INSTRUCTION MANUAL

V-NOTCH WEIR

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1 APPLICATIONS

Weirs are typically installed in open channels such as streams to determine the water flow rate.

2 PRODUCT

2.1 GENERAL DESCRIPTION

The base plate where the V-shape notch is located is made from stainless steel. On both sides of the notch are engraved two scales showing water levels and corresponding flow rates.

The plate can be provided with different values of V-notch angle, from 22.5 to 90°.

The V-notch design causes small changes in discharge to have a large change in depth allowing more accurate head measurement than with a rectangular weir.

2.2 OPERATION PRINCIPLE

The basic principle coming from hydrology laws is that flow rate is directly related to the upstream water depth.

3 READING PROCEDURE

Readings can be taken either manually or automatically.

3.1 MANUAL READINGS

Read the flow rate using the scale along the V-notch at the height of the water level. This is a direct reading, which does not need any correction.

3.2 AUTOMATIC READINGS

Automatic readings can be performed thanks to a pressure sensor or a water level indicator (such as PWL or NIVOLIC-WL models). To convert automatically water level into flow rates, use the following relation.

$$Q = C \cdot H^{5/2}$$

where Q = flow rate (units depends on the constant used, see table below)

C = constant depending on notch angle (see table below)

H = water height above the crotch (bottom) of the V, in meters

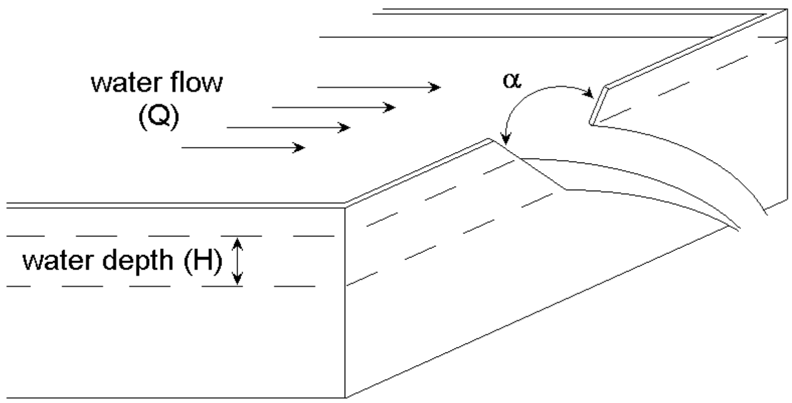

Figure 1: V-notch main notations

Use the following table to find the proper constant to use.

Note: The water height is expressed in meters.

	Notch angle α			
Flow unit	*22.5°*	*45°*	*60°*	*90°*
l/s	274.4	571.4	796.7	1380
m³/h	987.8	2057	2868	4969

Table 1: Constant value for different notch angles and flow units

4 MISCELLANEOUS

4.1 ENVIRONMENTAL FACTORS

Since the purpose of a weir installation is to monitor site conditions, factors which may affect these conditions should always be observed and recorded. Seemingly minor effects may have a real influence on the behaviour of the structure being monitored and may give an early indication of potential problems. Some of these factors include, but are not limited to: blasting, rainfall, tidal levels, excavation and fill levels and sequences, traffic, temperature and barometric changes, changes in personnel, nearby construction activities, seasonal changes, etc.

4.2 CONVERSION FACTORS

	To Convert From	To	Multiply By
LENGTH	Microns Millimetres Meters	Inches Inches Feet	3.94E-05 0.0394 3.2808
AREA	Square millimetres Square meters	Square inches Square feet	0.0016 10.7643
VOLUME	Cubic centimetres Cubic meters Litres Litres	Cubic inches Cubic feet U.S. gallon Can–Br gallon	0.06101 35.3357 0.26420 0.21997
MASS	Kilograms Kilograms Kilograms	Pounds Short tons Long tons	2.20459 0.00110 0.00098
FORCE	Newtons Newtons Newtons	Pounds-force Kilograms-force Kips	0.22482 0.10197 0.00023
PRESSURE AND STRESS	Kilopascals Bars Inches head of water* Inches head of Hg Pascal Kilopascals Kilopascals Kilopascals	Psi Psi Psi Psi Newton / square meter Atmospheres Bars Meters head of water*	0.14503 14.4928 0.03606 0.49116 1 0.00987 0.01 0.10197
TEMPERATURE	Temp. in °F = (1.8 x Temp. in °C) + 32 Temp. in °C = (Temp. in °F – 32) / 1.8		

* at 4 °C

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Table 2: Conversion factors