

# ChangeDetect operator

This operator can be used to filter out equal elements and reduce data rate.

## Parameter

- `ATTR (List<String>)`: only these attribute are considered for the comparison
- `group_by`: An optional list of attributes. If given, the elements are compared in their group (e.g. by a sensor id)
- `Heartbeatrate (Integer)`: For each nth element that is filtered out, a heartbeat is generated to state the progress of time
- `deliverFirstElement (Boolean)`: If true, the first element will be send to the next operator.
- `tolerance (Double)`: This value can be used, to allow a tolerance band (histerese band). Only if the difference between the last seen value and the new value is greater than this tolerance, an object is send.
- `relativeTolerance (Boolean)`: If set to true, the tolerance value is treated relative to the last send value, e.g. if tolerance = 0.1, a new element is send only if the new value is at least 10 percent higher or lower.
- `baseValue (Double)`: If 'useBaseValue' is true, the actual value is compared to the base value instead to the last value.
- `useBaseValue (Boolean)`: If this is set to true, the actual value is compared to the base value instead to the last value. Default is false.
- `useWindow (Boolean)`: If this is set to true, the operator compares not to the last value (or base value), but instead to the elements in the window. Therefore the difference to the minimum and maximum value to the new value is calculated. Default is false.