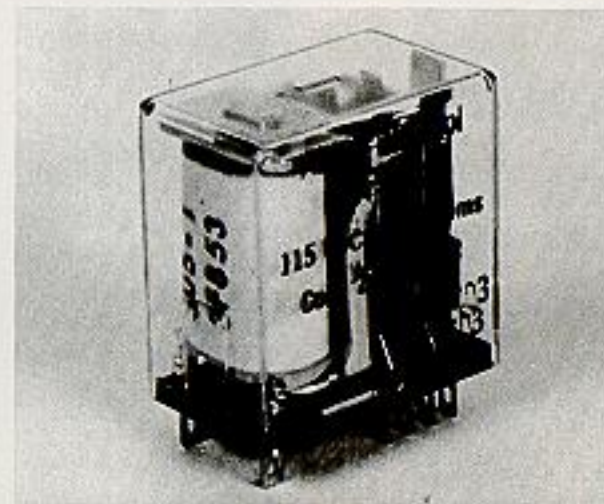


# DC Cradle Relays

## T154/TF154/T163/TY154 (up to 4 form C)— Standard DC Voltage Adjustment

COIL RESISTANCE at 25°C ± 10% (Ohms)			VDC at 25°C		
2 and 4 Form A, B, C, D Pick-up 500 mw	6 Form A, B, C or D Pick-up 850 mw	8 Form A, B, or C Pick-up 1000 mw	Pick-up (Max)	Nominal	Max. Continuous  2.2W Coil Disp
10	6	6	2.25	3.0	
52	25	20	4.5	6.0	
185	90	75	9.0	12.0	
700	430	430	18.0	24.0	
2500	1550	1275	36.0	48.0	
15,000	9000	9000	86.0	115.0	



## TS154/TSF154/TS163—Sensitive DC Voltage Adjustment

COIL RESISTANCE at 25°C ± 10% (Ohms)				VDC at 25°C		
1 and 2 Form A, B, C, D Pick-up 100 mw	4 Form A, B, C, D Pick-up 175 mw	6 Form A, B, C or D Pick-up 250 mw	8 Form A, B, C or D Pick-up 400 mw	Pick-up (Max.)	Nominal	Max. Cont.  2.2W Coil Disp.
52	30	20	12	2.25	3.0	
185	110	75	52	4.5	6.0	
800	430	350	190	9.0	12.0	
3200	1800	1275	800	18.0	24.0	
13,000	7500	5200	3200	36.0	48.0	

## TS154/TSF154/TS163—Sensitive DC Current Adjustment

Coil Resistance at 25°C ± 10%	MAXIMUM PICK-UP CURRENT (mA)					Max. Coil Current (mA)
	2 Form A, B, C, D Pick-up 85 mw	4 Form A, B, C or D Pick-up 175 mw	6 Form A, B, C or D Pick-up 250 mw	8 Form A, B, C or D Pick-up 400 mw		
1000	8.5	13.0	16.0	20.0	45.0	
2500	5.8	8.4	10.0	13.0	28.0	
5000	4.1	6.2	7.2	9.0	20.0	
10,000	3.1	4.5	5.0	6.4	14.0	
15,000	2.6	3.5	4.2	5.3	11.5	

## TSS154/TSS163—Ultra-sensitive Voltage Adjustment

COIL RESISTANCE at 25°C ± 10% (Ohms)					Nominal VDC	Max. Cont.
1 Form A, B, C, D Pick-up 20 mw	2 Form A, B, C, D Pick-up 40 mw	3 and 4 Form A, B, C, D Pick-up 80 mw	Pick-up (Max.) VDC			
220	110	52	2.25	3	2.2W 25°C	
1000	500	250	4.5	6		
4000	2000	1000	9.0	12		
9000	4500	2200	13.5	18		
15,000	7500	3700	18.0	24		

## TSS154/TSS163—Ultra-sensitive Current Adjustment

Coil Resistance at 25°C ± 10%	MAXIMUM PICK-UP CURRENT (mA)				Max. Cont. Coil Current (mA)
	1 Form A, B, C, D Pick-up 20 mw	2 Form A, B, C, D Pick-up 40 mw	3 Form A, B, C, D Pick-up 80 mw	4 Form A, B, C, D Pick-up 80 mw	
1000	4.5	6.5	9.0	9.0	45.0
2500	2.9	4.1	5.8	5.8	28.0
5000	2.1	2.9	4.1	4.1	20.0
10,000	1.5	2.0	3.0	3.0	14.0
15,000	1.2	1.7	2.4	2.4	11.5

### Ordering Information

T       VDC  
 i I II III IV V VI

#### i. Immersion Sealing

For immersion sealed relays add prefix S.

#### I. Type

Standard—No designation necessary  
 Sensitive—Insert letter S  
 Ultra-sensitive—Insert letter SS

#### II. Contact Rating

Low level to 2 ampere—No designation necessary  
 5 ampere—Insert letter F<sup>1</sup>  
 10 ampere—Insert letter Y<sup>2</sup>

#### III. Terminal Type and Mounting

Single stud—Insert letter V  
 Tapped holes in top—Insert letter W  
 Solder/plug-in—No designation necessary

Printed circuit—Insert letter P

#### III A. Light Option

For light option—Insert letter L  
 (UL recognition pending)

#### IV. Contact Type

Single contacts—Insert code 154  
 Bifurcated contacts—Insert code 163  
 Cross-bar bifurcated,  
 gold-platinum-silver alloy (WE #1)  
 contacts—Insert code K163

#### V. Contact Configuration

DPDT or 2 form C or C-C—Insert 2C  
 4 PDT or 4 form C or  
 CC-CC—Insert 4C  
 6 PDT or 6 form C or  
 CCC-CCC—Insert 6C  
 8 PDT or 8 form C or  
 CCCC-CCCC—Insert 8C

#### VI. Nominal Coil Voltage (VDC) or Maximum Operate Current (mADC)

Select one from coil data table

#### Example #1

T154-2C-24VDC  
 (T relay, 2 amp contacts rating,  
 2 form C, 24VDC coil)

#### Example #2

TSFP154-2C-24VDC  
 (T relay, sensitive adjust, 5 ampere  
 contacts rating, printed circuit terminals,  
 2 form C, 24VDC coil)

Note: For mating sockets, see page 8.

<sup>1</sup> Not available with SS adjustments.  
 TF163 UL recognition pending.

<sup>2</sup> Not available in bifurcated contacts or  
 with S or SS adjustments.  
 UL recognition pending.

# AC Cradle Relays

## Ordering Information

T    -  -  VAC  
 I I II III IV V

### i. Immersion Sealing

For immersion sealed relays add prefix S to Cat. No.

### I. Contact Rating

Low level to 2 ampere—no designation necessary

5 ampere—insert letter F<sup>1</sup>  
10 ampere—insert letter Y<sup>2</sup>

### II. Terminal Type

Single stud—insert letter V  
Tapped holes in top—insert letter W  
Solder/plug-in—no designation necessary  
Printed circuit—insert letter P

### III. Contact Type

Single point contacts—insert code 154  
Bifurcated contacts—insert code 163  
Cross-bar bifurcated gold-platinum-silver alloy (WE #1) contacts—insert K163

### III.A. Light Option

For light option—insert letter L (UL recognition pending)

### IV. Contact Configuration

DPDT or 2 form C or C-C—insert 2C  
4 PDT or 4 form C or CC-CC—insert 4C

### V. Nominal Coil Voltage

Select from coil data table

#### Example #1

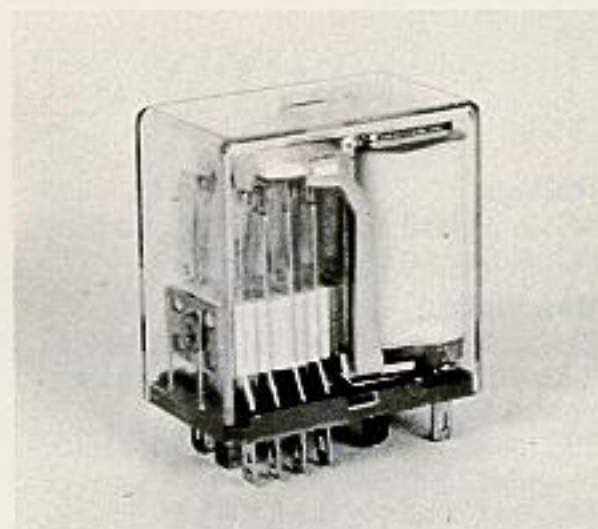
T154-2C-115VAC  
(T relay, 2 amp contact rating, 2 form C, 115 VAC coil)

#### Example #2

TP163-4C-115VAC  
(T relay, low level up to 2 amps contact rating, printed circuit terminals, bifurcated contacts, 4 form C, 115 VAC coil)

<sup>1</sup>Not available with SS adjustments. TF163 UL recognition pending.

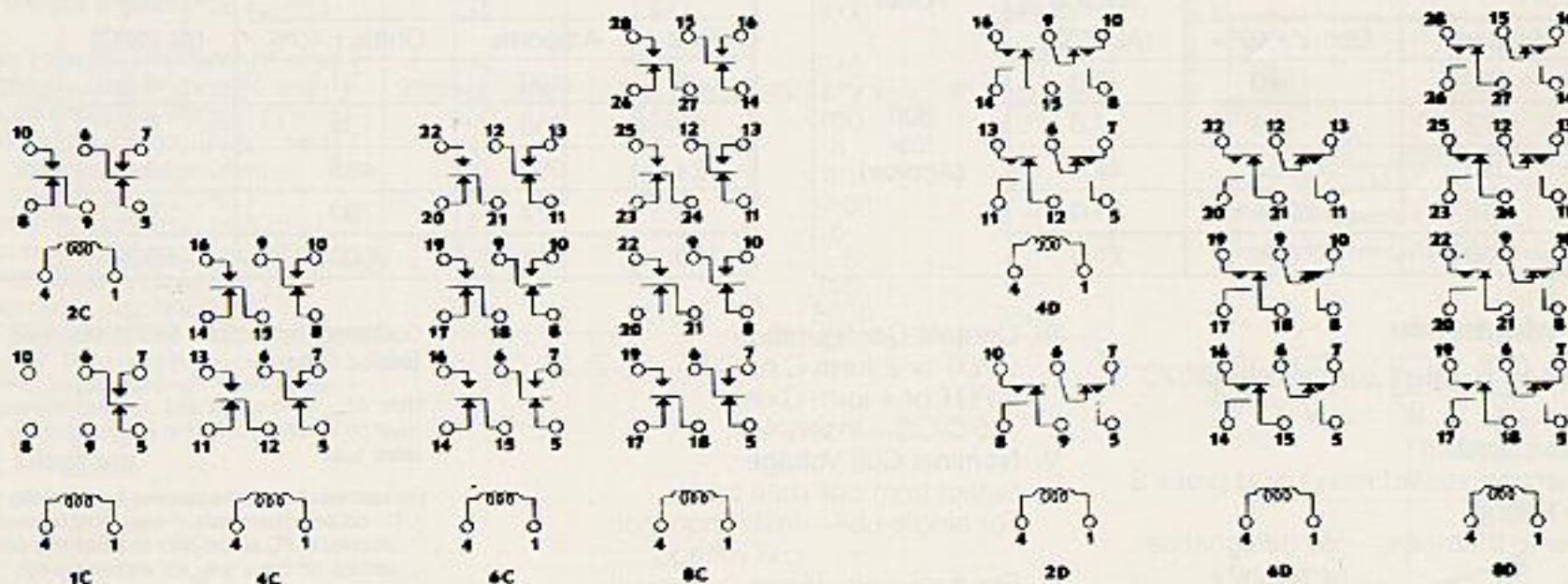
<sup>2</sup>Not available in bifurcated contacts or with S and SS adjustments. UL recognition pending.



Nominal AC Coil Data

Nominal AC Volts	COIL RESISTANCE	Max. Pick-up
Volts	Ohms DC ± 20%	Volts
6	14	5.0
12	65	9.0
24	280	18.0
48	1250	36.0
115	6000	86.0
220	15,000	170.0

## Cradle Wiring Diagrams

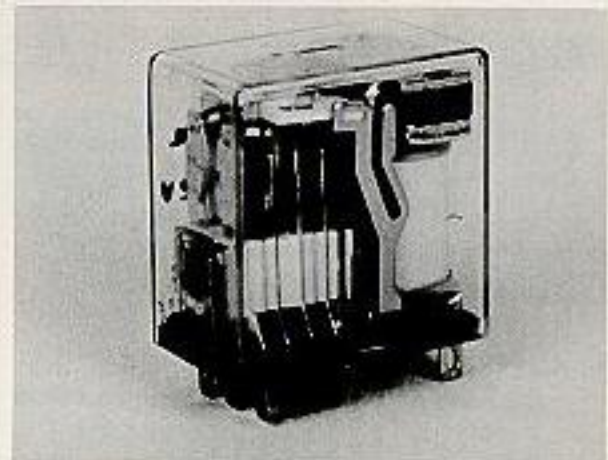


FORM C's

FORM D's

CIRCUIT DIAGRAMS-UNENERGIZED

(NOT AVAILABLE IN BIFURCATED)



## Ratings

AC: 2, 5 or 10 amp @ 115VAC, 50/60Hz  
 DC: 2, 5 or 10 amp @ 29VDC

## Description

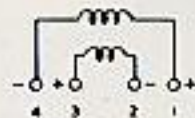
Series T351 have single-point contacts  
 Series T362 have bifurcated contacts  
 Proven Cradle® reliability  
 100 million mechanical operations  
 Bi-stable magnetic latch  
 Single or dual coil construction  
 Contact selection to match application  
 Input voltages from 6VDC to 110VDC  
 High density package  
 Mounting versatility  
 Weight: 22-30 grams  
 Enclosure: Polycarbonate or polyester dust cover  
 Terminals: Solder/plug-in and printed circuit  
 Immersion: Add prefix S to Cat. No.

## Performance Data

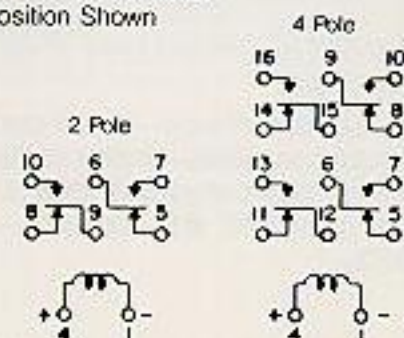
**Transfer Time:**  
 10ms maximum at nominal voltage  
**Pulse Width:**  
 A 10ms minimum pulse is recommended  
**Insulation Resistance:**  
 10,000 megohms min.  
**Contact Configuration:** 4 form C max.,  
 form A, B and D available on request  
**Dielectric Strength:**  
 1000V rms, 500V rms across contact gaps and between coils  
**Ambient Temperature:** -55° to +71°C

## Approvals

UL File E20604  
 CSA File 93349 - 1



Dual Winding Diagram  
 1-4 Operate 2-3 Reset  
 Reset Position Shown



Single Winding  
 All Circuits Shown Reset  
 To Operate Reverse Polarity

For different coil polarities, consult factory.  
 Other DC coil combinations are available, consult factory.

T351/TF351/T362/TY351— SINGLE WOUND COIL			Max Transfer Voltage (At 25°C)	Transfer Power
Volts	Amperes	Ohms ± 10%		
6	.150	40	3.6	300 mw (Approx)
12	.072	166	7.0	
24	.038	630	14.5	
48	.018	2640	29.0	
110	.008	13,800	71.0	

T351/TF351/T362/TY351— DUAL WOUND COIL Either Coil			Max Transfer Voltage Either Coil (At 25°C)	Transfer Power
Volts	Amperes	Ohms ± 10%		
6	.190	31.5	4.5	600 mw (Approx)
12	.090	134	9.2	
24	.050	485	18.0	
48	.027	1760	35.0	
110	.011	9600	90.0	

## Ordering Information

□ T □ □ □ □ - □ VDC  
 I I II III IV V

### i. Immersion Sealing

For immersion sealed relays add prefix S

### l. Contact Rating

Low level to 2 ampere—No designation necessary

5 ampere—Insert letter F<sup>1</sup>

10 ampere—Insert letter Y<sup>2</sup>

### II. Terminal Type

Solder/plug-in—No designation necessary

Printed circuit—Insert letter P

### III. Contact Type

Single contacts—Insert code 351

Bifurcated contacts—Insert code 362

Cross-bar bifurcated gold-platinum-silver alloy (WE #1) contacts—Insert code K362

### IV. Contact Configuration

DPDT or 2 form C or C-C—Insert 2C

4 PDT or 4 form C or CC-CC—Insert 4C

### V. Nominal Coil Voltage

Select from coil data table

For single coil—Insert nominal coil voltage

For dual coil—Insert 2/nominal coil voltage

1. TF362 or TY351 UL recognition pending

### Example #1

T351-2C-24VDC  
 (T relay, 2 amps contact rating, 2 form C, single 24VDC coil)

### Example #2

T351-2C-2/24VDC  
 (T relay, 2 amps contact rating, 2 form C, dual 24VDC coils)

Note: For mating sockets, see page 8.

## Soldering Instructions for PC Mounted, Immersion Sealed Relays

Note: After wave solder and cleaning, the sealing tape must be removed. This is to insure maximum life under rated load.

For best results, please observe the following precautions:

1. Do not bend terminals. If relay must be mechanically clinched to PC board prior to soldering, bend stationary contact terminals only, not exceeding 45°.
2. Do not immerse the unsealed relay in cleaning solutions.
3. Solder temperature, 270°C (500°F) max. Soldering time, 5 seconds max.

Sealed relays can withstand exposure to all commercial solvents used for flux removal.

Medium	Max. Temperature	Exposure
Fluorocarbon	70°C	2-3 Minutes
Chlorinated or Hydrocarbon	70°C	2-3 Minutes
Aqueous Detergent (Organic)	82°C	2-3 Minutes