COMAR & SCHURTER

February 2011

Motor Acc., Refridg. & A/C

COMAR & SCHURTER

DI

Motor Run and Motor Start Capacitors

Motor Circuit Breaker / Thermal Overloads

COMAR Condensatori

SCHURTER ELECTRONIC COMPONENTS

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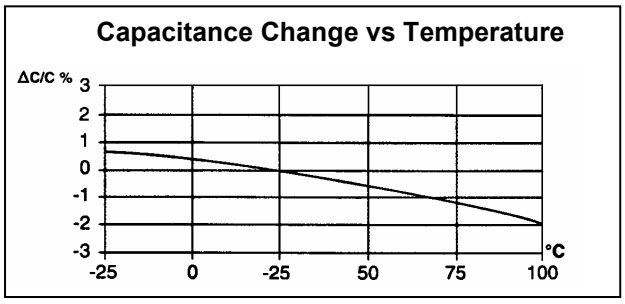
HAMER LIMITED

Contents

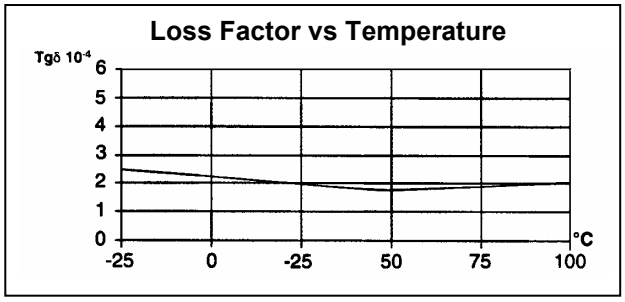
Comar Condenatori

COMAR CONDENSATORI S.p.A was established in 1968 and for over 30 years has produced electrical capacitors.
The production began with the “oil-paper” dielectric capacitors and it went on with the current “metallized polypropylene” capacitors.
In 1996 the company achieved the Quality System certification by CSQ (IMQ) in accordance with the UNI EN ISO9001 standard.
Thanks to the continual replacement and upgrading of production equipment, the quality and reliability levels are always improving and are at the top of the international standard. All products manufactured by COMAR have CE marking, they are responding to the most important international standards and they have achieved homologations like: ENEC, VDE, UL, IMQ, IRAM …
The search of innovative technical solutions and the continuous pursuit of new goals make COMAR a very qualified and dynamic company.
The production can be divided into five different product lines:
Capacitors for lamps – LIGHTING
Capacitor for electric motors – MOTOR
Capacitors for power electronic applications – POWER ELECTRONICS
Capacitors and systems for Power Factor Correction – POWER FACTOR CORRECTION
Filters for harmonic reduction – HARMONIC FILTERS
COMAR CONDENSATORI S.p.A exports its products to more than 85 countries all over the world.

The capacitors manufactured by COMAR CONDENSATORI S.p.A are made with self-healing metallized polyproplene film dielectric. The construction of those capacitors is achieved thanks to the use of advanced machines, which ensure high quality and high performance products.



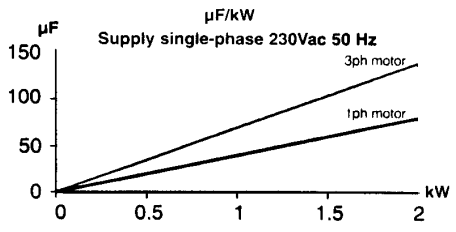
The capacitors for “MOTOR” applications, thanks to a very wide choice of models and construction options, offer the ideal solution for any type of application with single or three-phase motors supplied as single-phase.

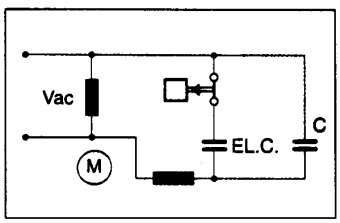


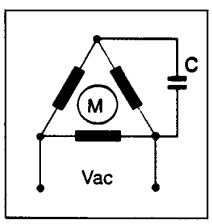
Single and three-phase electrical motors need, for their starting, a capacitor which generates a displaced current creating a rotating magnetic field.
The capacitor can be used also for permanent operation. It maintains the required magnetic field and it compensates the motor’s inductive load. There are two types of capacitors used for those applications:

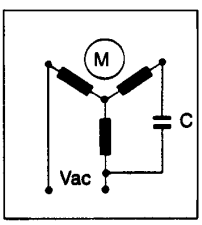
Motor starting capacitors, they are electrolytic capacitors with high capacitance value (in µF), able to provide a high starting torque to the motor. They are disconnected at the end of the starting in order to avoid overload to motor wiring.
Motor running capacitors, they are used to improve the value of the cos φ when motor is working at rated load conditions, they are permanently connected to the motor.

When using single-phase motors, the motor running capacitor also maintains the rotating magnetic field. For single-phase motors supplied at 230Vac 50Hz, the value of required motor running capacitors is between 30 and 50 µF for kW of motor power.
When using three-phase motors with single-phase supply, the motor running capacitor ensures the presence of the third phase. For three-phase motors with single-phase supply at 230Vac 50Hz, the value of required motor running capacitor is about 70 µF for kW of motor power.









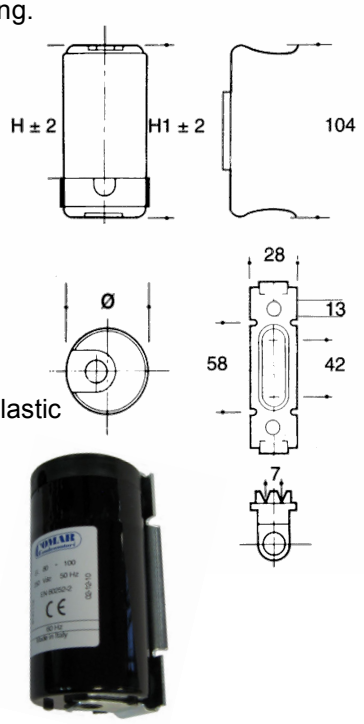
The above data is obtained from the catalogue of electrical motor manufacturers, they have indicative value and they are not binding for COMAR CONDENSATORI S.pA.

EL 250V Series Motor Start Capacitors

Motor start capacitors are electrolytic capacitors with high capacitance value (in µF) and are able to provide a high starting torque to the motor.
They are disconnected after starting in order to avoid overload to the winding.

Specifications

Rated Voltage:	EL 250V – 250Vac
Rated Frequency:	50/60Hz
Working Temperature:	-25°C/+75°C
Operating Class:	1,67%
Loss Factor:	≤ 0.10
Test Voltage between terminals:	1.4Vn x 1 sec
Test Voltage between terminals and case:	1.5kV x 5 sec
Endurance Test:	500h
Reference Standard:	EN60252 (IEC 252) VDE560-8
Case:	Plane base self-extinguishing (V2) plastic
Terminals:	Double tag 6.3mm x 0.8mm



Note

Capacitor provided with fixing bracket and protective cap as standard
Protective cap or fixing bracket is not available without capacitor

Hamer Code	Capacitance MFD Min-Max	Dimensions (mm) Dia x H x H1	Manufacturers Code
CS025	25-31	46 x 86 x 98	EL250-25
CS032	31.5-40	46 x 86 x 98	EL250-32
CS040	40-50	46 x 86 x 98	EL250-40
CS050	50-63	46 x 86 x 98	EL250-50
CS063	63-80	46 x 86 x 98	EL250-63
CS080	80-100	46 x 86 x 98	EL250-80
CS100	100-125	46 x 86 x 98	EL250-100
CS125	125-160	46 x 86 x 98	EL250-125
CS160	160-200	46 x 86 x 98	EL250-160
CS200	200-250	46 x 86 x 98	EL250-200
CS250	250-315	46 x 86 x 98	EL250-250
CS315	315-400	46 x 86 x 98	EL250-315

Options

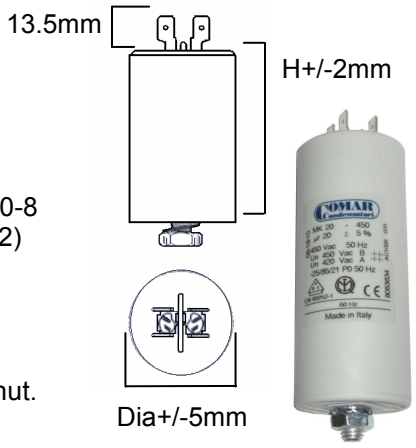
Hamer Code	Description
CS902	Bipolar cable 30cm long (black) c/w blue and brown wires and fitted with 6.35 quick fasteners for connection to Comar capacitors

MK 450V Series Motor Run Capacitors

Motor run capacitors are used to improve the value of the cos φ when the motor is working at rated load conditions. They are permanently connected to the motor.

Specifications

Capacitance tolerance:	±5%
Rated Frequency:	50/60Hz
Dissipation Factor :	$\leq 5 \times 10^{4}$
Insulation Resistance :	$\geq 1 \times 10^{5}$ MΩ x µF
Test Voltage between Terminals:	2.15 Vn, 2 sec. CEI 33-3, CEI EN 60252, VDE 560-8
Test Voltage between Terminals and Case:	2 KVac. 2 sec. EN 60252 (IEC 252)



Note

6.3mm Fast on Double Tags and M8 x 10mm Stud
Supplied complete with externally toothed anti shake washer and M8 nut.

Hamer Code	Capacitance MFD Nominal	Dimensions (mm) Dia x L	Manufacturers Code
CR101	1	30 x 57	MK 450 - 1
CR102	2	30 x 57	MK 450 - 2
CR103	3.15	30 x 57	MK 450 - 3.15
CR104	4	30 x 57	MK 450 - 4
CR105	5	30 x 57	MK 450 - 5
CR106	6.3	30 x 70	MK 450 - 6.3
CR108	8	30 x 70	MK 450 - 8
CR109	Protective cap	30	
CR110	10	35 x 70	MK 450 - 10
CR111	Protective cap	35	
CR125	12.5	40 x 70	MK 450 - 12.5
CR115	15	40 x 70	MK 450 – 15
CR116	16	40 x 70	MK 450 - 16
CR200	20	40 x 94	MK 450 - 20
CR201	Protective cap	40	
CR250	25	45 x 94	MK 450 - 25
CR300	30	45 x 94	MK 450 - 30
CR301	Protective cap	45	
CR350	35	50 x 94	MK 450 - 35
CR400	40	50 x 94	MK 450 - 40
CR500	50	50 x 120	MK 450 - 50
CR501	Protective cap	50	
CR550	55	55 x 120	MK 450 - 55
CR600	60	55 x 120	MK 450 - 60
CR601	Protective cap	55	
CR750	75	60 x 120	MK 450 - 75
CR800	80	60 x 120	MK 450 - 80
CR801	Protective cap	60	

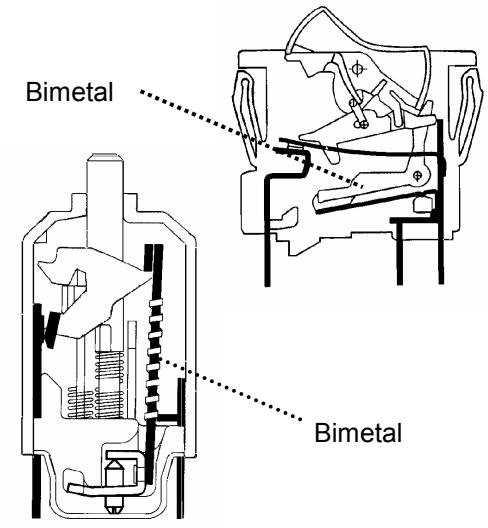
Schurter

The Schurter Series CBE's are specifically designed to protect equipment, wiring, transformers, power supplies, motors, and subassemblies such as printed circuit boards.

The Swiss precision designs are simple with few moving parts, which result in an extremely reliable circuit breaker for equipment with excellent life and resistance against shock and vibration.

Features

- Electrical noise due to contact bounce is prevented by maintaining a high contact force until the unit trips.
- Reduced risk of contact welding which may occur in spring type mechanisms.
- Immune to high currents and line transients.
- Superior latch type trip mechanism.
-
- Positively trip free – contacts will open and remain open during an overload.
- Contacts cannot close with manual actuation so long as overload condition exists.



Overload Protection by Thermally Operated CBE's

Thermal circuit breakers for equipment CBE's (above) simulate the electrothermal behaviour of the protected components (conductors in wiring, motors, transformers, etc) by a simple, but very clever device:

"The Thermo-Bimetal"

This mechanical element can simulate the heating effect of the current, can transform electric energy into a motion (deflection) and trigger a mechanism to cause automatic interruption of the current which produces these effects.

To use the heat created by the current instead of the magnitude of the current itself offers a great advantage, because heat determines the admissible stress of the insulation and the admissible duration of the various overload conditions encountered in practical applications.

Thermally operated CBE's, therefore, take good care of the surplus energy required for start-up or high-torque operation of motors. They cope well with high inrush spikes which occur in switching power supplies, transformers, tungsten filament lamps, etc and avoid nuisance tripping due to such transients.

The Schurter CBE's use a latch type thermal release mechanism. High contact force can be maintained until the unit trips. This prevents electrical noise due to contact bounce and reduces the risk of contact welding which may occur with spring type mechanisms.

The Strong Points Of Thermal CBE's Are

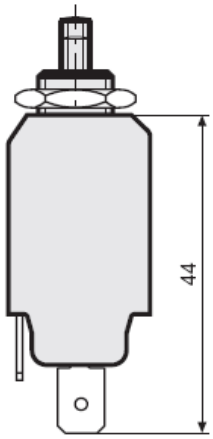
- Good simulation of the thermal behaviours of the protected component
- Capability of coping with start-up and inrush currents
- Suitability for a wide range of frequencies
- Simplicity / reliability
- Favourable price

SCHURTER
ELECTRONIC COMPONENTS

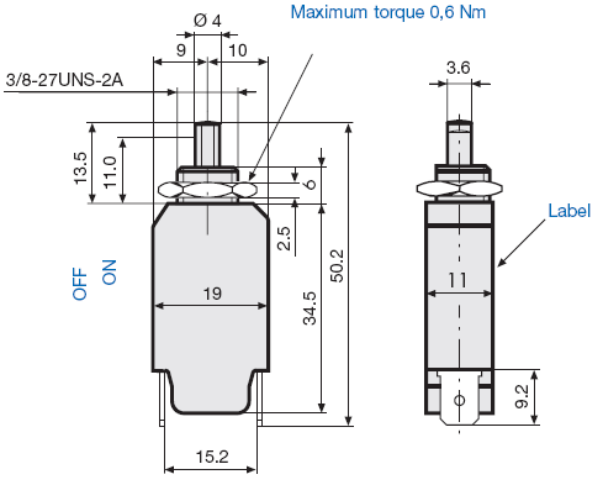
TII Thermal Circuit Breaker Single Pole, Push to Reset

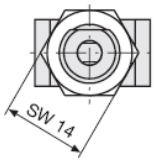
Hamer Code	Model Number	Rating (Amps)
WB2040	T11 211 0.2	0.2
WB2060	T11 211 0.3	0.3
WB2080	T11 211 0.4	0.4
WB2100	T11 211 0.5	0.5
WB2120	T11 211 0.6	0.6
WB2140	T11 211 0.7	0.7
WB2160	T11 211 0.8	0.8
WB2180	T11 211 1.0	1.0
WB2190	T11 211 1.1	1.1
WB2200	T11 211 1.2	1.2
WB2220	T11 211 1.5	1.5
WB2240	T11 211 1.8	1.8
WB2400	T11 211 2.0	2.0
WB2420	T11 211 2.3	2.3
WB2440	T11 211 2.5	2.5
WB2460	T11 211 2.8	2.8
WB2500	T11 211 3.0	3.0
WB2520	T11 211 3.5	3.5
WB2540	T11 211 4.0	4.0
WB2550	T11 211 4.5	4.5
WB2560	T11 211 5.0	5.0
WB2570	T11 211 5.5	5.5
WB2580	T11 211 6.0	6.0
WB2600	T11 211 6.5	6.5
WB2620	T11 211 7.0	7.0
WB2630	T11 211 7.5	7.5
WB2640	T11 211 8.0	8.0
WB2660	T11 211 9.0	9.0
WB2280	T11 211 10.235	10.235
WB2300	T11 211 12.0	12
WB2320	T11 211 13.0	13
WB2340	T11 211 14.0	14
WB2360	T11 211 15.0	15
WB2380	T11 211 16.0	16

T11-211

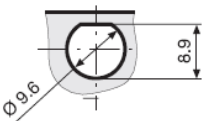


T11-211



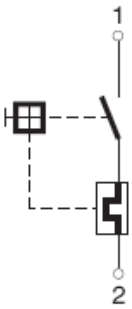


Cut-out

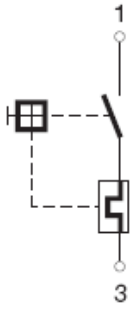


Schematic diagrams

Rated current
≤7,5 A

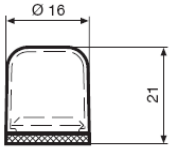


Rated current .
>7,5 A



Option

Hamer Code	Model Number	Description
WB2000	T11 /T1 (TZZ01)	Dust Cover IP54



TA45 General Description

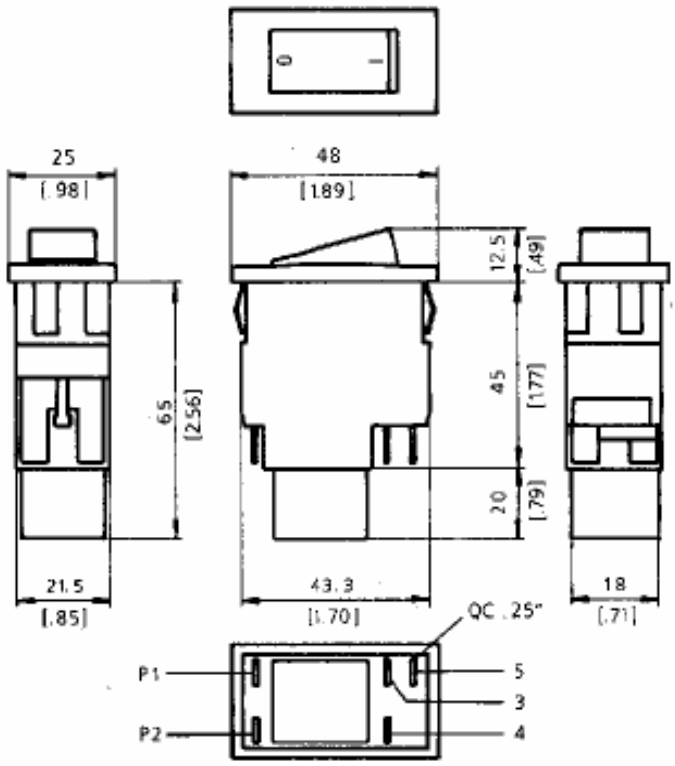
The TA45 series of circuit breakers for equipment are double pole rocker actuated devices for on/off switching and overload protection. They conveniently snap into a rectangular cut out and are connected to the wiring via 6.3mm quick connect terminals.

Features

- Worldwide approvals include UL, CSA and VDE etc…
- UL-approved as a motor starter for up to 1.5 HP motors
- Long life, sturdy mechanical construction
- Tripping occurs by a sustained overload, low line voltage, relay trip coil or safety mechanical trip

Technical Information

Current Ratings:	0.05-16A double pole thermal protected > 16-20A at 120 V AC single pole thermal protected with parallel contacts
Voltage Ratings:	240 V AC, 60 V DC
Interrupting Capacity:	2000 A acc. To UL 1077
Breaking Capacity:	In< 7A, 8 x In to IEC 934 In≥ 7A, = 200 Amps max.
Electrical Life:	50,000 cycles at rated current and resistive load



TA45 Rocker Switch

Snap-in style with quick connect terminals. 2 Pole Rocker actuated switch with 1 pole thermal overload protection.

Hamer Code	Model Number	(Old Weber Model #'s)	Rating (Amps)
WB3602	TA45 ABT WF J02 C0	WT22-551-0.2	0.2
WB3604	TA45 ABT WF J03 C0	WT22-551-0.3	0.3
WB3606	TA45 ABT WF J04 C0	WT22-551-0.4	0.4
WB3608	TA45 ABT WF J05 C0	WT22-551-0.5	0.5
WB3610	TA45 ABT WF J06 C0	WT22-551-0.6	0.6
WB3612	TA45 ABT WF J07 C0	WT22-551-0.7	0.7
WB3614	TA45 ABT WF J08 C0	WT22-551-0.8	0.8
WB3618	TA45 ABT WF J12 C0	WT22-551-1.2	1.2
WB3630	TA45 ABT WF J14 C0	WT22-551-1.4	1.4
WB3632	TA45 ABT WF J15 C0	WT22-551-1.5	1.5
WB3634	TA45 ABT WF J18 C0	WT22-551-1.8	1.8
WB3636	TA45 ABT WF J20 C0	WT22-551-2.0	2.0
WB3655	TA45 ABT WF J25 C0	WT22-551-2.5	2.5
WB3660	TA45 ABT WF 030 C0	WT22-551-3.0	3.0
WB3638	TA45 ABT WF 035 C0	WT22-551-3.5	3.5
WB3680	TA45 ABT WF 040 C0	WT22-551-4.0	4.0
WB3642	TA45 ABT WF 050 C0	WT22-551-5.0	5.0
WB3644	TA45 ABT WF 060 C0	WT22-551-6.0	6.0
WB3646	TA45 ABT WF 070 C0	WT22-551-7.0	7.0
WB3648	TA45 ABT WF 080 C0	WT22-551-8.0	8.0
WB3650	TA45 ABT WF 090 C0	WT22-551-9.0	9.0
WB3600	TA45 ABT WF 100 C0	WT22-551-10.0	10.0
WB3620	TA45 ABT WF 120 C0	WT22-551-12.0	12.0
WB3625	TA45 ABT WF 140 C0	WT22-551-14.0	14.0
WB3682	TA45 ABT WF 150 C0	WT22-551-15.0	15.0
WB3640	TA45 ABT WF 160 C0	WT22-551-16.0	16.0
WB3684	TA45 ABT WF 200 C0	WT22-551-20.0	20.0

TA45 Rocker Switch with illuminated Switch

Snap-in style with quick connect terminals. 2 Pole Rocker actuated switch with 1 pole thermal overload protection and illuminated switch.

Hamer Code	Model Number	(Old Weber Model #'s)	Rating (Amps)
WB3702	TA45 A12 6F J05 C0	WTL22-551-0.5	0.5
WB3704	TA45 A12 6F J07 C0	WTL22-551-0.7	0.7
WB3705	TA45 A12 6F J08 C0	WTL22-551-0.8	0.8
WB3706	TA45 A12 6F J10 C0	WTL22-551-1.0	1.0
WB3708	TA45 A12 6F J15 C0	WTL22-551-1.5	1.5
WB3712	TA45 A12 6F J20 C0	WTL22-551-2.0	2.0
WB3713	TA45 A12 6F J23 C0	WTL22-551-2.3	2.3
WB3714	TA45 A12 6F J25 C0	WTL22-551-2.5	2.5
WB3721	TA45 A12 6F J28 C0	WTL22-551-2.8	2.8
WB3722	TA45 A12 6F 030 C0	WTL22-551-3.0	3.0
WB3724	TA45 A12 6F 035 C0	WTL22-551-3.5	3.5
WB3715	TA45 A12 6F 040 C0	WTL22-551-4.0	4.0
WB3716	TA45 A12 6F 045 C0	WTL22-551-4.5	4.5
WB3718	TA45 A12 6F 060 C0	WTL22-551-6.0	6.0
WB3719	TA45 A12 6F 070 C0	WTL22-551-7.0	7.0
WB3723	TA45 A12 6F 075 C0	WTL22-551-7.5	7.5
WB3725	TA45 A12 6F 080 C0	WTL22-551-8.0	8.0
WB3726	TA45 A12 6F 090 C0	WTL22-551-9.0	9.0
WB3950	TA45 A12 6F 140 C0	WTL22-551-14.0	14.0
WB3711	TA45 A12 6F 160 C0	WTL22-551-16.0	16.0

TA45 Rocker Switch with Under Voltage Release Coil

Snap-in style with quick connect terminals. 2 Pole Rocker actuated switch with 1 pole thermal overload protection and under voltage release coil.

Hamer Code	Model Number	(Old Weber Model #'s)	Rating (Amps)
WB3730	TA45 ABT WF 060 U2	WTN22-551-6.0	6.0

TA45 Rocker Switch with Under Voltage Release Coil & Illuminated Switch

Snap-in style with quick connect terminals. 2 Pole Rocker actuated switch with 1 pole thermal overload protection and under voltage release coil.

Hamer Code	Model Number	(Old Weber Model #'s)	Rating (Amps)
WB3767	TA45 A12 6F J20 U2	WTNL22-551-2.0	2.0
WB3772	TA45 A12 6F 060 U2	WTNL22-551-6.0	6.0
WB3764	TA45 A12 6F 100 U2	WTNL22-551-10.0	10.0
WB3774	TA45 A12 6F 150 U2	WTNL22-551-15.0	15.0

Optional Accessories

Hamer Code	Model Number	Description
WB4010	AZM11	TA45 Cover IP54

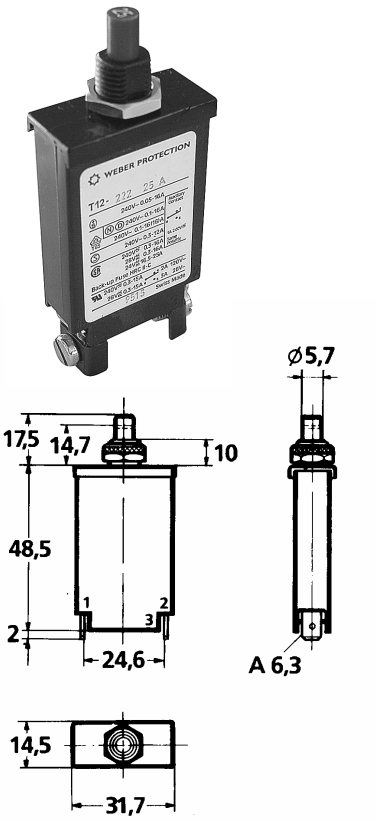
Many more models available via Indent

T12 Thermal Circuit Breaker

T12 Features

- Single pole thermal overload protection switch
- Positively trip free
- Threaded neck
- Manual on/off (push/push)
- Screw clamp terminals

Hamer Code	Catalogue Number	Rating (Amps)
WB3364	T12-222-0.5 CBE	0.5
WB3366	T12-222-1.0 CBE	1.0
WB3368	T12-222-1.2 CBE	1.2
WB3370	T12-222-1.5 CBE	1.5
WB3372	T12-222-1.8 CBE	1.8
WB3374	T12-222-2.0 CBE	2.0
WB3376	T12-222-2.3 CBE	2.3
WB3378	T12-222-2.5 CBE	2.5
WB3384	T12-222-2.8 CBE	2.8
WB3386	T12-222-3.0 CBE	3.0
WB3388	T12-222-3.5 CBE	3.5
WB3390	T12-222-4.0 CBE	4.0
WB3392	T12-222-4.5 CBE	4.5
WB3394	T12-222-5.0 CBE	5.0
WB3396	T12-222-6.0 CBE	6.0
WB3380	T12-222-10.0 CBE	10.0
WB3398	T12-222-16.0 CBE	16.0
WB3402	T12-222-20.0 CBE	20.0
WB3382	T12-222-22.0 CBE	22.0
WB3404	T12-222-25.0 CBE	25.0



T13 Thermal Circuit Breaker

T13 Features

- Single pole thermal overload protection switch
- Positively trip free
- Threaded neck
- Reset Type
- Screw clamp terminals

Hamer Code	Catalogue Number	Rating (Amps)
WB3462	13-212-5.0 CBE	5
WB3464	13-212-8.0 CBE	8
WB3466	13-212-15 CBE	15
WB3467	13-212-20 CBE	20
WB3468	13-212-30 CBE	30