

Abbreviations

ACC Air-Cooled Condenser
ACHE Air-Cooled Heat Exchanger
ADC Analog-to-Digital Converter
AGMD Air Gap Membrane Distillation
ANN Artificial Neural Network

BC Brine Concentration
BPE Boiling Point Elevation

CC Combined Cooler
CCS Combined Cooling System
CF Cascade-forward
CSP Concentrated Solar Power
CSP+D Concentrated Solar Power + Desalination
CST Concentrated Solar Thermal
CSTR-SA Self-Adaptive Constraint handling algorithm

DC Dry Cooler
DCMD Direct Contact Membrane Distillation
DE Differential Evolution algorithm
DEAHP Double-Effect Absorption Heat Pump
DE-CSTR Differential Evolution with self-adaptive Constraint Handling algorithm
DoE Design of Experiments
DoF Degrees of Freedom

ES Evolutionary Strategy

FAIR Findable, Accessible, Interoperable, Reusable
FF Feed Forward
FO Forward Osmosis
FSM Finite-State Machine

GA Genetic Algorithm
GACO Generalized Ant Colony Optimization algorithm
GHG Greenhouse Gas
GOR Gain Output Ratio
GP Gaussian Process
GPR Gaussian-Process Regression

hex Heat Exchanger

IEA International Energy Agency
IHS Improved Harmony Search algorithm
IRENA International Renewable Energy Agency
ITD Initial Temperature Difference

KPV Key Process Variable

LCOE Levelized Cost of Electricity
LCOW Levelized Cost of Water
LMTD Logarithmic Mean Temperature Difference
LT Low Temperature

MAE Mean Absolute Error
MAPE Mean Absolute Percentage Error
MD Membrane Distillation

MED Multi-Effect Distillation
med Separation subsystem
MIMO Multiple Inputs Multiple Outputs
MINLP Mixed Integer Non-Linear Programming
MLD Minimum Liquid Discharge
MPC Model Predictive Control
MRE Mean Relative Error
MSE Mean Squared Error
MSF Multi-Stage Flash
MVC Mechanical Vapor Compression

NEA Non-Equilibrium Allowance
NF Nanofiltration
NLP Non-Linear Programming
nNLP **problems** n Non-Linear Programming problems
NTU Number of Transfer Units

O&M Operation and Maintenance

P&ID Piping and Instrumentation Diagram
PI Proportional-Integral controller
PID Proportional-Integral-Derivative controller
PR Performance Ratio
PRBS Pseudo-Random Binary Sequence
PSA Plataforma Solar de Almería
PSO Particle Swarm Optimization algorithm
PT Parabolic Trough
PT100 Platinum temperature transducer, 100 ohms at 0 ^{circ}C
PV Photovoltaic

RBF Radial Basis Function
REE Red Eléctrica de España
RI Reconcentration Index
RMSE Root Mean Squared Error
RO Reverse Osmosis
RR Recovery Ratio
RRmax Maximum Recovery Ratio
RSI Ryznar Stability Index
RTO Real-Time Optimization

SA Sensitivity Analysis
SC Surface Condenser
SEA (N+1)-ES Simple Evolutionary algorithm
SEA-CSTR (N+1)-ES Simple Evolutionary algorithm with self-adaptive Constraint Handling
SEEC Specific Electrical Energy Consumption
SEXC Specific Exergy Consumption
sf Solar Field
sfts Solar Field and Thermal Storage subsystem
SGA Simple Genetic Algorithm
SGMD Sweeping Gas Membrane Distillation
SI Sensitivity Index
SolarMED A system that uses a combination of a thermal solar field and a thermal storage system as heat source to produce separation using a multi-effect distillation system.
ST Solar Tower
STEC Specific Thermal Energy Consumption

TBT Top Brine Temperature
TDS Total Dissolved Solids
TF Transfer Fluid
TL;DR Too Long; Didn't Read

TMY Typical Meteorological Year
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ts Thermal Storage
TSP Traveling Salesman Problem
TTD Terminal Temperature Difference
TVC Thermal Vapor Compression

VC Vapor Compression
VFD Variable Frequency Drive
VMD Vacuum Membrane Distillation

WCT Wet Cooling Tower
WH Waste Heat

ZLD Zero Liquid Discharge