WP 1000x600x200
10	FENCL 106025 ----	Encl. WP 1000x600x250
11	FENCL 1008020 ----	Encl. WP 1000x800x200
12	FENCL 1008025 ----	Encl. WP 1000x800x250
13	FENCL 1008030 ----	Encl. WP 1000x800x300
14	FENCL 10010025 ----	Encl. WP 1000x1000x250
15	FENCL 10010030 ----	Encl. WP 1000x1000x300
16	FENCL 1206030 ----	Encl. WP 1200x600x300
17	FENCL 1208025 ----	Encl. WP 1200x800x250
18	FENCL 1208030 ----	Encl. WP 1200x800x300
19	FENCL 12010025 ----	Encl. WP 1200x1000x250
20	FENCL 12010030 ----	Encl. WP 1200x1000x300
21	FENCL 12010040 ----	Encl. WP 1200x1000x400
22	FENCL 12012030D ----	Encl. WP 1200x1200x300 Double DOOR
23	FENCL 1406030 ----	Encl. WP 1400x600x300
24	FENCL 1406040 ----	Encl. WP 1400x600x400
25	FENCL 1408030 ----	Encl. WP 1400x800x300
26	FENCL 1408040 ----	Encl. WP 1400x800x400
27	FENCL 14010030 ----	Encl. WP 1400x1000x300
28	FENCL 14010040 ----	Encl. WP 1400x1000x400
29	FENCL 14012040D ----	Encl. WP 1400x1200x400 D/DOOR
30	FENCL 1606030 ----	Encl. WP 1600x600x300
31	FENCL 1606040 ----	Encl. WP 1600x600x400
32	FENCL 1608030 ----	Encl. WP 1600x800x300
33	FENCL 1608040 ----	Encl. WP 1600x800x400
34	FENCL 16010030 ----	Encl. WP 1600x1000x300
35	FENCL 16010040 ----	Encl. WP 1600x1000x400

IP 65 ENCLOSURE

Sl.No	Item Code	Description
36	FENCL 16012040D ----	Encl. WP 1600x1200x400 D/DOOR
37	FENCL 1806040 ----	Encl. WP 1800x600x400
38	FENCL 1808040 ----	Encl. WP 1800x800x400
39	FENCL 18010040 ----	Encl. WP 1800x1000x400
40	FENCL 18012040 ----	Encl. WP 1800x1200x400 D/DOOR

EXTENDABLE ENCLOSURE

41	FEX 18010040 ----	Ext. Encl. 1800x1000x400
42	FEX 2004060 ----	Ext. Encl. 2000x400x600
43	FEX 2006060 ----	Ext. Encl. 2000x600x600
44	FEX 2008060 ----	Ext. Encl. 2000x800x600
45	FEX 20010060 ----	Ext. Encl. 2000x1000x600
46	FEX 20012060 ----	Ext. Encl. 2000x1200x600
47	FEX 20040080 ----	Ext. Encl. 2000x400x800
48	FEX 2006080 ----	Ext. Encl. 2000x600x800
49	FEX 2008080 ----	Ext. Encl. 2000x800x800
50	FEX 20010080 ----	Ext. Encl. 2000x1000x800
51	FEX 20012080 ----	Ext. Encl. 2000x1200x800

EXTENDABLE ENCLOSURE MOUNTING PLATE

52	FMPL 20040	MOUNTING PLATE 2000X400
53	FMPL 20060	MOUNTING PLATE 2000X600
54	FMPL 20080	MOUNTING PLATE 2000X800
55	FMPL 200100	MOUNTING PLATE 2000X1000
56	FMPL 200120	MOUNTING PLATE 2000X1200

EXTENDABLE ENCLOSURE SIDE COVER

57	FCR 16040 ----	SIDE PANEL 1600 H X 400 D
58	FCR 18040 ----	SIDE PANEL 1800 H X 400 D
59	FCR 18060 ----	SIDE PANEL 1800 H X 600 D
60	FCR 18080 ----	SIDE COVER 1800 H X 800 D
61	FCR 180100 ----	SIDE COVER 1800 H X 1000 D
62	FCR 20040 ----	SIDE PANEL 2000 H X 400 D
63	FCR 20060 ----	SIDE PANEL 2000 H X 600 D

EXTENDABLE ENCLOSURE SIDE COVER

Sl.No	Item Code	Description
64	FCR 20080 ----	SIDE COVER 2000 H X 800 D
65	FCR 200100 ----	SIDE COVER 2000 HX 1000 D

ROW DB-FLUSH

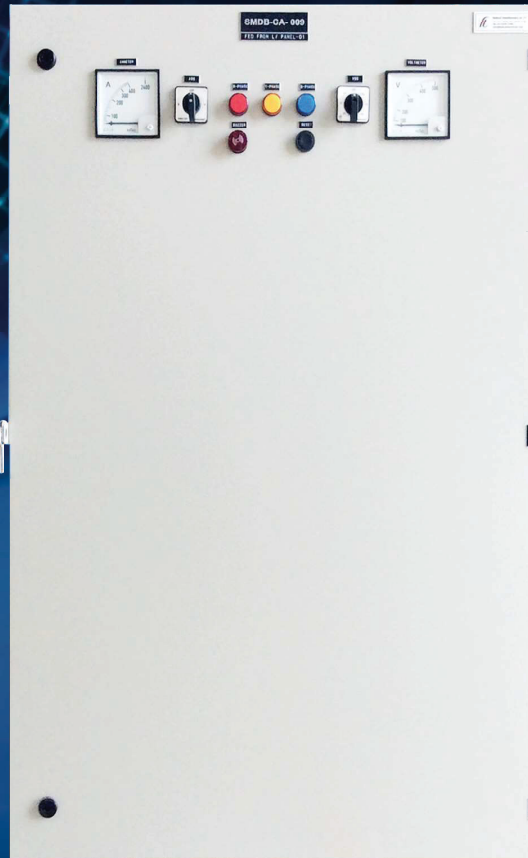
01	FRDB1R16F----	1 Row 16MW Encl-Flush
02	FRDB2R16F----	2 Row 16MW Encl-Flush
03	FRDB3R16F----	3 Row 16MW Encl-Flush
04	FRDB4R16F----	4 Row 16MW Encl-Flush
05	FRDB5R16F----	5 Row 16MW Encl-Flush
06	FRDB6R16F----	6 Row 16MW Encl-Flush
07	FRDB4R24F----	4 Row 24MW Encl-Flush
08	FRDB5R24F----	5 Row 24MW Encl-Flush
09	FRDB6R24F----	6 Row 24MW Encl-Flush

ROW DB-SURFACE

01	SRDB1R16S----	1 Row 16MW Encl-Surface
02	SRDB2R16S----	2 Row 16MW Encl-Surface
03	SRDB3R16S----	3 Row 16MW Encl-Surface
04	SRDB4R16S----	4 Row 16MW Encl-Surface
05	SRDB5R16S----	5 Row 16MW Encl-Surface
06	SRDB6R16S----	6 Row 16MW Encl-Surface
07	SRDB4R24S----	4 Row 24MW Encl-Surface
08	SRDB5R24S----	5 Row 24MW Encl-Surface
09	SRDB6R24S----	6 Row 24MW Encl-Surface

TECHNICAL CHARACTERISTICS

Compliance with Standards	IEC 62208
Product Description	Empty enclosure for low-voltage switchgear and control gear assemblies, Wall/ Floor mounted type metallic enclosure.
Enclosure Frame Thickness	1.5mm
Door/ Covers Thickness	1.5mm
Mounting Plate Thickness	2mm
Overall Dimensions	As Per Dimension Sheet
Material	GI Sheet Steel
Degree of Protection	IP65
Door Gasket	PU Foam Type
Paint/ Color	RAL 7032-Standard. All Other Color As Per Request
Ambient Temperature	50°C
Rated Service Voltage	Up to 690V
Rated Insulation Voltage	Up to 1000V
Rated Frequency	50-60 Hz
Rated Impulse Voltage	6KV



SUB MAIN DISTRIBUTION BOARD (SMDB)

FSL STANDARD SMDB DIMENSIONS				
SI No.	Code	Width	Height	Depth
1	FSL 080830	800	800	300
2	FSL 081030	800	1000	300
3	FSL 081230	800	1200	300
4	FSL081430	800	1400	300
5	FSL101030	1000	1000	300
6	FSL101230	1000	1200	300
7	FSL101430	1000	1400	300
8	FSL101630	1000	1600	300
9	FSL121230	1200	1200	300
10	FSL121430	1200	1400	300
11	FSL121235	1200	1600	350
12	FSL121240	1200	1800	400
13	FSL505020	500	500	200

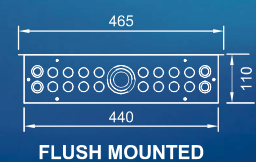
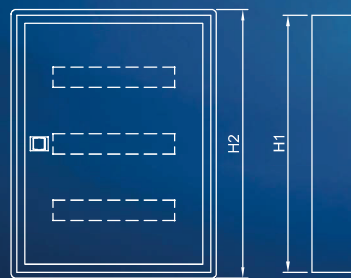
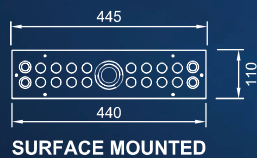
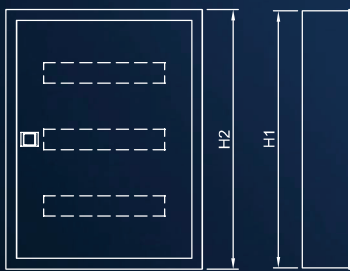
All Dimensions are in mm & Weights are in kg unless otherwise specified
 IP 42 - Our own tested certified regulations, IP 65 - Our own tested certified regulations,
 IP 54 - Our own tested certified regulations



Inside View



Hinges



DISTRIBUTION BOARD (DB)

16 MODULE DB'S

No. of Rows	BACK BOX DIMENSIONS			FLUSH TYPE			SURFACE TYPE		
	Height	Width	Depth	Height	Width	Depth	Height	Width	Depth
1ROW 16M	300	440	115	330	470	115	310	450	115
2ROW 16M	450	440	115	480	470	115	460	450	115
3ROW 16M	600	440	115	630	470	115	610	450	115
4ROW 16M	750	440	115	780	470	115	760	450	115
5ROW 16M	900	440	115	930	470	115	910	450	115
6ROW 16M	1050	440	115	1080	470	115	1060	450	115

24 MODULE DB'S

No. of Rows	BACK BOX DIMENSIONS			FLUSH TYPE			SURFACE TYPE		
	Height	Width	Depth	Height	Width	Depth	Height	Width	Depth
1ROW 24M	300	584	115	330	614	115	310	594	115
2ROW 24M	450	584	115	480	614	115	460	594	115
3ROW 24M	600	584	115	630	614	115	610	594	115
4ROW 24M	750	584	115	780	614	115	760	594	115
5ROW 24M	900	584	115	930	614	115	910	594	115
6ROW 24M	1050	584	115	1080	614	115	1060	594	115

All dimensions are in mm & Weights are in kg unless otherwise specified
 IP 42 - Our own tested certified regulations, IP 65 - Our own tested certified regulations,
 IP 54 - Our own tested certified regulations

SHEET METAL FABRICATION

Our Sheet Metal division turns ideas into functional realities through cutting edge metal fabrication technology performing design, fabrication and coating of sheet metal products for varied applications in the IT, construction and electrical industry. Combining quick turnaround, quality craftsmanship, engineering innovation and superior quality, we remain on the cutting edge of technology.

The complete in-house operation ensures that customers receive deliveries on schedule without any compromise on the quality or Integrity of the product. Our master metalworkers and highly skilled personnel are experts in all aspects of metal fabrication, from shearing, punching, bending and welding, while our varied capabilities allow us to approach each requirement with customized and innovative solutions



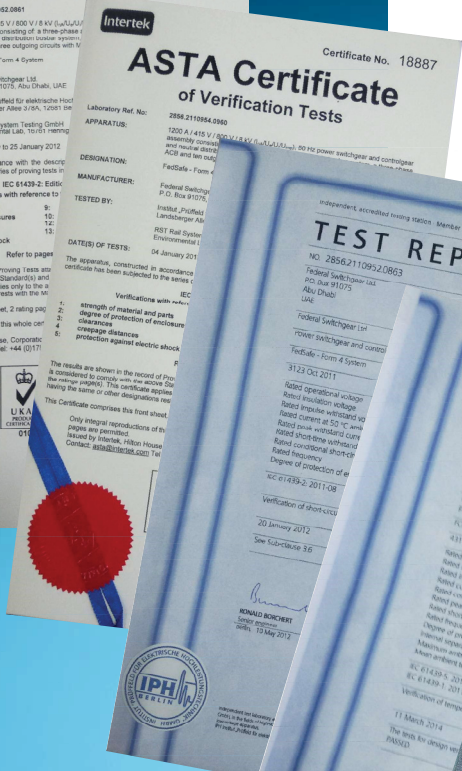
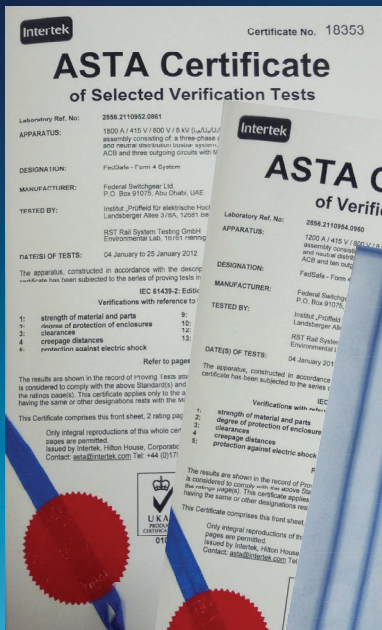


THE FEDERAL EDGE

Fully equipped with state-of-the-art technology including CNC punching, bending and electrostatic powder coating , Automatic Gasketing machinery.

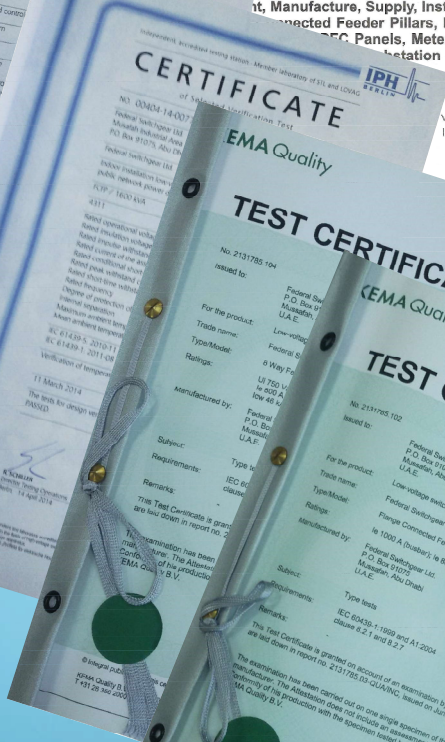
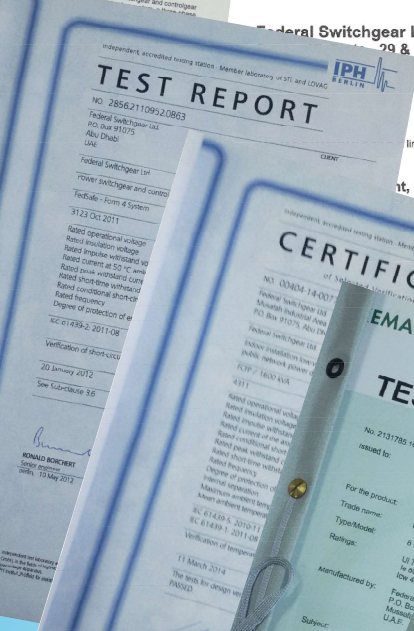
The complete in-house operation ensures deliveries are on schedule without any compromise on quality or Integrity of the product.

The enclosures are IP 55 protection class rated in accordance with IEC 60529 and certified by ASTA.



Management system as per EN ISO 9001 : 2008

Federal Switchgear Ltd. P.O. Box 91075, Mussaffah, Abu Dhabi, UAE



In accordance with TÜV NORD CERT procedures, it is hereby certified that the Management system conforms with the above standard for the following scope: Design, Manufacture, Supply, Installation and Maintenance of Connected Feeder Pillars, Low Voltage Switchgear, MCC Panels, Metering Panels, and Substation Enclosures.



الإشهاد
في أن نظام إدارة الجودة
والنظام المحوري لإنتاج
والصيانة لمقاطع المعدات
النظام المعاصر
" نظام إدارة الجودة و
المحدودة الحجم"
تاريخ الإصدار: 013
تاريخ التجدد: 016
مساحة الشهادة: 019
شهادة اعتماد رقم: ...
ملحظة هام:
يتم تطبيق نظام
معايير النظام ومطابق
المعيار
يتم توفير كافة الوثائق
مورد أو العميل وذلك طبق
الخطوة
يتم توفير كافة الوثائق
يتم توفير كافة الوثائق
مطابق المواصفات الفنية
مطابق مواصفات النظام