## Group Test

### Specification

<table>
<thead>
<tr>
<th>MAKE</th>
<th>MODEL</th>
<th>COST</th>
<th>TYPE</th>
<th>WEIGHT</th>
<th>H x W x D cm</th>
<th>TEMPS</th>
<th>TANK</th>
<th>PER DAY</th>
<th>SPEEDS</th>
<th>TIMER</th>
<th>AUTO OFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dimplex DXDH10D</td>
<td>£134.99</td>
<td>Compressor</td>
<td>10.5kg</td>
<td>49 x 36.5 x 22</td>
<td>5-35°C</td>
<td>2.0 hr</td>
<td>10 hr</td>
<td>1</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>2</td>
<td>EBAC 2650E</td>
<td>£179.99</td>
<td>Compressor</td>
<td>13.0kg</td>
<td>54 x 35 x 26</td>
<td>3-35°C</td>
<td>3.5 hr</td>
<td>18 hr</td>
<td>2</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>3</td>
<td>Meaco DD9L</td>
<td>£149.00</td>
<td>Desiccant</td>
<td>6.4kg</td>
<td>50 x 35 x 18.5</td>
<td>1-40°C</td>
<td>2.0 hr</td>
<td>6 hr</td>
<td>3</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>4</td>
<td>Prem-i-air EH1104</td>
<td>£144.00</td>
<td>Desiccant</td>
<td>6.5kg</td>
<td>49 x 30 x 20</td>
<td>1-40°C</td>
<td>2.6 hr</td>
<td>8 hr</td>
<td>3</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>5</td>
<td>Seago YL2007</td>
<td>£129.95</td>
<td>Compressor</td>
<td>11.0kg</td>
<td>49 x 27 x 36.5</td>
<td>5-35°C</td>
<td>2.6 hr</td>
<td>12 hr</td>
<td>1</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>6</td>
<td>Waveline WL-2110BP</td>
<td>£109.99</td>
<td>Compressor</td>
<td>8.75kg</td>
<td>48 x 30 x 19</td>
<td>5-35°C</td>
<td>2.0 hr</td>
<td>10 hr</td>
<td>1</td>
<td>N</td>
<td>N</td>
</tr>
</tbody>
</table>
DEHUMIDIFIERS

There are two types of mains-powered dehumidifiers available today – compressor or desiccant – and it’s important to know the difference or you could end up paying a lot of money for one that just isn’t up to the job on a boat.

**Absorption (Compressor) Types**

Compressor driven dehumidifiers work in a similar way to domestic refrigerators. A fan draws air into the machine, which passes over a cooled evaporator plate like the one in the back of your domestic fridge. As the air temperature quickly drops, the moisture in the air reaches its dew point and condenses onto the evaporator surface. This water then runs off to be collected in a small reservoir tank or is fed off through a drain hose.

In the right environment compressor-driven absorption dehumidifiers provide a simple, cheap and efficient method of removing moisture from the surroundings. However, they work best at temperatures above 20°C and are at their most efficient at around 30°C, so they’re really only suited to use in the summer, or in heated houses during the winter. Below 12°C some won’t work at all due to the evaporator plate icing up, so you would need to leave a heater on as well, which would be uneconomical to run throughout the winter.

To overcome this icing up problem, some compressor-driven models either switch off intermittently to allow the evaporator plate to thaw, or they employ a reverse hot gas cycle that rapidly reheats the frozen plate, before continuing to dehumidify.

**Desiccant (Rotary) Types**

These dehumidifiers use a desiccant (water-absorbing) material, typically Zeolite, which absorbs water vapour in much the same way the little packets of silica gel you can find in boxes containing electronic equipment. A fan draws air into the dehumidifier and passes it through the top half of a slowly rotating wheel containing the desiccant. This draws the moisture out, drying the air before it is sent back into the room. At the same time the lower section of the desiccant wheel is heated and the warm, moist air passed over a cold plate where it condenses and runs off into the integral tank or drain pipe.

Desiccant dehumidifiers work at much lower temperatures – from 1°C upwards – and are much more effective at extracting moisture than a compressor driven unit at these very low temperatures. A 7ltr/day desiccant unit can often extract more moisture than a 25ltr/day rated compressor unit, despite being smaller, lighter and generally more robust.

For liveaboards one notable advantage of the desiccant type is that it helps heat the cabin as the hot, dry air is expelled – a real bonus in winter. Also, these units tend to be considerably quieter than compressor types, which is particularly significant if left on at night.

**Important Features**

There are a few other important features to look out for on dehumidifiers – especially those that are going to be left on board unattended for long periods of time. Auto restart after a power cut being one of the most vital, especially where the shore power is unreliable or the circuit breaker is regularly being ‘popped’ by other folks putting fan heaters on in the winter!

A permanently plumbed drainage facility that allows the water to drain directly overboard (via a basin for instance) rather than collect in the unit’s internal reservoir, is also a must, but be sure the outlet hose or sink drain won’t freeze up in the winter by lagging it with foam.

A built-in humidistat is very useful and will save power as it can be set to a level (usually between 50-60 per cent), below which it switches off to conserve energy.

A frost-stat is also useful in very cold conditions, when it becomes almost impossible to dehumidify the air. Saying that, in very cold conditions it is unlikely to be particularly humid anyway.

As with many modern fan heaters, some dehumidifiers have ‘tip-over’ switches, that switch off the power if tipped over. This is an excellent safety feature, but sadly none of our selection had one of these sensible devices fitted.

**Electrical Safety**

As with all mains-powered equipment on board a high level of safety is required to ensure the equipment being deployed is as safe as a standard domestic installation. Shore power circuitry should contain an RCD (aka: earth trip) and each circuit should have its own MCB (aka: circuit breaker). For extra protection it makes sense to...
Small compared to other compressor types, this unit is primarily intended for wall or bulkhead mounting, although the handbook states that it can be left freestanding. The lack of a handle makes it difficult to carry, though.

One considerable advantage of being a wall-mount unit with the air intake at the front is that, even if you leave it freestanding you can tuck it right back against a bulkhead to keep it out of the way without the worry of restricting the airflow, a handy feature for tight spaces such as boat cabins.

It has few controls or features, and its mechanical Off/Continuous/0-8hr timer looks a bit 1970s. Operation couldn’t be simpler, though – you simply turn the rotary knob to Continuous or any time between 1-8hrs, after which it switches off. There is no adjustable humidistat as such, the unit simply dehumidifies until the relative humidity (rH) reaches a comfortable 50-60%.

Three LEDs on the front panel indicate Dehumidify, Defrost and Full water tank. Being a compressor-driven unit it goes into a defrost mode for no more than a third of its running time to ensure the plate remains ice-free. after defrosting it automatically returns to the dehumidify mode.

As with the others, when its small tank is full, the unit switches off until it is emptied and replaced. The handbook advises that you don’t use this model below 5ºC or it might ice up completely.

Like the others a permanent hose can be connected at the back for continuous draining. It also has an optional active carbon filter to clean the air as it is circulated through the machine.

**For:**
- Can be bulkhead mounted or put hard against something
- Very simple to use

**Against:**
- Very small water tank
- No user-settable humidistat
- No booster function

**VERDICT**
★★★★

Surprisingly effective for such a compact machine, but rather lacking in features. Its ability to be bulkhead mounted might be useful, although it is heavy. Being able to put it against a wall is also useful, but not having a user-settable humidistat means it will have to be left on permanently, which could be costly over time.

---

**Dimplex DXDH10D £134.99**

A low-cost compressor-driven dehumidifier from Force 4 chandlers, the Seago is somewhat larger than the dessicant types and almost twice as heavy, although in a way this makes it less likely to tip over accidently. It’s a little basic control-wise, but it does seem to do the job for which it was intended. The panel has three LEDs – Defrost, Power and Water full indicators. The humidistat is a simple rotary knob with an Off position, a symbol showing clockwise to increase, and a Continuous position. It’s not obvious, though, what it is you’re increasing – the power or the humidity setting. The handbook says turn it to the right for on and then set the humidity level at around 60% for normal use – but there are no percentages marked on the scale, merely five ‘notches’ between Off and Continuous. At first I assumed that each notch equaled a 20% incremental rise in relative humidity – i.e. the notch just before Continuous would dehumidify down to 80%, the second down to 60%. But if this was the case then it should start as soon as you rotate the knob past Off, as the first position would be 20%, which is low enough to trigger it immediately. So, in fact the reverse is true – the first notch is 80% RH, dropping to 20% just before the Continuous setting.

Should the temperature drop below 5ºC a heating fan is turned on to stop the plate from freezing up. This of course uses power, but less than in a dessicant unit, which has to heat all the time in order to operate.

Attaching the supplied drain hose requires a rubber bung to be removed on the rear and the hose to be simply pushed over the protruding spigot. The water tank still needs to be in place, however, or the auto shut-off stays activated.

**For:**
- Cheapest of all tested
- Very simple to operate (once figured out!)
- Effective at warmer temperatures

**Against:**
- Heavy and large
- No boost mode
- No timer

**VERDICT**
★★★★

A fairly basic machine with little in the way of functions or controls, but it does the job and is good value.
MEACO DD8L JUNIOR £149

This dessicant dehumidifier is compact and light. It has similar functions to the Premi-Air unit, although the Junior model we tried doesn’t have the ioniser found on its bigger brother, the DD8L. It’s relatively quiet and is unlikely to disturb when left on low or normal settings at night.

The air outlet is on the top of the unit, so blows vertically upwards. This is okay for general dehumidifying, but isn’t very useful for drying laundry.

Its control panel on top is straightforward, although the single page, quick-start manual supplied is desperately short of useful information. We were forced to download the slightly more comprehensive manual from the Meaco website before we were confident enough of getting the settings correct.

It has a basic humidistat with four settings – one, two or three drips and a laundry icon. The thumbs up symbol beside two drips is clearly the ‘normal’ setting (50% RH), but it’s a kind of reverse logic to realise that more drips means a lower setting – ie. three drips means it will continue running down to 40% RH and one drip to just 60% RH. When the selected level is achieved, the unit goes into fan only mode until it rises again, when it restarts.

The unit has a heating element, which, though it adds to the cost of running it in the winter, does mean it is effective down to an ambient 1ºC and increases room temperature some 5ºC or so.

The laundry setting is a boost mode for drying clothes and will force the machine to try to achieve a relative humidity of 35%, so drying must be done in a small, enclosed room. Wet washing must be kept far enough away so as not to get the unit wet inside.

The device also has a timer allowing it to run for 1, 2, 4 or 8 hours, after which it switches off. This is mainly for drying laundry, but it’s handy to dry your boat out for a few hours after leaving, without leaving it on permanently. The fan also has three speeds – 1x, 2x or 3x. The 3x is for laundry, 2x for high or 1x for normal use.

For:
- Light and compact
- Easy to use
- Works at low temperatures

Against:
- Fan blows vertically upwards
- Small capacity tank

VERDICT
★ ★ ★ ★ ★

This is a good little unit – lightweight and compact. Its controls and operating modes are intuitive to use. The vertical outlet isn’t ideal, however, and its water reservoir is a bit small.

ST TIPS

DO
- Make sure the dehumidifier you choose has a continuous drain feature.
- If draining down a sink outlet, lag the hose and seacock with foam so as to ensure it doesn’t freeze up in the winter.
- Choose a machine that has enough capacity to work in the volume of your boat. The larger the capacity the quicker it will bring the relative humidity down, which is important if you’re living aboard permanently.
- If you want your dehumidifier to automatically come on when humidity levels in your boat reach a certain point, look for a dehumidifier with an in-built humidistat, which can be set by the user.
- If unattended, leave doors, lockers and drawers open wherever possible and add vents to areas that can’t easily be reached so that the air can be circulated extensively.

DON’T
- Hang wet clothing or towels too close to the unit.
- Although leaving the boat well ventilated is the simplest solution to prevent mould and mildew getting hold down below, the opposite is true if you’re planning to leave a dehumidifier running continuously when the boat is unattended. Leaving vents and hatches open will just result in the dehumidifier slogging its guts out trying to dry the entire atmosphere – at huge expense!

PASSIVE DEHUMIDIFIERS

There are plenty of cheap ‘dehumidifying’ devices available that are simply aerated containers of a desiccant, such as silica-gel crystals. While they do indeed absorb a certain amount of moisture from the air (until they are saturated) they are really only suitable for very small, sealed areas such as drawers and boxes and are almost entirely useless for larger areas. Furthermore, when they are saturated you need to dry them out somehow, which often means putting them on a heat source somewhere for several hours. There are some around that have integral heating elements, but they’re not designed to be left powered up – the element is merely a convenient way of drying the crystals out.

One of the best passive products available, as featured in ST169, is the Pingi range of Eco-friendly dehumidifiers.

When saturated, the special indicator will change colour; when the indicator colour has changed from blue to pink, recharging is required. 2 x 6 minutes of heating in the microwave oven at ± 600 Watts and the retained moisture will hygienically evaporate from it.

Web: Pingi.com
The heaviest unit on test, but not quite as large as the Seago. This unit is popular in the chandlers, despite being a compressor-driven device. Unlike the Seago, its controls are comprehensive and includes auto, laundry, economy and air clean/fan modes. If fitted with a Bactiguard air filter the latter mode will purify the air using a activated carbon particles within the special filter.

The panel has three buttons and several LEDs, which require you to refer to the manual a few times before you get the hang of them. The central Mode button changes through the settings mentioned above, while the Fan button adjusts the speed of the fan in both dehumidify and air clean/fan mode. A fifth push puts it into standby, which effectively allows you to switch it off, but retain your preferred settings. There is no on/off switch.

Two keys at the top with big drip/little drip annotations are the humidistat adjustment and the chosen setting is indicated by a row of LEDs, showing 20/40/60/80/Max.

By far the easiest is to just switch it to Auto and let it work it out for itself. In this mode it aims to achieve a RH of between 50-60% and sets the humidistat and fan speed to suit.

In economy mode the fan remains at low speed and the auto function still operates, but the compressor turns on less often to save power. The unit restarts in the event of a power cut, but always defaults to Auto mode – even if it was left in Standby, so make sure you disconnect it from the mains if you don’t want to chance it coming on while you’re away.

The tank is the largest of those trialled and is dead easy to remove and carry to empty, only having a hole in it rather than a removable lid. Permanent drainage is obtained by removing a bung at the rear and attaching the hose supplied.

For:
- Comprehensive controls and indicators
- Auto, Eco and Laundry modes
- Large tank

Against:
- Heavy

VERDICT ★★★★
If you don’t need it to operate below 3ºC or you have a small bar heater to keep the boat’s interior at around 5ºC minimum then this is a very good buy. It’s a bit heavy, but it’s in-built Smart Control makes life really easy and during the times you’re not on board creating condensation, the Eco mode will save on energy costs.

I’ve had an earlier model Prem-I-Air on my boat for some years and it has performed faultlessly in all weathers – even close to freezing. One major improvement over my model is the auto-restart feature, as power cuts are common in my marina. The modes and controls are very similar to the Meaco and just as simple and intuitive to set use. Having three speeds is also ideal – High for fast drying and laundry, Normal for everyday use and Quiet for nighttime operation.

Being the desiccant type it is very light and easy to carry around, but this comes with the disadvantage of not being as stable as the heavier compressor types with their larger footprints. It also extracts less water in warmer temperatures, but most of us only use a dehumidifier during the winter months anyway.

The ioniser is a bonus too. I find it helps clean the air, especially in the summer, when I suffer from hayfever quite badly.

What I particularly like is the swinging air deflector, which directs the output through a 120-degree arc forward and above the horizontal when Autoswing is selected and can be locked into any particular position within that arc.

The air filter is easy to remove and, though not perfect, the water reservoir has a centrally-positioned handle that allows you to carry it without spilling.

Attaching the permanent drain hose is also dead easy.

This model also boasts an eco-mode that cuts in automatically after 12 hours, reducing the heater element power consumption from 620W to 390W.

For:
- Light and easily carried
- Useful functions and simple controls
- Swinging airflow director

Against:
- Slightly lower extraction rate
- No humidistat

VERDICT ★★★★
This is a sensibly-priced dehumidifier that does a good job and is logical to operate. If you live aboard in winter this unit is ideal as it’s quiet, but more efficient at low temperatures than the compressor types. Its heater will also help warm the boat, but the lack of a humidistat is disappointing.
Well known for its reasonably priced marine equipment, Waveline products often score above average in our group tests.

Despite being compressor-driven this is a surprisingly light unit and is as compact and easy to move around as the desiccant models. There are two models in the range – the WL-2110BP and the WL-2110B. They are easy to confuse by their names, but not when you look at the machine itself. The former has more controls and indicators, including a humidistat, the latter a simple on/off switch.

Clearly, it has to be more economical to run the unit with the humidistat, as it will shut off as soon as the preset RH level is achieved, whereas the B model will simply go on forever. I would suggest the latter is for attended use only.

Instead of having a defrost heater like the other compressor types tested, the Waveline models shut down for 10 minutes every 40 minutes when the ambient temperature is <16ºC, to allow the plate to defrost naturally. This means it will take longer to bring the humidity down in the first instance, but shouldn't make much of a difference when running over a longer period. It's also makes it cheaper to run than those with a heater. Despite this function, the unit is not designed to operate in temperatures below 5ºC, so you would need to leave some form of heating on low during the deepest winter months.

The humidistat on the BP model can be set to 40%, 60%, 80% or Continuous and there are LED indicators to show Power On, Tank Full and Defrost mode active. There is no boost function or laundry mode and, even more importantly, it won't auto-restart after a power cut.

For:
- Light and compact
- Low cost
- Simple to operate

Against:
- Few functions
- Small capacity tank
- No defrost heater
- No auto-restart after a power cut

**VERDICT**

This is a very reasonably priced but somewhat basic dehumidifier with simple controls (even simpler if you chose the WL-2110B model), so you wouldn't expect it to be up to the standard of one of the heavier, more complex units. However, it's quiet and, for its size, surprisingly effective. The temperature limitations are no worse than other compressor types, although the lack of a defrost heater effectively means that below 16ºC it will only actually be dehumidifying for 40 out of every 50 minutes.

### RESULTS

<table>
<thead>
<tr>
<th></th>
<th>START</th>
<th>1HR</th>
<th>2HR</th>
<th>QTY OUT</th>
<th>NOISE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimplex</td>
<td>23.0ºC/80%</td>
<td>25.6ºC/76%</td>
<td>26.4ºC/68%</td>
<td>525ML</td>
<td>42DB</td>
</tr>
<tr>
<td>EBAC</td>
<td>22.5ºC/82%</td>
<td>22.6ºC/79%</td>
<td>22.5ºC/76%</td>
<td>560ML</td>
<td>32/40DB</td>
</tr>
<tr>
<td>MEACO</td>
<td>21.5ºC/77%</td>
<td>24ºC/75%</td>
<td>25ºC/66%</td>
<td>490ML</td>
<td>34/40/44DB</td>
</tr>
<tr>
<td>Prem-I-Air</td>
<td>22.2ºC/79%</td>
<td>27.2ºC/78%</td>
<td>27.2ºC/68%</td>
<td>420ML</td>
<td>36/36/47DB</td>
</tr>
<tr>
<td>Seago</td>
<td>20.3ºC/82%</td>
<td>23ºC/77%</td>
<td>23.2ºC/76%</td>
<td>700ML</td>
<td>42DB</td>
</tr>
<tr>
<td>Waveline</td>
<td>20.0ºC/82%</td>
<td>20.6ºC/78%</td>
<td>20.9ºC/77%</td>
<td>475ML</td>
<td>40DB</td>
</tr>
</tbody>
</table>

### RELATIVE PERFORMANCE

The litres-per-day capacity of a compressor-driven dehumidifier is usually rated assuming an ambient temperature of 30ºC and a relative humidity of 80%. If either of these figures is lower, then their performance is likely to reduce considerably. Typically, their ability to remove water will be less than half of their rated capacity during the winter months.

Desiccant-type models are normally rated assuming a 20ºC temperature and 60 per cent humidity. These types are generally more efficient and work much closer to their quoted performance in typical, year-round marine applications, although they’re not quite so good at higher temperatures - in the tropics for instance.

Although it might go against the grain, in order to achieve the best results from an electric dehumidifier of any sort it is essential you close as many openings to the outside air as possible. This means closing hatches, blocking vents etc. Leave cabin and locker doors open though, so all the air within the boat is circulated.