Aspen HYSYS

The following attributes are transferred between Aspen HYSYS and ABE:

* [Pump](file:///C:\mywork\p4\ProductSupport\Current\AspenBasicEngineering\ManualSource\AspenBasicEngV14_2-SupportedObjects.docx#_Pump)
* [Heaters](file:///C:\mywork\p4\ProductSupport\Current\AspenBasicEngineering\ManualSource\AspenBasicEngV14_2-SupportedObjects.docx#_Heaters)
* [Multi-Mapping Heat Exchanger](file:///C:\mywork\p4\ProductSupport\Current\AspenBasicEngineering\ManualSource\AspenBasicEngV14_2-SupportedObjects.docx#_Multi-Mapping_Heat_Exchanger)
* [Separator](file:///C:\mywork\p4\ProductSupport\Current\AspenBasicEngineering\ManualSource\AspenBasicEngV14_2-SupportedObjects.docx#_Separator_1)
* [Valve](file:///C:\mywork\p4\ProductSupport\Current\AspenBasicEngineering\ManualSource\AspenBasicEngV14_2-SupportedObjects.docx#_Valve)
* [Shell and Tube Heat Exchanger](file:///C:\mywork\p4\ProductSupport\Current\AspenBasicEngineering\ManualSource\AspenBasicEngV14_2-SupportedObjects.docx#_Shell_and_Tube_1)
* [Rigorous Shell and Tube](file:///C:\mywork\p4\ProductSupport\Current\AspenBasicEngineering\ManualSource\AspenBasicEngV14_2-SupportedObjects.docx#_Rigorous_Shell_and)
* [Air Cooled](file:///C:\mywork\p4\ProductSupport\Current\AspenBasicEngineering\ManualSource\AspenBasicEngV14_2-SupportedObjects.docx#_Air_Cooled)
* [Heat Curves](file:///C:\mywork\p4\ProductSupport\Current\AspenBasicEngineering\ManualSource\AspenBasicEngV14_2-SupportedObjects.docx#_Heat_Curves_1)
* [Compressor](file:///C:\mywork\p4\ProductSupport\Current\AspenBasicEngineering\ManualSource\AspenBasicEngV14_2-SupportedObjects.docx#_Compressor)
* [Expander](file:///C:\mywork\p4\ProductSupport\Current\AspenBasicEngineering\ManualSource\AspenBasicEngV14_2-SupportedObjects.docx#_Expander_1)
* [Streams](file:///C:\mywork\p4\ProductSupport\Current\AspenBasicEngineering\ManualSource\AspenBasicEngV14_2-SupportedObjects.docx#_Streams_1)
* [Vessels](file:///C:\mywork\p4\ProductSupport\Current\AspenBasicEngineering\ManualSource\AspenBasicEngV14_2-SupportedObjects.docx#_Vessels_1)
* [Utility](file:///C:\mywork\p4\ProductSupport\Current\AspenBasicEngineering\ManualSource\AspenBasicEngV14_2-SupportedObjects.docx#_Utility_1)
* [Column](file:///C:\mywork\p4\ProductSupport\Current\AspenBasicEngineering\ManualSource\AspenBasicEngV14_2-SupportedObjects.docx#_Column_1)

## Pump

| **Pump** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| Capacity/Act. Volume Flow | Capacity |
| Pump Inlet Pressure | MaterialPorts[Name="Inlet"].Flow.BulkFlow.Pressure |
| Pump outlet Pressure | MaterialPorts[Name="Outlet"].Flow.BulkFlow.Pressure |
| Differential Pressure | Differential Pressure |
| Pressure Head | Differential Head |
| NPSH Available | NPSHAvailable |
| Pump Fluid | PumpedFluid.GeneralProperties.PhaseName |
| Specific heat | MaterialPorts.[Name="Inlet-Pump Energy"].Flow.BulkFlow.ThermodynamicProperties.HeatCapacityConstantPressureMoleBasis |
| Adiabatic efficiency | PumpPerformance.Efficiency |
| Inlet Nozzle size | Nozzles.[Name Nozzle].NominalSize |
| Outlet Nozzle size | Nozzles.[Name Nozzle].NominalSize |
| Total Power | Power |
| Viscosity | MaterialPorts.[Name="Inlet-Pump Energy"].Flow.BulkFlow.TransportProperties.Viscosity |
| Inlet Temperature | PumpedFluid.PropertiesAtNormalTemperature.Temperature |
| Inlet mass density | PumpedFluid.PropertiesAtNormalTemperature.PvtProperties.StandardDensityMassBasis |
| Pressure Ratio | Pressure Ratio |

| **Pump Curves** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| Efficiency | Curves.[Name FluidTransferCurve].CurveData.Efficiency |
| Flow | Curves.[Name FluidTransferCurve].CurveData.Flow |
| Head | Curves.[Name FluidTransferCurve].CurveData.Head |

## Heaters

| **Rigorous FireHeater** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| Heater Duty | PerformanceCriteria.PerformanceData.ExchangerPerformanceData.HeatDuty |
| Fuel efficiency calculated | PerformanceData.FuelEfficiencyCal |
| Fluid Mass Flowrate | MaterialPorts[Name="Inlet"].Flow.BulkFlow.MassFlowRate |
| Fluid Volumetric Flowrate | MaterialPorts[Name="Inlet"].Flow.BulkFlow.VolumetricFlowRate |
| Inlet Temperture | MaterialPorts[Name="Inlet"].Flow.BulkFlow.Temperature |
| Inlet Pressure | MaterialPorts[Name="Inlet"].Flow.BulkFlow.Pressure |
| Inlet Liquid Flow | MaterialPorts[Name="Inlet"].Flow.LiquidPhase.MassFlowRate |
| Inlet Vapor Flow | MaterialPorts[Name="Inlet"].Flow.VapourPhase.MassFlowRate |
| Inlet Liquid Viscosity | MaterialPorts[Name="Inlet"].Flow.LiquidPhase.TransportProperties.Viscosity |
| Inlet Vapor Viscosity | MaterialPorts[Name="Inlet"].Flow.VapourPhase.TransportProperties.Viscosity |
| Inlet Liquid Specifc Heat | MaterialPorts[Name="Inlet"].Flow.LiquidPhase.HeatCapacityContantPressureMassBasis |
| Inlet Vapor Specific Heat | MaterialPorts[Name="Inlet"].Flow.VapourPhase.HeatCapacityContantPressureMassBasis |
| Outlet Temperature | MaterialPorts[Name="Outlet"].Flow.BulkFlow.Temperature |
| Outlet Pressure | MaterialPorts[Name="Outlet"].Flow.BulkFlow.Pressure |
| Outlet liquid flow | MaterialPorts[Name="Outlet"].Flow.LiquidPhase.MassFlowRate |
| Outlet vapor flow | MaterialPorts[Name="Outlet"].Flow.VapourPhase.MassFlowRate |
| Outlet Liquid Viscosity | MaterialPorts[Name="Outlet"].Flow.LiquidPhase.TransportProperties.Viscosity |
| Outlet Vapor Viscosity | MaterialPorts[Name="Outlet"].Flow.VapourPhase.TransportProperties.Viscosity |
| Outlet liquid specific heat | MaterialPorts[Name="Outlet"].Flow.LiquidPhase.HeatCapacityContantPressureMassBasis |
| Outlet vapor specific heat | MaterialPorts[Name="Outlet"].Flow.VapourPhase.HeatCapacityContantPressureMassBasis |
| Excess air | Burners.ExcessAir |

| **Simple Fired Heater** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| Heater Duty | PerformanceCriteria.PerformanceData.ExchangerPerformanceData.HeatDuty |

| **Heater** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| Duty | PerformanceCriteria.PerformanceData.ExchangerPerformanceData.HeatDuty |

| **Cooler** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| Duty | PerformanceCriteria.PerformanceData.ExchangerPerformanceData.HeatDuty |

## Multi-Mapping Heat Exchanger

| **Multi-Mapping Heat Exchanger – Hot Side** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| Duty | PerformanceCriteria.PerformanceData.<Name ExchangePerformanceData>.HeatDuty |
| Enthalpy | HotSide.FluidProfiles.<Name ExchangerFluidProfileTable>.EnthalpyMoleBasis.EnthalpyMoleBasis() |
| Pressure | HotSide.FluidProfiles.<Name ExchangerFluidProfileTable>.Pressure.Pressure() |
| Temperature | HotSide.FluidProfiles.<Name ExchangerFluidProfileTable>.Temperature.Temperature() |
| Vapor Density | HotSide.FluidProfiles.<Name ExchangerFluidProfileTable>.VaporDensityMassBasis.VaporDensityMassBasis() |
| Vapor Mass Flow | HotSide.FluidProfiles.<Name ExchangerFluidProfileTable>.VaporMassFlow.VaporMassFlow() |
| Vapor Phase Mass Fraction | HotSide.FluidProfiles.<Name ExchangerFluidProfileTable>.VaporMassFraction.VaporMassFraction() |
| Vapor Frac. | HotSide.FluidProfiles.<Name ExchangerFluidProfileTable>.ValorMoleFraction.VaporMoleFraction() |
| Vapor MW | HotSide.FluidProfiles.<Name ExchangerFluidProfileTable>.VaporMolecularWeight.VaporMolecularWeight() |
| Vapor Thermal Cond. | HotSide.FluidProfiles.<Name ExchangerFluidProfileTable>.VaporThermalConductivity.VaporThermalConductivity() |
| Vapor Viscosity | HotSide.FluidProfiles.<Name ExchangerFluidProfileTable>.VaporViscosity.VaporViscosity() |

| **Multi-Mapping Heat Exchanger – Cold Side** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| Duty | PerformanceCriteria.PerformanceData.<Name ExchangePerformanceData>.HeatDuty |
| Enthalpy | ColdSide.FluidProfiles.<Name ExchangerFluidProfileTable>.EnthalpyMoleBasis.EnthalpyMoleBasis() |
| Light Liq. Density | ColdSide.FluidProfiles.<Name ExchangerFluidProfileTable>.LiquidDensityMassBasis.LiquidDensityMassBasis() |
| Light Liq. Mass Flow | ColdSide.FluidProfiles.<Name ExchangerFluidProfileTable>.LiquidMassFlow.LiquidMassFlow() |
| Light Liq. Surface Tension | ColdSide.FluidProfiles.<Name ExchangerFluidProfileTable>.LiquidSurfaceTension.LiquidSurfaceTension() |
| Light Liq. Thermal Conductivity | ColdSide.FluidProfiles.<Name ExchangerFluidProfileTable>.LiquidThermalConductivity.LiquidThermalConductivity() |
| Liquid Mass Specific Heat | ColdSide.FluidProfiles.<Name ExchangerFluidProfileTable>.LiquidHeatCapacityConstantPressureMassBasis.LiquidHeatCapacityConstantPressureMassBasis() |
| Light Liq. Viscosity | ColdSide.FluidProfiles.<Name ExchangerFluidProfileTable>.LiquidViscosity.LiquidViscosity() |
| Pressure | ColdSide.FluidProfiles.<Name ExchangerFluidProfileTable>.Pressure.Pressure () |
| Temperature | ColdSide.FluidProfiles.<Name ExchangerFluidProfileTable>.Temperature.Temperature() |
| Vapor Density | ColdSide.FluidProfiles.<Name ExchangerFluidProfileTable>.VaporDensityMassBasis.VaporDensityMassBasis() |
| Vapor Mass Flow | ColdSide.FluidProfiles.<Name ExchangerFluidProfileTable>.VaporMassFlow.VaporMassFlow() |
| Phase Frac. Mass Basis (Vapour) | ColdSide.FluidProfiles.<Name ExchangerFluidProfileTable>.VaporMassFraction.VaporMassFraction() |
| Vapor Frac. | ColdSide.FluidProfiles.<Name ExchangerFluidProfileTable>.VaporMoleFraction.VaporMoleFraction() |
| Vapor Mass Specific Heat | ColdSide.FluidProfiles.<Name ExchangerFluidProfileTable>.VaporHeatCapacityConstantPressureMassBasis.VaporHeatCapacityConstantPressureMassBasis() |
| Vapor MV | ColdSide.FluidProfiles.<Name ExchangerFluidProfileTable>.VaporMolecularWeight.VaporMolecularWeight() |
| Vapor Thermal Cond. | ColdSide.FluidProfiles.<Name ExchangerFluidProfileTable>.VaporThermalConductivity.VaporThermalConductivity() |
| Vapor Viscosity | ColdSide.FluidProfiles.<Name ExchangerFluidProfileTable>.VaporViscosity.VaporViscosity() |

## Separator

| **Separator** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| Operating Pressure | OperatingConditions.OperatingConditions.Flow.MaterialFlowSpecification.BulkFlow.Pressure |
| Operating Temperature | OperatingConditions.OperatingConditions.Flow.MaterialFlowSpecification.BulkFlow.Temperature |
| Liquid Quantity | OperatingConditions.OperatingConditions.Flow.MaterialFlowSpecification.LiquidPhase.MassFlowRate |
| Vapor Quantity | OperatingConditions.OperatingConditions.Flow.MaterialFlowSpecification.VapourPhase.MassFlowRate |
| Liquid Molar Flow | OperatingConditions.OperatingConditions.Flow.MaterialFlowSpecification.LiquidPhase.MoleFlowRate |
| Liquid Volume Flow | OperatingConditions.OperatingConditions.Flow.MaterialFlowSpecification.LiquidPhase.VolumetricFlowRate |
| Vapo Molar Flow | OperatingConditions.OperatingConditions.Flow.MaterialFlowSpecification.VapourPhase.MoleFlowRate |
| Vapor Volume Flow | OperatingConditions.OperatingConditions.Flow.MaterialFlowSpecification.VapourPhase.VolumetricFlowRate |
| Vessel Diameter | Shell.Diameter |
| Vessel T-T Length | Shell.TanTanLength |
| Boot Diameter | Shell.Boot.BootSection.InnerDiameter |
| Boot Height | Shell.Boot.BootSection.Length |
| Total Volume | Shell.Volume |
| Liquid density at working temperature | NormalContents.LiquidPhase.PvtProperties.DensityMassBasis |
| Vapor Molecular Weight | NormalContents.VapourPhase.PvtProperties.MolecularWeight |
| Vapor Density at Working Temperature | NormalContents.VapourPhase.PvtProperties.DensityMassBasis |
| Orientation | VesselOrientation |
| Normal Liquid Volumne | NormalLiquidVolume |
| VesselisHeating | CoilRequired |
| Pressure Drop | DifferentialPressure |

## Valve

| **Valve** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| Inlet Mass flow | MaterialPorts.[ValveName-"Inlet"].Flow.BulkFlow.MassFlowRate |
| Inlet Actual volumetirc flow | MaterialPorts.[ValveName-"Inlet"].Flow.BulkFlow.VolumetricFlowRate |
| Inlet pressure | MaterialPorts.[ValveName-"Inlet"].Flow.BulkFlow.Pressure |
| Differential Pressure | PressureDrop |
| outlet liquid density @normal | MaterialPorts.[ValveName-"Outlet"].Flow.LiquidPhase.PvtProperties.DensityMassBasis |
| outlet liquid viscosity @normal | MaterialPorts.[ValveName-"Outlet"].Flow.LiquidPhase.TransportProperties.Viscosity |
| Outlet Vapor density @Normal | MaterialPorts.[ValveName-"Outlet"].Flow.VapourPhase.PvtProperties.DensityMassBasis |
| Outlet Vapor Molecular Weight | MaterialPorts.[ValveName-"Outlet"].Flow.VapourPhase.PvtProperties.MolecularWeight |
| Outlet vapor heat capacity | MaterialPorts.[ValveName-"Outlet"].Flow.VapourPhase.ThermodynamicProperties.HeatCapacityConstantPressureMassBasis |
| Outlet vapor Compressibility facotr | MaterialPorts.[ValveName-"Outlet"].Flow.VapourPhase.PvtProperties.Compressibility |
| Outlet Vapor dynamic viscosity@normal | MaterialPorts.[ValveName-"Outlet"].Flow.VapourPhase.TransportProperties.Viscosity |
| ValvePercentOpening | ValvePercentOpening |
| Choking Status | ChokeStatus |
| Outlet Pressure | MaterialPorts.[ValveName-"Outlet"].Flow.BulkFlow.Pressure |
| ChokedOutletPressure | PressureOutChocked |
| Outlet Temperature | MaterialPorts.[ValveName-"Outlet"].Flow.BulkFlow.Temperature |
| OutletVaporFaction | MaterialPorts.[ValveName-"Outlet"].Flow.VapourPhase.MoleFraction |
| ValveFlowCoefficient | ValveFlowCoefficient |
| CavitationIndex | CavitationIndex |
| PressureRecoveryFactor | PressureRecoveryFactor |
| MoleFlowIn | MaterialPorts.[ValveName-"Inlet"].Flow.BulkFlow.MoleFlowRate |
| MoleFlowOut | MaterialPorts.[ValveName-"Outlet"].Flow.BulkFlow.MoleFlowRate |
| MassFlowOut | MaterialPorts.[ValveName-"Outlet"].Flow.BulkFlow.MassFlowRate |
| Inlet Temperature | MaterialPorts.[ValveName-"Outlet"].Flow.BulkFlow.Temperature |

## Shell and Tube Heat Exchanger

| **Shell and Tube Exchanger** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| Tube side mass flowrate | Assemblies.PerformanceCriteria.TubesidePerformance.Massflowrate |
| Shell side mass flowrate | Assemblies.PerformanceCriteria.ShellsidePerformance.Massflowrate |
| Shell side allowable pressure drop | Assemblies.PerformanceCriteria.ShellsidePerformance.PressureDrop |
| Tube side allowable pressure drop | Assemblies.PerformanceCriteria.TubesidePerformance.PressureDrop |
| shell side fouling resistance | Assemblies.PerformanceCriteria.ShellsidePerformance.FoulingResistance |
| Tube side fouling resistance | Assemblies.PerformanceCriteria.TubesidePerformance.FoulingResistance |
| Shell side heat transfer coefficient | Assemblies.PerformanceCriteria.ShellsidePerformance.HeatTransferCoefficient |
| Tube side heat transfer coefficient | Assemblies.PerformanceCriteria.TubesidePerformance.HeatTransferCoefficient |
| LMTD | Assemblies.PerformanceCriteria.Lmtd |
| Tube side OD | Assemblies.Bundle.TubeType.OuterDiameter |
| Tube Thickness | Assemblies.Bundle.TubeType.WallThickness |
| Tube Length | Assemblies.Bundle.TubeType.TotalLength |
| Tube Pitch | Assemblies.Bundle.TubePitch |
| Number of ShellPasses | Assemblies.ShellSide.NumberShellPasses |
| NumberofTubePassesPerShell | Assemblies.Bundle.NumberTubePassesPerShell |
| TubeInsideDiameter | Assemblies.Bundle.TubeType.InnerDiameter |
| Shell side inlet temperature | MaterialPorts[PhysicalAllocation="ShellIn"].Flow.BulkFlow.Temperature |
| Shell side outlet temperature | MaterialPorts[PhysicalAllocation="ShellOut"].Flow.BulkFlow.Temperature |
| Tube side inlet temperature | MaterialPorts[PhysicalAllocation="TubeIn"].Flow.BulkFlow.Temperature |
| Tube side outlet temperture | MaterialPorts[PhysicalAllocation="TubeOut"].Flow.BulkFlow.Temperature |
| Shell side inlet mass density | MaterialPorts[PhysicalAllocation="ShellInlet"].Flow.BulkFlow.PvtProperties.DensityMassBasis |
| Shell side outlet mass density | MaterialPorts[PhysicalAllocation="ShellOut"].Flow.BulkFlow.PvtProperties.DensityMassBasis |
| Tube side inlet liquid mass density | MaterialPorts[PhysicalAllocation="TubeInlet"].Flow.BulkFlow.PvtProperties.DensityMassBasis |
| Tube side outlet liquid mass density | MaterialPorts[PhysicalAllocation="TubeOut"].Flow.BulkFlow.PvtProperties.DensityMassBasis |
| Shell side inlet latent heat | MaterialPorts[PhysicalAllocation="ShellIn"].Flow.BulkFlow.ThermodynamicProperties.HeatOfVapourisationMassBasis |
| Shell side outlet latent heat | MaterialPorts[PhysicalAllocation="ShellOut"].Flow.BulkFlow.ThermodynamicProperties.HeatOfVapourisationMassBasis |
| Tube side inlet latent heat | MaterialPorts[PhysicalAllocation="TubeIn"].Flow.BulkFlow.ThermodynamicProperties.HeatOfVapourisationMassBasis |
| Tube side outlet latent heat | MaterialPorts[PhysicalAllocation="TubeOut"].Flow.BulkFlow.ThermodynamicProperties.HeatOfVapourisationMassBasis |
| Shell side inlet pressure | MaterialPorts[PhysicalAllocation="ShellIn"].Flow.BulkFlow.Pressure |
| Tube side inlet pressure | MaterialPorts[PhysicalAllocation="TubeIn"].Flow.BulkFlow.Pressure |
| Duty | PerformanceCriteria.PerformanceData.ExchangerPerformanceData.HeatDuty |
| Shell ID | Assemblies.ShellSide.Shell.InnerDiameter |
| UA | PerformanceCriteria.UA |
| UACurvatureError | UACurvatureError |
| FT factor | FTFactor |
| HeatLeak | HeatLeak |
| HeatLoss | HeatLoss |
| Number of Shell in Parallel | NumberShellsInParallel |
| Number of Shell in Series | NumberShellsInSeries |
| TemperatureHotPinch | HotSide.PinchTemperature |
| TemperatureColdPinch | ColdSide.PinchTemperature |

## Rigorous Shell and Tube Heat Exchanger

| **Shell and Tube Exchanger** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| Tube side mass flowrate | Assemblies.PerformanceCriteria.TubesidePerformance.Massflowrate |
| Shell side mass flowrate | Assemblies.PerformanceCriteria.ShellsidePerformance.Massflowrate |
| Shell side allowable pressure drop | Assemblies.DesignCriteriaBySide.<Name ShellAndTubeDesignCriteria>.ShellsideDesign.PressureDropAllowable |
| Tube side allowable pressure drop | Assemblies.DesignCriteriaBySide.<Name ShellAndTubeDesignCriteria>.TubesideDesign.PressureDropAllowable |
| shell side fouling resistance | Assemblies.PerformanceCriteria.ShellsidePerformance.FoulingResistance |
| Tube side fouling resistance | Assemblies.PerformanceCriteria.TubesidePerformance.FoulingResistance |
| Shell side heat transfer coefficient | Assemblies.PerformanceCriteria.ShellsidePerformance.HeatTransferCoefficient |
| Tube side heat transfer coefficient | Assemblies.PerformanceCriteria.TubesidePerformance.HeatTransferCoefficient |
| LMTD | Assemblies.PerformanceCriteria.LmtdCorrected |
| Tube side OD | Assemblies.Bundle.Tube Type.<Name ExchangerTube>. OutDiameter |
| Tube thickness | Assemblies.Bundle.TubeType.<Name ExchangerTube>.WallThickness |
| Tube length | Assemblies.Bundle.TubeType.<Name ExchangerTube>.TotalLength |
| Shell ID | Assemblies. ShellSide.Shell.InnerDiameter |
| tube pitch | Assemblies.Bundle.TubePitch |
| Shell side calculated pressure drop | Assemblies.PerformanceCriteria.ShellsidePerformance.PressureDrop |
| Tube side calculated pressure drop | Assemblies.PerformanceCriteria.TubesidePerformance.PressureDrop |
| Effective Surface Area | Assemblies.PerformanceCriteria.EffectiveArea |
| Number of ShellPasses | Assemblies.ShellSide.NumberShellPasses |
| ShellTEAMType | Assemblies.ShellSide.TemaDesignation |
| NumberofTubePassesPerShell | Assemblies.Bundle.NumberTubePassesPerShell |
| TubeInsideDiameter | Assemblies.Bundle.TubeType.<Name ExchangerTube>.InnerDiameter |
| Shell side inlet temperature | MaterialPorts.<Name Shell-Inlet>.Flow.BulkFlow.Temperature |
| Shell side outlet temperature | MaterialPorts.<Name Shell-Outlet>.Flow.BulkFlow.Temperature |
| tube side inlet temperature | MaterialPorts.<Name Tube-Inlet>.Flow.BulkFlow.Temperature |
| tube side outlet temperture | MaterialPorts.<Name Tube-Outlet>.Flow.BulkFlow.Temperature |
| shell side inlet liquid mass density | MaterialPorts.<Name Shell-Inlet>.Flow.LiquidPhase.PvtProperties.DensityMassBasis |
| shell side outlet liquid mass density | MaterialPorts.<Name Shell-Outlet>.Flow.LiquidPhase.PvtProperties.DensityMassBasis |
| tube side inlet liquid mass density | MaterialPorts.<Name Tube-Inlet>.Flow.LiquidPhase.PvtProperties.DensityMassBasis |
| tube side outlet liquid mass density | MaterialPorts.<Name Tube-Outlet>.Flow.LiquidPhase.PvtProperties.DensityMassBasis |
| Mass Heat of Vap | MaterialPorts.<Name Shell-Inlet>.Flow.BulkFlow.ThermodynamicProperties.HeatOfVapourisationMassBasis |
| Mass Heat of Vap | MaterialPorts.<Name Shell-Outlet>.Flow.LiquidPhase.ThermodynamicProperties.HeatOfVapourisationMassBasis |
| Mass Heat of Vap | MaterialPorts.<Name Tube-Inlet>.Flow.BulkFlow.ThermodynamicProperties.HeatOfVapourisationMassBasis (J/kg) |
| Mass Heat of Vap | MaterialPorts.<Name Tube-Outlet>.Flow.BulkFlow.ThermodynamicProperties.HeatOfVapourisationMassBasis (J/kg) |
| shell side inlet pressure | MaterialPorts.<Name Shell-Intlet>.Flow.BulkFlow.Pressure |
| tube side inlet pressure | MaterialPorts.<Name Tube-Intlet>.Flow.BulkFlow.Pressure |
| Duty | PerformanceCriteria.PerformanceData.<Name ExchangerPerformanceData>.HeatDuty |
| UA | PerformanceCriteria.UA |
| Overall Clean Coefficient | PerformanceCriteria.OverallCoefficientClean |
| Overall Dirty Coefficient | PerformanceCriteria.OverallCoefficientFouled |
| UACurvatureError | UaCurvatureError |
| FT factor | FT factor |
| HeatLeak | HeatLeak |
| HeatLoss | HeatLoss |
| Number of Shell in Parallel | NumberShellsInParallel |
| Number of Shell in Series | NumberShellsInSeries |
| Tube Pattern | Assemblies.Bundle.TubePattern |
| TemperatureHotPinch | HotSide.PinchTemperature |
| TemperatureColdPinch | ColdSide.PinchTemperature |

## Air Cooled

| **Simple Air Cooled** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| Heat exchanged | PerformanceCriteria.PerformanceData.HeatDuty |
| Tube side mass flow rate | MaterialPorts[PhysicalAllocation=TubeIn].Flow.BulkFlow.MassFlowRate |
| Tube side inlet pressure | MaterialPorts[PhysicalAllocation=TubeIn].Flow.BulkFlow.Pressure |
| Tube side inlet temperature | MaterialPorts[PhysicalAllocation=TubeIn].Flow.BulkFlow.Temperature |
| Tube side outlet temperature | MaterialPorts[PhysicalAllocation=TubeOut].Flow.BulkFlow.Temperature |
| Inlet air temperature | MaterialPorts[PhysicalAllocation="ShellIn"].Flow.BulkFlow.Temperature |
| Air mass flowrate | MaterialPorts[PhysicalAllocation="ShellIn"].Flow.BulkFlow.MassFlowRate |
| Air volumetric flow rate | Bays.MaterialPorts.Flow.BulkFlow.VolumetricFlowRate |
| Outlet air temperature | MaterialPorts[PhysicalAllocation="ShellOut"].Flow.BulkFlow.Temperature |

| **Rigorous Air Cooled** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| heat exchanged | PerformanceCriteria.PerformanceData(1).HeatDuty |
| MTD, eff | PerformanceCriteria.MTDEffective |
| Transfer Rate -Finned | PerformanceCriteria.OverallHeatTransferCoefficient |
| Fouling resistance | PerformanceCriteria.PerformanceData(1).FoulingResistance |
| Surface/Unit-Finned Tube | EffectiveSurfacePerUnit |
| Bare tube area | BareTubeArea |
| Transfer Rate - Bare | ServiceCoefficient |
| Transfer Rate - Clean | OverallCoefficientClean |
| No. of Tube Rows | NumberOfRows |
| header no. of passes | NumberOfPasses |
| tube transverse pitch | TubeTransversePitch |
| tube longitudinal pitch | TubeLongitudinalPitch |
| No. of Fans per bay | NumberOfFans |
| tube side mass flow rate | MaterialPorts[PhysicalAllocation=TubeIn].Flow.BulkFlow.MassFlowRate |
| Tube side latent heat | MaterialPorts[PhysicalAllocation=TubeIn].Flow.BulkFlow.ThermodynamicProperties.HeatOfVapourisationMassBasis |
| Tube side inlet pressure | MaterialPorts[PhysicalAllocation=TubeIn].Flow.BulkFlow.Pressure |
| Tube side inlet temperature | MaterialPorts[PhysicalAllocation=TubeIn].Flow.BulkFlow.Temperature |
| Tube side outlet temperature | MaterialPorts[PhysicalAllocation=TubeOut].Flow.BulkFlow.Temperature |
| Tube side inlet liquid mass flow rate | MaterialPorts[PhysicalAllocation=TubeIn].Flow.LiquidPhase.MassFlowRate |
| Tube side inlet vapor mass flow rate | MaterialPorts[PhysicalAllocation=TubeIn].Flow.VapourPhase.MassFlowRate |
| Tube side outlet liquid mass flow rate | MaterialPorts[PhysicalAllocation=TubeOut].Flow.LiquidPhase.MassFlowRate |
| Tube side outlet vapor mass flow rate | MaterialPorts[PhysicalAllocation=TubeOut].Flow.VapourPhase.MassFlowRate |
| Tube side inlet water mass flow rate | MaterialPorts[PhysicalAllocation=TubeIn].Flow.CoolingWater.MassFlowRate |
| Tube side inlet steam mass flow rate | MaterialPorts[PhysicalAllocation=TubeIn].Flow.Steam.MassFlowRate |
| Tube side outlet water mass flow rate | MaterialPorts[PhysicalAllocation=TubeOut].Flow.CoolingWater.MassFlowRate |
| Tube side outlet steam mass flow rate | MaterialPorts[PhysicalAllocation=TubeOut].Flow.Steam.MassFlowRate |
| Tube side inlet noncondensable flow rate | MaterialPorts[PhysicalAllocation=TubeIn].Flow.NonCondensibles.MassFlowRate |
| Tube side outlet noncondensable flow rate | MaterialPorts[PhysicalAllocation=TubeOut].Flow.NonCondensibles.MassFlowRate |
| Tube side inlet vapor molecular weight | MaterialPorts[PhysicalAllocation=TubeIn].Flow.VapourPhase.PVTProperties.MolecularWeight |
| Tube side inlet noncondensable molecular weight | MaterialPorts[PhysicalAllocation=TubeIn].Flow.NonCondensibles.PVTProperties.MolecularWeight |
| Tube side outlet vapor molecular weight | MaterialPorts[PhysicalAllocation=TubeOut].Flow.VapourPhase.PVTProperties.MolecularWeight |
| Tube side outlet noncondensable molecular weight | MaterialPorts[PhysicalAllocation=TubeOut].Flow.NonCondensibles.PVTProperties.MolecularWeight |
| Tube side inlet liquid viscosity | MaterialPorts[PhysicalAllocation=TubeIn].Flow.LiquidPhase.TransportProperties.Viscosity |
| Tube side inlet vapor viscosity | MaterialPorts[PhysicalAllocation=TubeIn].Flow.VapourPhase.TransportProperties.Viscosity |
| Tube side outlet liquid viscosity | MaterialPorts[PhysicalAllocation=TubeOut].Flow.LiquidPhase.TransportProperties.Viscosity |
| Tube side outlet vapor viscosity | MaterialPorts[PhysicalAllocation=TubeOut].Flow.VapourPhase.TransportProperties.Viscosity |
| Tube side inlet liquid specific heat capacity | MaterialPorts[PhysicalAllocation=TubeIn].Flow.LiquidPhase.ThermodynamicProperties.HeatCapacityConstantVolumeMassBasis |
| Tube side inlet vapor specific heat capacity | MaterialPorts[PhysicalAllocation=TubeIn].Flow.VapourPhase.ThermodynamicProperties.HeatCapacityConstantVolumeMassBasis |
| Tube side outlet liquid specific heat capacity | MaterialPorts[PhysicalAllocation=TubeOut].Flow.LiquidPhase.ThermodynamicProperties.HeatCapacityConstantVolumeMassBasis |
| Tube side outlet vapor specific heat capacity | MaterialPorts[PhysicalAllocation=TubeOut].Flow.VapourPhase.ThermodynamicProperties.HeatCapacityConstantVolumeMassBasis |
| Tube side inlet liquid thermal conductivity | MaterialPorts[PhysicalAllocation=TubeIn].Flow.LiquidPhase.TransportProperties.ThermalConductivity |
| Tube side inlet vapor thermal conductivity | MaterialPorts[PhysicalAllocation=TubeIn].Flow.VapourPhase.TransportProperties.ThermalConductivity |
| Tube side outlet liquid thermal conductivity | MaterialPorts[PhysicalAllocation=TubeOut].Flow.LiquidPhase.TransportProperties.ThermalConductivity |
| Tube side outlet vapor thermal conductivity | MaterialPorts[PhysicalAllocation=TubeOut].Flow.VapourPhase.TransportProperties.ThermalConductivity |
| Tube side inlet liquid density | MaterialPorts[PhysicalAllocation=TubeIn].Flow.LiquidPhase.PvtProperties.DensityMassBasis |
| Tube side inlet vapor density | MaterialPorts[PhysicalAllocation=TubeIn].Flow.VapourPhase.PvtProperties.DensityMassBasis |
| Tube side outlet liquid density | MaterialPorts[PhysicalAllocation=TubeOut].Flow.LiquidPhase.PvtProperties.DensityMassBasis |
| Tube side outlet vapor density | MaterialPorts[PhysicalAllocation=TubeOut].Flow.VapourPhase.PvtProperties.DensityMassBasis |
| Inlet air temperature | MaterialPorts[PhysicalAllocation="ShellIn"].Flow.BulkFlow.Temperature |
| air mass flowrate | MaterialPorts[PhysicalAllocation="ShellIn"].Flow.BulkFlow.MassFlowRate |
| outlet air temperature | MaterialPorts[PhysicalAllocation="ShellOut"].Flow.BulkFlow.Temperature |
| air flow rate/fan | AirSide.AirFlowRatePerFan |
| Tube side Pressure drop allow | Bays.Bundles.MaximumDesignCriteria.PressureDrop |
| pl | Bays.Bundles.NormalDesignCriteria.PressureDrop |
| air volumetric flow rate | Bays.MaterialPorts(1).Flow.BulkFlow.VolumetricFlowRate |
| Tube bundle length | Bays.Bundles.Length |
| bundle No. / Bay | Bays.Bundles.NumberPerBay |
| No. of tubes per bundle | Bays.Bundles.TotalNumberOfTubes |
| tube material | Bays.Bundles.TubeType(1).MaterialOfConstruction.MaterialName |
| Fin type | Bays.Bundles.TubeType(1).Externals.FinType |
| Fin thickness | Bays.Bundles.TubeType(1).Externals.BaseThickness |
| header corrosion allowance | Bays.Bundles.TubeType(1).MaterialOfConstruction.CorrosionAllowance |
| header plug material | Bays.Headers.PlugMaterial.MaterialName |
| header gasket material | Bays.Bundles.Gasket.BodyMaterial.MaterialName |
| tube O.D | Bays.Bundles.TubeType(1).OuterDiameter |
| tube length | Bays.Bundles.TubeType(1).EffectiveLength |
| Fin OD | Bays.Bundles.TubeType(1).Externals.OuterDiameter |
| Fan model | Bays.Fans.Model |
| speed RPM | Bays.Fans.Rpm |
| Fan diameter | Bays.Fans.FanDiameter |
| No. of blades | Bays.Fans.NumberOfBlades |
| altitude | Location.ElevationHeight |

## Heat Curves

| **Hot Side** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| temperature | HeatingCoolingCurve.Temperature |
| pressure | HeatingCoolingCurve.Pressure |
| EnthalpyMoleBasis | HeatingCoolingCurve.EnthalpyMoleBasis |
| vapor mass fraction | HeatingCoolingCurve.VaporMassFraction |
| vapor density | HeatingCoolingCurve.VaporDensityMassBasis |
| liquid density | HeatingCoolingCurve.LiquidDensityMassBasis |
| vapor viscosity | HeatingCoolingCurve.VaporViscosity |
| liquid viscosity | HeatingCoolingCurve.LiquidViscosity |
| vapor thermal conductivity | HeatingCoolingCurve.VaporThermalConductivity |
| liquid thermal conductivity | HeatingCoolingCurve.LiquidThermalConductivity |
| liquid surface tension | HeatingCoolingCurve.LiquidSurfaceTension |
| liquid critical pressure | HeatingCoolingCurve.LiquidCriticalPressure |
| liquid critical temperature | HeatingCoolingCurve.LiquidCriticalTemperature |

| **Cold Side** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| temperature(K) | HeatingCoolingCurve.Temperature (K) |
| pressure | HeatingCoolingCurve.Pressure |
| EnthalpyMoleBasis | HeatingCoolingCurve.EnthalpyMassBasis |
| vapor mass fraction | HeatingCoolingCurve.VaporMassFraction |
| vapor density | HeatingCoolingCurve.VaporDensityMassBasis |
| liquid density | HeatingCoolingCurve.LiquidDensityMassBasis |
| vapor viscosity | HeatingCoolingCurve.VaporViscosity |
| liquid viscosity | HeatingCoolingCurve.LiquidViscosity |
| vapor thermal conductivity | HeatingCoolingCurve.VaporThermalConductivity |
| liquid thermal conductivity | HeatingCoolingCurve.LiquidThermalConductivity |
| liquid surface tension | HeatingCoolingCurve.LiquidSurfaceTension |
| liquid critical pressure | HeatingCoolingCurve.LiquidCriticalPressure |
| liquid critical temperature | HeatingCoolingCurve.LiquidCriticalTemperature |

## Compressor

| **Compressor** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| Standard Volumetric Flowrate | CentrifugalCompressorOperatingConditions.Flow[Name=Inlet].VapourPhase.StandardVaporVolumetricFlowRate |
| Mass Flow Rate (kg/h) | CentrifugalCompressorOperatingConditions.Flow[Name=Inlet].VapourPhase.MassFlowRate |
| Inlet Pressure (kPa) | CentrifugalCompressorOperatingConditions.Flow[Name=Inlet].VapourPhase.Pressure |
| Inelet Temperature (K) | CentrifugalCompressorOperatingConditions.Flow[Name=Inlet].VapourPhase.Temperature |
| Molecular Weight | CentrifugalCompressorOperatingConditions.Flow[Name=Inlet].VapourPhase.PvtProperties.MolecularWeight |
| Inlet Cp/Cv | CentrifugalCompressorOperatingConditions.Flow[Name=Inlet].VapourPhase.ThermodynamicProperties.HeatCapacityRatio |
| Inlet Z factor | CentrifugalCompressorOperatingConditions.Flow[Name=Inlet].VapourPhase.PvtProperties.Compressibility |
| Inlet Volumetric Flowrate(ACT\_m3/h) | CentrifugalCompressorOperatingConditions.Flow[Name=Inlet].VapourPhase.VolumetricFlowRate |
| Discharge Pressure(kPa) | CentrifugalCompressorOperatingConditions.Flow[Name=Outlet].VapourPhase.Pressure |
| Discharge Temperature (K) | CentrifugalCompressorOperatingConditions.Flow[Name=Outlet].VapourPhase.Temperature |
| Discharge Cp/Cv | CentrifugalCompressorOperatingConditions.Flow[Name=Outlet].VapourPhase.ThermodynamicProperties.HeatCapacityRatio |
| Discharge Z factor | CentrifugalCompressorOperatingConditions.Flow[Name=Outlet].VapourPhase.PvtProperties.Compressibility |
| Polytropic Head (m) | CentrifugalCompressorOperatingConditions.PolytropicHead |
| Polytropic Efficiency/Isentropic | CentrifugalCompressorOperatingConditions.PolytropicEfficiency |
| Mole Flow Rate (gmole/s) | CentrifugalCompressorOperatingConditions(1).Flow[Name=Inlet].VapourPhase.DryConditions.MoleFlowRate |
| Volumetric flowOut (ACT\_m3/h) | CentrifugalCompressorOperatingConditions.Flow[Name=Outlet].VapourPhase.VolumetricFlowRate |
| Pressure Drop (kPa) | DifferentialPressure |
| Curve Speed (rpm) | FluidTransferCurve.Speed |
| Efficiency (%) | FluidTransferCurve.PerformanceCurve.CurveData.Efficiency |
| Flow (ACT\_m3/h) | FluidTransferCurve.PerformanceCurve.CurveData.Flow |
| Head (m) | FluidTransferCurve.PerformanceCurve.CurveData.Head |
| Head (m) | FluidTransferCurve.PerformanceCurve.CurveData.HeadAsForce |

## Expander

| **Expander** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| CompressibilityIn (Z factor) | MaterialPorts[Name="Inlet"].Flow.BulkFlow.PvtProperties.Compressibility |
| CompressibilityOut | MaterialPorts[Name="Outlet"].Flow.BulkFlow.PvtProperties.Compressibility |
| Outlet Pressure(kPa) | MaterialPorts[Name="Outlet"].Flow.BulkFlow.Pressure (Pa[a]) |
| Outlet Temperature (K) | MaterialPorts[Name="Outlet"].Flow.BulkFlow.Temperature (K) |
| MassFlowin (kg/h) | MaterialPorts[Name="Inlet"].Flow.BulkFlow.MassFlowRate (kg/h) |
| MoleFlowin (gmol/s) | MaterialPorts[Name="Inlet"].Flow.BulkFlow.MoleFlowRate (mol/s) |
| MassFlowOut (kg/h) | MaterialPorts[Name="Outlet"].Flow.BulkFlow.MassFlowRate (kg/h) |
| MoleflowOut (gmol/s) | MaterialPorts[Name="Outlet"].Flow.BulkFlow.MoleFlowRate (mol/s) |
| EnthalpyFlowIn (kJ/kg) | MaterialPorts[Name="Inlet"].Flow.BulkFlow.EnthalpyMassBasis (J/kg) |
| EnthalpyFlowOut (kJ/kg) | MaterialPorts[Name="Outlet"].Flow.BulkFlow.EnthalpyMassBasis (J/kg) |
| VolumetricFlowOut (m3/h) | MaterialPorts[Name="Outlet"].Flow.BulkFlow.PvtProperties.VolumetricFlowRate(m3/h) |
| PressureDrop (kPa) | DeltaP (Pa) |
| Polytropic Efficiency | PolytropicEfficiency |
| PressureRatio | TurbineSection. PressureRatio |

| **Expander Curves** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| Curve Speed (rpm) | Curves.Speed (rpm) |
| Efficiency (%) | Curves.FluidTransferCurve.PerformanceCurve.CurveData.Efficiency |
| Flow (m3/h) | Curves.FluidTransferCurve.PerformanceCurve.CurveData.Flow |
| Head (m) | Curves.FluidTransferCurve.PerformanceCurve.CurveData.Head |
| Head (kJ/kg) | Curves.FluidTransferCurve.PerformanceCurve.CurveData.Head |

## Streams

| **Streams** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| BulkCompressibility (unitless) | NormalFlow. BulkFlow.PvtProperties.Compressiblity |
| BulkHeatCapacityRatio | NormalFlow. BulkFlow.ThermodynamicProperties.HeatCapacityRatio |
| BulkMassDensity | NormalFlow. BulkFlow.PvtProperties.DensityMassBasis |
| BulkMassEnthalpy | NormalFlow. BulkFlow.EnthalpyMassBasis |
| BulkMassEntropy | NormalFlow. BulkFlow.EntropyMassBasis |
| BulkMassFlow | NormalFlow. BulkFlow.MassFlowRate |
| BulkMassHeatCapacity | NormalFlow. BulkFlow.ThermodynamicProperties.HeatCapacityConstantPressureMassBasis |
| BulkMolarDensity | NormalFlow. BulkFlow.PvtProperties.DensityMoleBasis |
| BulkMolarEnthalpy | NormalFlow. BulkFlow.EnthalpyMoleBasis |
| BulkMolarEntropy | NormalFlow. BulkFlow.EntropyMoleBasis |
| BulkMolarFlow | NormalFlow. BulkFlow.MoleFlowRate |
| BulkMolarHeatCapacity | NormalFlow. BulkFlow.ThermodynamicProperties.HeatCapacityConstantPressureMoleBasis |
| BulkMolecularWeight | NormalFlow. BulkFlow.PvtProperties.MolecularWeight |
| BulkPressure | NormalFlow. BulkFlow.Pressure |
| BulkSurfaceTension | NormalFlow. BulkFlow.TransportProperties.SurfaceTension |
| BulkTemperature | NormalFlow. BulkFlow.Temperature |
| BulkThermalConductivity | NormalFlow. BulkFlow.TransportProperties.ThermalConductivity |
| BulkViscosity | NormalFlow. BulkFlow.TransportProperties.Viscosity |
| BulkViscosityKinematic | NormalFlow. BulkFlow.TransportProperties.ViscosityKinematic |
| BulkVolumetricFlow | NormalFlow. BulkFlow.VolumetricFlowRate |

## Vessels

| **Vessels** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| Inlet 1 Liquid Phase Z Factor | MaterialPorts.EquipmentName-Inlet1.Flow.LiquidPhase.PvtProperties.Compressibility |
| Inlet 1 Heat Flow(kW) | MaterialPorts.EquipmentName-Inlet1.Flow.BulkFlow.EnthalpyRateBasis |
| Inlet 1 Cp/Cv | MaterialPorts.EquipmentName-Inlet1.Flow.BulkFlow.ThermodynamicProperties.HeatCapacityRatio |
| Inlet 1 MassDensity(kg/cum) | MaterialPorts.EquipmentName-Inlet1.Flow.BulkFlow.EnthalpyRateBasis |
| Mass Enthalpy(J/kg) | MaterialPorts.EquipmentName-Inlet1.Flow.BulkFlow.EnthalpyMassBasis |
| Mass Entropy(J/kg-K) | MaterialPorts.EquipmentName-Inlet1.Flow.BulkFlow.EntropyMassBasis |
| MassFlow(kg/h) | MaterialPorts.EquipmentName-Inlet1.Flow.BulkFlow.MassFlowRate |
| MassHeatCapacity (J/kg-K) | MaterialPorts.EquipmentName-Inlet1.Flow.BulkFlow.ThermodynamicProperties.HeatCapacityConstantPressureMassBasis |
| Molar Density | MaterialPorts.EquipmentName-Inlet1.Flow.BulkFlow.PvtProperties.DensityMoleBasis |
| Molar Enthalpy(kJ/kmol) | MaterialPorts.EquipmentName-Inlet1.Flow.BulkFlow.EnthalpyMoleBasis |
| Molar Entropy(kJ/kmol-K) | MaterialPorts.EquipmentName-Inlet1.Flow.BulkFlow.EntropyMoleBasis |
| Molar Flow(kmol/s) | MaterialPorts.EquipmentName-Inlet1.Flow.BulkFlow.MoleFlowRate |
| MolarHeatCapacity(J/mol-K) | MaterialPorts.EquipmentName-Inlet1.Flow.BulkFlow.ThermodynamicProperties.HeatCapacityConstantPressureMoleBasis |
| MolecularWeight | MaterialPorts.EquipmentName-Inlet1.Flow.BulkFlow.PvtProperties.MolecularWeight |
| Pressure(Pa) | MaterialPorts.EquipmentName-Inlet1.Flow.BulkFlow.Pressure |
| Temperature(K) | MaterialPorts.EquipmentName-Inlet1.Flow.BulkFlow.Temperature |
| ThermalConductivity(W/m-K) | MaterialPorts.EquipmentName-Inlet1.Flow.BulkFlow.TransportProperties.ThermalConductivity |
| Vicosity(cP) | MaterialPorts.EquipmentName-Inlet1.Flow.BulkFlow.TransportProperties.Viscosity |
| KineticViscosity(sqm/sec) | MaterialPorts.EquipmentName-Inlet1.Flow.BulkFlow.TransportProperties.ViscosityKinematic |
| VolumetricFlow (m3/h) | MaterialPorts.EquipmentName-Inlet1.Flow.BulkFlow.VolumetricFlowRate |

## Utility

| **Pump** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| UtilityType | UtilityType |
| UtilityMassFlow | UtilityMassFlow |
| UtilityInletTemperature | UtilityInletTemperature |
| UtilityOutletTemperature | UtilityOutletTemperature |
| UtilityCostPerUnit | UtilityCostPerUnit |

| **Separator** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| UtilityType | UtilityType |
| UtilityMassFlow | UtilityMassFlow |
| UtilityInletTemperature | UtilityInletTemperature |
| UtilityOutletTemperature | UtilityOutletTemperature |
| UtilityCostPerUnit | UtilityCostPerUnit |

| **Compressor** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| UtilityType | UtilityType |
| UtilityMassFlow | UtilityMassFlow |
| UtilityInletTemperature | UtilityInletTemperature |
| UtilityOutletTemperature | UtilityOutletTemperature |
| UtilityCostPerUnit | UtilityCostPerUnit |

| **Expander** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| UtilityType | UtilityType |
| UtilityMassFlow | UtilityMassFlow |
| UtilityInletTemperature | UtilityInletTemperature |
| UtilityOutletTemperature | UtilityOutletTemperature |
| UtilityCostPerUnit | UtilityCostPerUnit |

| **Column** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| UtilityType | UtilityType |
| UtilityMassFlow | UtilityMassFlow |
| UtilityInletTemperature | UtilityInletTemperature |
| UtilityOutletTemperature | UtilityOutletTemperature |
| UtilityCostPerUnit | UtilityCostPerUnit |

| **Cooler** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| UtilityType | UtilityType |
| UtilityMassFlow | UtilityMassFlow |
| UtilityInletTemperature | UtilityInletTemperature |
| UtilityOutletTemperature | UtilityOutletTemperature |
| UtilityCostPerUnit | UtilityCostPerUnit |

| **Heater** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| UtilityType | UtilityType |
| UtilityMassFlow | UtilityMassFlow |
| UtilityInletTemperature | UtilityInletTemperature |
| UtilityOutletTemperature | UtilityOutletTemperature |
| UtilityCostPerUnit | UtilityCostPerUnit |

## Column

| **Tray Section** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| Feed Tray Number | FeedTrayNumer.FeedTrayNumber |
| Top Tray Pressure | UtilityMassFlow |
| Feed Tray Pressure | UtilityInletTemperature |
| Number of Pump Arounds | UtilityOutletTemperature |
| Number of Tray sizing sections | UtilityCostPerUnit |
| BoilupRatio | PressureTop |
| CondenserDuty | FeedTrayPressure.FeedTrayPressure |
| ReboilerDuty | NumberofPumpArounds |
| ReboilerType |  |
| Reflux Ratio | BoilupRatio |

| **Trays** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| Tray Number | Shell.Sections.ShellSection.TrayStacks.SeparationTrayStack.TrayNumber |

| **Column Section** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| Tower section diameter | Shell.Sections.ShellSection.TrayStacks.SeparationTrayStack.StackDiameter |
| tray spacing | Shell.Sections.ShellSection.TrayStacks.SeparationTrayStack.TraySpacing |

| **Packing** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| Vapor to section temperature | Shell.Sections.Packing.Packing.MaterialPorts.Inlet.VapourPhase.Temperature |
| vapor to section pressure | Shell.Sections.Packing.Packing.MaterialPorts.Inlet.VapourPhase.Pressure |
| vapor to section molecular weight | Shell.Sections.Packing.Packing.MaterialPorts.Inlet.VapourPhase.MolecularWeight |
| vapor to section density | Shell.Sections.Packing.Packing.MaterialPorts.Inlet.VapourPhase.PvtProperties.DensityMassBasis |
| vapor to section dynamic viscosity | Shell.Sections.Packing.Packing.MaterialPorts.Inlet.VapourPhase.TransportProperties.Viscosity |
| vapor to section mass flow | Shell.Sections.Packing.Packing.MaterialPorts.Inlet.VapourPhase.MassFlowRate |
| vapor to section actual volumetric flow | Shell.Sections.Packing.Packing.MaterialPorts.Inlet.VapourPhase.VolumetricFlowRate |
| liquid to section temperature | Shell.Sections.Packing.Packing.MaterialPorts.Inlet.LiquidPhase.Temperature |
| liquid to section pressure | Shell.Sections.Packing.Packing.MaterialPorts.Inlet.LiquidPhase.Pressure |
| liquid to section molecular weight | Shell.Sections.Packing.Packing.MaterialPorts.Inlet.LiquidPhase.MolecularWeight |
| liquid to section density | Shell.Sections.Packing.Packing.MaterialPorts.Inlet.LiquidPhase.PvtProperties.DensityMassBasis |
| liquid to section viscosity | Shell.Sections.Packing.Packing.MaterialPorts.Inlet.LiquidPhase.TransportProperties.Viscosity |
| liquid to section surface tension | Shell.Sections.Packing.Packing.MaterialPorts.Inlet.LiquidPhase.TransportProperties.SurfaceTension |
| liquid to section mass flow | Shell.Sections.Packing.Packing.MaterialPorts.Inlet.LiquidPhase.MassFlowRate |
| liquid to section volumetric flow rate | Shell.Sections.Packing.Packing.MaterialPorts.Inlet.LiquidPhase.VolumetricFlowRate |

| **Column Section** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| tower inside diameter | Shell.Sections.ShellSection.Packing.Packing.BedDiameter |
| packed height | Shell.Sections.ShellSection.Packing.Packing.BedHeight |
| packing type | Shell.Sections.ShellSection.Packing.Packing.Type |
| packing size | Shell.Sections.ShellSection.Packing.Packing.PackingSize |
| surface area | Shell.Sections.ShellSection.Packing.Packing.SurfaceAreaPerVolume |
| section pressure drop | Shell.Sections.ShellSection.Packing.Packing.AllowablePressureDrop |
| MaxCapacityFactor | Shell.Sections.ShellSection.MaxCapacityFactor |
| MaxFractionalCapacity | Shell.Sections.ShellSection.MaxFractionalCapacity |
| StichlmairConstant1 | Shell.Sections.ShellSection.StichlmairConstant1 |
| StichlMairConstant2 | Shell.Sections.ShellSection.StichlmairConstant2 |
| StichlMairConstant3 | Shell.Sections.ShellSection.StichlmairConstant3 |
| void fraction | Shell.Sections.ShellSection.VoidFraction |

| **Pump Around** | |
| --- | --- |
| **Attributes** | **ABE Default View** |
| Return temperature | Stages.1-DistillationStage.TotalReturn.MaterialPort(2).Flow.BulkFlow.Temperature |
| Return Volumetric flow | Stages.1-DistillationStage.TotalReturn.MaterialPort(2).Flow.BulkFlow.VolumetricFlowRate |
| Heat duty | Stages.1-DistillationStage.HoldupHeatExchangeDuty |
| Draw temperature | Stages.2-DistillationStage.TotalDraw.MaterialPort.Flow.BulkFlow.Temperature |