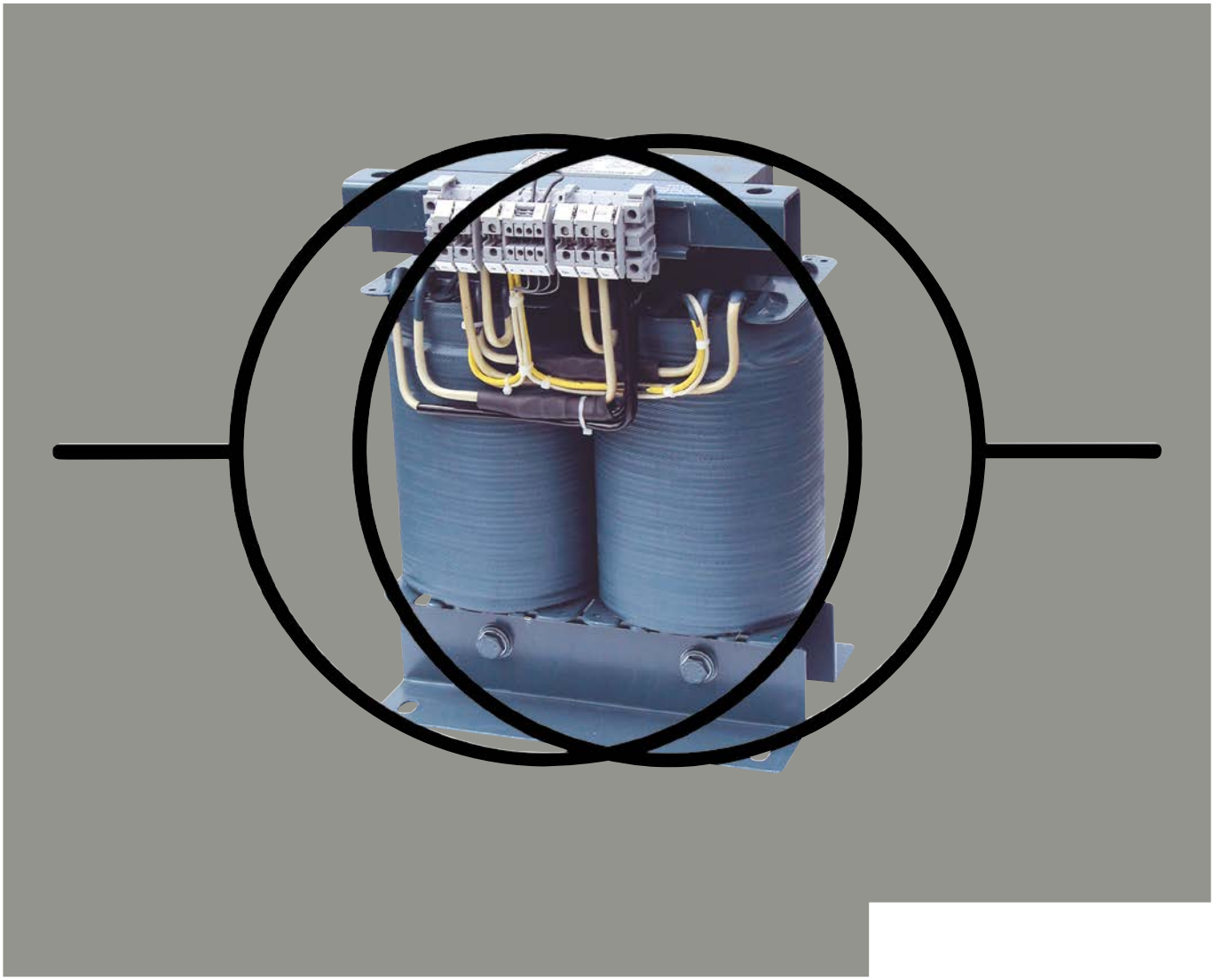
Isolating transformer ES710/...-2

with primary voltage 230 V

Single-phase isolating transformers for power supplies in medical locations



EDS710-2_D00274_01_D_XXEN/10.2025

BENDER

Isolating transformer ES710 /...-2

Single-phase isolating transformers for power supplies in medical locations

Device features

- Built-in temperature sensors according to DIN 44081 (120 °C)
- Screen winding with brought-out insulated connection terminal
- Isolated fixing angles
- Degree of protection IP 00 (construction type: open)
- Degree of protection IP 23 (enclosed type)
- Protection class I
- reinforced insulation
- Temperature class: t_a40/B
- UL insulation system: class F
- Connections: screw terminals
- Vector group IiO
- Noise level < 35 dB (A) (no-load and nominal load)
- No-load input current I_o < 2%
- Short-circuit voltage U_k < 2%

Approvals

CE

Application and description

The transformers of the ES710 series have reinforced insulation and comply with the requirements of DIN EN 61558-1 (VDE 0570-1) and DIN EN 61558-2-15 (VDE 0570-2-15).

In addition, the transformers comply with the requirements of DIN VDE 0100-710 (VDE 0100-710) for IT systems in rooms used for medical purposes. The windings are galvanically isolated. In order to minimize electrical interferences, an electrostatic screen is installed between the primary and secondary winding providing an isolated terminal suitable for connection to the equipotential bonding.

The fixing angles are isolated from the transformer core in order to guarantee an isolated installation to comply with the requirements of DIN VDE 0100-710 (VDE 0100-710), section 710.512.1.101.

The transformers are available for horizontal and vertical installation. Protection against corrosion is guaranteed by a complete resin impregnation.

The transformers are designed for use in dry locations.

Frequency/performance

The transformers are designed for rated frequencies of 50…60 Hz. The values specified in the chapter "Technical data" refer to a maximum ambient temperature of 40 °C and a rated frequency of 50 Hz.

Temperature rise

Free air circulation must be ensured. If the ambient temperature exceeds 40 °C the rated power decreases. For temperature monitoring, a PTC thermistor is placed on each transformer leg and the leads are connected to the terminals.

Enclosure

Appropriate steel sheet enclosures designed according to protection class IP 23 are available for all standard types of isolating transformers.

Overload protection

Isolating transformers used for the supply of medical IT systems in accordance with DIN VDE 0100-710 (VDE 0100-710), chapter 710.512.1.6.2 shall only be provided with short-circuit protection, overload protection is not allowed. That means, emphasis is focused on the availabilty of the power supply; it is therefore essential to avoid disconnection caused by overload. The protection of isolating transformers against overload and overtemperature can be realized by using monitoring devices in accordance with clause 710.531.3.1. The appropriate fuses for short-circuit protection can be selected from the table "Technical data".

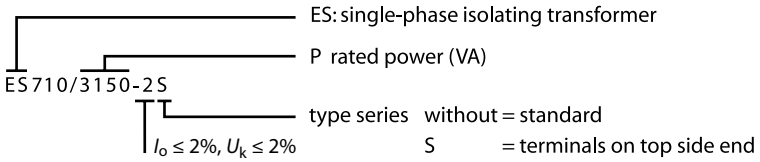
Standards

The ES710 series complies with the requirements of the following standards and regulations for the erection of electrical equipment:

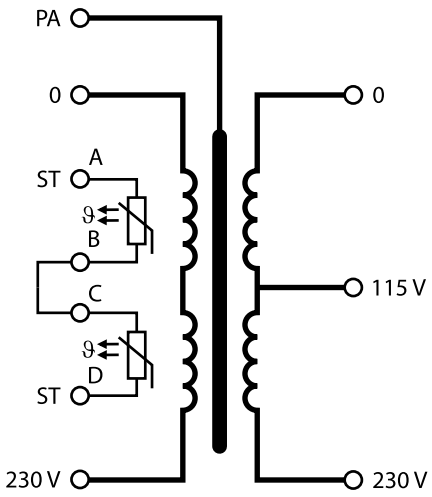
- DIN EN 61558-1 (VDE 570-1)
- IEC 61558-1
- DIN VDE 0100-710 (VDE 0100-710)
- DIN EN 61558-2-15 (VDE 0570-2-15)
- IEC 61558-2-15
- IEC 60364-7-710

Hazard warning:
When performing installation work in the environment of the transformer, it has to be ensured that the insulation coordination of the transformer is not influenced in a negative way.
For example, no ferromagnetic and conductive metal swarf may fall down close to the transformer. This can interfere with the function and the dielectric properties, especially after being turned on. The environment of the transformer must be kept free from such particles during the entire operating time and controls must be carried out at regular intervals.

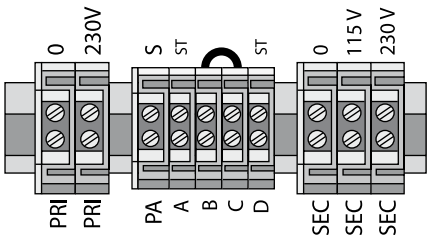
Type code



Wiring diagram



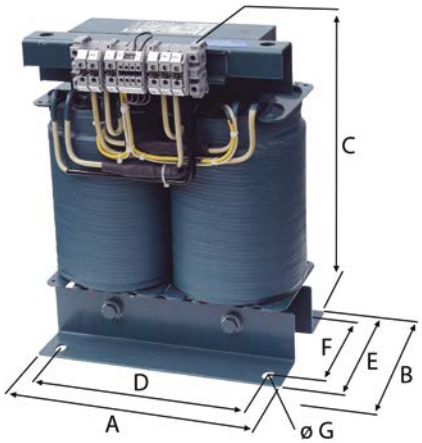
Terminal diagram



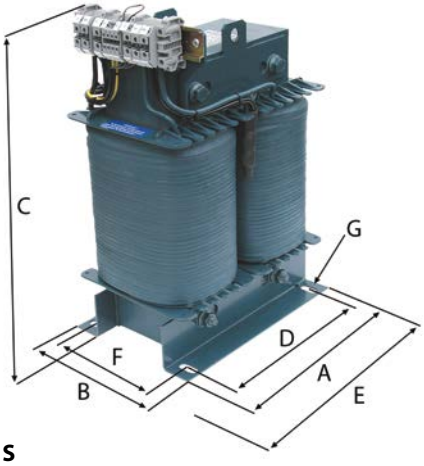
Connection details

Type	Input terminals flexible/rigid	Screen winding flexible/rigid	Screen winding flexible/rigid	Output terminals flexible/rigid
ES710/3150-2	16/16 mm²	16/16 mm²	4/6 mm²	16/16 mm²
ES710/4000-2	16/25 mm²	16/25 mm²	4/6 mm²	16/25 mm²
ES710/5000-2	16/25 mm²	16/25 mm²	4/6 mm²	16/25 mm²
ES710/6300-2	16/25 mm²	16/25 mm²	4/6 mm²	16/25 mm²
ES710/8000-2	16/25 mm²	16/25 mm²	4/6 mm²	16/25 mm²

Dimension diagrams



Standard version
Dimension B: depth including terminals



Type series S

Ordering information

	Dimensions (mm)							Cu weight (kg)	Weight (kg)	Core U/I	Type	Art. No.
	A	B	C	D	E	F	G					
Standard	280	200	370	240	150	115	11 x 28	32	60	210/63	ES710/3150-2	B924641
	280	210	370	240	160	125	11 x 28	34	63	210/73	ES710/4000-2	B924642
	280	225	370	240	175	140	11 x 28	38	68	210/88	ES710/5000-2	B924643
	280	240	370	240	190	155	11 x 28	40	80	210/103	ES710/6300-2	B924644
	280	270	370	240	220	185	11 x 28	42	95	210/133	ES710/8000-2	B924645
S series	280	150	420	240	290	115	11 x 28	32	60	210/63	ES710/3150S-2	B924717
	280	160	420	240	290	125	11 x 28	34	63	210/73	ES710/4000S-2	B924718
	280	175	420	240	290	140	11 x 28	38	68	210/88	ES710/5000S-2	B924719
	280	190	420	240	290	155	11 x 28	40	80	210/103	ES710/6300S-2	B924720
	280	220	420	240	290	185	11 x 28	42	94	210/133	ES710/8000S-2	B924737

Technical data

Type	ES710/3150-2	ES710/4000-2	ES710/5000-2	ES710/6300-2	ES710/8000-2
Power/voltage/currents					
Rated power	3150 VA	4000 VA	5000 VA	6300 VA	8000 VA
Rated frequency	50…60 Hz	50…60 Hz	50…60 Hz	50…60 Hz	50…60 Hz
Rated input voltage	AC 230 V	AC 230 V	AC 230 V	AC 230 V	AC 230 V
Rated input current I_n	14,2 A	18 A	22,5 A	28,5 A	36 A
Rated output voltage	AC 230/115 V	AC 230/115 V	AC 230/115 V	AC 230/115 V	AC 230/115 V
Rated output current	13,7 A	17,4 A	21,7 A	27,4 A	34,7 A
Inrush current I_E	< 8 x $\hat{I}_n$	< 8 x $\hat{I}_n$	< 8 x $\hat{I}_n$	< 8 x $\hat{I}_n$	< 8 x $\hat{I}_n$
Leakage current	≤ 0,5 mA	≤ 0,5 mA	≤ 0,5 mA	≤ 0,5 mA	≤ 0,5 mA
No-load input current i_0	≤ 2 %	≤ 2 %	≤ 2 %	≤ 2 %	≤ 2 %
No-load output voltage u_0	≤ 235 V	≤ 234 V	≤ 234 V	≤ 235 V	≤ 233 V
Short-circuit voltage u_k	≤ 2 %	≤ 2 %	≤ 2 %	≤ 2 %	≤ 2 %
Environmental conditions					
Ambient temperature max.	≤ 40 °C	≤ 40 °C	≤ 40 °C	≤ 40 °C	≤ 40 °C
No-load temperature rise	≤ 15 °C	≤ 18 °C	≤ 20 °C	≤ 20 °C	≤ 22 °C
Full-load temperature rise	≤ 30 °C	≤ 35 °C	≤ 40 °C	≤ 44 °C	≤ 50 °C
Noise level (no load and full load)	≤ 35 dB(A)	≤ 35 dB(A)	≤ 35 dB(A)	≤ 35 dB(A)	≤ 35 dB(A)
Other					
Temperature class	t_a40/B	t_a40/B	t_a40/B	t_a40/B	t_a40/B
UL insulation system	class F	class F	class F	class F	class F
Degree of protection	IP 00	IP 00	IP 00	IP 00	IP 00
Protection class	I	I	I	I	I
Recommended use when used in accordance with DIN VDE 0100-710	25 A gL/gG	25 A gL/gG	35 A gL/gG	50 A gL/gG	50 A gL/gG
Induction	0,87 T	0,9 T	0,97 T	0,90 T	0,88 T
$R_{primary}$	0,140 Ω	0,110 Ω	0,082 Ω	0,062 Ω	0,050 Ω
$R_{secondary}$	0,110 Ω	0,093 Ω	0,070 Ω	0,056 Ω	0,044 Ω
Efficiency	96 %	97 %	97 %	97 %	97 %
Documentation number: D00274					
Loss at 20…22 °C ambient temperature					
Fe loss (iron loss)	< 50 W	< 50 W	< 55 W	< 60 W	< 70 W
Cu loss (copper loss)	< 70 W	< 70 W	< 80 W	< 95 W	< 135 W
Heat dissipation loss at 40 °C ambient temperature and 100 % continuous load					
Heat dissipation loss	< 135 W	< 135 W	< 150 W	< 170 W	< 220 W

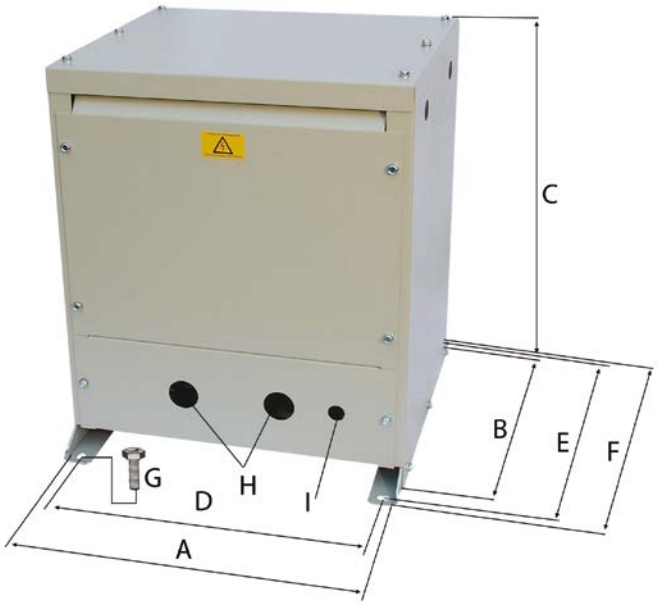
Isolating transformer enclosure

ESDS0107

Sheet steel enclosure in vertical position for single-phase transformers of the series ES710/3150 to ES710/10000.

Enclosure

- Sheet steel, varnished in RAL 7032
- Degree of protection IP 23
- Bore holes for cable entry
- The enclosures of our transformers (standard version), transformer sizes of 3.15…10 kVA, are provided with fixing holes intended for easy retrofitting at any time.



Ordering information enclosure

Dimensions (mm)									Weight (kg)	Version	Type	Art. No.
A	B	C	D	E	F	G	H	I				
430	380	500	385	420	450	M10	ø 37,5	ø 20,5	16	floor mounting	ESDS0107-1	B924673

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