DEDPV Expanded F.A.Q.

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How would I know if I need a booster fan for my clothes dryer?

All clothes dryers require adequate exhaust airflow to function properly. When that airflow is reduced, the clothes dryer performance is negatively affected. Without adequate airflow, not only will the clothes dryer take longer to perform its task and use more energy, but lint can accumulate inside the duct system and inside the dryer itself over time.

Sometimes all you need to restore your dryer's performance is a good professional cleaning of your dryer and duct system. If you have noticed that your clothes dryer doesn't perform as well as it used to, this is an indicator that lint buildup may be at fault. But it is important to also examine what allowed the lint to excessively accumulate inside the duct in the first place. Lint accumulation is normal and requires periodic cleaning of both the duct and dryer, but a correctly installed dryer with a properly designed duct system shouldn't allow lint to accumulate excessively. Excessive lint-buildup and airflow problems can sometimes be resolved by taking a careful look at your dryer duct system.

Sometimes the problem is the duct design itself. If you have noticed that your clothes dryer has never performed well, this may be the cause. Safety standards such as UL and CSA define adequate dryer duct air velocity as 1200 feet per minute (FPM). This air velocity is considered adequate to move entrained lint through the duct and out of the vent. Most residential clothes dryers are equipped to provide this air velocity up to a certain amount of "equivalent length" of ductwork, and each is rated for a specific maximum equivalent length. Each additional foot of ductwork adds to the friction by a defined amount as do each of the elbow fittings. This friction acts against the airflow and reduces the air velocity. If your clothes dryer's recommended maximum duct length is unavailable to you, the 2015 International Residential Code defines the safe maximum "total equivalent length" (TEL) as 35 feet. 35 feet of length sounds like plenty, but 35 feet of "equivalent" length can be much less than you expected. When calculating the TEL of your duct system, add 5' for every standard 90-degree elbow, double the actual length of flexible duct used behind your dryer, and remember to add another 5' if the flexible duct behind the dryer also turns 90 degrees. Certain types of exterior vents can also be restrictive and contribute to the total effective length. An example using a dryer duct that turns upward into the attic and exits the side of the house: if you have 2 1/2 feet of flexible duct that turns 90 degrees, then a 10' vertical pipe with another 90 degree elbow on top, you have already used up 20 equivalent feet. There is only 15' left in your horizontal run to the vent before the allowable 35' TEL is exceeded. If you do this calculation with the clothes dryer exhaust duct in your home and note that you have exceeded the clothes dryer manufacturer's TEL (or the IRC's recommendation of 35 feet), you have two options. One option is to relocate your clothes dryer and/or exterior vent such that their locations will require lengths of duct and fittings that fall inside the allowable TEL. The second option is to add a clothes dryer booster fan to your duct system.

In new construction, the ideal placement of your clothes dryer and exterior vent are sometimes your primary concern and the resultant TEL of duct required for those locations falls outside of the recommended TEL. Your only choice is a clothes dryer booster fan.

A clothes dryer booster fan installs inline with your existing or new 4" dryer exhaust duct and will synchronize or interlock its operation with your clothes dryer. This interlock can be achieved by either a pressure sensor or current sensor.

Why is a current sensor better than a pressure sensor for the dryer interlock?

In order for the booster to operate properly, it must interlock or synchronize its operation with the clothes dryer. A pressure sensor is one approach to achieve this interlock, but is not the best way in our view. A pressure sensor integral to the fan imposes restrictions on the mounting orientation of the fan. Care must be taken to orient the fan such that the intrusion of moisture in the sensing tube is reduced. Moisture and dust/lint buildup in the pressure sensor body can lead to problems. The second problem with a pressure sensor interlock is that the booster fan must run on a timed cycle. The fan must periodically turn off for a time and check the pressure sensor once more for the presence of positive pressure to determine if the clothes dryer is still operating. Turning the booster off repeatedly in the middle of a dryer cycle potentially increases the risk of lint buildup, and can also be a nuisance if you can hear the fan starting and stopping. The calibration cycle of some pressure-interlocked booster fans can be a nuisance as well. Interruptions to the power supply will force the fan to perform its 5 minute calibration cycle every time power is restored. Since the booster fan's pressure sensing cycle is on a fixed interval, it will often run for several minutes after the clothes dryer cycle has ended. There is no benefit to this extended run period. In fact, removing the lint from the clothes dryer's lint trap while the booster fan is continuing to draw air through the screen can be more difficult.

A better approach to interlocking the booster fan's operation with the clothes dryer is to use a current sensor. The current sensor will detect operation of the clothes dryer's motor and start/stop the booster fan accordingly. This is a much more reliable synchronization to the clothes dryer's operation that doesn't require cycling or inadvertently extended run-times. But a standard current sensor switch requires a hard-wired connection to the booster fan and involves interfacing with the supply wiring to the clothes dryer's power outlet on the wall. This line-voltage wiring work can be a barrier to some installers. This wiring work can be intimidating to the average do-it-yourself installer, or it can add unwelcome time to the busy professional installer's job. Suncourt's DEDPV uses a low-voltage clip-on (non-invasive) current sensor to achieve this interlock with minimal installation effort and time. The current sensor clips around one of the cord's power leads on the back of the clothes dryer. The sensor sits nicely inside the clothes dryer's wiring compartment after it is clipped onto the power lead. Since clothes dryers include a terminal block inside the wiring compartment for a customer-provided power cord, and our current sensor interfaces only with that power cord, the use of our current sensor does not constitute a modification of "factory wiring." Our current sensor interfaces to our booster fan's indicator panel using a 72" long cord with a standard 1/8" TRS phone plug, commonly used with headphones or computer speakers. Additional distance can be added between the sensor and indicator panel with an off-the-shelf extension cable if needed. Standards require that a booster fan start within one minute of the start of clothes dryer operation. Our fan starts after 3 seconds of continuous clothes dryer current detection. Standards also require that a booster fan run no longer than 5 minutes after the dryer cycle has ended. Our fan stops after 10 seconds.

What is a DEDPV?

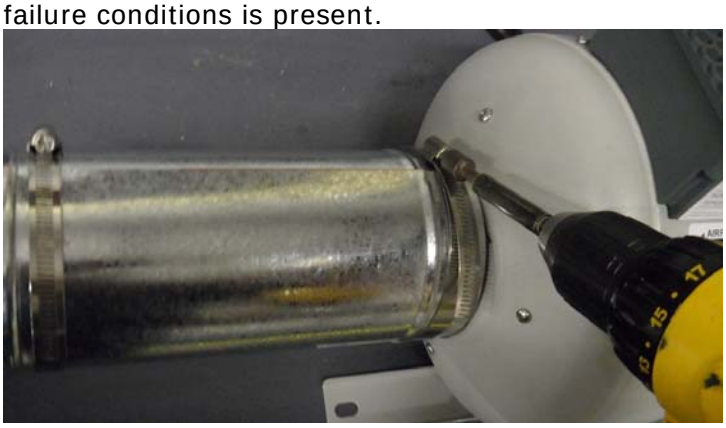
A DEDPV is a dryer exhaust duct power ventilator. It is a term used by safety standards and the International Residential Code to describe a specific category of clothes dryer booster fans. Clothes dryer booster fans solve a particular problem. But they may introduce new problems to the duct system if they do not function as intended. In recognizing the implications of these potential problems, UL developed specific standards for clothes dryer booster fans. These standards include specific construction requirements, performance standards, and additional safety features. These standards were appended to the UL Standard 705 in a section devoted specifically to DEDPV's. CSA22.2 113 also adopted similar standards for DEDPV's. All manufacturers of DEDPV's carrying a mark of safety conformance must meet one or both of these standards if their product is marked as a DEDPV. These standards ensure that all clothes dryer booster fans produced to the DEDPV standard will perform as intended and will include specific design features that properly mitigate the risks of potential malfunction.

Why is a DEDPV necessary?

Certified DEDPV's were required for all new residential construction in the 2015 International Residential Code. While many individual jurisdictions across the US are still on an older IRC standard, adoption of the 2015 IRC is gaining ground and it is expected that the 2015 IRC will be the prevalent standard everywhere clothes dryer duct boosters are used. Only certified DEDPV's will be acceptable for use. Clothes dryer booster fans not marked as DEDPV units will not pass building inspections. DEDPV's are required for clothes dryer boosting applications due to their additional safety features.

What are the additional safety features of a DEDPV?

A certified DEDPV has certain safety features that are not included in a standard clothes dryer booster fan:
1. The housing of the DEDPV must be metal to maintain the fire-rating of the dryer duct assembly.
2. The DEDPV must shut down within 15 seconds if it detects a fire inside the clothes dryer or inlet duct. This is a very important safety feature that a standard clothes dryer booster fan does not have. A certified DEDPV will shut down before it can contribute to the spread of fire.
3. The DEDPV must include an indication panel that shows that the fan is properly operating, and also shows when the fan is not operating properly. The DEDPV must warn the end-user of a low airflow condition in the duct system. This condition could exist due to crushed flexible duct, inoperable flap(s) in the vent, duct obstructions, or excessive lint buildup anywhere in the dryer or duct system. This low-airflow condition could also exist if the DEDPV itself is malfunctioning. That is an important warning since a non-operable fan in your otherwise problematic dryer duct makes the situation worse. A certified DEDPV must make this low airflow failure notification to the end-user within 4 minutes. Our DEDPV notifies this condition instantly. A certified DEDPV will continue to show a "failure" status indefinitely until the problem is resolved. The standard will allow the omission of an indicator panel if the DEDPV instead prevents the clothes dryer from operating any time one of these duct failure conditions is present.



4. The DEDPV must include provisions for periodic cleaning. The end-user must be able to easily inspect and clean the interior of the fan without removing the fan or any ductwork. We include removable metal duct cleanout sleeves in our kit for this purpose. The band clamps on each sleeve are loosened and both sleeves slide out of the way for inspection/cleaning. Without removable sleeves, a professional duct cleaner won't be able to pass their cleaning device through the entirety of the dryer duct without first removing the DEDPV.

5. The safety listing agency tests the performance of the DEDPV according to the special section in UL standard 705 and/or CSA22.2 113. The testing is rigorous and includes humidity conditioning tests, verifying proper interlock with the clothes dryer, verifying proper airflow at the maximum length, confirming that the fan can handle the duct temperatures at the minimum length, confirming that the fan is capable of maintaining the required airflow at the maximum length when subjected to significant lint-buildup conditions, verifying prompt shutdown during a clothes dryer fire, and proper notification of a low airflow condition. Their testing also authenticates most of the DEDPV manufacturer's claims about performance. As of this writing, only three ventilation manufacturers in the world have satisfied the safety requirements to carry a DEDPV designation on their product.
6. All of these features must be integral to the product in order to carry a DEDPV certification. The 2015 IRC requires a fan certified as a DEDPV. Only a fan with these integral features will be certified as a DEDPV after a safety listing agency has tested and verified these features. A building inspector will look for this DEDPV designation on the fan during an inspection

Why is Suncourt's DEDPV rated for 100' of duct?

When a DEDPV is certified by a safety listing agency, a "length" of duct is simulated by using a damper to produce the equivalent static pressure of that length. The listing agency verifies that your fan still produces 1200FPM of air velocity at the maximum equivalent length claimed. Our fan produces much more than 1200FPM at this equivalent 100' length, and thusly our maximum advertised length could be higher than 100'. But we have determined the optimum maximum distance. A safety listing agency does not test a DEDPV's ability to accurately indicate the low-airflow conditions when installed in various positions within varying duct lengths. We performed these tests ourselves using actual lengths of duct and fittings rather than simulating the length with a damper. We found on the outlet side that the accuracy of the low-airflow indication is optimum within 35 feet from the vent. We also determined that the optimum distance to the clothes dryer is up to 65' in order to reliably shut down within 15 seconds of detecting excessive duct temperature. So these two distances form the basis of our 100' maximum recommended duct length.

Subtracting the friction losses from the elbows and exterior vent and assuming 10' of length is used up in vertical elevation, that leaves between 70' and 80' of allowable equivalent duct length from the clothes dryer to the location of the exterior vent. This is more than ample for the typical residential application. Having additional equivalent duct length beyond 100' looks like a good metric on paper, but isn't relevant to the application. A clothes dryer placed anywhere inside even a 10,000 square foot single-story home would find a vent on the nearest exterior wall less than 50 feet away.

What is Centrasense™ and what are its advantages in a DEDPV?

For a DEDPV to do its job of notifying the end-user of potential low-airflow conditions, the fan needs a way to measure the airflow. There are many ways of accomplishing this often involving additional internal or external sensors. Our patented method uses no sensors, but instead directly monitors the impeller motor's electrical characteristics. These characteristics change in predictable and measurable ways under different airflow conditions. This correlation of motor electrical characteristics to airflow forms the basis of our Centrasense™ technology.

Unique advantages available only with our DEDPV employing Centrasense™:

- Instantaneous indication of high inlet static pressure condition (low outlet airflow).
- Instantaneous indication of low inlet static pressure condition (low inlet airflow).
- Fan reliably starts after 3 seconds of continuous clothes dryer operation.
- No periodic on/off cycling during clothes dryer operation.
- Fan stops 10 seconds after the clothes dryer stops operation.
- Fan can be installed in any orientation.
- No calibration cycle required when first powering up the unit.
- Remote indicator is designed for both surface mounting or electrical box mounting.

Each and every one of our DRM04 DEDPV fans are assembled and carefully calibrated right here at our facility in Durant, IA. And our method of motor detection, Centrasense™, is protected by a utility patent as is our use of a clip-on non-invasive current sensor for the clothes dryer interlock.

Dave Forman is the Principle Design Engineer for the DRM04 DEDPV, and inventor of the Centrasense™ monitor circuit.