

DIN EN 15450:2007-12 (E)

Heating systems in buildings - Design of heat pump heating systems

Contents		Page
Foreword		4
Introduction		5
1	Scope	6
2	Normative references	7
3	Terms, definitions and symbols	7
3.1	Terms and definitions	7
3.2	Symbols, units and abbreviations	9
4	System design requirements	10
4.1	General	10
4.1.1	Basic consideration	10
4.1.2	Heat source	10
4.1.3	Electrical supply	13
4.1.4	Strategy	13
4.1.5	Positioning	14
4.1.6	Noise level	14
4.2	Heat supply	15
4.3	Additional backup heater	15
4.4	Domestic hot water production or other attached systems	16
4.4.1	Hot water demand	16
4.4.2	Heat pump data	16
4.4.3	Sizing (heat pump capacity, DHW storage volume, auxiliary source capacity)	16
4.4.4	Specific control requirement for DHW production	19
4.4.5	Other specifications	19
4.5	Hydraulic integration	20
4.6	Control of the system	20
4.7	Safety arrangements	20
4.8	Operational requirements	20
4.8.1	General	20
4.8.2	Provisions for monitoring operational conditions (e.g. temperature, power consumption)	20
5	Installation requirements	21
6	Commissioning of the system	21
6.1	Overview	21
6.2	Preparation of commissioning	22
6.2.1	Heat distribution circuit	22
6.2.2	Ground loop	22
6.2.3	Filling and venting	22
6.2.4	Switch box and electrical wiring	22
6.3	Commissioning	23
6.3.1	Functional performance tests	23
6.3.2	Operation performance tests	23
6.3.3	Balancing	24
6.4	Handing over	24
Annex A (informative)	Guidelines for determining design parameters	25

A.1	Design parameters for heat pumps using water as a heat source	25
A.1.1	Water quality	25
A.1.2	Water temperature	25
A.1.3	Water quantity	25
A.2	Design parameters for heat pumps using ground as a heat source	25
A.2.1	General	25
A.2.2	Ground temperature	26
A.2.3	Heat extraction rates	26
A.2.4	Vertical bore heat exchanger	27
Annex B (informative) Standard hydraulic circuits		30
Annex C (normative) Calculation and requirements for Seasonal Performance Factors (SPF)		36
C.1	Definitions	36
C.2	Calculations	36
C.3	Minimum and target SPF-values for heat pumps	37
Annex D (informative) Noise levels in the vicinity		39
Annex E (informative) Average daily tapping patterns for domestic hot water production		40
E.1	Average daily tapping patterns	40
E.2	Example calculation	44
Annex F (informative) Capacity control		45
F.1	General control strategy	45
F.2	Capacity control of the heat pump	45
F.3	Enhanced Cycle Systems	46
Bibliography		47