

ISO 18320:2020 (E)

Hydrometry — Measurement of liquid flow in open channels — Determination of the stage–discharge relationship

Contents

| | |
|---------|----------------------------------------------------------------|
| | Foreword |
| 1 | Scope |
| 2 | Normative references |
| 3 | Terms, definitions and symbols |
| 3.1 | Terms and definitions |
| 3.2 | Symbols |
| 4 | Principle of the stage–discharge relationship |
| 4.1 | General |
| 4.2 | Controls |
| 4.3 | Governing hydraulic formulae |
| 5 | Stage–discharge calibration of a gauging station |
| 5.1 | General |
| 5.2 | Preparation of a stage–discharge relationship |
| 5.2.1 | General |
| 5.2.2 | List of discharge measurements |
| 5.2.3 | Arithmetic plotting scales |
| 5.2.4 | Logarithmic plotting scales |
| 5.2.5 | Commercially available software |
| 5.2.6 | Rating-curve shape |
| 5.2.6.1 | General |
| 5.2.6.2 | Gauge height of zero flow |
| 5.3 | Curve fitting |
| 5.3.1 | General |
| 5.3.2 | Hydraulic-formula curves |
| 5.3.3 | Mathematical rating curves |
| 5.3.4 | Software packages to aid the determination of the rating curve |
| 5.4 | Combination-control stage–discharge relationships |
| 5.5 | Stable stage–discharge relationships |
| 5.6 | Unstable stage–discharge relationships |
| 5.7 | Shifting controls |
| 5.8 | Variable-backwater effects |
| 5.8.1 | General |
| 5.8.2 | Downstream backwater influences |
| 5.8.3 | Hysteresis effects or loop rating curves |
| 5.9 | Extrapolation of the stage–discharge relationship |
| 6 | Methods of testing stage–discharge relationships |
| 7 | Uncertainty in the stage–discharge relationship |
| 7.1 | General |
| 7.2 | Definition of uncertainty |
| 7.3 | Statistical analysis of the stage–discharge relationship |
| 7.3.1 | General |
| 7.3.2 | Standard error of estimate |
| 7.3.3 | Standard uncertainty |
| 7.4 | Uncertainty of predicted discharge |
| Annex A | (informative) Types of control |

- A.1 Section control
- A.2 Channel control
- A.3 Combination controls

Annex B (informative) Complexities of stage–discharge relationships

Annex C (informative) Software packages available to evaluate the stage–discharge relationship^{1 1}
These are examples of suitable products available commercially. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of these products.

- C.1 General
- C.2 CES
- C.3 Components of the CES
- C.4 Calculating conveyance in CES
- C.5 Other packages

Annex D (informative) Examples of a hypothetical rating curve

Annex E (informative) Example of how hydraulic properties of a river channel properties vary with stage

- E.1 General

Annex F (informative) Use of shift controls

Annex G (informative) Extrapolation of a stage–discharge relationship

- G.1 General
- G.2 Hand methods of extrapolating a stage–discharge relationship
- G.3 Use of models to extrapolate a stage–discharge relationship

Annex H (informative) Uncertainty in the stage–discharge relationship and in a continuous measurement of discharge

- H.1 General
- H.2 Example of uncertainty calculations for individual gaugings
- H.3 Example of overall estimation of uncertainty for a given stage reading

Page count: 46