SOUTHCORP CLEAN AIR SYSTEMS
EXTENDING YOUR CLEAN AIR OPTIONS

# FLOW RATE FORMULA

## FORMULAE FOR AIR AND GASES

VALVE SIZE: $$Cv = \frac{cfm}{22.67}\sqrt{\frac{RD \times T}{(P_1 - P_2)\,P_2}}$$

FLOW CAPACITY: $$cfm = \frac{Cv \times 22.67}{\sqrt{\frac{RD \times T}{(P_1 - P_2)\,P_2}}}$$

WHERE: cfm = flow in cubic feet per min of free air/gas (1 cu. ft = 28.3 litres)
RD = Relative Density of medium controlled (air =1)
T = Absolute temperature °F + 460
$P_1$ = Inlet or upstream pressure } 1b. in² absolute
$P_2$ = Outlet or downstream pressure } = psig + 14.7
Cv = The Cv factor listed for each valve

IMPORTANT: Once the pressure drop across a valve reaches 47% of the inlet pressure, the maximum flow capacity of that valve has been reached for air for that inlet pressure.

## FORMULAE FOR LIQUID (with viscosity similar to that of water)

VALVE SIZE: $$Cv = \frac{GPM}{\sqrt{\frac{\triangle P}{SG}}}$$

FLOW CAPACITY: $$GPM = Cv\sqrt{\frac{\triangle P}{SG}}$$

PRESSURE DROP: $$\triangle P = SG\,\frac{GPM^2}{Cv^2}$$

WHERE: Cv = The Cv factor (listed for each valve)
GPM = U.S. Gallons per minute (= 0.83 Imp. gallons = 3.78 litres/min.)
ΔP = Pressure drop in PSI
SG = Specific Gravity of the fluid controlled. (Water = 1)

EXAMPLE: Assume valve inlet pressure = 80PSI
Liquid to be controlled = Water
Maximum pressure drop = 10PSI
Volume required per minute = 10GPM

$$Cv = \frac{10GPM}{\sqrt{\frac{10PSI}{1}}} = 3.16$$

*Select valve with pressure rating ≥ 80PSI and Cv ≥ 3.16.*

INSTALLATION: Unless otherwise stated, valves in this catalogue may be installed in any orientation although it is preferable to mount the solenoid above the valve so as to minimise the ingress of dirt and foreign matter into the ferrule tube. Care should be taken not to use the solenoid enclosure as a lever when installing or removing the valve.

SPECIAL NOTE: The pressure ratings shown in this catalogue are intended to cover both AC and DC voltages, with hot coils and -15% supply voltages. If your particular requirement exceeds the pressure ratings shown, please contact your nearest Goyen Sales Office for advice. In all cases ambient temperture is taken to be 25°C (77°F).

The metric equivalent of Cv is Kv. Kv = 0.86Cv