GE
Grid Solutions

FT & RT Test Switches

Key Benefits

The FT Switches and FT Test Plugs have all the features necessary for applications involving the measurement of individual currents and voltages to facilitate testing of substation instrumentation and protection devices from the front of the panel. The make before-break current short circuit feature allows test personnel the convenience of isolating equipment from current transformer circuits.

Voltage measurements can be made directly on the FT Switch without disturbing existing connections. There is a test clip provision located on the top of each pole that allows connection with standard spring clip test leads.

Applications

FT Test Switches:

The FT Test Switches and Test Plugs provide a safe, simple, immediate and reliable method to isolate equipment and measure system current and voltage during field testing and commissioning.

RT Rack Mount Test Switches:

RT Switch assemblies for rack and switchboard mounting permit convenient isolation of switchboard relays, meters and instruments. RT racks allow quick and easy multi-circuit testing by conventional test methods and for faster installation into switchgear.

Features

FT Test Switch:

- Built with a maximum of ten individual poles, of potential, current, and current shorting switch units
- Switches can be assembled in a variety of different arrangements to match customer requirements
- FT Test plugs are used in conjunction with the FT Switches to enable easy measurement, calibration, verification or maintenance of relays, meters and instruments
- UL / cUL E101598

Protection:

- With the cover in place, a meter type seal can be placed through either of the cover studs of the FT Switch to prevent unauthorized access
- Standard black cover mounts only when all switches are in the closed position
- A clear cover is available that can be installed with the switchblades in the open or closed position

RT Rack Mount Test Switches:

- RT Switches accommodate three FT switches mounted on a 19" wide steel mounting panel (Brushed aluminum available)
- Provides up to 30 terminals with three FT combinations
- Color and finish can be customized
- Optional rack heights for label applications
- Each panel is supplied with the hardware to mount the RT assembly to the 19" rack enclosure
- The RT assembly will support an FT style test plug
- Full-length clear cover is standard. Full length black cover, individual clear covers, and individual black covers are available UL / cUL E101598

Protection:

- Once the full-length clear cover on the RT switch is installed, it prohibits access to some of the rack mounting screws
- Individual clear covers offer additional protection consistent with common testing procedures to ensure only correct switch is exposed during testing

FT Specifications

Rating

The standard FT switch is rated at 600 volts and 30 Amps. The Switch meets or exceeds all requirements of ANSI / IEEE Standard C37.90 and is UL and cUL recognized.

Mounting

FT Switches are designed for semi-flush mounting on the front of switchboard panels, facilitating inspection and accessibility.

Drilling Plan - Inches

Weight	Net Lbs	Shipping Lbs
FT Switch	1.4	1.6
Test Plug	1.2	1.4
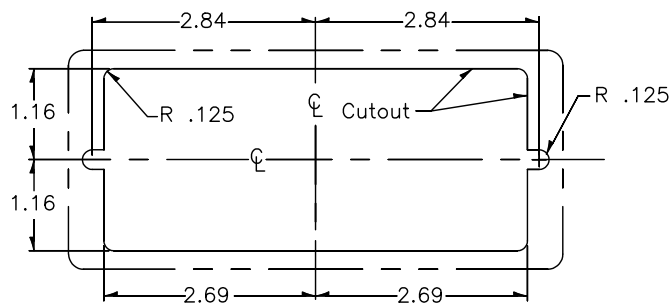
FT Switch Construction

The base of the FT Switch is made of black electrical grade plastic material which provides a tough insulated enclosure. Barriers are molded into the base (front and rear) to separate the switch units from one another. The barriers provide insulation between poles and ample space between terminals.

Cover

FT Switches come with a black opaque cover or a clear see-through cover. Switch covers provide a tough insulated enclosure for the switch and are made from plastic material. The clear cover affords the user the option of leaving switch handles in the open position and replacing the cover while maintaining the provision for a meter type seal when some or all switch handles are in the open position. This feature allows the user to service electrical equipment while still complying with OSHA lockout/tag-out procedures. The clear cover can be ordered separately for retrofit to existing FT Switches. RT racks come standard with a full length clear cover and can be sealed with a meter seal.

Fasteners

Captive fasteners are made of molded plastic with a threaded brass insert for easy cover installation and removal.

Switch Poles

FT Switches are available in configuration of 1 to a maximum of 10 individual poles or switch units. Each pole identified by letter (A thru J), which is visible along the top of the base from left to right. The individual switch units are of knife blade type. There are three different types of switch units available: potential, current, and current shorting.
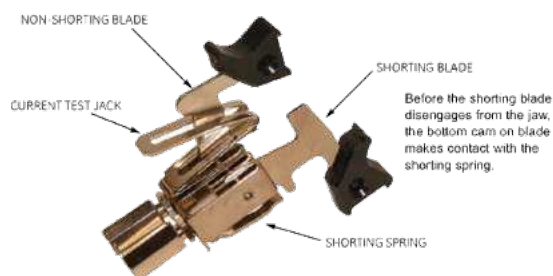
Switch Handles

Switch handles are made of a molded plastic insulating material typically black in color. Red handles can be supplied by replacing the "P" with "T" for potential handles and replacing "C" with "R" for current handles. Additional colors are available upon request.

Each handle has a dovetail indentation to hold a circuit identification label (by others). Knife blade switches can be operated independently or ganged together with a horizontal interlocking bar (see page 4).

A hole runs through the middle of each switch handle to allow insertion of interlocking bars. 2 to 10 switch handles can be mechanically tied together.

Terminals

Connection terminals are located at the rear of the switch and can be either screw or stud type. Terminals are numbered 1 thru 20 for easy identification. Each pair of numbered terminals is associated with a matching pole designated by a letter on the front of the switch.

FT Test Plugs

The Test Plug with a maximum of 10 positions is designed to match the pole configuration of specific styles of FT Switches. Not every switch configuration is suitable to accept a Test Plug. For available styles, see switch selection tables.

10-Pole "In-Service Series" Test Plug Inserted into FT Test Switch

In-Service Series Test Plug

Provision is made only on current poles with shorting springs to automatically short-circuit current transformer circuits when the knife switches are opened prior to inserting the Test Plug. This Test Plug is typically used to connect devices measuring the currents and voltages being applied to the switchboard relays, meters and instruments without interrupting or short-circuiting the circuit. Only the current test switches with the current jack must be opened before inserting the Series Test Plug. Connections to the test plug must be made before inserting the test plug into the FT Switch. Before inserting the Test Plug, all switchblades that are opposite bi-conductor paddles must be placed in the full open position.
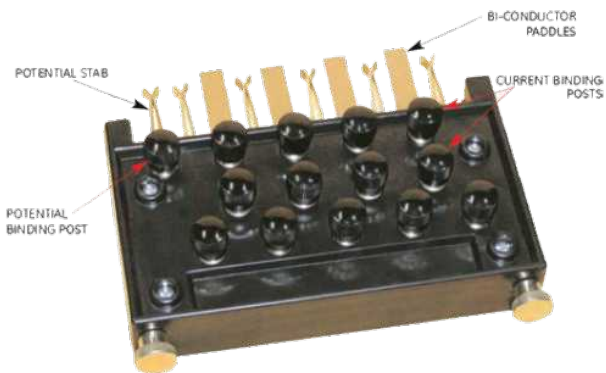
10-Pole "In-Service Series" Test Plug

Non Standard FT Style Switch Selector

Step 1

- The Switch body can support 1 to 10 poles in slot marked A through J
- Enter a letter from the legend. Leave unused slots blank

Position:

A	B	C	D	E	F	G	H	I	J

Example:

A	B	C	D	E	F	G	H	I	J
P	C -	- C	R	C	R -	- R	P	P	P

Legend:

P=Potential, Black

T=Potential, Red

C=Current, Non-shorting, Black

C-C or C-C-C- or C-C-C-C = Current , Shorting, Black

R = Current, Non-shorting, Red

R-R, R-R-R, R-R-R-R = Current, Shorting, Red

Additional colors available - See page 11

(Note: Some functions will require more than one slot in the switch body).

Step 2

(Optional)

If a tie bar is required then check this box and draw a dark heavy line over the poles to be joined. (In the example shown in Step 1 positions H, I and J will operate together.)

Step 3

Select a cover style

Clear (installs over open and closed switch blades)

Black (installs over closed switch blades only)

Step 4

Select a rear terminal type

Screws (Standard)   Studs (Optional)

Catalog Number for FT Style Switches

FT C - 074 S

Cover
Black -------- (Blank)
Clear -------- **C**

Configuration
See website,
GEDigitalEnergy.com
Also on pages 8-11

Terminals
Screws ------ (Blank)
Studs -------- **S**
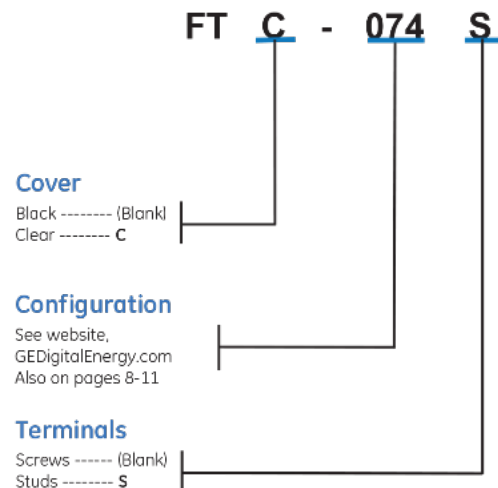
Catalog Number for RT Style Rack Mount Switches

						Left			Center			Right	
1	2	3	4	5	6	7	8	9	10	11	12	13	14
R	T	2	G	G	0	6	6	0	8	4	1	2	5

RT-19" Rack

Terminal Connectors
Screw .... T
Stud ....S

Panel Height (ref. pg 7)
2 - 2 rack units centered
3 - 3 rack units centered
X - 3 rack units low
H - 3 rack units high
4 - 4 rack units low
5 - 4 rack units centered*
6 - 4 rack units high*

Color
ANSI 61** .... G
ANSI 70 .... A
Brush AI .... B
Black X

Cover
Full Length Clear .... G
3 individual Clear covers .... A
3 individual Black covers .... B

Position # (as viewed from front)***
Left
Center
Right
000 - Blank

* Not UL/cUL
** Denotes Standard Features
*** See page 8 through 11 for 3 digit codes of go to "Configurate a FT Switch" at www.GEGridSolutions

Dimensional Drawing - Type FT Test Switch

Black cover and threaded stud terminals
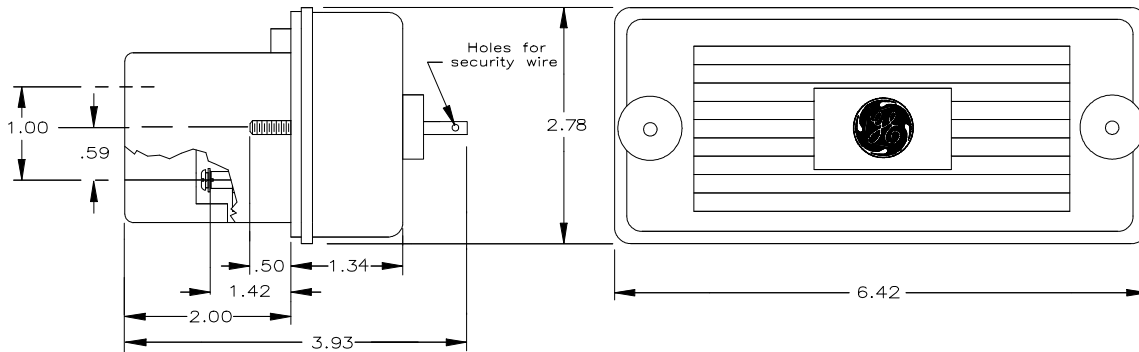
Clear cover and screw terminals
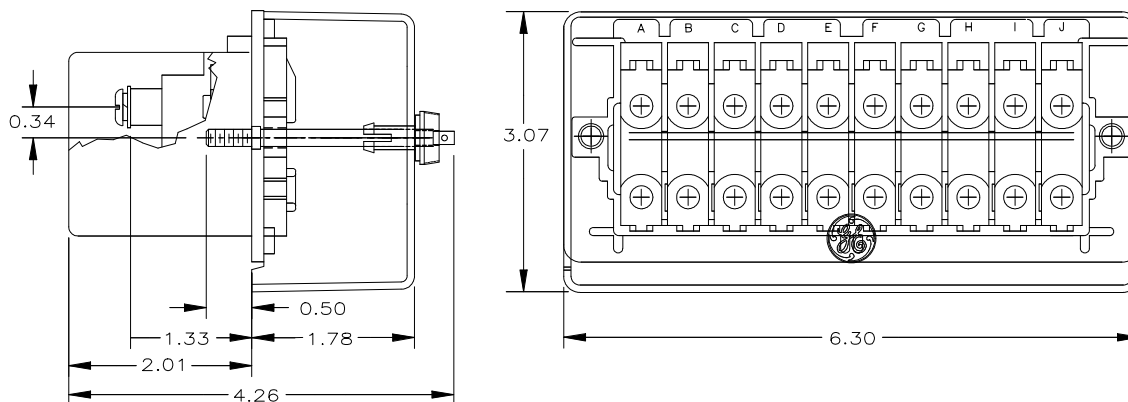
Typical FT Switch Connection Schematic using an FT-076 switch
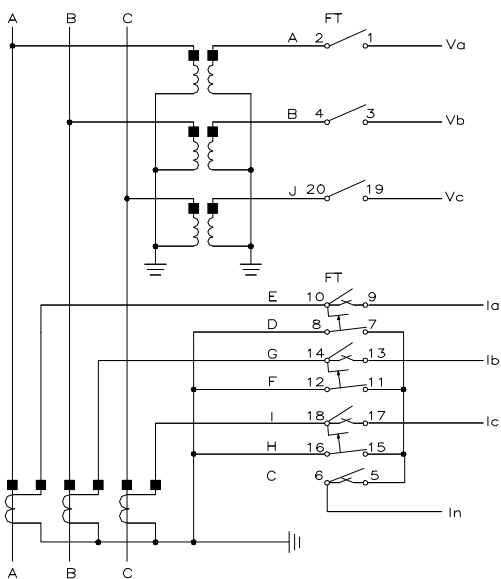
Dimensional Drawing - Type RT Mounting Racks
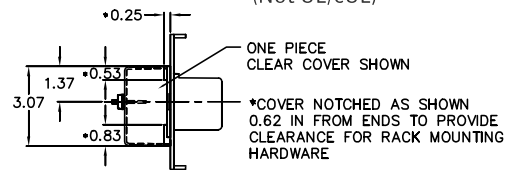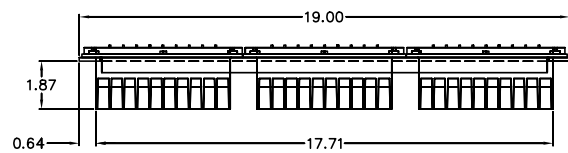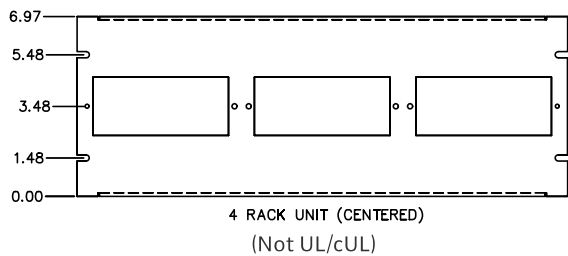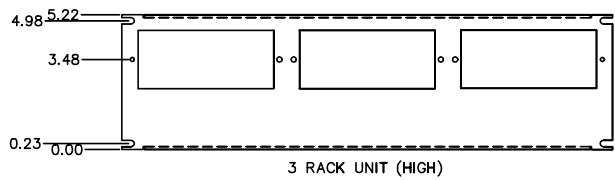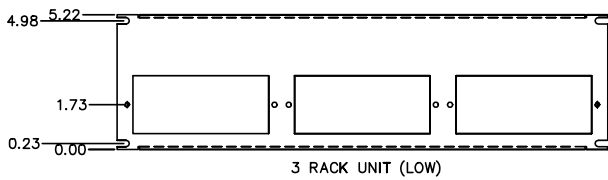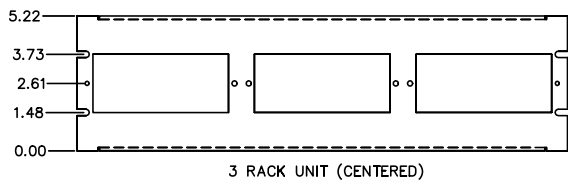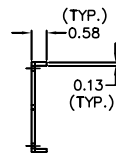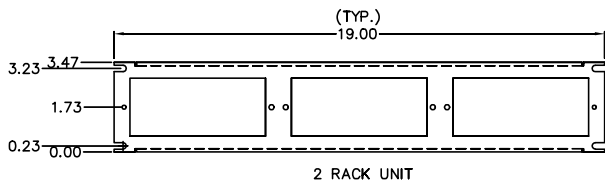
2 RACK UNIT

3 RACK UNIT (CENTERED)

3 RACK UNIT (LOW)

3 RACK UNIT (HIGH)

4 RACK UNIT (CENTERED)
(Not UL/cUL)

4 RACK UNIT (LOW)

4 RACK UNIT (HIGH)
(Not UL/cUL)

ONE PIECE CLEAR COVER SHOWN

*COVER NOTCHED AS SHOWN 0.62 IN FROM ENDS TO PROVIDE CLEARANCE FOR RACK MOUNTING HARDWARE

FT & RT Configuration Selection Chart

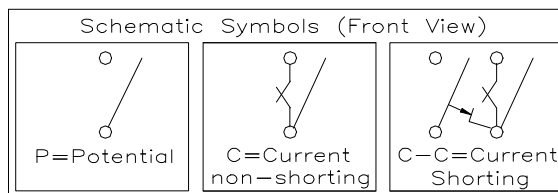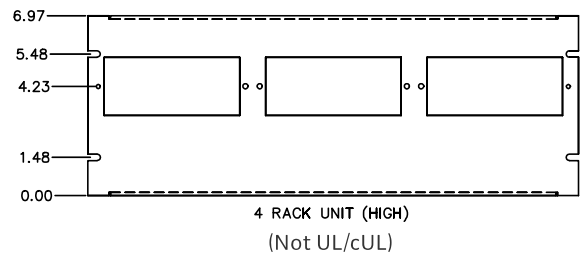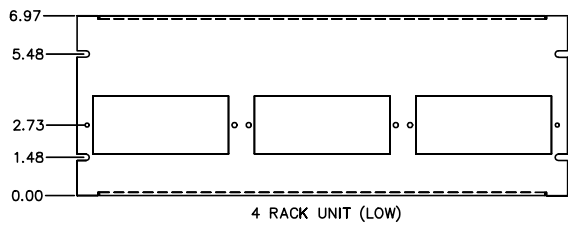| Individual FT Switch Number	Poles			Switch Configuration										Test Plug Number
				P=Potential			*C=Current (Non-Shorting)			* C-C=Current (Shorting)				
	Total	V	A	A	B	C	D	E	F	G	H	I	J	
-001	2	2	0	P	P									TP-109
-002	2	2	0				P			P				TP-109
-003	2	0	2		C------------C									TP-106
-004	2	0	2						C------------C					TP-107
-005	2	0	2								C------------C			TP-101
-006	4	4	0	P	P	P							P	TP-109
-007	4	4	0	P	P							P	P	TP-109
-008	4	4	0	P							P	P	P	TP-109
-009	4	4	0				P	P	P	P				TP-109
-010	4	2	2	P	P						C------------C			TP-101
-011	4	2	2	P							C------------C		P	TP-101
-012	4	0	4		C------------C		C------------C							TP-108
-013	4	0	4						C------------C		C------------C			TP-102
-014	4	0	4		C	C	C	C						
-015	5	5	0	P	P						P	P	P	TP-109
-016	5	3	2	P	P						C------------C		P	TP-101
-017	5	3	2	P	C------------C		P						P	TP-108
-018	5	1	4		C	C		C		C			P	
-019	5	0	5	C		C		C		C		C		
-020	6	6	0	P	P	P						P	P	TP-109
-021	6	6	0	P	P	P					P	P	P	TP-109
-022	6	6	0				P	P	P	P	P	P		TP-109
-023	6	4	2	P					P	P	C------------C		P	TP-101
-024	6	3	3	P	P						C------------C		P	TP-102
-025	6	2	4	P					C------------C		C------------C		P	TP-102
-026	6	0	6	C		C		C			C	C	C	
-027	6	0	6		C------------C			C--------------C			C------------C			
-028	6	0	6			C	C	C	C	C	C			
-029	6	0	6				C------------C		C------------C		C------------C			TP-103
-030	6	0	6				C	C	C	C	C	C		
-031	7	7	0	P	P	P	p			P	P	P		TP-109
-032	7	7	0	P	P	P	P			P	P	P		TP-109
-033	7	7	0		P	P	P	P	P	P	P			TP-109
-034	7	7	0	P			P	P	P	P	P	P		TP-109
-035	7	7	0	P			P	P	P		P	P	P	TP-109
-036	7	5	2	P	P	P	P	P			C------------C			TP-101
-037	7	5	2	P	P		P		C------------C		P	P	P	TP-107
-038	7	5	2	P	C------------C		P				P	P	P	TP-106
-039	7	4	3	P	P	C		C		C		P	P	TP-113
-040	7	3	4	P	P	P			C------------C		C------------C			TP-102
-041	7	3	4	P	P				C------------C		C------------C		P	TP-102
-042	7	3	4	P	C	C		C		C		P	P	
-043	8	8	0	P	P	P	P	P			P	P	P	TP-109
-044	8	8	0	P	P	P	P			P	P	P	P	TP-109
-045	8	8	0	P			P	P	P	P	P	P	P	TP-109
-046	8	6	2	P	P	P	P	P			C------------C		P	TP-101
-047	8	6	2	P	P	P			C------------C		P	P	P	TP-106
-048	8	4	4	P	P	P	P		C------------C		C------------C			TP-102
-049	8	4	4	P	P		C	C	C	C		P	P	
-050	8	4	4	P	P		C------------C		C------------C			P	P	TP-110

FT & RT Configuration Selection Chart

Individual FT Switch Number	Poles			Switch Configuration — P=Potential *C=Current (Non-Shorting) * C-C=Current (Shorting)										Test Plug Number
	Total	V	A	A	B	C	D	E	F	G	H	I	J	
-051	8	4	4	p	C-------------C	P				P	C------=------C	P		TP-105
-052	8	4	4			P	P	P	C------=------C		C------=------C	P		TP-102
-053	8	2	6		C-------------C		C------=------C		C------=------C		P	P		TP-108
-054	8	2	6		C-------------C		C------=------C		C------=------C			P	P	TP-108
-055	8	1	7	p		C	C------=------C		C------=------C		C------=------C			TP-111
-056	8	0	8	C	C	C	C			C	C	C	C	
-057	8	0	8		C	C	C	C	C	C	C	C		
-058	8	0	8		C------=------C		C------=------C		C------=------C		C------=------C			TP-111
-059	9	9	0	P	P	P	P		P	P	P	P	P	TP-109
-060	9	9	0	P	P		P	P	P	P	P	P	P	TP-109
-061	9	6	3	P	P	P	P	P		C------=------C		C	P	
-062	9	5	4	P	P	P	P	P	C------=------C		C------=------C			TP-102
-063	9	5	4	P	P	P	P		C------=------C		C------=------C	P		TP-102
-064	9	3	6	P	P		C------=------C		C------=------C		C------=------C	P		TP-103
-065	9	0	9	C	C------=------C		C------------C		C------=------C		C------=------C			
-066	10	10	0	P	P	P	P	P	P	P	P	P	P	TP-109
-067	10	9	1	C	P	P	P	P	P	P	P	P	P	
-068	10	8	2	P	P	P	P	P	P	P	C------=------C		P	TP-101
-069	10	7	3	P	P	P	P	P	P	C	C------=------C		P	
-070	10	6	4	P	P	P	P	P	C------=------C		C------=------C	P		TP-102
-071	10	6	4	P	P	P	C------=------C		P	P	C------=------C		P	TP-104
-072	10	6	4	P	C-------=------C		P	P	P	P	C------=------C		P	TP-105
-073	10	6	4	C--------=------C		C------=------C		P	P	P	P	P	P	
-074	10	4	6	P	P	P	C------=------C		C-C------=------C		C------=------C		P	TP-112
-075	10	4	6	P	C------=------C		P	C------=------C		P	C------=------C		P	
-076	10	3	7	P	P	C	C------=------C		C------=------C		C------=------C		P	TP-111
-077	10	2	8	P	C	C	C	C	C	C	C	C	P	
-078	10	2	8	P	C------=------C		C------=------C		C------=------C		C------=------C		P	TP-111
-079*	10	2	8	C---------=------C		C------=------C		C------=------C		C------=------C *		P	P	
-080	10	1	9	C	C	C	C	C	C	C	C	C	P	
-081	10	0	10	C	C	C	C	C	C	C	C	C	C	
-082	10	0	10	C---------=------C		C------=------C		C------=------C		C------=------C		C------=------C	
-083	10	10	0	T	T	T	T	T	T	T	T	T	T	
-084	10	4	6	P	P	P	P	C------=------C		C------=------C		C------=------C		
-085	10	2	8	C---------=------C		C------=------C		C------=------C		C------=------C		P	P	
-086	10	3L	7	L	C-------=------C		L	C------=------C		L	C------=------C		C	
-087	10	4	6	P	P	P	C------=------C		C------=------C		C------=------C		T	TP-112
-088														
-089	10	2	8	P	P	C------=------C		C------=------C		C------=------C		C------=------C		
-090	10	0	10	C	C-------=------C		C------=------C		C------=------C		C------=------C		C	
-091	9	9	0	P	P	P	P	P	P		P	P	P	TP-114
-092	8	2	6	C	C	C	C	C	C	P	P			
-092	8	2	6	C	C	C	P	P	P					
-093	6	6	0	P	P	P	P	P	P					TP-114
-094	6	4	2	P	P	P	C------------C		P					TP-115
-095	8	0	8	C----------=-----C				C------=------C		C------=------C		C------=------C	
-096	9	3	6	P	P	P	C------=------C		C------=------C		C	C		
-097	9	3	6	P	P	P	C------=------C		C------=------C		C------=------C			
-098	10	4	6	C---------=------C		C------=------C		C------=------C		P	P	P	P	
-099	10	4	6	C---------=------C		C------=------C		C------=------C		T	T	T	T	
-100	10	10	0	P	P	P	P	P	P	P	P	T	T	

FT & RT Configuration Selection Chart

Individual FT Switch Number	Poles Total	V	A	Switch Configuration P=Potential *C=Current (Non-Shorting) * C-C=Current (Shorting) A	B	C	D	E	F	G	H	I	J	Test Plug Number
-101	10	10	0	T	T	P	P	P	P	P	P	P	P	
-102	10	0	10	R--------------	--------------R	R------------	------------R	R------------	------------R	R------------	------------R	R-------------	-------------R	
-103	9	9	0	T	T	T	T		T	T	T	T	T	TP-109
-104	10	8	2	P	P	P	P	P	P	C------------	------------C	P	P	
-105	7	0	7			C	C------------	------------C	C------------	------------C	C------------	------------C		
-106	3	3	0	T				T					T	
-107	10	4	6	P	P	P	C------------	------------C	C------------	------------C	C------------	------------C	T	
-108	9	3	6	P	P	P	C------------	------------C	C------------	------------C	C------------	------------C		
-109	2	2	0	T									T	
-110	6	0	6	C---------------	---------------C	C------------	------------C	C------------	------------C					
-111	10	10	0	P	P	P	P	P	P	P	T	P	T	TP-109
-112	10	10	0	P	P	P	P	P	P	P	P	P	T	TP-109
-113	10	2	8	T	C------------	------------C	C------------	------------C	C------------	------------C	C------------	------------C	T	TP-111
-114	10	10	0	T	T	T	T	T	T	T	T	T	T	TP-109
-115	6	6	0	T	T	T	T					T	T	TP-109
-116	10	10	0	P	P	P	T	T	P	P	P	P	P	TP-109
-117	10	10	0	P	P	P	P	P	P	T	T	P	P	TP-109
-118	10	2	8	C--------------	--------------C	C------------	------------C	C------------	------------C	C------------	------------C	T	T	
-119	10	2	8	P	C------------	------------C	C------------	------------C	C------------	------------C	C------------	------------C	T	TP-111
-120	8	8	0	T	T	P	P			P	P	P	P	TP-109
-121	10	10	0	T	T	P	P	P	P	P	P	T	T	TP-109
-122	10	6	4	P	P	C	P	C	P	C	P	C	P	TP-111
-123	7	7	0	T	T	P	P				P	P	P	TP-109
-124	10	2	8	T	T	C------------	------------C	C------------	------------C	C------------	------------C	C------------	------------C	
-125	4	4	0	T	T	T							T	TP-109
-126	10	6	4	C--------------	--------------C	C------------	------------C	T	T	T	T	T	T	
-127	6	6	0					T	T	T	T	T	T	TP-109
-128	10	4	6	P	P	P	R------------	------------R	R------------	------------R	R------------	------------R	P	TP-112
-129	10	10	0	O	O	O	O	O	O	O	O	O	O	TP-109
-130	10	2	8	C---------------	---------------C-------------	-------------C-------------	-------------C	C--------------	--------------C-------------	-------------C	B	P	P	
-131	10	4	6	P	P	P	P	R------------	------------R	R------------	------------R	R------------	------------R	
-132	10	4	6	P	P	P	P	O	O	O	O	O	O	
-133	10	6	4	R	R	R	R	P	P	P	B	P	P	
-134	6	6	0					P	P	P	P	P	P	
-135	10	2	8	R	R	R	R	P	P	R	R	R	R	
-136	10	10	0	P	P	P	P	P	P	P	P	T	T	
-137	8	0	8	R	R	R	R			R	R	R	R	
-138	8	4	4	P	P			R	R	R	R	P	P	
-139	6	6	0	T	T	T	T					T	T	
-140	10	0	10	R	R	R	R	R	R	R	R	R	R	
-141	10	2	8	P	P	R------------	------------R	R------------	------------R	R------------	------------R	R------------	------------R	
-142	4	0	4		R	R	R	R						
-143	10	10	0	P	P	P	P	P	P	P	T	T	T	
-144	10	8	2	C--------------	--------------C	T	T	T	T	T	T	T	T	
-145	10	1	9	C--------------	--------------C	C------------	------------C	C------------	------------C	C	C------------	------------C	T	
-146	10	4	6	P	P	T	C------------	------------C	C------------	------------C	C------------	------------C	T	
-147	10	10	0	p	P	P	P	T	T	T	T	T	T	
-148	4	4	0					P------------	------------P-------------	-------------P-------------	-------------P			
-149	10	10	0	T--------------	--------------T	T	T	T	T	T	T	T	T	
-150	10	10	0	P	P	P	P	T	T	T	T	P	P	

FT & RT Configuration Selection Chart

Individual FT Switch Number	Poles			Switch Configeation P=Potential *C=Current (Non-Shorting) * C-C=Current (Shorting)										Test Plug Number
	Total	V	A	A	B	C	D	E	F	G	H	I	J	
-151	10	10	0	P	T	P	P	T	P	P	T	P	P	
-152	10	2	8	P	C------------C		C------------C		C------------C		C------------C		P	TP-111
-153	10	3	7	P	P	C	C------------C		C------------C		C------------C		T	TP-111
-154	10	4	6	P	C------------C		C------------C		C------------C		P	P	P	
-155	10	10	0	P	T	P	P	P	P	P	P	P	T	
-156	10	10	0	P	T	P	P	P	P	P	P	T	T	
-157	10	10	0	P	T	P	P	P	P	P	T	T	T	
-158	10	10	0	P	T	T	P	P	P	P	P	T	T	
-159	10	10	0	P	T	T	P	P	P	P	T	T	T	
-160	10	10	0	P	T	T	P	P	P	T	T	T	T	
-161	10	10	0	P	T	T	P	P	T	T	T	T	T	
-162	10	10	0	P	T	T	P	T	T	T	T	T	T	
-163	10	10	0	P	T	T	T	T	P	T	T	T	T	
-164	10	10	0	P	T	T	T	T	T	T	T	T	T	
-165	10	10	0	P	T	P	P	T	P	P	P	P	T	
-166	10	10	0	P	T	T	T	T	P	P	P	P	P	
-167	8	0	8		R------------R		R------------R		R------------R		R------------R			TP-111
-168	8	4	4		R	P	R	P	R	P	R	P		
-169	10	8	2	C---------------C		P	P	P	P	P	P	P	P	
-170	10	2	8	T	R------------R		R------------R		R------------R		R------------R		T	TP-111
-171	10	10	0	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	TP-109
-172	10	1	9	C---------------C		C------------C		C------------C		C	C------------C		P	
-173	10	10	0	P	P	T	T	T	T	T	T	P	P	
-174	10	10	0	P	P	T	T	T	T	T	T	T	T	
-175	10	10	0	O	O	O	O	O	Y	Y	Y	Y	Y	TP-109
-176	5	1	4		C		C	P	C		C			TP-109
-177	10	6	4	C---------------C		T	P	P	P	T	P	C------------C		
-178	10	4	6	T	T	T	T	C------------C		C------------C		C------------C		
-179	10	10	0	P	T	P	P	P	P	P	P	T	P	TP-109
-181	10	0	10	C-------------C---------------C-------------C				C---------------C---------------C-------------C				C------------C		
-182	10	0	10	C---------------C		C------------C		C------------C		C--------------C---------------C------------C				
-183	10	4	6	C-------------C---------------C-------------C				P	P	P	P	C------------C		
-184	10	10	0	B	B	B	B	B	B	B	B	T	P	TP-109
-185	10	10	0	T	T	T	T	T	T	P	P	P	P	TP-109
-186	10	10	0	T	T	T	T	P	P	P	P	P	P	TP-109
-187	10	4	6	T	T	T	C------------C		C------------C		C------------C		T	TP-112
-188	10	4	6	C---------------C		C------------C		C------------C		P	P	P	T	
-189	10	4	6	T	C------------C		T	C------------C		T	C------------C		T	
-190	10	6	4	P	P	P	P	P	P	C--------------C---------------C-------------C				

P = POTENTIAL- black handle
T = POTENTIAL- red handle
C = Current Non-shorting - black handle
R = Current Non-shorting - red handle
C-C = Current shorting - black handle
R-R = Current shorting - red handle
O = POTENTIAL- orange handle

Y = POTENTIAL- yellow handle
G = POTENTIAL- green handle
B = POTENTIAL- blue handle
W = POTENTIAL- white handle
CO = Current Non-shorting - orange handle
CY = Current Non-shorting - yellow handle
CG = Current Non-shorting - green handle

CB = Current Non-shorting - blue handle
CW = Current Non-shorting - White handle
CO-CO = Current shorting - orange handle
CY-CY = Current shorting - yellow handle
CG-CG = Current shorting - green handle
CB-CB = Current shorting - blue handle
CW-CW = Current shorting - white handle

* = Short Circuit without Jaw or Blade at position "H"
= FT-079 and FT-085 *Appear similar except that FT-079 is Short Circuit without Jaw or Blade at position "H"
Note: Selection Chart does not include all possible configurations