Variable Orifice Double Regulating Valve

Flow Data
and
Installation Instructions

Technical Data

The Albion ART 28 is a variable orifice double regulating valve used to regulate and measure the flow passing through it.

Flow Coefficient

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

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

where K_v & K_{vs} = flow coefficient (m³/hr at 1 bar differential)

Q = flow rate (l/s)

ΔP = headloss attributable to valve (kPa)

ΔP_s = 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.
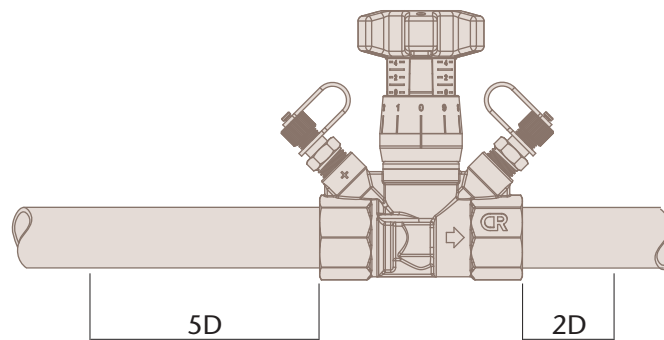
Technical Data

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.
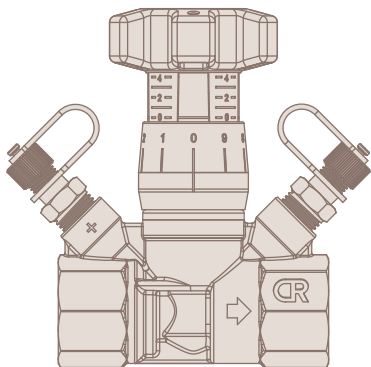
Pressure Equipment Directive

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

Signal kPa (y-axis) vs Flowrate l/s (x-axis). Curves labelled 1, 1.5, 2, 2.5, 3, 4.
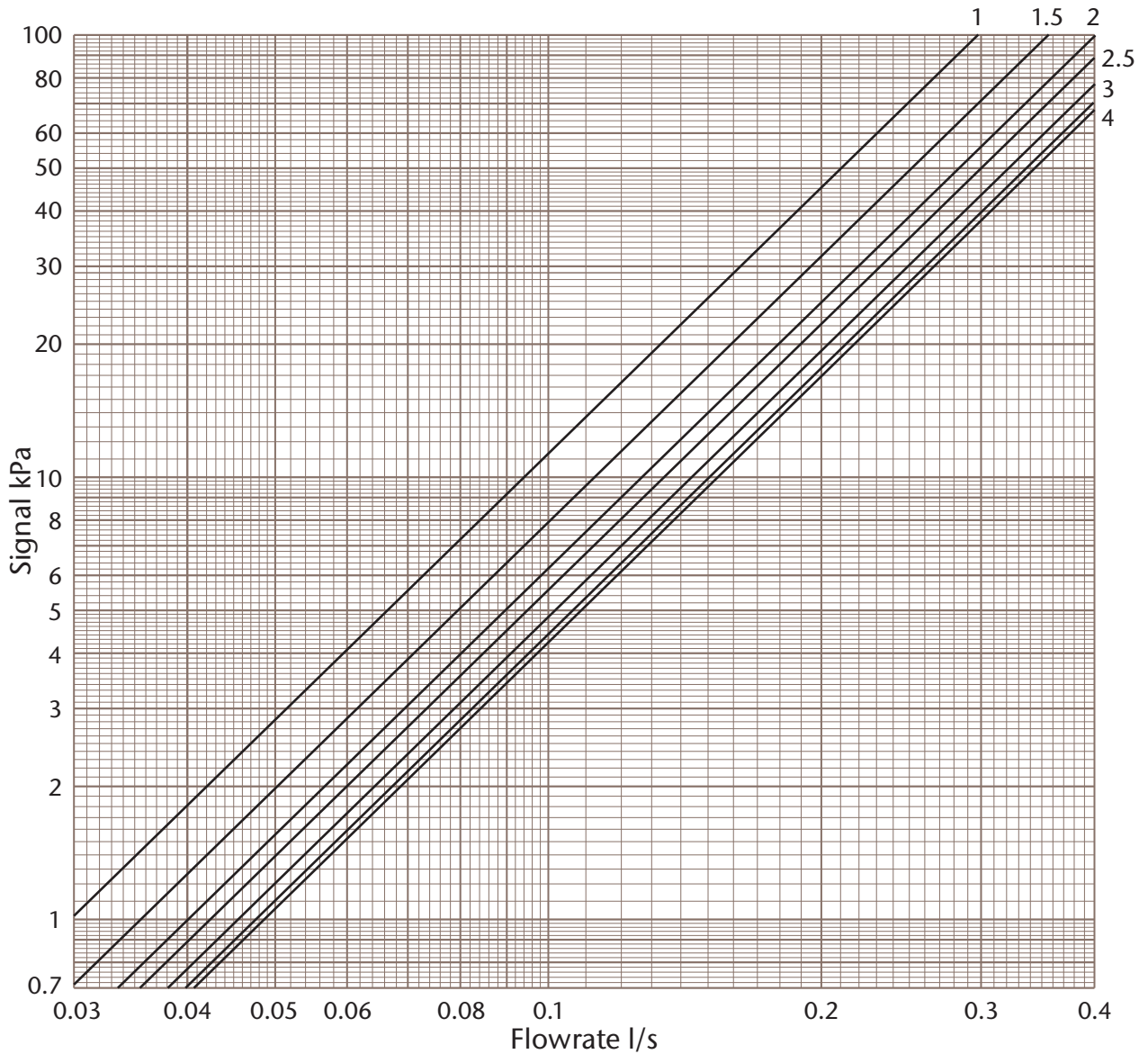
Position	1	1.5	2	2.5	3	3.5	4
Kvs	1.07	1.28	1.44	1.53	1.64	1.71	1.75

Signal / Flowrate

Chart used to determine flowrate from signal measured across orifice
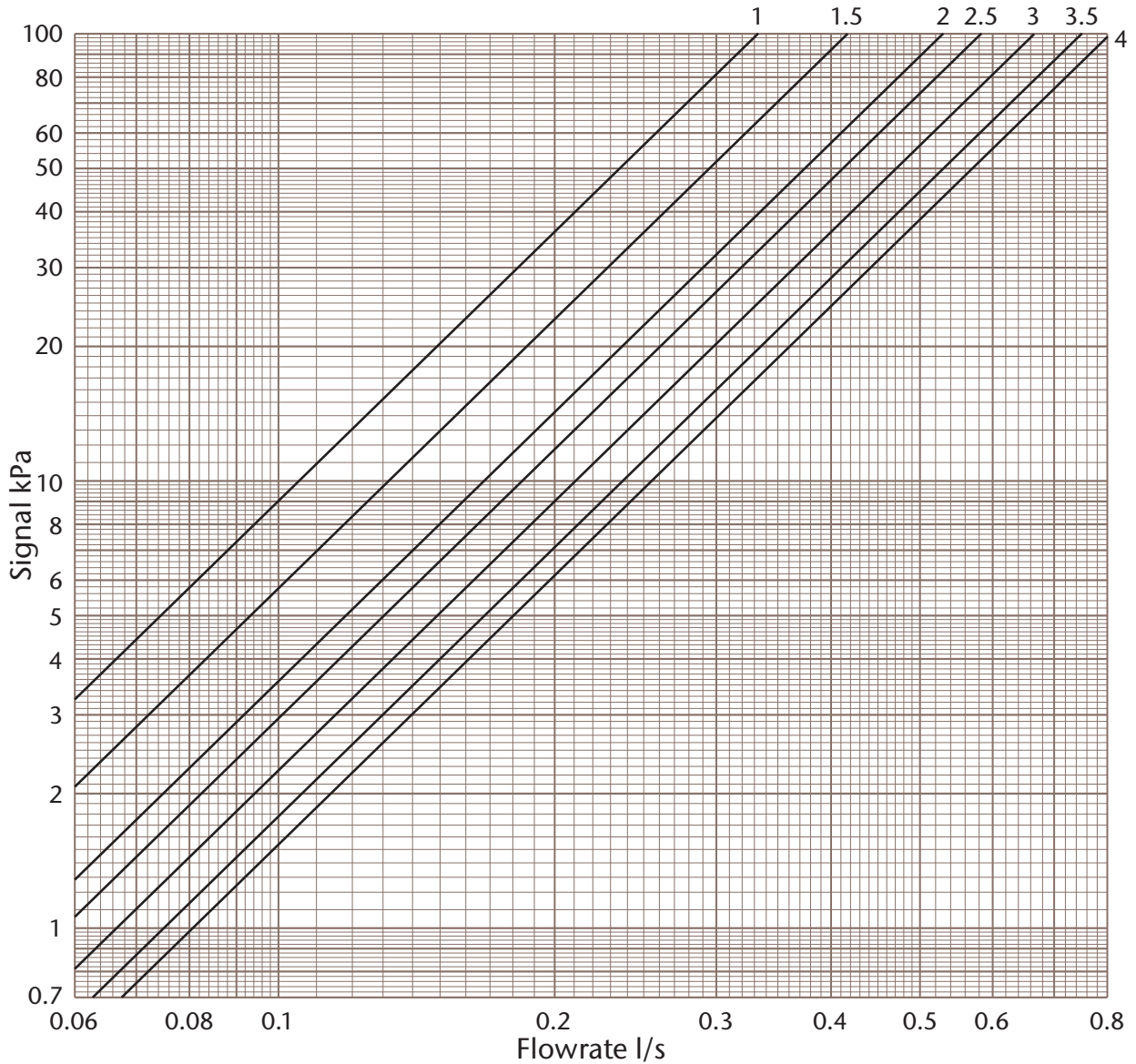
$$Q = \frac{K_{vs} \sqrt{\Delta p}}{36}$$

Where

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

¾" ART 28 Variable Orifice Double Regulating Valve

Position	1	1.5	2	2.5	3	3.5	4
Kvs	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
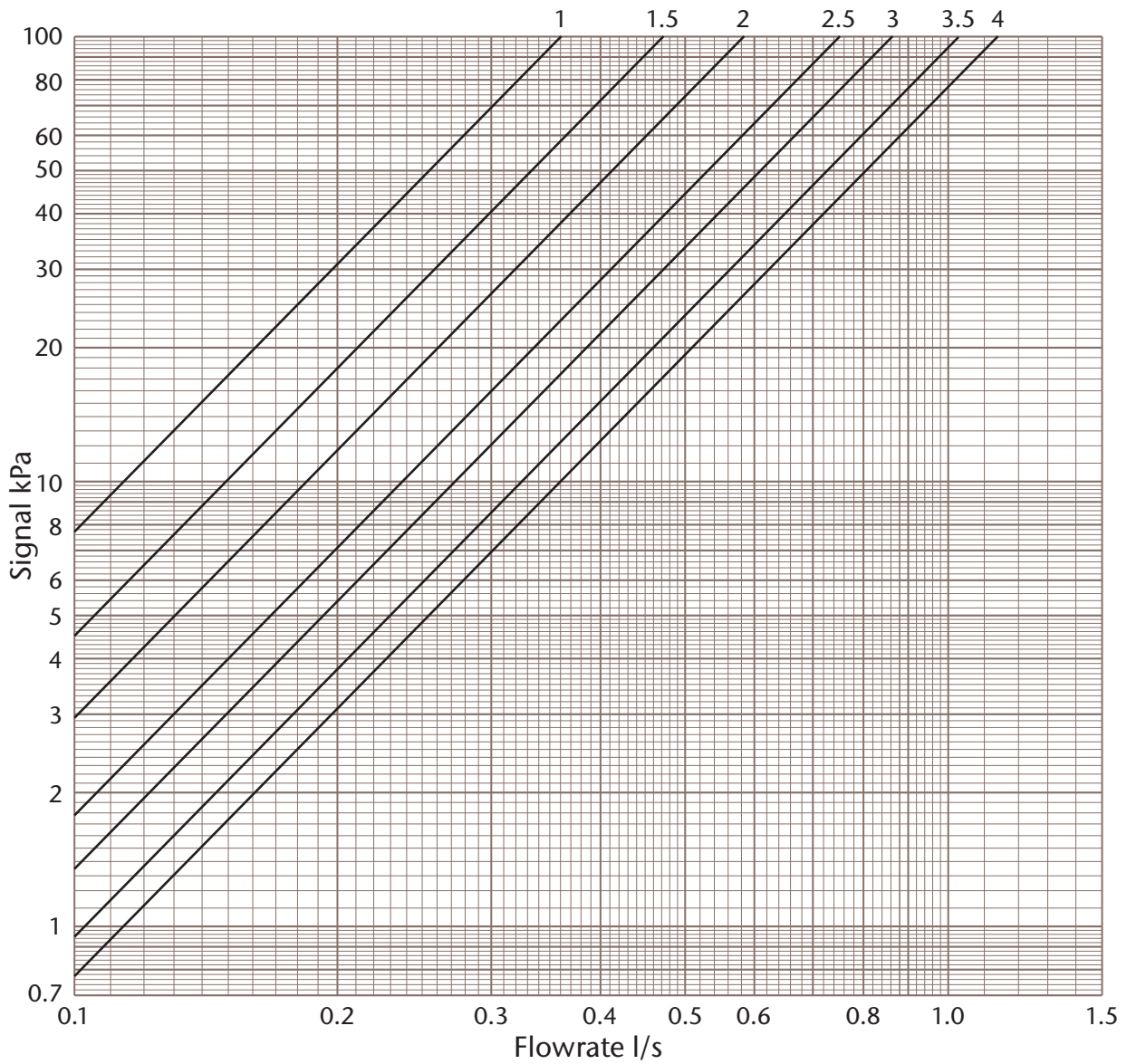
$$Q = \frac{K_{vs} \sqrt{\Delta p}}{36}$$

Where

Q	= Flowrate	l/s
Δp	= Signal	kPa
Kvs	= Signal Co-efficient	

Issue

1" ART 28 Variable Orifice Double Regulating Valve

Position	1	1.5	2	2.5	3	3.5	4
Kvs	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
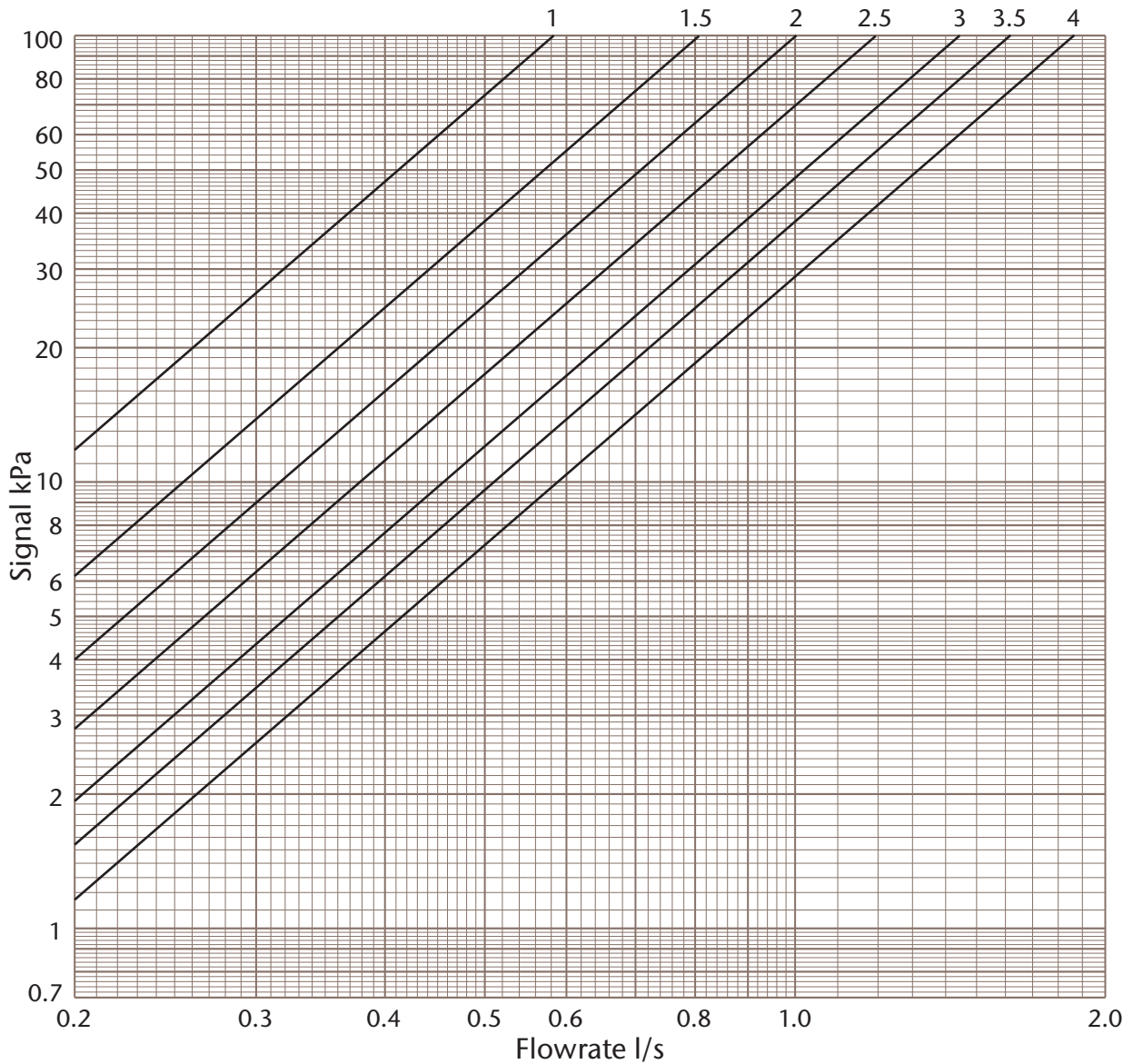
$$Q = \frac{K_{vs} \sqrt{\Delta p}}{36}$$

Where

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

Issue

1^{1}/$_{4}$" ART 28 Variable Orifice Double Regulating Valve

Position	1	1.5	2	2.5	3	3.5	4
Kvs	2.1	2.9	3.6	4.3	5.2	5.8	6.7
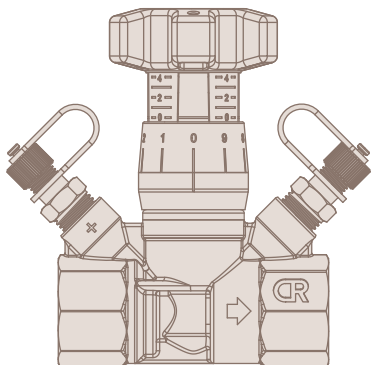
Signal / Flowrate
Chart used to determine flowrate
from signal measured across orifice

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

Where

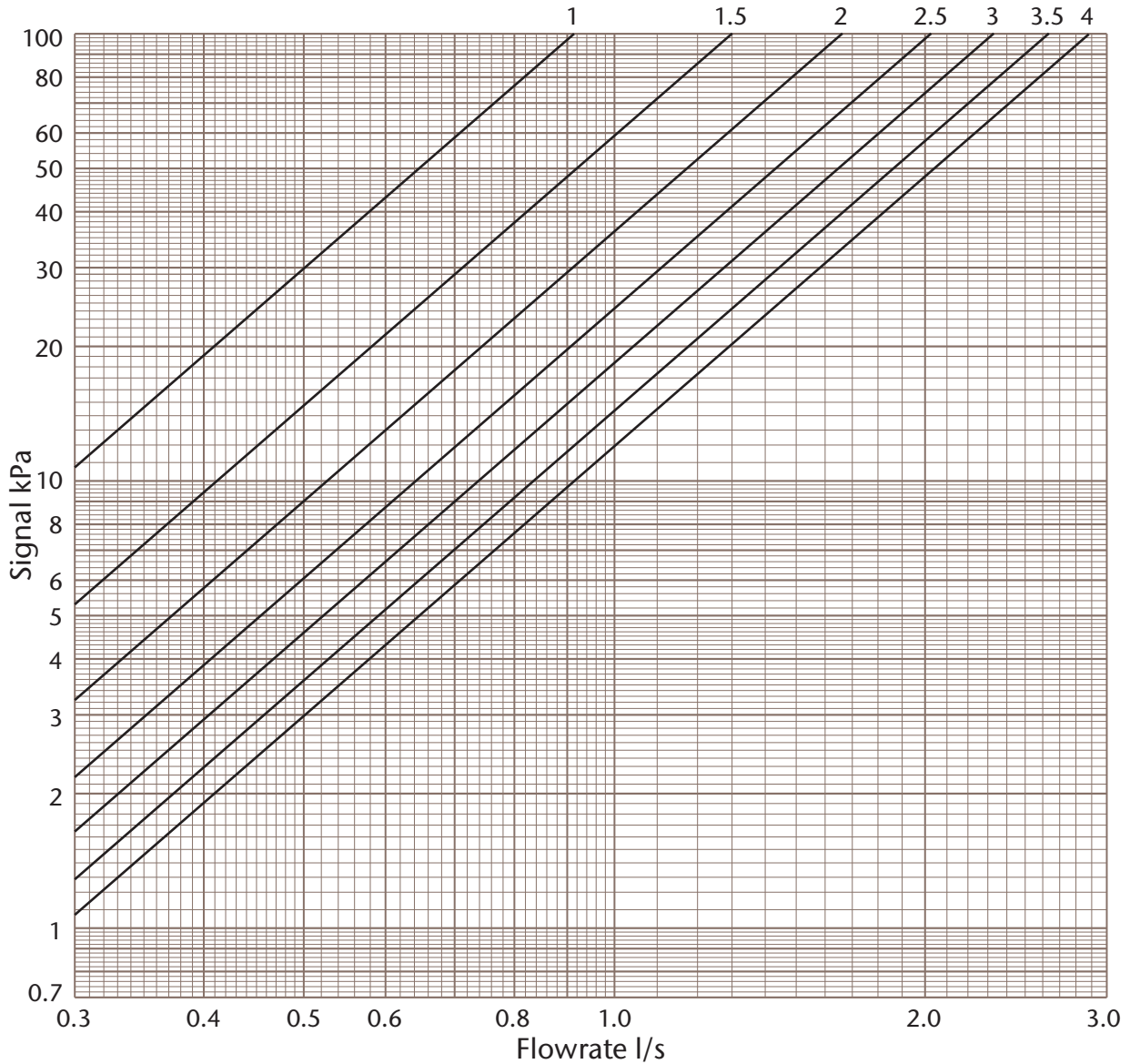|		
Q	= Flowrate	l/s
Δp	= Signal	kPa
Kvs	= Signal Co-efficient	

1^1/$_2$" ART 28 Variable Orifice Double Regulating Valve

Position	1	1.5	2	2.5	3	3.5	4
Kvs	3.3	4.7	6.0	7.3	8.4	9.5	10.4
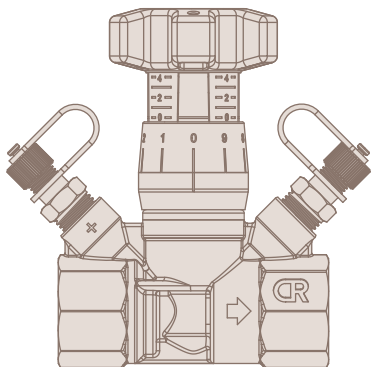
Signal / Flowrate

Chart used to determine flowrate from signal measured across orifice

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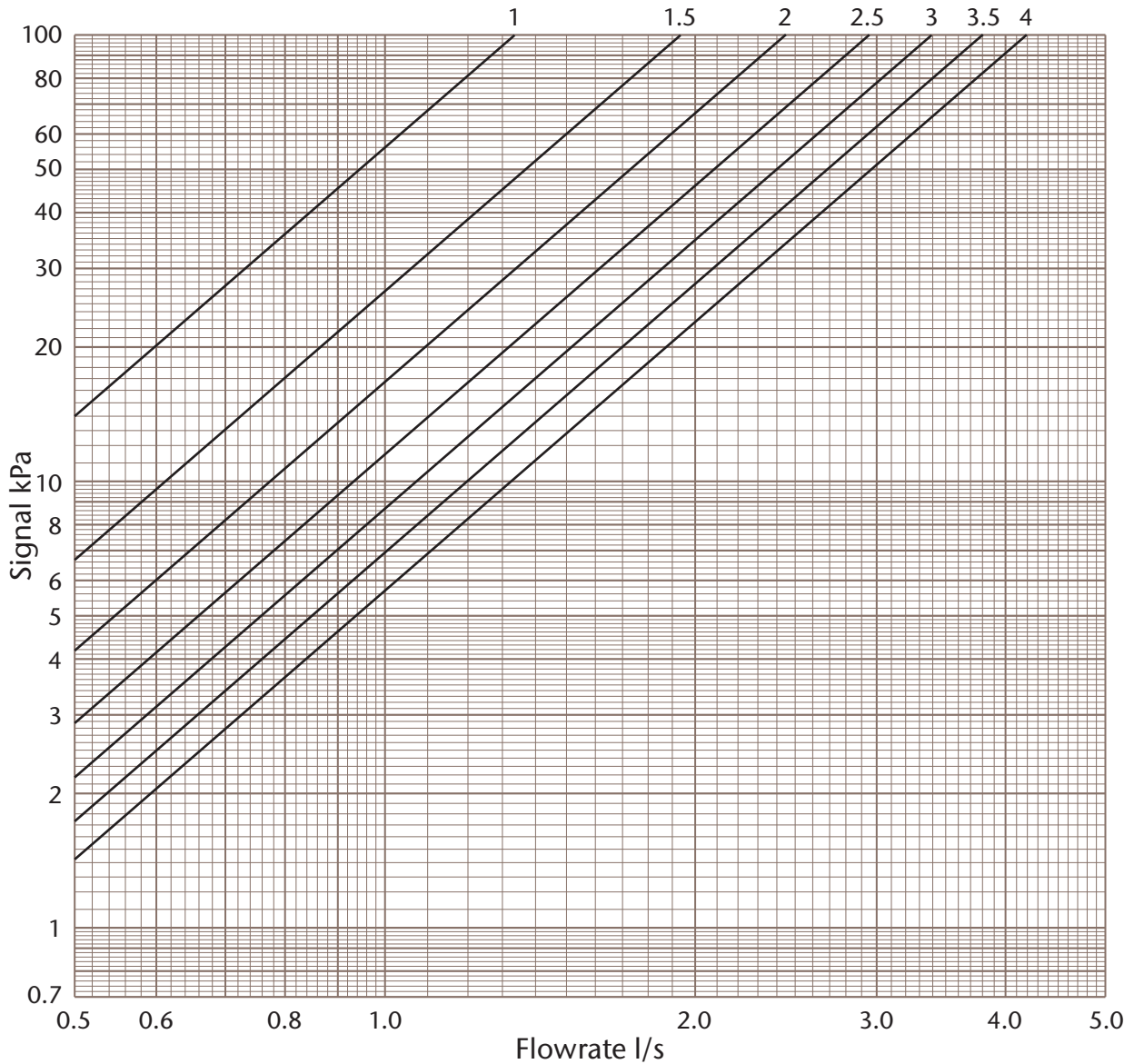
Where

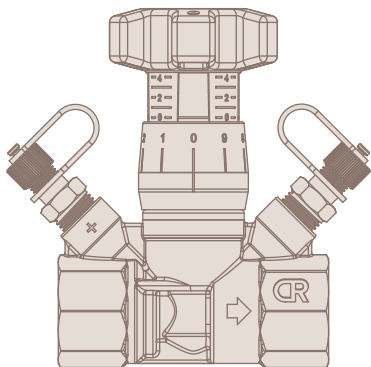| Q	= Flowrate	l/s
Δp	= Signal	kPa
Kvs	= Signal Co-efficient	

Issue

This data sheet is designed as a guide and should not be regarded as wholly accurate in every detail. We reserve the right to amend the specification of any product without notice.

2" ART 28 Variable Orifice Double Regulating Valve

Position	1	1.5	2	2.5	3	3.5	4
Kvs	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
Kvs	= Signal Co-efficient	

Issue