

Water jet candle with low pressure coupling range

The water jet candle is a patented function unit in which a jet vertically leaves above the uppermost water surface to the top.

Two function versions of the water jet candle exist, one with a low pressure coupling range and one with an air pressure coupling range, the hero's fountain.

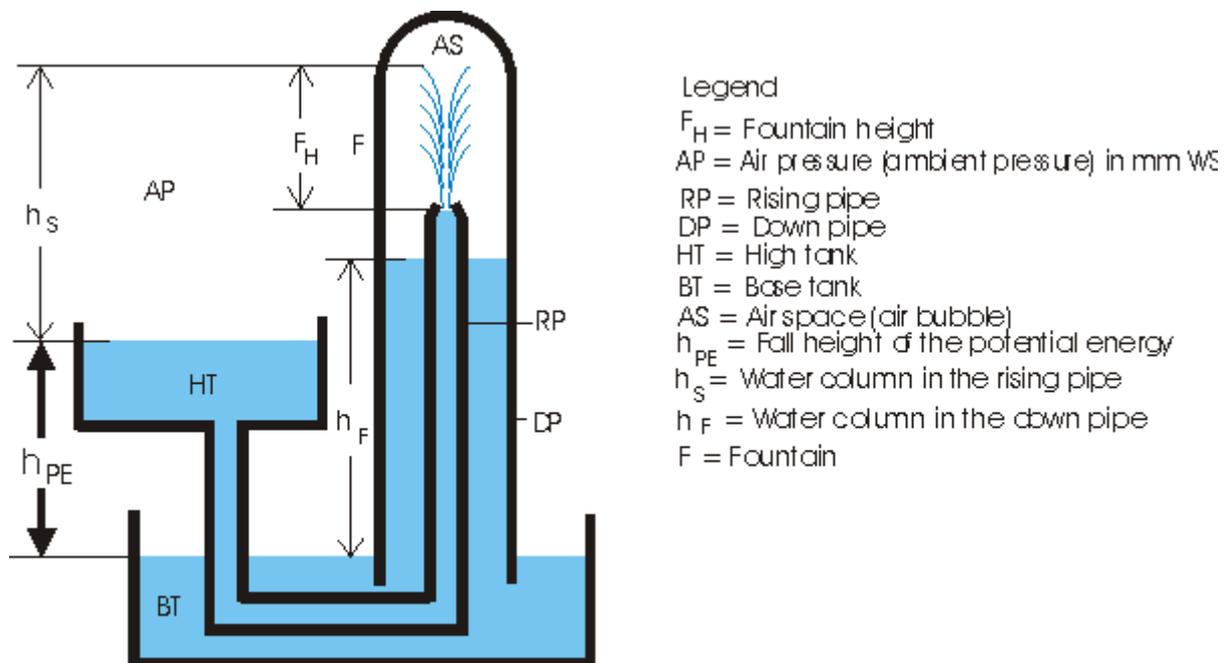
The physical built-up of the water jet candle (WJC) with low pressure coupling range consists of a high tank HT, a base tank BT, a rising pipe RP and a down pipe DP.

The functional layout of the WJC with low pressure coupling range contains an energy reservoir, that consist of a high tank HT and a base tank BT, a coupling range, that is placed in the upper region of the down pipe, an air space AS, that is enclosed as air bubble between the water surfaces of the rising and the down pipe in the coupling range, and the equilibrium of all pressure columns.

The characteristic dimension of the energy reservoir is the potential energy, which effects a potential energy by the height difference between the water surfaces of the high tank HT and the base tank BT.

The coupling range consists of the upper part of the down pipe DP that protrudes into the base tank, the upper end of the rising pipe RP and the air range AR.

The water reservoir is neither the energy reservoir nor part of it.



Principle representation of the water jet candle with low pressure coupling range

The potential energy is worked off by the water that flows from the high tank HT over the higher placed coupling range into the base tank BT.

The highest water surface in the higher placed coupling range is at the upper end of the rising pipe RP, that ends in a diminution (nozzle), from which a fountain leaves, so that at this place potential energy is visibly converted into kinetical energy.

In this theoretical case the jet height FH can reach at maximum the height of hPE.

Pratically it is smaller by the value of all resisting forces of all pressure columns, that means FH is equal or less than hPE.

The fountain height FH becomes smaller with decreasing height of the potential energy hPE until it is finally exhausted $hPE = 0$.

The readiness of operation of the water jet candle built up is realized, by filling of the mentioned tanks in the proper sequence and the bringing of all air and are water columns into a statical equilibrium.

The commissioning can be ensued by transferring this static equilibrium of the resting pressure columns into an equivalent dynamic equilibrium.
From this point of time the jet sprinkles.

The pressure of the air column included by the water surfaces in the rising pipe RP and the down pipe DP breakes down and all water of the function unit accumulates in the lowest point of the function unit according to the principle of the communicating vessels.

The system-specific energy reservoir hPE becomes zero and the active phase of the water jet candle ends.

A new cycle can be started, after the depleting of the deepest points of the function unit, as mentioned above.

