

Innovative Technology line filters and surge protectors



Electronic equipment protection for reliable operations

Introduction

Eaton delivers a higher level of system protection

Eaton's Innovative Technology® line filters and surge protectors are specifically designed to protect sensitive electronics from hazards that exist within a facility. The Innovative Technology hybrid filter reacts instantly to changes in voltage regardless of phase angle or polarity. In comparison to other line filters, this technology provides a higher level of suppression, reliability, and life expectancy.

Increasing importance of surge protection and line filtering

PLC manufacturers and service technicians recommend the use of power line filters and surge suppressors to prevent downtime and equipment damage due to surges and electrical line noise. Studies have shown that failure to protect sensitive electronic loads costs American manufacturing and commercial and service industries over \$39 billion per year in lost time and revenue. Preventing these losses is a major cost-saving opportunity.

Features, benefits, and functions

Innovative Technology line filters and surge protectors protect against the full spectrum of transient disturbances and are engineered to filter the entire sine wave. As a result, Innovative Technology in-line devices are effective against both low- and high-energy transients to prevent immediate equipment damage and microprocessor failure over time.

- Compact design with multiple mounting options
- Meets new UL® safety standards for surge and filtering protection
- A range of surge current capacity ratings for a variety of applications
- Range of models with different levels of filtering, allowing flexibility for each application
- Contains no replaceable parts or items that require periodic maintenance

EAT•N

Powering Business Worldwide

Applications

By providing surge protection and line filtering, Innovative Technology in-line devices can suppress the noise and transients prevalent throughout the power distribution system to support reliable operations in applications including:

- Instrumentation
- Water treatment facilities
- Pulp and paper operations
- Refrigeration and heating plants
- Petrochemical and refinery installations
- Food processing
- Textiles
- Automotive assembly
- Manufacturing operations

No matter where transients originate, the application of Innovative Technology in-line filters throughout a facility will help protect sensitive electronic equipment including:

- Programmable logic controllers (PLCs)
- Scanning devices
- Automatic teller machines (ATMs)
- Cash registers
- Alarm systems
- Microprocessor-controlled
- OEM products
- Robotics
- CAD/CAM systems
- Control equipment
- Medical electronics and devices

Innovative Technology in-line filters are available in common voltages and configurations, and also in a variety of surge current capacity ratings from 20 to 80 kA at 120 Vac.

Standards and certifications

- UL 1449 5th Edition
- UL 1283 7th Edition
- CSA® C22.2 No. 269.4-17
- CSA C22.2 No. 8-13
- RoHS compliant
- IEC 61000-4.5
- Built in an ISO® 9001 facility
- Designed and tested in accordance with:
 - IEEE® C62.41.1
 - IEEE C62.41.2
 - IEEE C62.43
 - IEEE C62.45
 - IEEE C62.48
 - IEEE C62.62

Feature package options

Innovative Technology PH and PV Series

The Innovative Technology PH and PV models are the high-performance line filters in the line, offering the best EMI/RFI filtering and lowest VPR ratings.

The Innovative Technology PH and PV devices can be used where:

- The lowest let-through voltage (VPR) is desired
- The best filtering of electromagnetic interference (EMI) and radio frequency interference (RFI) is needed
- The longest equipment life and lowest maintenance cost is required
- The value of the equipment protected or process controlled is highest
- 120 or 240 Vac circuits up to 20 A are to be protected

Technical data

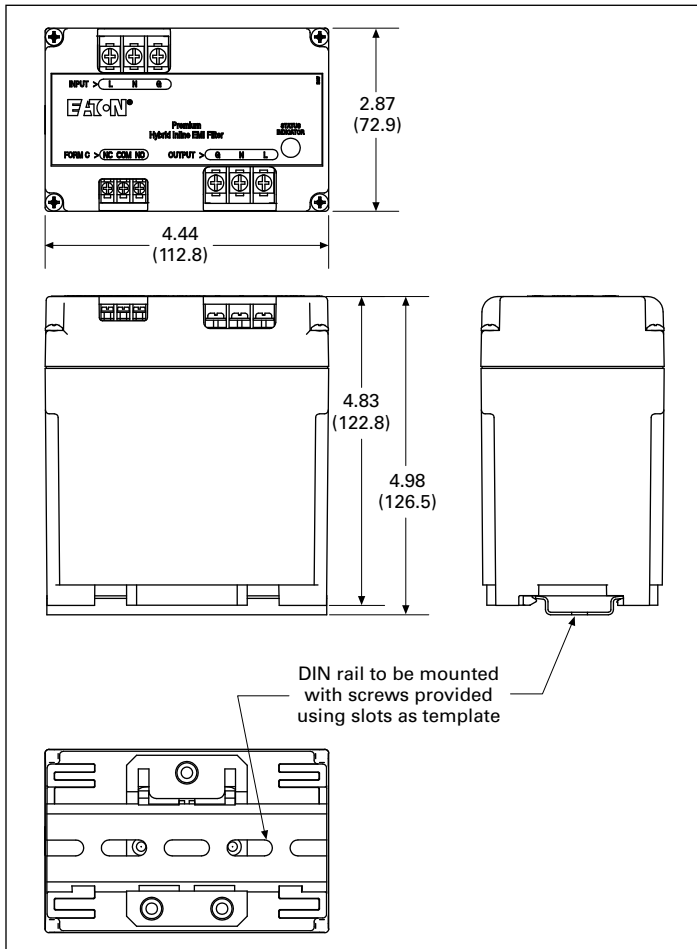


Figure 1. ITPHxxxxx dimensions in inches (mm)

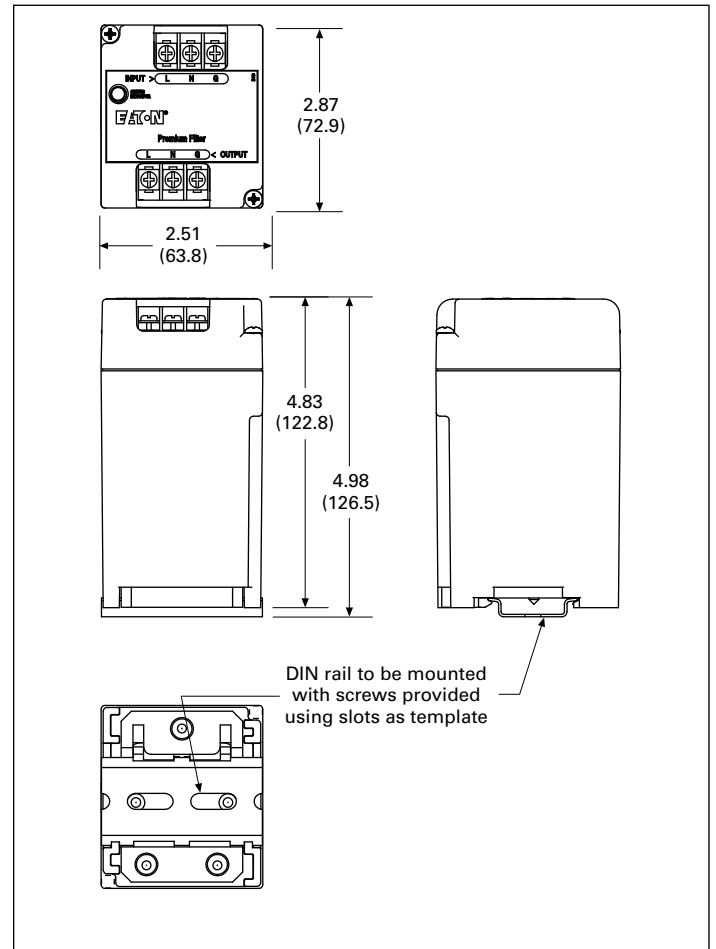


Figure 2. ITPVxxxxx dimensions in inches (mm)

Table 1. Innovative Technology PH and PV specifications

	PH 120 Vac	PH 240 Vac	PV 120 Vac	PV 240 Vac
Specification	3, 5, 10, 15, 20 A	3, 5, 10, 15, 20 A	1, 3, 5 A	1, 3, 5 A
DIN mounting	Yes	Yes	Yes	Yes
UL 1283 7th Edition and UL 1449 5th Edition	Yes	Yes	Yes	Yes
RoHS compliant	Yes	Yes	Yes	Yes
Filtering	Yes	Yes	Yes	Yes
EMI/RFI filtering attenuation at 100 kHz	75 dB	75 dB	50 dB	50 dB
L-G, L-N, and N-G protection modes	Yes	Yes	Yes	Yes
Peak kA per phase/mode	60/30	60/30	40/20	40/20
UL nominal discharge current (I _n)	5 kA	5 kA	5 kA	5 kA
UL voltage protection rating (VPR) L-G / L-N / N-G	330/400/330	600/700/600	330/400/330	600/700/600
MCOV	150	275	150	275
Short-circuit current rating (SCCR)	5 kA	5 kA	5 kA	5 kA
Alarm contacts	Yes	Yes	No	No
Warranty (years) Ⓞ	15	15	15	15
Communication line protection (UL 497A)	No	No	No	No

Ⓞ With product registration.

Innovative Technology CF

The Innovative Technology CF devices provide the widest current ratings with line filtering and surge protection, and are available with optional communication line protection and status contacts.

The Innovative Technology CF can be used where:

- Higher kA of protection is required
- Good filtering of electromagnetic interference (EMI) and radio frequency interference (RFI) is desired
- Communication line protection is needed
- 120/230/240 Vac or 24 Vdc circuits up to 60 A are to be protected

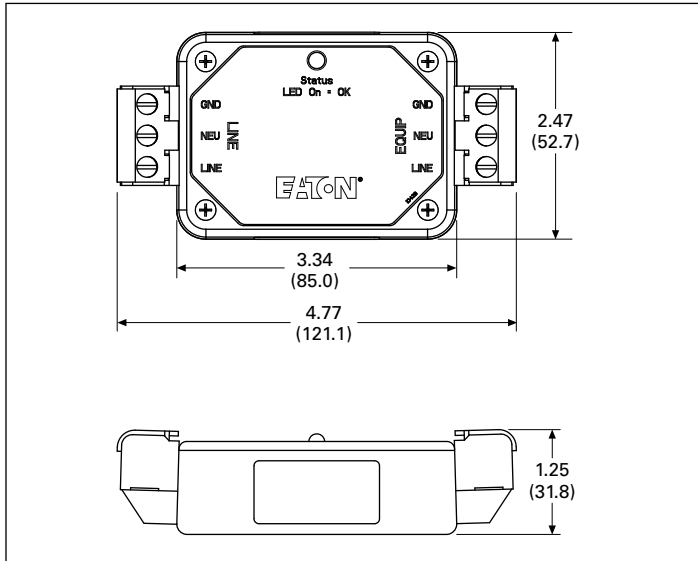


Figure 3. ITCF12010-CP dimensions in inches (mm)

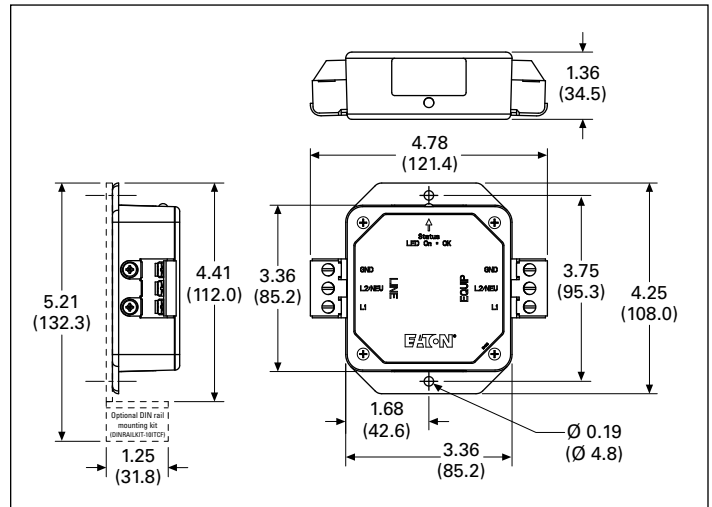


Figure 4. ITCFxxx10 dimensions in inches (mm)

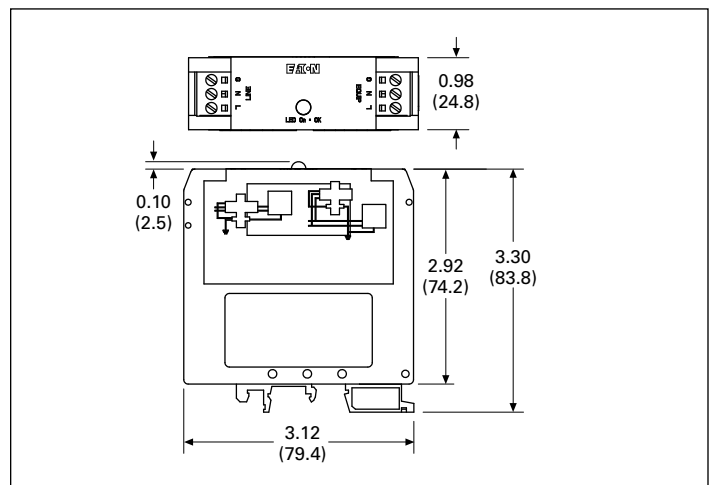


Figure 5. ITCFxxx10-DIN and ITCFxxx10-DIN2 dimensions in inches (mm)

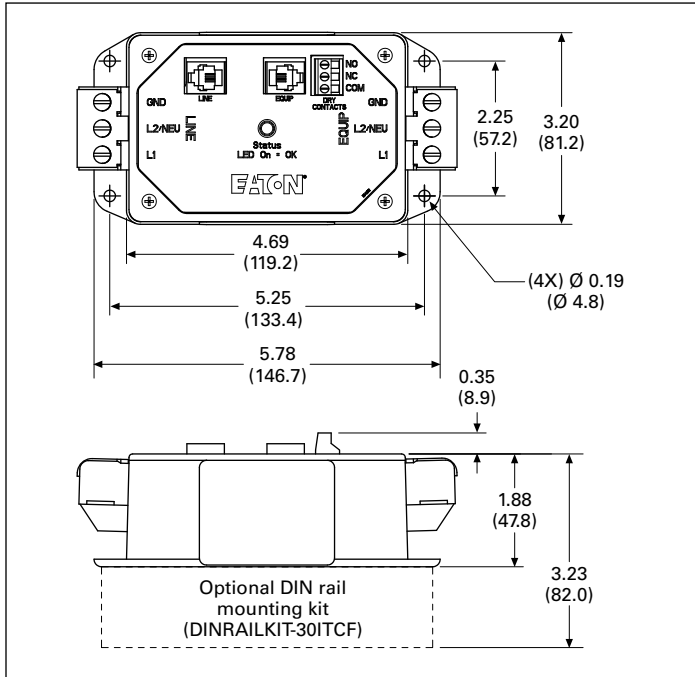


Figure 6. ITCFxxx15 and ITCFxxx30 dimensions in inches (mm)

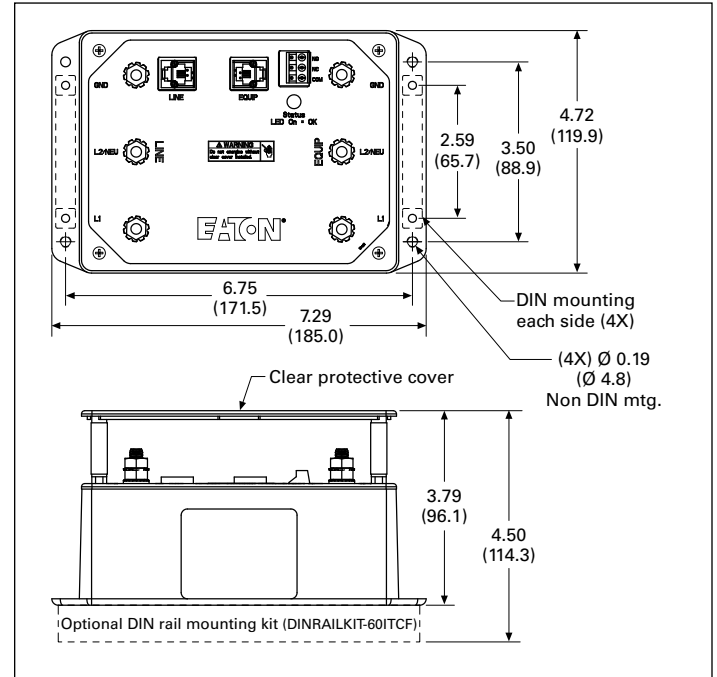


Figure 7. ITCFxxx60xxx dimensions in inches (mm)

Table 2. Innovative Technology CF specifications

Specifications	CF 24 Vdc		CF 120 Vac			CF 230 Vac		CF 240 Vac
	10 A	10 A	10 A	30 A	60 A	15 A	30 A	10 A
DIN mounting	Yes	No	No	Yes ①	Yes ①	Yes ①	Yes ①	Yes
UL 1283 7th Edition and UL 1449 5th Edition	—	—	Yes	Yes	Yes	Yes	Yes	Yes
RoHS compliant	—	—	Yes	Yes	Yes	Yes	Yes	Yes
IEC 61000-4.5	Yes	Yes	Yes	Yes	Yes	—	—	Yes
Filtering	Yes	Yes	Yes	Yes	Yes	—	Yes	Yes
EMI/RFI filtering attenuation at 100 kHz	40 dB	40 dB	40 dB	40 dB	40 dB	40 dB	40 dB	40 dB
L–G, L–N, and N–G protection modes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Peak kA per phase/mode	6/2	6/2	40/20	80/40	80/40	120/60	120/60	30/10
UL nominal discharge current (I _n)	N/A	N/A	5 kA	5 kA	5 kA	3 kA	3 kA	3 kA
UL voltage protection rating (VPR) L–G / L–N / N–G	N/A	N/A	500/500/500	500/500/500	500/500/500	800/800/800	800/800/800	990/980/960
MCOV	30	30	150	150	150	275	275	275
Short-circuit current rating (SCCR)	10 kA	10 kA	10 kA	10 kA	10 kA	10 kA	10 kA	N/A
Alarm contacts	No	No	No	Yes ①	Yes ①	No	Yes ①	No
Warranty (years) ②	10	10	10	10	10	10	10	10
Communication line protection (UL 497A)	No	No	No	Yes ①	Yes ①	No	Yes ①	No

① Optional.

② With product registration.

Innovative Technology CN

The Innovative Technology CN series provides low-cost surge protection in a compact package.

The Innovative Technology CN can be used where:

- Only surge and transient voltage protection is needed
- 120/230 Vac or 24/48 Vdc circuits up to 30 A are to be protected

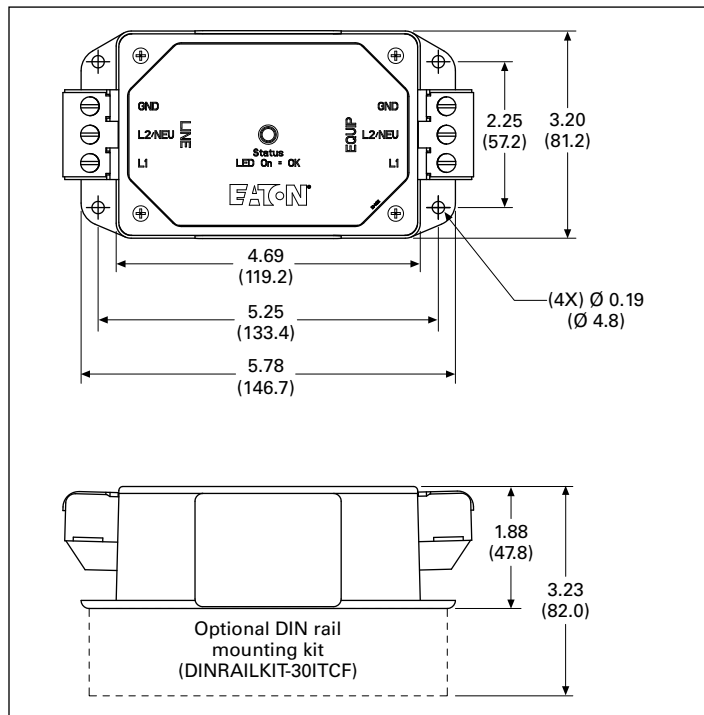


Figure 8. ITCNxxx30 dimensions in inches (mm)

Table 3. Innovative Technology CN specifications

Specifications	24 Vdc	48 Vdc	120 Vac	230 Vac
	30 A	30 A	30 A	30 A
DIN mounting	Yes ①	Yes ①	Yes ①	Yes ①
UL 1449 5th Edition	—	—	Yes	Yes
Filtering	No	No	No	No
L-G, L-N, and N-G protection modes	Yes	Yes	Yes	Yes
Peak kA per phase/mode	20/6	46/20	80/40	80/40
UL nominal discharge current (I _n)	N/A	N/A	5 kA	3 kA
UL voltage protection rating (VPR) L-G / L-N / N-G	N/A	N/A	500/500/500	800/800/800
MCOV	30	50	150	275
Short-circuit current rating (SCCR)	10 kA	10 kA	10 kA	10 kA
Alarm contacts	No	No	No	No
Warranty (years) ②	10	10	10	10
Communication line protection (UL 497A)	No	No	No	No

① Optional.

② With product registration.

Innovative Technology DN

The Innovative Technology DN series provides DIN rail surge protection in a compact package.

The Innovative Technology DN can be used where:

- Only surge and transient voltage protection is needed
- 120–600 Vac, 12/24/48 Vdc, or 1000/1500 Vdc circuits are to be protected
- Replacement modules are specified

Table 4. Innovative Technology DN specifications

Specifications	12 Vdc	24 Vdc	48 Vdc	120 Vac	240 Vac	277 Vac	400 Vac	480 Vac	600 Vac	1000 Vdc	1500 Vdc
DIN mounting	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
UL 1449 5th Edition	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Filtering	No	No	No	No	No	No	No	No	No	No	No
L–G, L–N, and N–G protection modes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A
Peak kA per phase	20 kA	20 kA	20 kA	50 kA	50 kA	50 kA	50 kA	50 kA	35 kA	40 kA	40 kA
UL nominal discharge current (I _n)	10 kA	10 kA	10 kA	20 kA	20 kA	20 kA	20 kA	20 kA	20 kA	20 kA	10 kA
UL voltage protection rating (VPR)	N/A	N/A	N/A	600 V	900 V	1000 V	1500 V	2000 V	2500 V	2500 V	4000 V
MCOV	15	28	52	150	300	350	480	550	750	1000	1500
Short-circuit current rating (SCCR)	N/A	N/A	N/A	200 kA	150 kA	200 kA	200 kA	200 kA	200 kA	50 kA	65 kA
Alarm contacts	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Warranty (years)	1	1	1	1	1	1	1	1	1	1	1
Communication line protection (UL 497A)	No	No	No	No	No	No	No	No	No	No	No

Table 5. Replacement modules for DN series

Voltage	Unit application for module	Catalog number
120 V	ITDN12010R, ITDN12020R, ITDN12030R, ITDN12040R	ITDN120P
240 V	ITDN24010R, ITDN24020R, ITDN24030R, ITDN24040R	ITDN240P
277 V	ITDN27710R, ITDN27720R, ITDN27730R, ITDN27740R	ITDN277P
400 V	ITDN40010R, ITDN40020R, ITDN40030R, ITDN40040R	ITDN400P
480 V	ITDN48010R, ITDN48020R, ITDN48030R, ITDN48040R	ITDN480P
600 V	ITDN60010R, ITDN60020R, ITDN60030R	ITDN600P
500 V	ITDN1000PV30LR	ITDN500PVP
750 V	ITDN1500PV30LR	ITDN750PVP

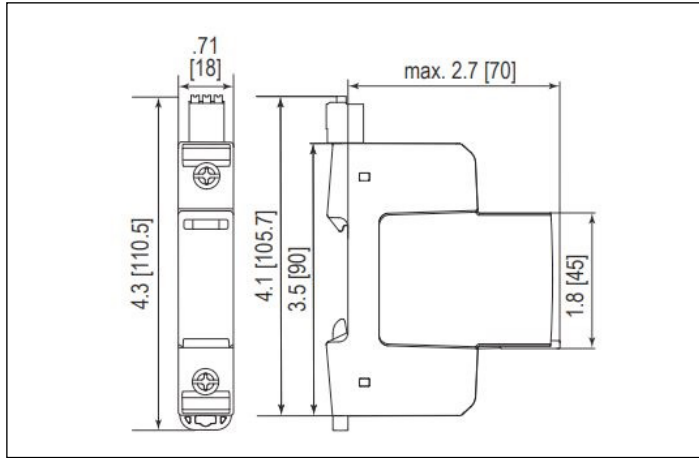


Figure 9. ITDNxxx10R dimensions in inches (mm)

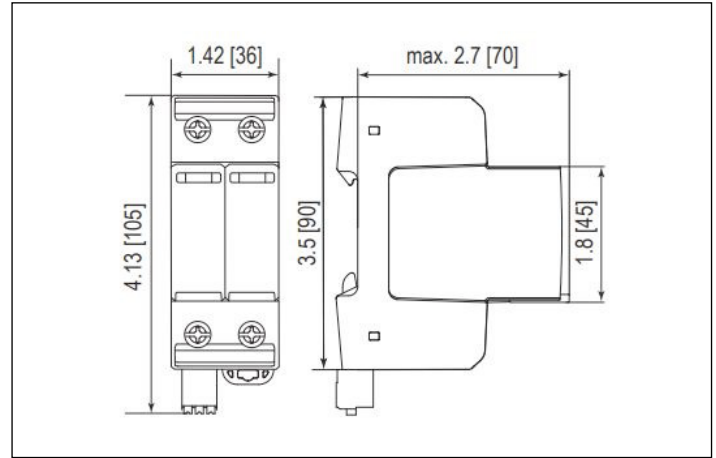


Figure 13. ITDNxxx20R dimensions in inches (mm)

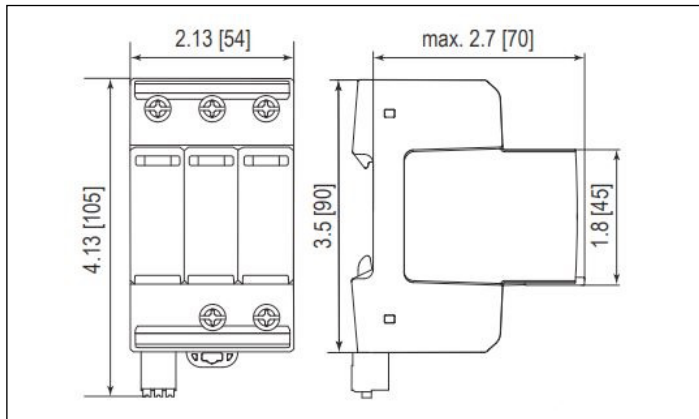


Figure 10. ITDNxxx30R dimensions in inches (mm)

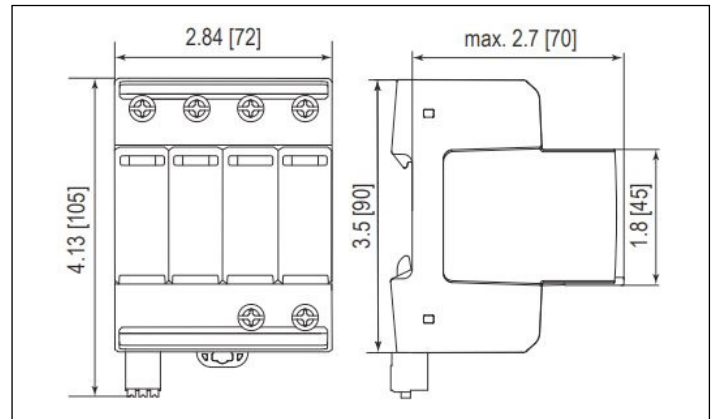


Figure 14. ITDNxxx40R dimensions in inches (mm)

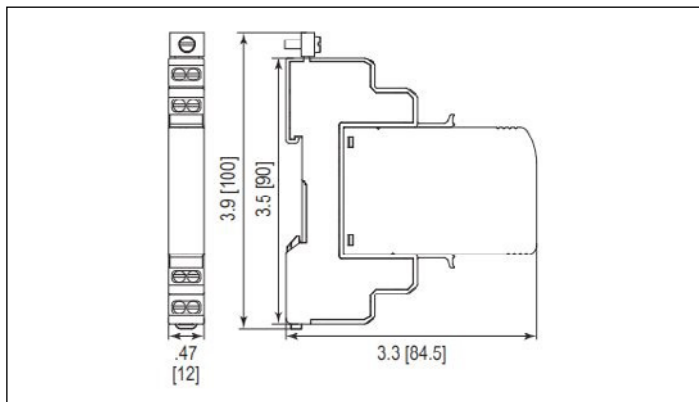


Figure 11. ITDN0xx dimensions in inches (mm)

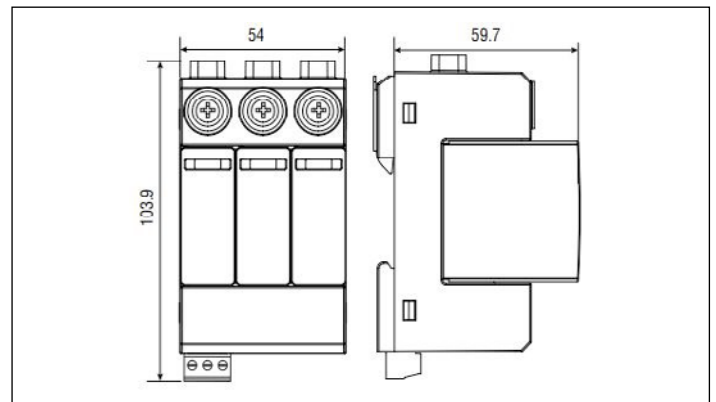


Figure 15. ITDNxxxPV30LR dimensions in millimeters

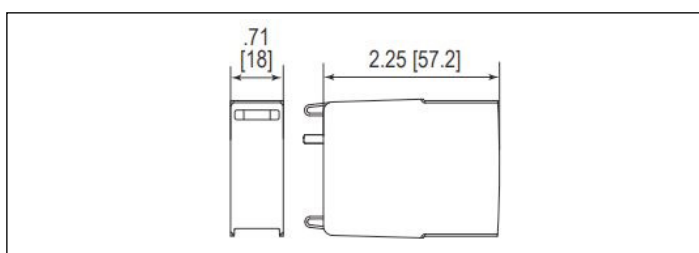


Figure 12. ITDNxxxP dimensions in inches (mm)

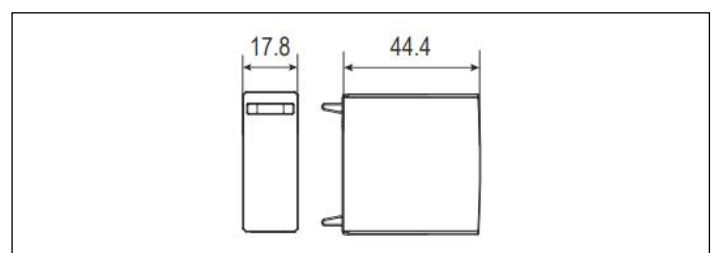


Figure 16. ITDNxxxPVP dimensions in millimeters

Performance data

- ANSI/UL 1449 5th Edition voltage protection ratings
- UL 1283 7th Edition electromagnetic interference filter ratings

Table 6. Specifications

Rating	Innovative Technology series				
	PH	PV	CF	CN	DN
Application	Single-phase, two- or three-wire grounded systems	Single-phase, two- or three-wire grounded systems	Single-phase, two- or three-wire grounded systems	Single-phase, two- or three-wire grounded systems	Single-, split-, or three-phase systems
Input voltage range—AC	100–127 Vac, 200–240 Vac	100–127 Vac, 200–240 Vac	100–127 Vac, 200–240 Vac ①	100–127 Vac, 200–230 Vac	120–600 Vac
Input voltage range—DC	N/A	N/A	5–38 Vdc, 48–149 Vdc, 150–300 Vdc	5–38 Vdc, 24–65 Vdc, 48–149 Vdc, 150–300 Vdc	12–48 Vdc, 1000–1500 Vdc
Amperage	3, 5, 10, 15, and 20 A	1, 3, and 5 A	10, 30, and 60 A	30 A	N/A
Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Protection modes	L–N, L–G, and N–G	L–N, L–G, and N–G	L–N, L–G, and N–G	L–N, L–G, and N–G	L–N, L–G, and N–G
MCOV	150 V and 275 V	150 V and 275 V	150 V and 275 V	150 V and 275 V	Up to 1500 V
Noise attenuation (normal mode)	74 dB at 100 kHz	56 dB at 100 kHz	48 dB at 100 kHz	N/A	N/A
Filter bandwidth	10 kHz to 100 MHz	10 kHz to 100 MHz	10 kHz to 100 MHz	N/A	N/A
Peak surge current per phase / per mode	60 kA / 30 kA	40 kA / 20 kA	Up to 80 kA / 40 kA	Up to 80 kA / 40 kA	Up to 50 kA / 25 kA
Operating temperature	–40 °F to +122 °F (–40 °C to +50 °C)	–40 °F to +122 °F (–40 °C to +50 °C)	–40 °F to +140 °F (–40 °C to +60 °C)	–40 °F to +140 °F (–40 °C to +60 °C)	–40 °F to +185 °F (–40 °C to +85 °C)
Response time	<1 nanosecond	<1 nanosecond	<1 nanosecond	<1 nanosecond	<25 nanoseconds
Agency approvals	UL 1449 5th Edition, UL 1283 7th Edition and CSA C22.2 No 269.4-17 and No 8-13	UL 1449 5th Edition, UL 1283 7th Edition and CSA C22.2 No 269.4-17 and No 8-13	xxCF230xx UL 1283 7th Edition, EMI filter xxCF120xx UL 1449 5th Edition, UL 1283 7th Edition xxCFxxx10-DIN2 UL 1449 5th Edition, IEC61000-4.5	xxCNxxx30 UL 1449, UL 1283 7th Edition, EMI filter xxCN12030 UL 1449 5th Edition	UL 1449 5th Edition, IEC 61643-11, EN 61643-11
UL 1449 Type	Type 2	Type 2	Type 2	Type 2	Type 1CA
Warranty ②	15 years	15 years	10 years	10 years	1 year
Status indicator	LED	LED	LED	LED	Indication flag
Form C contacts	Yes	No	Yes ④	No	Yes
Communication line protection (UL 497A)	No	No	Optional	No	No
External circuit breaker ③	Eaton P/N: FAZ-C25/1-NA-SP or equiv. 25 A circuit breaker	Eaton P/N: FAZ-C7/1-NA-SP or equiv. 7 A circuit breaker	15 A—Eaton P/N: FAZ-C15/1-NA-SP or equiv. 15 A circuit breaker 30 A—Eaton P/N: FAZ-C40/1-NA-SP or equiv. 40 A circuit breaker 60 A—Eaton P/N: EGC3100FFG or equiv. 100 A circuit breaker	Eaton P/N: FAZ-C40/1-NA-SP or equiv. 40 A circuit breaker	

① Voltage rating of 240 Vac applies to CF24010-DIN2 only.

② With product registration.

③ External circuit breaker sold separately.

④ Optional on 30 A and 60 A models only.

Table 7. Let-through voltages based on IEEE Std. C62.62-2010 testing waveforms ①

Test impulse	Innovative Technology series						
	ITPH120xx	ITPV120xx	ITCF12010	ITCF12010-CP	ITCF12030xxx	ITCF12060xxx	ITCN12030
IEEE Category A 100 kHz ring wave 6000 V, 200 A	25 V	30 V	150 V	300 V	150 V	90 V	400 V
IEEE Category B 100 kHz ring wave 6000 V, 500 A	35 V	40 V	330 V	400 V	330 V	230 V	500 V
IEEE Category B combination wave 6000 V, 3000 A (UL 1449-3 VPR)	360 V	370 V	470 V	460 V	460 V	450 V	460 V

① All tests conducted on 120 Vac units.

Product selection

Table 8. Catalog numbering system

Product family/OEM	IT		DIN	
	Protection/filtering	Voltage	Amperage	Options
IT	PH = Premium protection with hybrid filtering	120 = 120 Vac 240 = 240 Vac	03 = 3 A 05 = 5 A 10 = 10 A 15 = 15 A 20 = 20 A	
	PV = Premium protection with filtering	120 = 120 Vac 240 = 240 Vac	01 = 1 A 03 = 3 A 05 = 5 A	
	CF = Critical protection with filtering	120 = 120 Vac	10 = 10 A	CP = Compact
		240 = 240 Vac	10 = 10 A	DIN2 = DIN mount (1-inch wide)
		024 = 24 Vdc	10 = 10 A	DIN = DIN mount (2.5-inch wide)
		230 = 230 Vac	15 = 15 A	Optional DIN mount kit DINRAILKIT-30ITCF
	120 = 120 Vac 230 = 230 Vac	30 = 30 A	RJ = Telcom protection and Form C status contacts Optional DIN mount kit DINRAILKIT-30ITCF	
		60 = 60 A ①	RJ = Telcom protection and Form C status contacts Optional DIN mount kit DINRAILKIT-30ITCF	
	CN = Critical protection without filtering	120 = 120 Vac 230 = 230 Vac 024 = 24 Vdc 048 = 48 Vdc	30 = 30 A	
	DN = DIN rail surge protection without filtering	120 = 120 Vac 240 = 240 Vac 277 = 277 Vac 400 = 400 Vac 480 = 480 Vac 600 = 600 Vac	10R = 1 mode (single-phase) 20R = 2 modes (two-phase) ② 30R = 3 modes (three-phase) 40R = 4 modes (three-phase + neutral) ③	
012 = 12 Vdc 024 = 24 Vdc 048 = 48 Vdc				
1000PV = 1000 Vdc 1500PV = 1500 Vdc		30LR = solar		

① Only available in the 120 Vac version.

② 20R typically used for split-phase.

③ 40R not available in 600 Vac versions.

Technical support information

If you have any questions or need additional information, please contact the Eaton Technical Resource Center at 1-800-809-2772, option 5, option 2, or go to Eaton.com/itvss. You may also submit inquiries via email to spd@eaton.com.

Eaton
1000 Eaton Boulevard
Cleveland, OH 44122
United States
Eaton.com

© 2023 Eaton
All Rights Reserved
Printed in USA
Publication No. TD158004EN / Z27088
January 2023



Eaton is a registered trademark.

All other trademarks are property
of their respective owners.