



TSni & TSnc Product Spec Sheet

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AC NON-MODULAR PRODUCTS TSni/TSnc 50, 100, 150kA Per Mode SURGE PROTECTIVE DEVICE (SPD)

THOR SYSTEMS **TSn** Series is a Non-modular, UL 1449 4th Edition Surge Protective Device (SPD). These high performance SPDs are suitable for service entrance or distribution panel applications. Our Single-**TILE** Architecture (using the StakTraks™ design) is the base building block for the **TSn** product platforms, offering 50, 100, and 150kA/mode surge protection utilizing an optional two-tier or three-tier hybrid design. The **TSn** Series is available in two configurations for all three surge ratings. The **TSni** (Industrial) is a three-tier hybrid design with Thermally Protected Metal Oxide Varistors (**TpMOVs**), TVS Diodes (**SADs**), and EMI/RFI Filter Capacitors. The **TSnc** (Commercial) is a two-tier hybrid design (**TpMOVs** and EMI/RFI Filter Capacitors) configuration. The SPDs are prewired with low impedance wire which improves suppression performance (4-8%) by reducing skin-effect losses.

KEY FEATURES & BENEFITS

GENERAL INFORMATION

Agency Listings	UL1449 4 th Ed., UL 1283 5 th Ed., cUL
Application	TSni (Industrial) or TSnc (Commercial)
Warranty	TSni: Life of Original Installation TSnc: 5 Years

ELECTRICAL SPECIFICATIONS

Configuration	Parallel
Voltages (AC)	240/120; 208/120; 480/277; 600/347; 240 Hi-Leg; 480
Wire Type	TSni: #10 AWG Rope-Lay (413 Strands) TSnc: #10 AWG MTW (133 Strands)
Breaker Size	30A when required by NEC
SCCR	100k AIC
Operating Freq	50Hz to 60Hz
Operating Temp	-40° to 70°C
Operating Humidity	0% to 95% Non-condensing
Operating Altitude	0 to 12,000 feet

MECHANICAL SPECIFICATIONS

Enclosure/Rating	NEMA 4X Polycarbonate with clear lid
Input Connection	Prewired #10 AWG low impedance wire

SURGE SPECIFICATIONS

kA Per Mode	50, 100, or 150kA
kA Per Phase	100, 200, or 300kA
Protection Modes	All Modes
MCOV	150V, 320V, or 550V
PCB "TILE" Design	Up to 4 oz. Parallel Copper Traces (Top & Bottom)
Response Time	<1 nanosecond
Technology	TSni: Hybrid 3-Tier (TpMOV, SAD, Filter Capacitor) TSnc: Hybrid 2-Tier (TpMOV, Filter Capacitor)
Monitoring (Standard)	Green LED (OK) and Red LED (Fault)

PRODUCT OPTIONS

▪ Form C Contact ▪ 1.5kW SADs ▪ 15kW SADs ▪ Audible Alarm ▪ Surge Counter

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 system surge capacity

Series TSn Configurations

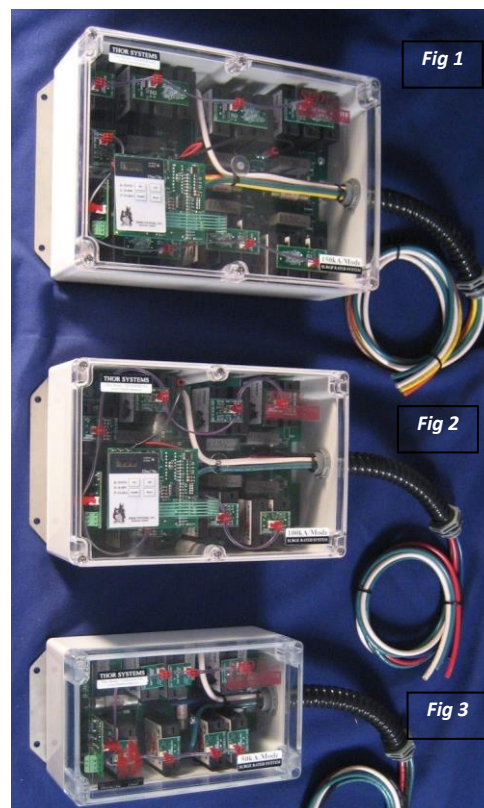


Fig 1: TSn 150 with L2 Monitor & Surge Counter
(10-3/8" x 7-1/4" x 3-3/4")

Fig 2: TSn 100 with L2 Monitor & Surge Counter
(9-1/2" x 6-1/4" x 3-1/2")

Fig 3: TSn 050 with L1 Monitor
(7-3/4" x 4-3/4" x 3-1/2")

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	403	405	440	736	700	700	800	1000	1200	1093	1280	1547
480/277 Vac	869	853	520	1627	1200	1200	900	2000	1813	1707	1440	2613
600/347 Vac	1060	1041	634	1985	1500	1500	900	3000	2212	2083	1757	3188

All tests reflect Models using 6" Leads. Test impulses were dynamic and applied to the 90° phase angle of the sine wave. Test results DO NOT reflect subtraction of the sine wave peak from the let-through voltage measured at zero (0).



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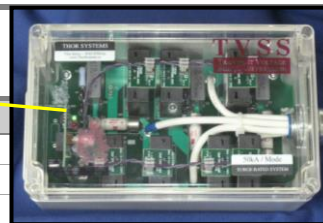
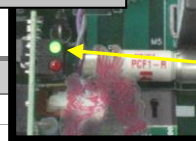
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TYPE 1 MONITORING SERIES Vertical PCB

DISPLAY FEATURES

Green LED indicates all suppression elements are good
Red LED indicates loss of any protection mode

Enlarged View of LEDs



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 an 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).



MODEL NO. NOMENCLATURE FOR TSni & TSnc PRODUCTS

SAMPLE MODEL NO.:

TSn i 150 W s 3Y4 P 1 01

MANUFACTURER SERIES
TSn TSnc Series, Non-replaceable (Single Surge TILE)

MANUFACTURER GRADE
i Industrial Grade (TpMOV, SADs, & EMI/RFI Filtering)
c Commercial Grade (TpMOV & EMI/RFI Filtering)

MANUFACTURER SURGE CURRENT RATING
050 050kA/Mode 100 100kA/Mode
150 150kA/Mode

CONNECTION METHOD*
#10 AWG Low Impedance Wire:
TSni uses #10 AWG Rope-Lay; TSnc uses #10 AWG MTW
*2 Ft provided for each Phase Conductor
*3 Ft provided for each Ground & Neutral Conductor

HYBRID CONFIGURATION
TSni Industrial Series:
s TpMOV, 1.5kW SADs, EMI/RFI Filtering
x TpMOV, 15kW SADs, EMI/RFI Filtering
TSnc Commercial Series:
z TpMOV, EMI/RFI Filtering

ADDITIONAL SYSTEM OPTIONS

00 No Options (Standard) 01 Form C Contact

MONITOR TYPE

1 Type 1: Green & Red LED per System
2 Type 2: Green & Red LED, Audible Alarm, Surge Counter
3 Type 3: Green & Red LED, Audible Alarm

ENCLOSURE TYPE

P Polycarbonate NEMA 4X

VOLTAGE CONFIGURATION

1S1	120Vac	Single Ø, L-N-G	(150 MCOV)
2S1	240/120Vac	Split Ø, L-L-N-G	(150 MCOV)
2S2	240Vac	Single Ø, L-L-G	(320 MCOV)
2S4	480Vac	Single Ø, L-L-G	(550 MCOV)
3Y2	208/120Vac	3Ø, L-L-L-N-G	(150 MCOV)
3Y4	480/277Vac	3Ø, L-L-L-N-G	(320 MCOV)
3Y6	600/347Vac	3Ø, L-L-L-N-G	(550 MCOV)
3D2*	240Vac	3Ø, L-L-L-G	(320 MCOV)
3D4*	480Vac	3Ø, L-L-L-G	(550 MCOV)
3Ha	240/208/120Vac	3Ø High-Leg (AØ) Delta	(150, 320 MCOV)
3Hb	240/208/120Vac	3Ø High-Leg (BØ) Delta	(150, 320 MCOV)
3Hc	240/208/120Vac	3Ø High-Leg (CØ) Delta	(150, 320 MCOV)

*Built in TSni150 Box Size