ENCLOSED-VENTURI VENTS

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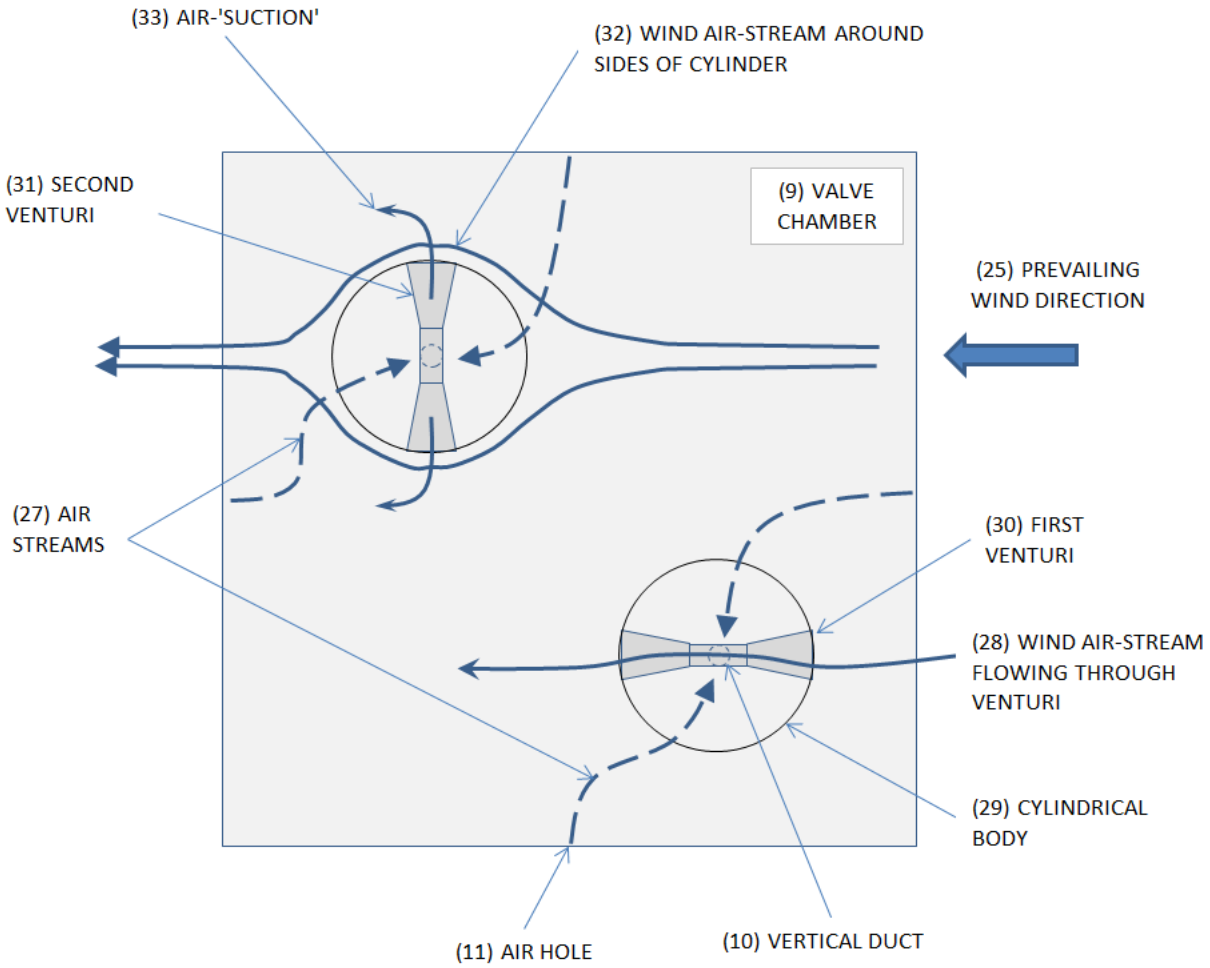

See also www.damsforafrica.com for an alternative way of venting a valve-chamber, as well as our range of anti-theft/vandalism products, which are variously suitable for securing pump-houses, sub-stations, valve-chambers, control panels, boreholes, etc.

Wind tunnel tests have made it possible to predict the pressures that a cylindrical structure will encounter in wind. The wind exerts a positive pressure on a front of the cylinder, i.e. that area of the cylinder that is the first to encounter the wind. But by the time the wind passes around the sides of the cylinder it has gained considerable velocity, corresponding to a reduction in pressure in this zone. This pressure reduction continues all the way to the back of the cylinder, although the reduction is not as great at the back. The effect of this is that a venturi housed in a cylindrical body will be more efficient. This principle can be used to good effect to improve the venting efficiency of a venturi vent, as explained below.

Considering the lower vent arrangement in the illlustrated valve chamber, a venturi (30) is housed in a cylindrical body (29). The flow axis of the venturi is in line with the prevailing wind direction (25). Since the venturi is housed inside a cylindrical housing the venturi will have a positive pressure (relative to atmospheric pressure) at its entry funnel, and a negative pressure (relative to atmospheric) at its exit funnel. Both these pressures will enhance the flow of the wind air-stream (28) flowing through the venturi, making it in effect a 'super' venturi. Thus more outside air will enter into the air-holes (11) and mingle with the humid air inside as it makes its way to the vertical duct and then exits via the venturi, thus reducing the RH inside the valve chamber (9).

A second vent arrangement (35), installed on the opposite diagonal of the structure's roof-slab is identical to the first vent, but the flow axis of the venturi (31) is at a right angle to the flow axis of the first venturi (30). The effectiveness of this vent will also be enhanced by the cylinder effect. In this case the increased velocity of the wind air-stream around the sides of the cylinder (32) will create a negative pressure (relative to atmospheric) on both sides, and this will cause air 'suction' (33) out of both funnels, and hence out of the chambers's interior. Thus, while the first venturi (30) performs as a 'super' venturi, the second also makes a positive contribution to venting, performing as a T-shaped suction duct. In this process there are air-streams (27) moving from the air holes (11) to both of the vertical ducts (10) via a circuitous path through the interior of the structure, reducing the RH in the chamber.