Flowmeter Pulse Output and Totaliser Scaling (K-Factor)

K-factor and pulse frequency of a flowmeter's pulse output at maximum flow, the divider needed to stay within a counter's input limit, and the scaled volume per pulse.

Method: Pulse output relations f = Q/V_p

Input parameters

Unit system: SI

Parameter	Value	Unit
Volume per pulse from the meter	1.0000	L
Maximum flow	50.000	m³/h
Highest pulse rate the counter or PLC input accepts	10.000	Hz

Calculated results

Parameter	Value	Unit
K-factor (pulses per m³)	1,000.0	
Pulse frequency at maximum flow	13.889	Hz
Smallest pulse divider within the limit (whole number, no margin)	2.0000	
Volume per pulse after the divider	2.0000	L
Pulse frequency after the divider	6.9444	Hz
Pulses per day at maximum flow (after the divider)	600,000	

Notes for this case

- Keep some margin below the input limit, and check the pulse width as well as the rate: slow PLC inputs miss short pulses.

Formula and method

$$K = \frac{1}{V_p}, \quad f = \frac{Q}{V_p}, \quad n = \left\lceil \frac{f}{f_{lim}} \right\rceil$$

Variables

V_p	Volume per pulse from the meter	m³
Q_{max}	Maximum flow	m³/s
f_{lim}	Highest pulse rate the counter or PLC input accepts	1/s
K	K-factor (pulses per m³)	-
f_{max}	Pulse frequency at maximum flow	1/s
n	Smallest pulse divider within the limit (whole number, no margin)	-
$V_{p,out}$	Volume per pulse after the divider	m³
f_{out}	Pulse frequency after the divider	1/s
N_d	Pulses per day at maximum flow (after the divider)	-

Method and standards

Pulse rate equals flow divided by volume per pulse.

Assumptions and limits

- Constant K-factor.
- The divider is the smallest that keeps the pulse rate at or below the limit, with no margin: choose a larger one for margin. Pulse width and duty cycle are not computed; check them against the input's minimum on-time.

References

- Pulse output relations f = Q/V_p

Report details

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Release checks	3 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/instrumentation/flow/flow-totaliser-pulse-scaling

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.