

## HMT370EX Series Intrinsically Safe Humidity and Temperature Transmitters



### Features

- Intrinsically safe (Ex i) for operation in up to Zone 0 / 20
- Measures RH and T, and outputs an extensive range of calculated parameters
- Designed for harsh conditions
- Temperature range between  $-70 \dots +180 \text{ }^{\circ}\text{C}$  ( $-94 \dots +356 \text{ }^{\circ}\text{F}$ ) depending on the probe option
- Vaisala HUMICAP® sensor features high accuracy, excellent long-term stability, and negligible hysteresis
- Display options: graphical LCD display and non-display model
- Traceable calibration (certificate included)
- Compatible with Vaisala Insight PC software and Vaisala Indigo80 handheld indicator

Vaisala HMT370EX Series HUMICAP® Humidity and Temperature Transmitters are the ideal solution for measuring humidity in hazardous areas. The intrinsically safe and robust transmitter operates safely and reliably even in the most hazardous classifications, such as Zone 0. The HMT370EX transmitter series can be used as a replacement of the long-running HMT360 transmitter series.

### Interchangeable probes and detachable probe module

HMT370EX offers several probe options for different applications:

- HMP371 — wall mount
- HMP373 — confined spaces
- HMP374 — pressurized spaces
- HMP375 — high temperature
- HMP377 — high humidity
- HMP378 — pressurized pipelines

For information on the HMP378F and HMP378H probe variants for oil and JET A-1 fuel moisture and temperature measurement, see [HMP378F and HMP378H Datasheet \(B212512EN\)](#). HMP371 and HMP373 can be ordered as temperature-only versions.

Thanks to the detachable probe module, probes can be easily replaced and removed for calibration outside the hazardous area without removing the entire transmitter. Attaching new probes involves minimal reconfiguration, as up-to-date settings can be restored from the transmitter.

### Intrinsically safe and robust

The entire HMT370EX transmitter can be installed directly in hazardous areas. It can withstand continuous exposure to potentially explosive environments that contain flammable gases or dust. Operation in either gas or dust environments requires no additional protective enclosures. A rugged design,

combined with trouble-free operation, ensures a long-term solution for monitoring humidity and dew point in potentially explosive environments.

### Easy configuration access with local display and Insight PC software

Output configuration and measurement calibration and adjustment can be carried out directly on the local display interface. For additional configuration and monitoring options, you can connect the transmitter to Vaisala Insight PC software with an accessory USB cable. The probe and transmitter body can be connected to Insight for configuration either together as one unit or separately.

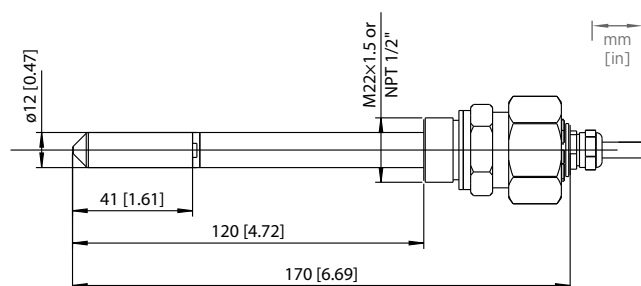
Left: Installation kit for duct mounting dimensions. Right: Installation flange dimensions. Aluminum or stainless steel.

## HMP374 for high pressure

|                      |                                                         |
|----------------------|---------------------------------------------------------|
| Temperature range    | -70 ... +180 °C (-94 ... +356 °F)                       |
| Pressure range       | 0–10 MPa                                                |
| Probe cable length   | 2, 5, or 10 meters (6 ft 7 in, 16 ft 5 in, 32 ft 10 in) |
| Probe diameter       | 12 mm (0.47 in)                                         |
| Fitting body M22x1.5 | 17223                                                   |
| Fitting body NPT1/2  | 17225                                                   |



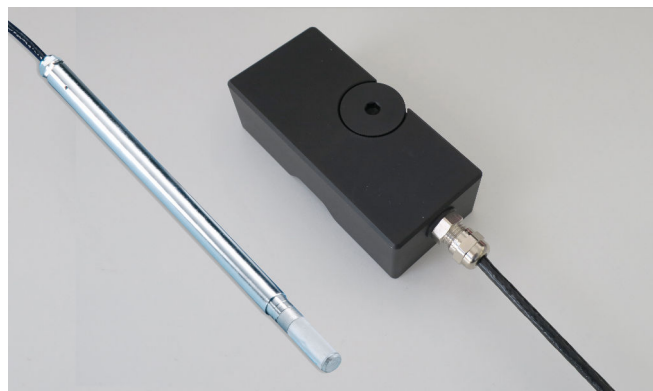
HMP374 is designed for measurement in pressurized spaces or vacuum chambers



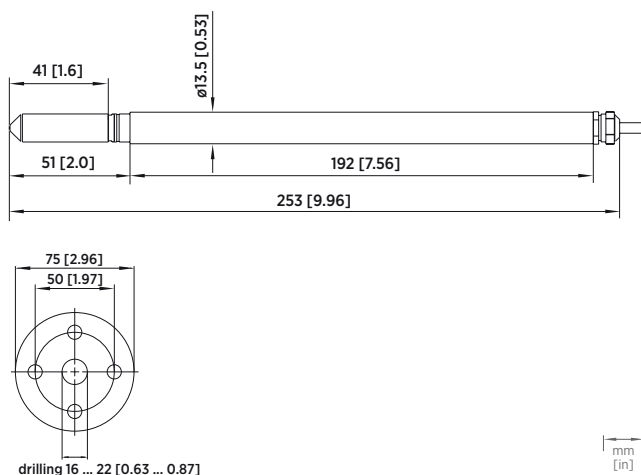
HMP374 dimensions

## HMP375 for high temperature

|                                         |                                                         |
|-----------------------------------------|---------------------------------------------------------|
| Temperature range                       | -70 ... +180 °C (-94 ... +356 °F)                       |
| Probe cable length                      | 2, 5, or 10 meters (6 ft 7 in, 16 ft 5 in, 32 ft 10 in) |
| Probe diameter                          | 13.5 mm (0.53 in)                                       |
| <b>Installation</b>                     |                                                         |
| Mounting flange                         | 210696                                                  |
| Cable gland M20x1.5 with splitting seal | HMP247CG                                                |



HMP375 is designed for high temperature environments



HMP375 probe and stainless steel installation flange dimensions

## HMP377 for high humidities

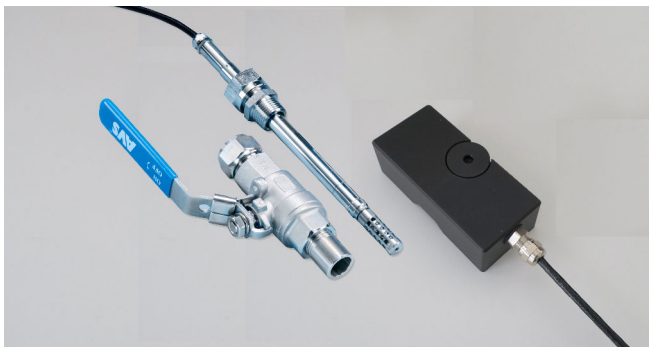
|                                           |                                                         |
|-------------------------------------------|---------------------------------------------------------|
| Temperature range                         | -70 ... +180 °C (-94 ... +356 °F)                       |
| Pressure range                            | 0-1 MPa                                                 |
| Probe cable length                        | 2, 5, or 10 meters (6 ft 7 in, 16 ft 5 in, 32 ft 10 in) |
| Probe diameter                            | 12 mm (0.47 in)                                         |
| <b>Installation</b>                       |                                                         |
| Duct installation kit                     | 210697                                                  |
| Cable gland M20x1.5 with splitting seal   | HMP247CG                                                |
| Swagelok for 12 mm probe, 3/8" ISO thread | SWG12ISO38                                              |
| Swagelok for 12 mm probe, 1/2" NPT thread | SWG12NPT12                                              |



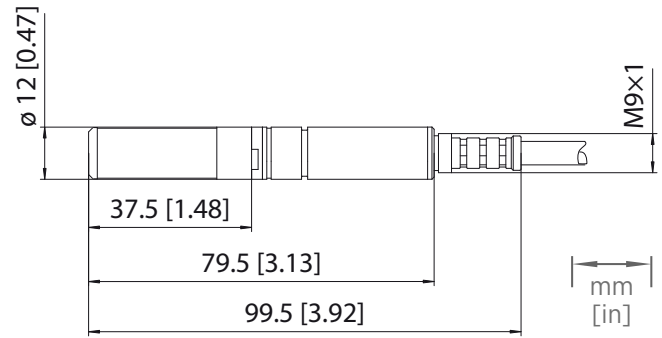
HMP377 is constructed to be installed in environments with high humidities

## HMP378 for pressurized pipelines

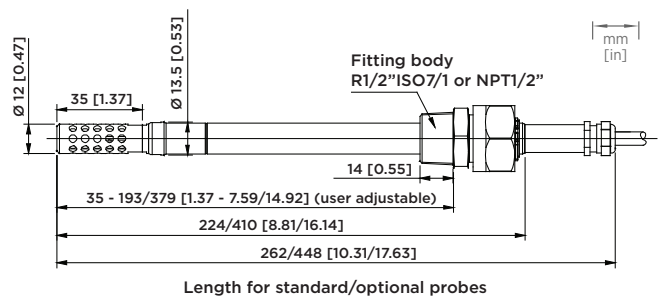
|                                       |                                                         |
|---------------------------------------|---------------------------------------------------------|
| Temperature range                     | -70 ... +180 °C (-94 ... +356 °F)                       |
| Pressure range                        | 0-4 MPa                                                 |
| Probe cable length                    | 2, 5, or 10 meters (6 ft 7 in, 16 ft 5 in, 32 ft 10 in) |
| Probe diameter                        | 13.5 mm / 12 mm (0.53 in / 0.47 in)                     |
| Available probe lengths               | 262 mm / 448 mm (10.31 in / 17.6 in)                    |
| <b>Installation</b>                   |                                                         |
| Fitting body ISO1/2 solid structure   | DRW212076SP                                             |
| Fitting body NPT1/2 solid structure   | NPTFITBODASP                                            |
| Ball valve ISO 1/2 with welding joint | BALLVALVE-1                                             |



HMP378 enables flexible installation in pressurized pipelines



HMP377 dimensions



HMP378 dimensions

# Technical data

## Measurement performance

| Relative humidity                             |                                                   |
|-----------------------------------------------|---------------------------------------------------|
| Measurement range                             | 0–100 %RH, at max. +95 °C (203 °F) T <sub>d</sub> |
| Accuracy at +23 °C (+73.4 °F) <sup>1)</sup>   | ±0.8 %RH (0–90 %RH)                               |
| Factory calibration uncertainty <sup>2)</sup> | ±0.5 %RH (0–40 %RH)<br>±0.8 %RH (40–95 %RH)       |
| T <sub>63</sub> response time                 | 15 s                                              |
| Sensor options                                | HUMICAP® R2                                       |
| Temperature                                   |                                                   |
| Measurement range                             | –70 ... +180 °C (–94 ... +356 °F)                 |
| Accuracy at +23 °C (+73.4 °F) <sup>1)</sup>   | ±0.1 °C (±0.18 °F)                                |
| Factory calibration uncertainty <sup>2)</sup> | ±0.1 °C (±0.18 °F) at +23 °C (+73.4 °F)           |
| Sensor                                        | Pt1000 RTD Class F0.1 IEC 60751                   |

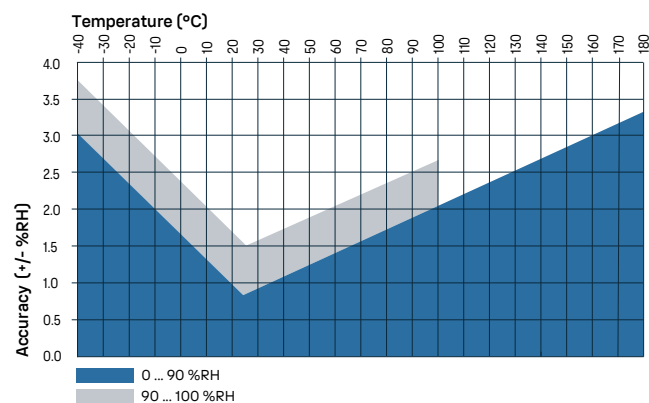
### Other available measurement parameters <sup>3)</sup>

Dew point temperature, dew point / frost point temperature, absolute humidity, mixing ratio, wet-bulb temperature, water concentration, water vapor pressure, water vapor saturation pressure, enthalpy, dew point temperature difference, absolute humidity at NTP, water mass fraction

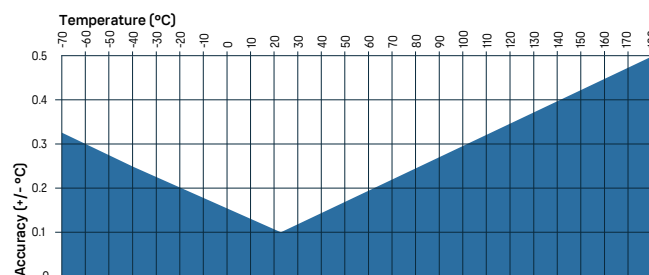
1) Defined against calibration reference. Including non-linearity, hysteresis, and repeatability.

2) Defined as ±2 standard deviation limits. Small variations possible; see calibration certificate.

3) Parameter options depend on selected probe variant. For specifications, see HMT370EX User Guide (M212305EN).



Humidity measurement accuracy as function of temperature



Temperature measurement accuracy over full range

## Operating environment

|                                       |                                      |
|---------------------------------------|--------------------------------------|
| Operating temperature for electronics | –40 ... +60 °C (–40 ... +140 °F)     |
| Operating temperature with display    | –20 ... +60 °C (–4 ... +140 °F)      |
| Operating humidity of probe head      | Max. +100 °C (212 °F) T <sub>d</sub> |
| Storage temperature                   | –40 ... +70 °C (–40 ... +158 °F)     |
| Pressure range                        | See probe specifications             |

**Note:** Do not install the LCD display model in a location where the transmitter is exposed to direct sunlight.

## Compliance

|                                     |                                    |
|-------------------------------------|------------------------------------|
| Electromagnetic compatibility (EMC) | EN 61326-1, industrial environment |
| Compliance marks                    | CE, China RoHS, RCM                |

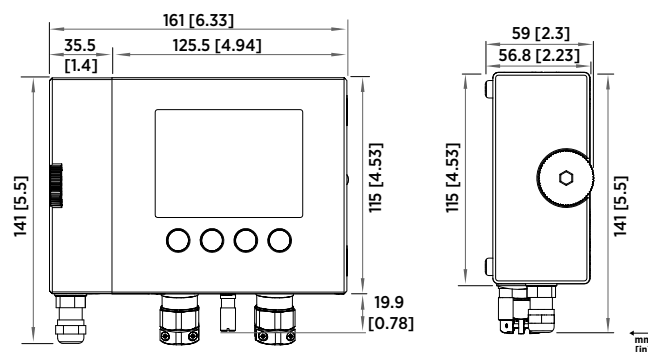
## Inputs and outputs

|                                                  |                                                                                                                      |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| Operating voltage                                | 12–28 V                                                                                                              |
| Analog outputs                                   | 2 outputs (two-wire, 4–20 mA)<br>Connection via safety barriers                                                      |
| Typical accuracy of analog outputs at +20 °C     | ±0.0625 % full scale                                                                                                 |
| Typical temperature dependence of analog outputs | 0.005 % / °C (0.005 % / °F) full scale                                                                               |
| Transmitter service port connection              | USB cable 219690                                                                                                     |
| Probe service port connection                    | USB cable USB2                                                                                                       |
| Display options                                  | <ul style="list-style-type: none"> <li>Graphical LCD display</li> <li>Model without display <sup>1)</sup></li> </ul> |

1) Recommended when the transmitter is exposed to direct UV light, and for outdoor installations and high-humidity environments.

## Mechanical specifications

|                  |                                                                                                               |
|------------------|---------------------------------------------------------------------------------------------------------------|
| Connections      | Screw terminals, 0.33–2.0 mm <sup>2</sup> wires (AWG 14–22)                                                   |
| Cable glands     | M20×1.5                                                                                                       |
| Conduit fitting  | NPT 1/2" and M16                                                                                              |
| Housing material | EN AW-6082                                                                                                    |
| Housing weight   | LCD transmitter: 1500 g (3.3 lb)<br>LED transmitter: 1520 g (3.35 lb)<br>HMP371 fixed probe: 320 g (0.7 lb)   |
| IP rating        | With probe connected to the transmitter: <b>IP66</b><br>With probe detached from the transmitter: <b>IP54</b> |



HMT370EX transmitter dimensions

## Ex classifications by region

NOTE: The Ex classifications show the highest level of compliance. Although lower compliance levels are not shown in the classification, they are also included in the classification. For example, compliance with Division 1 also means compliance with Division 2, and compliance with Zone 0 also means compliance with Zone 1 and Zone 2.

### Europe (ATEX)

|                                       |                                                                                                                                |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Gas classification<br>EU (2014/34/EU) | II 1 G Ex ia IIC T4 Ga                                                                                                         |
| Dust classification                   | II 1 D Ex ia IIIC T <sub>200</sub> 85 °C Da                                                                                    |
| Safety factors                        | U <sub>i</sub> = 28 VDC, I <sub>i</sub> = 100 mA, C <sub>i</sub> = 12.1 nF,<br>P <sub>i</sub> = 700 mW, L <sub>i</sub> = 16 µH |
| Environmental specifications          |                                                                                                                                |
| T <sub>amb</sub>                      | -40 ... +60 °C (-40 ... +140 °F)                                                                                               |
| P <sub>amb</sub>                      | 0.8 ... 1.1 bar                                                                                                                |

### International (IECEx)

|                              |                                                                                                                                |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Gas classification           | Ex ia IIC T4 Ga                                                                                                                |
| Dust classification          | II 1 D Ex ia IIIC T <sub>200</sub> 85 °C Da                                                                                    |
| Safety factors               | U <sub>i</sub> = 28 VDC, I <sub>i</sub> = 100 mA, C <sub>i</sub> = 12.1 nF,<br>P <sub>i</sub> = 700 mW, L <sub>i</sub> = 16 µH |
| Environmental specifications |                                                                                                                                |
| T <sub>amb</sub>             | -40 ... +60 °C (-40 ... +140 °F)                                                                                               |
| P <sub>amb</sub>             | 0.8 ... 1.1 bar                                                                                                                |

### Japan (CML)

|                   |                                                        |
|-------------------|--------------------------------------------------------|
| Ex classification | Ex ia IIC T4 Ga<br>Ex ia IIIC T <sub>200</sub> 85°C Da |
|-------------------|--------------------------------------------------------|

### China (NEPSI)

|                   |                    |
|-------------------|--------------------|
| Ex classification | Ex ia IIC T3-T6 Ga |
|-------------------|--------------------|

### Korea (KCs)

|                   |                                                                       |
|-------------------|-----------------------------------------------------------------------|
| Ex classification | Ex ia IIC T4 Ga<br>Ex ia IIIC T200 85 °C Da<br>-40 °C ≤ Tamb ≤ +60 °C |
|-------------------|-----------------------------------------------------------------------|

### US (FM)

|                   |                                                                                                                                                                                        |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ex classification | Class I, Zone 0, AEx ia IIC T4 Ga<br>Zone 20, AEx ia IIIC T85°C Da<br>IS Class I, Division 1, Groups A, B, C,<br>and D T4<br>IS Class II, III, Division 1, Groups E, F,<br>and G T85°C |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### CAN (FM)

|                           |                                                                                                                                                                                                                                                                                            |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| HMT370EX equipment rating | Intrinsically safe for:<br>Class I, II, III Division 1, Groups A, B, C,<br>D, E, F, and G, T4<br>Class I, Zone 0, Ex ia IIC T4<br>Zone 20, Ex ia IIIC Temperature Code<br>T85°C<br>Ta: -40 °C to +60 °C;<br>IP54 (transmitter alone)<br>IP66 (transmitter with the probe body<br>attached) |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### UK (UKEX)

|                   |                                                                                     |
|-------------------|-------------------------------------------------------------------------------------|
| Ex classification | II 1 G Ex ia IIC T4 Ga<br>II 1 D Ex ia IIIC T200 85 °C Da<br>-40 °C ≤ Tamb ≤ +60 °C |
|-------------------|-------------------------------------------------------------------------------------|

## Transmitter accessory availability

| Accessory                                                             | Item code   | Compatible models                 |
|-----------------------------------------------------------------------|-------------|-----------------------------------|
| <b>Cable lead-through accessories</b>                                 |             |                                   |
| Cable gland M20 x 1.5 for Ø 5–11 mm cable                             | 265207SP    | All models                        |
| Cable gland M20 x 1.5 for Ø 10–14 mm cable                            | 265208SP    | All models                        |
| Conduit fitting M16                                                   | 265243SP    | All models                        |
| Conduit fitting NPT1/2"                                               | 265240SP    | All models                        |
| Dummy plug (Ex, 2 pcs)                                                | 254931SP    | All models                        |
| <b>Mounting, wiring, cable, and adapter accessories</b>               |             |                                   |
| HMT360 retrofit mounting plate                                        | DRW253246SP | All models                        |
| Turbine mounting kit                                                  | HMT300TMK   | All models                        |
| Outdoor installation kit (weather shield)                             | 215109      | All models                        |
| USB service cable for transmitter                                     | 219690      | All models                        |
| Indigo80 handheld indicator connection cable (M12-M8) for transmitter | 262195SP    | All models                        |
| Zener barrier for 1 channel (with 2 channels, order 2 pcs)            | 210664      | All models                        |
| Galvanic isolator for 1 channel                                       | 212483      | All models                        |
| Galvanic isolator for 1 channel                                       | 272886SP    | All models                        |
| Galvanic isolator for 2 channels                                      | 272887SP    | All models                        |
| Calibration adapter for HMK15                                         | 211302      | HMP371, HMP373,<br>HMP374, HMP377 |

## Probe spare parts and accessories

| Accessory                                                                                                                                                                                                      | Item code   | Compatible models      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------------|
| M12 Indigo USB Adapter cable accessory for connecting HMT370EX probes to Insight                                                                                                                               | USB2        | All models             |
| Indigo80 handheld indicator connection cable (M12-M12) for probes                                                                                                                                              | 272075SP    | All models             |
| Ball valve ISO 1/2 with welding joint <ul style="list-style-type: none"> <li>Pressure range at +100 °C (+212 °F) 0–40 bar (0–580 psi absolute) (during installation max. 10 bar (145 psi absolute))</li> </ul> | BALLVALVE-1 | HMP378                 |
| Duct installation kit                                                                                                                                                                                          | 210697      | HMP373, HMP377         |
| Mounting flange                                                                                                                                                                                                | 210696      | HMP375                 |
| Washer set for pressure-tight installation (3 pcs)                                                                                                                                                             | 4PROBESETSP | HMP374                 |
| Cable gland M20×1.5 with split seal                                                                                                                                                                            | HMP247CG    | HMP373, HMP375, HMP377 |
| Fitting body M22×1.5                                                                                                                                                                                           | 17223SP     | HMP374                 |
| Fitting body NPT1/2                                                                                                                                                                                            | 17225SP     | HMP374                 |
| Fitting body ISO1/2 solid structure                                                                                                                                                                            | DRW212076SP | HMP378                 |
| Fitting body NPT1/2 solid structure                                                                                                                                                                            | 212810SP    | HMP378                 |
| Swagelok fitting for 12 mm probe, 1/2" NPT thread                                                                                                                                                              | SWG12NPT12  | HMP377                 |
| Swagelok fitting for 12 mm probe, 3/8" ISO thread                                                                                                                                                              | SWG12ISO38  | HMP377                 |
| Swagelok fitting for 12 mm probe, 1/2" ISO thread                                                                                                                                                              | SWG12ISO12  | HMP377                 |
| Thread adapter ISO 1/2" to NPT 1/2"                                                                                                                                                                            | 210662SP    | All models             |
| Manual press                                                                                                                                                                                                   | HM36854SP   | HMP378/F/H             |
| Metallized PPS plastic filter grid with stainless steel mesh, for general use (pore size 15 µm)                                                                                                                | DRW010281SP | All models             |
| Stainless steel sintered filter, for general use (pore size 38 µm)                                                                                                                                             | HM47280SP   | All models             |
| Metallized PPS plastic filter grid, for fast response in clean environments (6.5 mm gaps)                                                                                                                      | DRW010276SP | All models             |
| Stainless steel filter for high oil flow applications                                                                                                                                                          | 220752SP    | HMP378/F/H             |
| Stainless steel filter with PTFE membrane                                                                                                                                                                      | 214848SP    | All models             |
| Stainless steel filter for oil and vacuum environments                                                                                                                                                         | HM47453SP   | All models             |