IT system floor-standing distribution cabinet series ...-IPS-F/EDS

for supplying power to medical locations
in accordance with IEC 60364-7-710
and featuring a built-in insulation fault location system

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BENDER

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Device features

- Completely standardized IT system featuring
  - 3.15…8 kVA (10 kVA optional) isolating transformer
  - Insulation, load, temperature and connection monitoring
  - Main isolator switch
  - 6 subcircuits with 2-pole circuit breakers/IT system (max. 24)
- Automatic insulation fault location system
- Power supply unit for alarm indicator and operator panels
- Time saving as the floor-standing distribution cabinets are supplied prewired and factory tested
- Versions for 1…4 IT systems in one enclosure
- Designed in accordance with the requirements of applicable standards
- In and outgoing wires are terminated by screwless type/cage clamp spring terminals or as per customer specification
- Exchange of information via bus technology
- Short delivery times

Application

The IT system distribution cabinet in the IPS-F series supplies electrical power to group 2 medical locations. In such locations, according to the requirements of

- IEC 60364-7-710
  for circuits supplying medical electrical equipment and systems intended for life support, surgical applications and other electrical equipment located in the “patient environment”

the use of the IT system with insulation monitoring and load current monitoring (IEC 60364-7-710) is recommended. This requirement applies for example to anaesthetic rooms, operating theatres, preparation rooms, plaster rooms, recovery rooms, heart catheterization rooms, intensive care rooms, angiographic examination rooms, premature baby rooms.

The distribution cabinet of the IPS-F series features all necessary components and is supplied prewired to terminals, thereby drastically reducing the time needed for installation and commissioning. The completely factory tested cabinets do comply with our high quality and safety requirements and ISO9001 standard.

Built-in components in accordance with IEC 60364-7-710

The IPS-F series distribution cabinet features the following components:

- 3.15…8 kVA isolating transformer (10 kVA optional)
- Insulation, load, and temperature monitoring device isoMED427P
- Main isolator switch
- 6 x 2-pole circuit breakers/IT system (max. 24 circuit breakers/IT system)
- 1 load current transformer
- 1 equipotential bonding terminal
- Power supply for maximum of 7 MK2430 alarm indicator and operator panel(s) or for maximum of 7 control panels CP305 series (the maximum number of alarm indicator and operator panels to be connected to a power supply unit also depends on the cable length)

Ventilation filters and fans are mounted into the cabinet door.

Insulation, load and temperature monitoring

The isoMED427P insulation monitoring device continuously monitors the insulation resistance, load current and the temperature of the IT system transformer. If one or a number of response values have been reached (insulation resistance, load current, temperature), the alarm relay will switch and a corresponding message will appear. The connecting cables to the system and PE, as well as to the measuring current transformer and temperature sensor, are permanently monitored. In the event of wire breakage or short circuit of the current transformer an alarm will come on. The patented AMP measuring technique is used in order to exclude the possibility of insulation monitoring being impaired by DC components.

Insulation fault location system (EDS system)

In group 2 medical locations featuring a large number of socket-outlet circuits and/or loads (e.g. intensive care units), locating faulty circuits or loads can often be a time-consuming and difficult task for medical and technical personnel. The EDS insulation fault location system solves this problem by automatically locating the insulation fault during operation. This results in two decisive advantages: fault location and availability are optimized in terms of both time and cost, because the system remains in operation during automatic fault location.

Insulation fault location

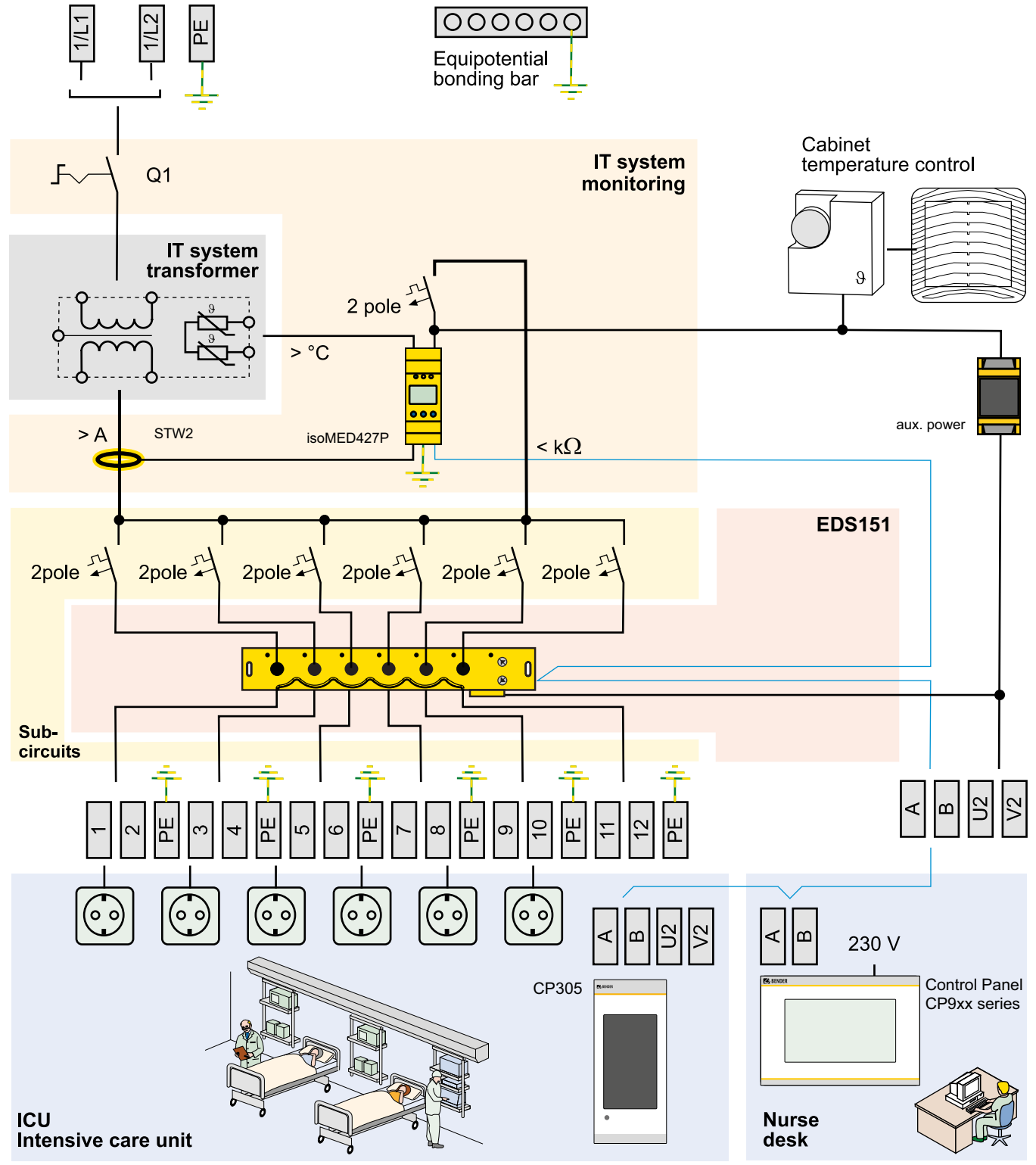
The insulation fault location process starts when the ISOMETER® isoMED427P reports an insulation fault. The locating current injector integrated in the isoMED427P generates a test current of max. 1 mA. This test current flows via the insulation fault location and via the earth wire (PE wire) back to the test device. The test current is detected by a measuring current transformer located on the fault path and processed by the EDS151 evaluator.

The location of the faulty circuit or load is identified by means of an assignment between the measuring current transformer/subcircuit and a unique text message, e.g. on a control panel CP9xx series, on the control panel CP305 series or the MK2430 alarm indicator and test combination.

Messages displayed in plain text

The unique status, warning and fault messages are displayed in plain text. The MK2430 alarm indicator and test combination or control panel CP9xx/CP305 series must be installed in a suitable location in the medical location and permanently monitored by medical staff. A twisted pair shielded bus cable is used to connect the IPS distribution cabinet to the alarm indicator panels.

Overview wiring diagram



Technical data

Distribution cabinet data

Cabinet range	ABB/Striebel & John
Cabinet type	Tri Line R, floor-standing cabinet with door
Degree of protection	max. IP54*
Protection class	Class I (earthed)
Ventilation	fan and filter in the distribution cabinet door, top and bottom
Doors and side panels	sheet steel 1.5…2 mm
Door	right-hinged
Door lock	lock with double bit insert
Paint finish	RAL7035, light grey (powder-coated)

Installation data

Type of installation	free-standing
Dimensions/weight/power consumption	see table

Type of wiring

Terminal area	at the top
Cable entry	via gland plates/optional closed cover
Cable duct	none
Protective/neutral conductor	PE terminals, isolating terminals ≤ 10 mm²
Conductor colours	acc. to IEC 60446
Conductors	halogen-free

Connection type

Connection method	typically: screwless-type connection/ cage clamp spring terminals/or as specified

Labeling

Devices	adhesive labels, IEC 61346-2
Distribution cabinet	adhesive labels, black type on a white
System type labelling	according to IEC

System data

Type of distribution system	IT system
Nominal voltage	AC 230 V/50…60 Hz

Insulation monitoring

Adjustable response value R_{an1}	50 … 500 kΩ
Hysteresis	≤ 25 %
Response time t_{an} at $R_F = 0.5$ x R_{an} and $C_e = 1$ µF	≤ 3 s
Max. permissible system leakage capacitance	≤ 1 µF
Measuring voltage U_m	12 V
Measuring current I_m (at $R_F = 0$ Ω)	≤ 50 µA
Internal DC resistance R_i	≥ 240 kΩ
Impedance Z_i at 50 Hz	≥ 200 kΩ
Permissible external DC voltage U_{fg}	≤ DC 375 V

Overload monitoring

Adjustable response value	5 … 50 A
Hysteresis	4 %
Temperature influence	≤ 0.15 %/°C

Overtemperature monitoring

Response value	4 kΩ
Release value	1.6 kΩ
PTC resistors acc. to DIN 44081	max. 6 in series

Insulation fault location

Test current IT	≤ 1 mA
Test pulse/break	2 s/4 s

Interfaces

Interface/protocol	RS-485/BMS
Connection terminals	A/B
Max. cable length	≤ 1200 m
Cable (shielded twisted pair, shield connected to PE at one end)	recommended: J-Y(St)Y 2 x 0.8
Terminating resistor	120 Ω (0.25 W)

Switching elements (alarm contacts isoMED427P)

Switching elements	1 changeover contact
Operating principle, adjustable	N/C or N/O operation
Electrical endurance, number of cycles	12000
Rated contact voltage	AC 250 V/DC 300 V
Making capacity	AC/DC 5 A
Breaking capacity	2 A, AC 230 V, cos phi 0.4 0.2 A, DC 220 V, L/R = 0.04 s

General data

Ambient temperature (operation in door use)	0…+ 30 °C
Ambient temperature (storage)	- 40…+ 70 °C
Operating mode	continuous operation

Product standards

Insulation monitoring	IEC 61557-8
Load and temperature monitoring	IEC 60364-7-710
Insulation fault location system	IEC 61557-9
Distribution cabinet	IEC 61439-1/2
Isolating transformer	IEC 60364-7-710 IEC 61558-1 IEC 61558-2-15

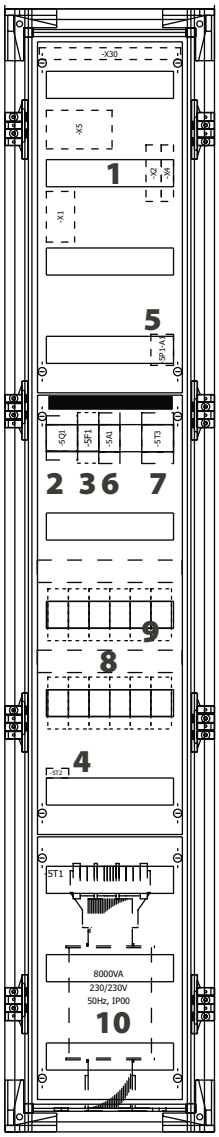
* with filter IP31

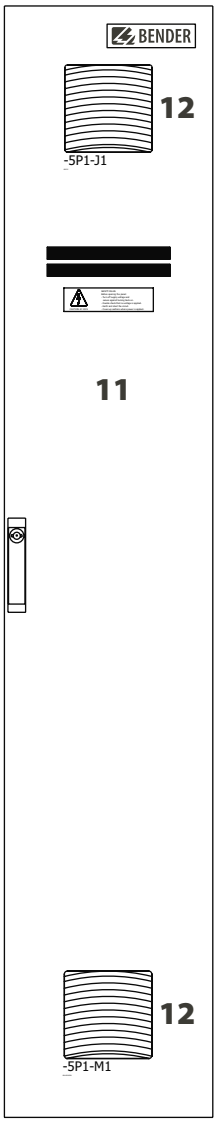
Overview/ordering information

Type	Isolating transformer	Subcircuits (typically)	Quantity IT systems	Dimensions WxHxD (mm)	Weight (kg)
S-IPS-F/EDS	up to 8 kVA	1 x 6…24	1	374 x 1913 x 425*	155
D-IPS-F/EDS		2 x 6…24	2	624 x 1913 x 425*	250
T-IPS-F/EDS		3 x 6…24	3	874 x 1913 x 425*	350
F-IPS-F/EDS		4 x 6…24	4	1124 x 1913 x 425*	455

* 10 kVA systems: depth 425 mm (only applies to transformer model ES710/10000SN-GL)
10 kVA systems: depth 625 mm (only applies to transformer model ES710/10000)

S-IPS-F/EDS





Dimensions:

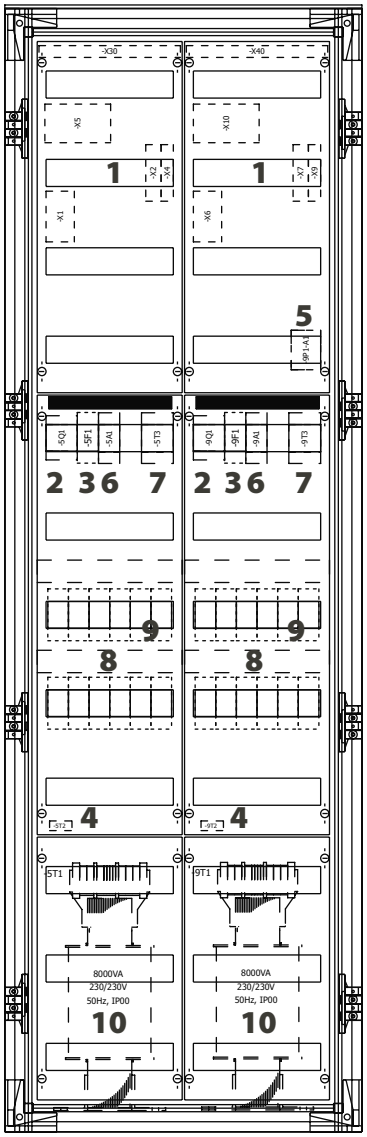
up to 8 kVA	374 x 1913** x 425 (W x H x D)
10 kVA	374 x 1913** x 425 (W x H x D) (only applies to transformer model ES710/10000SN-GL)
10 kVA	374 x 1913** x 625 (W x H x D) (only applies to transformer model ES710/10000)

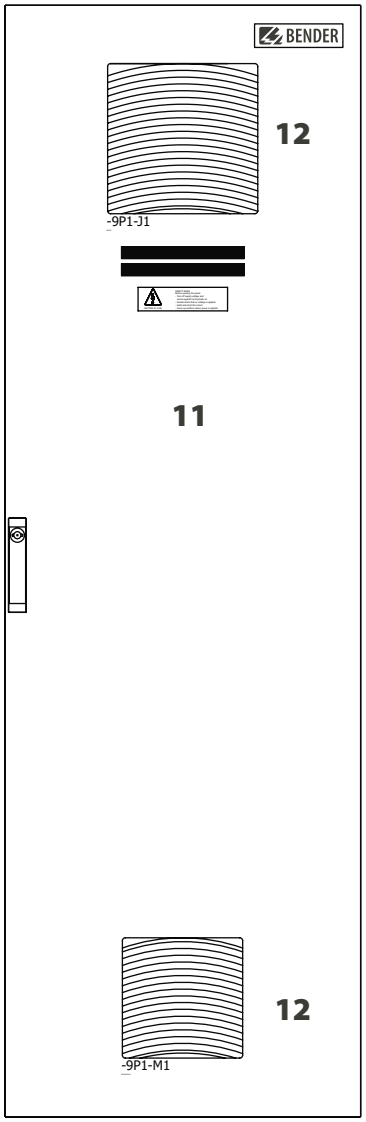
1	Terminal area and equipotential bonding terminals
2	Main isolator switch
3	Circuit breaker for internal power supply
4	Current transformer for load monitoring
5	Temperatur sensor (thermostat)
6	isoMED427P insulation, load and temperature monitoring device

7	Power supply unit for alarm indicator and operator panels MK2430 / control panel CP305 series
8	2-pole circuit-breaker subcircuits IT system (max. 24/IT system)
9	Insulation fault locator EDS151
10	IT system transformer typically 3.15…8 kVA (10 kVA optional)
11	Front door
12	Filter and fan

** with plinth: 2013 mm

D-IPS-F/EDS





Dimensions:

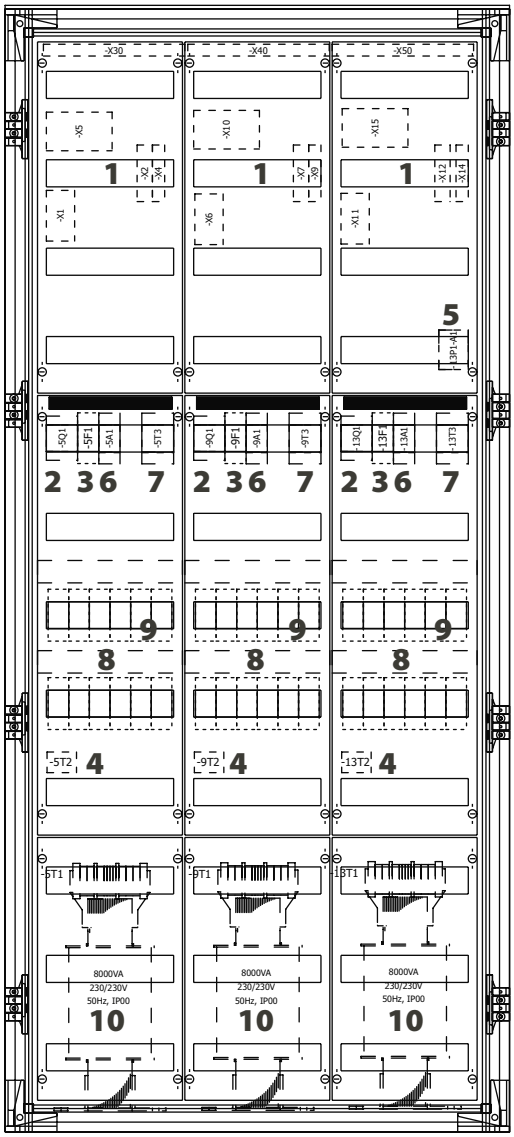
up to 8 kVA	624 x 1913** x 425 (W x H x D)
10 kVA	624 x 1913** x 425 (W x H x D) (only applies to transformer model ES710/10000SN-GL)
10 kVA	624 x 1913** x 625 (W x H x D) (only applies to transformer model ES710/10000)

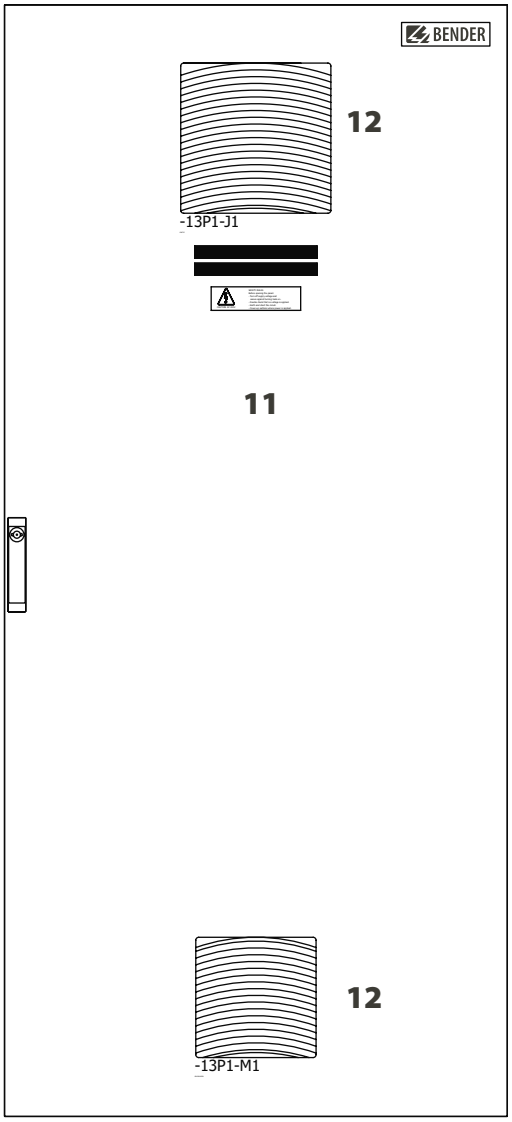
1	Terminal area and equipotential bonding terminals
2	Main isolator switch
3	Circuit breaker for internal power supply
4	Current transformer for load monitoring
5	Temperatur sensor (thermostat)
6	isoMED427P insulation, load and temperature monitoring device

7	Power supply unit for alarm indicator and operator panels MK2430 / control panel CP305 series
8	2-pole circuit-breaker subcircuits IT system (max. 24/IT system)
9	Insulation fault locator EDS151
10	IT system transformer typically 3.15…8 kVA (10 kVA optional)
11	Front door
12	Filter and fan

** with plinth: 2013 mm

T-IPS-F/EDS





Dimensions:

up to 8 kVA	874 x 1913** x 425 (W x H x D)
10 kVA	874 x 1913** x 425 (W x H x D) (only applies to transformer model ES710/10000SN-GL)
10 kVA	874 x 1913** x 625 (W x H x D) (only applies to transformer model ES710/10000)

1	Terminal area and equipotential bonding terminals
2	Main isolator switch
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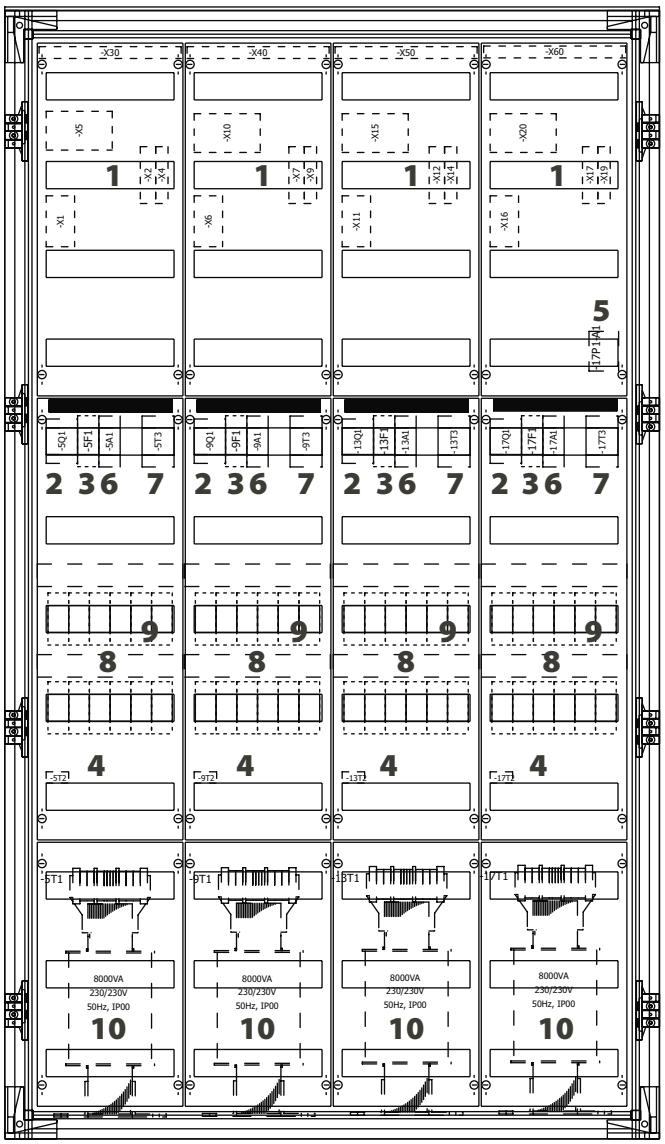
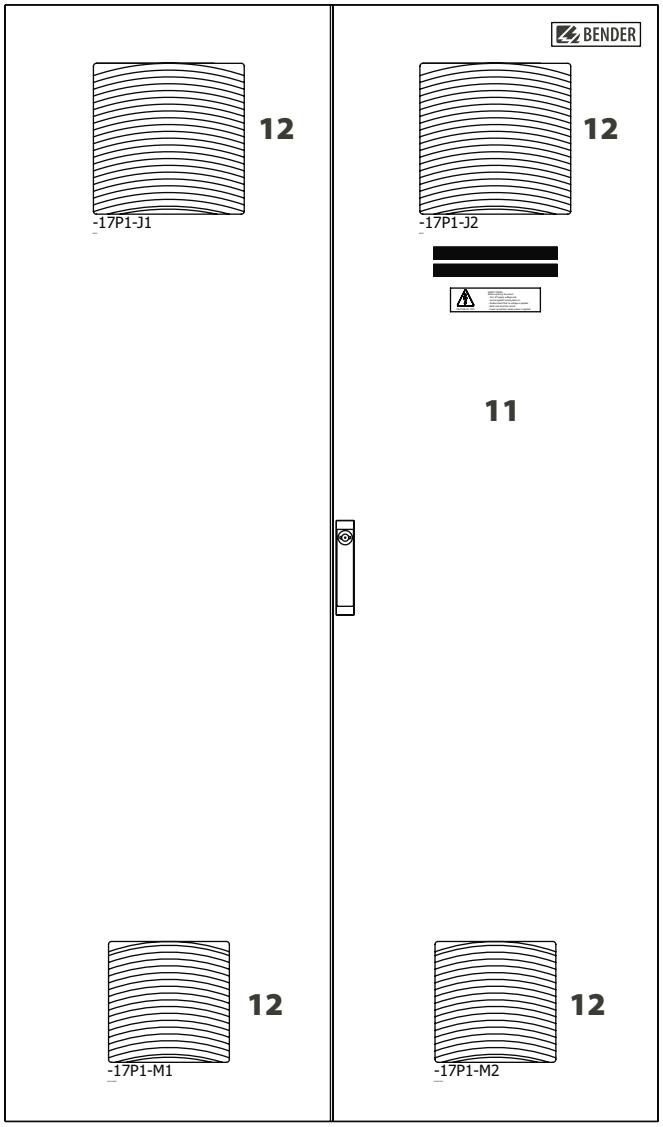
4	Current transformer for load monitoring
5	Temperatur sensor (thermostat)
6	isoMED427P insulation, load and temperature monitoring device

7	Power supply unit for alarm indicator and operator panels MK2430 / control panel CP305 series
8	2-pole circuit-breaker subcircuits IT system (max. 24/IT system)
9	Insulation fault locator EDS151
10	IT system transformer typically 3.15…8 kVA (10 kVA optional)
11	Front door
12	Filter and fan

** with plinth: 2013 mm

F-IPS-F/EDS





Dimensions:

up to 8 kVA	1124 x 1913** x 425 (W x H x D)
10 kVA	1124 x 1913** x 425 (W x H x D) (only applies to transformer model ES710/10000SN-GL)
10 kVA	1124 x 1913** x 625 (W x H x D) (only applies to transformer model ES710/10000)

1	Terminal area and equipotential bonding terminals
2	Main isolator switch
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4	Current transformer for load monitoring
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11	Front door
12	Filter and fan

** with plinth: 2013 mm

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