

# DIN EN 15316-2-3:2007-10 (E)

## Heating systems in buildings - Method for calculation of system energy requirements and system efficiencies - Part 2-3: Space heating distribution systems

---

<b>Contents</b>		<b>Page</b>
Foreword .....		4
Introduction .....		6
1 Scope .....		7
2 Normative references .....		7
3 Terms and definitions .....		7
4 Symbols, units and indices .....		9
5 Principle of the method and definitions .....		10
6 Auxiliary energy demand .....		12
6.1 General .....		12
6.2 Design hydraulic power .....		12
6.3 Detailed calculation method .....		13
6.3.1 Input/output data .....		13
6.3.2 Calculation method .....		14
6.3.3 Correction factors .....		15
6.3.4 Expenditure energy factor .....		17
6.3.5 Intermittent operation .....		21
6.4 Deviations from the detailed calculation method .....		23
6.5 Monthly auxiliary energy demand .....		23
6.6 Recoverable auxiliary energy .....		24
7 System thermal loss of distribution systems .....		24
7.1 General .....		24
7.2 Detailed calculation method .....		24
7.2.1 Input/output data .....		24
7.2.2 Calculation method .....		25
7.2.3 Thermal losses of accessories .....		26
7.2.4 Recoverable and un-recoverable system thermal loss .....		27
7.2.5 Total system thermal loss .....		27
7.3 Calculation of linear thermal transmittance (W/mK): .....		27
7.4 Calculation of mean part load of distribution per zone .....		28
8 Calculation of supply and return temperature depending on mean part load of distribution .....		28
8.1 Temperature calculation of heat emitters .....		28
8.1.1 General .....		28
8.1.2 Continuous control depending on outdoor temperature .....		29
8.1.3 Continuous control with thermostatic valves .....		29
8.1.4 On-Off control with room thermostat .....		30
8.2 Effect of by-pass connections .....		30
8.3 Effect of mixing valves .....		31
8.4 Parallel connection of distribution circuits .....		32
8.5 Primary circuits .....		33
Annex A (informative) Preferred procedures .....		34

<b>A.1</b>	<b>Simplified calculation method for determination of annual auxiliary energy demand</b> .....	<b>34</b>
<b>A.1.1</b>	<b>Input/output data</b> .....	<b>34</b>
<b>A.1.2</b>	<b>Calculation method</b> .....	<b>35</b>
<b>A.1.3</b>	<b>Correction factors</b> .....	<b>37</b>
<b>A.1.4</b>	<b>Expenditure energy factor</b> .....	<b>37</b>
<b>A.1.5</b>	<b>Intermittent operation</b> .....	<b>38</b>
<b>A.1.6</b>	<b>Monthly auxiliary energy demand and recoverable auxiliary energy</b> .....	<b>38</b>
<b>A.2</b>	<b>Tabulated calculation method for determination of annual auxiliary energy demand</b> .....	<b>39</b>
<b>A.2.1</b>	<b>Input/output data</b> .....	<b>39</b>
<b>A.2.2</b>	<b>Calculation method, tabulated values</b> .....	<b>39</b>
<b>A.2.3</b>	<b>Monthly auxiliary energy demand and recoverable auxiliary energy</b> .....	<b>41</b>
<b>A.3</b>	<b>Simplified calculation method for determination of annual system thermal loss</b> .....	<b>41</b>
<b>A.3.1</b>	<b>Input/output data</b> .....	<b>41</b>
<b>A.3.2</b>	<b>Calculation method</b> .....	<b>42</b>
<b>A.3.3</b>	<b>Approximation of the length of pipes per zone in distribution systems</b> .....	<b>42</b>
<b>A.3.4</b>	<b>Default values of the outer total surface coefficient of heat transfer (convection and radiation)</b> .....	<b>43</b>
<b>A.3.5</b>	<b>Approximation of <math>\alpha</math>-values</b> .....	<b>43</b>
<b>A.3.6</b>	<b>Equivalent length of valves</b> .....	<b>44</b>
<b>A.3.7</b>	<b>Default values for the exponent of the heat emission system</b> .....	<b>44</b>
<b>A.4</b>	<b>Tabulated calculation method for determination of annual system thermal loss</b> .....	<b>44</b>
<b>A.4.1</b>	<b>Input/output data</b> .....	<b>44</b>
<b>A.4.2</b>	<b>Calculation method, tabulated values</b> .....	<b>45</b>
<b>A.5</b>	<b>Example</b> .....	<b>46</b>
<b>Bibliography</b> .....		<b>49</b>