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其它

基于BP神经网络和回归预测的供热调节可靠性

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摘要:

为了满足供热系统运行调节的需要,提出对系统供水温度和供水流量进行预测研究。选取某实际供热系统某时间段的200组运行参数作为样本,利用matlab7.0进行编程,分别采用反向传播(back propagation,BP)神经网络和回归分析方法进行预测和分析。前者确定合理的BP网络结构,编程并采用traingdm函数进行训练;后者拟合出置信水平高的回归方程。最后,将两种方法的预测值和实际值进行比较,并分析误差。结果表明:二者预测值均可靠,但BP神经网络得到的预测结果更好,误差更小。

关键词: 供热调节 神经网络 回归法 预测

Study on the reliability of heating regulation based on prediction using the BP neural network and regression

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Abstract:

To meet the operational regulation demand of heating system, a study was conducted on the prediction of supply water temperature and water flux in a heating system. 200 groups of operating parameters were selected as samples from a certain period of a practical heating system, processed with matlab7.0, and predicted and analyzed with the back propagation neural network and regression. The former determined a reasonable back propagation network structure,and was processed and trained with traingdm function. The latter fit a regression equation with high confidence level. Finally, predicted values of supply temperature and water flux were compared with the actual values while their errors were analyzed. The result showed that the two forecast values were reliable, but the back propagation neural network had a better result and smaller error.

Keywords: heating regulation neural network regression prediction

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