SLOVENSKI STANDARD
SIST EN 14268:2005

01-november-2005

Namakalna tehnika – Vodomeri

Irrigation techniques - Meters for irrigation water

Bewässerungsverfahren - Zähler für Bewässerungwasser

Techniques d´irrigation - Compteurs d´eau pour l´irrigation

Ta slovenski standard je istoveten z: **EN 14268:2005**

ICS:

65.060.35	Namakalna in drenažna oprema	Irrigation and drainage equipment

SIST EN 14268:2005 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 14268

August 2005

ICS 65.060.35

English Version

Irrigation techniques - Meters for irrigation water

Techniques d´irrigation - Compteurs d´eau pour l´irrigation

Bewässerungsverfahren - Zähler für Bewässerungwasser

This European Standard was approved by CEN on 8 July 2005.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Ref. No. EN 14268:2005: E

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Foreword

This European Standard (EN 14268:2005) has been prepared by Technical Committee CEN/TC 334 “Irrigation techniques”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2006, and conflicting national standards shall be withdrawn at the latest by February 2006.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

1 Scope

This European Standard applies to meters fitted to irrigation machines and networks. These meters are used to meter the actual volume of irrigation water flowing through a fully charged, closed pipe, in order to manage consumption, and to invoice the volume of water distributed.

Irrigation water is likely to contain mineral and organic particles.

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1092-1, *Flanges and their joints – Circular flangesfor pipes, valves, fittings and accessories PN designated – Part 1: Steel flanges*

EN 1092-2, *Flanges and their joints – Circular flanges for pipes, valves, fittings and accessories-PN designated – Part 2: Cast iron flanges*

EN 1267, *Valves – Test of flow resistance using water as test fluid*

prEN 12266-3, *Industrial valves – Technical conditions of delivery – Part 3 : Test procedures and acceptance criteria*

EN 14154-1, *Water meters – Part 1: General requirements*

EN 14154-2, *Water meters – Part 2: Installation and conditions of use*

EN 14154-3, *Water meters – Part 3: Test methods and equipment*

EN 60439-5, *Low-voltage switchgear and controlgear assemblies – Part 5: Particular requirements for assemblies intended to be installed outdoors in public places – Cable distribution cabinets (CDCs) for power distribution in networks (IEC 60439-5:1996)*

EN 60529, *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)*

EN 60811-4-1, *Insulating and sheathing materials of electric and optical cables – Common test methods – Part 4-1: Methods specific to polyethylene and polypropylene compounds – Resistance to environmental stress cracking – Measurement of the melt flow index – Carbon black and/or mineral filler content measurement in polyethylene by direct combustion – Measurement of carbon black content by thermogravimetric analysis (TGA) – Assessment of carbon black dispersion in polyethylene using a microscope (IEC 60811-4-1:2004)*

EN ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads – Part 1: Dimensions, tolerances and designation (ISO 228-1:2000)*

EN ISO 4628-1, *Paints and varnishes – Evaluation of degradation of coatings – Designation of quantity and size of defects, and of intensity of uniform changes in appearance – General introduction and designation system (ISO 4628-1:2003)*

ISO 9227, *Corrosion tests in artificial atmospheres – Salt spray tests*

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply[1].

3.1
flow rate
volume of water passing through the water meter in a unit of time

3.2
maximum permissible error
extreme values of the relative error (of indication), permitted by this European Standard

3.3
overload flow-rate *(Q4)*
highest flow rate, at which a water meter is required to operate, for a short period of time, within its maximum permissible error, whilst maintaining its metrological performance when it is subsequently operated within its rated operating conditions

3.4
permanent flow-rate *(Q3)*
highest flow-rate within the rated operating conditions, at which the water meter is required to operate in a satisfactory manner within the maximum permissible error

3.5
minimum flow-rate *(Q1)*
lowest flow-rate at which the water meter is required to operate within the maximum permissible error

3.6
minimum and Maximum Admissible working Pressure (mAP and MAP)
minimum and maximum admissible working pressures are respectively the minimum and maximum pressures that a water meter can withstand permanently within Rated Operating Conditions, without deterioration of its metrological performance mAP and MAP are respectively the lower and upper limits of the rated operating conditions for working pressure

3.7
allowable operating pressure (PFA)
maximum hydrostatic pressure that a component is capable of withstanding continuously in service
[EN 805:2000]

3.8
head loss (Δh)
loss of energy for a given flow-rate due to the presence of the water meter in the pipeline

3.9
rated operating conditions (r.o.c.)
conditions of use giving the range of values of the influence factors for which the errors (of indication) of the water are required to be within the maximum permissible errors

3.10
nominal diameter (*DN*)
alpha-numerical designation of dimension for the components of piping network used for reference purposes. It comprises the letters *DN* followed by a whole number without units, which is indirectly related to the actual dimensions, in millimetres, of the bore or the external diameter of the end connections

NOTE The number which follows the letters *DN* does not represent a measurable value and should not be used for calculation purposes, except where specified in the relevant European Standard.

[1] The terminology used also conforms to the International Vocabulary of Basic and General Terms in Metrology (v.i.m.).

[EN ISO 6708:1995]

3.11
influence quantity
quantity that is not the volume of water but which affects the result of the measurements

3.12
actual volume, V_a
total volume of water passing through the water meter, disregarding the time taken

3.13
indicated volume, V_i
volume of water indicated by the meter, corresponding to the actual volume

3.14
error of indication
indicated volume minus the actual volume

3.15
relative error of indication
error of indication divided by the actual volume

3.16
resolution of indication
smallest difference between indications of an indicating device that can be meaningfully distinguished

NOTE For a digital device, this is the change in the indication when the least significant digit changes by one step.

3.17
intrinsic error
error (cf. indication) of a water meter determined under reference conditions

3.18
fault
difference between the error (of indication) and the intrinsic error of a water meter

3.19
reference conditions
set of reference values, or reference ranges of influence quantities, prescribed for testing the performance of a water meter, or for the inter-comparison of the results of measurements

3.20
maximum admissible temperature (m.a.t.)
maximum water temperature that a water meter can withstand permanently, within its rated operating conditions, without deterioration of its metrological

3.21
limiting conditions
extreme conditions, including, flow-rate, temperature, pressure, humidity, and electromagnetic interference (EMI), that a water meter is required to withstand without damage, and without degradation of its error (of indication), when it is subsequently operated within its rated operating conditions

3.22
measurement transducer
part of the meter which transforms the flow or the volume of the water to be measured into signals which are passed to the calculator. It can be based on a mechanical, an electrical or an electronic principle. It may be autonomous or use an external power source

NOTE For the purposes of this definition, the measurement transducer includes the flow or volume sensor.

3.23
calculator
part of the meter that receives the output signals from the transducer(s) and, possibly, from associated measuring instruments, transforms them and, if appropriate, stores in memory the results until they are used. In addition, the calculator may be capable of communicating both ways with peripheral equipment

3.24
indicating device
part of the meter which displays the measurement results either continuously or on demand

NOTE A printing device that provides an indication at the end of the measurement is not an indicating device.

4 Technical characteristics

4.1 General specifications

— A water meter measures continuously, memorises and displays the integrated volume of water passing through the measurement transducer.

NOTE A water meter includes at least a measurement transducer, a calculator and an indicating device.

— The manufacturer shall specify in his instruction manual the conditions in which the meter can operate in the event of reversal of the flow direction.

— Other ancillary functions of output and reception of information (remote reading, prepayment etc.) may be included provided they do not affect the performance of the meters as defined in this European Standard.

— The meter will preferably be designed in such a way as to present as little obstacle as possible to the water flow and any solid materials it may transport.

— The meter shall be designed such that its operation cannot be affected by a magnetic field as defined in 6.1.3.

4.2 Rated operating conditions

Rated operating conditions are given below:

a) Ambient temperature (T_{amb}): 0,1 °C ≤ T_{amb} < 50 °C

b) Pressure (P): P < *m.a.p.* (maximum admissible pressure)

c) Water temperature (T): 0,1 °C ≤ T < 30 °C

d) Flow-rate range (Q): *Q1* (minimum flow-rate) < Q < *Q3* (permanent flow-rate)

4.3 Materials

The meter shall be fabricated using materials which are resistant to internal and external corrosion, or which are protected by the application of an appropriate surface treatment. Qualification of materials or surface treatments used shall be carried out by salt spray ageing test, as defined in ISO 9227. The different degrees of corrosion (defined in EN ISO 4628-1) after test shall be equal to 0.

Materials shall be capable of resisting thermal variations within a temperature range of -10 °C to + 70 °C.