Variable Orifice Double Regulating Valve

Flow Data and Installation Instructions

Flow Coefficient

The flow rate can be calculated using the K_v value and a measured signal.

$$K_v = \frac{Q*36}{\sqrt{\Delta P}} \qquad K_{vs} = \frac{Q*36}{\sqrt{\Delta Ps}}$$

where K_v & K_{vs} = flow coefficient (m^3/hr at 1 bar differential)
Q = flow rate (l/s)
ΔP = headloss attributable to valve (kPa)
ΔPs = differential pressure across tappings (signal) (kPa)

K_{vs} Values

The K_{vs} values are given on each flow chart at various positions from 25% to fully open.

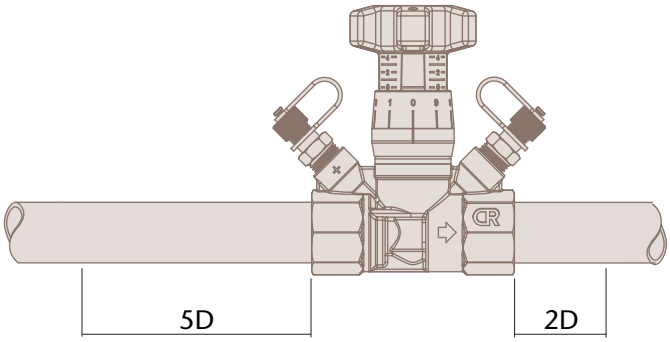
Pressure Loss and Kv Value

The pressure loss across a variable orifice double regulating valve is the same as the differential pressure (signal) measured across the body seat.

The K_v value is therefore the same as the K_{vs} value used to calculate flow rate.

Installation

Variable orifice double regulating valves must always be installed with a minimum of 5 pipe diameters of straight pipe, without intrusion, upstream of the valve and a minimum of 2 pipe diameters downstream.



Sizing

Once the required flow rate has been calculated, the size of the variable orifice double regulating valve can be determined based on the following:

With the valve fully open, a minimum signal at the design flow rate of 1 kPa. The maximum signal is normally less than 5 kPa but can be up to 10 kPa.

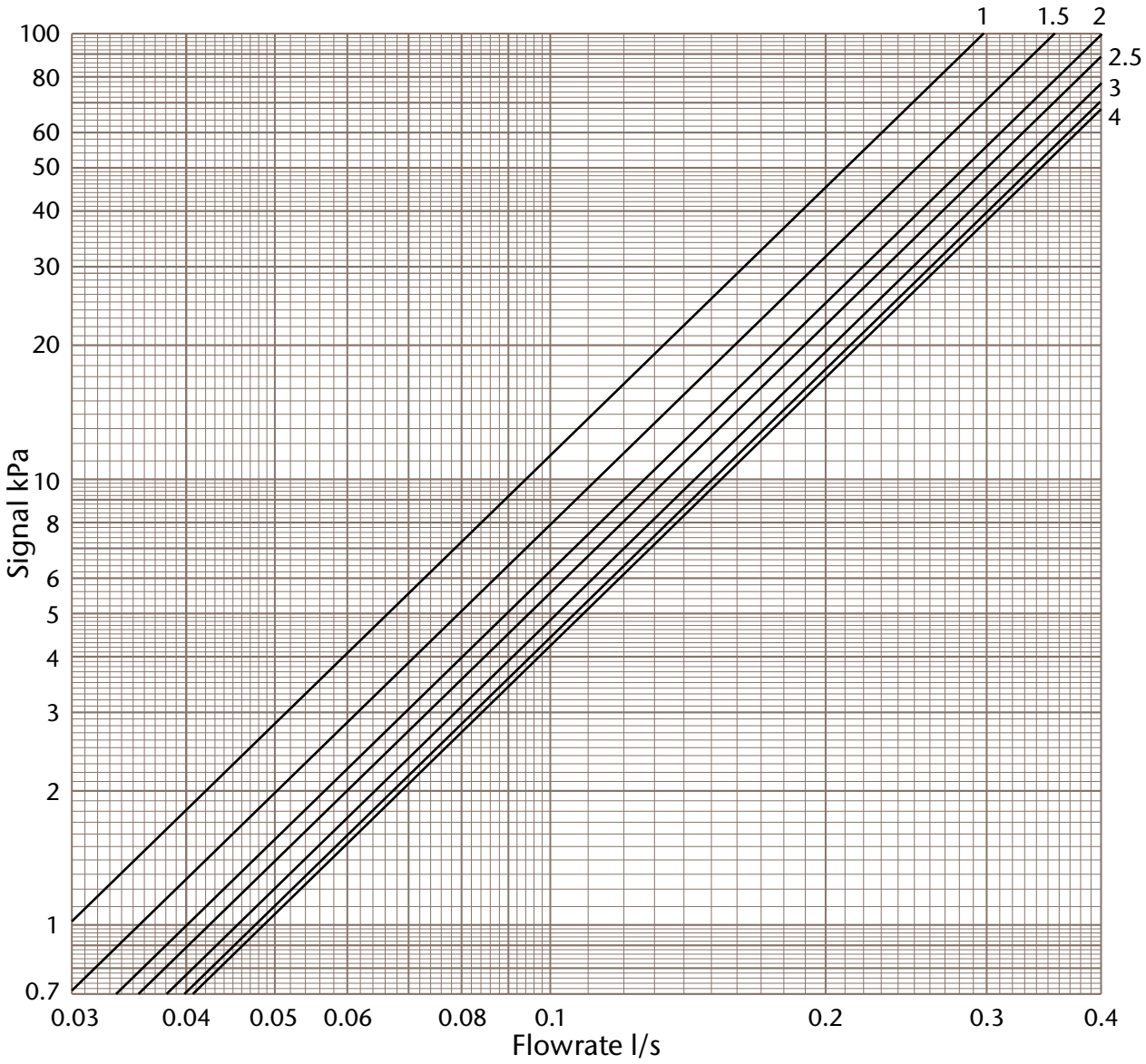
For sizing the flow velocity should not exceed 1.15 m/s at the design flow rate.

Pressure Equipment Directive

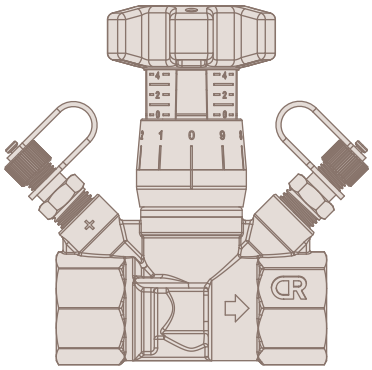
Under the Pressure Equipment Directive (PED) these variable orifice double regulating valves have been specified for Group 2 Liquids i.e. non-hazardous

Sizes ½" to 2" are classified as SEP (Sound Engineering Practice)

1/2" ART 28 Variable Orifice Double Regulating Valve



Position	1	1.5	2	2.5	3	3.5	4
K_{vs}	1.07	1.28	1.44	1.53	1.64	1.71	1.75



Signal / Flowrate

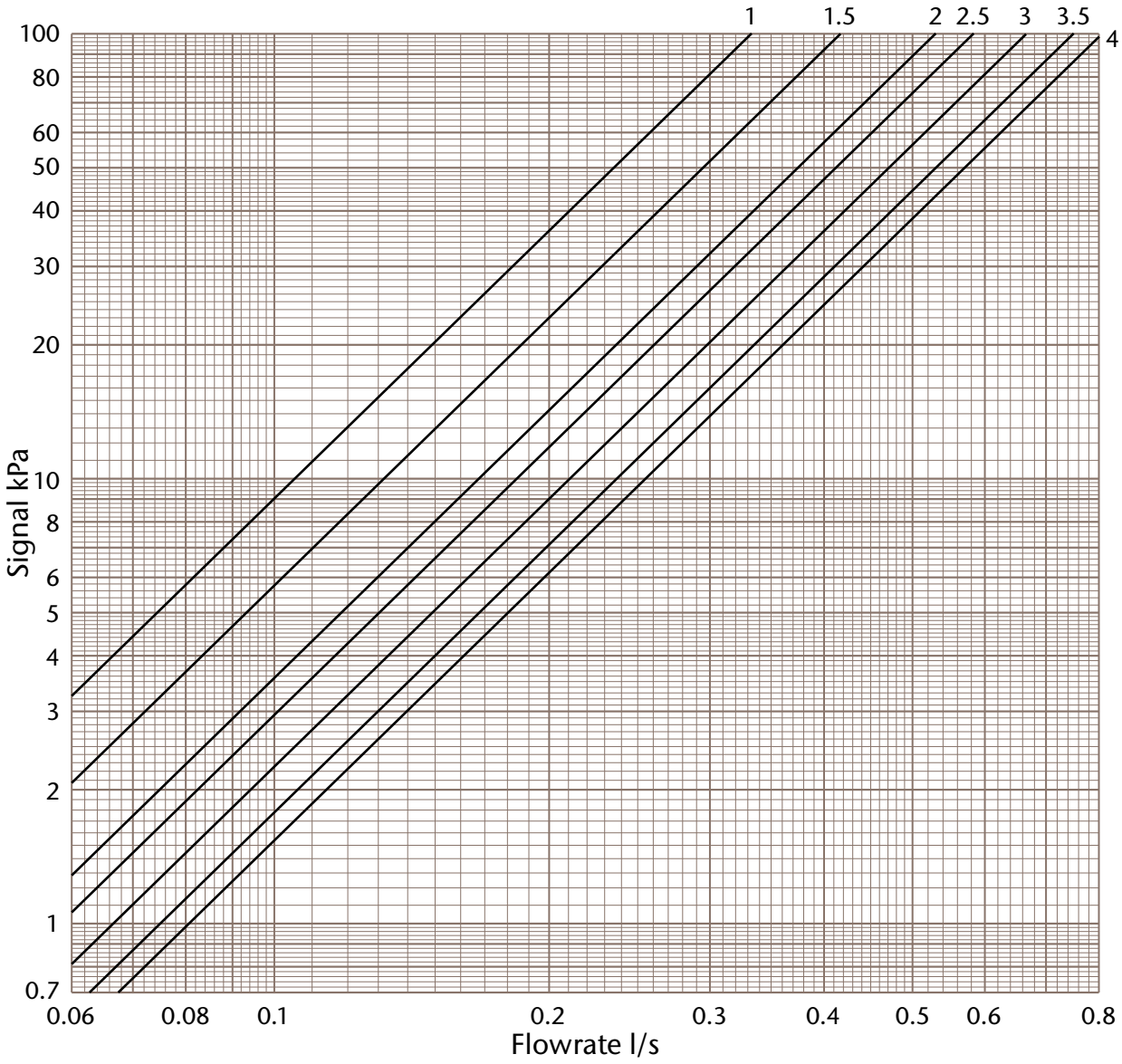
Chart used to determine flowrate from signal measured across orifice

$$Q = \frac{K_{vs} \sqrt{\Delta p}}{36}$$

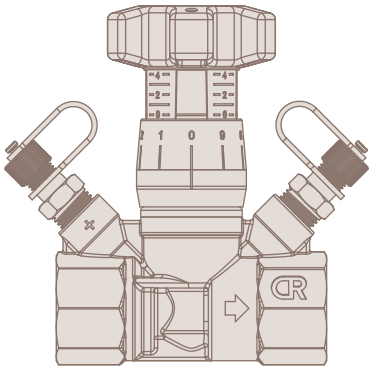
Where

Q	=	Flowrate	l/s
Δp	=	Signal	kPa
K_{vs}	=	Signal Co-efficient	

3/4" ART 28 Variable Orifice Double Regulating Valve



Position	1	1.5	2	2.5	3	3.5	4
K_{vs}	1.2	1.5	1.9	2.1	2.4	2.7	2.9



Signal / Flowrate

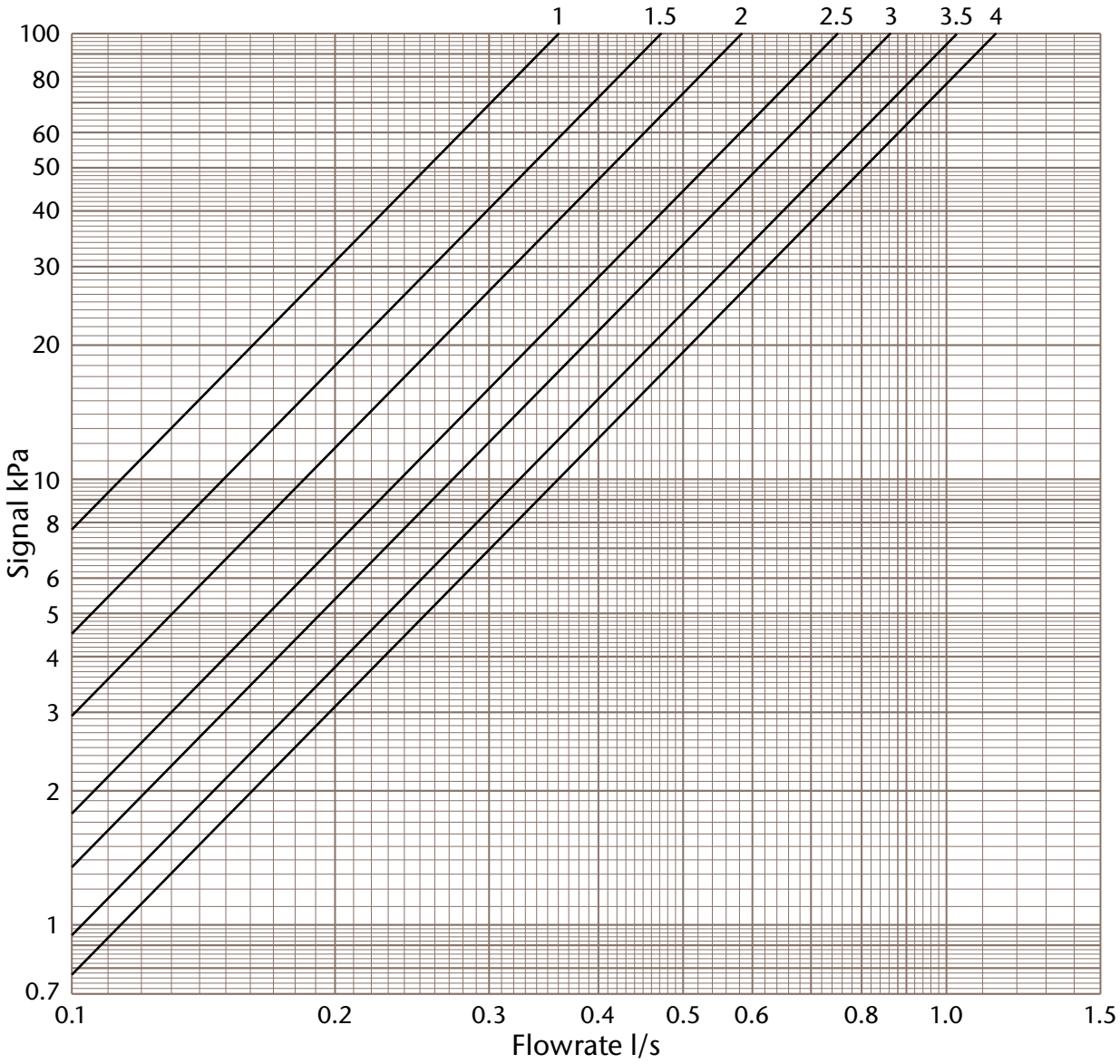
Chart used to determine flowrate from signal measured across orifice

$$Q = \frac{K_{vs} \sqrt{\Delta p}}{36}$$

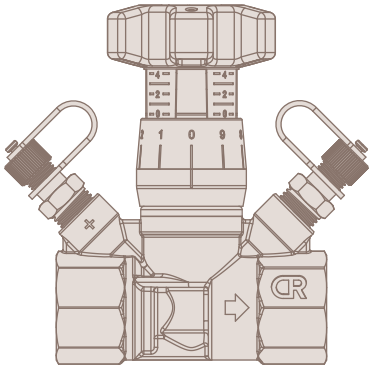
Where

Q	=	Flowrate	l/s
Δp	=	Signal	kPa
K_{vs}	=	Signal Co-efficient	

1” ART 28 Variable Orifice Double Regulating Valve



Position	1	1.5	2	2.5	3	3.5	4
K_{vs}	1.3	1.7	2.1	2.7	3.1	3.7	4.1



Signal / Flowrate

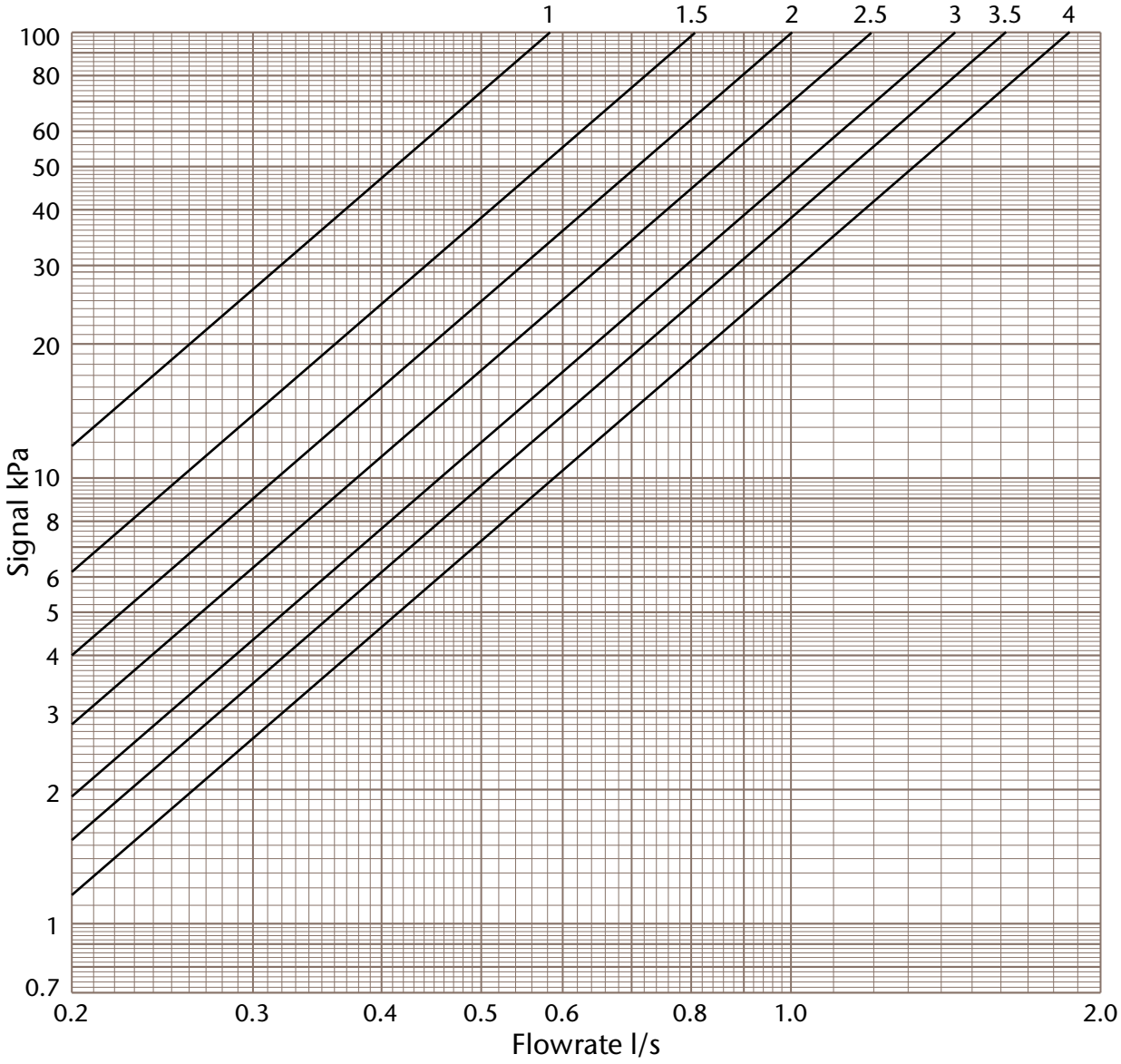
Chart used to determine flowrate from signal measured across orifice

$$Q = \frac{K_{vs}\sqrt{\Delta p}}{36}$$

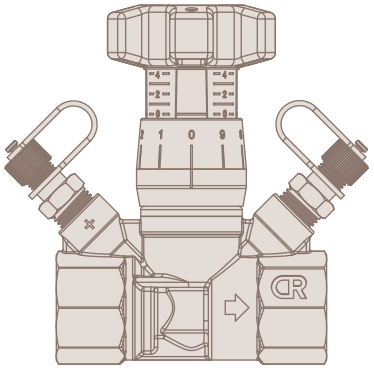
Where

Q	=	Flowrate	l/s
Δp	=	Signal	kPa
K_{vs}	=	Signal Co-efficient	

1 1/4" ART 28 Variable Orifice Double Regulating Valve



Position	1	1.5	2	2.5	3	3.5	4
K_{vs}	2.1	2.9	3.6	4.3	5.2	5.8	6.7



Signal / Flowrate

Chart used to determine flowrate from signal measured across orifice

$$Q = \frac{K_{vs}\sqrt{\Delta p}}{36}$$

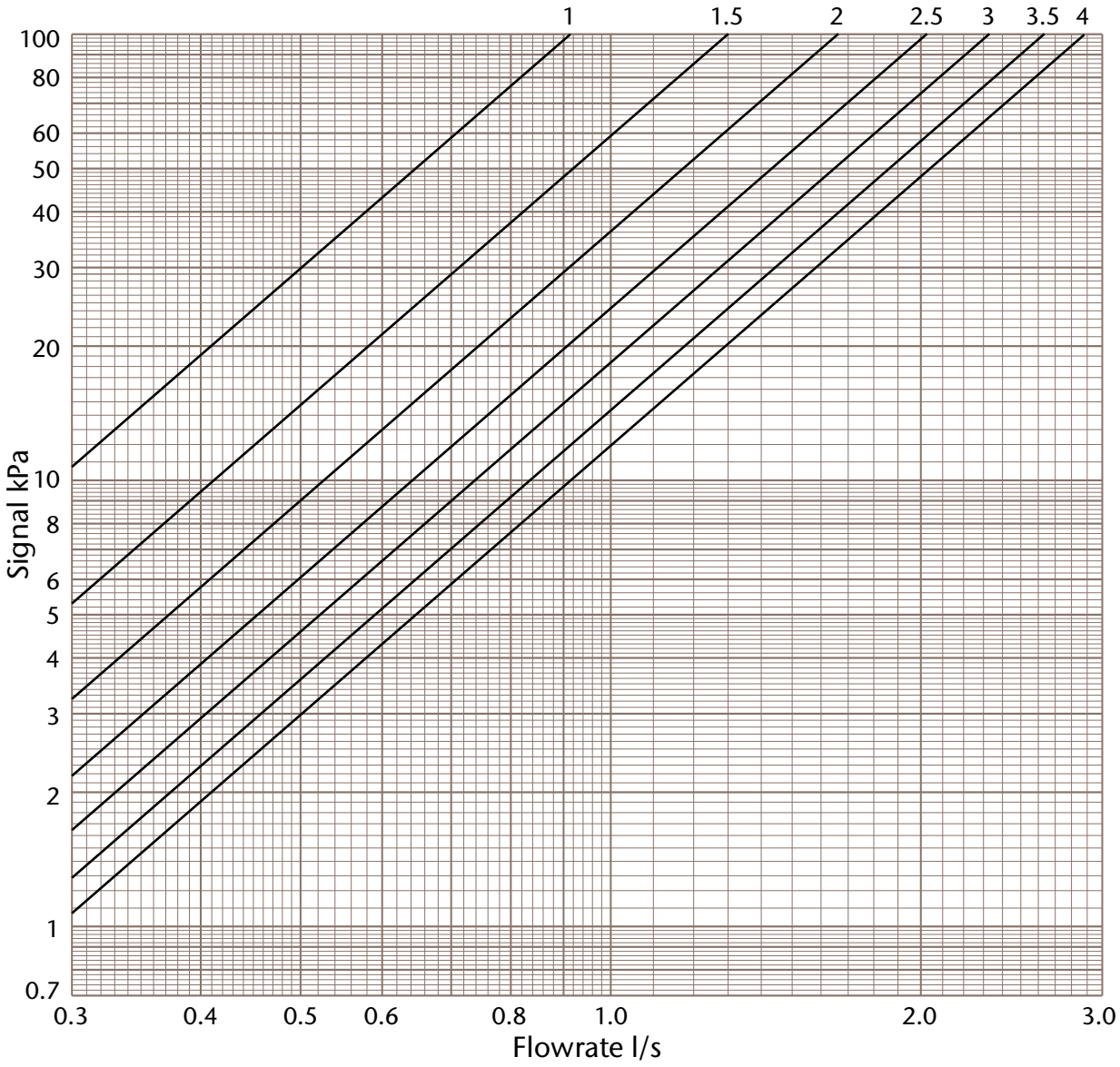
Where

Q = Flowrate l/s

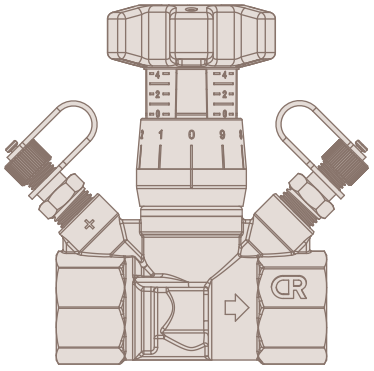
Δp = Signal kPa

K_{vs} = Signal Co-efficient

1 1/2" ART 28 Variable Orifice Double Regulating Valve



Position	1	1.5	2	2.5	3	3.5	4
K_{vs}	3.3	4.7	6.0	7.3	8.4	9.5	10.4



Signal / Flowrate

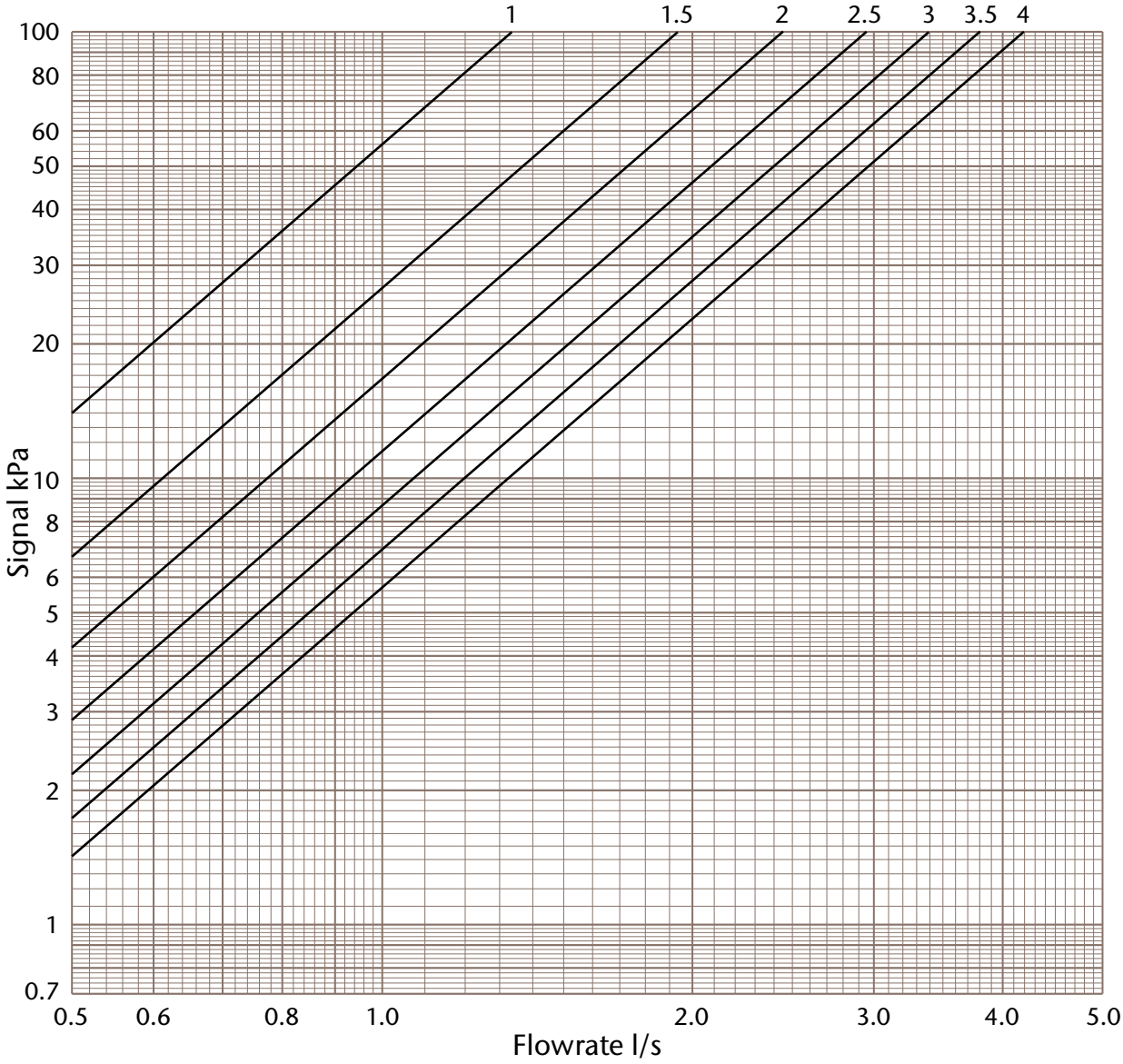
Chart used to determine flowrate from signal measured across orifice

$$Q = \frac{K_{vs}\sqrt{\Delta p}}{36}$$

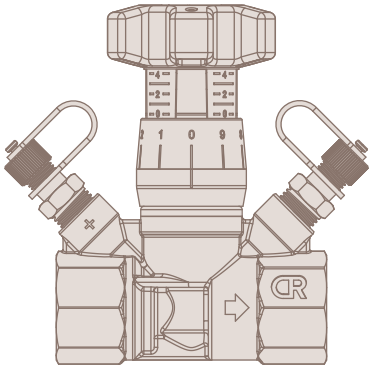
Where

Q	=	Flowrate	l/s
Δp	=	Signal	kPa
K_{vs}	=	Signal Co-efficient	

2” ART 28 Variable Orifice Double Regulating Valve



Position	1	1.5	2	2.5	3	3.5	4
K_{vs}	4.8	7.0	8.8	10.6	12.2	13.7	15.1



Signal / Flowrate

Chart used to determine flowrate from signal measured across orifice

$$Q = \frac{K_{vs}\sqrt{\Delta p}}{36}$$

Where

Q	=	Flowrate	l/s
Δp	=	Signal	kPa
K_{vs}	=	Signal Co-efficient	