



BSH Home Appliances Group

**B/S/H/**

# Condensate Dryers

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Statement concerning this presentation:

- The following information is based on market and product experience, sound engineering and technical understanding. As such not all information is substantiated with documented or empirical data.
- As technology changes and previous data/information becomes obsolete there could be specific exceptions to this information. This information is presented as general current knowledge.

# Condensation and Vented Dryer comparison

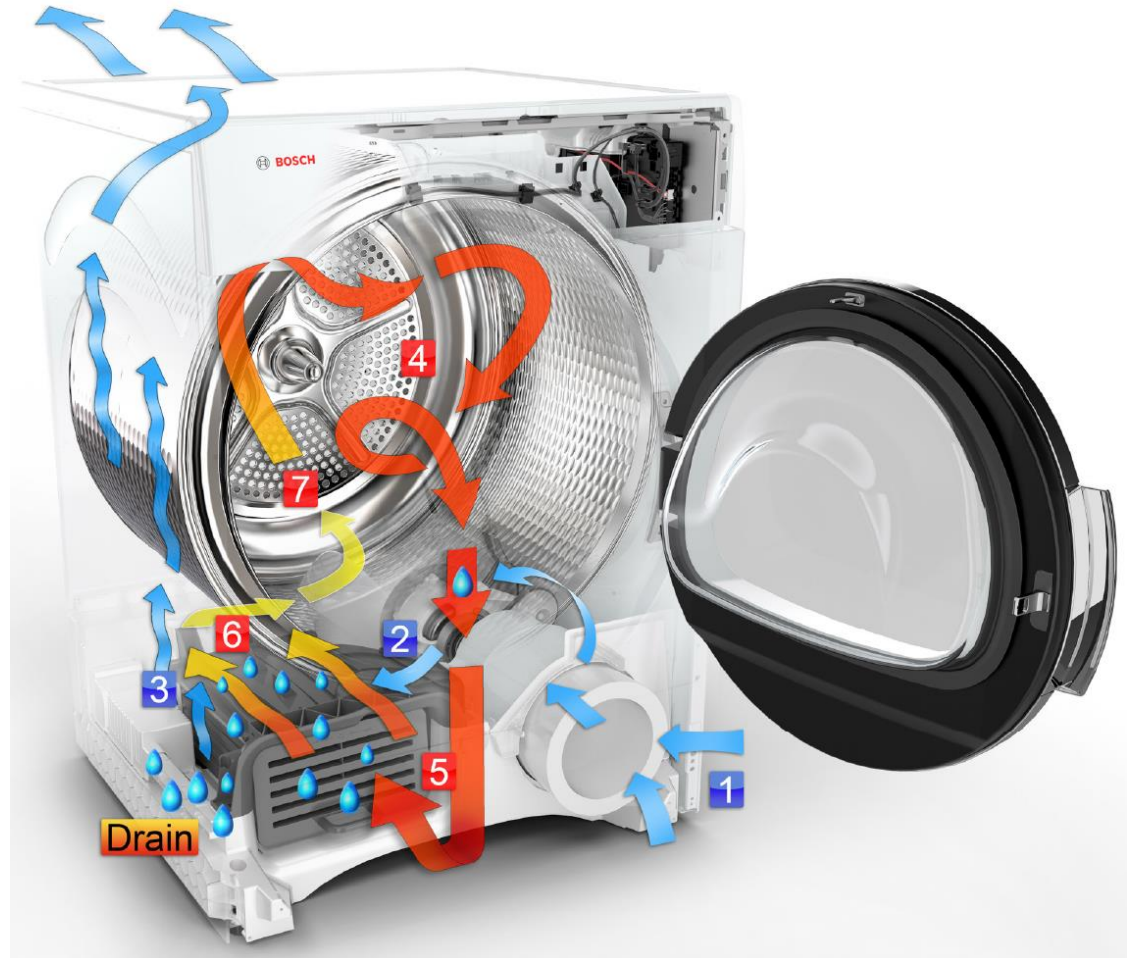


Physical System	Condensation Dryer	Vented Dryer
Heating Source	Generally either an Electric Resistance Heater or a Heat Pump type system	Generally either an Electric Resistance Heater or a Gas burner
Heating System Power	Generally between 2,200 and 3,000 Watts. About the same as 2 hair dryers.	Generally between 5,200 and 6,000 Watt electric element or 20,000 to 24,000 BTU/hr gas burners
Air Flow configurations	One internal air flow path which removes moisture from load (“Closed Loop”) + One external air flow path which cools and condenses the moisture in the Closed Loop path	One air flow path which takes the home’s (ambient) air, heat’s it, removes moisture from load and exhausts it to the outside of the home.
External venting or exhaust duct needed	No	Yes. This requires the home HVAC to recondition required make up air
Moisture removal path	Moisture from load is condensed into water and pumped to an external drain or internal container	Moisture is retained in the air flow path and exhausted through the external duct to the outside of the home
Noise	Generally Less due to less air flow	Generally More due to higher air flow
Size	Generally found in smaller (24” category) dryers	Found in both larger and smaller size dryers



# Condensation Drying illustration

1. Ambient (cool) air enters dryer.
  2. Ambient air enters heat exchanger and is heated.
  3. Ambient air (warm and dry) exits heat exchanger.
  4. Process (heated) air enters drum to absorb moisture and dry load.
  5. Process air (wet) enters heat exchanger, is cooled releasing moisture.
  6. Process air (dry) exits heat exchanger.
  7. Process air enters heater and is heated up.
- Drain.** Water is collected and pumped to drain.



# Condensation and Vented Dryer comparison



Installation and Maintenance	Condensation Dryer	Vented Dryer
Location	Any where due to no ventilation needs and small size.	Some limits due to recommendations to keep exhaust path as short as possible. Some manufactures suggest adjacent to an exterior wall
Duct Maintenance (cleaning of lint and repair )	None	Regular cleaning of duct to repair leaks, remove lint build up, repair or clean outlet/baffle
Lint accumulation inside dryer housing	Generally less, due to the finer mesh lint filters required to keep the condenser/heat exchanger clean and tighter door and drum seals to maintain the internal air flow	Generally more, due to the higher air flow and less consideration for tight door and drum seals.
Ambient room temperature	Adds to ambient room temperature due to radiant heat and warming ambient air (cooling air). Note this cooling air contains no moisture.	Raises ambient room temperature only due to radiant heat
UL requirement of Fire Containment for Drum	None	Yes, due to the availability of fresh air in drum this type fire is nearly impossible to contain 100% of the time.
UL requirement of Fire Containment for Internal Base or Housing	Yes	Yes

# Condensation and Vented Dryer comparison



Performance	Condensation Dryer	Vented Dryer
Over Drying of textiles	No	Yes. Due to historical North American customer expectations and continuing market for basic mechanical timer controls
Control of Drying process	Sensor type controls detecting moisture and temperature of fabric.	Can have both sensor type controls or basic mechanical timer with no sensing attributing to fabric damage.
Lint generation	Less due to: <ul style="list-style-type: none"> <li>- less over drying</li> <li>- lower drying temperatures</li> <li>- finer lint screen mesh</li> <li>- tighter drum and door seals</li> </ul>	More due to: <ul style="list-style-type: none"> <li>- more over drying</li> <li>- higher drying temperatures</li> <li>- more course lint screen mesh</li> <li>- less tight drum and door seals</li> </ul>
Textile “feel”	Generally cooler giving impression of higher moisture content. Actually it can be as low as 1% moisture content	Generally warmer giving impression of lower moisture content. Actually can be as low as -5% moisture content
Drying cycle time	Slightly longer due to the two air path system, lower wattage (power) heating elements and lower temperatures. Can be sensitive to condition of ambient air environment	Generally shorter due higher heating power and single air path system.

# BOSCH CONDENSER DRYERS



1. No ducting required due to vent-less technology
2. No washer power outlet needed. Washer plugs into integrated power outlet on back of dryer
3. All Bosch 24" dryers are supplied with power cords so no additional expense for customer
4. Bosch 24" dryers are the fastest Condensate dryers in the market today and are comparable in drying time to some vented models.





## History and Customer information

Condenser clothes dryers have been around for many years and are more predominant in Europe than in the US or Canada. Their emergence in Europe was due to the easy installation cost (no venting required) and their condensation of water that could be reused in the household for such things as watering plants, washing of clothes or other household items.

One of the main benefits to condensate dryers is their fabric care capabilities due to not over drying the fabric and lower temperatures.

Their use in the US is mainly a niche market due to their small size. Their market share is between 1 and 3 percent of the total clothes dryer market in the US.



## **Additional Information**

Condenser type clothes dryers offer additional benefits that in many situations reduce energy consumption.

1. Produce warm dry air for the interior living space during winter, reducing the heating load for the home's heating system during this time
2. Reducing the amount of hot moist air being brought into a home in a hot humid climate during the summer months. Reducing this amount of hot moist air reduces the energy usage of the home's air conditioning system

# Maintenance and Care

## From the User Manuals

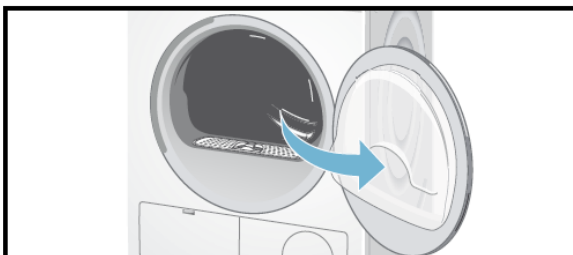
### Cleaning the moisture sensors

The dryer is equipped with a stainless-steel moisture sensor. The moisture sensor measures how damp the laundry is.

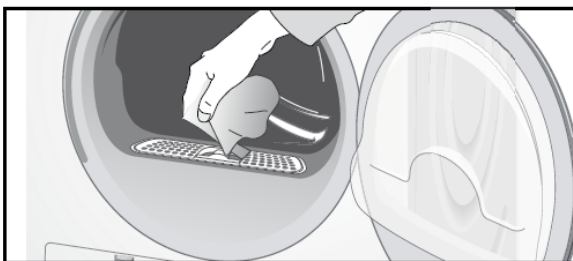
After long periods of usage the moisture sensor may become covered by a fine layer of limescale or residues of detergents and textile care products. Such residues must be removed regularly as the sensor function and in consequence the drying result may be impaired.

#### To clean the moisture sensors:

1. Open the door.



2. The deposit on the sensors can easily be removed by wiping the sensors (the two bars next to the lint filter) with a cloth and a little white vinegar.



**NOTICE:** Use white vinegar only!

Customer complaints of “the load is coming out wet” may be due to the heavy use of Fabric Softener both in the Washer (liquid) and Dryer (fabric sheets).

Softener leaves a chemical residue on the moisture sensors that must be removed for the dryer to operate as designed. Frequency of cleaning depends on the customers use of Softener but a good rule of thumb is to clean once per month if Softener is used often.

If drying time is shorter than normal or clothes are “coming out wet”, this should be one of the first things to check and clean.



## Maintenance and Care, cont.

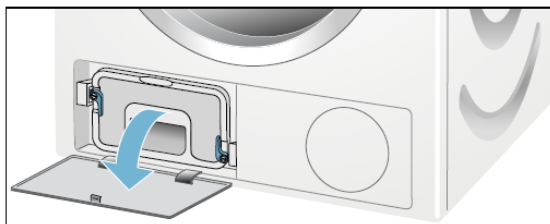
### From the User Manuals

#### Cleaning the heat exchanger

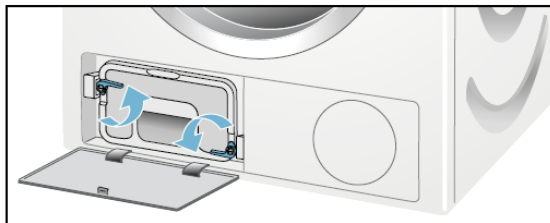
The heat exchanger requires periodic cleaning (recommended once per month under normal drying conditions). The frequency of cleaning depends on the amount and type loads being dried.

##### To clean the heat exchanger:

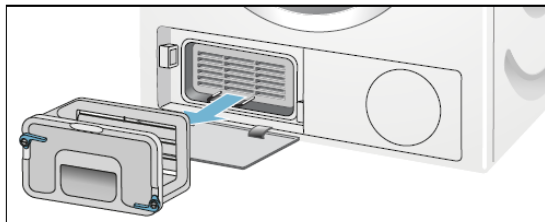
1. If the dryer is hot, run on **Air Fluff/No Heat** program to allow the dryer to cool down.
2. Residual water may escape, place an absorbent cloth under the maintenance flap.
3. Unlock the maintenance flap and open it completely.



4. Turn both locking levers towards each other.

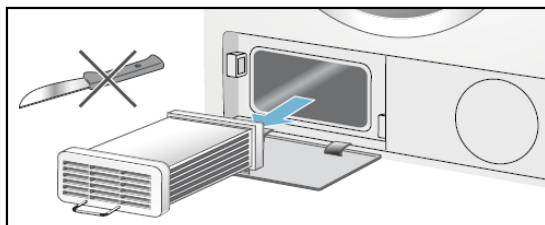


5. Pull out the heat exchanger cap.

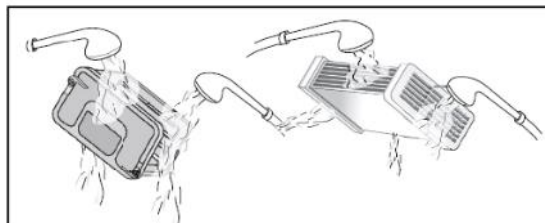


6. Remove the heat exchanger.

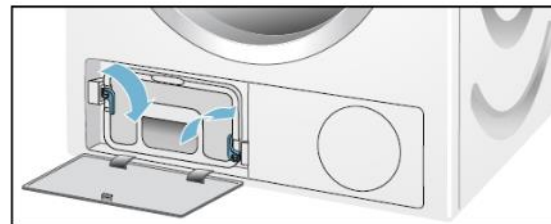
**NOTICE:** Do not damage the heat exchanger! Clean with warm water only. Do not use hard or sharp edged objects!



7. Rinse the heat exchanger and the cap on all sides with a jet of water to completely remove all of the lint and fluff.



8. Remove all lint and fluff from the seals on the dryer and heat exchanger.
9. Allow the cap and the heat exchanger to dry fully.
10. First insert the heat exchanger, then the cap.
11. Turn back both locking levers.



12. Close the maintenance flap until it locks into position.

