

DIN EN 327:2014-11 (E)

Heat exchangers - Forced convection air cooled refrigerant condensers - Test procedures for establishing performance

Contents		Page
Foreword		4
1	Scope	6
2	Normative references	6
3	Terms and definitions	6
4	Symbols	9
5	Standard capacity	11
5.1	Basis for standard capacity data	11
5.2	Standard capacity conditions	11
5.3	Conditions for the nominal air flow rate	12
5.4	Conditions for nominal fan power	12
6	Manufacturer's data	12
7	Measurements	13
7.1	Uncertainty of measurements	13
7.2	Measurement criteria	14
7.2.1	Pipe side temperature measurement	14
7.2.2	Condenser and gas cooler inlet temperature	15
7.2.3	Subcooled refrigerant temperature	15
7.2.4	Water temperatures (Balancing air cooler - Air side calorimeter)	15
7.2.5	Gas cooler outlet temperature	15
7.2.6	Air temperatures	15
7.2.7	Pressure measuring points	16
7.2.8	Refrigerant flow rate	16
7.2.9	Water flow rate	16
7.2.10	Oil content	16
7.2.11	Non-azeotropic refrigerant	16
8	Testing methods and equipment	16
8.1	Testing methods for capacity	16
8.1.1	General	16
8.1.2	High pressure calorimeter (primary method)	17
8.1.3	Low pressure calorimeter (primary method)	17
8.1.4	Air side calorimeter (primary method)	17
8.1.5	Refrigerant flow method (confirming method)	18
8.1.6	Air flow method	18
8.2	Air flow measurement	18
8.3	Equipment for capacity measurement	18
8.3.1	General	18
8.3.2	High pressure calorimeter	19
8.3.3	Low pressure calorimeter	20
8.3.4	Air side calorimeter	20
8.3.5	Refrigerant flow method	21
8.3.6	Liquid receiver	21
9	Test procedures	21

9.1	General	21
9.2	Heat loss measurement - calibration	22
9.2.1	General	22
9.2.2	High pressure calorimeter - direct heat inducement into refrigerant	22
9.2.3	Low and high pressure calorimeters - heat inducement into secondary fluid	23
9.2.4	Air calorimeter room	23
9.3	Capacity measurement	23
9.3.1	Steady-state	23
9.3.2	Test duration	24
9.3.3	Conducting the test	25
9.3.4	Data to be recorded	25
9.4	Measuring the fan performance	26
10	Capacity calculation	26
10.1	General	26
10.2	Heat loss factor: calibration test	26
10.2.1	High pressure calorimeter - direct heat inducement into the refrigerant	26
10.2.2	High and low pressure calorimeter - indirect heat inducement into the refrigerant	26
10.2.3	Air side calorimeter	27
10.3	Capacity measurement test	27
10.3.1	High and low pressure calorimeter - flow rate measurement methods	27
10.3.2	High pressure calorimeter method - direct capacity measurement	27
10.3.3	Air side calorimeter	27
10.3.4	Confirming method	28
11	Conversion to Standard Conditions	28
11.1	General	28
11.1.1	Introduction	28
11.1.2	Correction for atmospheric pressure	28
11.1.3	Standard capacity	28
11.2	Nominal air flow	28
11.3	Nominal fan power	28
12	Test report	29
Annex A (normative) Flow meter method		30
Annex B (informative) Low pressure calorimeter		32
Annex C (informative) Air-Side calorimeter		33
Annex D (informative) Procedure to measure the oil content		34
Bibliography		35