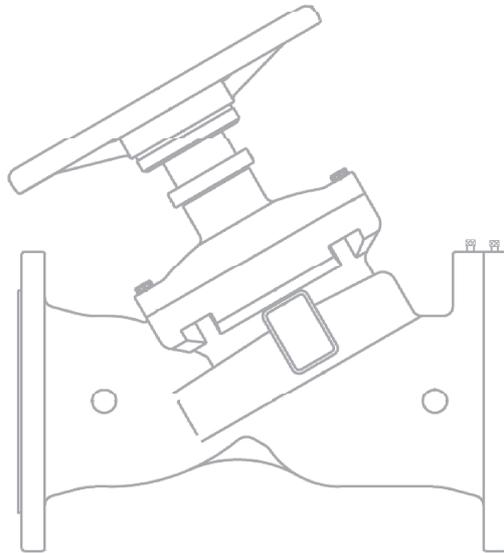


NIBCO®

AHEAD OF THE FLOW™

Figure Installation Instruction & Flow Data



Fixed Orifice Double Regulating Valve

Definitions

To assist users to use the value, the following definitions apply to terms given in this catalogue. These definitions align with those given in **BS 7350:1990 Sec.2**.

Double regulating globe valve: A globe valve for the regulation of flow rate having an established valve characteristic and provided with indicated positions of the valve pening and an adjustable stop device to limit the opening movement such that the valve can be closed for isolation purposes and re-opened to the previously determined set position

Fixed orifice valve: A globe valve with pressure tapping points having an established valve characteristic used, in the fully open position for the determination of flow rates, and for isolating purposes

Variable orifice valve: A double regulating globe valve with pressure tapping points used for the determination of flow rates and also for regulating and isolating purposes.

Pressure tapping point: A hole in the wall of the flow measurement device, the internal end of which is flush with the internal surface of the flow measurement device, and which can be connected to pressure measuring equipment through a suitable adaptor to enable pressure differential to be measured

Pressure differential signal: The difference in pressure existing between upstream and downstream pressure tapping points on any flow measurement device.

Valve characteristic: The relationship between flow and valve lift resulting from the application of a constant pressure difference across the valve

Valve lift: The total displacement of the valve disk from the fully closed position to the fully open position.

Valve or device headloss: Loss in total pressure to a pipework system attributable to the valve or device as installed within that system.

Headloss Coefficient (K): Headloss caused by fluid flow through a valve or fitting also causes a reduction in the static pressure head and is seen as a pressure drop across the device.

The resistance coefficient can be thought of as the number of velocity heads lost due to a valve or fitting and has been shown to be constant for flow in the completely turbulent region. The value of K is an expression of the hydraulic resistance in reference to the diameter of the pipeline in which the velocity occurs.

$$K = \frac{2g \times H_L}{v^2} \text{ or } H_L = K \frac{v^2}{2g}$$

where:

- g = gravitational constant (9.81 m/s²)
- H_L = headloss (m H₂O)
- v = flow velocity (m/s)

Flow coefficient:

K_V: The flow of water through a double regulating globe valve and flow measurement device at a temperature between 5 °C and 40 °C and measured in cubic metres per hour that will induce a valve or device headloss of 1 bar

K_{Vs}: The flow of water through a flow measurement device at a temperature between 5 °C and 40 °C and measured in cubic metres per hour that will induce a pressure differential of 1 bar across the pressure tapping points

Determination of flow coefficients:

The flow rate can be calculated.

$$K_V = \frac{Q \times 36}{\sqrt{\Delta P_V}} \text{ or } \Delta p = \left[\frac{36Q}{K_V} \right]^2$$

$$K_{Vs} = \frac{Q \times 36}{\sqrt{\Delta P_s}}$$

Where:

- K_V: Flow coefficient related to pressure loss through valve, m³/(h.bar)
- K_{Vs}: Flow coefficient related to differential pressure signal, m³/(h.bar)
- ΔP_V: Pressure loss attributable to double regulating valves only, kPa
- ΔP_s: Pressure differential, kPa
- Q: Flowrate, l/s

Note:

C_V = Flow coefficient for valves
Expresses flow rate in gallons per minute of 60°F water with 1.0 psi pressure drop across valve.

$$C_V = 1.156 K_V \text{ or } K_V = 0.865 C_V$$

VALVE INSTALLATION INSTRUCTIONS

1. Unpack the valve and inspect to insure no damage has occurred during shipment. Rotate valve handwheel in counter-clockwise direction, opening valve to full open position.
2. Remove protective covers from both ends of valve. Inspect valve bore and piping system to assure it is clean and free from foreign materials. Rotate handwheel in clockwise direction until valve is fully closed.
3. Determine where the valve is to be located into the piping system. This valve is a combined regulating and flow measurement device and must be installed with minimum length to five diameters of inlet straight pipe; two diameters of straight pipe on the outlet of the valve. If it is located on the outlet of a pump, the equivalent straight length of pipe leading up to the valve must be a minimum of 10 diameters.
4. Locate flow direction arrow on valve body to determine valve orientation direction in piping system. The arrow must align with the direction of fluid flow.
5. Install the valve into the piping system. **DO NOT LIFT THE VALVE BY HANDWHEEL**, as damage may occur. Connect valve to piping using proper gaskets for your installation.

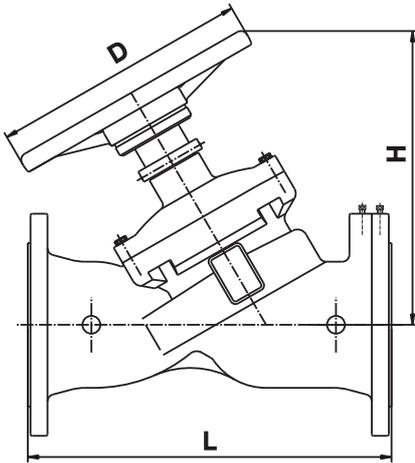
TEST POINT INSTALLATION INSTRUCTIONS

1. **Verify that piping system/valve is NOT PRESSURIZED.** Remove two threaded pipe plugs from valve body, and replace with two test points which are supplied with each valve. They are enclosed in a plastic bag along with these instructions, and secured to the valve lifting lug.
2. Apply PTFE tape, or other thread sealant compound, to the threads of test points. Install test points into valve body and tighten at hexagonal portion of test point body. **DO NOT OVERTIGHTEN** as damage to test points or body threads may occur. Finger-tighten the knurled cap on test points.
3. Determine which side of the valve body offers the best location to install the test points. Enough clearance is needed to allow the balancing technician to make manometer connections to the test points for proper valve adjustment.
4. Piping system is now ready for pressure testing.

REGULATING

The regulating of flow and measurement is done by adjusting the handwheel setting until the desired flow rate is obtained. The flow rate is derived from the pressure drop signal measured across the pressure test valves. Please refer to the attached flow charts for all valve sizes. The relationship between pressure drop and flow is not altered by the handwheel setting.

Fixed Orifice Double Regulating Valve FIG.
Flanged PN16 for Single Unit Systems Conforms to BS 7350



Specification

Single unit Y-pattern globe valves incorporating an integral orifice plate to form a fixed orifice flow measurement unit with regulation and isolation capacity. Valves conform to requirements of BS 7350.

Application

Primarily used in injection or other circuits requiring a double regulating valve for systems balancing. Accuracy of flow measurement is ±5% at all open positions of the valve in accordance with BS 7350.

Pressure/Temperature Ratings

	PN16
Temperature°C	-10 to 120
Working Pressure(Bar)	16
Test Pressure(Bar)	Shell:24 Seat:17.6

Materials

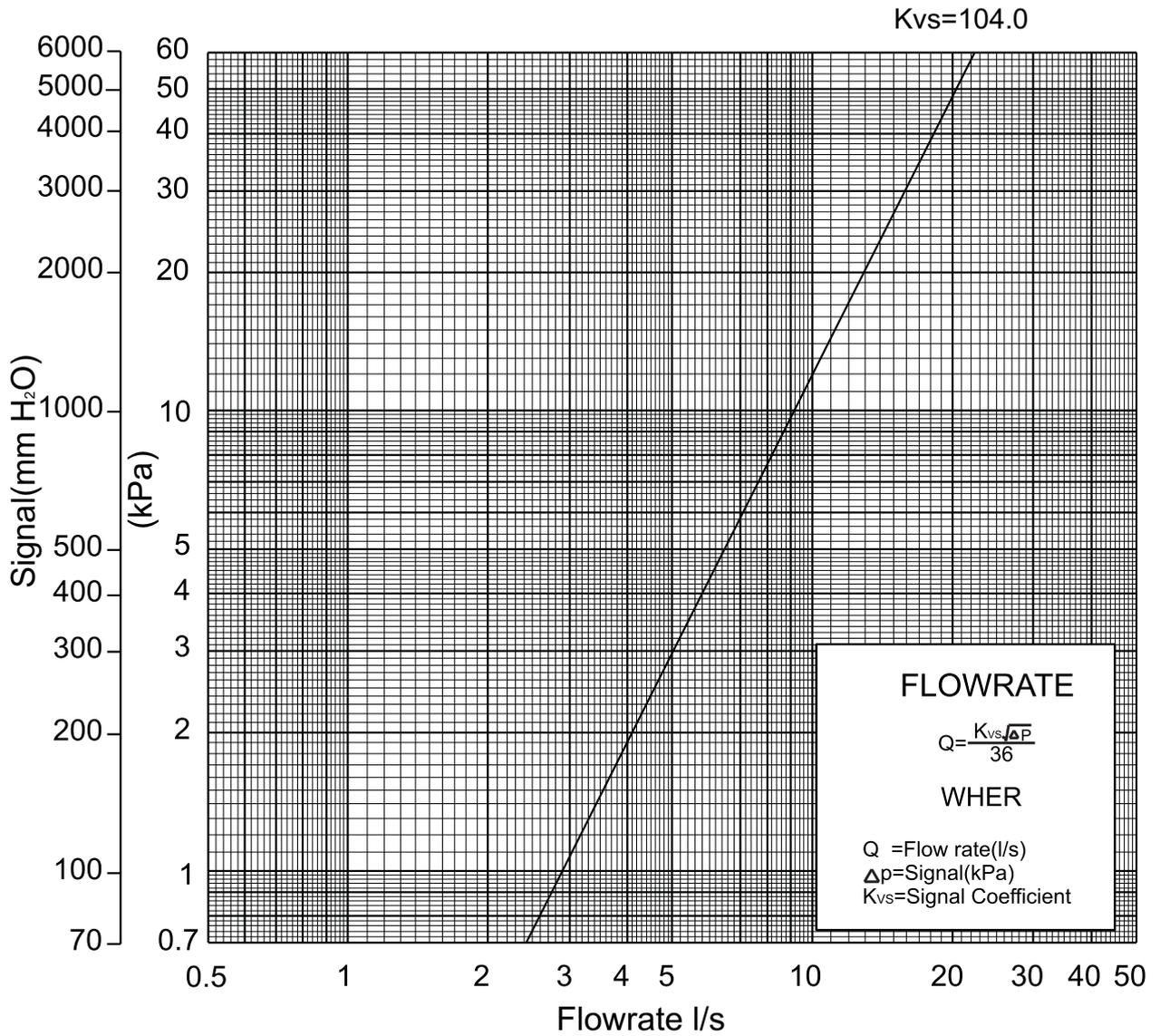
Part	Material	Specification
Body	Ductile	EN-JL 1050
Bonnet	Ductile	EN-JL 1050
Stem	Stainless Steel 410	BS970 410S21
Disc	EPDM Coated DI	EN-JL 1050
Gland (65-150mm)	Brass	EN 12165 CW617N
Gland (200-300mm)	Ductile	EN-JL 1050
Stem Nut	Brass	EN 12165 CW617N
Hand Wheel	Ductile	EN-JL 1050
Test Valve	Brass	EN 12165 CW602N
Orifice Insert	Brass	EN 12165 CW617N
Packing	Graphite	Non-Asbestos

Dimensions, Coefficients

Nom. Size		Dimensions(mm)			Flow	Head loss	Kvs
		L	H	D	Kv	K	
2½	DN65	290	265	205	104	5.32	104
3	DN80	310	270	205	112	6.48	116
4	DN100	350	310	250	162	13.15	213
5	DN125	400	340	300	254	8.32	333
6	DN150	480	350	300	335	7.33	476
8	DN200	600	537	375	535	8.26	768
10	DN250	730	591	435	1099	7.27	1153
12	DN300	850	690	450	1588	8.36	1743

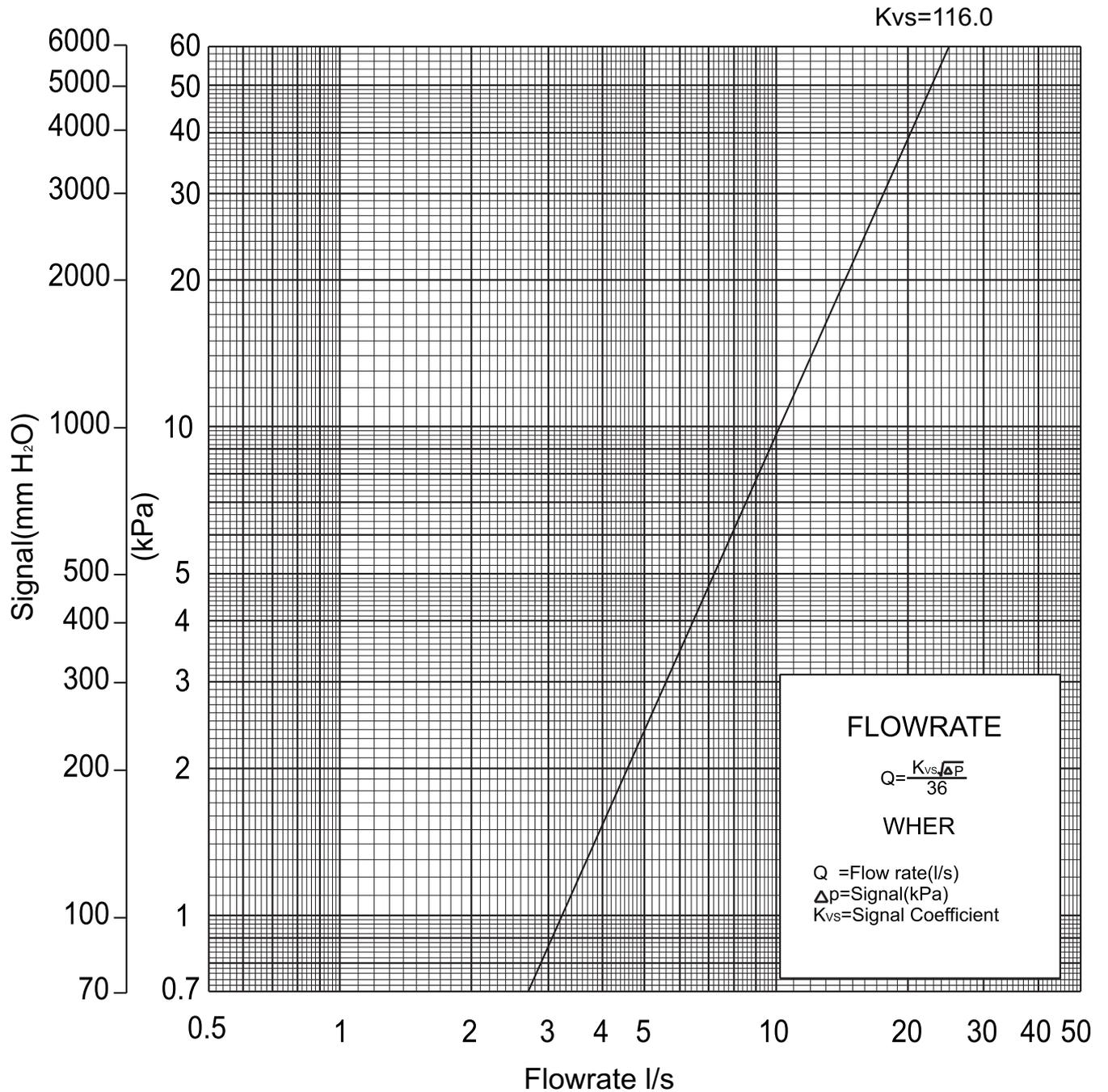
Size 65mm

Fixed orifice devices for standard applications



Size 80mm

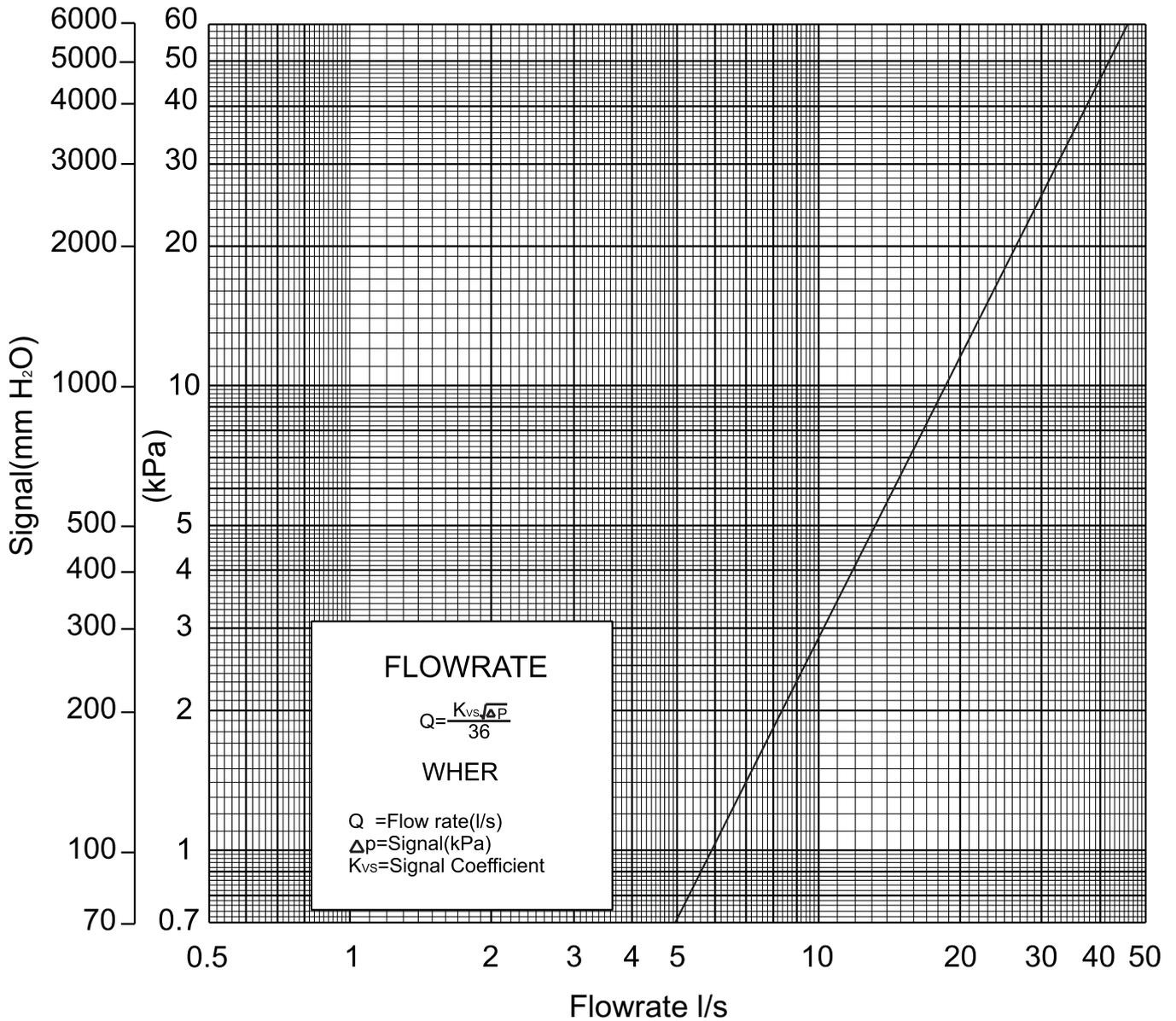
Fixed orifice devices for standard applications



Size 100mm

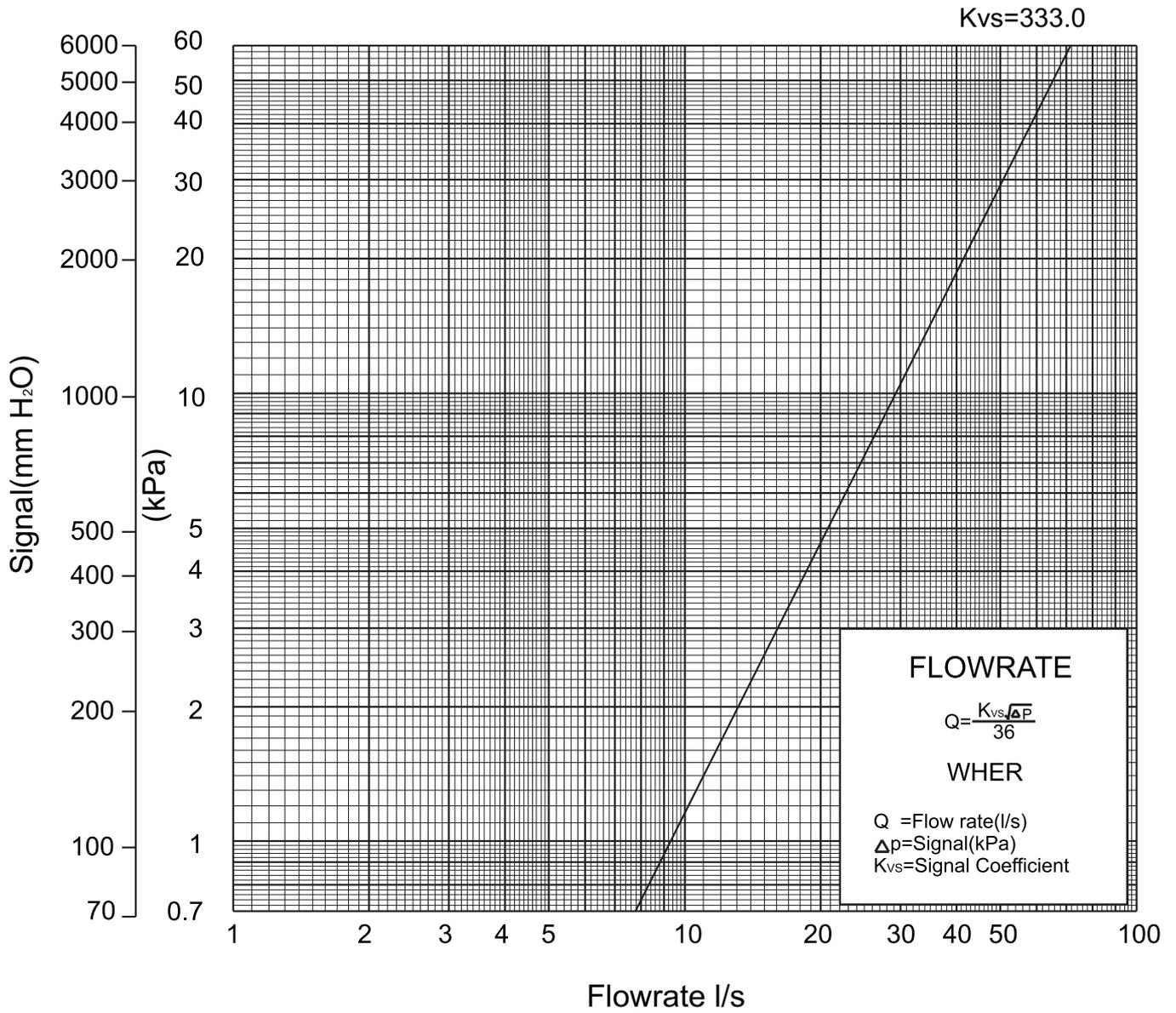
Fixed orifice devices for standard applications

Kvs=213.0



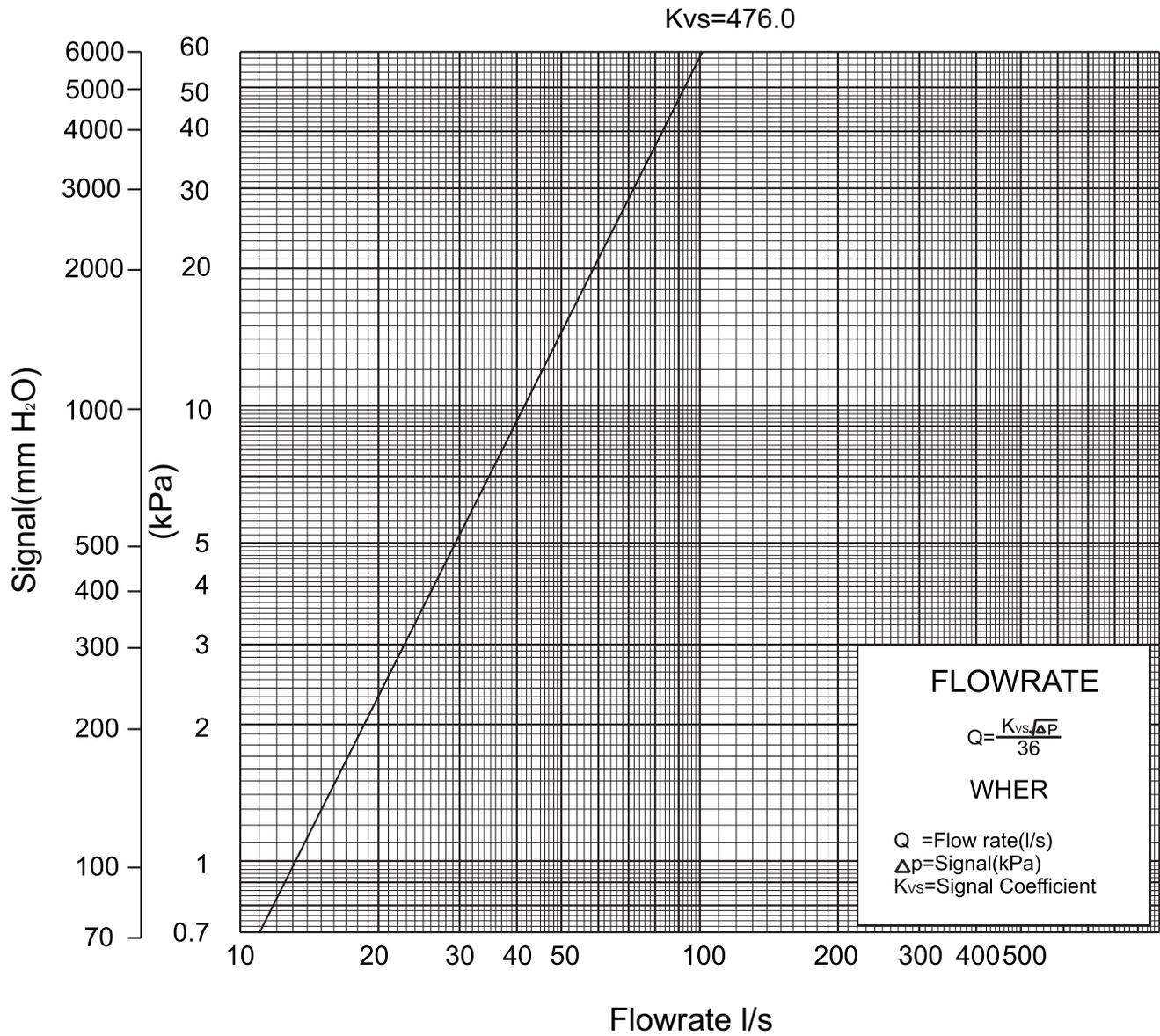
Size 125mm

Fixed orifice devices for standard applications



Size 150mm

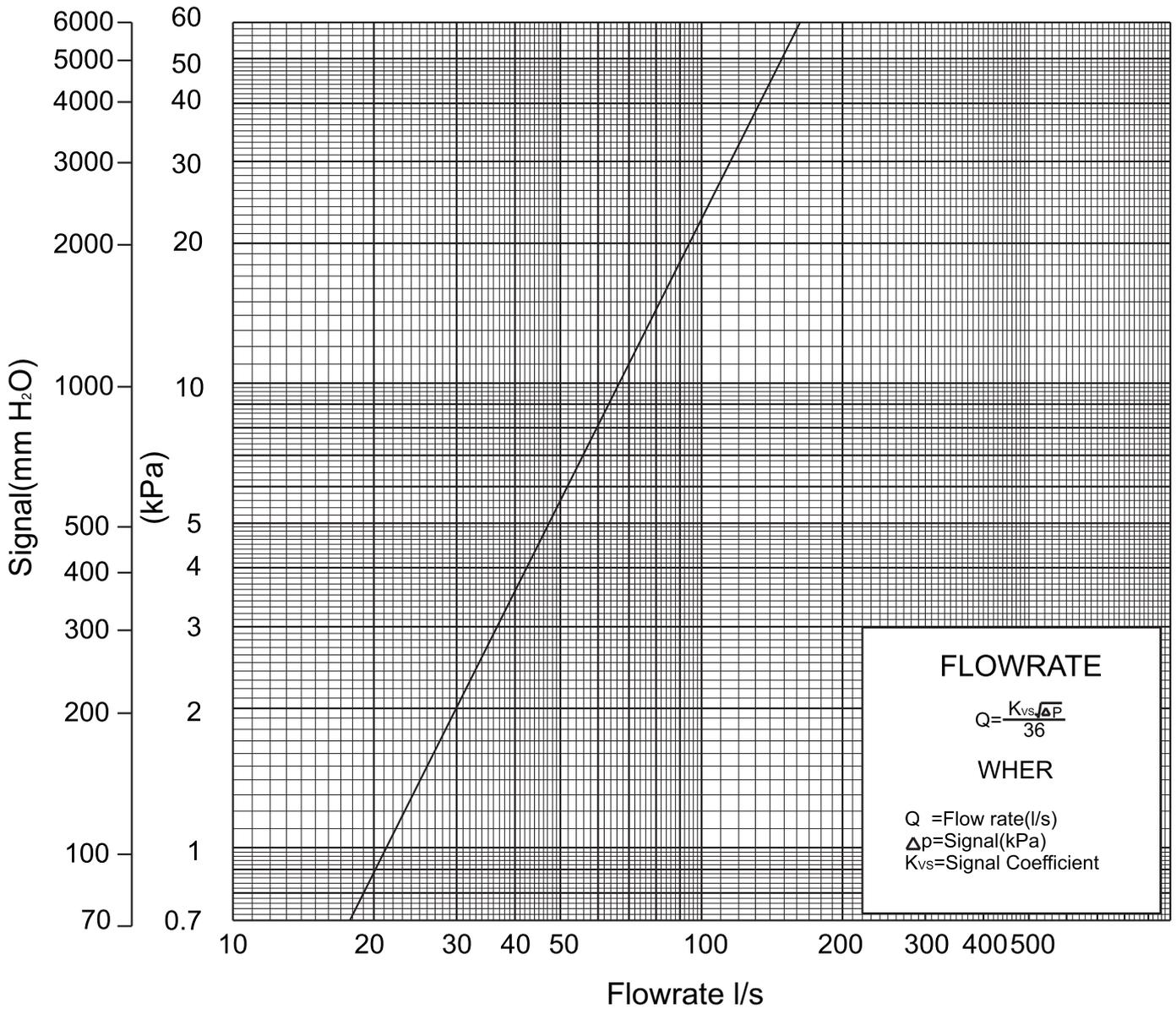
Fixed orifice devices for standard applications



Size 200mm

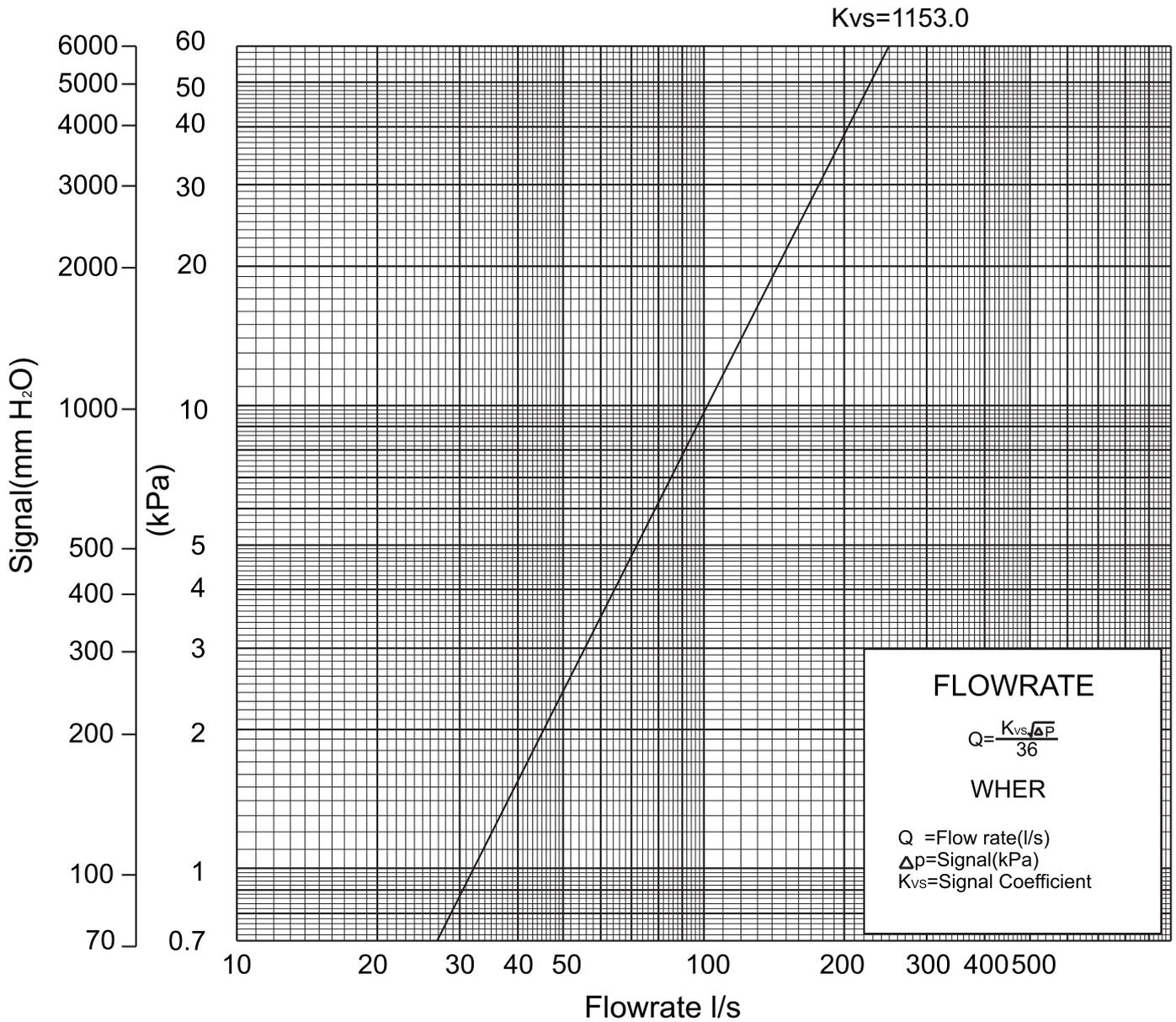
Fixed orifice devices for standard applications

Kvs=768.0



Size 250mm

Fixed orifice devices for standard applications



Size 300mm

Fixed orifice devices for standard applications

Kvs=1743.0

