DIN EN ISO 15112:2014-09 (E)

Natural gas - Energy determination (ISO 15112: 2011)

Contents

Page

Foreword 4

Introduction 5

1 Scope 6

2 Normative references 6

3 Terms and definitions 6

4 Symbols and units 11

5 General principles 11

6 Gas measurement 13
6.1 General 13
6.2 Volume measurement 14
6.3 Calorific value measurement 14
6.4 Volume conversion 15
6.5 Calibration 16
6.6 Data storage and transmission 16

7 Energy determination 17
7.1 Interfaces 17
7.2 Methods of energy determination 19

8 Strategy and procedures 21
8.1 General 21
8.2 Strategies for energy determination 23
8.3 Plausibility checks 27

9 Assignment methods 28
9.1 Fixed assignment 28
9.2 Variable assignment 30
9.3 Determination of the representative calorific value 32

10 Calculation of energy quantities 33
10.1 General equations for energy 33
10.2 Calculation of averaged values -- Calculation from average calorific values and cumulative volumes 35
10.3 Volume and volume-to-mass conversions 35
10.4 Energy determination on the basis of declared calorific values 35

11 Accuracy on calculated energy 36
11.1 Accuracy 36
11.2 Calculation of uncertainty 36
11.3 Bias 37

12 Quality control and quality assurance 38
12.1 General 38
12.2 Check of the course of the measuring data 39
12.3 Traceability 39

12.4 Substitute values 39

Annex A (informative) Main instruments and energy-determination techniques 41

Annex B (informative) Different possible patterns in the change of the calorific value 46

Annex C (informative) Volume conversion and volume-to-mass conversion 49

Annex D (informative) Incremental energy determination 50

Annex E (informative) Practical examples for volume conversion and energy quantity calculation .. 52

Annex F (informative) Practical examples for averaging the calorific value due to different delivery situations 56

Annex G (informative) Ways of determining substitute values 61

Annex H (informative) Plausibility check graphical example 63

Annex I (informative) Uncorrected data, bias correction and final result graphical example 64

Annex J (informative) Single-reservoir calorific value determination 66

Bibliography 67