



FCL Components

RELAYS

Automotive, Power, Signal, Solid State





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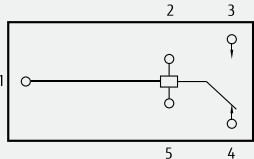
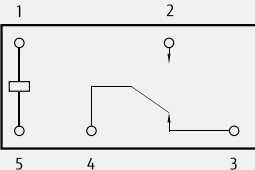
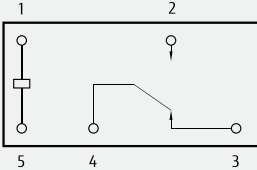
Contact	Page 31
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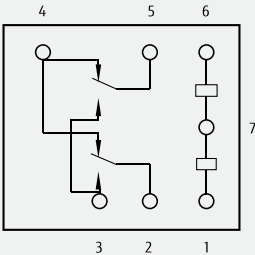
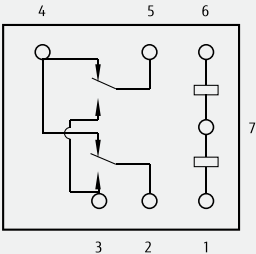
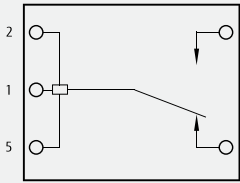
Relays with this logo are available as “Glow Wire” versions. (-GW)
These relays are IEC60335-1 compliant.

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/>

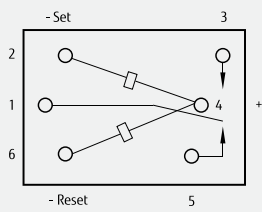
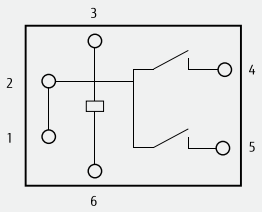
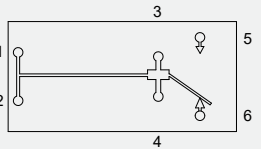
Automotive relays (12V car battery, 25A)

Series Name	FTR-G1	FTR-P3	FTR-P5
			
Description	25A Compact Relay	25A Compact Relay	25A Low Noise Compact Relay
Features	0.25mm contact gap - Average acoustic noise level 60dB @ 5cm - No polarity on coil terminals	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	- Pin compatible wit 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	7.2x17.4x13.5, (THR:7.2x17.4x14.1)	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	0.640 W	0.6 W / 0.8 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	

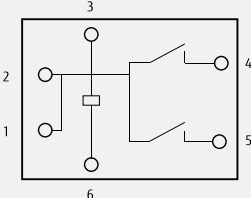
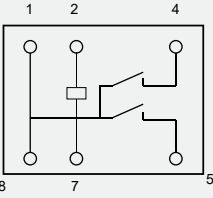
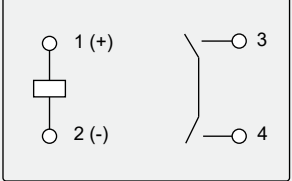
Automotive relays (12V car battery, 25A)

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	0.25mm contact gap - Pin compatible with FTR-P2 - No polarity on coil terminals	- Pin compatible wit FTR-P34 - Average acoustic noise level 50dB @ 5cm - No polarity on coil terminals	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 cx2 (H-bridge)	1c 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, 25A ~ 40A)

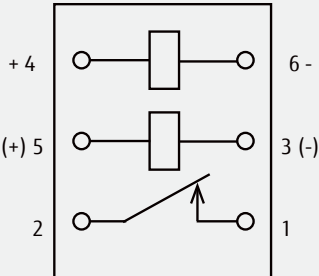
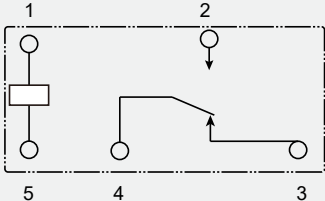
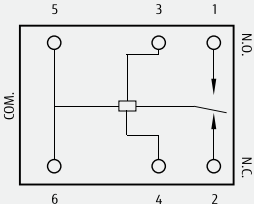
Series Name	FBR51L	FBR53	FTR-G3
			
Description	25A Dual coil Latching Compact Automotive Relay	30A Compact Automotive Relay	30A Compact Relay
Features	- THR type (-RW) available - High power type 220A max. inrush - No polarity on coil terminals	- THR type (-RW) available 60A max. inrush - No polarity on coil terminals	30A fuse capacity - THR type available - No polarity on coil terminals
Dimensions (W x L x H mm)	12.1 x 15.5 x 13.7	12.3 x 15.7 x 14.0	6.6 x 13.7 x 14.0
Weight (approx.)	6.0 g	6.0 g	4.0 g
Contact form	1 c	1 form U	1 a, 1 c
Contact rating	25A, 14VDC, locked motor load	25A, 14VDC, resistive load	30A, 14VDC
Maximum carrying current	30A 1Hr	30A	40.5A 30 minutes
Expected life on load example	14VDC, 25A, locked motor load 200 x 10 ³ ops. (-W1 type) 50 x 10 ³ ops. (E type)	14VDC, 25A, resistive load 100 x 10 ³ ops.	100 x 10 ³ ops.
Operating temperature	-40 to +125 °C	-40 to +125 °C	-40 to +125 °C
Coil voltage (DC)	10 V	9 to 12 V	12 V
Nominal coil power	1.11 W	0.556 to 0.6 W	0.64 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)			 1c contact form

Automotive relays (12V car battery, 40A ~ 70A)

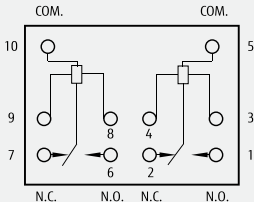
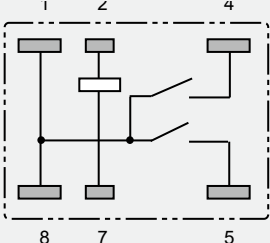
Series Name	FBR53-HW	FBR59-HW	FTR-E1-HC
			
Description	40A Compact Relay	45A/70A High Power Relay	60A compact relay
Remarks	- THR type (-RW) available - High power type 80A max. inrush - No polarity on coil terminals	- THR type (-RW) available - High power type 220A max. inrush - No polarity on coil terminals	No polarity on coil terminals
Dimensions (W x L x H mm)	12.3 x 15.7 x 14.0	15.0 x 20.0 x 16.8	28.3 x 43.6 x 26.8
Weight (approx.)	6.0 g	13.0 g	80.0 g
Contact form	1 form U	1 form U	1a (1 form X)
Contact rating	40A, 14VDC, resistive load	45A, 14VDC motor lock, 70A 14VDC resistive	60A 400VDC (at 60°C)
Maximum carrying current	40A	70A 1Hr	60A at 60°C
Expected life on load example	14VDC, 40A, resistive load 100 x 10 ³ ops.	70A 14VDC, resistive 50 x 10 ³ ops.	500 x 10 ³ ops.
Operating temperature	-40 to +125 °C	-40 to +125 °C	-40 to +60°C (at 60A)
Coil voltage (DC)	9 to 12 V	9 to 12V	12, 24V
Nominal coil power	0.855 to 0.862 W	0.45 to 0.477 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)

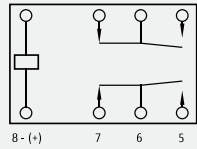
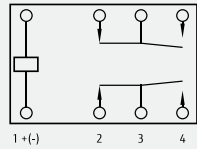
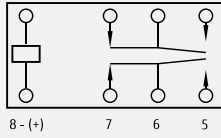
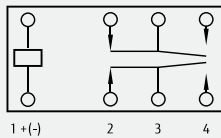
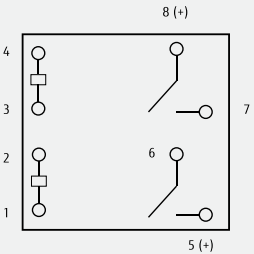
Automotive (24V battery applications)

Series Name	FTR-V1	FTR-P3 (-06)	FBR57
			
Description	210A High Capacity Latching Relay	6A Compact Relay	12A High Power Relay
Features	■ 210A (@85°C)/120A (@125°C) continuous current ■ Polarized coil terminals	■ For 24V battery applications ■ THR type available ■ No polarity on coil terminals	■ For 24V battery applications ■ 70A inrush ■ No polarity on coil terminals
Dimensions (W x L x H mm)	52.8 x 84.5 x 24.7	7.2 x 17.5 x 14.1	14.4 x 20.0 x 16.2
Weight (approx.)	120 g	5.0 g	9.4 g
Contact form	1b	1 c	1 c
Contact rating	Inrush 230A, 14VDC Break 1A, 14VDC, dedicated load	6A, 28VDC	12A, 28VDC, locked motor load
Maximum carrying current	210A at 85°C	20A 1 Hr	40A 10 min. / 30A 1 Hr
Expected life on load example	Inrush 230A, 14VDC Break 1A, 14VDC 120 x 10 ³ ops.	20VDC 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.
Operating temperature	-40 to +125 °C	-40 to +125 °C	-40 to +85°C
Coil voltage (DC)	12V	24V	24 V
Nominal coil power	28.8 W	0.9W	1.5 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	Plastic seal	Through hole / plastic seal	Through hole / plastic seal
Terminal layout (bottom view)			

Automotive relays (24V battery applications)

Series Name	FBR572 / 582	FBR59-HW
		
Description	12/14A High Power Twin Relay	30A High Power Relay
Features	■ For 24V battery applications ■ 0.8/1.4mm contact gap ■ 60A inrush ■ No polarity on coil terminals	■ For 24V battery applications ■ THR type available ■ No polarity on coil terminals
Dimensions (W x L x H mm)	20.0 x 26.0 x 16.2 (FBR572) 20.0 x 26.0 x 17.0 (FBR582)	15.0 x 20.0 x 16.8
Weight (approx.)	18.0 g	13.0 g
Contact form	1 c x2	1 form U
Contact rating	12A, 28VDC, locked motor load	30A 28VDC
Maximum carrying current	40A 2min.	70A 1 Hr (@20°C)
Expected life on load example	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)	28VDC 20A resistive 100 x 10 ³ ops.
Operating temperature	-40 to +85 °C	-40 to +125 °C
Coil voltage (DC)	24 V	12, 24 V
Nominal coil power	1.5W / 3.4W	1.2 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	Through hole / plastic seal
Terminal layout (bottom view)		

EV/PHV relays (DC control)

Series Name	FTR-B3	FTR-B4	FTR-J2
			
Description	2A Low Profile Relay	2A Slim Type Relay	10A 450VDC Small High Voltage DC Relay
Features	- Space saving versions available - THT and SMT versions - Polarity on coil terminals	- Space saving versions available - THT and SMT versions - Polarity on coil terminals	- 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 110V
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)	B3C (Bottom view)  B3G, B3S (Top view) 	B4C (Bottom view)  B4G, B4S (Top view) 	

EV/PHV relays (DC control)

Series Name	FTR-E1
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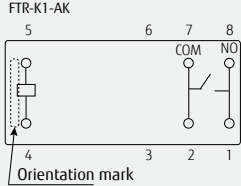
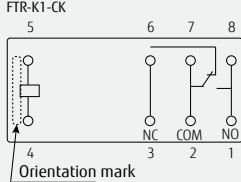
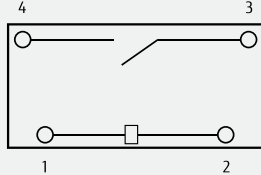
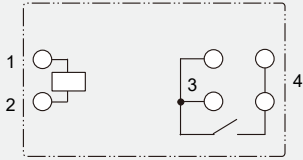


Description	20A/30A, 450VDC High Voltage DC Relay
Features	- cULus recognized types available - Polarized on coil terminals - No polarity on contacts

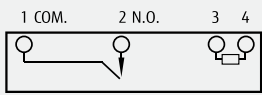
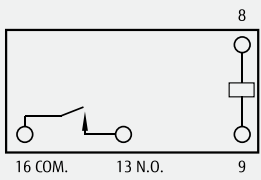
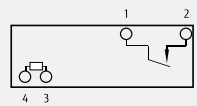
Dimensions (W x L x H mm)	28.3 x 43.6 x 36.8
Weight (approx.)	75.0 g
Contact form	1a (1 Form X)
Contact rating	20A 450VDC (20A type) 30A 450VDC (30A type)
Maximum carrying current	40A (@ +85 °C)
Min. switching load (ref.)	6VDC, 1A
Expected life on load example	10 x 10 ³ ops. (20A 450VDC)* 5 x 10 ³ ops (30A 450VDC) * * with varistor
Coil voltage (DC)	12, 24V
Nominal coil power	0.9W
Surge strength	-
Dielectric strength (1 min.)	Open contacts: 2,500VAC Coil and contacts: 5,000VAC
Safety standards	-
Mounting / Enclosure	Through hole / plastic seal

Terminal layout (bottom view)	
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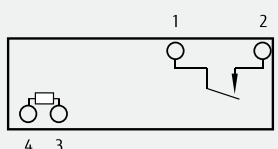
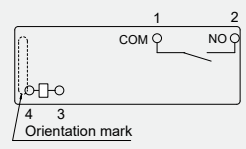
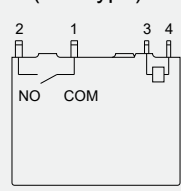
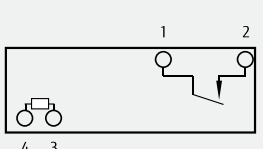
EV/PHV relays (AC control)

Series Name	FTR-K1(-HT / -KW)	FTR-K3 (-WG / -WS / -PV / -PS)	FTR-K5
			
Description	16A Plastic sealed 105°C type	25/32A Wide Contact Gap Relay	40A relay for on-board charger
Features	■ UL TV-5 available ■ 5mm pitch ■ Creepage/clearance>10mm ■ No polarity on coil terminals	■ Conform to VDE0127 ■ 1.5mm or 1.8mm contact gap ■ No polarity on coil terminals	■ For 6.6kW standard charger ■ 1.5mm or 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	18.0 x 30.5 x 29.7
Weight (approx.)	13.0g	25.0 to 26.0g	39.0g
Contact form	1a, 1c	1a	1a
Contact rating	16A 250VAC/24VDC	25A/32A 250VAC	32A 250VAC
Maximum carrying current	20A	25A, 32A	40A (at 105°C, 8mm ² cable)
Min. switching load (ref.)	5VDC 100mA	5VDC 100mA	6VDC 1A
Expected life on load example	10 x 10 ³ ops. to 100 x 10 ³ ops.	100 x 10 ³ ops. (25A)* 30 x 10 ³ ops. (32A)* * 1.5mm gap type	1,000 ops. (plastic seal) 30 x 10 ³ ops. (flux proof)
Coil voltage (DC)	5 to 110V	5 to 48V	5 to 24V
Nominal coil power	0.4 to 0.43mW	0.78 to 1.4W	0.9W
Surge strength	10,000V	8,500VAC(25A), 6,000V (32A)	-
Dielectric strength (1 min.)	Open contacts: 1,000VAC Coil and contacts: 5,000VAC	Open contact 2,500VAC Coil and contacts: 5,000V (25A), 4,000V (32A)	Open contacts: 1,000VAC Coil and contacts: 5,000VAC
Safety standards	UL, CSA, VDE	UL, VDE, CQC	-
Mounting / Enclosure	Through hole / plastic seal or flux proof	Through hole / plastic seal	Through hole / plastic seal or flux proof
Terminal layout (bottom view)	FTR-K1-AK  Orientation mark FTR-K1-CK  Orientation mark		

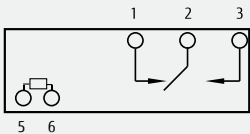
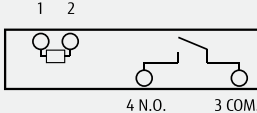
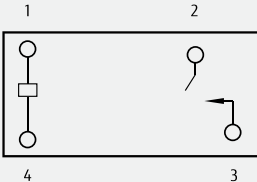
Power relays (3A ~ 5A)

Series Name	NY	JY	FTR-F3 (3A)
			 
Description	5A Slim Type Relay	3/5A Compact Relay	3A Slim Type Relay
Remarks	■ Socket available (-NYP) ■ Compliant to IEC61010-2-201 and 61131 reinforced insulation ■ Compatible with SN solid state relay ■ No polarity on coil terminals	■ Socket available (-P) ■ Pin compatible with SJ solid state relay ■ No polarity on coil terminals	■ IEC60695-2-11 types (-GW) ■ AgNi contacts ■ No polarity on coil terminals
Dimensions (W x L x H mm)	5.0 x 20.1 x 17.5	9.8 x 20.0 x 12.8	7.0 x 20.3 x 15.0
Weight (approx.)	3.5 g	5.0 g	4.0 g
Contact form	1 a	1 a	1 a
Contact rating (resistive load)	5A, 250VAC/30VDC	3A, 250VAC/30VDC (3A type) 5A, 250VAC/30VDC (5A type)	3A, 125VAC/30VDC
Maximum carrying current	5A	5A	5A
Minimum switching load (ref.)	5VDC, 1mA	100m VDC 0.01mA (W) 5VDC 10mA (G, HG) 5VDC 100mA (R, HR)	5VDC 10mA
Electrical life (rated load)	100 x 10 ³ ops. (at 3A, 250VAC, 30VDC) 50 x 10 ³ ops. (at 5A, 250VAC, 30VDC)	100 x 10 ³ ops.	200 x 10 ³ ops.
Coil voltage (DC)	4.5 to 24 V	4.5 to 48 V	5 to 24 V
Nominal coil power	0.12 W	0.2 to 0.36 W	0.2W
Surge strength	5,080 V	4,000 V	10,000 V
Dielectric strength (1 min.)	Open contacts: 750VAC Coil and contacts: 3,000VAC	Open contacts: 750VAC Coil and contacts: 2,000VAC	Open contacts: 750VAC Coil and contacts: 4,000VAC
Safety standards	UL, CSA	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)			

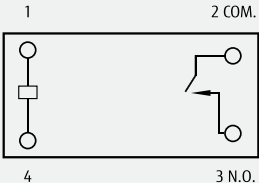
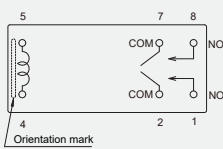
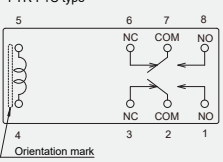
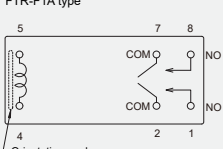
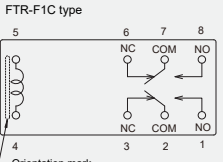
Power relays (3A ~ 5A)

Series Name	FTR-F3 (5A)	FTR-F3 (5A TV rating)	FTR-F3 (10A)
			
			
Description	5A Slim Type Relay	5A Slim or Flat Type Relay	10A Slim Type Relay
Remarks	- IEC60335-1 types (-GW) - AgNi contacts - No polarity on coil terminals	- Right angle versions available - TV-3 or TV-5 rating - AgSnO2 contacts - No polarity on coil terminals	- 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 20.3 x 15.0
Weight (approx.)	4.0 g	6.0 g	4.0 g
Contact form	1a	1 a	1 a
Contact rating (resistive load)	5A, 250VAC/30VDC	5A, 250VAC/30VDC	10A, 250VAC
Maximum carrying current	5A	5A	10A
Minimum switching load (ref.)	5VDC 10mA	5VDC 10mA	5VDC 100mA
Electrical life (rated load)	100 x 10 ³ ops.	50 x 10 ³ ops.	50 x 10 ³ ops. (flux proof type) 10 x 10 ³ ops (plastic sealed type)
Coil voltage (DC)	5 to 24 V	3 to 24 V	5 to 24 V
Nominal coil power	0.2W	0.28W	0.2 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 or flux proof
Terminal layout (bottom view)		 (slim type)  (flat type)	

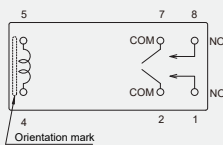
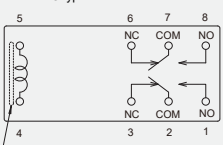
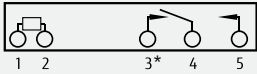
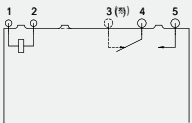
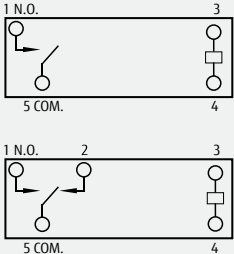
Power relays (3A ~ 5A)

Series Name	FTR-F3 (5A 1 transfer)	FTR-MY	FTR-F2
			
Description	5A 1 TransferType Relay	5A Slim Type Relay	5A High profile Relay
Remarks	■ 1 form C type ■ AgNi contacts ■ No polarity on coil terminals	■ Compliant to IEC61010-2-201, 61131-2 reinforced insulation ■ Conforms to ANSI/ISA12.12.01 ■ Creepage, clearance >5.6mm ■ No polarity on coil terminals	■ TV-5 rated ■ High sensitive coil types ■ No polarity on coil terminals
Dimensions (W x L x H mm)	7.0 x 23.4 x 15.0	5.0 x 20.0 x 12.0	11.0 x 24.0 x 25.0
Weight (approx.)	6.0 g	2.5 g	13.0 g
Contact form	1c	1 a	1 a
Contact rating (resistive load)	10A, 250VAC/30VDC	5A, 250VAC/30VDC	5A, 250VAC/30VDC
Maximum carrying current	5A	5A	5A
Minimum switching load (ref.)	5VDC 10mA	5VDC 1mA	5VDC 100mA
Electrical life (rated load)	50 x 10 ³ ops.	5 x 10 ³ ops.	100 x 10 ³ ops.
Coil voltage (DC)	5 to 24 V	4.5 to 24 V	5 to 48 V (sensitive: 5 to 24 V)
Nominal coil power	0.36 W	0.11 W	0.25 to 0.53 W
Surge strength	10,000 V	5,080 V	10,000 V
Dielectric strength (1 min.)	Open contacts: 750VAC Coil and contacts: 4,000VAC	Open contacts: 750VAC Coil and contacts: 3,000VAC	Open contacts: 1,000VAC Coil and contacts: 4,000VAC
Safety standards	UL, CSA, VDE, CQC	UL, CSA, VDE, CQC	UL, CSA, VDE, CQC
Mounting / Enclosure	Through hole / plastic seal	Through hole / plastic seal	Through hole / flux proof
Terminal layout (bottom view)			

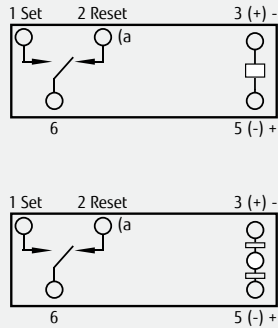
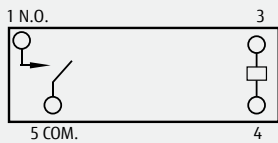
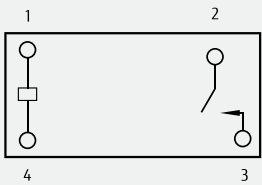
Power relays (5A ~ 10A)

Series Name	JV	FTR-F1 (5A)	FTR-F1 (8A)
			
Description	5A Medium Load Relay	2 poles, 5A Low Profile Relay	2 poles, 8A Low Profile Relay
Remarks	- High sensitive type available - No polarity on coil terminals	- Pin compatible with VB series - TV-3 rating available (2a) - Clear cover available (-RG) - Sensitive coil types 8A types FTR-F1R available - No polarity on coil terminals	- Pin compatible with VB series - TV-3 rating available (2a) - Clear cover available (-RG) - Sensitive coil types available - No polarity on coil terminals
Dimensions (W x L x H mm)	10.0 x 17.5 x 12.5	12.8 x 29.0 x 16.5	12.8 x 29.0 x 16.5
Weight (approx.)	4.3 g	12.0 g	12.0 g
Contact form	1 a	2 a, 2 c	2 a, 2 c
Contact rating (resistive load)	5A, 250VAC/30VDC	5A, 250VAC/24VDC	8A, 250VAC/24VDC
Maximum carrying current	5A	7A	8A
Minimum switching load (ref.)	5VDC, 100mA	5VDC 10mA	5VDC 10mA
Electrical life (rated load)	100 x 10 ³ ops.	100 x 10 ³ ops.	50 x 10 ³ ops.
Coil voltage (DC)	3 to 48 V (High sensitive: 3 to 24V)	1.5 to 110 V (High sensitive: 1.5 to 48V)	1.5 to 110 V (High sensitive: 1.5 to 48V)
Nominal coil power	0.2 to 0.3 W	0.4 to 0.55 W	0.4 to 0.55 W
Surge strength	10,000 V	10,000 V	10,000 V
Dielectric strength (1 min.)	Open contacts: 750VA 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, CQC	UL, CSA, VDE
Mounting / Enclosure	Through hole / plastic seal	Through hole / plastic seal	Through hole / flux proof
Terminal layout (bottom view)		FTR-F1A type  FTR-F1C type 	FTR-F1A type  FTR-F1C type 

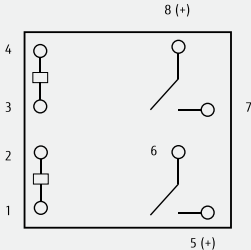
Power relays (5A ~ 10A)

Series Name	FTR-F1L	FTR-LY	JS
			
Description	2 poles 8A Low Profile Latching Relay	6A Slim Type Relay	8A Low Profile Relay
Remarks	- Latching relay 1 and 2 coil types - Polarized coil terminals	- Ultra slim - Socket type available - Right angle type available - Creepage/clearance >8mm	3.2 and 5 mm pitch types - Creepage/clearance >8mm - Au plated version available - No polarity on coil terminals
Dimensions (W x L x H mm)	12.8 x 29.0 x 16.5	5.0 x 28.0 x 15.0 (straight)	10.0 x 29.0 x 12.5
Weight (approx.)	13.0 g	5.0 g	8.0 g
Contact form	2 a, 2 c	1 a, 1 c	1 a, 1 c
Contact rating (resistive load)	8A, 250VAC/24VDC	6A, 250VAC/24VDC	8A, 250VAC/24VDC
Maximum carrying current	8A	6A	10A
Minimum switching load (ref.)	5VDC 10mA	5VDC, 10mA (-V type) 5VDC 100mA (-Y, -E type)	5VDC 100mA, 5VDC 10mA (3μAu)
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)	5 to 24 V	5 to 60 V	5 to 60 V
Nominal coil power	0.4 to 0.6 W	0.17 W / 0.217 mW	0.22 to 0.29 W
Surge strength	10,000 V	6,000 V	10,000 V
Dielectric strength (1 min.)	Open contacts: 1,000VAC Coil and contacts: 5,000VAC	Open contacts: 1,000VAC Coil and contacts: 4,000VAC	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 / plastic seal	Through hole / plastic seal
Terminal layout (bottom view)	FTR-F1A type  Orientation mark FTR-F1C type  Orientation mark (1 coil)	 (straight)  (right angle) *omitted on 1 form A type	

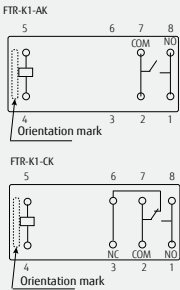
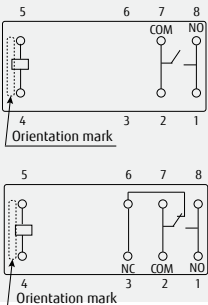
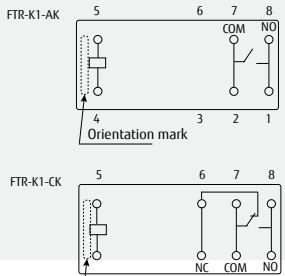
Power relays (5A ~ 10A)

Series Name	JSL	JS-KS	FTR-H2
			
Description	8A Low Profile Latching Relay	8A Low Profile High Inrush Relay	10A High Profile Relay
Remarks	- Latching type 1 and 2 coil types available 3.2mm pitch - Creepage/clearance >8mm - Polarized coil terminals	1000W lamp load 165A inrush 5mm pitch - Creepage/clearance >8mm - TV-5 rated	1000W lamp load - Highly sensitive types available - Creepage/clearance >6mm - 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	11.0 x 24.0 x 25.0
Weight (approx.)	8.0 g	8.0 g	13.0 g
Contact form	1 a, 1 c	1 a	1 a
Contact rating (resistive load)	8A, 250VAC/24VDC	8A, 250VAC/24VDC	10A, 250VAC/30VDC
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.	100k @ rated load 25k @ lamp load (TV4)	100 x 10 ³ ops. @ rated load 25 x 10 ³ ops. (@ lamp load TV-5)
Coil voltage (DC)	3 to 24 V	5 to 60 VDC	5 to 48 V (High sensitive: 5 to 24V)
Nominal coil power	0.22 to 0.25 (1coil), 0.48 (2 coils)	0.22 to 0.29 W	0.25 to 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, CSA, VDE	UL, CSA	UL, CSA, VDE, CQC
Mounting / Enclosure	Through hole / plastic seal	Through hole / plastic seal	Through hole / flux proof
Terminal layout (bottom view)	 (a omitted on 1 a types)		

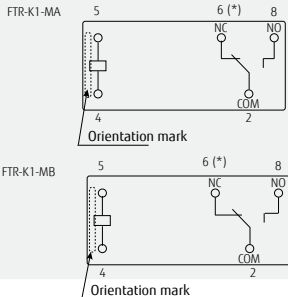
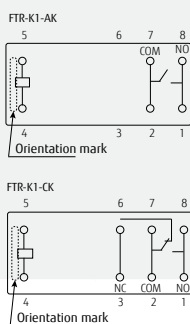
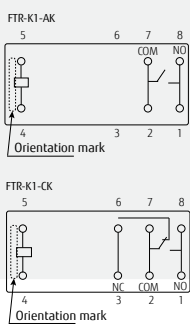
Power relays (5A ~ 10A)

Series Name	FTR-J2
	
Description	10A, 450VDC Small High Voltage DC Relay
Remarks	■ Special arc extinguishing provision ■ 150A inrush per contact ■ Polarized contact terminals ■ No polarity on coil terminals
Dimensions (W x L x H mm)	23.5 x 24.0 x 27.0
Weight (approx.)	26.0 g
Contact form	1a x 2
Contact rating (resistive load)	10A, 200VDC (use NO contact independently) or 10A, 450VDC 600VDC max. (2 contacts connected in series)
Maximum carrying current	12A
Minimum switching load (ref.)	5VDC, 100mA
Electrical life (Rated load)	10 x 10 ³ ops.
Coil voltage (DC)	5 to 110 V
Nominal coil power	0.53W each contact
Surge strength	10,000 V
Dielectric strength (1 min.)	Open contacts: 1,000VAC Coil and contacts: 4,000VAC
Safety standards	UL, VDE
Mounting / Enclosure	Through hole / flux proof
Terminal layout (bottom view)	

Power relays (>10A ~ 20A)

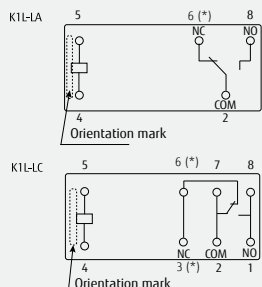
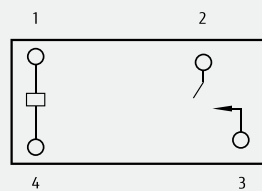
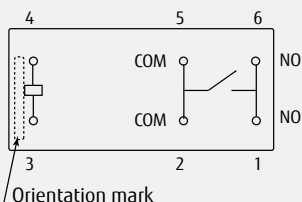
Series Name	FTR-K1		FTR-K1-E		FTR-K1-KS	
						
Description	16A Inrush 80A Type		16A AgNi Contact		16A Inrush 120A Type	
Type	FTR-K1AK()T	FTR-K1CK()W	FTR-K1AK()E	FTR-K1CK()E	FTR-K1AK()T-KS	FTR-K1CK()T-KS
Remarks	- Au plated types (-BG) - Creepage/clearance >10mm - UL-TV-5 (N.O.) - IEC60335-1 type (-GW) available - Transparent cover available - No polarity on coil terminals		- Contact material AgNi - Clear cover types (-RG) available 5mm pitch - Creepage/clearance >10mm - No polarity on coil terminals		5mm pitch - Creepage/clearance >10mm - UL TV-8 (N.O.) - 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		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 (>10A ~ 20A)

Series Name	FTR-K1-MA / MB		FTR-K1-HT		FTR-K1-KW	
						
Description	12A Type		16A High Temperature 105°C Type		16A Plastic Sealed 105°C Type	
Type	FTR-K1AK() W-(MA;MB)	FTR-K1CK() W-(MA;MB)	FTR-K1AK() T-HT	FTR-K1CK() W-HT	FTR-K1AK() W-KW	FTR-K1CK() W-KW
Remarks	■ 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		■ 5mm pitch ■ Creepage/clearance >10mm ■ UL TV-5 (1a) ■ EC60335-1 type (-GW) available ■ No polarity on coil terminals		■ 5mm pitch ■ Creepage/clearance >10mm ■ UL TV-5 (1a) ■ 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		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)	12A, 250VAC/24VDC		16A, 250VAC/24VDC		16A, 250VAC	
Maximum carrying current	14A		20A		20A	
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)		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)
Coil voltage (DC)	5 to 110 V		5 to 110 VDC		5 to 110 V	
Nominal coil power	0.4 W / 0.43 W		0.4 to 0.43W		0.4 to 0.43W	
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		UL, VDE		UL, VDE	
Mounting / Enclosure	Through hole / flux proof		Through hole / flux proof		Through hole / plastic seal	
Terminal layout (bottom view)						

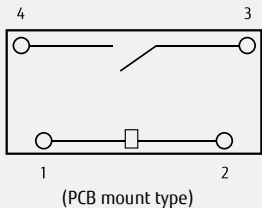
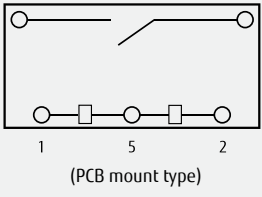
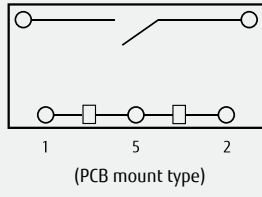
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Power relays (>10A ~ 20A)

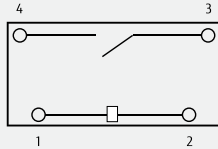
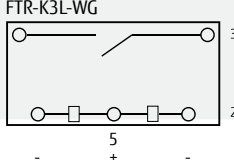
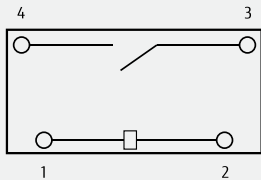
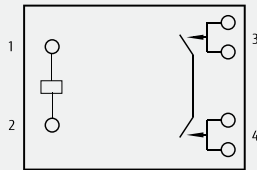
Series Name	FTR-K1-LA / LB		FTR-K2	FTR-K2G
				
Description	10A High Sensitive Type		16A High Profile Relay	20A 3mm Wide Contact Gap Relay
Type	FTR-K1AL() W-(LA, LB)	FTR-K1CL() W-(LA, LB)	FTR-K2AK-T	FTR-K2G
Remarks	■ Clear cover types (-RG) ■ Gold plated contact types (-BG) ■ 3.5mm pitch LA type ■ 5mm pitch LB type ■ Creepage/clearance >10mm ■ No polarity on coil terminals		■ TV-5 or TV-8 rated ■ 1mm contact gap types available ■ 3.5mm pitch ■ No polarity on coil terminals	■ TV-8 rated ■ 3mm contact gap ■ Peak inrush 120A ■ No polarity on coil terminals
Dimensions (W x L x H mm)	12.7 x 29.0 x 15.7		11.0 x 24.0 x 25.0	16.0 x 35.0 x 28.0
Weight (approx.)	13.0 g		13.0 g	34.0 g
Contact form	1 a	1 c	1 a	1 a
Contact rating (resistive load)	10A, 250VAC		16A, 250VAC / 30VDC	20A, 250VAC
Maximum carrying current	14A		16A	25A
Minimum switching load (ref.)	5VDC 100mA		5VDC 100mA	5VDC 100mA
Electrical life (rated load)	100 x 10 ³ ops. (LA), 150 x 10 ³ ops. (LB)	100 x 10 ³ ops. (LA, LB)	100 x 10 ³ ops. 25 x 10 ³ ops. (lamp load TV-5)	100 x 10 ³ ops. 25 x 10 ³ ops. (lamp load TV-8)
Coil voltage (DC)	5 to 48 V		3 to 48 V	5 to 110 V
Nominal coil power	0.25 W		0.53 W	0.93 to 1.05 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: 4,000VAC	Open contacts: 2,000VAC Coil and contacts: 5,000VAC
Safety standards	UL, CSA, VDE		UL, CSA, VDE, CQC	VDE, cULus
Mounting / Enclosure	Through hole / flux proof		Through hole / flux proof	Through hole / flux proof
Terminal layout (bottom view)				

(*) : No 3 & 6 are omitted on 1a

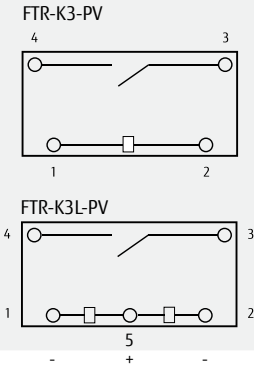
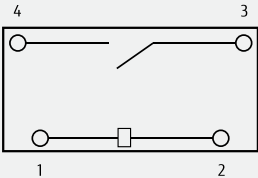
Power relays (20A ~ 25A)

Series Name	FTR-K3	FTR-K3L	FTR-K3LV
			
Description	20 - 25A Heavy Load Relay	25A Heavy Load Latching Relay	32A Heavy Load Latching Relay
Type	FTR-K3	FTR-K3L	FTR-K3LV
Remarks	■ Tab terminal types (J) ■ Flat types (-F) ■ High insulation type (-LS) ■ High current type (-HC) ■ PCB mount types (A) ■ IEC60335-1 type (-GW) available ■ No polarity on coil terminals	■ 2 coil latching type ■ Tab terminal types (J) and PCB mount types (A) ■ Peak inrush 120A ■ Polarized coil terminals	■ 2 coil latching type ■ 32A screw terminal type ■ Polarized coil terminals
Dimensions (W x L x H mm)	5.7 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	27.0 g
Contact form	1a	1a	1a
Contact rating (resistive load)	20A, 250VAC 25A, 250VAC (-HC)	25A, 250VAC	32A 250VAC
Maximum carrying current	25A	30A	32A
Minimum switching load (ref.)	5VDC 100mA	5VDC 100mA	5VDC 100mA
Electrical life (rated load)	100 x 10 ³ ops.	100 x 10 ³ ops.	30 x 10 ³ ops. (cosφ=0.8)
Coil voltage (DC)	5 to 48 V	5 to 24 V	5 to 48V
Nominal coil power	0.78 W	0.9mW	1.2W
Surge strength	8,500 V	8,500 V	6,000V
Dielectric strength (1 min.)	Open contacts: 1,000VAC 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	UL, CSA, VDE, CQC, TÜV	cULus, VDE	No safety standard
Mounting / Enclosure	Through hole / flux proof	Through hole / flux proof	Through hole / flux proof
Terminal layout (bottom view)			

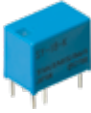
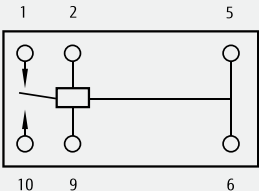
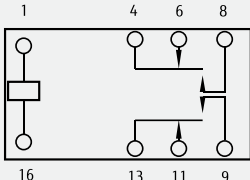
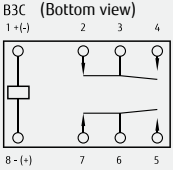
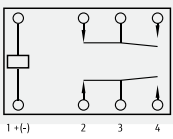
Power relays (20A ~ 25A)

Series Name	FTR-K3-WG	FTR-K3-WS	FTR-E1
			
Description	25A 1.5mm Contact Gap Relay	25A 1.8mm Contact Gap Relay	20/30A high voltage DC relay
Type	FTR-K3-WG	FTR-K3-WS	FTR-E1
Remarks	1.5mm contact gap 2 coil latching type available (FTR-K3L-WG) - Conform to VDE0126 - No polarity on coil terminal (latching: polarized)	1.8mm contact gap - Conform to VDE0126 - No polarity on coil terminal (latching: polarized)	- cULus recognized types available - Polarized on coil terminals - 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	28.3 x 43.6 x 36.8
Weight (approx.)	25.0 g	25.0 g	75.0 g
Contact form	1 a	1 a	1a (1 Form X)
Contact rating (resistive load)	25A, 250VAC	25A, 250VAC	20A 450VDC (20A type) 30A 450VDC (30A type)
Maximum carrying current	25A	25A	40A (at 85°C)
Minimum switching load (ref.)	5VDC 100mA	5VDC 100mA	6VDC, 1A
Electrical life (rated load)	100 x 10 ³ ops.	30 x 10 ³ ops.	10 x 10 ³ ops.(20A 450VDC)* 5 x 10 ³ ops. (30A 450VDC) * * with varistor"
Coil voltage (DC)	5 to 48 V	5 to 48 V	12, 24V
Nominal coil power	0.78 W	1.2 W	0.9W
Surge strength	8,500 V	8,500 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: 5,000VAC
Safety standards	UL, VDE, CQC	UL, VDE	-
Mounting / Enclosure	Through hole / flux proof	Through hole / flux proof	Through hole / plastic seal
Terminal layout (bottom view)	FTR-K3-WG  FTR-K3L-WG  - + -		

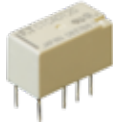
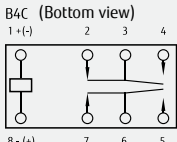
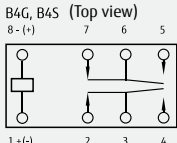
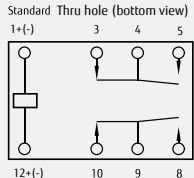
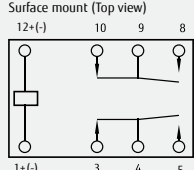
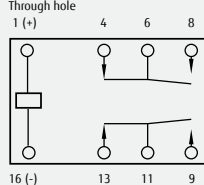
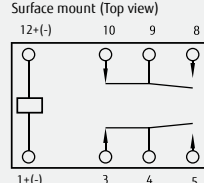
Power relays (30A ~ 120A)

Series Name	FTR-K3-PV	FTR-K3-PS
		
Description	32A 1.5mm Contact Gap Relay	32A 1.8mm Contact Gap Relay
Type	FTR-K3-PV	FTR-K3-PS
Remarks	■ 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)	■ High capacity 32A ■ 1.8mm contact gap ■ 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
Weight (approx.)	26.0 g	26.0 g
Contact form	1 a	1 a
Contact rating (resistive load)	32A, 250VAC	32A, 250VAC
Maximum carrying current	32A	32A
Minimum switching load (ref.)	5VDC 100mA	5VDC 100mA
Electrical life (Rated load)	30 x 10 ³ ops.	30 x 10 ³ ops.
Coil voltage (DC)	5 to 48 V	5 to 48 V
Nominal coil power	1.2 W	1.4 W
Surge strength	6,000 V	6,000 V
Dielectric strength (1 min.)	Open contacts: 2,500VAC Coil and contacts: 4,000VAC	Open contacts: 2,500VAC Coil and contacts: 4,000VAC
Safety standards	UL, VDE	UL, VDE
Mounting / Enclosure	Through hole / flux proof	Through hole / flux proof
Terminal layout (bottom view)		

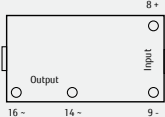
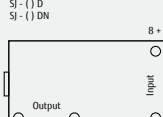
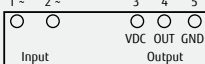
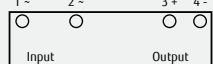
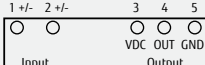
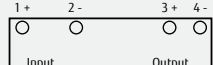
Signal relays (1A ~ 2A)

Series Name	SY	RY	FTR-B3
			
Description	1 to 2A Slim Type Relay	1 to 2A Signal Relay	2A Low Profile Relay
Remarks	■ DIL pitch terminals ■ Single or bifurcated contact types ■ No polarity on coil terminals	■ High dielectric strength types ■ MBB contact available ■ No polarity on coil terminals	■ Latching type available ■ Space saver versions available ■ THT and SMT versions ■ Polarized coil terminals
Dimensions (W x L x H mm)	7.4 x 12.5 x 9.5	9.8 x 20.2 x 12.5	7.2 x 10.6 x 5.25 (SMT)
Weight (approx.)	1.7 g	5.0 g	0.85 g
Contact form	1 c	2 c	2 c
Contact rating (resistive load)	0.5A 120VAC, 1A 24VDC	0.5 120VAC, 1A 24VDC (RY-W, WZ) 0.25A 120VAC, 1A 24VDC (RY-WF) 0.4A 120VAC (RY-WFZ)	0.3A 125VAC 1A 30VDC
Maximum carrying current	2A	1.25 A, 2A (WFZ)	2A
Minimum switching load (ref.)	100mVDC, 0.1mA (SY-W) 1VDC 1mA (SY)	10mVDC 0.01mA	10mVDC 0.01mA
Electrical life (rated load)	100 x 10 ³ ops.	100 x 10 ³ ops. (WFZ) 200 x 10 ³ ops. (W, WZ) (AC) 500 x 10 ³ ops. (W, WZ, WF) (DC)	100 x 10 ³ ops.
Coil voltage (DC)	1.5 to 24 V	3 to 48 V	1.5 to 24 V
Nominal coil power	0.15 to 0.175 W	0.15 to 0.58 W	0.1 to 0.23 W
Surge strength	1,500 V	1,500 V	2,500 V
Dielectric strength (1 min.)	Open contacts: 300/400VAC Coil and contacts: 1,000VAC	Open contacts: 500VAC (W, WZ, WFZ) 1,000VAC (WF) Coil and contacts: 1,000VAC	Open contacts: 1,000VAC Coil and contacts: 1,500VAC
Safety standards	UL, CSA, FCC68	UL, CSA, FCC68	UL, CSA, BSI, FCC68, Telcordia, IEC60950-1
Mounting / Enclosure	Through hole / plastic seal	Through hole / plastic seal	Through hole / surface mount / plastic seal
Terminal layout (bottom view)			B3C (Bottom view)  B3G, B3S (Top view) 

Signal relays (1A ~ 2A)

Series Name	FTR-B4	FTR-C1	FTR-C2
			
Description	2A Slim Type Relay	2A Miniature Relay	2A Miniature Relay
Remarks	- Latching type available - Space saver versions available - THT and SMT versions - Polarized coil terminals	- Latching type available - Contact gap 0.6mm - Creepage>2.5mm, clearance >2.0mm - Polarized coil terminals	- Contact gap 2mm - Creepage>2.5mm, clearance >2.0mm - THT and SMT versions - Polarized coil terminals
Dimensions (W x L x H mm)	5.7 x 10.6 x 9.7 (SMT)	7.4 x 14.9 x 9.1 (THT)	9.85 x 20.05 x 11.7 (SMT)
Weight (approx.)	1.0 g	2.0 g	3.7 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	3 to 24 V	3 to 24 V
Nominal coil power	0.1 to 0.23 W	0.14 to 0.3 W	0.15 to 0.3 W
Surge strength	2,500 V	5,000 V	2,500 V
Dielectric strength (1 min.)	Open contacts: 1,000VAC Coil and contacts: 1,500VAC	Open contacts: 1,500VAC Coil and contacts: 3,000VAC	Open contacts: 1,500VAC Coil and contacts: 2,000VAC
Safety standards	UL, CSA, BSI, FCC68, Telcordia, IEC60950-1	UL, CSA, BSI, Telcordia	UL, CSA, BSI, Telcordia, IEC60950-1
Mounting / Enclosure	Through hole / surface mount / plastic seal	Through hole / surface mount / plastic seal	Through hole / surface mount / plastic seal
Terminal layout (bottom view)	B4C (Bottom view)  B4G, B4S (Top view) 	Standard Thru hole (bottom view)  Surface mount (Top view) 	Through hole  Surface mount (Top view) 

Solid State relays (1A ~ 3A)

Series Name		SJ				SN			
									
Description		1A AC/DC SSR				1A AC/DC SSR			
Remarks		■ Pin compatible with JY ■ Internal surge absorber ■ Socket available ■ Polarized coil terminals				■ 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
		12 V	1.0k Ω	12 V	1.2k Ω	-	-	12 V	1.1k Ω
		24 V	2.2k Ω	24 V	2.4k Ω	-	-	24 V	2.2k 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	1.0 Arms		1.0 A		±4 mA (VDD=5 V)	±0.4 mA (VDD=5 V)	1.0 Arms	1.0 A
	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)		SJ - () A SJ - () AN  SJ - () D SJ - () DN 				SNA 1 ~ 2 ~ 3 4 5  SNC 1 ~ 2 ~ 3+ 4-  SNB 1 +/- 2 +/- 3 4 5  SND 1+ 2- 3+ 4- 			

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)



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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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