AC MODULAR PRODUCTS

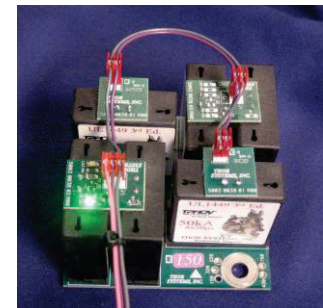**50, 100, 150, 200, 250, 300kA Per Mode**   **SURGE PROTECTIVE DEVICE (SPD)**

THOR SYSTEMS' *Modular* Design, featuring field replaceable individual suppression modules. Modular products are specifically designed for the more harsh service entrance and main distribution environments, where protected equipment criticality is a vital consideration. The units are available in various voltage configurations with models ranging from 50kA to 300kA per mode surge current capacity. The three-tier hybrid design with Thermally Protected Metal Oxide Varistors (TpMOVs), TVS Diodes (SADs), and EMI/RFI Filter Capacitors. The two-tier hybrid design with TpMOVs and EMI/RFI Filter Capacitors. All units consist of individual surge suppression modules bolted to solid copper bus bars providing robust products with superior performance and the ability to quickly and easily replace any failed modules. The products are housed in a NEMA 4X, Fiberglass enclosure with a hinged, clear front door that displays the status of each individual Surge Protection module.

KEY FEATURES & BENEFITS

GENERAL INFORMATION

Agency Listings	*UL1449 5th Edition, UL 1283 5th Edition; cUL*
Application	*TSri (Industrial) or (TSrc) Commercial*
Warranty	*TSri (Life of Original Installation); TSrc (5 Years)*

ELECTRICAL SPECIFICATIONS

Configuration	*Parallel*
Voltages	*208/120; 240/120; 480/277; 600/347; 240 Hi-Leg; 480*
Wire Size	*#6 AWG Rope-Lay Wire Recommended*
Breaker Size	*60A when required by NEC*
SCCR	*100kAIC*
Operating Freq	*47 to 63 Hz*
Operating Temp	*-40ºC to 70ºC*
Operating Humidity	*0% to 95%, Non-condensing*
Operating Altitude	*0 to 12,000 ft.*

MECHANICAL SPECIFICATIONS

Enclosure	*NEMA 4X Fiberglass with clear, hinged lid*
Size	**Std**: *17-1/4"H x 15-1/4"W x 6-3/4"D* *Optional: 19-1/4H" x 17-1/4"W x 9-3/4"D*
Input Termination	**Std**: *Terminal Block (Up to #4 AWG Wire)* *Optional: Distribution Block (Up to 1/0 AWG Wire)* *Fused Disconnect Switch (Up to #4 AWG Wire)*

SURGE SPECIFICATIONS

kA Per Mode	*50, 100, 150, 200, 250, or 300*
Protection	*All Modes (L-N, L-G, N-G, L-L)*
MCOV	*150V, 320V, or 550V*
Serviceability	*Modular, field-replaceable "Surge TILES"*
PCB "TILE" Design	*Up to 4-oz. Parallel Copper Traces (Top & Bottom)*
Response Time	*<1 Nanosecond*
Technology	*TSri: Hybrid 3-Tier; TpMOVS, 1,500W SADS, Filter Caps* *TSrc: Hybrid 2-Tier; TpMOVS, Filter Caps*
Monitoring	*Module Status LEDs and (2) Form C Contacts (Std)*

PRODUCT OPTIONS

- *Surge Counter with 8 Sensitivity Settings (User Selectable) with Audible Alarm*
- *High Energy 15,000W SADs*
- *Extended Filter Network*
- *Phase Loss Contacts*
- *Multi-function Relay: Over/under Voltage, Phase Loss & Phase Rotation*
- *Form C Contact (TSrc Models only)*
- *#6 AWG Rope-Lay Connection Wire*

ADDITIONAL FEATURES/BENEFITS

- *Surge conduction paths are 2x the surge current rating of suppression components*
- *Fewer, larger TpMOVs provide lower let-through voltage and 100x greater pulse life*
- *Each TpMOV is "fail-safe" technology providing full-rated surge capacity*

Modular Product Series
(50, 100,150, 200, 250 & 300kA/Mode)

Multi-TILE Architecture
(Replaceable Module)

Thermally Protected Metal Oxide Varistor (TpMOV)
"Fail-Safe Device

THOR SYSTEMS continuously strives to improve its products. Occasionally there may be changes in features or optional equipment. All information contained in this printed material is based on the latest product information available at the time of printing. THOR SYSTEMS reserves the right to implement changes, without notice, in specifications and equipment services.
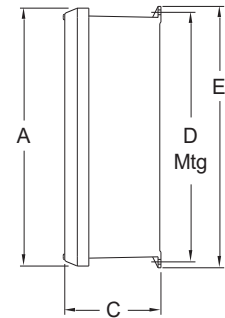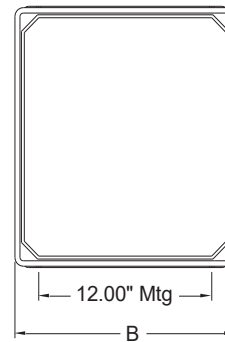
Product Spec Sheet

PERFORMANCE LET-THROUGH RESULTS

VOLTAGE	Surge Voltage Ratings (SVR) 500A 8x20µs Impulse				Voltage Protection Ratings (VPR) 3000A 8x20µs Impulse				Category C3 Ratings 10,000A 8x20µs Impulse			
	L:N	L:G	N:G	L:L	L:N	L:G	N:G	L:L	L:N	L:G	N:G	L:L
208/120 Vac (300kA)	352	387	376	661	800	700	600	1200	1120	1253	1040	1360
480/277 Vac (300kA)	637	787	752	883	1200	1200	1000	1800	1493	1680	1520	2133
600/347 Vac (300kA)	777	963	917	1077	1500	1500	1500	3000	1821	2050	1854	2602

All tests reflect Models using 6" Leads. Test impulses were dynamic and applied at the 90º phase angle of the sine wave per the requirements of ANSI/UL 1449 4th Edition, Section 37.6. Test results DO NOT reflect subtraction of the sine wave peak from the let-through voltage measured at zero (0) crossing.

NOMENCLATURE DETAIL: TSri300Fx 3Y4 P201 BFi (example)

Model No.	TSr	i	300	F	x	3Y4	P	2	01	BFi
Description *(See Below)*	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

(1) Family
THOR SYSTEMS "Replaceable" Module SPD

(2) Series
i	Three tier (with SADs)
c	Two Tier (without SADs)

(3) Surge Current per Rating
050	50kA per Mode (100kA per Phase)
100	100kA per Mode (200kA per Phase)
150	150kA per Mode (300kA per Phase)
200	200kA per Mode (400kA per Phase)
250	250kA per Mode (500kA per Phase)
300	300kA per Mode (600kA per Phase)

(4) Input Termination
T	DIN Rail Terminal Block, Std (up to #4 AWG Max)
F	60A Integral Fused Disconnect Switch (up to #4 AWG Max)
D	DIN Rail Distribution Block (up to #1/0 AWG Max)

(5) TVS Diodes (SADs)
s	1,500W Rated SADs (TSri Models only)
x	15,000W Rated SADs (TSri Models only)
z	No SADs (TSrc Models only)

(6) Voltage Configuration
2S1	240/120V, Split Phase
3Y2	208/120V, Three Phase Wye
3Y4	480/277V, Three Phase Wye
3Y6	600/347V, Three Phase Wye
*3D2**	240V, Three Phase Delta
*3D4**	480V, Three Phase Delta
3Hb	240V, "B" Phase High-Leg Delta

(7) Enclosure Type
P	NEMA 4X Fiberglass
S	NEMA 4 Stainless Steel

(8) Monitoring
1	Module LEDs & 2-Form C Contact (*Std*)
2	Module LEDs, 2-Form C Contacts, Counter & Alarm
3	Module LEDs, 2-Form C Contacts & Alarm

(9) Options
01	No Additional Options
*05**	Adds Extended Filter Network
06	Adds Phase Loss Contact
*07**	Adds Multi-function Relay
*10**	Adds Extended Filter Network & Phase Loss Contact
*11**	Adds Phase Loss Contact & Multi-function Relay

(10) Orientation
BF	Bottom Feed, Lid Mounted Monitor (if applicable)
BFi	Bottom Feed, Lid Internally Mounted Monitor (Outdoor application)

*Enclosure Size: 19-1/4"H" x 17-1/4"W x 9-3/4"D

Product Spec Sheet

PHYSICAL DIMENSIONS

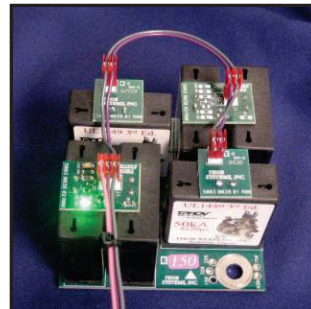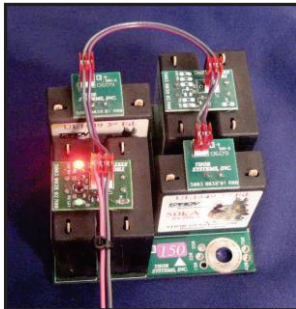| Details	DIMENSIONS				
	A	B	C	D	E
Models w/o Extended Filter or Multi-function Relay	17-1/4"	15-1/4"	6-3/4"	16-3/4"	17-1/2"
Delta Models - Models w/Extended Filter or with Multi-function Relay	19-1/4"	17-1/4"	9-3/4"	18-3/4"	19-1/2"

12.00" Mtg — B

A — D Mtg — E — C

TYPE 1 MONITORING

DISPLAY FEATURES

Each replaceable module contains a Red and Green LED, visible through a clear window.

TYPE 2 MONITORING - SERIES TSm270a

DISPLAY & OVERLAY FEATURES

Overlay has (4) membrane-style switches providing protection against outside contaminants and clear window for the bright, clear LED Counter
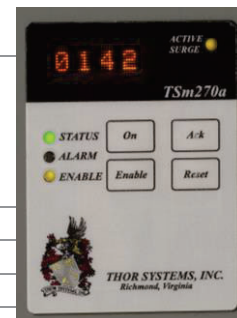
Overlay has (4) LED windows:
- Yellow *ACTIVE SURGE* LED (upper right corner) indicates active surge event mode
- Green *STATUS* LED indicates power is supplied to the device
- Red *ALARM* LED indicates loss of a protection mode
- Yellow *ENABLE* LED indicates Audible Alarm is enabled

Power *On* button turns the display "ON" and "OFF"

Audible Alarm (horn) sounds in the event of a protection mode loss.

Silence (*Ack*) button on the overlay silences the alarm.

Yellow *Enable* button enables/disables the Audible Alarm (illuminated = enabled)

SURGE COUNTER

Smart alphanumeric display (4) digit, 5x7 dot matrix, indicates total surge events:
- Displays up to 27,000 events
- Stores event level in an EE PROM to ensure the event total is not lost if a power outage occurs
- If there is a protection mode loss, display will alternate between the count total and an "ALRM" display

Surge Counter has (8) levels of sensitivity, allowing adjustment of the Counter trigger level by the end user

Sensitivity **Level #3** is calibrated to increment using a combination (1.2µs x 50µs Voltage and 8µs x 20µs Current) waveform.
This sensitivity level is the standard setting based on a nominal 500A current impulse.

Adjustment of each Sensitivity Level results in an approximate 80A increment from the previous setting (340A to 900A range).