Flowmetres in KAN-therm stainless steel manifolds.

Hereby KAN Sp. z o.o. as a producer of System KAN-therm stainless steel manifolds informs, that in above mentioned products, balancing flowmeters with available pre-set between 0 to 2,5 l/min are used.
Pre-set is validated for water (H_2O), however KAN Sp. z o.o. allows also antifreeze agents based over propylene and ethylene glycols with concentrations not exceeding 50% to be used. Construction of the flowmeters determines their use on supply (inlet) beam of the manifold with heating medium parameters 6 bar at 60 °C (T_{max} = 70 °C).

Taking into consideration limitations given by EN 1264 standard "Water based surface embedded heating and cooling systems", we may see that:

1. Allowable surface temperature in standard rooms may not exceed 29 °C.
2. Maximal floor heating power output will not exceed 99 W/m^2.
3. Maximal pressure drop in single heating coil should not exceed 20 kPa.

Additionally, to calculate necessary flow in the single heating coil, we may use equation:

$$Q = m \cdot c_V \cdot \Delta t \text{ [W]}$$

where:
Q - heat demand of the room [W]
m – flow in the system [kg/s]
c_V – water specific heat ≈ 4190 [J/kg·K]
Δt – temperature drop in the system = 10 [°C] = 10 [K]

$$Q = m \cdot 41900 \text{ [W]}$$

According to above mentioned standard, maximal linear pressure drop in pipeline should not exceed 150 [Pa/m], hence length of single heating loop should not exceed:

20 [kPa] / 150 [Pa/m] = 20000 [Pa] / 150 [Pa/m] = 133,33 [m]

If we consider, that unit thermal output q = 99 [W/m^2] may be achieved only with smallest 0,1 [m] heating coil spacing and floor coverage $R_{\lambda B}$ = 0,00 [m^2K/W], we may estimate surface covered by single heating loop and it's total power output:

A = 0,1 · 133,33 = 13,333 [m^2]

Q = q · A = 99 · 13,333 = 1319,967 ≈ 1320 [W]

$$1320 = m \cdot 41900$$

$$m = 1320 / 41900 = 0{,}0315\ [kg/s] = 1{,}89\ [kg/min] \approx 1{,}89\ [l/min]$$

If we consider additional 10% increase of the flow due to heat losses outside the room:

$$1{,}89 \cdot 110\% = 1{,}89 \cdot 1{,}1 = \mathbf{2{,}08\ [l/min]}$$

As clearly visible from above calculations, for floor radiant heating systems made in accordance with European standard EN 1264, there is no need to apply flowmeters with bigger adjustment range than 2,5 [l/min].
Increasing of flowmeter adjustment up to 5,0 [l/min] without elongating flowmeters body, may only distort proper adjustment by decreasing exact readout of the scale (2x longer scale on the same length is 2x less exact).

Of course KAN Sp. z o.o. is aware that bigger adjustment range (up to 5,0 [l/min]) of the flowmeters may be necessary in case of radiant cooling on industrial (non domestic) applications. Due to this reason, KAN Sp. z o.o. is planning to implement short series of manifolds with increased flowmeter scale in the future.

Kind regards,

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