



# International Standard

**ISO 16358-1**

## **Air-cooled air conditioners and air-to-air heat pumps — Testing and calculating methods for seasonal performance factors —**

Part 1:

### **Cooling seasonal performance factor**

#### **AMENDMENT 2**

*Climatiseurs à condenseur à air et pompes à chaleur air/air —  
Essais et méthodes de calcul des coefficients de performance  
saisonniers —*

*Partie 1: Coefficient de performance saisonnier de  
refroidissement (COPSR)*

*AMENDEMENT 2*

**First edition  
2013-04-15  
AMENDMENT 2  
2024-12**



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Published in Switzerland

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This document was prepared by Technical Committee ISO/TC 86 *Refrigeration and air-conditioning*, Subcommittee SC 6, *Testing and rating of air-conditioners and heat pumps*.

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# Air-cooled air conditioners and air-to-air heat pumps — Testing and calculating methods for seasonal performance factors —

## Part 1: Cooling seasonal performance factor

### AMENDMENT 2

#### 5.2, Table 1

Replace Table 1 with the following:

**Table 1 — Temperature and humidity conditions and default values for cooling at T1 moderate climate condition of ISO 5151, ISO 13253 and ISO 15042**

| Test                                                                                            | Characteristics                       | Fixed | Two-stage        | Mul-ti-stage     | Variable         | Default value                 |
|-------------------------------------------------------------------------------------------------|---------------------------------------|-------|------------------|------------------|------------------|-------------------------------|
| Standard cooling capacity<br>Indoor DB 27 °C<br>WB 19 °C<br>Outdoor DB 35 °C<br>WB 24 °C        | Full capacity $\phi_{ful}(35)$ (W)    | ■     | ■                | ■                | ■                | —                             |
|                                                                                                 | Full power input $P_{ful}(35)$ (W)    |       |                  |                  |                  |                               |
|                                                                                                 | Half capacity $\phi_{haf}(35)$ (W)    | —     | —                | ○ <sup>a</sup>   | ■                | $\phi_{haf}(29)/1,077$        |
|                                                                                                 | Half power input $P_{haf}(35)$ (W)    |       |                  |                  |                  | $P_{haf}(29)/0,914$           |
|                                                                                                 | Minimum capacity $\phi_{min}(35)$ (W) | —     | ○ <sub>b,c</sub> | ○ <sub>b,c</sub> | ○ <sub>b,c</sub> | $\phi_{min}(29)/1,077$        |
|                                                                                                 | Minimum power input $P_{min}(35)$ (W) |       |                  |                  |                  | $P_{min}(29)/0,914$           |
| Low temperature cooling capacity<br>Indoor DB 27 °C<br>WB 19 °C<br>Outdoor DB 29 °C<br>WB 19 °C | Full capacity $\phi_{ful}(29)$ (W)    | ■     | ■                | ■                | —                | $1,077 \times \phi_{ful}(35)$ |
|                                                                                                 | Full power input $P_{ful}(29)$ (W)    |       |                  |                  |                  | $0,914 \times P_{ful}(35)$    |
|                                                                                                 | Half capacity $\phi_{haf}(29)$ (W)    | —     | —                | ■                | ○ <sup>a</sup>   | $1,077 \times \phi_{haf}(35)$ |
|                                                                                                 | Half power input $P_{haf}(29)$ (W)    |       |                  |                  |                  | $0,914 \times P_{haf}(35)$    |
|                                                                                                 | Minimum capacity $\phi_{min}(29)$ (W) | —     | ■                | ○ <sub>b,c</sub> | ○ <sub>b,c</sub> | —                             |
|                                                                                                 | Minimum power input $P_{min}(29)$ (W) |       |                  |                  |                  |                               |

#### Key

■ required test.

○ optional test.

<sup>a</sup> If  $t_{z,haf}$  as calculated by Formula (28) is greater than  $t_0 - 5$ , the optional half capacity and power test data shall be deemed invalid, and the default values specified in this table shall be used.

<sup>b</sup> If  $t_{z,min}$  as calculated by Formula (29) is greater than  $t_0 - 5$ , the optional minimum capacity and power data shall be deemed invalid, and shall not be used.

<sup>c</sup> If the minimum capacity test is measured, min(29) test is conducted first. Min(35) test may be measured or may be calculated by using default value.

NOTE 2 Voltage(s) and frequency(ies) are as given in ISO 5151, ISO 13253 and ISO 15042.

Table 1 (continued)

| Test                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Characteristics                    |                  | Fixed | Two-stage        | Mul-ti-stage     | Variable | Default value |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|------------------|-------|------------------|------------------|----------|---------------|
| Low humidity and cyclic cooling<br>Indoor DB 27 °C<br>WB 16 °C or lower<br>Outdoor DB 29 °C<br>WB -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Degradation coef-<br>ficient $C_D$ | Full capacity    | ○     | —                | —                | —        | 0,25          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                    | Half capacity    | —     | —                | ○ <sup>a</sup>   | —        | 0,25          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                    | Minimum capacity | —     | ○ <sup>b,c</sup> | ○ <sup>b,c</sup> | —        | 0,25          |
| <b>Key</b><br>■ required test.<br>○ optional test.<br><br><sup>a</sup> If $t_{z,haf}$ as calculated by Formula (28) is greater than $t_0 - 5$ , the optional half capacity and power test data shall be deemed invalid, and the default values specified in this table shall be used.<br><br><sup>b</sup> If $t_{z,min}$ as calculated by Formula (29) is greater than $t_0 - 5$ , the optional minimum capacity and power data shall be deemed invalid, and shall not be used.<br><br><sup>c</sup> If the minimum capacity test is measured, min(29) test is conducted first. Min(35) test may be measured or may be calculated by using default value.<br><br>NOTE 2 Voltage(s) and frequency(ies) are as given in ISO 5151, ISO 13253 and ISO 15042. |                                    |                  |       |                  |                  |          |               |

## 5.3.2

Insert the following after the fourth paragraph:

The temperature  $t_{z,haf}$  at which  $P_{haf}$  is equal to zero shall be determined by Formula (28):

$$t_{z,haf} = 35 + \frac{P_{haf}(35) \times (35 - 29)}{P_{haf}(29) - P_{haf}(35)} \quad (28)$$

If  $t_{z,haf}$  is greater than  $t_0 - 5$ , the optional half capacity and power data shall be deemed invalid, and the default values specified in Table 1 shall be used.

The temperature  $t_{z,min}$  at which  $P_{min}$  is equal to zero shall be determined by Formula (29):

$$t_{z,min} = 35 + \frac{P_{min}(35) \times (35 - 29)}{P_{min}(29) - P_{min}(35)} \quad (29)$$

If  $t_{z,min}$  is greater than  $t_0 - 5$ , the optional minimum capacity and power data shall be deemed invalid and shall not be used.

## D.1.2

Insert the following after d):

NOTE For valid calculations, 0 % load outdoor temperature can be no lower than 18 °C.