

## Control- and safety isolating- resp. isolating transformer

**ST**



### General Data

Rated input voltage 230 - 690 Vac
Rated output voltage 12 - 230 Vac
Rated power 20 - 2500 VA
Insulation class B
Maximum ambient temperature 40 °C
Efficiency up to 96 %
Degree of protection IP 00

### Advantages

Very good switch-on behaviour thanks to reduced starting currents
High performance for the volume thanks to compact design
Primary side $\pm 5\%$ tapplings for voltage adjustment
Very good corrosion protection and low noise thanks to vacuum impregnation
Contact protected screw connection terminals complying with UVV BGV A3
Simple mounting thanks to robust metal footplate with oval slots

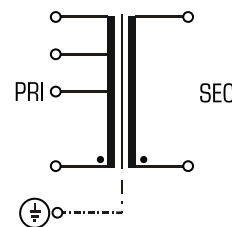
### Applications

As a control transformer for the electrical isolation of the input and output sides. The construction of the transformer to supply control systems according to VDE 0113 is designed.

As an isolating transformer for the safe electrical isolation of the input and output sides. The transformer may be used to set up protective separation as a protective measure in accordance with VDE 0100.

As a safety isolating transformer for the safe electrical isolation of the input and output sides. The transformer is suitable for creating SELV and PELV circuits because of the limit on the output voltage.

### Sample application



### Standards



Control transformer  
to: VDE 0570 Teil 2-2, DIN EN 61558-2-2, EN 61558-2-2, IEC 61558-2-2,  
UL 5085-1/-2, CSA 22.2 No.66

Safety isolating transformer  
to: VDE 0570 Teil 2-6, DIN EN 61558-2-6, EN 61558-2-6, IEC 61558-2-6, UL  
5085-1/-2, CSA 22.2 No.66

Isolating transformer  
to: VDE 0570 Part 2-4, DIN EN 61558-2-4, EN 61558-2-4, IEC 61558-2-4, UL  
5085-1/-2, CSA 22.2 No.66

### Approvals



ENEC 10 (VDE), UL 5085-1/-2, CSA 22.2 No.66



## Control- and safety isolating- resp. isolating transformer **ST**

Typ	ST 20/23/12	ST 20/23/24	ST 20/23/23	ST 20/4/23	ST 63/23/12	ST 63/23/24
<b>Electrical data</b>						
<b>Input</b>						
Rated input voltage	230 Vac	230 Vac	230 Vac	400 Vac	230 Vac	230 Vac
Tappings Input	±5 %	±5 %	±5 %	±5 %	±5 %	±5 %
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
<b>Output</b>						
Rated output voltage	12 Vac	24 Vac	230 Vac	230 Vac	12 Vac	24 Vac
Rated power VDE (DB cos phi=1)	20 VA	20 VA	20 VA	20 VA	63 VA	63 VA
Rated power VDE (KB cos phi=0.5)	42 VA	42 VA	42 VA	42 VA	110 VA	110 VA
No-load voltage (app. x factor)	1.10	1.10	1.10	1.10	1.10	1.10
Efficiency	81.0 %	81.0 %	81.0 %	81.0 %	84.0 %	84.0 %
<b>Standards</b>						
Classification	Safety isolating transformer	Safety isolating transformer	Isolating transformer	Isolating transformer	Control- and safety isolating transformer	Control- and safety isolating transformer
<b>Approvals</b>						
Approvals	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)
<b>Environment</b>						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
<b>Safety and protection</b>						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
<b>PRI Fusing recommendation</b> by circuit breaker with tripping characteristic type 20 x I <sub>rated</sub> related to set)						
Setting range	0.10 - 0.16 A	0.10 - 0.16 A	0.10 - 0.16 A	0.10 - 0.16 A	0.25 - 0.40 A	0.25 - 0.40 A
Setting value	0.11 A	0.11 A	0.11 A	0.10 A	0.33 A	0.33 A
<b>Order numbers</b>						
<b>Order Number</b>	<b>ST 20/23/12</b>	<b>ST 20/23/24</b>	<b>ST 20/23/23</b>	<b>ST 20/4/23</b>	<b>ST 63/23/12</b>	<b>ST 63/23/24</b>

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## Control- and safety isolating- resp. isolating transformer **ST**

Typ	ST 63/23/23	ST 63/4/24	ST 63/4/42	ST 63/4/23	ST 63/44/23	ST 63/69/23
<b>Electrical data</b>						
<b>Input</b>						
Rated input voltage	230 Vac	400 Vac	400 Vac	400 Vac	440 Vac	690 Vac
Tappings Input	±5 %	±5 %	±5 %	±5 %	±5 %	±5 %
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
<b>Output</b>						
Rated output voltage	230 Vac	24 Vac	42 Vac	230 Vac	230 Vac	230 Vac
Rated power VDE (DB cos phi=1)	63 VA	63 VA	63 VA	63 VA	63 VA	63 VA
Rated power VDE (KB cos phi=0.5)	110 VA	110 VA	110 VA	110 VA	110 VA	110 VA
No-load voltage (app. x factor)	1.10	1.10	1.10	1.10	1.10	1.10
Efficiency	84.0 %	84.0 %	84.0 %	84.0 %	84.0 %	84.0 %
<b>Standards</b>						
Classification	Control- and isolating transformer	Control- and safety isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer
<b>Approvals</b>						
Approvals	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	-
<b>Environment</b>						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
<b>Safety and protection</b>						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	B
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
<b>PRI Fusing recommendation</b> by circuit breaker with tripping characteristic type 20 x I <sub>rated</sub> related to set)						
Setting range	0.25 - 0.40 A	0.16 - 0.25 A	0.16 - 0.25 A	0.16 - 0.25 A	0.16 - 0.25 A	0.10 - 0.16 A
Setting value	0.33 A	0.19 A	0.19 A	0.19 A	0.17 A	0.10 A
<b>Order numbers</b>						
<b>Order Number</b>	<b>ST 63/23/23</b>	<b>ST 63/4/24</b>	<b>ST 63/4/42</b>	<b>ST 63/4/23</b>	<b>ST 63/44/23</b>	<b>ST 63/69/23</b>



## Control- and safety isolating- resp. isolating transformer **ST**

Typ	ST 100/23/12	ST 100/23/24	ST 100/23/23	ST 100/4/24	ST 100/4/23	ST 100/69/23
<b>Electrical data</b>						
<b>Input</b>						
Rated input voltage	230 Vac	230 Vac	230 Vac	400 Vac	400 Vac	690 Vac
Tappings Input	±5 %	±5 %	±5 %	±5 %	±5 %	±5 %
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
<b>Output</b>						
Rated output voltage	12 Vac	24 Vac	230 Vac	24 Vac	230 Vac	230 Vac
Rated power VDE (DB cos phi=1)	100 VA	100 VA	100 VA	100 VA	100 VA	100 VA
Rated power VDE (KB cos phi=0.5)	225 VA	225 VA	225 VA	225 VA	225 VA	225 VA
No-load voltage (app. x factor)	1.10	1.10	1.10	1.10	1.10	1.10
Efficiency	86.0 %	86.0 %	86.0 %	86.0 %	86.0 %	86.0 %
<b>Standards</b>						
Classification	Control- and safety isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer	Control- and isolating transformer
<b>Approvals</b>						
Approvals	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	-
<b>Environment</b>						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
<b>Safety and protection</b>						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	B
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
<b>PRI Fusing recommendation</b> by circuit breaker with tripping characteristic type 20 x I <sub>rated</sub> related to set)						
Setting range	0.40 - 0.63 A	0.40 - 0.63 A	0.40 - 0.63 A	0.25 - 0.40 A	0.25 - 0.40 A	0.15 - 0.25 A
Setting value	0.50 A	0.50 A	0.50 A	0.29 A	0.29 A	0.18 A
<b>Order numbers</b>						
<b>Order Number</b>	<b>ST 100/23/12</b>	<b>ST 100/23/24</b>	<b>ST 100/23/23</b>	<b>ST 100/4/24</b>	<b>ST 100/4/23</b>	<b>ST 100/69/23</b>

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## Control- and safety isolating- resp. isolating transformer **ST**

Typ	ST 130/23/24	ST 130/23/11	ST 130/4/23	ST 130/69/23	ST 160/23/24	ST 160/23/23
<b>Electrical data</b>						
<b>Input</b>						
Rated input voltage	230 Vac	230 Vac	400 Vac	690 Vac	230 Vac	230 Vac
Tappings Input	±5 %	±5 %	±5 %	±5 %	±5 %	±5 %
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
<b>Output</b>						
Rated output voltage	24 Vac	110 Vac	230 Vac	230 Vac	24 Vac	230 Vac
Rated power VDE (DB cos phi=1)	130 VA	130 VA	130 VA	130 VA	160 VA	160 VA
Rated power VDE (KB cos phi=0.5)	300 VA	300 VA	300 VA	300 VA	390 VA	390 VA
No-load voltage (app. x factor)	1.10	1.10	1.10	1.10	1.10	1.09
Efficiency	86.0 %	86.0 %	86.0 %	86.0 %	86.0 %	87.0 %
<b>Standards</b>						
Classification	Control- and safety isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer
<b>Approvals</b>						
Approvals	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	-	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)
<b>Environment</b>						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
<b>Safety and protection</b>						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	B	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
<b>PRI Fusing recommendation</b> by circuit breaker with tripping characteristic type 20 x I <sub>rated</sub> related to set)						
Setting range	0.63 - 1.00 A	0.63 - 1.00 A	0.25 - 0.40 A	0.16 - 0.25 A	0.63 - 1.00 A	0.63 - 1.00 A
Setting value	0.64 A	0.64 A	0.37 A	0.23 A	0.78 A	0.78 A
<b>Order numbers</b>						
<b>Order Number</b>	<b>ST 130/23/24</b>	<b>ST 130/23/11</b>	<b>ST 130/4/23</b>	<b>ST 130/69/23</b>	<b>ST 160/23/24</b>	<b>ST 160/23/23</b>



## Control- and safety isolating- resp. isolating transformer **ST**

Typ	ST 160/4/24	ST 160/4/23	ST 160/69/23	ST 250/23/12	ST 250/23/24	ST 250/23/42
<b>Electrical data</b>						
<b>Input</b>						
Rated input voltage	400 Vac	400 Vac	690 Vac	230 Vac	230 Vac	230 Vac
Tappings Input	±5 %	±5 %	±5 %	±5 %	±5 %	±5 %
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
<b>Output</b>						
Rated output voltage	24 Vac	230 Vac	230 Vac	12 Vac	24 Vac	42 Vac
Rated power VDE (DB cos phi=1)	160 VA	160 VA	160 VA	250 VA	250 VA	250 VA
Rated power VDE (KB cos phi=0.5)	390 VA	390 VA	390 VA	555 VA	555 VA	555 VA
No-load voltage (app. x factor)	1.09	1.09	1.09	1.08	1.08	1.08
Efficiency	87.0 %	87.0 %	87.0 %	90.0 %	90.0 %	90.0 %
<b>Standards</b>						
Classification	Control- and safety isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and safety isolating transformer	Control- and safety isolating transformer
<b>Approvals</b>						
Approvals	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	-	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)
<b>Environment</b>						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
<b>Safety and protection</b>						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	B	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
<b>PRI Fusing recommendation</b> by circuit breaker with tripping characteristic type 20 x I <sub>rated</sub> related to set)						
Setting range	0.40 - 0.63 A	0.40 - 0.63 A	0.25 - 0.40 A	1.00 - 1.60 A	1.00 - 1.60 A	1.00 - 1.60 A
Setting value	0.45 A	0.45 A	0.28 A	1.20 A	1.20 A	1.20 A
<b>Order numbers</b>						
<b>Order Number</b>	<b>ST 160/4/24</b>	<b>ST 160/4/23</b>	<b>ST 160/69/23</b>	<b>ST 250/23/12</b>	<b>ST 250/23/24</b>	<b>ST 250/23/42</b>

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## Control- and safety isolating- resp. isolating transformer **ST**

Typ	ST 250/23/23	ST 250/4/23	ST 250/44/23	ST 250/69/23	ST 320/23/24	ST 320/23/23
<b>Electrical data</b>						
<b>Input</b>						
Rated input voltage	230 Vac	400 Vac	440 Vac	690 Vac	230 Vac	230 Vac
Tappings Input	±5 %	±5 %	±5 %	±5 %	±5 %	±5 %
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
<b>Output</b>						
Rated output voltage	230 Vac	230 Vac	230 Vac	230 Vac	24 Vac	230 Vac
Rated power VDE (DB cos phi=1)	250 VA	250 VA	250 VA	250 VA	320 VA	320 VA
Rated power VDE (KB cos phi=0.5)	555 VA	555 VA	555 VA	555 VA	810 VA	810 VA
No-load voltage (app. x factor)	1.08	1.08	1.08	1.08	1.06	1.06
Efficiency	90.0 %	90.0 %	90.0 %	90.0 %	91.0 %	91.0 %
<b>Standards</b>						
Classification	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer
<b>Approvals</b>						
Approvals	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	-	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)
<b>Environment</b>						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
<b>Safety and protection</b>						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	B	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
<b>PRI Fusing recommendation</b> by circuit breaker with tripping characteristic type 20 x I <sub>rated</sub> related to set)						
Setting range	1.00 - 1.60 A	0.63 - 1.00 A	0.63 - 1.00 A	0.40 - 0.63 A	1.00 - 1.60 A	1.00 - 1.60 A
Setting value	1.20 A	0.69 A	0.63 A	0.43 A	1.50 A	1.50 A
<b>Order numbers</b>						
<b>Order Number</b>	<b>ST 250/23/23</b>	<b>ST 250/4/23</b>	<b>ST 250/44/23</b>	<b>ST 250/69/23</b>	<b>ST 320/23/24</b>	<b>ST 320/23/23</b>



## Control- and safety isolating- resp. isolating transformer **ST**

Typ	ST 320/4/23	ST 320/69/23	ST 400/23/24	ST 400/23/23	ST 400/4/24	ST 400/4/23
<b>Electrical data</b>						
<b>Input</b>						
Rated input voltage	400 Vac	690 Vac	230 Vac	230 Vac	400 Vac	400 Vac
Tappings Input	±5 %	±5 %	±5 %	±5 %	±5 %	±5 %
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
<b>Output</b>						
Rated output voltage	230 Vac	230 Vac	24 Vac	230 Vac	24 Vac	230 Vac
Rated power VDE (DB cos phi=1)	320 VA	320 VA	400 VA	400 VA	400 VA	400 VA
Rated power VDE (KB cos phi=0.5)	810 VA	810 VA	1.020 VA	1.020 VA	1.020 VA	1.020 VA
No-load voltage (app. x factor)	1.06	1.06	1.06	1.06	1.06	1.06
Efficiency	91.0 %	91.0 %	91.0 %	91.0 %	91.0 %	91.0 %
<b>Standards</b>						
Classification	Control- and isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer
<b>Approvals</b>						
Approvals	cURus, ENEC 10 (VDE)	-	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)
<b>Environment</b>						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
<b>Safety and protection</b>						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 105	B	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
<b>PRI Fusing recommendation</b> by circuit breaker with tripping characteristic type 20 x I <sub>rated</sub> related to set)						
Setting range	0.63 - 1.00 A	0.40 - 0.63 A	1.60 - 2.50 A	1.60 - 2.50 A	1.00 - 1.60 A	1.00 - 1.60 A
Setting value	0.88 A	0.55 A	1.90 A	1.90 A	1.10 A	1.10 A
<b>Order numbers</b>						
<b>Order Number</b>	<b>ST 320/4/23</b>	<b>ST 320/69/23</b>	<b>ST 400/23/24</b>	<b>ST 400/23/23</b>	<b>ST 400/4/24</b>	<b>ST 400/4/23</b>

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## Control- and safety isolating- resp. isolating transformer **ST**

Typ	ST 400/69/23	ST 500/23/23	ST 500/4/23	ST 500/44/23	ST 500/69/23	ST 630/4/23
<b>Electrical data</b>						
<b>Input</b>						
Rated input voltage	690 Vac	230 Vac	400 Vac	440 Vac	690 Vac	400 Vac
Tappings Input	±5 %	±5 %	±5 %	±5 %	±5 %	±5 %
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
<b>Output</b>						
Rated output voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Rated power VDE (DB cos phi=1)	400 VA	500 VA	500 VA	500 VA	500 VA	630 VA
Rated power VDE (KB cos phi=0.5)	1.020 VA	1.370 VA	1.370 VA	1.370 VA	1.370 VA	1.540 VA
No-load voltage (app. x factor)	1.06	1.05	1.05	1.05	1.05	1.05
Efficiency	91.0 %	91.0 %	91.0 %	91.0 %	91.0 %	92.0 %
<b>Standards</b>						
Classification	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer
<b>Approvals</b>						
Approvals	-	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	-	cURus, ENEC 10 (VDE)
<b>Environment</b>						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
<b>Safety and protection</b>						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	B	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	B	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
<b>PRI Fusing recommendation</b> by circuit breaker with tripping characteristic type 20 x I <sub>rated</sub> related to set)						
Setting range	0.63 - 1.00 A	1.60 - 2.50 A	1.00 - 1.60 A	1.00 - 1.60 A	0.63 - 1.00 A	1.60 - 2.50 A
Setting value	0.65 A	2.40 A	1.40 A	1.20 A	0.80 A	1.70 A
<b>Order numbers</b>						
<b>Order Number</b>	<b>ST 400/69/23</b>	<b>ST 500/23/23</b>	<b>ST 500/4/23</b>	<b>ST 500/44/23</b>	<b>ST 500/69/23</b>	<b>ST 630/4/23</b>



Control- and safety isolating- resp. isolating transformer  
**ST**

Typ	ST 630/69/23	ST 800/23/23	ST 800/4/23	ST 800/44/23	ST 800/69/23	ST 1000/23/23
<b>Electrical data</b>						
<b>Input</b>						
Rated input voltage	690 Vac	230 Vac	400 Vac	440 Vac	690 Vac	230 Vac
Tappings Input	±5 %	±5 %	±5 %	±5 %	±5 %	±5 %
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
<b>Output</b>						
Rated output voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Rated power VDE (DB cos phi=1)	630 VA	800 VA	800 VA	800 VA	800 VA	1.000 VA
Rated power VDE (KB cos phi=0.5)	1.540 VA	2.000 VA	2.000 VA	2.000 VA	2.000 VA	3.120 VA
No-load voltage (app. x factor)	1.05	1.04	1.04	1.04	1.04	1.03
Efficiency	92.0 %	92.0 %	92.0 %	92.0 %	92.0 %	94.0 %
<b>Standards</b>						
Classification	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer
<b>Approvals</b>						
Approvals	-	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	-	cURus, ENEC 10 (VDE)
<b>Environment</b>						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
<b>Safety and protection</b>						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	B	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	B	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
<b>PRI Fusing recommendation</b> by circuit breaker with tripping characteristic type 20 x I <sub>rated</sub> related to set)						
Setting range	1.00 - 1.60 A	2.50 - 4.00 A	1.60 - 2.50 A	1.60 - 2.50 A	1.00 - 1.60 A	4.00 - 6.30 A
Setting value	1.00 A	3.70 A	2.10 A	2.00 A	1.24 A	4.60 A
<b>Order numbers</b>						
<b>Order Number</b>	<b>ST 630/69/23</b>	<b>ST 800/23/23</b>	<b>ST 800/4/23</b>	<b>ST 800/44/23</b>	<b>ST 800/69/23</b>	<b>ST 1000/23/23</b>

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## Control- and safety isolating- resp. isolating transformer **ST**

Typ	ST 1000/4/23	ST 1000/44/23	ST 1000/5/23	ST 1000/69/23	ST 1600/4/23	ST 1600/69/23
<b>Electrical data</b>						
<b>Input</b>						
Rated input voltage	400 Vac	440 Vac	500 Vac	690 Vac	400 Vac	690 Vac
Tappings Input	±5 %	±5 %	±5 %	±5 %	±5 %	±5 %
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
<b>Output</b>						
Rated output voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Rated power VDE (DB cos phi=1)	1.000 VA	1.000 VA	1.000 VA	1.000 VA	1.600 VA	1.600 VA
Rated power VDE (KB cos phi=0.5)	3.120 VA	3.120 VA	3.120 VA	3.120 VA	7.800 VA	7.800 VA
No-load voltage (app. x factor)	1.03	1.03	1.03	1.03	1.03	1.03
Efficiency	94.0 %	94.0 %	94.0 %	94.0 %	94.0 %	94.0 %
<b>Standards</b>						
Classification	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer
<b>Approvals</b>						
Approvals	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	-	cURus, ENEC 10 (VDE)	-
<b>Environment</b>						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
<b>Safety and protection</b>						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	B	VDE=B, UL=class 130	B
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
<b>PRI Fusing recommendation</b> by circuit breaker with tripping characteristic type 20 x I <sub>rated</sub> related to set)						
Setting range	2.50 - 4.00 A	1.60 - 2.50 A	1.60 - 2.50 A	1.60 - 2.50 A	4.00 - 6.30 A	1.60 - 2.50 A
Setting value	2.70 A	2.40 A	2.20 A	1.60 A	4.30 A	2.50 A
<b>Order numbers</b>						
<b>Order Number</b>	<b>ST 1000/4/23</b>	<b>ST 1000/44/23</b>	<b>ST 1000/5/23</b>	<b>ST 1000/69/23</b>	<b>ST 1600/4/23</b>	<b>ST 1600/69/23</b>



## Control- and safety isolating- resp. isolating transformer **ST**

Typ	ST 2000/4/23	ST 2000/69/23	ST 2500/4/23	ST 2500/69/23
<b>Electrical data</b>				
<b>Input</b>				
Rated input voltage	400 Vac	690 Vac	400 Vac	690 Vac
Tappings Input	±5 %	±5 %	±5 %	±5 %
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
<b>Output</b>				
Rated output voltage	230 Vac	230 Vac	230 Vac	230 Vac
Rated power VDE (DB cos phi=1)	2.000 VA	2.000 VA	2.500 VA	2.500 VA
Rated power VDE (KB cos phi=0.5)	10.900 VA	10.900 VA	12.400 VA	12.400 VA
No-load voltage (app. x factor)	1.03	1.03	1.03	1.03
Efficiency	96.0 %	96.0 %	96.0 %	96.0 %
<b>Standards</b>				
Classification	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer
<b>Approvals</b>				
Approvals	cURus, ENEC 10 (VDE)	-	cURus, ENEC 10 (VDE)	-
<b>Environment</b>				
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling
<b>Safety and protection</b>				
Type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 130	B	VDE=B, UL=class 130	B
Protection index	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
<b>PRI Fusing recommendation</b> by circuit breaker with tripping characteristic type 20 x I <sub>rated</sub> related to set)				
Setting range	4.00 - 6.30 A	2.50 - 4.00 A	6.30 - 10.00 A	4.00 - 6.30 A
Setting value	5.30 A	3.00 A	6.50 A	4.00 A
<b>Order numbers</b>				
<b>Order Number</b>	<b>ST 2000/4/23</b>	<b>ST 2000/69/23</b>	<b>ST 2500/4/23</b>	<b>ST 2500/69/23</b>

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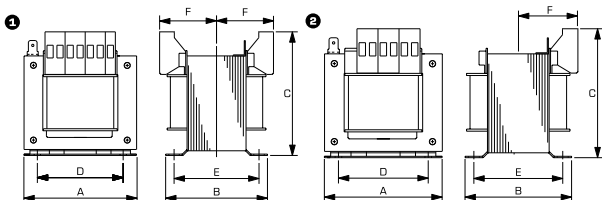
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## Control- and safety isolating- resp. isolating transformer **ST**

Typ	Terminals	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	E	F
ST 20/23/12	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	0.70 kg	1	66	56	81	50	44.5	42
ST 20/23/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	0.70 kg	1	66	56	81	50	44.5	42
ST 20/23/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	0.70 kg	1	66	56	81	50	44.5	42
ST 20/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	0.70 kg	1	66	56	81	50	44.5	42
ST 63/23/12	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	1.10 kg	1	78	60	89	56	48.5	44
ST 63/23/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	1.10 kg	1	78	60	89	56	48.5	44
ST 63/23/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	1.10 kg	1	78	60	89	56	48.5	44
ST 63/4/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	1.10 kg	1	78	60	89	56	48.5	44
ST 63/4/42	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	1.10 kg	1	78	60	89	56	48.5	44
ST 63/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	1.10 kg	1	78	60	89	56	48.5	44
ST 63/44/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	1.10 kg	1	78	60	89	56	48.5	44
ST 63/69/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	1.10 kg	1	78	60	89	56	48.5	44
ST 100/23/12	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	2.00 kg	2	84	76	95	64	63.5	53
ST 100/23/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	2.00 kg	2	84	76	95	64	63.5	53
ST 100/23/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	2.00 kg	2	84	76	95	64	63.5	53
ST 100/4/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	2.00 kg	2	84	76	95	64	63.5	53
ST 100/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	2.00 kg	2	84	76	95	64	63.5	53
ST 100/69/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	2.00 kg	1	84	87	91	64	63.5	53
ST 130/23/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	2.30 kg	2	96	78	105	84	63.5	48
ST 130/23/11	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	2.30 kg	2	96	78	105	84	63.5	48
ST 130/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	2.30 kg	2	96	78	105	84	63.5	48
ST 130/69/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	2.30 kg	2	96	78	105	84	63.5	48
ST 160/23/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	2.80 kg	2	96	88	103	84	73	53
ST 160/23/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	2.80 kg	2	96	88	103	84	73	53
ST 160/4/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	2.80 kg	2	96	88	103	84	73	53
ST 160/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	2.80 kg	2	96	88	103	84	73	53
ST 160/69/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	2.80 kg	2	96	88	103	84	73	53
ST 250/23/12	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	3.50 kg	2	96	103	105	84	86.5	61
ST 250/23/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	3.50 kg	2	96	103	105	84	86.5	61
ST 250/23/42	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	3.50 kg	2	96	103	105	84	86.5	61
ST 250/23/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	3.50 kg	2	96	103	105	84	86.5	61
ST 250/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	3.50 kg	2	96	103	105	84	86.5	61
ST 250/44/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	3.50 kg	2	96	103	105	84	86.5	61
ST 250/69/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	3.50 kg	2	96	103	105	84	86.5	61
ST 320/23/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	4.30 kg	2	105	103	114	80	83	61
ST 320/23/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	4.30 kg	2	105	103	114	80	83	61
ST 320/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	4.30 kg	2	105	103	114	80	83	61
ST 320/69/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	4.30 kg	2	105	103	114	80	83	61
ST 400/23/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	5.00 kg	2	120	110	123	90	85	57
ST 400/23/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	5.00 kg	2	120	110	123	90	85	57
ST 400/4/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	5.00 kg	2	120	110	123	90	85	57
ST 400/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	5.00 kg	2	120	110	123	90	85	57
ST 400/69/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	5.00 kg	2	120	102	123	90	85	57
ST 500/23/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	6.60 kg	2	120	122	123	90	104	68
ST 500/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	6.60 kg	2	120	122	123	90	104	68
ST 500/44/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	6.60 kg	2	120	122	123	90	104	68
ST 500/69/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	6.60 kg	2	120	122	123	90	104	68

### Dimension pictures

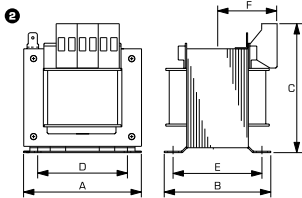




Control- and safety isolating- resp. isolating transformer  
**ST**

Typ	Terminals	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	Dimension picture (in mm)					
						A	B	C	D	E	F
ST 630/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M6	7.70 kg		150	111	148	122	90	56
ST 630/69/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M6	7.70 kg		150	111	148	122	90	56
ST 800/23/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M6	9.80 kg		150	128	148	122	106	63
ST 800/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M6	9.80 kg		150	128	148	122	106	63
ST 800/44/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M6	9.80 kg		150	128	148	122	106	63
ST 800/69/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M6	9.80 kg		150	128	148	122	106	63
ST 1000/23/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M6	13.10 kg		150	154	148	122	130	77
ST 1000/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M6	13.10 kg		150	154	148	122	130	77
ST 1000/44/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M6	13.10 kg		150	154	148	122	130	77
ST 1000/5/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M6	13.10 kg		150	154	148	122	130	77
ST 1000/69/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M6	13.10 kg		150	154	148	122	130	77
ST 1600/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M8	16.80 kg		192	146	182	156	119	65
ST 1600/69/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M8	16.80 kg		192	146	182	156	119	65
ST 2000/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M8	21.00 kg		192	162	182	156	135	73
ST 2000/69/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M8	21.00 kg		192	162	182	156	135	73
ST 2500/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M8	25.50 kg		192	185	185	156	157	84
ST 2500/69/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	25.50 kg		192	185	185	156	157	84

Dimension pictures



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