2. For forced circulation loops, with nanofluid concentration 'figure of merit' decreases, consequently pressure drop decreases. It is also found that size of the loop is decreasing with volume fraction.

3. As magnetic field strength increases, thermal conductivity and viscosity of the Fe_3O_4/water nanofluid increases. Increase of thermal conductivity and viscosity is more at higher concentrations.

4. Increase in the magnetic field strength decreases heat transfer loop diameter marginally at low concentrations and increases substantially at high concentrations.

Scope of future work

It is very clear from the present article that, MNF as working fluid in different heat transfer loops owes some benefits. However, knowledge on fluid flow behavior inside the loop is very critical. Hence, it is important to carryout numerical and experimental studies on both NCL and FCL, especially in the presence of magnetic field.

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NOMENCLATURE

A	Cross sectional Area of the pipe (m^2)
B	Magnetic field strength (G)
c	Specific heat capacity (kJ/kg-K)
d	Diameter of the pipe (m)
f_c	Friction factor
g	Acceleration due to gravity (m/s^2)
L_t	Total length (m)
Mn	Magnetic number(-)
m	Mass flow rate (kg/s)
Q	Heat load (kW)
u	Fluid velocity (m/s)
k	Thermal Conductivity (W/mK)
V	Volume flow rate (m^3/s)
Δp	Pressure drop(kPa)
R	Overall resistance parameter
ΔT	Temperature difference across heat source (K)

Greek symbols

ρ	Density (kg/m^3)
Φ	Volume Fraction
η	Efficiency of the motor
α	Thermal Diffusivity (m^2/s)
σ	Surface tension (N/m)
β	Thermal Expansion coefficient (K^{-1})
μ	Dynamic viscosity (Pa-s)

Subscripts

MNF	Magnetic Nanofluid
F	Base Fluid
p	Particle

Abbreviations

NCL	Natural Circulation Loop
FCL	Forced Circulation Loop
MNF	Magneticnanofluid