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pressure loss calculation for GFO-RM gasmeters

Qmax	=	maximum Flowrate of meter	m3/h	
Qb	=	Flowrate in operating conditions	m3/h	
Δp_Qmax	=	Pressureloss at maximum Flowrate of meter at 1 bar absolute with natural gas	mbar	(see table 1)
Δp_ng	=	Pressureloss in operating conditions with naturalgas	mbar	
Pb	=	aboslute operating pressure	bar	
Patm	=	absolate atmosperic pressure	bar	
ρn	=	Density in standard conditions	kg/m3	(see table 2)

Calculation of pressureloss under operating conditions in Natural gas :

Δp_ng = Pb / Patm * (Qb / Qmax)^2 * Δp_Qmax

Calculation of pressureloss under operating conditions for any gas

Δp = ρn / ρn_ng * Δp_ng

Table 1 : Pressureloss table.
Pressureloss at maximum Flowrate of meter at 1 bar absolute with natural gas

Gvalue	Diameter	Qmax	Δp_Qmax
	(mm)	(m3/h)	(mbar)
G16	40	25	0,14
G25	40	40	0,37
G40	40	65	0,97
G40	50	65	0,77
G65	50	100	1,38
G100	80	160	2,15
G160	80	250	2,00
G160 Twin	N.A.	N.A.	N.A.
G250	100	400	4,10
G400 Twin	100	650	3,55
G400 Twin	150	650	3,30
G650 Twin	150	1000	3,30

Table 2 : Densities in standard conditions for common Gases

Medium	**ρn**
	(kg/m3)
Natural gas	0,83
Town gas	0,64
Carbon dioxide	1,98
Air	1,29
Nitrogen	1,25
Hydrogen	0,09
Methane	0,72
Propane	2,01

Example : Determination of the pressure loss under operating conditions

Given : IMRM G100 ; DN80; load = 100 m3/h; operating pressure 4 bar natural gas / air

for natural gas :

Δp_ng	**=**	**ρn_ng * Pb / Patm * (Qb / Qmax)^2 * Δp_Qmax**			
	=	5 / 1 * (100/160)^2 * 2.11	=	**4,12**	mbar

For air

Δp	**=**	**ρn / ρn_ng * Δp_ng**			
	=	1.29 / 0.83 * 3.42	=	**6,40**	mbar