A DEVICE FOR REDUCING LIQUID INGRESS INTO A TUBE AND AN ASSEMBLY COMPRISING SAID DEVICE AND SAID TUBE

TECHNICAL FIELD

Various embodiments relate to a device for reducing liquid ingress into a tube and an assembly comprising said device and said tube.

BACKGROUND

A pitot tube may be used as a pressure measurement instrument to measure fluid flow velocity. For example, a pitot tube may be used to determine the airspeed of an aircraft or to measure air and gas velocities in various industrial applications. A pitot tube may comprise an open tube for pointing directly into a fluid flow. The fluid flow may be brought into stagnation in the tube, for example, the pitot tube may have no outlet. A pressure of the fluid flow in the tube can be measured. This pressure can be used as the stagnation pressure of the fluid, also known as the total pressure or, particularly in aviation, the pitot pressure.

It is known to mount a pitot tube to an aircraft in order to measure airspeed of the aircraft in flight. In this case, a static pressure may be measured using static ports on a side of the aircraft. The dynamic pressure may be calculated as the difference between the stagnation pressure determined via the pitot tube and the static pressure determined via the static ports. The dynamic pressure can be used to determine the airspeed of the aircraft.

The accuracy of the pitot tube may be degraded by ingress of liquid into the pitot tube.

SUMMARY

Various embodiments provide a device for reducing liquid ingress into a tube, the device comprising: a coupling portion adapted to couple the device to the tube, a guiding channel portion comprising a tubular portion and adapted to receive gas and liquid moving relatively towards an inlet of the device, and a plurality of diverting channel portions circumferentially distributed around a sidewall of the tubular portion and adapted to divert the liquid away from an inlet of the tube, the diverting channel portions being in fluid communication with the guiding channel portion, wherein the guiding channel portion is configured in use to guide the gas into the inlet of the tube, but guide the liquid into respectivean inlets of the diverting channel portions.

In an embodiment, the device is made of a non-absorbent material and/or a material having a low surface energy.

Various embodiments provide an assembly comprising: a tube having an inlet in fluid communication with an internal bore, and a device for reducing liquid ingress into the tube as described hereinclaimed in any preceding claim.

In an embodiment, the assembly further comprises a connector for connecting the internal bore of the tube to a pressure measuring device.

In an embodiment, an external surface of an inlet portion of the tube comprises a tapered portion, wherein the taper diverges in a direction from the inlet of the tube.

In an embodiment, the internal bore at an inlet portion of the tube comprises a tapered portion, wherein the taper converges in a direction from the inlet of the tube.

In an embodiment, the inlet of the tube comprises a rounded inner leading edge to promote a consistent stream of gas to enter the internal bore of the tube.

In an embodiment, the device is configured to receive a portion of the tube to couple the device to the tube.

In an embodiment, an internal surface portion of the device is adapted to couple to an external surface portion of the tube via an interface fit, and wherein a contact point of the interface fit is located adjacent the inlet of the or each diverting channel portion.

In an embodiment, the device is configured to receive the portion of the tube to locate the inlet of the tube adjacent to the inlet of the or each diverting channel portion of the device.

In an embodiment, the tube is a pitot tube.

In an embodiment, the tube further comprises a mounting portion for mounting the assembly to a vehicle.

In an embodiment, the vehicle is an unmanned aerial vehicle.

CLAIMS

1. A device for reducing liquid ingress into a tube, the device comprising:

a coupling portion adapted to couple the device to the tube,

a guiding channel portion comprising a tubular portion and adapted to receive gas and liquid moving relatively towards an inlet of the device, and

a plurality of diverting channel portions circumferentially distributed around a sidewall of the tubular portion and adapted to divert the liquid away from an inlet of the tube,

the diverting channels portions being in fluid communication with the guiding channel portion,

wherein the guiding channel portion is configured in use to guide the gas into the inlet of the tube, but guide the liquid into respective inlets of the diverting channel portions.

2. The device of claim 1, wherein a size of an inlet of the diverting channel portions is greater than a size of the inlet of the tube.

3. The device of claim 1 or 2, wherein a distance between the inlet of the device and an inlet of the diverting channel portions is set in dependence on a pre-determined speed at which the device moves relatively towards the gas and liquid.

4. The device of any one of the preceding claims, wherein the inlet of the device comprises an inlet of the tubular portion.

5. The device of claim 4, wherein the coupling portion comprises an outlet portion of the tubular portion, the outlet portion being adapted to receive a portion of the tube.

6. The device of any one of the preceding claims, wherein each of the diverting channel portions comprises a bore through the sidewall of the tubular portion.

7. The device of claim 6 when dependent on claim 4, wherein the bore is positioned in an inlet end portion of the tubular portion.

8. The device of claim 6 or 7, wherein a longitudinal axis of the bore is at an angle of 7° to 35° to a longitudinal axis of the tubular portion.