



Depending on the Vaisala product, you may have several filter options to choose from. Typically one of the options is defined as the recommended filter. The recommended filter is suitable for the majority of the applications where the specific product is designed to be used. There are, however, some exceptions where another type of filter may be the best option. This document provides some general guidelines when considering the optimal filter for a specific application.

Particulate protection

Typically the primary task of the filter is to prevent dust from entering the sensor element. Vaisala capacitive sensor technology is not sensitive to particulates as such, but dust accumulating on the sensor surface may still have an impact on the measurement performance. It may weaken the response time and particulates may also carry harmful substances, causing corrosion in certain conditions. This is why keeping the sensor clean with the proper filter is a good idea.

Stainless steel mesh and PTFE membrane are the typical filtering materials. Sintered filters offer the best protection against dust, but there are also use cases where particulate filtering is not a critical requirement, or it is considered undesirable because it slows down the response time. For example, in handheld devices it is common to use a mesh filter without the actual particulate filtering element.

Mechanical protection

Capacitive thin film sensor is a sensitive component and it does not withstand severe mechanical stress, such as physical shocks. For this reason, it needs

a protective element around it. Another cause of mechanical stress is high flow speed in the measurement environment, where a simple grid is not enough to protect the sensor. Sintered filter is a good choice for high wind speeds, because the environment inside the filter stays calm.



Response time

There are two factors in a filter affecting the response time of the sensor. First, the diffusion rate. Steel mesh has much faster diffusion rate than a sintered filter, meaning that the humidity level inside the filter stabilizes faster to the same level with the surrounding environment. Another factor is thermal mass. A heavier






filter will add more mass to the sensor head and thus it takes longer for the sensor to adapt into changes in temperature.

A sintered filter has the slowest response time and an open grid filter made of plastic has the fastest. This can be especially critical in applications with still air of very weak flow. A higher flow rate will balance the difference.

When is it time to replace the filter?






Filters should be visually inspected on a regular basis. Filter replacement is recommended if the filter appears clogged or there are signs of severe corrosion or mechanical damage. Keep in mind that a clogged sintered filter that is otherwise in good condition may still be reused. You may be able to clean the filter with an ultrasonic bath or an appropriate cleaning agent. Remember to dry the filter well before reinstalling it.

GENERAL PURPOSE FILTERS FOR HUMIDITY AND DEW POINT APPLICATIONS ¹⁾

	Plastic grid with steel mesh filter	Plastic grid with PTFE membrane filter	Stainless steel grid with PTFE membrane filter	Sintered stainless steel filter	Stainless steel grid with mesh filter
Example image					
Particulate protection	★★★★☆	★★★★☆	★★★★☆	★★★★★	★★★★☆
Mechanical protection	★★★★☆	★★★★☆	★★★★★	★★★★★	★★★★★
Response time	★★★★☆	★★★★☆	★★☆☆☆	★☆☆☆☆	★★★★☆
Typical use / Features	Industrial applications, up to 180 °C (356 °F)	Generic applications, up to 80 °C (176 °F)	Demanding applications, rugged design	Demanding industrial applications	Industrial applications
High end probes					
HMP series, HMT330, HMT310, HMT360, HMT370EX, HMM170	DRW010281SP	—	—	HM47280SP	—
DMP series, DMT340	DRW010281SP	—	—	HM47280SP	—
Miniature humidity probes					
HMP110, HMP60, HMT120, HMT130	—	DRW010525SP	ASM212652SP	HM46670SP	—
HMP113, HMP63, RFL100	—	ASM210856SP	—	HM47280SP	—
Handhelds					
HM40	—	For HM41 and HM45: ASM210856SP For HM46: 10159HM	For HMP42: 19867HM, 19858HM	For HM46: 0195 (brass)	—
HM70	For HMP77: DRW010281SP	10159HM	—	DRW212987SP (brass) HM47280SP	—
DM70	DRW010281SP	—	—	HM47280SP	—
OEM models					
DMT143	—	—	—	DRW010335SP	—
DMT143L	—	—	—	HM47280SP	—
DMT152	—	—	—	—	220957SP
DPT146	—	—	—	—	220957SP

1) Recommended filter marked in bold.

OTHER FILTERS ¹⁾

	Sintered PTFE filter	Plastic grid	Stainless steel grid	Stainless steel grid for high flow rate	Stainless steel grid with membrane and drain hole
Example image					
Particulate protection	★★★★★	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	★★★★☆
Mechanical protection	★★☆☆☆	★★★★☆	★★★★★	★★★★★	★★★★★
Response time	★★★☆☆	★★★★★	★★★★★	★★★☆☆	★★★★★
Typical use / Features	Fast drying, corrosion resistant	Clean environment, fast response time	Oil measurement or vacuum	Oil measurement, high flow rate	Condensing environment, PEM fuel cells
High end probes					
HMP series, HMT330, HMT310, HMT360, HMT370EX, HMM170	(219452SP)	DRW010276SP	HM47453SP	220752SP	214848SP
DMP series, DMT340	—	—	HM47453SP	—	—
MMP series, MMT330	—	—	HM47453SP	220752SP	—
Miniature humidity probes					
HMP110, HMP60, HMT120, HMT130	DRW244938SP	DRW010522SP	—	—	—
HMP113, HMP63, RFL100	219452SP	DRW240185SP	—	—	—
Handhelds					
HM40	—	For HM41 and HM45: DRW240185SP	—	—	—
HM70	—	For HMP75: 6221	—	—	—
DM70	—	—	HM47453SP	—	—
MM70	—	—	HM47453SP	220752SP	—
OEM models					
DMT143	—	—	HM47453SP	—	—
DMT143L	—	—	HM47453SP	—	—

1) Recommended filter marked in bold.