

# **Stainless Steel Metering Stations**



## **Flow Data and Installation Instructions**

## Technical Data

The Albion ART 270 is a fixed orifice metering station used to measure the flow passing through it, which can be used close coupled to a double regulating valve to form a commissioning set.

This flow data can also be used for the Albion ART 280 metering station manufactured from 316 stainless steel.

### Flow Coefficient

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

$$K_v = \frac{Q \cdot 36}{\sqrt{\Delta P}} \quad K_{vs} = \frac{Q \cdot 36}{\sqrt{\Delta P_s}}$$

where  $K_v$  &  $K_{vs}$  = flow coefficient (m<sup>3</sup>/hr at 1 bar differential)

$Q$  = flow rate (l/s)

$\Delta P$  = headloss attributable to valve (kPa)

$\Delta P_s$  = differential pressure across tapings (signal) (kPa)

### $K_{vs}$ Values

Size	DN50	DN65	DN80	DN100	DN125	DN150
$K_{vs}$	47.5	88.5	150.6	281.1	328.8	477.5

Size	DN200	DN250	DN300
$K_{vs}$	826	1218	1794

### Pressure Loss

The pressure loss across a metering station is less than signal differential pressure indicated on the flow charts. The pressure loss is obtained by using the  $K_v$  values given below.

This applies to when the metering station is used in a stand alone application or close coupled to a double regulating valve.

### $K_v$ Values for Calculating the Pressure Loss

Size	DN50	DN65	DN80	DN100	DN125	DN150
$K_v$	71.6	145.5	295.4	702	572	807

Size	DN200	DN250	DN300
$K_v$	1416	1975	2990

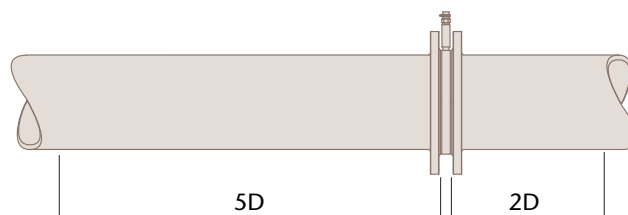
## Technical Data

### Installation

Metering stations must always be installed with a minimum of 5 pipe diameters of straight pipe, without intrusion, upstream of the metering station.

Downstream of the metering station a minimum of 2 pipe diameters of straight pipe are required.

When close coupled to a double regulating valves only the straight pipe upstream of the metering station is required.



### Sizing

Once the required flow rate has been calculated, the size of the metering station can be determined based on the following:

- The minimum signal at the design flow rate of 1 kPa.

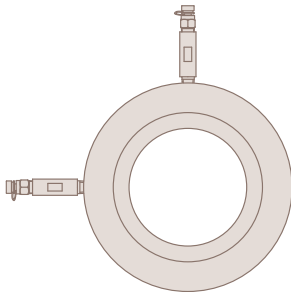
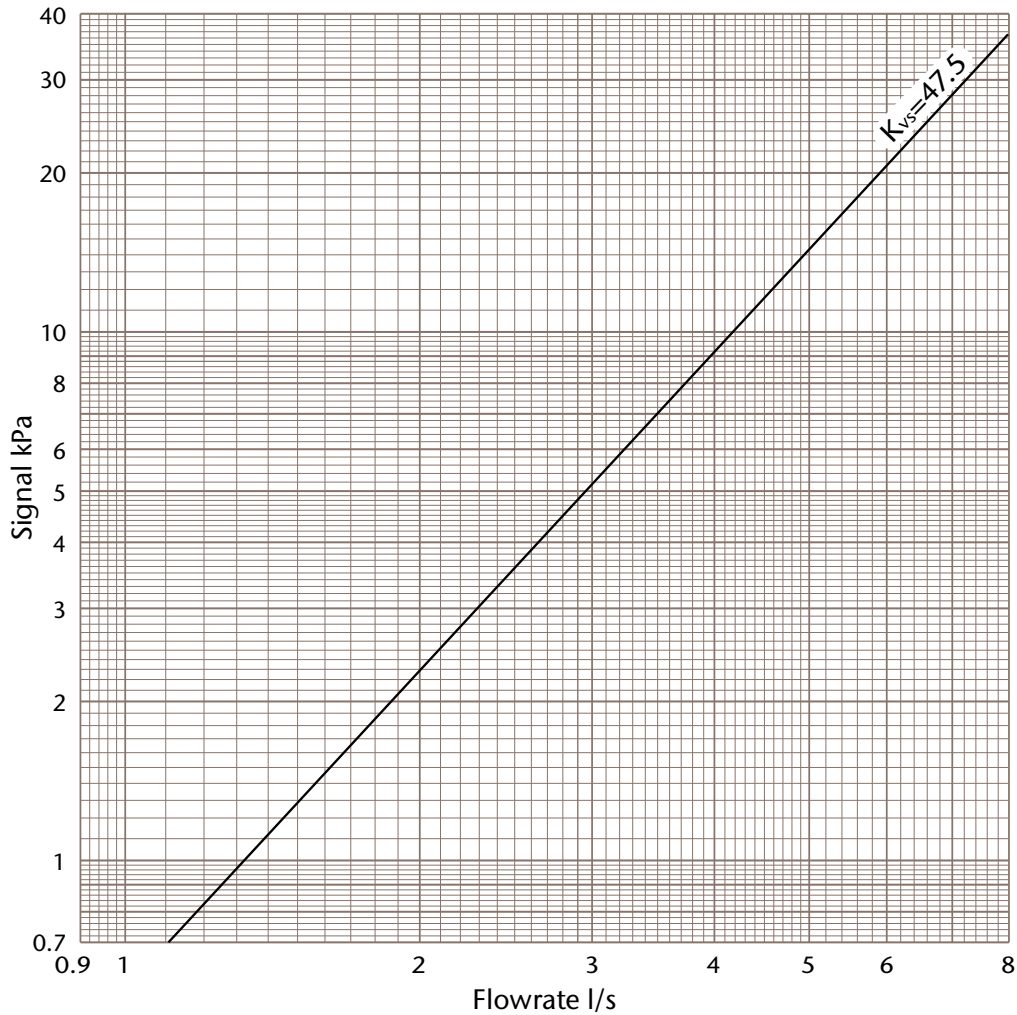
- For minimum pressure loss, a maximum signal of 4.7 kPa, which corresponds to the maximum differential pressure range of a fluorocarbon manometer.

### Pressure Equipment Directive

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

- Sizes DN50 to DN300 are classified as SEP (Sound Engineering Practice)

## DN50 ART 270 Stainless Steel Metering Station



### Signal / Flowrate

Chart used to determine flowrate from signal measured across orifice

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

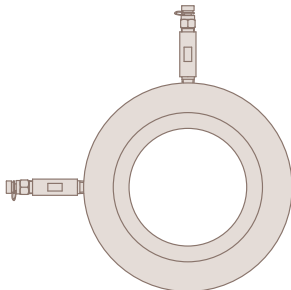
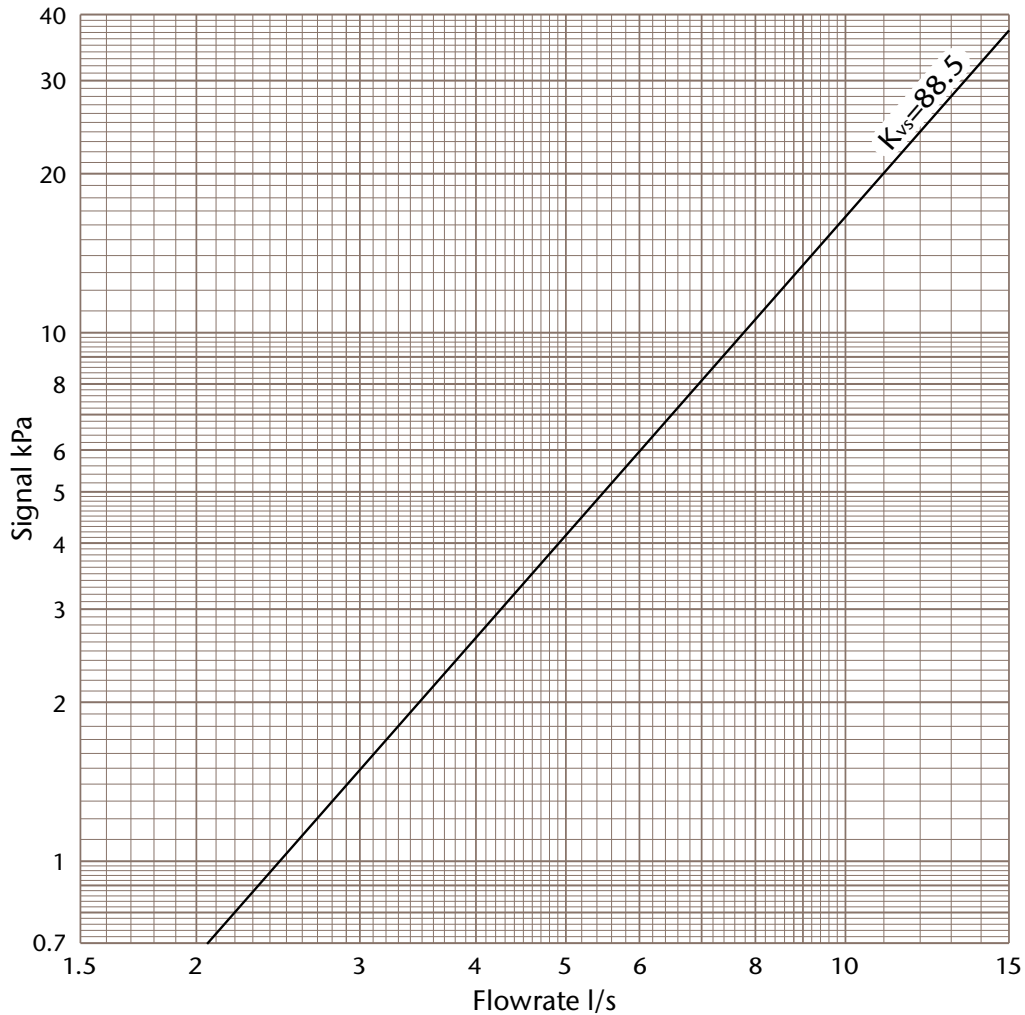
Where

Q = Flowrate l/s

$\Delta p$  = Signal kPa

$K_{vs}$  = Signal Co-efficient

## DN65 ART 270 Stainless Steel Metering Station



### Signal / Flowrate

Chart used to determine flowrate from signal measured across orifice

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

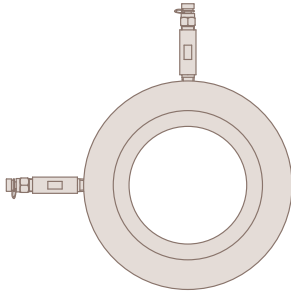
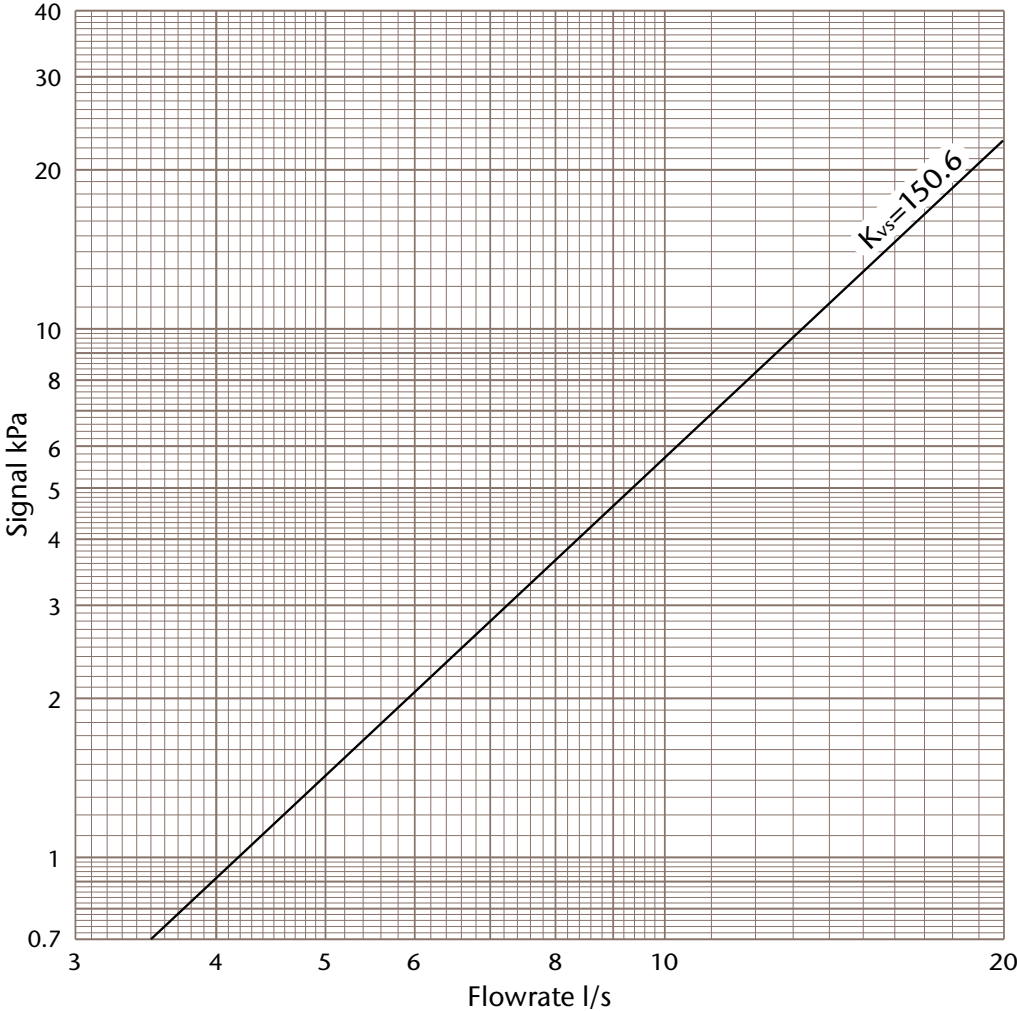
Where

Q = Flowrate l/s

$\Delta p$  = Signal kPa

$K_{vs}$  = Signal Co-efficient

# DN80 ART 270 Stainless Steel Metering Station



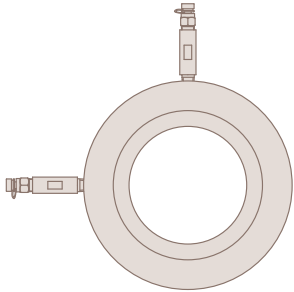
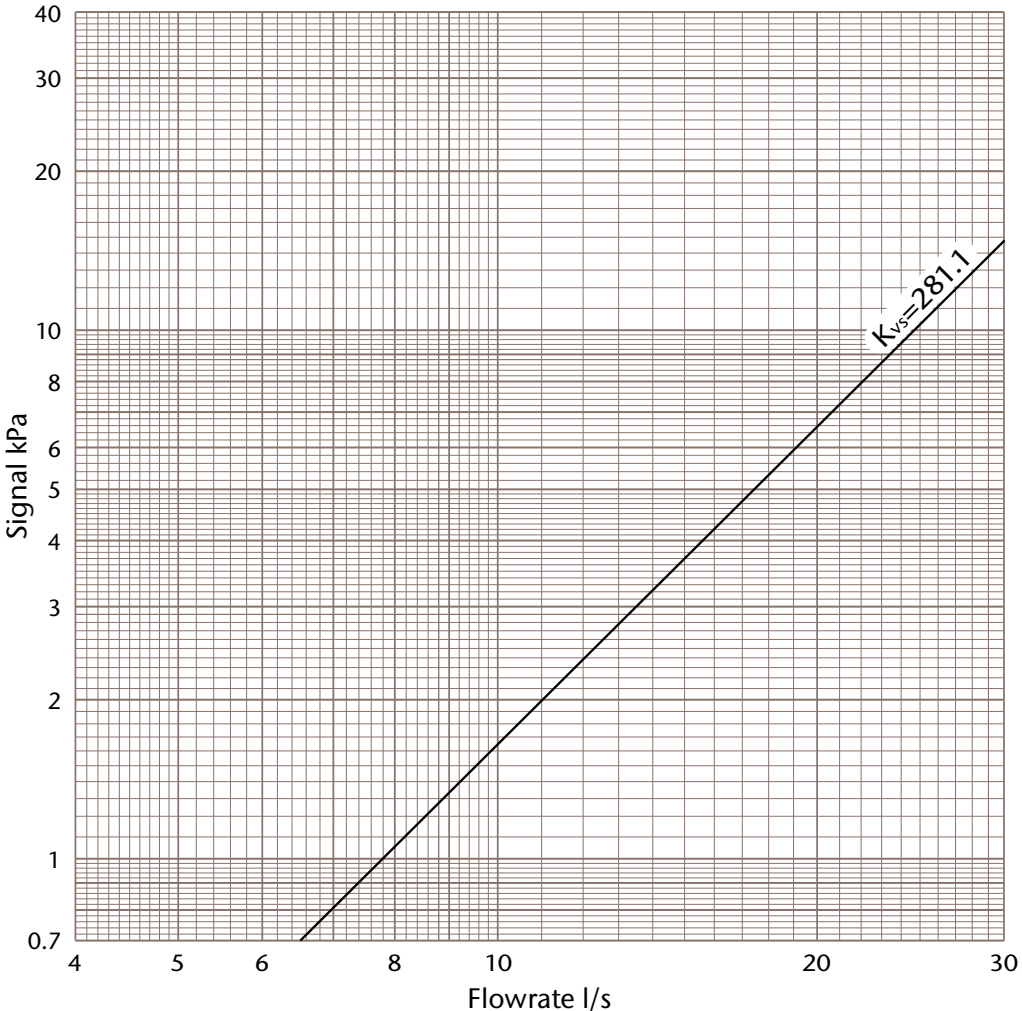
**Signal / Flowrate**  
 Chart used to determine flowrate from signal measured across orifice

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

Where

- Q = Flowrate            l/s
- Δp = Signal            kPa
- K<sub>vs</sub> = Signal Co-efficient

# DN100 ART 270 Stainless Steel Metering Station



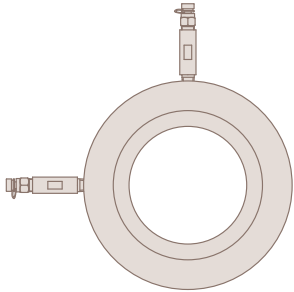
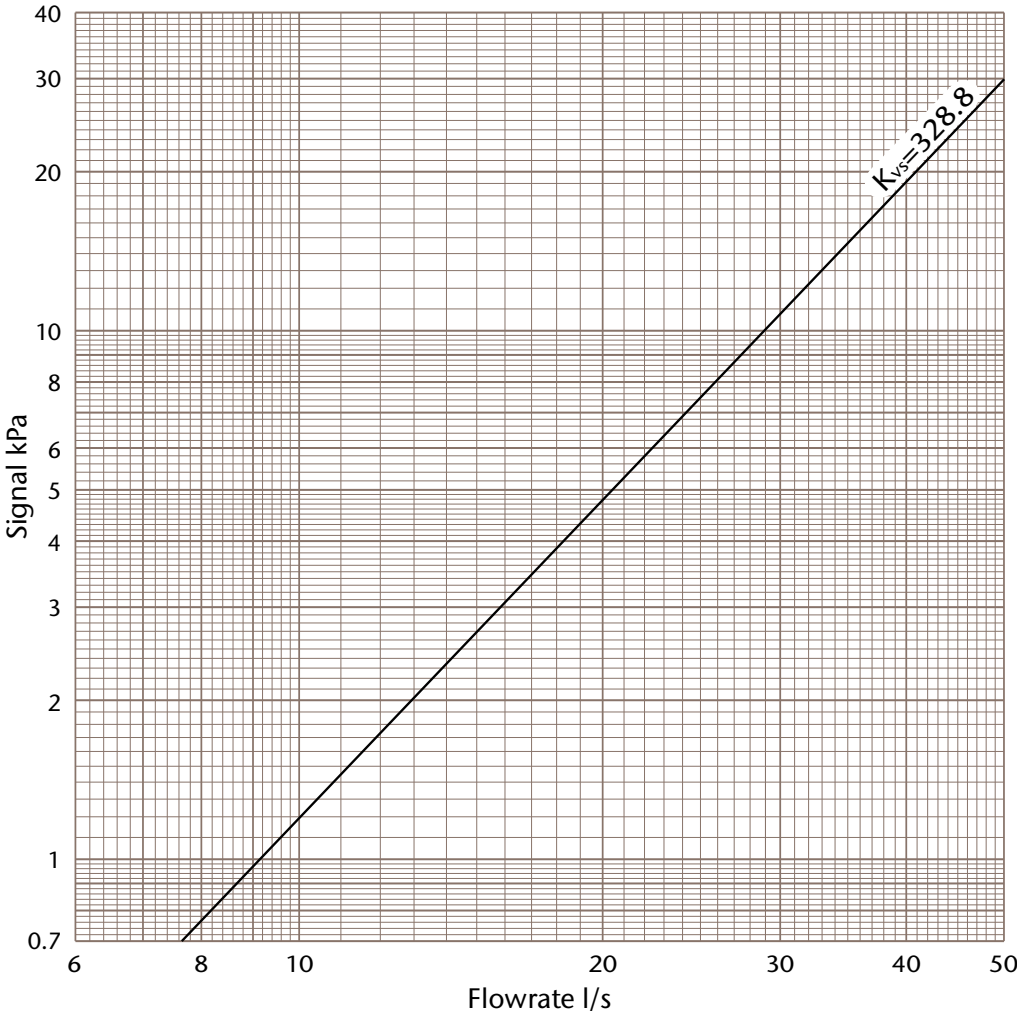
**Signal / Flowrate**  
 Chart used to determine flowrate from signal measured across orifice

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

Where

- Q = Flowrate            l/s
- $\Delta p$  = Signal            kPa
- $K_{vs}$  = Signal Co-efficient

# DN125 ART 270 Stainless Steel Metering Station



**Signal / Flowrate**  
 Chart used to determine flowrate from signal measured across orifice

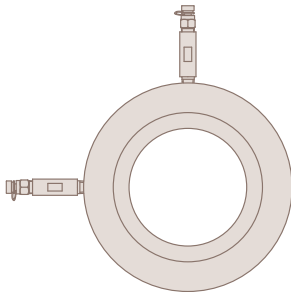
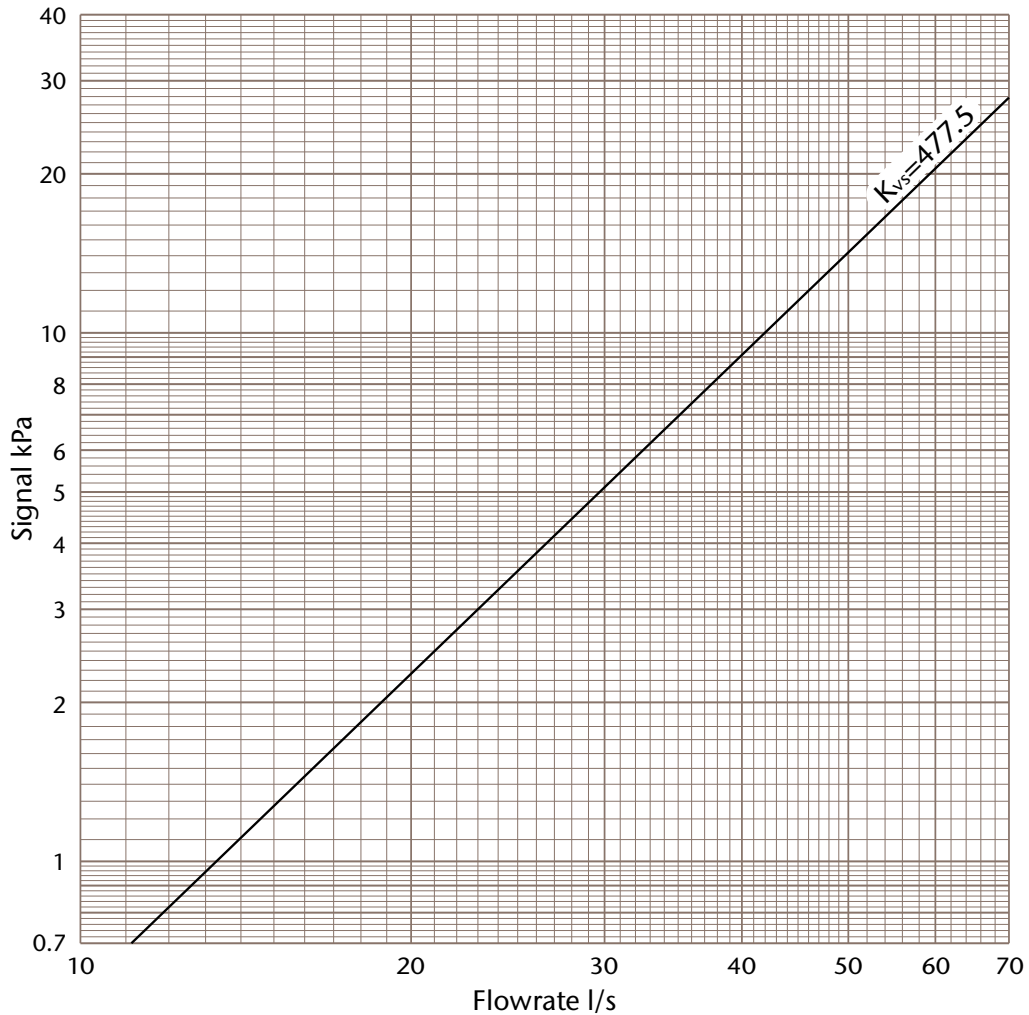
$$Q = \frac{K_{vs} \sqrt{\Delta p}}{36}$$

Where

- Q = Flowrate            l/s
- $\Delta p$  = Signal            kPa
- $K_{vs}$  = Signal Co-efficient



## DN150 ART 270 Stainless Steel Metering Station



### Signal / Flowrate

Chart used to determine flowrate from signal measured across orifice

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

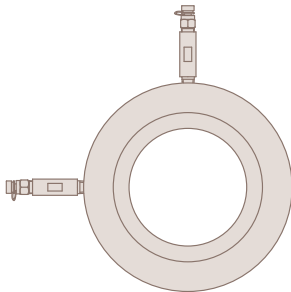
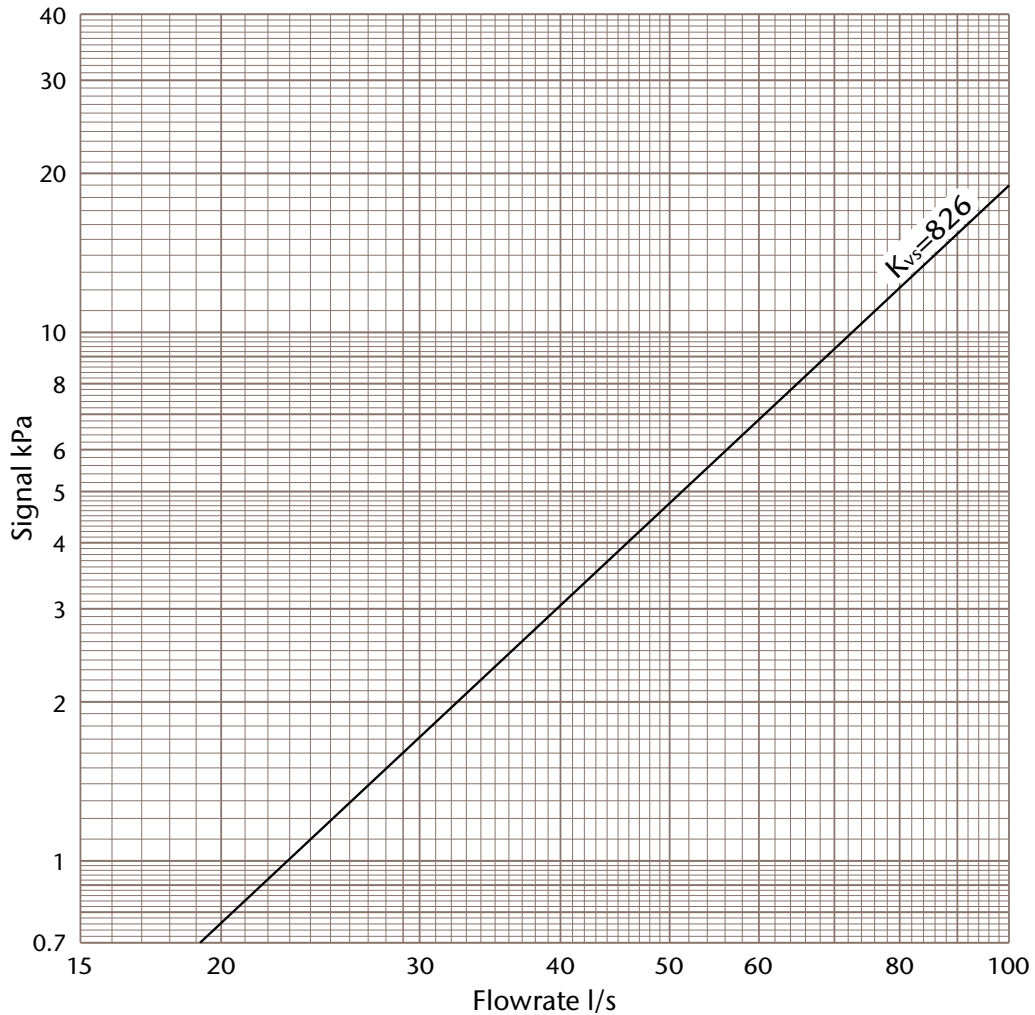
Where

Q = Flowrate l/s

$\Delta p$  = Signal kPa

$K_{vs}$  = Signal Co-efficient

## DN200 ART 270 Stainless Steel Metering Station



### Signal / Flowrate

Chart used to determine flowrate from signal measured across orifice

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

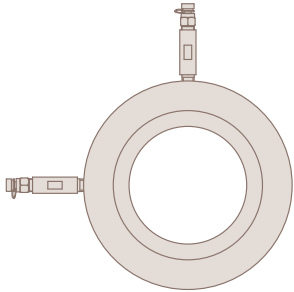
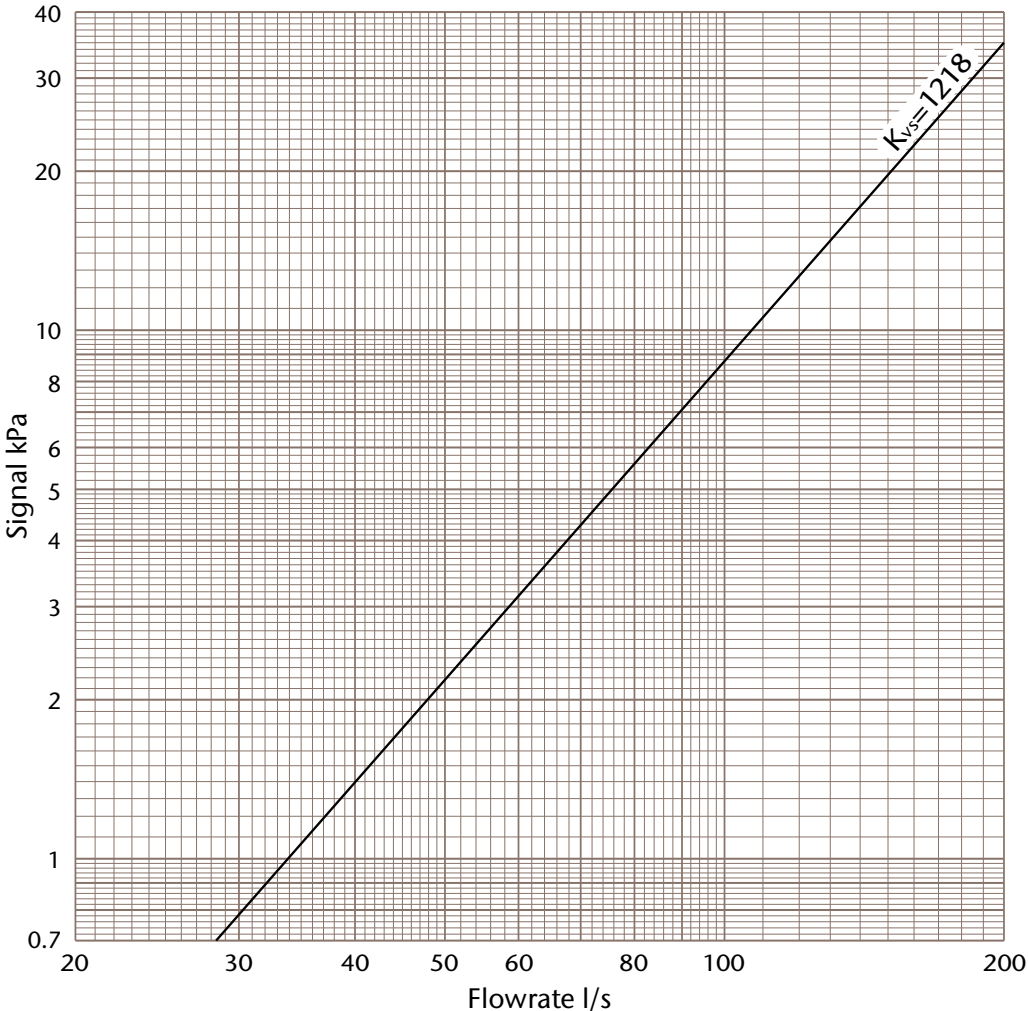
Where

Q = Flowrate l/s

$\Delta p$  = Signal kPa

$K_{vs}$  = Signal Co-efficient

# DN250 ART 270 Stainless Steel Metering Station



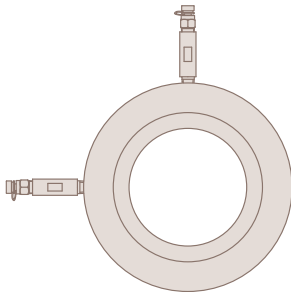
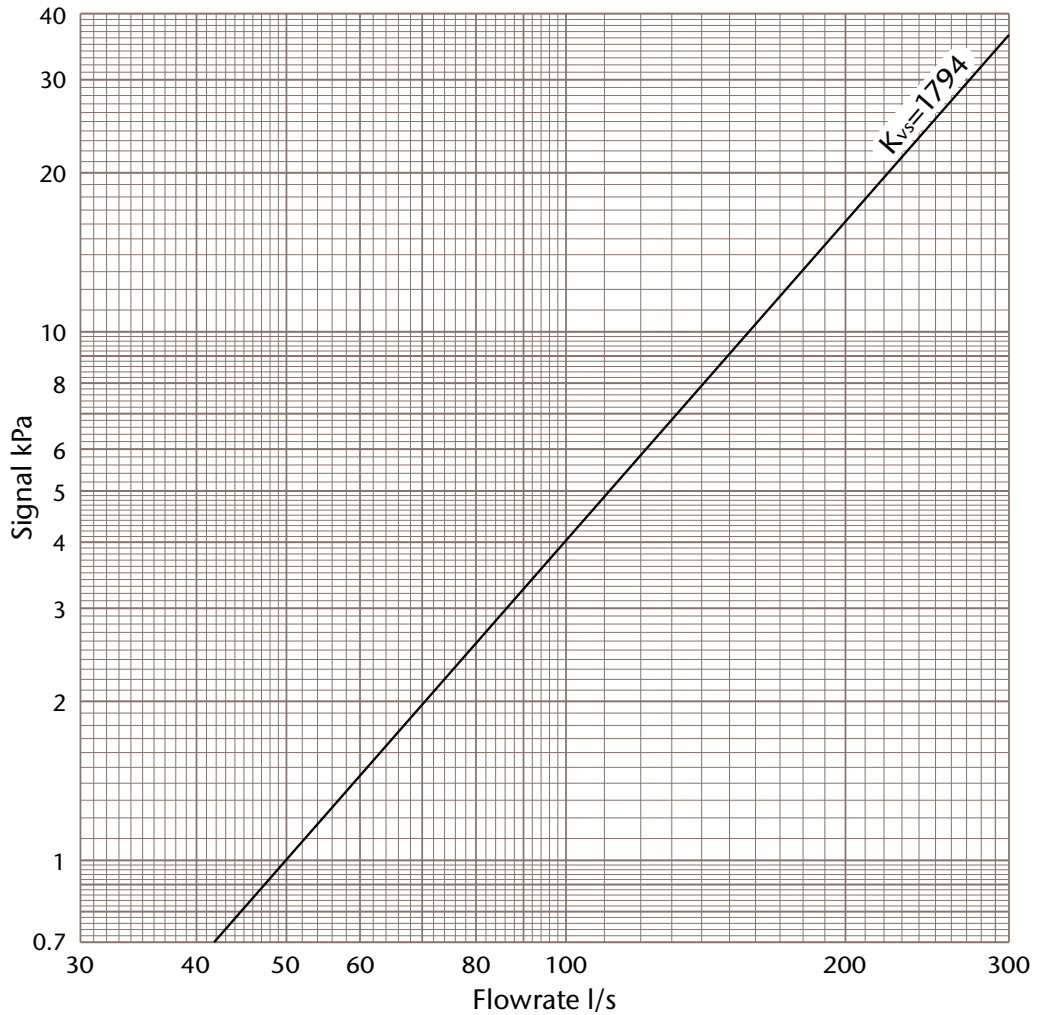
**Signal / Flowrate**  
 Chart used to determine flowrate from signal measured across orifice

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

Where

- Q = Flowrate            l/s
- $\Delta p$  = Signal            kPa
- $K_{vs}$  = Signal Co-efficient

## DN300 ART 270 Stainless Steel Metering Station



### 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

$\Delta p$  = Signal      kPa

$K_{vs}$  = Signal Co-efficient