

# DEXPI2graph

**Process Intelligence Research**  
Dept. Chemical Engineering  
Delft University of Technology



TU Delft



Process  
Intelligence  
RESEARCH

# Requirements

- Dense graph
  - Good for machine learning
  - Good for LLM integration
  - Good for manual graph drawing
- Important attributes to include
  - NominalDiameterStandard
  - FluidCode
  - (PipingClassCode)
  - (OperatingTemperature)
  - (OperatingPressure)<sup>1</sup>

[1] not a DEXPI attribute, Nozzle has NominalPressure

# Classes to be nodes

- NozzleOwner
- PipingNetworkSegmentItem
- ProcessInstrumentationFunction
- SignalOffPageConnector
- ControlledActuator
- Positioner
- ElectronicFrequencyConverter
- OfflinePrimaryElement

# Classes to be edges

- PipingConnection<sup>1</sup>
- SignalConveyingFunction<sup>2</sup>
- OperatedValveReference
- ElectronicFrequencyConverter<sup>3</sup>

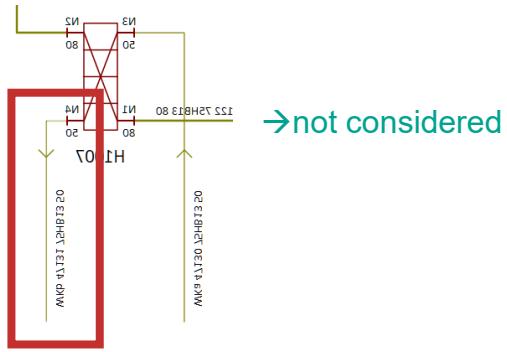
[1] Includes Pipe and DirectPipingConnection. For every PipingConnection, we add all attributes of the PNS that it is part of.

[2] Includes SignalLineFunction and MeasuringLineFunction

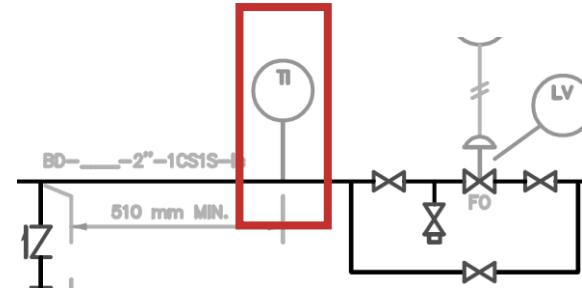
[3] Included for now as edge type, need to be verified with DEXPI example

# Points of concern

- Loose pipe end/start



- ProcessInstrumentationFunction (PIF) referencing PNS



Should not occur according to DEXPI, rather PIF is connected to PipingComponent

- HeatExchanger connectivity information stored in chambers, but chambers not included as nodes

get information from chambers, store as extra edge attribute. Not implemented yet

- How to save component position as node position?

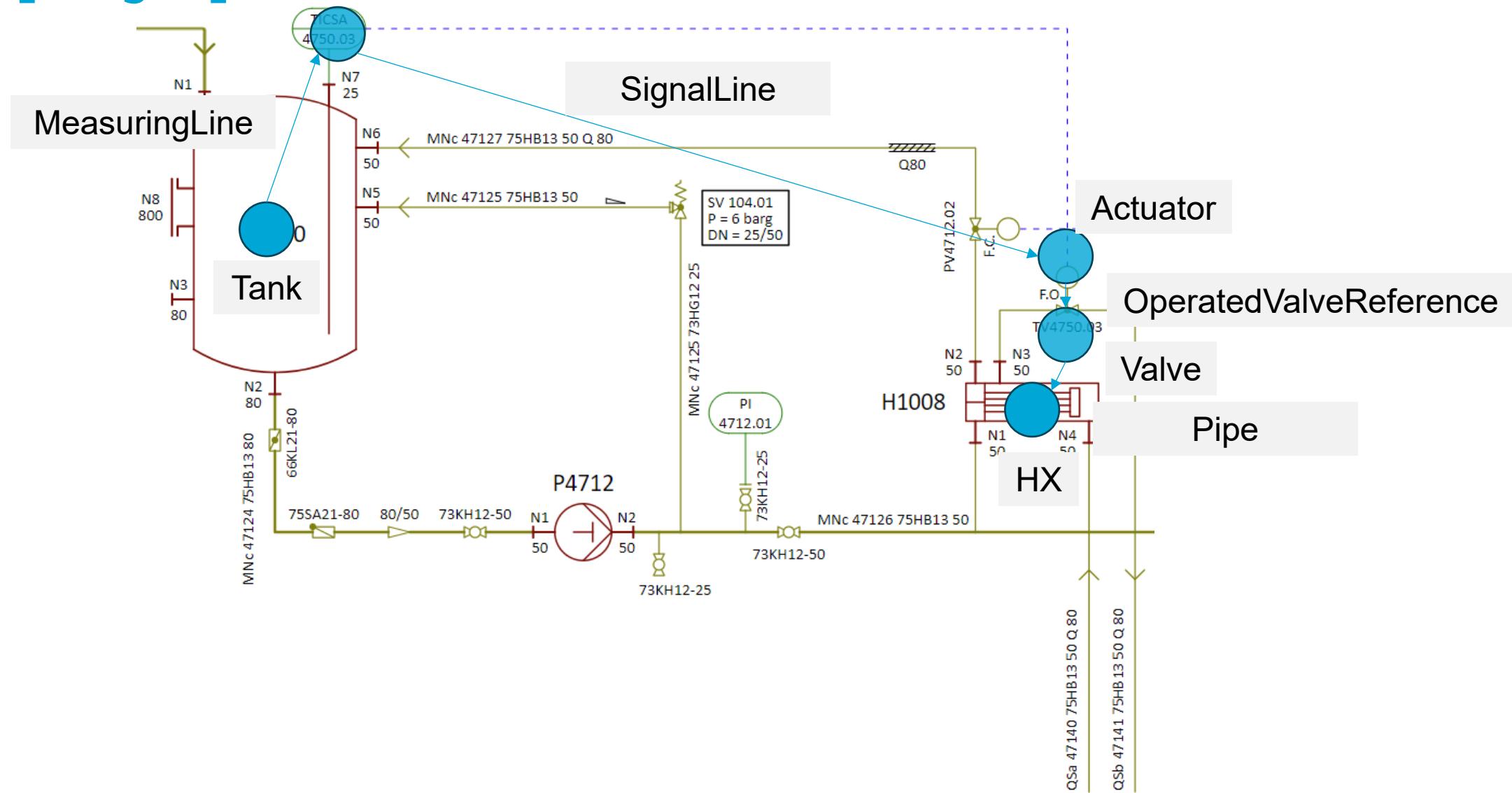
Extra attribute for every node: Point:[x:float,y:float]

- Custom classes that are not a subclass of any class already included? E.g., CustomActuatingElectricalSystemComponent

Don't worry about it for now. If they Occur: implement for every class a Special case

# Example graph

PIF



# Thank you very much for your attention!