

GENERAL RULES FOR SANITARY INSTALLATIONS

Sanitary installations must comply with local and national water supply regulations (Water Supply Regulations, Scottish Bylaws, NF P 41-205, REEF).

These are, however, often incomplete non-domestic installations. They require a particular assessment.

Pipework diameters are often chosen depending on the flow rate they provide to the different points-of-use, their development, the distribution height and the minimum static pressure available.

Every country has its own rules based on the same principals. Please refer to local and national regulations.

CALCULATION CRITERIA FOR WATER SUPPLY PIPES

Total pressure

Static pressure at the water meter.

Static pressure

Pressure with no flow at a single point in the installation.

Dynamic pressure

Pressure under flow at a single point in the installation.
Maximum pressure for time flow valves to operate: 10 bar.
Recommended pressure range: 1 to 5 bar.
Recommended pressure on each floor: 3 bar.

(x) = number of time flow or electronic valves per installation branch.

Base flow rate (Q min L/sec.)

Minimum flow rate per fitting, serving as model for calculation. The base flow rates of time flow and electronic valves are mentioned in the catalogue and *table 2* (see page 262). Base flow rates are always presented in relation to dynamic pressure.

Gross flow rate (Q)

Sum of base flow rate of the different valves on the same branch.

Design flow rate

Gross flow rate (Q) x simultaneous coefficient (Y).

Simultaneous coefficient

(Y) coefficient to apply to gross flow rate, relative to the number of installed valves (x) to simulate the number of valves operating simultaneously.

This coefficient will vary according to the type of product, run time and frequency of use of the sanitary facilities.

For example: the probability of having multiple showers operating at the same time is a lot higher than it is for WC flushes: a DELABIE shower runs for approximately 30 seconds at a time (over the length of the shower) while WC direct flush system (cistern-less) only lasts a few seconds.

• Point-of-use: urinal, shower or basin.

Use the following formula:

$$Y = \frac{0,8}{\sqrt{x-1}}$$

• Direct flush valve (cistern-less WC)

Flush valves, which only operate for a few seconds, are not counted the same way as other fittings in the calculation. These flush valve equivalents are as follows:

- for 3 installed valves: 1 valve operating
- for 4 to 12 installed valves: 2 valves operating
- for 13 to 24 installed valves: 3 valves operating
- for 25 to 50 installed valves: 4 valves operating
- for more than 50 installed valves : 5 valves operating.

Please note minimum dynamic pressure required for the correct functioning of fittings is as follows:

Product family	Ranges	Required dynamic pressure
Basins	TEMPOSTOP, TEMPOGENOU, MIX-MONOFOOT, TEMPOMATIC, BINOPTIC	0.5 bar min.
	TEMPOSOFIT, TEMPOMIX	1 bar min.
Showers	TEMPOSTOP, TEMPOMATIC, mechanical	0.5 bar min.
	SPORTING 2, TEMPOSOFIT, TEMPOMIX, OUTDOOR	1 bar min.
Urinals	TEMPOSTOP, TEMPOMATIC	0.5 bar min.
	TEMPOSOFIT, TEMPOFLUX	1 bar min.
WCs	TEMPOFLUX, TEMPOCHASSE, TEMPOMATIC	1 bar min.

RECOMMENDATIONS FOR CONNECTION PIPE DIAMETER

To simplify your work, here are DELABIE's recommendations for selecting the correct internal diameter for horizontal final pipework (*table 1*). These diameters are calculated according to the base flow rates recommended by DELABIE for each point-of-use as well as the simultaneous coefficient calculated following the rules detailed in the previous chapter.

For pipes that are joined or connected using other types of quick connectors, the interior diameter of the passage through the connection should be verified.

Important: after choosing the diameter, check whether the residual dynamic pressure is sufficient at the valve inlets. Loss of pressure in the installation should also be considered.

TABLE 1 / PIPEWORK DIAMETER RELATIVE TO THE NUMBER OF TIME FLOW OR ELECTRONIC VALVES

Horizontal pipe runs - Design velocity 2 m/sec.

Time flow or electronic valve	Number of valves supplied on the same pipe run	FLOW RATE		PIPE Minimum interior diameter
		Gross flow rate L/sec.	Design corrected L/sec.	
 BASIN Base flow rate 0.05 L/sec.	1	0.05	0.05	6
	2 or 3	0.10 to 0.15	0.08	7
	4 to 6	0.20 to 0.30	0.09 to 0.11	8
	7 to 11	0.35 to 0.55	0.11 to 0.14	9
	12 to 17	0.60 to 0.85	0.14 to 0.17	10
	18 to 25	0.90 to 1.25	0.17 to 0.20	11
	26 to 36	1.30 to 1.80	0.21 to 0.24	12
	37 to 50	1.85 to 2.50	0.25 to 0.29	13
 SHOWER Base flow rate 0.10 L/sec.	1	0.10	0.10	8
	2 or 3	0.20 to 0.30	0.16 to 0.17	10
	4 or 5	0.40 to 0.50	0.18 to 0.20	11
	6 to 8	0.60 to 0.80	0.21 to 0.24	12
	9 to 15	0.90 to 1.50	0.25 to 0.32	13 to 14
	16 to 27	1.60 to 2.70	0.33 to 0.42	15 to 16
	28 to 50	2.80 to 5	0.43 to 0.57	17 to 19
	 URINAL With water nozzle and stall Flow rate 0.15 L/sec.	1	0.15	0.15
2 to 4		0.3 to 0.60	0.24 to 0.28	12 to 13
5 to 8		0.75 to 1.20	0.30 to 0.36	14 to 15
9 to 14		1.35 to 2.10	0.38 to 0.47	16 to 17
15 to 23		2.25 to 3.45	0.48 to 0.59	18 to 19
24 to 35		3.60 to 5.25	0.60 to 0.72	20 to 21
36 to 50		5.40 to 7.50	0.73 to 0.86	22 to 23
 SIPHON ACTION URINAL With small independent plastic or ceramic waste Base flow rate 0.25 L/sec.	1	0.25	0.25	13
	2 or 3	0.50 to 0.75	0.40 to 0.42	16
	4 to 7	1 to 1.75	0.46 to 0.57	17 to 19
	8 to 14	2 to 3.50	0.60 to 0.78	20 to 22
	15 to 25	3.75 to 6.25	0.80 to 1.02	23 to 25
	26 to 34	6.50 to 8.50	1.04 to 1.18	26 to 27
	35 to 50	8.75 to 12.50	1.20 to 1.43	28 to 30
 DIRECT FLUSH WC ¾" to 1¼" Base flow rate 1 L/sec.	1	1	1	20
	2 or 3	2 to 3	1	25
	4 to 12	4 to 12	2	36
	13 to 24	13 to 24	3	44
	25 to 50	25 to 50	4	50
	+50	+50	5	56