



FCL Components

RELAYS

Automotive, Power, Signal, Solid State



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Relays with this logo are available as "Glow Wire" versions. (-GW)
These relays are IEC60335-1 compliant.

Please refer to your supplier for more information or contact your local FCL Components Office.
For contact information, see the last page of this document, or <https://www.fcl-components.com/en/>

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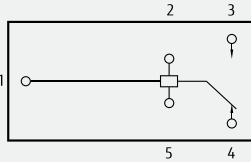
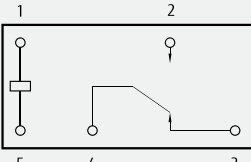
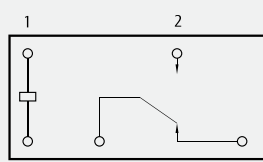
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SOLID STATE RELAYS




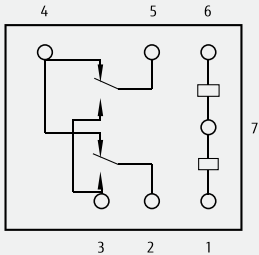
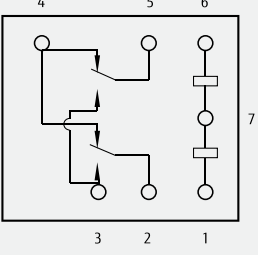
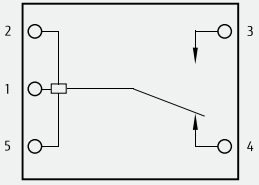
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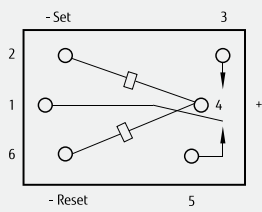
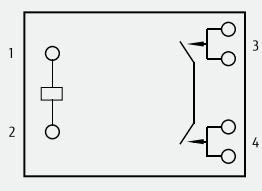
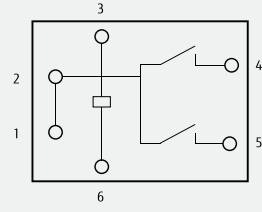
Automotive relays - 12V car battery

Series Name	FTR-G1	FTR-P3	FTR-P5
			
Description	25A Compact Relay	25A Compact Relay	25A Low Noise Compact Relay
Features	<ul style="list-style-type: none"> Average acoustic noise level 60dB @ 5cm No polarity on coil terminals 	<ul style="list-style-type: none"> 0.25 & 0.6mm contact gap types THR type available High temp. types available (+125°C) (THR) Pin compatible w/ FTR-P5 No polarity on coil terminals 	<ul style="list-style-type: none"> Pin compatible with FTR-P3 Average acoustic noise level 50dB @ 5cm No polarity on coil terminals
Dimensions (W x L x H mm)	6.6 x 13.7 x 13.5	7.2 x 17.4 x 13.5, (THR: 7.2 x 17.4 x 14.1)	9.7 x 20.4 x 16.7
Weight (approx.)	3.5 g	5.0 g	7.0 g
Contact form	1 c	1 c, (THR: 1a, 1c)	1 c
Contact rating	25A, 14VDC locked motor load	25A, 14VDC, locked motor load	25A, 14VDC, locked motor load
Maximum carrying current	25A 1 Hr	25A 1 Hr	25A 1 Hr
Expected life on load example	14VDC, 25A Locked motor load 100 x 10 ³ ops.	14VDC, 25A, locked motor load 100 x 10 ³ ops.	14VDC, 25A, locked motor load 100 x 10 ³ ops.
Operating temperature	-40 to +85 °C	-40 to +85 °C / +125 °C (THR)	-40 to +85 °C
Coil voltage (DC)	9 to 12 V	9 to 12 V	9 to 12 V
Nominal coil power	0.625 to 0.643 W	0.6 to 0.86 W	0.45 to 0.455 W
Dielectric strength (1 min.)	Open contacts: 500VAC Coil and contacts: 500VAC	Open contacts: 500VAC Coil and contacts: 500VAC	Open contacts: 500VAC Coil and contacts: 500VAC
Mounting / enclosure	Through hole / plastic seal	Through hole / plastic seal	Through hole / plastic seal
Terminal layout (bottom view)		 1a does not carry #3 contact	




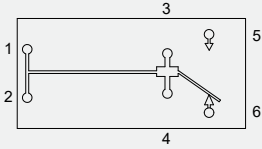
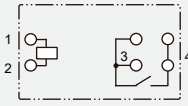
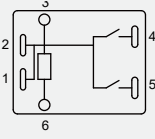
Automotive relays - 12V car battery

Series Name	FTR-P4	FTR-P2	FTR-P7
			
Description	25A H-bridge Relay	25A Low Noise H-bridge Relay	25A Low Noise Compact Automotive Relay
Features	<ul style="list-style-type: none"> 0.25mm contact gap Pin compatible with FTR-P2 No polarity on coil terminals 	<ul style="list-style-type: none"> Pin compatible with FTR-P3/4 Average acoustic noise level 50dB @ 5cm No polarity on coil terminals 	<ul style="list-style-type: none"> 0.3 mm contact gap Average acoustic noise level 45dB @ 5cm No polarity on coil terminals
Dimensions (W x L x H mm)	14.2 x 17.4 x 13.5	16.5 x 21.0 x 18.0	17.0 x 20.8 x 14.0
Weight (approx.)	10.0 g	13.0 g	7.0 g
Contact form	1 c x 2 (H-bridge)	1 c x 2 (H-bridge)	1 c
Contact rating	25A, 14VDC, locked motor load	25A, 14VDC, locked motor load	25A, 14VDC locked motor load
Maximum carrying current	25A 1 Hr	25A 1 Hr	25A 1 Hr
Expected life on load example	14VDC, 25A, locked motor load 100 x 10 ³ ops.	14VDC, 25A, locked motor load 100 x 10 ³ ops.	14VDC, 25A, locked motor load 100 x 10 ³ ops.
Operating temperature	-40 to +85°C	-40 to +85°C	-40 to +85 °C
Coil voltage (DC)	9 to 12 V	9 to 12 V	12 V
Nominal coil power	0.6 W	0.45 to 0.455W	0.554 W
Dielectric strength (1 min.)	Open contacts: 500VAC Coil and contacts: 500VAC	Open contacts: 500VAC Coil and contacts: 500VAC	Open contacts: 500VAC Coil and contacts: 500VAC
Mounting / enclosure	Through hole / plastic seal	Through hole / plastic seal	Through hole / plastic seal
Terminal layout (bottom view)			




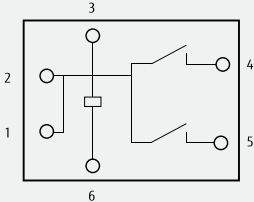
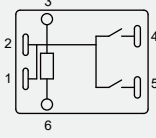
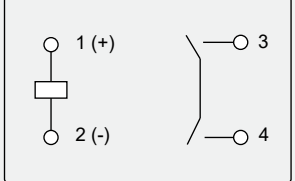
Automotive relays - 12V car battery

Series Name	FBR51L	FTR-E1	FBR53
			
Description	25A Dual coil Latching Compact Automotive Relay	High Voltage DC switching Relay	30A Compact Automotive Relay
Features	<ul style="list-style-type: none"> THR type (-RW) available High power type High temperature (+125°C) No polarity on coil terminals 	<ul style="list-style-type: none"> Polarized coil terminals No polarity on coil terminals 	<ul style="list-style-type: none"> THR type (-RW) available 60A max. inrush No polarity on coil terminals
Dimensions (W x L x H mm)	12.1 x 15.5 x 13.7	28.3 x 43.6 x 36.8	12.3 x 15.7 x 14.0
Weight (approx.)	6.0 g	75.0 g	6.0 g
Contact form	1 c	1 a (1 form X)	1 form U
Contact rating	25A, 14VDC, locked motor load	25A, 450VDC (20A) 25A, 450VDC (30A) 10A 1,000VDC (20/30A type)	25A, 14VDC, resistive load
Maximum carrying current	30A 1Hr	40A (85°)	30A
Expected life on load example	14VDC, 25A, locked motor load 200 x 10 ³ ops. (-W1 type) 50 x 10 ³ ops. (E type)	450VDC, resistive 75 x 10 ³ ops.* 450VDC, 20A resistive 10 x 10 ³ ops.* * with suppression device	14VDC, 25A, resistive load 100 x 10 ³ ops.
Operating temperature	-40 to +125 °C		-40 to +125 °C
Coil voltage (DC)	10 V	12, 24V	9 to 12 V
Nominal coil power	1.11 W	0.9W	0.556 to 0.6 W
Dielectric strength (1 min.)	Open contacts: 500VAC Coil and contacts: 500VAC	Open contacts: 2,500VAC Coil and contacts: 5,000VAC	Open contacts: 500VAC Coil and contacts: 500VAC
Mounting / enclosure	Through hole / plastic seal	Through hole / plastic seal	Through hole / plastic seal
Terminal layout (bottom view)			



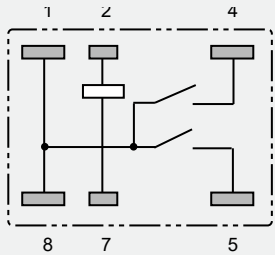
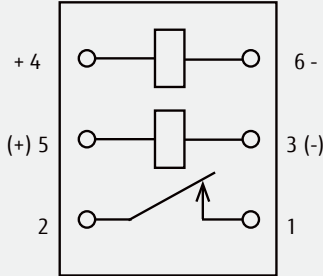
Automotive relays - 12V car battery

Series Name	FTR-G3	FTR-K5	FBR53-LE
			
Description	30A Compact Relay	40A High Insulation relay	40 Ultra-compact relay
Remarks	<ul style="list-style-type: none"> ■ 30A fuse capacity ■ THR type available ■ No polarity on coil terminals 	<ul style="list-style-type: none"> ■ No polarity on coil terminals ■ Corresponds 6.6kW standard charger 	<ul style="list-style-type: none"> ■ No polarity on coil terminals ■ 200A max. inrush current ■ Through hole reflow type available
Dimensions (W x L x H mm)	6.6 x 13.7 x 14.0	18.0 x 30.5 x 29.7	12.1 x 15.5 x 13.7
Weight (approx.)	4.0 g	39.0 g	6.0 g
Contact form	1 a, 1 c	1 a	1 form U
Contact rating	30A, 14VDC	32A, 250VAC	40A 14VDC
Maximum carrying current	40.5A 30 minutes	40A	54A 1 hr
Expected life on load example	14VDC, 30A, locked motor load 100 x 10 ³ ops.	Inrush 60A/interrupt 10mA 250VAC 200 x 10 ³ ops.	40A 14VDC, resistive 100 x 10 ³ ops.
Operating temperature	-40 to +125 °C	-40 to +105 °C	-40 to +125 °C
Coil voltage (DC)	12 V	5 to 24V	12V
Nominal coil power	0.64 W	0.9W	0.6W
Dielectric strength (1 min.)	Open contacts: 500VAC Coil and contacts: 500VAC	Open contacts: 1,000VAC Coil and contacts: 5,000VAC	Open contacts: 500VAC Coil and contacts: 500VAC
Mounting	Through hole / plastic seal or flux proof	Through hole / plastic seal / flux proof	Through hole / plastic seal
Terminal layout (bottom view)	 <p>1c contact form</p>		




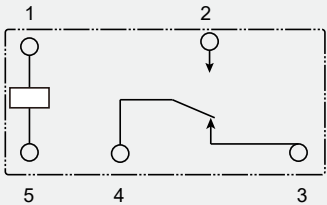
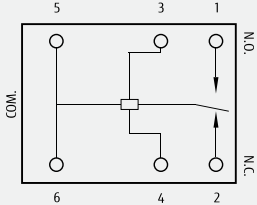
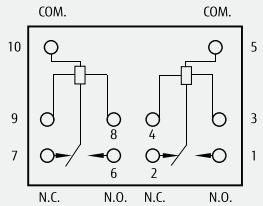
Automotive relays - 12V car battery

Series Name	FBR53-HW	FBR53-HC	FTR-E1-HC
			
Description	40A Compact Relay	50A Ultra-compact relay	60A compact relay
Remarks	<ul style="list-style-type: none"> ■ THR type (-RW) available ■ High power type ■ 80A max. inrush ■ No polarity on coil terminals 	<ul style="list-style-type: none"> ■ No polarity on coil terminals ■ 200A max. inrush current ■ Through hole reflow type available 	<ul style="list-style-type: none"> ■ No polarity on coil terminals
Dimensions (W x L x H mm)	12.3 x 15.7 x 14.0	12.1 x 15.5 x 13.7	28.3 x 43.6 x 36.8
Weight (approx.)	6.0 g	6.0 g	80.0 g
Contact form	1 form U	1 form U	1a (1 form X)
Contact rating	40A, 14VDC, resistive load	50A, 14VDC	60A, 450VDC (at 85°C) 10A, 1000VDC
Maximum carrying current	40A	50A. 14 VDC	60A at 85°C
Expected life on load example	14VDC, 40A, resistive load 100 x 10 ³ ops.	14VDC, 50A, resistive load 100 x 10 ³ ops.	450VDC, 60A, resistive load 500 ops. (with suppression device)
Operating temperature	-40 to +125 °C	-40 to +125 °C	-40 to +85°C (at 60A)
Coil voltage (DC)	9 to 12 V	12 V	12, 24V
Nominal coil power	0.855 to 0.862 W	0.64 W	1.2 W
Dielectric strength (1 min.)	Open contacts: 500VAC Coil and contacts: 500VAC	Open contacts: 500VAC Coil and contacts: 500VAC	Open contacts: 2,500VAC Coil and contacts: 5,000VAC
Mounting	Through hole / plastic seal	Through hole / plastic seal	Through hole / plastic seal
Terminal layout (bottom view)			

Automotive relays - 12V car battery

Series Name	FBR59-HW	FTR-V1
		
Description	30A High Power Relay	210A High Capacity Latching Relay
Features	<ul style="list-style-type: none"> For 24V battery applications THR type available No polarity on coil terminals 	<ul style="list-style-type: none"> 210A (@85°C)/120A (@125°C) continuous current Polarized coil terminals
Dimensions (W x L x H mm)	15.0 x 20.0 x 16.8	52.8 x 84.5 x 24.7
Weight (approx.)	13.0 g	120 g
Contact form	1 form U	1b
Contact rating	30A 28VDC	Inrush 230A, 14VDC Break 1A, 14VDC, dedicated load
Maximum carrying current	70A 1 Hr (@20°C)	210A at 85°C
Expected life on load example	28VDC 20A resistive 100 x 10 ³ ops.	Inrush 230A, 14VDC Break 1A, 14VDC 120 x 10 ³ ops.
Operating temperature	-40 to +125 °C	-40 to +125 °C
Coil voltage (DC)	12, 24 V	12V
Nominal coil power	1.2 W	28.8 W
Dielectric strength (1 min.)	Open contacts: 500VAC Coil and contacts: 500VAC	Open contacts: 500VAC Coil and contacts: 500VAC
Mounting / enclosure	Through hole / plastic seal	Plastic seal
Terminal layout (bottom view)		

Automotive relays - 24V car battery

Series Name	FTR-P3 (-06)	FBR57	FBR572 / 582
			
Description	6A Compact Relay	12A High Power Relay	12/14A High Power Twin Relay
Features	<ul style="list-style-type: none"> For 24V battery applications THR type available No polarity on coil terminals 	<ul style="list-style-type: none"> For 24V battery applications 70A inrush No polarity on coil terminals 	<ul style="list-style-type: none"> For 24V battery applications 0.8mm contact gap (FBR572) 1.4mm contact gap (FBR582) 60A inrush No polarity on coil terminals
Dimensions (W x L x H mm)	7.2 x 17.5 x 14.1	14.4 x 20.0 x 16.2	20.0 x 26.0 x 16.2 (FBR572) 20.0 x 26.0 x 17.0 (FBR582)
Weight (approx.)	5.0 g	9.4 g	18.0 g
Contact form	1 c	1 c	1 c x2
Contact rating	6A, 28VDC	12A, 28VDC, locked motor load	12A, 28VDC, locked motor load
Maximum carrying current	20A 1 Hr	40A 10 min. / 30A 1 Hr	40A 2min.
Expected life on load example	28VDC 6A resistive 100 x 10 ³ ops.	28VDC, 12A, locked motor load 100x10 ³ ops. 28VDC, inrush 16A/break 2.5A, free motor load 500 x 10 ³ ops.	28VDC, 12A, locked motor load 100 x 10 ³ ops. (FBR572, 582) 28VDC, inrush 15A/break 2.5A, free motor load 500 x 10 ³ ops. (FBR572)
Operating temperature	-40 to +125 °C	-40 to +85°C	-40 to +85 °C
Coil voltage (DC)	24 V	24 V	24 V
Nominal coil power	0.9W	1.5 W	1.5W / 3.4W
Dielectric strength (1 min.)	Open contacts: 500VAC Coil and contacts: 500VAC	Open contacts: 500VAC Coil and contacts: 500VAC	Open contacts: 500VAC Coil and contacts: 500VAC
Mounting / enclosure	Through hole / plastic seal	Through hole / plastic seal	Through hole / plastic seal
Terminal layout (bottom view)			

Automotive relays - 24V car battery

Series Name

FBR59-HW



Description

30A High Power Relay

Features

- For 24V battery applications
- THR type available
- No polarity on coil terminals

Dimensions (W x L x H mm)

15.0 x 20.0 x 16.8

Weight (approx.)

13.0 g

Contact form

1 form U

Contact rating

30A 28VDC

Maximum carrying current

70A 1 Hr (@20°C)

Expected life on load example

28VDC 20A resistive
100 x 10³ ops.

Operating temperature

-40 to +125 °C

Coil voltage (DC)

12, 24 V

Nominal coil power

1.2 W

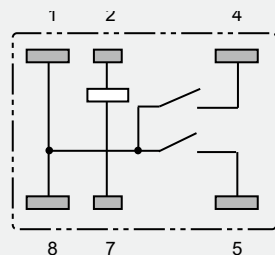
Dielectric strength (1 min.)

Open contacts: 500VAC
Coil and contacts: 500VAC

Mounting / enclosure

Through hole / plastic seal

**Terminal layout
(bottom view)**



EV/PHV relays (DC control)

Series Name	FTR-B3	FTR-B4	FTR-J2
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Description	2A Low Profile Relay	2A Slim Type Relay	10A 450VDC Small High Voltage DC Relay
Features	<ul style="list-style-type: none"> Space saving versions available THT and SMT versions Polarity on coil terminals 	<ul style="list-style-type: none"> Space saving versions available THT and SMT versions Polarity on coil terminals 	<ul style="list-style-type: none"> Special arc extinguishing provision 150A inrush current Polarity on coil terminals

Dimensions (W x L x H mm)	7.2 x 10.6 x 5.25 (SMT)	5.7 x 10.6 x 9.7 (SMT)	23.5 x 24.0 x 27.0
Weight (approx.)	0.85g	1.0g	26.0g
Contact form	2c	2c	1a x 2
Contact rating	0.3A 125VAC/1A 30VDC	0.3A 125VAC/1A 30VDC	10A 200VDC (NO contact used independently) 10A 450VDC (2 contacts connected in series)
Maximum carrying current	2A	2A	12A
Min. switching load (ref.)	10mVDC 0.01mA	10mVDC 0.01mA	5VDC 100mA
Expected life on load example	100 x 10 ³ ops.	100 x 10 ³ ops.	10 x 10 ³ ops.
Coil voltage (DC)	1.5 to 24V	1.5 to 24V	5 to 24V
Nominal coil power	0.14 to 0.23W	0.14 to 0.23W	1.06W (2 contacts connected in series)
Surge strength	2,500V	2,500V	10,000V
Dielectric strength (1 min.)	Open contacts: 1,000VAC Coil and contacts: 1,500VAC	Open contacts: 1,000VAC Coil and contacts: 1,500VAC	Open contacts: 1,000VAC Coil and contacts: 4,000VAC
Safety standards	UL, CSA, BSI, FCC68, Telcordia, IEC60950-1	UL, CSA, BSI, FCC68, Telcordia, IEC60950-1	UL, VDE
Mounting / Enclosure	Through hole or surface mount / plastic seal	Through hole or surface mount / plastic seal	Through hole/ flux proof

Terminal layout (bottom view)	<p>B3C (Bottom view)</p> <p>B3G, B3S (Top view)</p>	<p>B4C (Bottom view)</p> <p>B4G, B4S (Top view)</p>	
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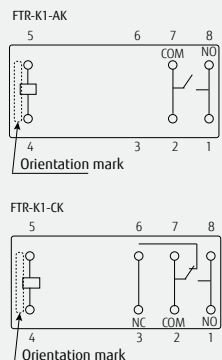
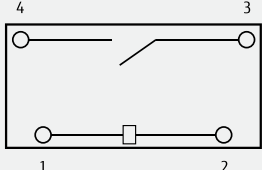
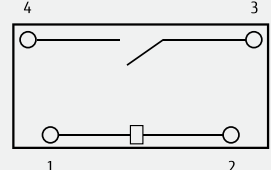
EV/PHV relays (DC control)

Series Name	FTR-E1	FTR-E1-HC
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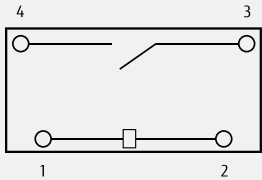
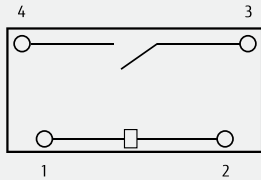
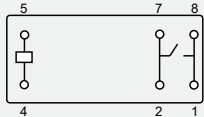


Description	20A/30A, 450VDC High Voltage DC Relay	High Voltage DC Switching Relay
Features	<ul style="list-style-type: none"> ■ Polarized on coil terminals ■ No polarity on contacts ■ 1,000 VDC break high capacity 	<ul style="list-style-type: none"> ■ Polarized coil terminals ■ No polarity on contacts ■ Switchable for charge/discharge circuit
Dimensions (W x L x H mm)	28.3 x 43.6 x 36.8	28.3 x 43.6 x 36.8
Weight (approx.)	75.0 g	80.0 g
Contact form	1a (1 Form X)	1a
Contact rating	20A 450VDC (20A type) 30A 450VDC (30A type) 10A 1,000VDC (20/30A type)	DC: 60A 450VDC (at 85°C) 10A, 1,000VDC
Maximum carrying current	40A (@ +85 °C)	60A at 85°C
Expected life on load example	450VDC, resistive 75 x 10 ³ ops. 450VDC, 20A, resistive 10 x 10 ³ ops. (with suppression device) 10A 1,000VDC resistive 50 ops.	450VDC, 60A, resistive load 500 ops. (with suppression device)
Operating temperature		-40 to +85°C (at 60A)
Coil voltage (DC)	12, 24V	12, 24V
Nominal coil power	0.9W	1.2 W
Surge strength	-	-
Dielectric strength (1 min.)	Open contacts: 2,500VAC Coil and contacts: 5,000VAC	Open contacts: 2,500VAC Coil and contacts: 5,000VAC
Safety standards		cULUS, TUV
Mounting / Enclosure	Through hole / plastic seal	Through hole / plastic seal
Terminal layout (bottom view)		

EV/PHV relays (AC control)

Series Name	FTR-K1(-HT / -KW)	FTR-K3-WG	FTR-K3-WS
			
Description	16A 105°C type (plastic sealed type available, incl OBC apps., sealed type is also adopted)	25 A Wide Contact Gap Relay	25A Wide Contact Gap Relay
Features	<ul style="list-style-type: none"> UL TV-5 available Creepage/clearance ≥10mm No polarity on coil terminals Compliant with ATEX directive based on IEC60079-1 /-15 	<ul style="list-style-type: none"> Conform to VDE0127 1.5mm contact gap No polarity on coil terminals 	<ul style="list-style-type: none"> Conform to VDE0127 1.8mm contact gap No polarity on coil terminals
Dimensions (W x L x H mm)	12.7 x 29.0 x 15.7	15.7 x 30.1 x 23.3	15.7 x 30.1 x 23.3
Weight (approx.)	13.0g	25.0	25.0g
Contact form	1a, 1c	1a	1a
Contact rating	16A 250VAC/24VDC	25A 250VAC	25A 250VAC
Maximum carrying current	20A	25A	25A
Min. switching load (ref.)	5VDC 100mA	5VDC 100mA	5VDC 100mA
Expected life on load example	10 x 10 ³ ops. to 100 x 10 ³ ops.	100 x 10 ³ ops.	30 x 10 ³ ops.
Coil voltage (DC)	5 to 110V	5 to 48V	5 to 48V
Nominal coil power	0.4 to 0.43mW	0.78W	1.2W
Surge strength	10,000V	8,500VAC	8,500VAC
Dielectric strength (1 min.)	Open contacts: 1,000VAC Coil and contacts: 5,000VAC	Open contact 2,500VAC Coil and contacts: 5,000V	Open contact 2,500VAC Coil and contacts: 5,000V
Safety standards	UL, CSA, VDE	UL, VDE, CQC	UL, VDE, CQC
Mounting / Enclosure	Through hole / plastic seal or flux proof	Through hole / flux proof	Through hole / flux proof
Terminal layout (bottom view)	 <p>FTR-K1-AK</p> <p>FTR-K1-CK</p>		

EV/PHV relays (AC control)

Series Name	FTR-K3-PV	FTR-K3-PS	FTR-K5
			
Description	32A Wide Contact Gap Relay	32A Wide Contact Gap Relay	40A relay for on-board charger
Features	<ul style="list-style-type: none"> Conform to VDE0127 1.5mm contact gap No polarity on coil terminals 	<ul style="list-style-type: none"> Conform to VDE0127 1.8mm contact gap No polarity on coil terminals 	<ul style="list-style-type: none"> For 6.6kW standard charger No polarity on coil terminals
Dimensions (W x L x H mm)	15.7 x 30.1 x 23.3	15.7 x 30.1 x 23.3	18.0 x 30.5 x 29.7
Weight (approx.)	26.0g	26.0g	39.0g
Contact form	1a	1a	1a
Contact rating	32A 250VAC	32A 250VAC	32A 250VAC
Maximum carrying current	32A	32A	40A (at 105°C, 8mm ² cable)
Min. switching load (ref.)	5VDC 100mA	5VDC 100mA	6VDC 1A
Expected life on load example	30 x 10 ³ ops.	30 x 10 ³ ops.	1,000 ops. (plastic seal) 30 x 10 ³ ops. (flux proof)
Coil voltage (DC)	5 to 48V	5 to 48V	5 to 24V
Nominal coil power	1.2W	1.4W	0.9W
Surge strength	6,000V	6,000V	-
Dielectric strength (1 min.)	Open contact 2,500VAC Coil and contacts: 4,000V	Open contact 2,500VAC Coil and contacts: 4,000V	Open contacts: 1,000VAC Coil and contacts: 5,000VAC
Safety standards	uULus, VDE	uULus, VDE	-
Mounting / Enclosure	Through hole / flux proof	Through hole / flux proof	Through hole / plastic seal or flux proof
Terminal layout (bottom view)			

Power relays - 1 pole

Series Name	FTR-F3 (3A)	FTR-F6	FTR-F2
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Description	3A Slim Type Relay	3A Slim Type Relay	5A High Profile Relay
Remarks	<ul style="list-style-type: none"> IEC60695-2-11 types (-GW)** AgNi contacts No polarity on coil terminals 	<ul style="list-style-type: none"> No polarity on coil terminals Conforms to IEC60065 	<ul style="list-style-type: none"> TV-5 rated High sensitive coil types No polarity on coil terminals

Dimensions (Wx L x H mm)	7.0 x 20.3 x 15.0	7.0 x 20.3 x 15.0	11.0 x 24.0 x 25.0
Weight (approx.)	4.0 g	4.0 g	13.0 g
Contact form	1 a	1 a	1 a
Contact rating (resistive load)	3A, 125VAC/30VDC	3A, 125VAC	5A, 250VAC/30VDC
Maximum carrying current	5A	5A	5A
Minimum switching load (ref.)	5VDC 10mA	5VDC 10mA	5VDC 100mA
Electrical life (rated load)	200 x 10 ³ ops.	200 x 10 ³ ops.	100 x 10 ³ ops.
Coil voltage (DC)	5 to 24 V	5 to 24 V	5 to 48 V (sensitive: 5 to 24 V)
Nominal coil power	0.2W	0.2W	0.25 to 0.53 W
Surge strength	10,000 V	10,000 V	10,000 V
Dielectric strength (1 min.)	Open contacts: 750VAC Coil and contacts: 4,000VAC	Open contacts: 750VAC Coil and contacts: 4,000VAC	Open contacts: 1,000VAC Coil and contacts: 4,000VAC
Safety standards	UL, CSA, VDE, CQC	UL, CSA	UL, CSA, VDE, CQC
Mounting / Enclosure	Through hole / plastic seal or flux proof	Through hole / flux proof	Through hole / flux proof

Terminal layout (bottom view)			
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Power relays - 1 pole

Series Name	FTR-F3 (5A)	FTR-F3 (5A TV rating)	FTR-F3 (5A 1 transfer)
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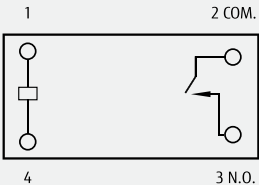
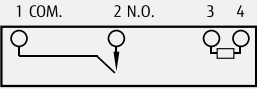
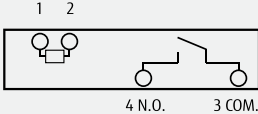


Description	5A Slim Type Relay	5A Slim or Flat Type Relay	5A 1 Transfer Type Relay
Remarks	<ul style="list-style-type: none"> IEC60335-1 types (-GW)** AgNi contacts No polarity on coil terminals Compliant with ATEX directive based on IEC60079-15 	<ul style="list-style-type: none"> Right angle versions available TV-3 or TV-5 rating AgSnO2 contacts No polarity on coil terminals Compliant with ATEX directive based on IEC60079-15 	<ul style="list-style-type: none"> 1 form C type AgNi contacts No polarity on coil terminals




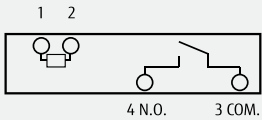
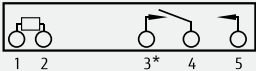
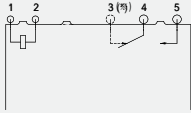
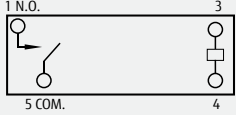
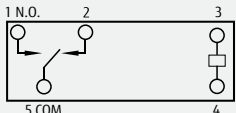
Dimensions (W x L x H mm)	7.0 x 20.3 x 15.0	7.0 x 20.3 x 15.0 (slim) 15.0 x 20.3 x 7.0 (flat)	7.0 x 23.4 x 15.0
Weight (approx.)	4.0 g	6.0 g	6.0 g
Contact form	1a	1 a	1c
Contact rating (resistive load)	5A, 250VAC/30VDC	5A, 250VAC/30VDC	5A, 250VAC/30VDC
Maximum carrying current	5A	5A	5A
Minimum switching load (ref.)	5VDC 10mA	5VDC 10mA	5VDC 10mA
Electrical life (rated load)	100 x 10 ³ ops.	50 x 10 ³ ops.	50 x 10 ³ ops.
Coil voltage (DC)	5 to 24 V	3 to 24 V	5 to 24 V
Nominal coil power	0.2W	0.28W	0.36 W
Surge strength	10,000 V	10,000 V	10,000 V
Dielectric strength (1 min.)	Open contacts: 750VAC Coil and contacts: 4,000VAC	Open contacts: 750VAC Coil and contacts: 4,000VAC	Open contacts: 750VAC Coil and contacts: 4,000VAC
Safety standards	UL, CSA, VDE, CQC	UL, CSA, VDE	UL, CSA, VDE, CQC
Mounting / Enclosure	Through hole / flux proof	Through hole / plastic seal	Through hole / plastic seal

Terminal layout (bottom view)			
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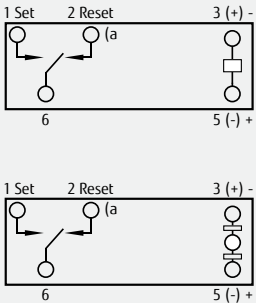
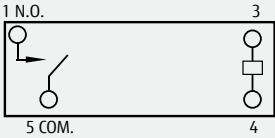
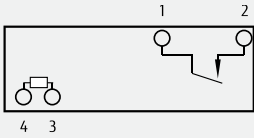
Power relays - 1 pole

Series Name	JV	NY	FTR-MY (110mW)
			
Description	5A Medium Load Relay	5A Slim Type Relay	5A Slim Type Relay
Remarks	<ul style="list-style-type: none"> High sensitive type available No polarity on coil terminals 	<ul style="list-style-type: none"> Socket available (-NYP) Compliant IEC61010, 61131 reinforced insulation Compatible with SN solid state relay No polarity on coil terminals 	<ul style="list-style-type: none"> Compliant to IEC61010-2-201, 61131-2 reinforced insulation UL61010-1, UL61010-2-201, IEC/EN61010-1, IEC/EN61010-2-201 reinforced insulation (up to 277VAC) No polarity on coil terminals Compliant with ATEX directive based on IEC60079-15
Dimensions (W x L x H mm)	10.0 x 17.5 x 12.5	5.0 x 20.1 x 17.5	5.0 x 20.0 x 12.0
Weight (approx.)	4.3 g	3.5 g	2.5 g
Contact form	1 a	1 a	1 a
Contact rating (resistive load)	5A, 250VAC/30VDC	5A, 250VAC/30VDC	5A, 250VAC/30VDC
Maximum carrying current	5A	5A	5A
Minimum switching load (ref.)	5VDC, 100mA	5VDC, 1mA	5VDC 1mA
Electrical life (rated load)	100 x 10 ³ ops.	50 x 10 ³ ops.	50 x 10 ³ ops.
Coil voltage (DC)	3 to 48 V (High sensitive: 3 to 24V)	4.5 to 24 V	4.5 to 24 V
Nominal coil power	0.2 to 0.3 W	0.12 W	0.11 W
Surge strength	10,000 V	5,080 V	5,080 V
Dielectric strength (1 min.)	Open contacts: 750VA Coil and contacts: 5,000VAC	Open contacts: 750VAC Coil and contacts: 3,000VAC	Open contacts: 750VAC Coil and contacts: 3,000VAC
Safety standards	UL, CSA, VDE, CQC	UL, CSA	UL, CSA, VDE, CQC
Mounting / Enclosure	Through hole / plastic seal	Through hole / plastic seal	Through hole / plastic seal
Terminal layout (bottom view)			




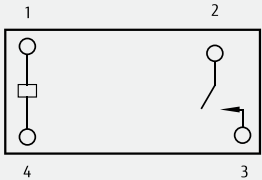
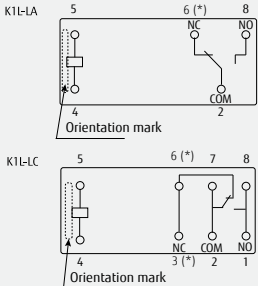
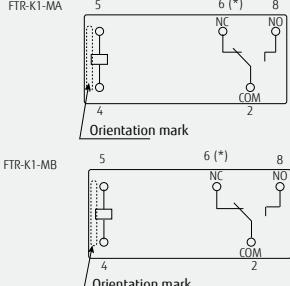
Power relays - 1 pole

Series Name	FTR-MY (150mW)	FTR-LY	JS
			
Description	5A Slim type relay	6A Slim Type Relay	8A Low Profile Relay
Remarks	<ul style="list-style-type: none"> No polarity on coil terminals UL61010-1, UL61010-2-201, IEC/EN61010-1, IEC/EN61010-2-201 reinforced insulation (up to 288VAC) 	<ul style="list-style-type: none"> Ultra slim Socket type available Right angle type available Creepage/clearance $\geq 8\text{mm}$ 	<ul style="list-style-type: none"> 3.2 and 5 mm pitch types Creepage/clearance $\geq 8\text{mm}$ Au plated version available No polarity on coil terminals
Dimensions (W x L x H mm)	5.0 x 20.0 x 12.0	5.0 x 28.0 x 15.0 (straight)	10.0 x 29.0 x 12.5
Weight (approx.)	2.5 g	5.0 g	8.0 g
Contact form	1 a	1 a, 1 c	1 a, 1 c
Contact rating (resistive load)	AC: 5A, 250VAC, DC: 5A, 30VAC	6A, 250VAC/24VDC	8A, 250VAC/24VDC
Maximum carrying current	5A, 30VDC	6A	10A
Minimum switching load (ref.)	5VDC 1mA	5VDC, 10mA (-V type) 5VDC 100mA (-Y, -E type)	5VDC 100mA, 5VDC 10mA (3 μ Au)
Electrical life (rated load)	50 x 10 ³ ops.	30 x 10 ³ ops. NC 50 x 10 ³ ops. NO	20 x 10 ³ ops. to 50 x 10 ³ ops. (Depends on contact material)
Coil voltage (DC)	4.5 to 24 V	5 to 60 V	5 to 60 V
Nominal coil power	0.15 W	0.17 W / 0.217 mW	0.22 to 0.29 W
Surge strength	5,080 V	6,000 V	10,000 V
Dielectric strength (1 min.)	Open contacts: 750VAC Coil and contacts: 3,000VAC	Open contacts: 1,000VAC Coil and contacts: 4,000VAC	Open contacts: 1,000VAC Coil and contacts: 5,000VAC
Safety standards	UL, cUL	UL, CSA, VDE	UL, CSA, VDE, CQC
Mounting / Enclosure	Through hole / plastic seal	Through hole / plastic seal	Through hole / plastic seal
Terminal layout (bottom view)		 (straight)  (right angle) *omitted on 1 form A type	 




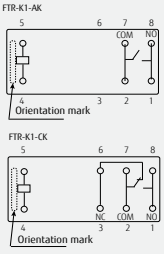
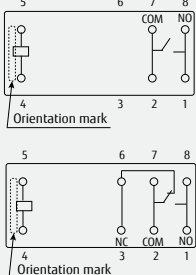
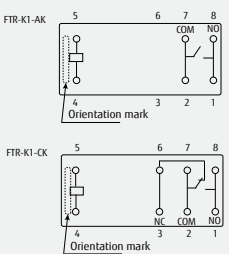
Power relays - 1 pole

Series Name	JSL	JS-KS	FTR-F3 (10A)
			
Description	8A Low Profile Latching Relay	8A Low Profile High Inrush Relay	10A Slim Type Relay
Remarks	<ul style="list-style-type: none"> Latching type 1 and 2 coil types available 3.2mm pitch Creepage/clearance ≥8mm Polarized coil terminals 	<ul style="list-style-type: none"> 1,000W lamp load 65A inrush 5mm pitch Creepage/clearance ≥8mm TV-4 rated 	<ul style="list-style-type: none"> AgNi contacts No polarity on coil terminals
Dimensions (W x L x H mm)	10.0 x 29.0 x 12.5	10.0 x 29.0 x 12.5	7.0 x 20.3 x 15.0
Weight (approx.)	8.0 g	8.0 g	4.0 g
Contact form	1 a, 1 c	1 a	1 a
Contact rating (resistive load)	8A, 250VAC/24VDC	8A, 250VAC/24VDC	10A, 250VAC
Maximum carrying current	10A	10A	10A
Minimum switching load (ref.)	5VDC 100mA	5VDC 100mA	5VDC 100mA
Electrical life (rated load)	50 x 10 ³ ops.	100 x 10 ³ ops @ rated load 25 x 10 ³ ops. @ lamp load (TV-4)	50 x 10 ³ ops. (flux proof type) 10 x 10 ³ ops (plastic sealed type)
Coil voltage (DC)	3 to 24 V	5 to 60 VDC	5 to 24 V
Nominal coil power	0.22 to 0.25 (1coil), 0.48 (2 coils)	0.22 to 0.29 W	0.2 W
Surge strength	10,000 V	10,000 V	10,000 V
Dielectric strength (1 min.)	Open contacts: 1,000VAC Coil and contacts: 5,000VAC	Open contacts: 1,000VAC Coil and contacts: 5,000VAC	Open contacts: 750VAC Coil and contacts: 4,000VAC
Safety standards	UL, CSA, VDE	UL, CSA	UL, CSA, VDE, CQC
Mounting / Enclosure	Through hole / plastic seal	Through hole / plastic seal	Through hole / plastic seal or flux proof
Terminal layout (bottom view)	 <p>(a omitted on 1 a types)</p>		




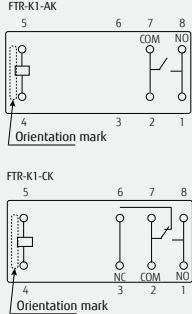
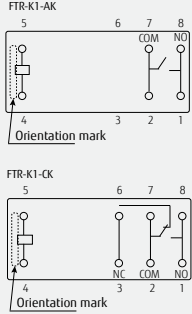
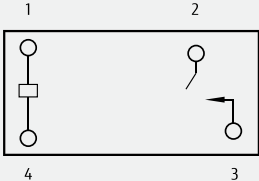
Power relays - 1 pole

Series Name	FTR-H2	FTR-K1-LA / LB		FTR-K1-MA / MB	
					
Description	10A High Profile Relay	10A High Sensitive Type		12A Type	
Type	FTR-H2	FTR-K1AL() W-(LA, LB)	FTR-K1CL() W-(LA, LB)	FTR-K1AK() W-(MA;MB)	FTR-K1CK() W-(MA;MB)
Remarks	<ul style="list-style-type: none"> 1,000W lamp load Highly sensitive types available Creepage/clearance ≥6mm No polarity on coil terminals TV-5 rated 	<ul style="list-style-type: none"> Clear cover types (-RG) Gold plated contact types (-BG) 3.5mm pitch LA type 5mm pitch LB type Creepage/clearance 10mm No polarity on coil terminals 		<ul style="list-style-type: none"> Au plated types (-BG) Clear cover types (-RG) ≥3.5mm pitch MA type 5mm pitch MB type Creepage/clearance ≥10mm No polarity on coil terminals 	
Dimensions (W x L x H mm)	11.0 x 24.0 x 25.0	12.7 x 29.0 x 15.7		12.7 x 29.0 x 15.7	
Weight (approx.)	13.0 g	13.0 g		13.0 g	
Contact form	1 a	1 a	1 c	1 a	1 c
Contact rating (resistive load)	10A, 250VAC/30VDC	10A, 250VAC		12A, 250VAC/24VDC	
Maximum carrying current	10A	14A		14A	
Minimum switching load (ref.)	5VDC 100mA	5VDC 100mA		5VDC 100mA	
Electrical life (Rated load)	100 x 10 ³ ops. @ rated load 25 x 10 ³ ops. @ lamp load TV-5)	100 x 10 ³ ops. (LA), 150 x 10 ³ ops. (LB)	100 x 10 ³ ops. (LA, LB)	100 x 10 ³ ops. (AC) 100 x 10 ³ ops. (DC)	
Coil voltage (DC)	5 to 48 V (High sensitive: 5 to 24V)	5 to 48 V		5 to 110 V	
Nominal coil power	0.25 to 0.53 W	0.25 W		0.4 W / 0.43 W	
Surge strength	10,000 V	10,000 V		10,000 V	
Dielectric strength (1 min.)	Open contacts: 1,000VAC Coil and contacts: 4,000VAC	Open contacts: 1,000VAC Coil and contacts: 5,000VAC		Open contacts: 1,000VAC Coil and contacts: 5,000VAC	
Safety standards	UL, CSA, VDE, CQC	UL, CSA, VDE		UL, CSA, VDE	
Mounting / Enclosure	Through hole / flux proof	Through hole / flux proof		Through hole / flux proof	
Terminal layout (bottom view)		 <p>(*): No 3 & 6 are omitted on 1a</p>		 <p>(*): No 6 is omitted on 1a</p>	

Power relays - 1 pole

Series Name	FTR-K1		FTR-K1-E		FTR-K1-KS	
						
Description	16A Inrush 80A Type		16A AgNi Contact		16A Inrush 120A Type	
Type	FTR-K1AK()T	FTR-K1CK()W	FTR-K1AK()E	FTR-K1CK()E	FTR-K1AK()T-KS	FTR-K1CK()T-KS
Remarks	<ul style="list-style-type: none"> ■ Au plated types (-BG) ■ Creepage/clearance $\geq 10\text{mm}$ ■ UL-TV-5 (N.O.) ■ IEC60335-1 type (-GW) available** ■ Transparent cover available ■ No polarity on coil terminals ■ Compliant w/ ATEX directive based on IEC60079-1 		<ul style="list-style-type: none"> ■ Contact material AgNi ■ Clear cover types (-RG) available ■ 5mm pitch ■ Creepage/clearance $\geq 10\text{mm}$ ■ No polarity on coil terminals 		<ul style="list-style-type: none"> ■ 5mm pitch ■ Creepage/clearance $\geq 10\text{mm}$ ■ UL TV-8 (N.O.) ■ No polarity on coil terminals ■ IEC600335-1 type (-GW) available** 	
Dimensions (W x L x H mm)	12.7 x 29.0 x 15.7		12.7 x 29.0 x 15.7		12.7 x 29.0 x 15.7	
Weight (approx.)	13.0 g		13.0 g		13.0 g	
Contact form	1 a	1 c	1 a	1 c	1 a	1 c
Contact rating (Resistive load)	16A, 250VAC/24VDC		16A, 250VAC/24VDC		16A, 250VAC	
Maximum carrying current	20A		20A		20A	
Minimum switching load (ref.)	5VDC 100mA		5VDC 100mA		5VDC 100mA	
Electrical life (Rated load)	100 x 10 ³ ops. (AC)	50 x 10 ³ ops. (AC)	100 x 10 ³ ops. (AC)	50 x 10 ³ ops. (AC)	100 x 10 ³ ops. (AC)	30 x 10 ³ ops. (AC)
	100 x 10 ³ ops. (DC)	30 x 10 ³ ops. (DC)	100 x 10 ³ ops. (DC)	30 x 10 ³ ops. (DC)	25 x 10 ³ ops. (TV-8)	25 x 10 ³ ops. (TV-8) (N.O.)
Coil voltage (DC)	5 to 110 VDC		5 to 110 V		5 to 110 V	
Nominal coil power	0.4 to 0.43W		0.4 to 0.43 W		0.4 to 0.43 W	
Surge strength	10,000 V		10,000 V		10,000 V	
Dielectric strength (1 min.)	Open contacts: 1,000VAC Coil and contacts: 5,000VAC		Open contacts: 1,000VAC Coil and contacts: 5,000VAC		Open contacts: 1,000VAC Coil and contacts: 5,000VAC	
Safety standards	UL, CSA, VDE, CQC		UL, CSA, VDE		UL, CSA, VDE	
Mounting / Enclosure	Through hole / flux proof		Through hole / flux proof		Through hole / flux proof	
Terminal layout (bottom view)						

Power relays - 1 pole




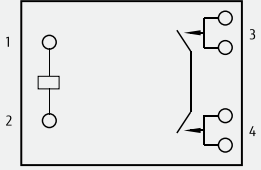
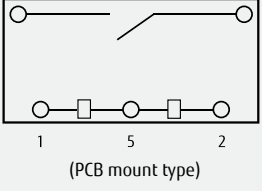
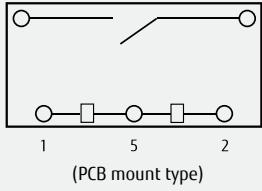
Series Name	FTR-K1-HT		FTR-K1-KW		FTR-K2
					
Description	16A High Temperature 105°C Type		16A Plastic Sealed 105°C Type		16A High Profile Relay
Type	FTR-K1AK() J-HT	FTR-K1CK() W-HT	FTR-K1AK() W-KW	FTR-K1CK() W-KW	FTR-K2AK-T
Remarks	<ul style="list-style-type: none"> 5mm pitch Creepage/clearance ≥10mm UL TV-5 (1a) EC60335-1 type (-GW) available** No polarity on coil terminals Compliant with ATEX directive based on IEC60079-1 		<ul style="list-style-type: none"> 5mm pitch Creepage/clearance ≥10mm No polarity on coil terminals Compliant with ATEX directive based on IEC60079-15 		<ul style="list-style-type: none"> TV-5 or TV-8 rated 1mm contact gap types available 3.5mm pitch No polarity on coil terminals
Dimensions (W x L x H mm)	12.7 x 29.0 x 15.7		12.7 x 29.0 x 15.7		11.0 x 24.0 x 25.0
Weight (approx.)	13.0 g		13.0 g		13.0 g
Contact form	1 a	1 c	1 a	1 c	1 a
Contact rating (resistive load)	16A, 250VAC/24VDC		16A, 250VAC		16A, 250VAC / 30VDC
Maximum carrying current	20A		20A		16A
Minimum switching load (ref.)	5VDC 100mA		5VDC 100mA		5VDC 100mA
Electrical life (rated load)	100 x 10 ³ ops. (AC) 100 x 10 ³ ops.(DC) 25 x 10 ³ ops. (1a / TV-5)	50 x 10 ³ ops. (AC) 30 x 10 ³ ops. (DC)	20 x 10 ³ ops. (AC)	10 x 10 ³ ops. (AC)	100 x 10 ³ ops. 25 x 10 ³ ops. (lamp load TV-5)
Coil voltage (DC)	5 to 110 VDC		5 to 110 V		3 to 48 V
Nominal coil power	0.4 to 0.43W		0.4 to 0.43W		0.53 W
Surge strength	10,000 V		10,000 V		10,000 V
Dielectric strength (1 min.)	Open contacts: 1,000VAC Coil and contacts: 5,000VAC		Open contacts: 1,000VAC Coil and contacts: 5,000VAC		Open contacts: 1,000VAC Coil and contacts: 4,000VAC
Safety standards	UL, VDE, CSA		UL, VDE, CSA		UL, CSA, VDE, CQC
Mounting / Enclosure	Through hole / flux proof		Through hole / plastic seal		Through hole / flux proof
Terminal layout (bottom view)					

** Please contact us for further information




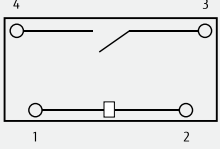
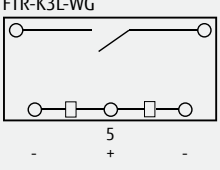
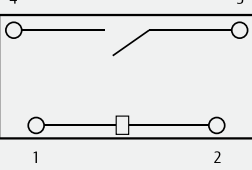
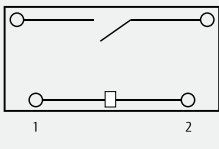
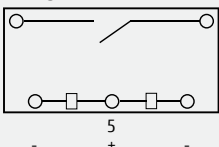
Power relays - 1 pole

Series Name	FTR-K2G	FTR-K1-HA	FTR-K3
			 
Description	20A 3mm Wide Contact Gap Relay	20A High Ampere Relay	20 - 25A Heavy Load Relay
Type	FTR-K2G	FTR-K1-HA	FTR-K3
Remarks	<ul style="list-style-type: none"> TV-8 rated 3mm contact gap Peak inrush 120A No polarity on coil terminals 	<ul style="list-style-type: none"> No polarity on coil terminals UL class F coil wire 	<ul style="list-style-type: none"> Tab terminal types (J) High isolation type (-LS) High current type (-HC) PCB mount types (A) IEC60335-1 type (-GW) available** No polarity on coil terminals
Dimensions (W x L x H mm)	16.0 x 35.0 x 28.0	12.7 x 29.0 x 15.7	15.7 x 30.1 x 23.3
Weight (approx.)	34.0 g	13.0 g	25.0 g
Contact form	1 a	1 a	1a
Contact rating (resistive load)	20A, 250VAC	20A, 250VAC	20A, 250VAC 25A, 250VAC (-HC)
Maximum carrying current	25A	24A	25A
Minimum switching load (ref.)	5VDC 100mA	5VDC 100mA	5VDC 100mA
Electrical life (rated load)	100 x 10 ³ ops. 25 x 10 ³ ops. (lamp load TV-8)	30x 10 ³ ops.	100 x 10 ³ ops.
Coil voltage (DC)	5 to 110 V	5 to 18 V	5 to 48 V
Nominal coil power	0.93 to 1.05 W	0.4 W	0.78 W
Surge strength	10,000 V	10,000 V	8,500 V
Dielectric strength (1 min.)	Open contacts: 2,000VAC Coil and contacts: 5,000VAC	Open contacts: 1,000VAC Coil and contacts: 5,000VAC	Open contacts: 1,000VAC Coil and contacts: 5,000VAC
Safety standards	VDE, cULus	UL, CSA, VDE, CQC	UL, CSA, VDE, CQC, TÜV
Mounting / Enclosure	Through hole / flux proof	Through hole / flux proof	Through hole / flux proof
Terminal layout (bottom view)			




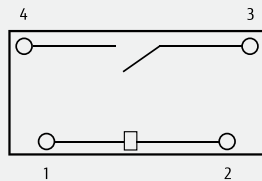
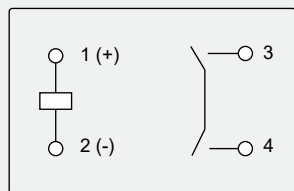
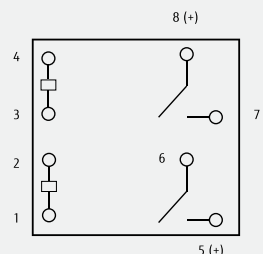
Power relays - 1 pole

Series Name	FTR-E1	FTR-K3L	FTR-K3LV
			
Description	20/30A high voltage DC relay	25A Heavy Load Latching Relay	32A Heavy Load Latching Relay
Type	FTR-E1	FTR-K3L	FTR-K3LV
Remarks	<ul style="list-style-type: none"> cULus recognized types available Polarized on coil terminals No polarity on coil terminals 	<ul style="list-style-type: none"> 2 coil latching type Tab terminal types (J) and PCB mount types (A) Polarized coil terminals 	<ul style="list-style-type: none"> 2 coil latching type 32A screw terminal type Polarized coil terminals
Dimensions (W x L x H mm)	28.3 x 43.6 x 36.8	15.7 x 30.1 x 23.3	15.7 x 30.1 x 23.3
Weight (approx.)	75.0 g	25.0 g	27.0 g
Contact form	1a (1 Form X)	1a	1a
Contact rating (resistive load)	20A 450VDC (20A type) 30A 450VDC (30A type) 10A 1,000VDC (20/30A type)	25A, 250VAC	32A 250VAC
Maximum carrying current	40A (at 85°C)	30A	32A
Minimum switching load (ref.)	6VDC, 1A	5VDC 100mA	5VDC 100mA
Electrical life (rated load)	10 x 10 ³ ops.(20A 450VDC)* 5 x 10 ³ ops. (30A 450VDC) * * with varistor"	100 x 10 ³ ops.	30 x 10 ³ ops. (cosφ=0.8)
Coil voltage (DC)	12, 24V	5 to 24 V	5 to 48V
Nominal coil power	0.9W	0.9mW	1.2W
Surge strength	-	8,500 V	6,000V
Dielectric strength (1 min.)	Open contacts: 2,500VAC Coil and contacts: 5,000VAC	Open contacts: 1,000VAC Coil and contacts: 5,000VAC	Open contacts: 2,500VAC Coil and contacts: 4,000VAC
Safety standards	-	cULus, VDE	No safety standard
Mounting / Enclosure	Through hole / plastic seal	Through hole / flux proof	Through hole / flux proof
Terminal layout (bottom view)			




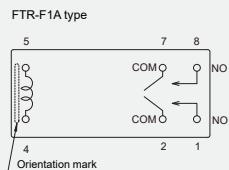
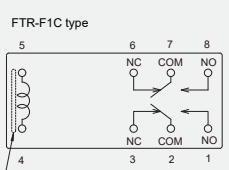
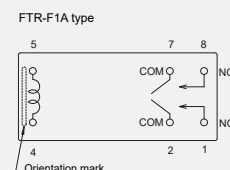
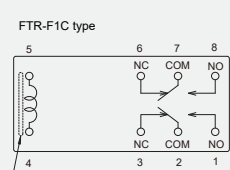
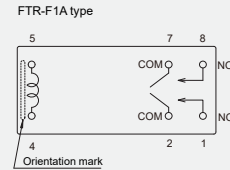
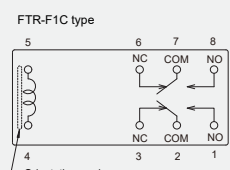
Power relays - 1 pole

Series Name	FTR-K3-WG	FTR-K3-WS	FTR-K3-PV
			
Description	25A 1.5mm Contact Gap Relay	25A 1.8mm Contact Gap Relay	32A 1.5mm Contact Gap Relay
Type	FTR-K3-WG	FTR-K3-WS	FTR-K3-PV
Remarks	<ul style="list-style-type: none"> 1.5mm contact gap 2 coil latching type available (FTR-K3L-WG) Conform to VDE0126 No polarity on coil terminal (latching: polarized) 	<ul style="list-style-type: none"> 1.8mm contact gap Conform to VDE0126 No polarity on coil terminal 	<ul style="list-style-type: none"> High capacity 32A 1.5mm contact gap 2 coil latching type available (FTR-K3L-PV) Conform to VDE0126 No polarity on coil terminals (latching: polarized)
Dimensions (W x L x H mm)	15.7 x 30.1 x 23.3	15.7 x 30.1 x 23.3	15.7 x 30.1 x 23.3
Weight (approx.)	25.0 g	25.0 g	26.0 g
Contact form	1 a	1 a	1 a
Contact rating (resistive load)	25A, 250VAC	25A, 250VAC	32A, 250VAC
Maximum carrying current	25A	25A	32A
Minimum switching load (ref.)	5VDC 100mA	5VDC 100mA	5VDC 100mA
Electrical life (Rated load)	100 x 10 ³ ops.	30 x 10 ³ ops.	30 x 10 ³ ops.
Coil voltage (DC)	5 to 48 V	5 to 48 V	5 to 48 V
Nominal coil power	0.78 W	1.2 W	1.2 W
Surge strength	8,500 V	8,500 V	6,000 V
Dielectric strength (1 min.)	Open contacts: 2,500VAC Coil and contacts: 5,000VAC	Open contacts: 2,500VAC Coil and contacts: 5,000VAC	Open contacts: 2,500VAC Coil and contacts: 4,000VAC
Safety standards	UL, VDE, CQC	UL, VDE	UL, VDE
Mounting / Enclosure	Through hole / flux proof	Through hole / flux proof	Through hole / flux proof
Terminal layout (bottom view)	<p>FTR-K3-WG</p>  <p>FTR-K3L-WG</p> 		<p>FTR-K3-PV</p>  <p>FTR-K3L-PV</p> 



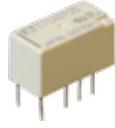
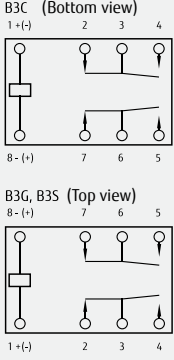
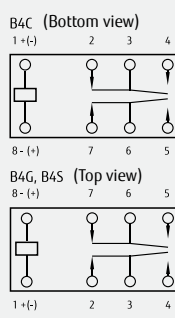
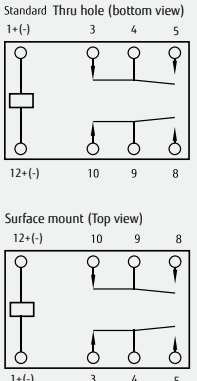
Power relays - 1 pole

Series Name	FTR-K3-PS	FTR-E1-HC	FTR-J2
			
Description	32A 1.8mm Contact Gap Relay	High Voltage DC Switching Relay	10A, 450VDC Small High Voltage DC Relay
Type	FTR-K3-PS	FTR-E1-HC	FTR-J2
Remarks	<ul style="list-style-type: none"> ■ High capacity 32A ■ 1.8mm contact gap ■ Conform to VDE0126 ■ No polarity on coil terminals 	<ul style="list-style-type: none"> ■ Polarized coil terminals ■ No polarity on contacts ■ Switchable for charge/discharge circuit 	<ul style="list-style-type: none"> ■ Special arc extinguishing provision ■ 150A inrush per contact ■ Polarized contact terminals ■ No polarity on coil terminals
Dimensions (W x L x H mm)	15.7 x 30.1 x 23.3	28.3 x 43.6 x 36.8	23.5 x 24.0 x 27.0
Weight (approx.)	26.0 g	80.0 g	26.0 g
Contact form	1 a	1 a	1a x 2
Contact rating (resistive load)	32A, 250VAC	DC: 60A 450VDC 10A, 1000VDC	10A, 200VDC (use NO contact independently) or 10A, 450VDC
Maximum carrying current	32A	60A	12A
Minimum switching load (ref.)	5VDC 100mA	6VDC 1A	5VDC, 100mA
Electrical life (rated load)	30 x 10 ³ ops.	500 ops. at 450VDC 60A resistive with suppression device	10 x 10 ³ ops.
Coil voltage (DC)	5 to 48 V	12, 24 V	5 to 24 V
Nominal coil power	1.4 W	1.2 W	0.53W each contact
Surge strength	6,000 V	-	10,000 V
Dielectric strength (1 min.)	Open contacts: 2,500VAC Coil and contacts: 4,000VAC	Open contacts: 2,500VAC Coil and contacts: 5,000VAC	Open contacts: 1,000VAC Coil and contacts: 4,000VAC
Safety standards	UL, VDE	cULus, TUV	UL, VDE
Mounting / Enclosure	Through hole / flux proof	Through hole / plastic seal	Through hole / flux proof
Terminal layout (bottom view)			

Power relays - 2 poles

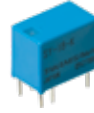
Series Name	FTR-F1 (5A)	FTR-F1 (8A)	FTR-F1L
			
Description	2 poles, 5A Low Profile Relay	2 poles, 8A Low Profile Relay	2 poles 8A Low Profile Latching Relay
Remarks	<ul style="list-style-type: none"> Pin compatible with VB series TV-3 rating available (2a) Clear cover available (-RG) Sensitive coil types No polarity on coil terminals 	<ul style="list-style-type: none"> Pin compatible with VB series TV-3 rating available (2a) Clear cover available (-RG) Sensitive coil types available No polarity on coil terminals 	<ul style="list-style-type: none"> Latching relay 1 and 2 coil types Polarized coil terminals
Dimensions (W x L x H mm)	12.8 x 29.0 x 16.5	12.8 x 29.0 x 16.5	12.8 x 29.0 x 16.5
Weight (approx.)	12.0 g	12.0 g	13.0 g
Contact form	2 a, 2 c	2 a, 2 c	2 a, 2 c
Contact rating (resistive load)	5A, 250VAC/24VDC	8A, 250VAC/24VDC	8A, 250VAC/24VDC
Maximum carrying current	7A	8A	8A
Minimum switching load (ref.)	5VDC 10mA	5VDC 10mA	5VDC 10mA
Electrical life (rated load)	100 x 10 ³ ops.	50 x 10 ³ ops.	50 x 10 ³ ops.
Coil voltage (DC)	1.5 to 110 V (High sensitive: 1.5 to 48V)	1.5 to 110 V (High sensitive: 1.5 to 48V)	5 to 24 V
Nominal coil power	0.4 to 0.55 W	0.4 to 0.55 W	0.4 to 0.6 W
Surge strength	10,000 V	10,000 V	10,000 V
Dielectric strength (1 min.)	Open contacts: 1,000VAC Coil and contacts: 5,000VAC	Open contacts: 1,000VAC Coil and contacts: 5,000VAC	Open contacts: 1,000VAC Coil and contacts: 5,000VAC
Safety standards	UL, CSA, VDE, CQC	UL, CSA, VDE	UL, CSA, VDE, CQC
Mounting / Enclosure	Through hole / plastic seal	Through hole / flux proof	Through hole / plastic seal
Terminal layout (bottom view)	<p>FTR-F1A type</p>  <p>FTR-F1C type</p> 	<p>FTR-F1A type</p>  <p>FTR-F1C type</p> 	<p>FTR-F1A type</p>  <p>FTR-F1C type</p> 

Signal relays

Series Name	FTR-B3	FTR-B4	FTR-C1
			
Description	2A Low Profile Relay	2A Slim Type Relay	2A Miniature Relay
Remarks	<ul style="list-style-type: none"> Latching type available Space saver versions available THT and SMT versions Polarized coil terminals 	<ul style="list-style-type: none"> Latching type available Space saver versions available THT and SMT versions Polarized coil terminals 	<ul style="list-style-type: none"> Latching type available Contact gap 0.6mm Creepage ≥ 2.5mm, clearance ≥ 2.0mm Polarized coil terminals
Dimensions (W x L x H mm)	7.2 x 10.6 x 5.25 (SMT)	5.7 x 10.6 x 9.7 (SMT)	7.4 x 14.9 x 9.1 (THT)
Weight (approx.)	0.85 g	1.0 g	2.0 g
Contact form	2 c	2 c	2 c
Contact rating (resistive load)	0.3A 125VAC 1A 30VDC	0.3A 125VAC 1A 30VDC	0.3A 125VAC 1A 30VDC
Maximum carrying current	2A	2A	2A
Minimum switching load (ref.)	10mVDC 0.01mA	10mVDC 0.01mA	10mVDC 0.01mA
Electrical life (rated load)	100 x 10 ³ ops.	100 x 10 ³ ops.	100 x 10 ³ ops.
Coil voltage (DC)	1.5 to 24 V	1.5 to 24 V	3 to 24 V
Nominal coil power	0.1 to 0.23 W	0.1 to 0.23 W	0.14 to 0.3 W
Surge strength	2,500 V	2,500 V	5,000 V
Dielectric strength (1 min.)	Open contacts: 1,000VAC Coil and contacts: 1,500VAC	Open contacts: 1,000VAC Coil and contacts: 1,500VAC	Open contacts: 1,500VAC Coil and contacts: 3,000VAC
Safety standards	UL, CSA, BSI, FCC68, Telcordia, IEC60950-1	UL, CSA, BSI, FCC68, Telcordia, IEC60950-1	UL, CSA, BSI, Telcordia
Mounting / Enclosure	Through hole / surface mount / plastic seal	Through hole / surface mount / plastic seal	Through hole / surface mount / plastic seal
Terminal layout (bottom view)	 <p>B3C (Bottom view) 1+(-) 2 3 4 8-(-) 7 6 5</p> <p>B3G, B3S (Top view) 8-(-) 7 6 5 1+(-) 2 3 4</p>	 <p>B4C (Bottom view) 1+(-) 2 3 4 8-(-) 7 6 5</p> <p>B4G, B4S (Top view) 8-(-) 7 6 5 1+(-) 2 3 4</p>	 <p>Standard Thru hole (bottom view) 1+(-) 3 4 5 12+(-) 10 9 8</p> <p>Surface mount (Top view) 12+(-) 10 9 8 1+(-) 3 4 5</p>

Signal relays

Series Name	FTR-C2	SY	RY
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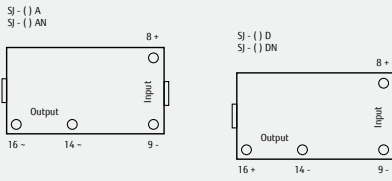
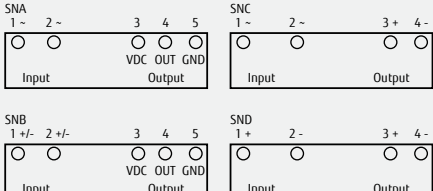


Description	2A Miniature Relay	1 to 2A Slim Type Relay	1 to 2A Signal Relay
Remarks	<ul style="list-style-type: none"> Contact gap 2mm Creepage ≥ 2.5mm, clearance ≥ 2.0mm THT and SMT versions Polarized coil terminals 	<ul style="list-style-type: none"> DIL pitch terminals Single or bifurcated contact types No polarity on coil terminals 	<ul style="list-style-type: none"> High dielectric strength types No polarity on coil terminals

Dimensions (W x L x H mm)	9.85 x 20.05 x 11.7 (SMT)	7.4 x 12.5 x 9.5	9.8 x 20.2 x 12.5
Weight (approx.)	3.7 g	1.7 g	5.0 g
Contact form	2 c	1 c	2 c
Contact rating (Resistive load)	0.3A 125VAC 1A 30VDC	0.5A 120VAC, 1A 24VDC	0.5 120VAC, 1A 24VDC (RY-W, WZ) 0.25A 120VAC, 1A 24VDC (RY-WF) 0.4A 120VAC, 2A 30VDC (RY-WFZ)
Maximum carrying current	2A	2A	1.25 A, 2A (WFZ)
Minimum switching load (ref.)	10mVDC 0.01mA	100mVDC, 0.1mA (SY-W) 1VDC 1mA (SY)	10mVDC 0.01mA
Electrical life (Rated load)	100 x 10 ³ ops.	100 x 10 ³ ops.	100 x 10 ³ ops. (WFZ) (DC) 200 x 10 ³ ops. (W, WZ) (AC) 500 x 10 ³ ops. (W, WZ, WF) (DC) 500 x 10 ³ ops. (WF) (AC)
Coil voltage (DC)	3 to 24 V	1.5 to 24 V	3 to 48 V
Nominal coil power	0.15 to 0.3 W	0.15 to 0.175 W	0.15 to 0.58 W
Surge strength	2,500 V	1,500 V	1,500 V
Dielectric strength (1 min.)	Open contacts: 1,500VAC Coil and contacts: 2,000VAC	Open contacts: 300/400VAC Coil and contacts: 1,000VAC	Open contacts: 500VAC (W, WZ, WFZ) 1,000VAC (WF) Coil and contacts: 1,000VAC
Safety standards	UL, CSA, BSI, Telcordia, IEC60950-1	UL, CSA, FCC68	UL, CSA, FCC68
Mounting / Enclosure	Through hole / surface mount / plastic seal	Through hole / plastic seal	Through hole / plastic seal

Terminal layout (bottom view)	FTR-C2	SY	RY

Solid State relays

Series Name		SJ				SN					
											
Description		1A AC/DC SSR				1A AC/DC SSR					
Remarks		<ul style="list-style-type: none"> ■ Pin compatible with JY ■ Internal surge absorber ■ Polarized coil terminals 				<ul style="list-style-type: none"> ■ Pin compatible with NY ■ Internal surge absorber ■ Socket available ■ Polarized coil terminals 					
Dimensions (W x L x H mm)		10.0 x 20.0 x 12.8				5.0 x 20.0 x 17.0					
Module		-				Input (AC)	Input (DC)	Output (AC)	Output (DC)		
Weight (approx.)		5.5 g				2.0 g	3.3 g	3.5 g	2.9 g		
Current		1.0 A						1A			
Voltage type		AC		DC		AC	DC	AC	DC		
Nominal Voltage		3, 5, 12, 24 VDC		5, 12, 24 VDC		100 /200 VAC	12, 24 VDC	3, 5, 12, 24 VDC	5, 12, 24 VDC		
Input side	Impedance	3 V	130 Ω	-	-	-	-	3 V	130 Ω	-	-
		5 V	330 Ω	5 V	430 Ω	-	-	5 V	330 Ω	5 V	390 Ω
		12 V	1.0k Ω	12 V	1.2k Ω	-	-	12 V	1.1k Ω	12 V	1.2k Ω
		24 V	2.2k Ω	24 V	2.4k Ω	-	-	24 V	2.2k Ω	24 V	2.4k Ω
Output side	Load voltage range	24 to 265 V rms		3 to 30 VDC		4 to 6 VDC		24 to 265 V rms		3 to 30 VDC	
	Max. load current	1.0A rms		1.0A		±4 mA (VDD=5 V)	±0.4 mA (VDD=5 V)	1.0A rms		1.0A	
	Min. load current	10 mA rms		1 mA		-	-	10 mA rms		1 mA	
	1 cycle surge current	50 A		3.0 A (10ms)		-	-	50 A		3 A (10ms)	
	Max. off-state leakage current	0.75 / 1.5 mA rms		0.1 mA		-	-	1.5/3.0 mA rms		0.1 mA	
	Max. on-state voltage drop	1.2 V rms		1.2 V		-	-	1.2 V rms		1.2 V	
Max. operating time		1 ms				25 ms	10 ms	1 ms			
Max. release time		1/2 cycle + 1 ms	1 ms			30 ms	10 ms	1/2 cycle + 1 ms	1 ms		
Operating temperature		-30°C to +85°C				-30°C to +85°C					
Storage temperature		-40°C to +100°C				-40°C to +100°C					
Dielectric strength (I/O)		2,500 V rms				2.500 V rms					
Safety standards		-				-					
Mounting		Through hole / plastic seal				Through hole / plastic seal / flux proof					
Terminal layout (bottom view)											

Reference

Contact forms

Pole and throw

Since relays are switches, the terminology applied to switches is also applied to relays; a relay switches one or more poles, each of whose contacts can be thrown by energizing the coil in one of three ways:

Normally-open (NO)

Normally-open (NO) contacts connect the circuit when the relay is activated; the circuit is disconnected when the relay is inactive. It is also called a Form A contact or "make" contact. NO contacts may also be distinguished as "early-make" or NOEM, which means that the contacts close before the button or switch is fully engaged.

Normally-closed (NC)

Normally-closed (NC) contacts disconnect the circuit when the relay is activated; the circuit is connected when the relay is inactive. It is also called a Form B contact or "break" contact. NC contacts may also be distinguished as "late-break" or NCLB, which means that the contacts stay closed until the button or switch is fully disengaged.

Change-over (CO), or double-throw (DT)

Change-over (CO), or double-throw (DT), contacts control two circuits: one normally-open contact and one normally-closed contact with a common terminal. It is also called a Form C contact or "transfer" contact ("break before make"). If this type of contact utilizes a "make before break" functionality, then it is called a Form D contact.

Designations

SPST – Single Pole Single Throw

These have two terminals which can be connected or disconnected. Including two for the coil, such a relay has four terminals in total. It is ambiguous whether the pole is normally open or normally closed. The terminology "SPNO" and "SPNC" is sometimes used to resolve the ambiguity.

SPDT – Single Pole Double Throw

A common terminal connects to either of two others. Including two for the coil, such a relay has five terminals in total.

DPST – Double Pole Single Throw

These have two pairs of terminals. Equivalent to two SPST switches or relays actuated by a single coil. Including two for the coil, such a relay has six terminals in total. The poles may be Form A or Form B (or one of each).

DPDT – Double Pole Double Throw

These have two rows of change-over terminals. Equivalent to two SPDT switches or relays actuated by a single coil. Such a relay has eight terminals, including the coil.

Contacts

Contact Resistance

Statistical value. Specifies the total resistance of the closed contacts, terminals and contact springs, in milli-Ohms (or max Voltage drop) Not reproducible value. Sometimes the measuring condition is specified e.g. 6V/1A.

Contact Rating

The resistive Voltage and Ampere rating of a contact.

Max Switching Voltage

The max open circuit voltage that can be safely switched by the contacts to reach the limiting switching cycles. AC and DC voltages may differ.

Max Switching current

The max inrush current that can be safely switched by the contacts. <0.5sec. Meeting the specified number of making cycles. AC and DC currents may differ.

Max carry current

The current that can safely be carried by the contacts without causing damage due to overheating.

Max Switching Power

The max power in Watts or VA that can be safely switched by the contacts.

Coil Values

Coil Voltage

Nominal voltage to be applied to the coil terminals, to assure reliable operation, maintaining all specifications

Coil Resistance

Nominal resistance measured in Ohms @ 20C or 23C. In most cases tolerance is +/- 10%.

Coil Power

The Voltage-current product of the coil indicating the dissipation (Heat) of the coil in Watts @ nominal coil voltage at 20C. (Short time value)

Coil Inductance

Inductance of the relay coil in [H or mH]. Normally not mentioned in the specifications, but can be important for designers.

Coil operating temperature

Indicating temp. Operating range of the coil. Is depending on the used coil wire temperature class and used relay materials. Coil temperature is an important parameter to calculate the actual operating voltage of the relay. (See operating range graphs in the relay specifications)



About Us

With over 100 years of experience in design and development, FCL Components' customer centric approach has resulted in high quality products fully adapted to customer and market requirements

We collaborate with in-house specialists and have a team of experts supporting customers around the globe.

Our overall product portfolio covers IoT solutions, wireless modules, touch panels, printers and relays.

Quality is the key word describing FCL Components' relays. The relay product range covers automotive, power, signal, high frequency and solid state relays. The relays are available in a wide range of variations such as slim line, ultra quiet and low power consumption. Through continued research and development FCL Components keeps expanding its product range.

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