EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 17038-2:2019/AC

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ICS 23.080

English version

Pumps - Methods of qualification and verification of the Energy Efficiency Index for rotodynamic pump units - Part 2: Testing and calculation of Energy Efficiency Index (EEI) of single pump units

Pompes - Méthodes de qualification et de vérification de l'indice de rendement énergétique des groupes motopompes rotodynamiques - Partie 2 : Essais et calcul de l'indice de rendement énergétique (EEI) des groupes motopompes simples

Pumpen - Methoden zur Qualifikation und Verifikation des Energieeffizienzindexes für Kreiselpumpen - Teil 2: Prüfung und Berechnung des Energieeffizienzindexes (EEI) einzelner Pumpenaggregate

This corrigendum becomes effective on 13 October 2021 for incorporation in the official English version of the EN.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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1.1 Modification to 5.2.3, Determination of part load and over load points and reference control curve

*Format the line "*Determination of part load and over load points and reference control curve" *as heading 5.2.3.*

1.2 Modification to 6.3.4, Determination of $Q_{100\ \%}$ from Q_{BEP}

In 1), replace "Formula 6.23" *with* "Formula (23)"*.*

1.3 Modification to 6.3.5, Determination of the $P_{1,avg,c}$-value

In 5), replace "Formula (10)" *with* "Formula (4)".

2 Changes related to EN 17038-2:2019/AC:2021 (00197C17)

2.1 Modification to 5.2.3, Determination of part load and over load points and reference control curve

In Formula (3), the quotient in brackets shall be multiplied by "$H_{100\%}$" instead of *"$Q_{100\%}$".*

I.e. replace Formula (3): "

$$H_i = \left(\frac{H}{100}\right)_i \cdot Q_{100\%} \tag{3}$$

" *with:* "

$$H_i = \left(\frac{H}{100}\right)_i \cdot H_{100\%} \tag{3}$$

".

2.2 Modification to 6.2, The semi-analytical model of the pump

In Formula (13), – the exponent shall be „-0,15".

I.e. replace Formula (13): "

$$D_{imp}^2 \cdot \frac{n}{60} < 1 \Rightarrow k_{corr} = \left(\frac{n}{n_{N,PU}}\right)^{0,15} \tag{13}$$

" *with:* "

$$D_{imp}^2 \cdot \frac{n}{60} < 1 \Rightarrow k_{corr} = \left(\frac{n}{n_{N,PU}}\right)^{-0,15} \tag{13}$$

".

2.3 Modification to 6.4.2, The model of the Power Drive System (PDS)

In Formula (33):

— *at the beginning of the formula, replace* "$p_{l,PDS(100;100)}$" *with* "$p_{L,PDS\,(100;100)}$"*;*

— *at the end of the formula, replace the index to read* "-2 $p_{L,PDS(50;25)}$"*.*

I.e. replace Formula (33): "

$$B_n = -p_{l,PDS(100;100)} + 3 \cdot p_{L,PDS(100;50)} - 2 \cdot p_{L,PDS(100;25)} \tag{33}$$

" *with:* "

$$B_n = -p_{L,PDS(100;100)} + 3 \cdot p_{L,PDS(100;50)} - 2 \cdot p_{L,PDS(50;25)} \tag{33}$$

".

2.4 Modification of B.2.1, Additional supporting points at Q/Q_{BEP} = 0,25

In Formula (B.9): "

$$\left(\frac{P}{P_{BEP}}\right)_{q=0,25} = \frac{0,0962 \cdot \left(\lambda_{PL}^{*}\right)^{3} - 0,0727 \cdot \left(\lambda_{PL}^{*}\right)^{2} + 0,6651 \cdot \lambda_{PL}^{*} + 0,0085}{0,937 \cdot \left(\lambda_{BEP}^{*}\right)^{2} + 0,7468 \cdot \lambda_{BEP}^{*} + 0,02} \cdot \frac{\lambda_{PL}^{*}}{\lambda_{BEP}^{*}}$$

replace "+ 0,0085*" with "*- 0,0085*" and* "0,937" *with* "0,0937"*, to read the following formula:* "

$$\left(\frac{P}{P_{BEP}}\right)_{q=0,25} = \frac{0,0962 \cdot \left(\lambda_{PL}^{*}\right)^{3} - 0,0727 \cdot \left(\lambda_{PL}^{*}\right)^{2} + 0,6651 \cdot \lambda_{PL}^{*} - 0,0085}{0,0937 \cdot \left(\lambda_{BEP}^{*}\right)^{2} + 0,7468 \cdot \lambda_{BEP}^{*} + 0,02} \cdot \frac{\lambda_{PL}^{*}}{\lambda_{BEP}^{*}}$$

".

I.e. replace Formula (B.9): "

$$\left(\frac{P}{P_{BEP}}\right)_{q=0,25} = \frac{0,0962 \cdot \left(\lambda_{PL}^{*}\right)^{3} - 0,0727 \cdot \left(\lambda_{PL}^{*}\right)^{2} + 0,6651 \cdot \lambda_{PL}^{*} + 0,0085}{0,937 \cdot \left(\lambda_{BEP}^{*}\right)^{2} + 0,7468 \cdot \lambda_{BEP}^{*} + 0,02} \cdot \frac{\lambda_{PL}^{*}}{\lambda_{BEP}^{*}} \quad \text{(B.9)}$$

" *with:* "

$$\left(\frac{P}{P_{BEP}}\right)_{q=0,25} = \frac{0,0962 \cdot \left(\lambda_{PL}^{*}\right)^{3} - 0,0727 \cdot \left(\lambda_{PL}^{*}\right)^{2} + 0,6651 \cdot \lambda_{PL}^{*} - 0,0085}{0,0937 \cdot \left(\lambda_{BEP}^{*}\right)^{2} + 0,7468 \cdot \lambda_{BEP}^{*} + 0,02} \cdot \frac{\lambda_{PL}^{*}}{\lambda_{BEP}^{*}} \quad \text{(B.9)}$$

".

And "0,0937" *in the nominator shall also appear in Formula (B.8).*

I.e. replace Formula (B.8): "

$$\left(\frac{P}{P_{BEP}}\right)_{q=0,25} = \frac{0,2699 \cdot \left(\lambda_{PL}^{*}\right)^{2} - 0,4442 \cdot \lambda_{PL}^{*} + 0,021}{0,937 \cdot \left(\lambda_{BEP}^{*}\right)^{2} + 0,7468 \cdot \lambda_{BEP}^{*} + 0,02} \cdot \frac{\lambda_{PL}^{*}}{\lambda_{BEP}^{*}} \quad \text{(B.8)}$$

" *with:* "

$$\left(\frac{P}{P_{BEP}}\right)_{q=0,25} = \frac{0,2699 \cdot \left(\lambda_{PL}^{*}\right)^{2} - 0,4442 \cdot \lambda_{PL}^{*} + 0,021}{0,0937 \cdot \left(\lambda_{BEP}^{*}\right)^{2} + 0,7468 \cdot \lambda_{BEP}^{*} + 0,02} \cdot \frac{\lambda_{PL}^{*}}{\lambda_{BEP}^{*}} \quad \text{(B.8)}$$

".

2.5 Modification of D.2, The measurement uncertainty of the *EEI*-value determined by test

In Formula (D.3), replace „tf" with "tf_i".

I.e. replace Formula (D.3): "

$$F_{x\to P_{1,avg}} = \sqrt{\sum_{i=1}^{N}\left(tf \cdot F_{x\to P_1}\right)_i^2} \qquad \text{(D.3)}$$

" *with:* "

$$F_{x\to P_{1,avg}} = \sqrt{\sum_{i=1}^{N}\left(tf_i \cdot F_{x\to P_1}\right)_i^2} \qquad \text{(D.3)}$$

".

The second Formula (D.3) $\left(\frac{H_i}{H_{meas}}\right)_{avg} = \sum_{i=1}^{N}\left[tf \cdot \left(\frac{H_i}{H_{meas}}\right)\right]$ *shall be identified as Formula (D.4). I.e. replace* "(D.3)" *with* "(D.4)".

2.6 Modification of D.3.2, Operation mode: Fixed speed

In Formula (D.5), the index "avg" is missing. Correct to read $(P/\eta_M)_{avg.}$

I.e., replace Formula (D.5): "

$$P_{1,avg} = \left(\frac{P_2}{\eta_M}\right)_{avg} = \left(\frac{P}{\eta_M}\right) \approx \frac{P_{avg}}{\eta_{M,avg}} \qquad \text{(D.5)}$$

" *with:* "

$$P_{1,avg} = \left(\frac{P_2}{\eta_M}\right)_{avg} = \left(\frac{P}{\eta_M}\right)_{avg} \approx \frac{P_{avg}}{\eta_{M,avg}} \qquad \text{(D.5)}$$

".