



# Single Phase TC Series Circuit Breakers

## Miniature Ambient Compensated

### Features

- Miniature size
- Light weight
- Trip free
- Mil-qualification
- Current rating 1-35 amperes
- Coordinated ratings
- High vibration resistance
- High interrupt capacity



### Overview

Klixon® single-phase TC devices are the smallest, lightest aircraft circuit breakers available today. They represent “state-of-the-art” protection for today’s aerospace power systems. Their light weight and small size make them especially well suited for aircraft, avionics and electronic systems.

The Klixon trademark has set the standard for aerospace circuit breakers. Despite the small size, the TC series offers the endurance and reliability required by exacting military specifications, and are available in standard current ratings from 1 – 35 amperes.

### Coordination

The 2, 3, 6 and 9TC breaker ratings are coordinated so any rating will trip before another circuit breaker, twice its rating, in the event of a fault of up to 6000 amps let-thru current. This results in improved overall equipment performance, since only the smallest faulted circuit is interrupted, while larger circuits remain operational (see pages 6 and 7 for 6/9TC details).

### Ambient Temperature Compensation

Ambient compensated circuit breakers permit system designers to specify smaller gauge wire where the circuit breaker and wiring are exposed to different ambient temperatures. They are especially suited for applications where the ambient temperature exceeds the 160°F maximum of non-ambient compensated thermal circuit breakers. The TC series may be applied where operating temperatures are as high as 250°F (121°C), with no derating of the circuit breaker. This eliminates the need for cooling air and allows substantial weight, space and cost savings.

### Options\*

- Longer push buttons
- High vibration
- Random vibration
- Metric mounting thread
- Metric terminal thread
- Dust boot†
- Auxiliary switch - male and female contacts available
- Terminal barriers
- Plug-in terminals

### Trip Free

The complete line of TC series circuit breakers is trip free. The circuit breaker cannot be maintained closed during an overload even with the actuator button held closed.

### High Short Circuit Capacity

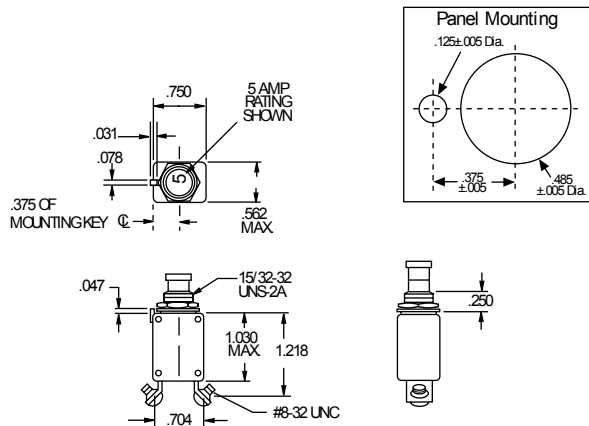
For its miniature size, the 2/3TC series offers unusually high current interrupting capacity. Overloads up to 6000 amps at 28 VDC or 2000-3500 amps at 120 VAC, 400 Hz can be safely interrupted without affecting calibration or operating performance in the standard 2/3TC series.

### Qualifications

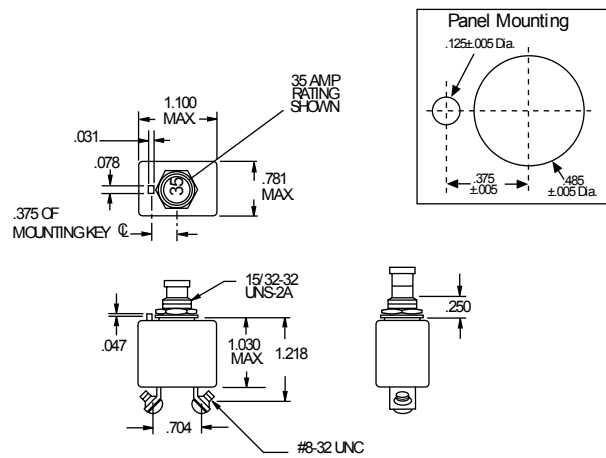
MS3320 - 2TC2  
MS3320L - 2TC27  
MS3320V - 2TC63  
MS14105 - 3TC2  
MS14105L - 3TC27  
European standards  
SAE standards  
All U.S. aircraft OEM's  
Most European aircraft OEM's

\* Contact factory for details  
† Part Number 14500-1 Fits 15/32 Bushing  
Part Number 14500-5 Fits 7/16 Bushing

### 2TC14



### 3TC14



### Calibration: 1-25 amps

TEMP °C	MIN ULT TRIP	MAX ULT TRIP	TRIP TIME - SECONDS		
			200%	500%	1000%
+25	115%	138%	4-16	.4-1.6	.10-.40
-54	115%	165%	7-35	.6-3.0	.15-.70
+121	85%	145%	2-13	.25-1.0	.06-.25

### Calibration: 15-35 amps

TEMP °C	MIN ULT TRIP	MAX ULT TRIP	TRIP TIME - SECONDS		
			200%	500%	1000%
+25	115%	138%	4-20	.40-1.7	.10-.40
-54	115%	165%	6-35	.55-3.0	.15-.70
+121	85%	145%	2-15	.25-1.0	.06-.25

Vibration\* ..... 10 G's minimum, 50 - 500 Hz  
 Mechanical Shock ..... 50 G's  
 Acceleration ..... 10 G's  
 Weight ..... 2TC14 - 24 gm max.  
 3TC14 - 36 gm max.

### Interrupt Current

1-20 amps: 6000 amps at 28 VDC  
 25 amps: 1625 amps at 28 VDC  
 1-15 amps: 2500 amps at 120 VAC, 400 Hz  
 20 amps: 2000 amps at 120 VAC, 400 Hz  
 25 amps: 1800 amps at 120 VAC, 400 Hz

### Endurance

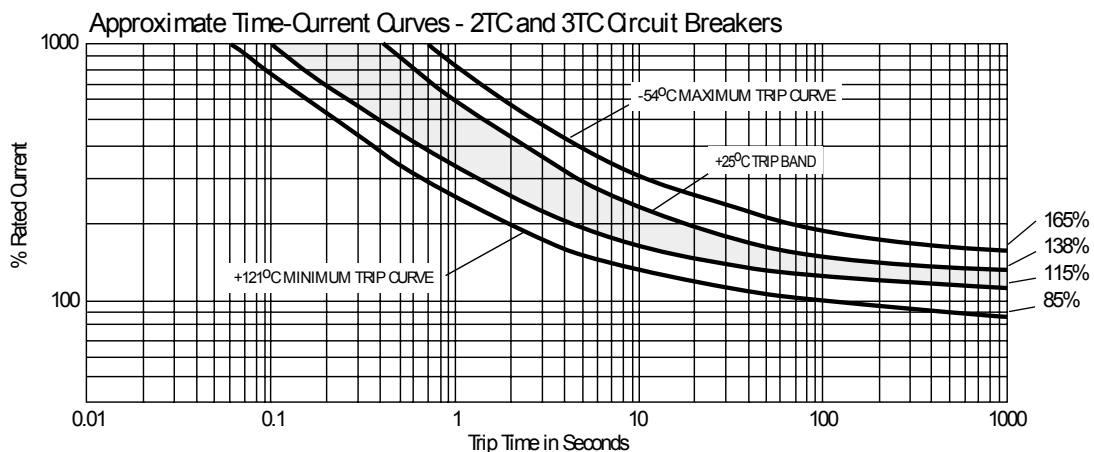
2500 cycles 120 VAC, 400 Hz Inductive  
 5000 cycles 120 VAC, 400 Hz Resistive  
 2500 cycles 30 VDC Inductive  
 5000 cycles 30 VDC Resistive  
 10,000 cycles Mechanical, no load

\* Other vibration levels available. Contact factory for details.

TI Number	Voltage Drop (max.)**
2TC14-1	1.10
2TC14-2	0.70
2TC14-2½	0.50
2TC14-3	0.40
2TC14-4	0.45
2TC14-5	0.35
2TC14-7½	0.30
2TC14-10	0.28
2TC14-15	0.25
2TC14-20	0.25
2TC14-25	0.20

TI Number	Voltage Drop (max.)**
3TC14-15	0.25
3TC14-20	0.25
3TC14-25	0.25
3TC14-30	0.25
3TC14-35	0.25

\*\* Max. voltage drop at nominal rated current.



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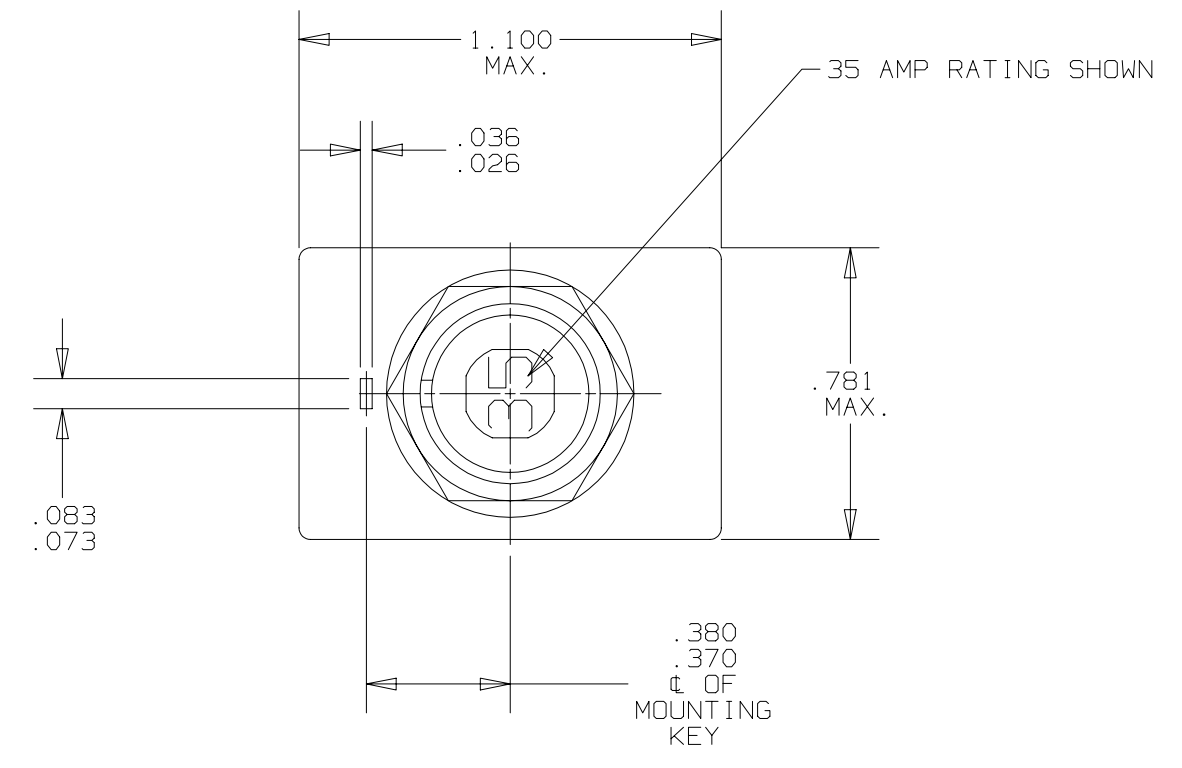
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REVISIONS					
ZONE	LTR	DESCRIPTION	1294	DATE	APPROVED
	M	UPDATED PER MARKUP AND REDRAWN IN CAD.	ECN0025542 PAF	1-5-06	DM



**PERFORMANCE CHARACTERISTICS**

OVERLOAD CYCLING	-----	100 CYCLES AT 200% RATING
VIBRATION	-----	10 G'S MINIMUM 50 - 500 HZ
MECHANICAL SHOCK	-----	25 G'S
ACCELERATION	-----	10 G'S
SAND & DUST	-----	12 HOURS
CORROSION	-----	SALT SPRAY 50 HOURS
HUMIDITY	-----	10 DAYS
EXPLOSION PROOF	-----	WHILE INTERRUPTING RUPTURE CURRENTS

**ENDURANCE:**

120 VAC	400 HZ INDUCTIVE	2,500 CYCLES
MECHANICAL	400 HZ RESISTIVE	5,000 CYCLES
	NO LOAD	10,000 CYCLES

**CALIBRATION:** 15 AMP THRU 35 AMP

	MIN. ULT. TRIP	MAX. ULT. TRIP	200%	500%	1000%
+25°C. (+77°F.)	115% RATING	138% RATING	4 - 20 SEC.	.4 - 1.7 SEC.	.1 - .4 SEC.
-54°C. (-65°F.)	115% RATING	165% RATING	6 - 35 SEC.	.55 - 3.0 SEC.	.15 - .7 SEC.
+71°C. (+160°F.)	100% RATING	138% RATING	3.0 - 15 SEC.	.33 - 1.5 SEC.	.08 - .35 SEC.

**RUPTURE:** 15 AMP THRU 35 AMP      120 VAC 400 HZ      2000 AMPERES

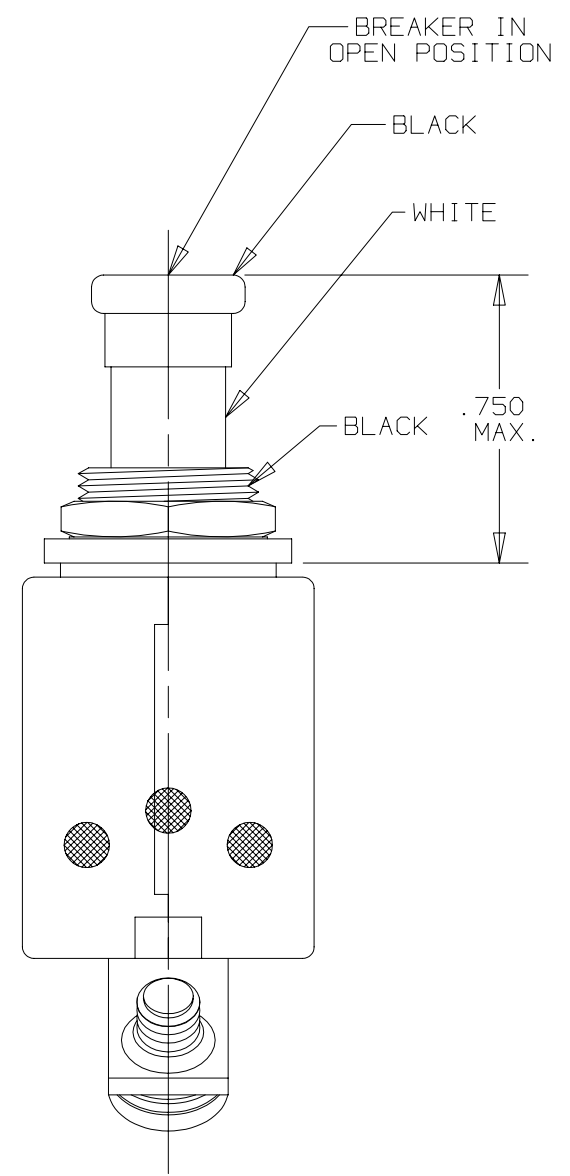
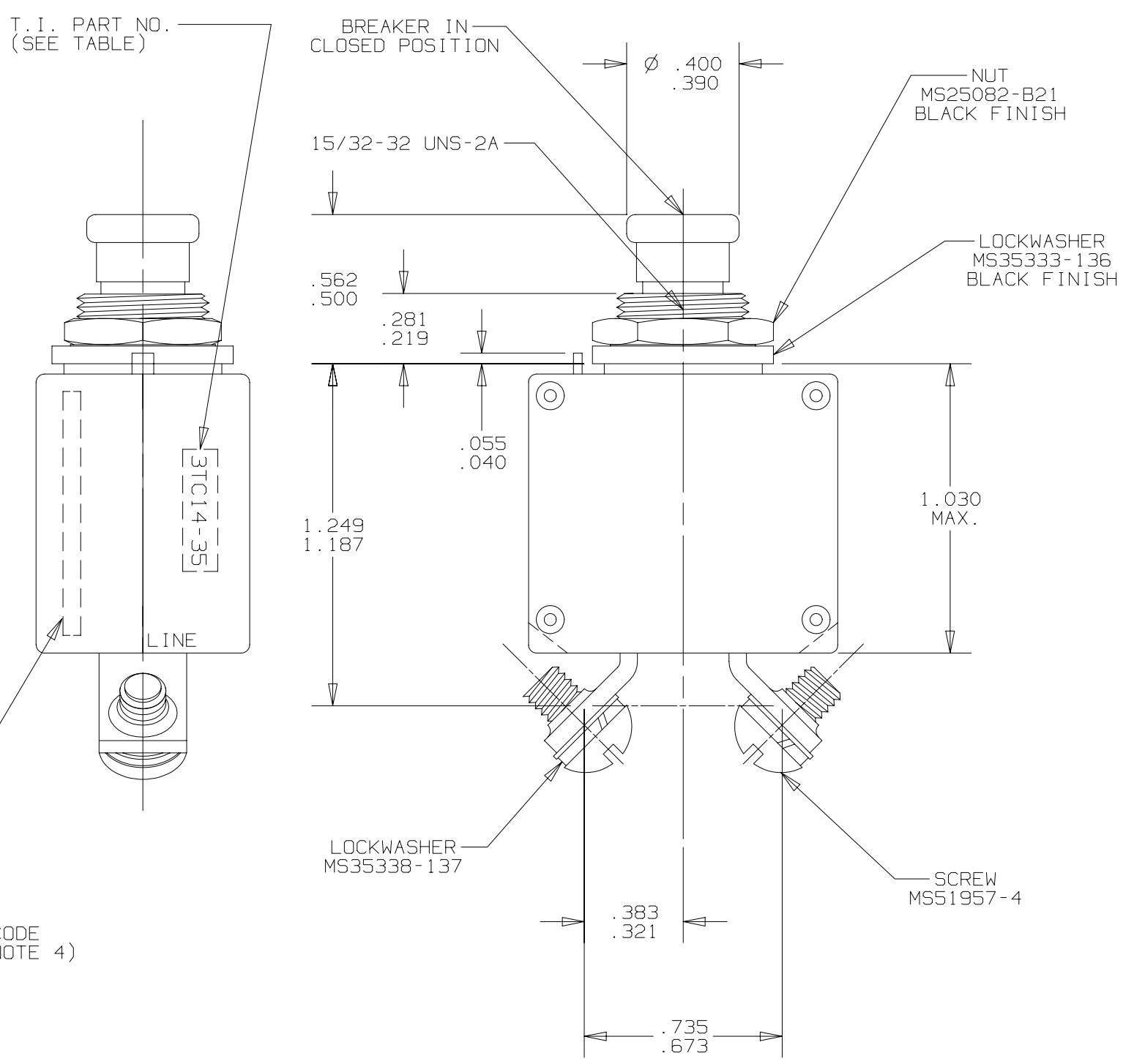
**MAXIMUM OPERATING FORCES:**

PULL OUT ----- 5 LBS MAX. (22.2N)  
 RESET ----- 5 LBS MAX. (22.2N)

**OPERATING ALTITUDE:** 70,000 FT. (21,000m)  
**WEIGHT/MASS:** 37 GRAMS MAX. (.082 LBS.)  
 35 GRAMS NOMINAL (.077 LBS.)

**VOLTAGE DROP:** 15 THRU 35 AMP ----- 0.25 VOLTS MAX.

T. I. PART NO.	AMP RATING
3TC14-15	15
3TC14-20	20
3TC14-25	25
3TC14-30	30
3TC14-35	35



- NOTES:**
- EPOXY SURFACES ARE NON-DIMENSIONED. ENVELOPE DRAWING DIMENSIONS DO NOT APPLY TO THESE PROJECTED EPOXY SURFACES.
  - TERMINAL AND MOUNTING HARDWARE MAY BE PACKAGED RATHER THAN INSTALLED.
  - COUNTRY OF ORIGIN TO BE IDENTIFIED AS REQUIRED.
  - DATE CODE PER 10588-285.
  - ALL MARKINGS TO BE MADE IN APPROXIMATE POSITIONS SHOWN, WITH BLACK INK PER 12506-70: 3/32 INCH HIGH CHARACTERS.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	DRAWN B. NICKERSON	DATE 2-12-70	TEXAS INSTRUMENTS ATTLEBORO, MASSACHUSETTS 02703	Klixon CONTROL PRODUCTS DIVISION
TOLERANCE ON FRACTIONS DECIMALS ANGLES	APPROVED T. BRASSARD	2-12-70		
	APPROVED T. BRASSARD	2-12-70	TITLE PART NO. 3TC14 AMBIENT COMPENSATED, HIGH TEMP PUSH-PULL TRIP-FREE CIRCUIT BREAKER ENVELOPE DRAWING	
MATERIAL			SIZE	CODE IDENT NO.
			C	82647
	SIGNATURES ON FILE. REFER TO ELECTRONIC CHANGE NOTICE.			3TC14