Johnson Controls

Ducted Systems
Technical Services
Service Tips Letter

Letter: **STR-008-24**

Date: December 13, 2024

To: All Ducted Systems Branch Service, Sales, and Training Managers
All Ducted Systems Distribution Service, Sales, and Training Managers

Subject: Surge Protection Devices

Product: Residential equipment containing inverter driver compressors and / or ECM motors.

Effective: **December 13, 2024**

Residential equipment containing sensitive electronics such as electronically commutated motors (ECMs) and / or inverter drives are extra susceptible to damage from inconsistent incoming power. Inconsistent incoming power, typically referred to as "dirty power" refers to irregularities, distortions, disturbances, or deviations from the ideal sinusoidal waveform in an electrical power supply.

United Laboratories (UL) has a standard for Surge Protection Devices (SPDs) which is UL 1449. This standard applies to end-users, manufacturers, and specifiers. UL addresses electrical product safety in areas that involve a risk of fire, electric shock, or injury to persons. UL verifies the safe operation of SPDs through a listing or component recognition process including a series of stringent destructive and non-destructive tests. These ensure safe operation during normal operation, and at the unit's end of life.

End-of-life characteristics are particularly important because SPDs are placed in harm's way and can affect the rest of the electrical distribution system. Areas of interest include fault current testing, thermal issues, touch-safety, etc.

Effective immediately, we recommend the installation of a UL 1449 approved surge protection device on all residential inverter-driven compressor bearing units. Even if the outdoor section does not have a compressor inverter drive, it may still have an ECM outdoor fan motor and if so, a surge protection device is recommended. We also recommend installation of a surge protection device on indoor air movers containing ECM blower motors.

There are many surge protection devices on the market, with a wide range of features and benefits which of course effect the up-front cost of the device. Some devices only offer surge protection, which is great for indoor sections

containing ECM blower motors or outdoor sections containing ECM outdoor fan motors, but for inverter driven compressor bearing units, we recommend surge protection devices that **also offer brown-out protection**. A brown-out is when line voltage dips or drops below the standard or nominal voltage level. To protect against brownouts, the surge protection device must be able to interrupt or suspend operation of the compressor. Most surge protection devices can be located outdoors next to the outdoor unit service disconnect as shown in the image to the right.

The products shown in the first section below, all have the ability to interrupt compressor operation. Install the surge protection device per the device installation instructions.

ICM 493:

UL 1449:	Yes
Outdoor enclosure:	Yes, NEMA Type 3R
Surge protection:	Yes
Brown-out protection:	Yes
Low voltage contacts:	No
Line voltage contacts:	Yes
Audible Alarm:	No

INTERMATIC CD1-024R:

UL 1449:	Yes
Outdoor enclosure:	Yes, NEMA Type 3
Surge protection:	Yes
Brown-out protection:	Yes
Low voltage contacts:	Yes
Line voltage contacts:	No
Audible Alarm:	No

RECTORSEAL RSH-60 VMD:

UL 1449:	Yes
Outdoor enclosure:	Yes, NEMA Type 4X
Surge protection:	Yes
Brown-out protection:	Yes
Low voltage contacts:	Yes
Line voltage contacts:	No
Audible Alarm:	Yes

Other surge protection devices that do not offer brown out protection, are **only** recommended for indoor and outdoor sections containing ECM motors. These are shown below. Install the surge protection device per the device installation instructions.

ICM 517A:

UL 1449:	Yes
Outdoor enclosure:	Yes, NEMA Type 4X
Surge protection:	Yes
Brown-out protection:	No
Low voltage contacts:	No
Line voltage contacts:	No
Audible Alarm:	No

INTERMATIC AG3000:

UL 1449:	Yes
Outdoor enclosure:	Yes, NEMA Type 4X
Surge protection:	Yes
Brown-out protection:	No
Low voltage contacts:	No
Line voltage contacts:	No
Audible Alarm:	No

MARS 83907:

UL 1449:	Yes
Outdoor enclosure:	Yes, NEMA Type 4X
Surge protection:	Yes
Brown-out protection:	No
Low voltage contacts:	No
Line voltage contacts:	No
Audible Alarm:	No

RECTORSEAL RSH-50:

UL 1449:	Yes
Outdoor enclosure:	Yes, NEMA Type 4
Surge protection:	Yes
Brown-out protection:	No
Low voltage contacts:	No
Line voltage contacts:	No
Audible Alarm:	No

RECTORSEAL RSH-60:

UL 1449:	Yes
Outdoor enclosure:	Yes, NEMA Type 4X
Surge protection:	Yes
Brown-out protection:	No
Low voltage contacts:	No
Line voltage contacts:	No
Audible Alarm:	Yes

DITEK DTK-120/240CM+:

UL 1449:	Yes
Outdoor enclosure:	Yes, NEMA Type 4X
Surge protection:	Yes
Brown-out protection:	No
Low voltage contacts:	No
Line voltage contacts:	No
Line voltage contacts:	No
Audible Alarm:	No

If you have any questions on this, feel free to call Ducted Systems Technical Services at 1-877-UPG-SERV and speak with a technical support representative or contact your Regional Technical Service Manager.

Casey McConnaughy
UPG Regional Technical Service Manager
Ducted Systems Technical Services - Johnson Controls