DIN EN 12828:2013-04 (E)

Heating systems in buildings - Design for water-based heating systems

Contents

Page

Foreword 4

Introduction 5

1 Scope 6

2 Normative references 6

3 Terms, definitions and symbols 7
3.1 Terms and definitions 7
3.2 Symbols 10

4 System design requirements 13
4.1 Requirements for preliminary design information 13
4.2 Heat supply 14
4.2.1 General 14
4.2.2 Sizing 14
4.3 Heat distribution 15
4.3.1 General 15
4.3.2 Design criteria 15
4.4 Heat emission 17
4.4.1 General 17
4.4.2 Sizing 17
4.4.3 Positioning 17
4.4.4 Thermal environment 18
4.4.5 Surface temperatures 18
4.5 Controls 18
4.5.1 General 18
4.5.2 Classification 18
4.5.3 Central control 19
4.5.4 Zone control 19
4.5.5 Local control 19
4.5.6 Timing control 20
4.6 Safety arrangements 20
4.6.1 General 20
4.6.2 Equipment required for sealed systems 21
4.6.3 Equipment required for open vented systems 23
4.7 Operational requirements 24
4.7.1 General 24
4.7.2 Provision for monitoring operating conditions 25
4.7.3 Temperature controller 25
4.7.4 Pressure maintaining control device 25
4.7.5 Water level adjustment 25
4.8 Thermal insulation 25
4.8.1 General 25
4.8.2 Undesirable heat losses 26
4.8.3 Harmful effects of too high temperatures 27
4.8.4 Frost protection 27

5 Instructions for operation, maintenance and use 27

6 Installation and commissioning 27

Annex A (informative) Control system classification 28

A.1 Control system classification 28
A.1.1 General 28
A.1.2 Heating control system modes 28
A.1.3 Control system performance modes 28
A.1.4 Control system classification table 28
A.2 Examples of control system classification 29
A.2.1 Local manual control 29
A.2.2 Local manual control and central automatic control 30
A.2.3 Local automatic control and central automatic control 31
A.2.4 Local automatic control and automatic zone control 32
A.2.5 Local automatic control and central automatic control with optimisation 33

Annex B (informative) Thermal Environment 34

Annex C (informative) Thermal insulation 36

Annex D (informative) Guidance for dimensioning diaphragm expansion vessels and pressurisation systems (sealed systems) 39

D.1 General 39
D.2 Expansion vessel size calculation 40

Annex E (informative) Safety valves for heating systems 43

E.1 Classification 43
E.2 General requirements 43
E.2.1 General 43
E.2.2 Materials 43
E.2.3 Protection against maladjustments 43
E.2.4 Guidance of the moveable parts 43
E.2.5 Easing gear 43
E.2.6 Protection of sliding and rotating elements 44
E.2.7 Design of coil compression springs 44
E.2.8 Transport protections 44
E.2.9 Pipes, installation and body 44
E.2.10 Marking 44
E.3 Calculation of the relief capacity 46
E.4 Requirements for safety valves marked H 46
E.4.1 General 46
E.4.2 Body and spring cap design 46
E.4.3 Threads on the inlet and outlet 47
E.4.4 Connections 47
E.4.5 Calculation 47
E.4.6 Setting 47
E.5 Requirements for safety valves marked D/G/H 47
E.5.1 General 47
E.5.2 Body and spring cap design 48
E.5.3 Design of the valve disc 48
E.5.4 Protection of sliding and rotating elements as well as springs 48
E.5.5 Safety valve with back pressure compensation 48
E.5.6 Setting 48

Annex F (informative) A-deviations 52

Bibliography 53