



# The TURBINE in petroleum application

## Competitive features and benefits in 10 points

Turbine Flow meter Vs. PD meter

### ● 1 STABILITY

The extended time **stability of the measurement** allows reducing the number of controls during lifetime and avoids the losses of product increasing with the wear of parts in friction of a volumetric flowmeter. A volumetric flowmeter may lose from 2 to 4 per thousand per year due to this wear. Some Companies prescribe an adjustment every 6 months.

### ● 2 TOLERANCE

The **turbine tolerance to solid impurities** up to 0.8 mm allows a possible reduction of the filtration degree, down to a simple removal of the filter, if a sufficient prefilter is present. For example, the very frequent and impeding solid impurities found in the LPG originating, e.g., in part of the Eastern Europe (alumina after drying, tanks calamine deposits...) lead to an even larger advantage of the turbine in these cases.

The turbine being almost free of moving parts, with reduced clearances or friction, allows avoiding the locks met on the volumetric flowmeters when internal parts may have been corroded. This occurs when the measured product contains water or traces of corrosive substances. This insensitivity to internal corrosion may even be enhanced by an anodization process of the aluminium parts. It can even be made almost fully free of corrosion by using helix titanium and inert material as ceramic or stainless steel for the body.

### ● 3 FLOW

**Higher flow** for a given diameter: from 30 m<sup>3</sup>/h up to 60 m<sup>3</sup>/h for the 2" turbine.

### ● 4 PRESSURE

**Reduced pressure drop** allows a more important flow for an equivalent installation (gain from 1 to 3 m<sup>3</sup>/h compared to a classic system)

### ● 5 MANUFACTURING SAVINGS

**Manufacturing cost basically lower** than the volumetric flowmeter: less number of parts, smaller size, but the propeller, from a traditional manufacturing process. An additional source of reduction resides in the body which can be moulded, or in the helix which could be moulded too and/or made out of composite material.

### ● 6 CALIBRATION SAVINGS

**Cost of calibration basically lower** than for the volumetric flowmeter, which cyclic distortion implies a larger volume of product to calibrate than a turbine, which flow has a constant velocity. This inherent advantage of the turbine (no cyclic distortion) remains specially valid for the LPG.

### ● 7 REPEATABILITY

**Very good repeatability** : with identical conditions of influence, repeatability is about 0.5 per 1000

### ● 8 RELIABILITY

**Large reliability and robustness**: the turbine, once assembled, does not require any maintenance or servicing for breakdown.

### ● 9 DESIGN RULES

Nearly **insensitive to the hydraulic hammers**, as the pressure wave crosses the turbine without meeting frontal obstacles. Moreover, resistance to the random passage of pockets of gas seems very high (self-lubrication of the graphite-carbide bearing).

### ● 10 RESTRAINED FRAUDABILITY

**Reduced possibility for cheating**, the only access being limited to the wiring of the pulse transmitter, which is easily detectable.



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The photos are not intended contractual

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