
IT system distributor S-IPS-F/EDS-UMA

With ATICS® changeover and monitoring device, insulation fault location and optional bypass switch for operating theatres and intensive care stations



IT system distributor S-IPS-F/EDS-UMA

with ATICS® changeover and monitoring device, insulation fault location and optional bypass switch

for operating theatres and intensive care wards



Device features

- Installed units
 - ATICS® automatic changeover and monitoring device with monitoring of:
 - voltage of supply points
 - output voltage
 - correct switch position
 - switch times
 - insulation resistance
 - load current
 - transformer temperature
 - functional safety in acc. with IEC 61508 (SIL2)
 - up to 12 or 24 outputs respectively, with line protection switches, BxxA, 2-pole
 - insulation fault location system
 - 5...8 kVA isolating transformer (10 kVA optional)
- Uninterruptible inspection and replacement with bypass switch
- Variable changeover time $t \leq 0.5...15$ s
- Information exchange using bus technology
- Connection of control panel CP9xx or CP305 series or the MK2430 alarm indicator and test combination.
- Short delivery lead times
- Savings in terms of cost and time with turnkey distributors
- Steel plate panelling in acc. with IEC 60364- 7-710: 2002
- Standard-compliant layout
- Verification of design in acc. with new DIN/EN 61439-1, -2, VDE 0660-600-1, -2, IEC 61439-1, -2
- Voluntary TÜV inspection of the changeover unit

Application

The IT system distributors in the S-IPS-F/EDS-UMA range supply areas in Group 2 used for medical purposes, for example operating theatres and intensive care wards with electrical power. Here, the protective measure 'Protection by insulation monitoring with report to the IT system' is used in socket-based power circuits for medical electrical devices that are operated at voltage ratings in excess of AC 25 V or above DC 60 V. In addition, a changeover device should be provided capable of switching over to a second power source in the event of any failure in the safety current supply. An insulation fault location device is integrated in the S-IPS-F/EDS-UMA to locate insulation faults.

Description of function

The distributors in the S-IPS-F/EDS-UMA series are to receive an isolating transformer and an UMA710-2-xx-ISO changeover and monitoring module ... with optional bypass switch and will all the monitoring devices required for the compliance of IT systems with IEC 60364- 7-710: 2002:

- Changeover device with voltage monitoring
- Insulation monitoring
- Load and temperature monitoring

In addition, the distributor is to receive an insulation fault location system for 6, 12, 18 or 24 outputs. On the secondary side of the isolating transformer, 6, 12, 18 or 24 corresponding line protection switches (BxxA, 2-pole) are installed. The sockets of group 2 medical location are connected to them.

To reduce noise emissions, waste heat can be dissipated by natural convection, even at 100% transformer utilisation levels.

Functions in acc. with IEC 60364- 7-710: 2002

- Voltage monitoring with variable control function on the preferred line and on the second line as well as on the output of the changeover unit
- Variable changeover time $t \leq 0.5...15$ s for AV/SV and/or SV/UPS changeovers
- Protection against circuit faults involving the use of mech. and electr. multiple interlocks
- Cable routing protected from short circuits and shorts to earth
- Control circuit with 'One Fault' failsafe in acc. with IEC 60364- 7-710: 2002
- Automatic release can be set when electrical power is restored
- Function check including a check of switching time
- Monitoring of insulation, load current and temperature for the IT system Connection monitoring mains power/PE insulation monitoring device
- Isolating transformer 6300, 8000 or 10000 VA for IT system with Inrush current $< 12 \times I_n$ or optionally $< 6 \times I_n$ ("Green Line only")

Other safety-enhancing measures

- Continuous monitoring of functional capability of all important internal components and connecting wires
- Monitoring for short circuit at output of changeover unit with defined switching characteristics
- Maximum reliability when switching:
 - through patented switching system with mechanical and electrical locking action
 - through welded switch contacts with the mechanism of a power switch
 - resistant e. g. to voltage fluctuations or vibration through stable switch position and permanent contact pressure
- Preventive safety with automatic reminder for specified tests, service times, number of switching actions
- Optional bypass switch for uninterruptible testing / maintenance
- Voluntary TÜV inspection of the changeover unit
- Functional safety tested in acc. with IEC 61508 (SIL2) of the ATICS® switch (provide messages to at least two points)

Changeover unit

In fault-free operating condition, the preferred line is switched on. If the voltage drops below its set value, the system switches automatically to the second line. This changeover time can be set individually. To assure operational readiness, the second cable and the output on the changeover unit (cable 3) are also monitored.

Switching back to the preferred cable takes place automatically after a time lag associated with the return of electrical power. With a choice of time settings, for example response time, pause time, release time, the changeover unit can take account of the individual layout of a system (for example Sequencing of several changeover units, dissipation of switching power).

A bypass switch is provided for uninterruptible testing and maintenance of the changeover and monitoring device.

Insulation, load and temperature monitoring

The insulation monitoring device continuously monitors the insulation resistance, load current and temperature of the transformer on the IT system. If results drop below (insulation resistance) or rise above (load current, temperature) response values in one or more cases, the alarm relay switches and a corresponding message is displayed. The connecting wires to the system and PE and to the measuring current transformer and the temperature sensor are monitored continuously. A message is issued immediately in the event of an open circuit or of a short circuit. To eliminate the influence of DC fault currents on insulation monitoring, a patented measuring process is used.

Insulation fault-finding unit (EDS system)

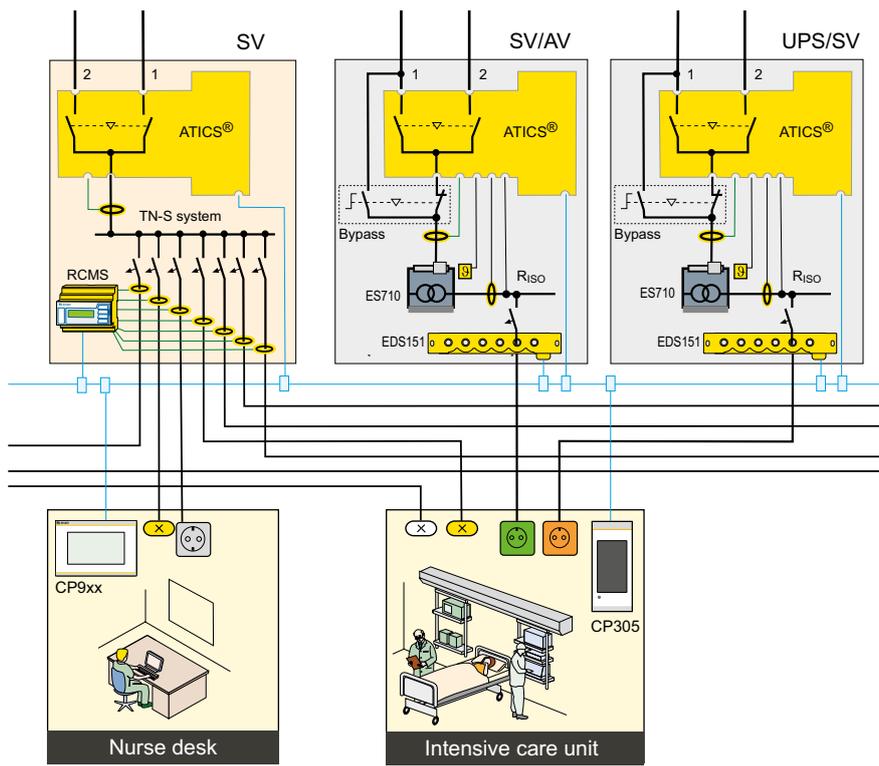
In Group 2 medical locations with many socket-based power circuits and/or consumers (for example intensive care wards), it is often time-consuming and difficult for medical or technical personnel to locate defective power circuits or consumers. The EDS insulation fault location system resolves this problem through automatic location of insulation faults during operation. This delivers two substantial benefits: Optimum time-based and cost-based fault location and availability because the system remains in operation during automatic troubleshooting.

Functional method of the EDS system

Whenever the ATICS-2-xx-ISO changeover and monitoring device reports an insulation fault, the insulation fault location search commences: The device generates a test current of max. 1 mA. This test current flows across the insulation fault location and across the earth cable (PE cable) then back to the test device. This test current is recorded by the measuring current transformer located in the fault path and is then reported to the EDS insulation fault location detector via the bus. Based on the assignment of measuring current transformer to output to an individual text message, e.g. to a control panel CP9xx or CP305 series or a alarm indicator and test combination MK2430, the defective power circuit or consumer is located.

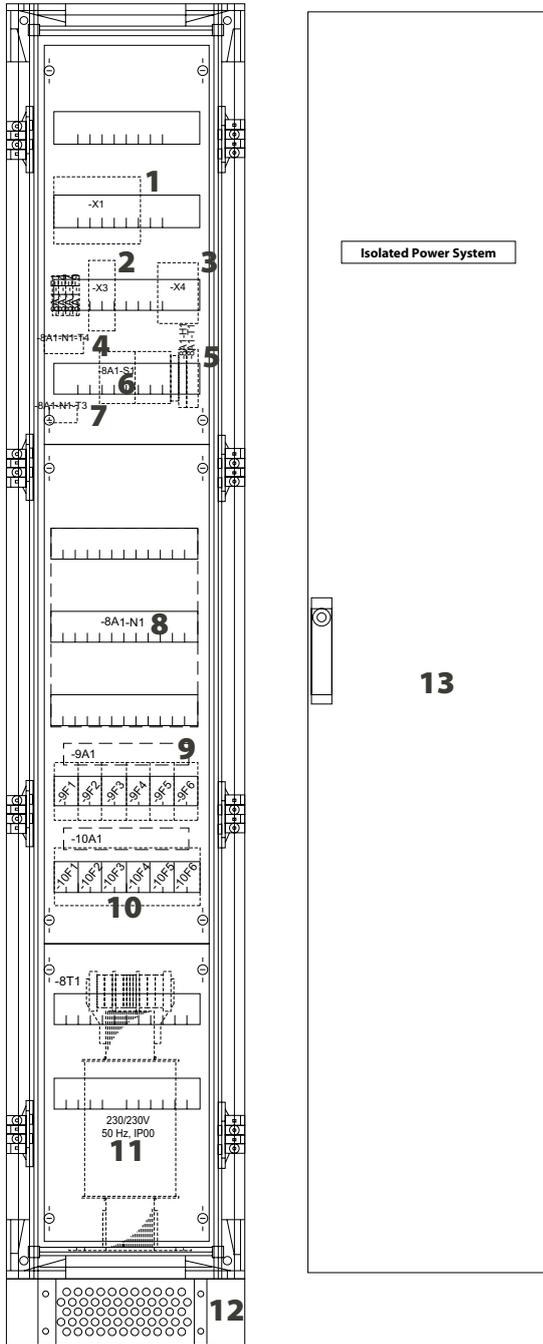
Messages in clear text display

Clear text messages display unambiguous messages relating to operation, warnings and faults. The control panel CP9xx or CP305 series or the alarm indicator and test combination MK2430 must be housed at an appropriate location must be housed at an appropriate location, one continuously monitored by medical personnel. The connection between the S-IPS-F/EDS-UMA distributor and the reporting units takes the form of a 2-wire bus line.



Intensive care unit group 2

Layout



1	Terminals on supply lines
2	Terminals on the control connections
3	Terminals on the outputs
4	Converter for load monitoring of the IT transformer
5	Mains system device for reporting to control panel CP9xx or CP305 series or the alarm indicator and test combination MK2430.
6	Bypass switch (optional)
7	Converter for current monitoring

8	ATICS® changeover and monitoring device. (3 rows)
9	EDS151 insulation location detector
10	2-pole circuit-breaker subcircuits IT system (max. 24)
11	IT system transformer
12	Plinth, perforated and with a ventilation opening at the top (only with natural convection)
13	Front door

Distributor design data

Distributor data	
Cabinet range	Striebel & John, Triline R
Cabinet type	
S-IPS-F/EDS-UMA-06	1/8 RG
S-IPS-F/EDS-UMA-12	1/8 RG
S-IPS-F/EDS-UMA-18	1/10 RG
S-IPS-F/EDS-UMA-24	1/10 RG
Degree of protection	IP54
Class of protection	SK I (earthed)
Ventilation	Fan
Field layout	Separation between the system types
Cable guide	Inlets and outlets from above
Doors and walls	Steel plate 1.5...2 mm
Doors/stop	right
Door lock	Rod lock with 3 mm two-way key bit
Paintwork	RAL7035, light grey (powder-coated)
Plinth	Steel plate, height 100 mm, RAL 7005 (mouse grey)

Set-up data	
Type of assembly	Upright cabinet with door and plinth
Type of installation	Free-standing
Ambient temperature	max. 30°C
Dimensions (W x H x D)	
S-IPS-F/EDS-UMA-06	374 x 2013 x 425 mm
S-IPS-F/EDS-UMA-12	374 x 2013 x 425 mm
S-IPS-F/EDS-UMA-18	374 x 2313 x 425 mm
S-IPS-F/EDS-UMA-24	374 x 2313 x 425 mm

Comment:
When using an isolating transformer = 10000 VA, depth = 625* mm

Type of wiring	
Terminal compartment	top
Cable duct	none
Protection/neutral conductor	PE terminals, separating terminals ≤ 10 mm ²
Bus bars	none
Conductor colours	IEC 60446
Cables	halogen-free

Nomenclature	
Devices	Adhesive label, IEC 61346-2
Distributor	Adhesive label, background white, lettering black
Type of system	acc. to IEC

System data	
System type	IT system
Nominal voltage	N/PE/AC 230 V

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

Technical data
Insulation coordination in acc. with IEC 60664-1¹⁾

Nominal insulation voltage	AC 400 V
Voltage test in acc. with IEC 61010-18 (normal/safe isolation)	2,21 kV/3,54 kV

Power unit / switching elements¹⁾

Switch system	patented mech./electr. locking system
Rated operational voltage U_e	AC 230 V
Operating range U_e	0.8...1.15 x U_e
Frequency f_e	50...60 Hz
Rated operational current I_e of the module	(AC-3) 63 A/80 A
Pre-fuse	63 A/80 A gG
Category of use	AC-3
Changeover time adjustable	≤ 0.5 s...15 s
Current during the changeover process	<17 A/<30 ms
Line protection switch (project-dependent)	B 16 A

Voltage monitoring / changeover¹⁾

Response values	
Undervoltage, alarm 1, (1-V increments)	160...220 V
Overvoltage, alarm 2 (1-V increments)	240...275 V
Response time t_{on} (50-ms increments)	50 ms...100 s
Release time t_{off} (50-ms increments)	50 ms...100 s
Hysteresis (1% increments)	2...10 %
Frequency measurement	40...460 Hz
Operating measurement deviation	± 1 %

Isolating transformer

Classification of insulation	t_a 40/B
Insulation	double insulation
Ambient temperature	≤ 40°C
Rated power	3150...10000 VA
Rated frequency	50...60 Hz
Rated input voltage	AC 230 V
Rated output voltage	AC 230/115 V
Engagement current I_e	< 12 x I_n
Leakage current	≤ 0.5 mA
Standby input current i_0	≤ 3 %
Short circuit voltage U_k	≤ 3 %
Shielding	between primary and secondary coil

Current monitoring (output current)¹⁾

Measuring range I_n (true RMS)	0...200 A
Response value for message (1-A increments)	1...160 A
Response value for short circuit detection	160 A
Response delay t_{on} (50-ms increments)	50 ms...100 s
Delay on release t_{off} (50-ms increments)	50 ms...100 s
Hysteresis	5...30 %

Insulation monitoring¹⁾

Measuring range	10 k...1 MΩ
Response value R_{an1} (alarm 1)	50...250 kΩ
Response deviation	± 15 %
Hysteresis	≤ 25 %
Response time t_{on} at $R_F = 0.5 \times R_{an}$ and $C_e = 1 \mu F$	≤ 3.5 s
Measuring voltage U_m	≤ DC 12 V
Measuring current I_m (at $R_F = 0 \Omega$)	≤ 120 μA
Internal resistance DC R_i	≥ 240 kΩ
Impedance Z_i at 50 Hz	≥ 240 kΩ
Permitted system leakage capacitance C_e	≤ 1 μF

Load monitoring¹⁾

Measuring range, adjustable from response value	10...110 %
Response value (1A increments)	5...50 A (100A)
Hysteresis	5...30 %

Temperature monitoring¹⁾

Response value	4 kΩ
Release value	1.6 kΩ
Measuring time	≤ 2s
PTC thermistor in acc. With DIN 44081	max. 6 in series

Insulation fault location¹⁾

Test current IT	1 mA
Test cycle/Pause	2 s/4 s

Interface¹⁾

Interface/protocol	RS-485/BMS
Baud rate	9.6 kBit/s
Line length	≤ 1200 m
Recommended line (shielded, twisted pair, one-sided shield on PE)	min. J-Y(St)Y 2x0.6
Terminating resistor	120 Ω (0.25 W)
Device address	2...90
Display, character	Graphic display
Reports in history memory	300 data records

Switching elements (reporting contacts)¹⁾

Number	1 directional contact, isolated
Working method (standby/working current variable)	Standby current
Contact data	AC 230V, 5 A/DC 30 V, 5 A
Rated operational voltage U_e	AC 230 V/DC 220V
Electrical endurance	10,000 cycles
Minimum contact current 10 mA at AC/DC	> 5 V

Environment/EMC¹⁾

Standards	IEC/EN 61326-1, -2-4
Working temperature, Bender devices	-10...+55°C

Climate classes in acc. with IEC 60721

Stationary use	3K22
Transport	2K11
Long-term storage	1K22

Mechanical loading in acc. with IEC 60721

Stationary use	3M11
Transport	2M4
Long-term storage	1M12

Connection terminals¹⁾

Control unit	
Type of connection	Screw-type plug-in terminals
Connection properties	
Rigid/flexible	0.14...1.5 mm ²
Insulation stripping length	7 mm

Power section

Type of connection	Screw-type plug-in terminals
Connection properties	
Rigid/flexible	10...70 mm ² /6...50 mm ²
Insulation stripping length	15 mm

Outputs

Type of connection	Caged spring terminals
Connection properties	
Rigid/flexible conductor sizes	0.08...2.5 mm ² /4 mm ²
Insulation stripping length	6...7 mm

Technical data (contd.)

Product standards

Insulation monitoring	IEC 61557-8
Load and temperature monitoring	IEC 60364-7-710
Changeover unit	IEC 60364-7-710 IEC 60947-6-1
Distribution network	IEC EN 61439-1,-2
Isolating transformer	IEC 60364-7-710 IEC 61558-1, IEC 61558-2-15

Other

Operating mode	Continuous operation
Installation position	vertical
View drawing/circuit diagram	Documents are produced on a customer-specific and project-specific basis
Documentation number	D00350
Weight / power consumption	see order details

¹⁾ For further detailed technical information, please refer to the ATICS® Manual, D00046.

Variants

Type	Dimensions in mm			LS switch	Transformer rating	Power losses ¹⁾	Weight
	Beam	Depth	Height				
S-IPS-F/EDS-UMA-12-6300	374	425	2013	max. 12 pieces	6300 VA	approx. 277 W	approx. 170 kg
S-IPS-F/EDS-UMA-12-8000					8000 VA	approx. 305 W	approx. 180 kg
S-IPS-F/EDS-UMA-12-10000		625 ²⁾	2013	max. 12 pieces	10000 VA	approx. 380 W	approx. 190 kg
S-IPS-F/EDS-UMA-24-6300		425	2313	max. 24 pieces	6300 VA	approx. 277 W	approx. 180 kg
S-IPS-F/EDS-UMA-24-8000					8000 VA	approx. 305 W	approx. 190 kg
S-IPS-F/EDS-UMA-24-10000		625 ²⁾	2313	max. 24 pieces	10000 VA	approx. 380 W	approx. 200kg

¹⁾ Details for standard transformers.

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



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Subject to change!

The specified standards take into account the edition valid until 03.2024 unless otherwise indicated.