

diffuser controller. Although estimates can be made of the seed values used before the controller is optimised, the final tuning will be specific to the factory configuration.

Conclusion

The anticipated move towards the automation of the diffuser control has inspired several innovations for providing the measurement of the conditions within the diffuser. These alternative measurement techniques can be used to supplement the traditional measurements. An overlap exists between the various measurements that have been proposed; therefore, a subset of the available techniques can be chosen to implement a diffuser control system. The training of controllers will depend on the types of measuring devices that are chosen; it is likely that each factory will have to collect data to train the controller, based on its specific types measurement devices installed by the factory.

References

- Angel D, Love DJ, Jensen P and Selegiam P (2017). Monitoring juice hold-up in a cane diffuser bed, using electrical conductivity – Evaluation on a Plant Scale. *Proc. S. Afr. Sug. Technol. Assoc.* 90: 322-331.
- Angel DMS (2020). Pressure in a porous medium as an indicator of the observed liquid level in a cane diffuser bed. *International Journal for Innovative Research in Multidisciplinary Field* 6(2): 214-222.
- Anon (2012). *SMRI Monthly Report No. 763*, SMRI November/December 2012 Monthly report 763: 12 pp.
- Beward C, Hocking G, Ockendon H, Please C and Schwendeman D (2012). *Modelling the extraction of sugar from sugar cane in a diffuser*. Mathematics in Industry Study Group: 27 pp.
- Davis S (2021). Applying 4IR technologies to address factory performance. *South African Sugar Journal* Oct-Dec-2021.
- Hocking G and Fowkes N (2020). *Sugar holdup in a diffuser*. Mathematics in Industry, Study Group: 11 pp.
- Jensen P (2013). Continuous percolation rate measurement in a sugarcane diffuser. *Proc. S. Afr. Sug. Technol. Assoc.* 86: 404-421.
- Loubser R (2016). Tracking dynamic hold-up of juice in a cane bed. *Proc. S. Afr. Sug. Technol. Assoc.* 89: 8.
- Loubser R and Barker B (2011). Cane characterisation - The percolation test. *Proc. S. Afr. Sug. Technol. Assoc.* 84: 413-422.
- Loubser RC (2022). *STEP-SF4.0 Close-out Report: Juice level detector, SMRI Technical Report 2373*: 14.
- Matthesius G (1977). Juice samplers for the feed end of the diffuser, *SMRI Technical Report 1129*: 4.
- Rein PW and Ingham PJS (1992). Diffuser performance optimization through control of liquid flow patterns. *Int. Soc. Sug. Cane. Technol.* 21: 779-795.