



# **Modular transformer range**

The right power for  
your application

System pro M compact®

# General information

## Modular transformers

The new TM and TS extend the proven System pro M compact® series with a wider range of modular transformers. They have been designed to provide SELV protection according to worldwide international standards.

Power for SELV circuits in households, tertiary and industrial applications is supplied by transformers that guarantee separation between circuits and keep the end user protected from accidental contact. Installed on DIN-Rail, they can be integrated in consumer units and be used for discontinuous and continuous applications.

The range of System pro M compact® modular transformers consists of:

- the TM range of bell transformers, with secondary voltages of 12-24 V and a maximum rated power of 10-15-30-40 VA;
- the TS range of bell transformers, with secondary voltages of 8-12-24 V and a rated secondary power of 8-16-24 VA;
- a series of safety transformers for general use, the TS-C range, with 12-24 V secondary and powers of 10, 16, 25, 40, 63 and 100 VA;
- the energy saving bell transformers TM-ES and TS-ES, with 50% of power loss reduction.

### The benefit of an efficient product lasts for years.

TM transformers are suitable for use in combination with loads that require a discontinuous supply at a safety extremely-low voltage (SELV).

The most common application is providing a SELV protection for door bells and bathroom buzzers in residential environments.

TS transformers have the peculiarity of maintaining their temperature below the specified limits even after a short-circuit. They are in fact equipped with a thermal protective device which automatically restores when the transformer is sufficiently cooled down or the overload has been removed.

TS-C safety transformers are insulation transformers used for supplying SELV circuits or PELV circuits. In contrast to the bell transformers, TS-C transformers can be used to continuously supply low voltage loads and they have a reduced voltage drop value. Even after a short-circuit they maintain their temperature below the specified limits and are equipped with a thermal sensitive restoring device which automatically restores power when the transformer is sufficiently cooled down or the overload has been removed.

Thanks to the new energy savings ranges, TM-ES and TS-ES, power losses are restrained by the 50%, to help energy saving in residential and commercial buildings.



TM



TS



TS-C



TS-ES

# Main features of the new range

## Modular transformers

### Reliability

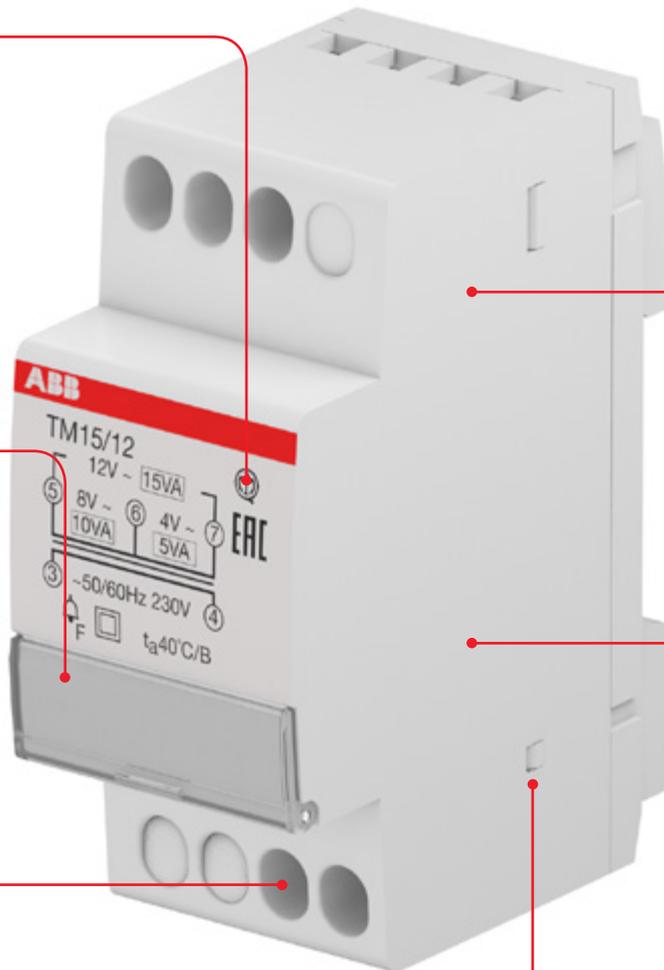
High quality approvals guarantee compliance safety.

### Label holder

Tidy and clearly organized consumer unit with the new label holder.

### Safe

Faster and error-proof wiring thanks to sealed terminals holes. Fail safe operation and excellent safety are assured thanks to the perfect isolation and separation between the primary and secondary circuits.



### Compactness

The compact dimensions enable to save space in your switchboard. TS-C 100 VA modular transformer for continuous use is now available in only 6 modules.

### Innovative

Energy saving up to 50% is guaranteed with TM-ES and TS-ES bell transformers for residential and commercial applications.

### Completeness

Complete offer of low voltage bell transformers, with a wide range in terms of rated power and voltage. The new range of TM and TS extends the actual range of ABB Modular DIN-Rail Transformers up to 100VA and with new energy saving bell transformers.

# Applications

## Bell transformer

Bell transformers (TM and TS) are suitable for loads that require discontinuous supply at extremely safety low voltage (12 to 24 V) and are therefore mainly used in residential application in combination with bells and buzzers for public and tertiary acoustic signaling. The ABB range of bells and buzzers includes modular versions for discontinuous use (SM1, RM1) and modular transformers that combine in a unique solution both the signaling and transformer functionalities (TSM, TSR).

Bell transformers guarantee a high level of safety thanks to perfect isolation and separation between primary and secondary circuits. In addition, the TS transformers adopt a thermal protection device integrated into the secondary that makes them resistant to short circuit currents (non-inherently short-circuit proof).



— SM electro-mechanical modular bell



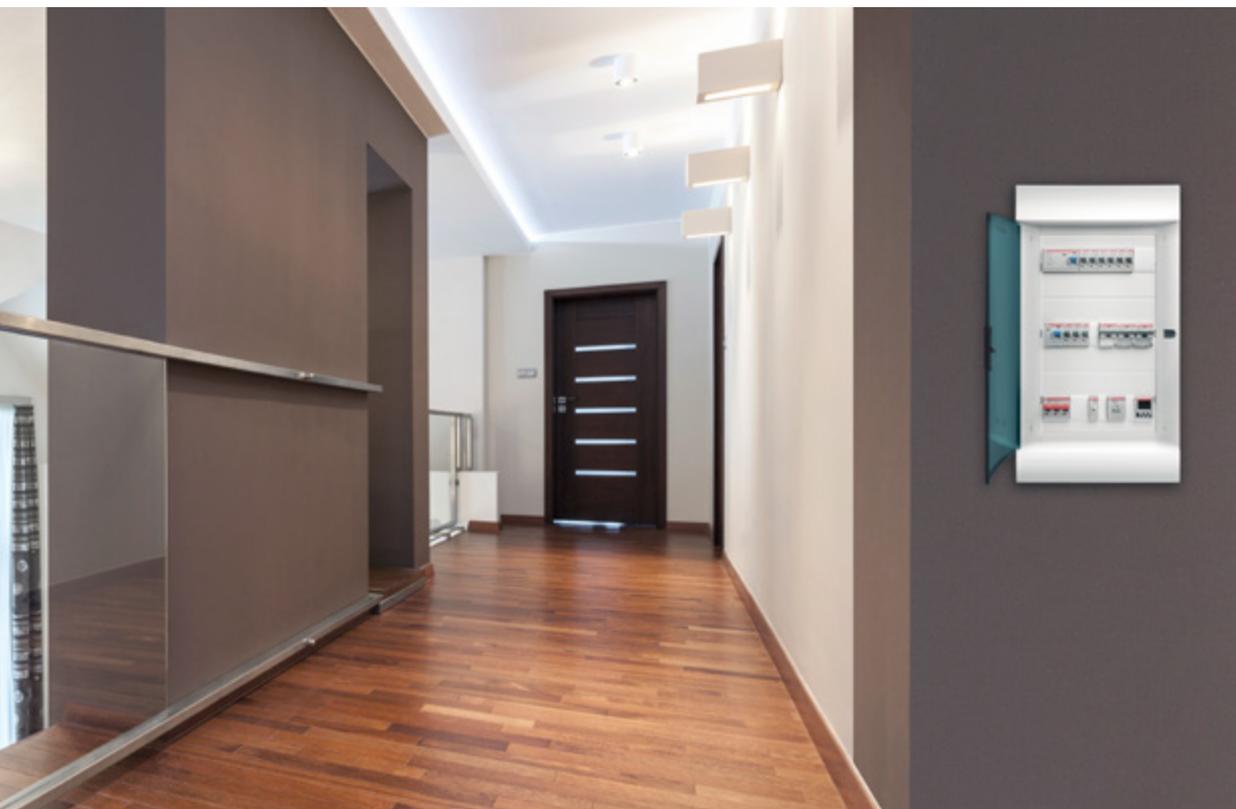
— RM buzzer



— TSM modular electronic bell (two-tones)



— TSR bell + buzzer + transformer included



— Bell transformer are ideal for small apartments, student residences etc.

# Applications

## Safety transformer

Transformers for continuous use (TS-C) are mainly used in industrial and tertiary sector when continuous power supply is needed, i.e. in combination with Small contactors, PLCs, electrical boards or SELV circuits.

The range of safety modular transformers is now even wider with the low rated power version of 10 and 16 VA for residential and industrial applications and the 100 VA transformer now a DIN-Rail mounting in very small dimensions specifically developed for automation applications.



— Contactors



— Motor Starter Combination



— Relays



— Installation contactors



— Safety transformer are ideal for industrial and building application

# Technical Data

## Modular transformers



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TM 15/12

TM		
Primary rated voltage Un	[V]	230 a.c.
Secondary rated voltage Un	[V]	4, 8, 12, 24
Tolerance on secondary voltage (with load)	[%]	+/- 15% (according to standards)
Rated frequency	[Hz]	50/60
Rated power (discontinuous use)	[VA]	10, 15, 30, 40
Power loss (off load)	[W]	<2.5 (TM4, TM8), <3 (TM30, TM40), <1.25 (TM15 ES)
Modules	[No.]	2 (TM10, TM15), 3 (TM30, TM40)
Cable section	[mm <sup>2</sup> -AWG]	2.5 - 14
Tightening torque	[Nm]	0.5
Protection degree		IP 20
Standards		IEC/EN 61558-2-8
Approvals		 



—  
TS24/8-12-24

TS		
Primary rated voltage Un	[V]	230 a.c.
Secondary rated voltage Un	[V]	4, 8, 12, 24
Tolerance on secondary voltage (with load)	[%]	+/- 15% (according to standards)
Rated frequency	[Hz]	50/60
Rated power (discontinuous use)	[VA]	8, 16, 24
Power loss (off load)	[W]	<2.5 (TS8, TS16), <3 (TS24), <0.8 (TS8/8 ES), <1.2 (TS16/8-12 ES)
Modules	[No.]	2 (TS8, TS16), 3 (TS24)
Cable section	[mm <sup>2</sup> -AWG]	2.5 - 14
Tightening torque	[Nm]	0.5
Protection degree		IP 20
Standards		IEC/EN 61558-2-8
Approvals		 

# Technical Data

## Modular transformers



TS100/12-24 C

TS-C		TS 10 C	TS 16 C	TS 25 C	TS 40 C	TS 63 C	TS 100 C
Primary rated voltage Un	[V]	230 a.c.	230 a.c.	230 a.c.	230 a.c.	230 a.c.	230 a.c.
Secondary rated voltage Un	[V]	12 - 24 V a.c.	12 - 24 V a.c.	12 - 24 V a.c.	12 - 24 V a.c.	12 - 24 V a.c.	12 - 24 V a.c.
Tolerance on secondary voltage (full load)	[%]	< +/- 5% (according to standards)					
Tolerance on secondary voltage (off load)	[%]	<100% rated secondary voltage (according to standards)					
Rated frequency	[Hz]	50/60	50/60	50/60	50/60	50/60	50/60
Rated power (continuous use)	[VA]	10	16	25	40	63	100
Maximum output current (at 24 V)	[A]	0.42	0.67	1.04	1.67	2.63	4.17
Power loss (off load)	[W]	< 2.5	< 3	< 4	< 4.5	< 4.5	< 1
Power loss (full load)	[W]	< 5	< 5	< 5	< 10	< 15	< 20
Modules	[No.]	2	3	4	4	5	6
Cable section	[mm <sup>2</sup> -AWG]	2.5					
Tightening torque	[Nm]	0.5					
Protection degree		IP 20					
Standards		IEC/EN 61558-2-6					
Approvals							
Temperature class resistance		B (corresponding to maximum 120°C)					

# Selection Tables

## Modular transformers

		Bell transformers		Safety transformers	
					
					
Series		TM	TS	TS-C	
Reference standard		IEC EN 61558-2-8	IEC EN 61558-2-8	IEC EN 61558-2-6	
Classification		Fail safe	Non-inherently short-circuit proof	Non-inherently short-circuit proof	
Thermal protection integrated in secondary			■	■	
Rated power		10, 15, 30, 40 VA	8, 16, 24 VA	10, 16, 25, 40, 63, 100 VA	
Operation		Discontinuous	Discontinuous	Continuous	
Primary circuit voltage ratings		230 V a.c.	230 V a.c.	230 V a.c.	
Secondary circuit characteristics	Double insulation between primary and secondary windings	■	■	■	
	Full power on all outputs				
	SELV secondary (no-load output voltage <50 V a.c.)	■	■	■	
Dimensions		2 modules [10 VA, 15 VA] 3 modules [30 VA, 40 VA]	2 modules [8 VA, 16 VA] 3 modules [24 VA]	2 modules [10 VA] 3 modules [16 VA] 4 modules [25 VA, 40 VA] 5 modules [63 VA] 6 modules [100 VA]	

Application	Use	Type	Range	Secondary voltage	Rated power (VA)
Residential	Discontinuous	Fail-safe	TM	4-8-12 V, 12-24 V	10, 15, 30, 40
		Non-inherently short circuit proof	TS	8 V, 12 V, 24 V, 4-6-8 V, 4-8-12 V, 8-12 V, 8-12-24 V	8, 16, 24
Building and Industrial	Continuous	Non-inherently short circuit proof	TS-C	12-24 V	10, 16, 25, 40, 63, 100

# Ordering Data

## Modular transformers



TM

TM						
Max rated power (disc.) VA	Secondary voltage range V a.c.	Bbn 8012542 EAN	Order details		Weight 1 piece kg	Pack unit pc.
			Type code	Order code		
10	4-8-12	287155	TM10/12	2CSM228715R0802	0.30	6
10	12-24	287254	TM10/24	2CSM228725R0802	0.30	6
15	4-8-12	287353	TM15/12	2CSM228735R0802	0.30	6
15	12-24	287452	TM15/24	2CSM228745R0802	0.30	6
15	4-8-12	285854	TM15/12 ES	2CSM228585R0802	0.30	1
30	4-8-12	287551	TM30/12	2CSM228755R0802	0.45	4
30	12-24	287650	TM30/24	2CSM228765R0802	0.45	4
40	4-8-12	287759	TM40/12	2CSM228775R0802	0.45	4
40	12-24	287858	TM40/24	2CSM228785R0802	0.45	4



TS

TS							
Max rated power (disc.) VA	Secondary voltage range V a.c.	Switch 0-1	Bbn 8012542 EAN	Order details		Weight 1 piece kg	Pack unit pc.
				Type code	Order code		
8	8		285953	TS8/8 ES	2CSM228595R0812	0.35	1
8	8		286653	TS8/8	2CSM228665R0812	0.35	6
8	12		286851	TS8/12	2CSM228685R0812	0.35	6
8	24		286752	TS8/24	2CSM228675R0812	0.35	6
8	8		368304	TS8/8 SW	2CSM081302R0811	0.35	6
8	12	■	368403	TS8/12 SW	2CSM081402R0811	0.35	6
8	4-6-8	■	368601	TS8/4-6-8 SW	2CSM081012R0811	0.35	6
8	4-8-12	■	368700	TS8/4-8-12 SW	2CSM081022R0811	0.35	6
16	8-12	■	286059	TS16/8-12 ES	2CSM228605R0812	0.35	1
16	8		286455	TS16/8	2CSM228645R0812	0.35	6
16	12		286356	TS16/12	2CSM228635R0812	0.35	6
16	24		286158	TS16/24	2CSM228615R0812	0.35	6
16	4-6-8		286554	TS16/4-6-8	2CSM228655R0812	0.35	6
16	4-8-12		286257	TS16/4-8-12	2CSM228625R0812	0.35	6
24	4-8-12		287056	TS24/4-8-12	2CSM228705R0812	0.45	4
24	8-12-24		286950	TS24/8-12-24	2CSM228695R0812	0.45	4



TS-C

TS-C						
Rated power (cont.) VA	Secondary rated voltage V a.c.	Bbn 8012542 EAN	Order details		Weight 1 piece kg	Pack unit pc.
			Type code	Order code		
10	12-24	285557	TS 10/12-24 C	2CSM228595R0812	0.35	1
16	12-24	285656	TS 16/12-24 C	2CSM228665R0812	0.45	1
25	12-24	928508	TS 25/12-24 C	2CSM228685R0812	0.92	1
40	12-24	928607	TS 40/12-24 C	2CSM228675R0812	1.1	1
63	12-24	928706	TS 63/12-24 C	2CSM081302R0811	1.15	1

# Questions and answers

## What do fail-safe transformer and non-inherently short-circuit proof transformer mean?



Fail-safe transformer: permanently fails to function during overload or short-circuit presenting no danger to the user or surroundings. It can be equipped with an external protective device, which reactivates after fault resolution.



Non-inherently short-circuit proof transformer: equipped with a PTC protective device which reduces the current in the input circuit when the transformer is overloaded or short-circuited and continues to function after fault resolution.

## How long can a bell transformer supply power?

The reference standard EN 61558-2-8 does not specify a specific time but states “Bell and chime transformers are generally intended to supply domestic sound signalling equipment and other similar devices where the load is applied for short periods of time.”

Moreover, regarding temperature testing it says “Temperatures are determined during a cyclic test of 20 cycles, each cycle consisting of 1 min operation with the simulated full load and 5 min operation with a load of 20% of the simulated full load.”

Therefore using a bell transformer for continuous use deter-

mines a temperature rise of the transformer which could cause it to stop supplying power, unless the work/pause cycle allows the transformer to sufficiently cool down.

## Is it possible to downgrade bell transformer’s power to use it continuously?

Using a transformer to supply a lower load than the nominal power reduces the power loss containing the temperature rise of a bell transformer used continuously.

Nevertheless a lower load than the nominal one destabilizes the voltage output, which by standard has a tolerance of 15% at full load but 100% with no load!

Since the relation is not linear, a transformer working closer to no-load conditions could give a voltage output between 15% and 100% higher than the nominal secondary voltage, endangering a device sensitive to voltage variations.





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