PostgreSQL Connector

The **PostgreSQL Connector** allows you to perform CRUD operation on PostgreSQL database. You can choose the required operation from the dropdown using templates from your BPMN process.

Prerequisites

To start working with the **PostgreSQL Connector**, a relevant database user password must be configured and stored as a secret in your cluster. The user must have permission to perform database operation on given database instance.

Create a PostgreSQL Connector task

Currently, the PostgreSQL Connector supports seven types of operations: create database, create table, insert data into the table, delete data from the table, update table data, read table data and alter table.

To use a **PostgreSQL Connector** in your process, either change the type of existing task by clicking on it and using the wrench-shaped **Change type** context menu icon or create a new Connector task by using the **Append Connector** context menu. Follow our guide on using Connectors to learn more.

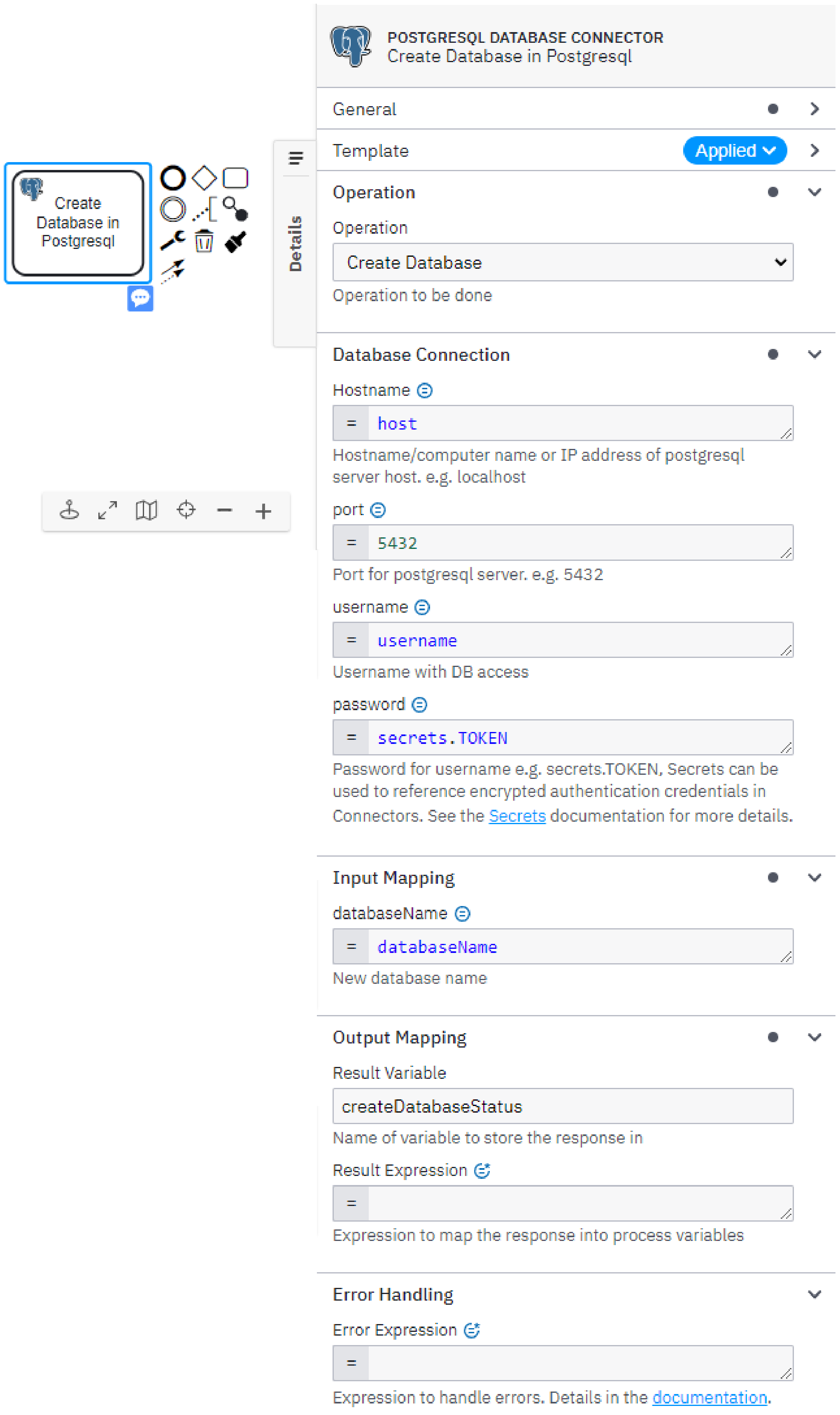
Make your PostgreSQL Connector executable

To make the **PostgreSQL Connector** executable, fill out the mandatory fields highlighted in red in the properties panel.

Database connection Object input for PostgreSQL Connector

PostgreSQL Connector database connection object takes – host, port, username and password. e.g. localhost, 5432, username, password as (secrets Token e.g. secrets.POSTGRES_TOKEN)

Create a new database



POSTGRESQL DATABASE CONNECTOR
Create Database in Postgresql

General

Template Applied

Operation

Operation: Create Database
Operation to be done

Database Connection

Hostname: = host
Hostname/computer name or IP address of postgresql server host. e.g. localhost

port: = 5432
Port for postgresql server. e.g. 5432

username: = username
Username with DB access

password: = secrets.TOKEN
Password for username e.g. secrets.TOKEN, Secrets can be used to reference encrypted authentication credentials in Connectors. See the Secrets documentation for more details.

Input Mapping

databaseName: = databaseName
New database name

Output Mapping

Result Variable: createDatabaseStatus
Name of variable to store the response in

Result Expression: =
Expression to map the response into process variables

Error Handling

Error Expression: =
Expression to handle errors. Details in the documentation.

To create a database, take the following steps:

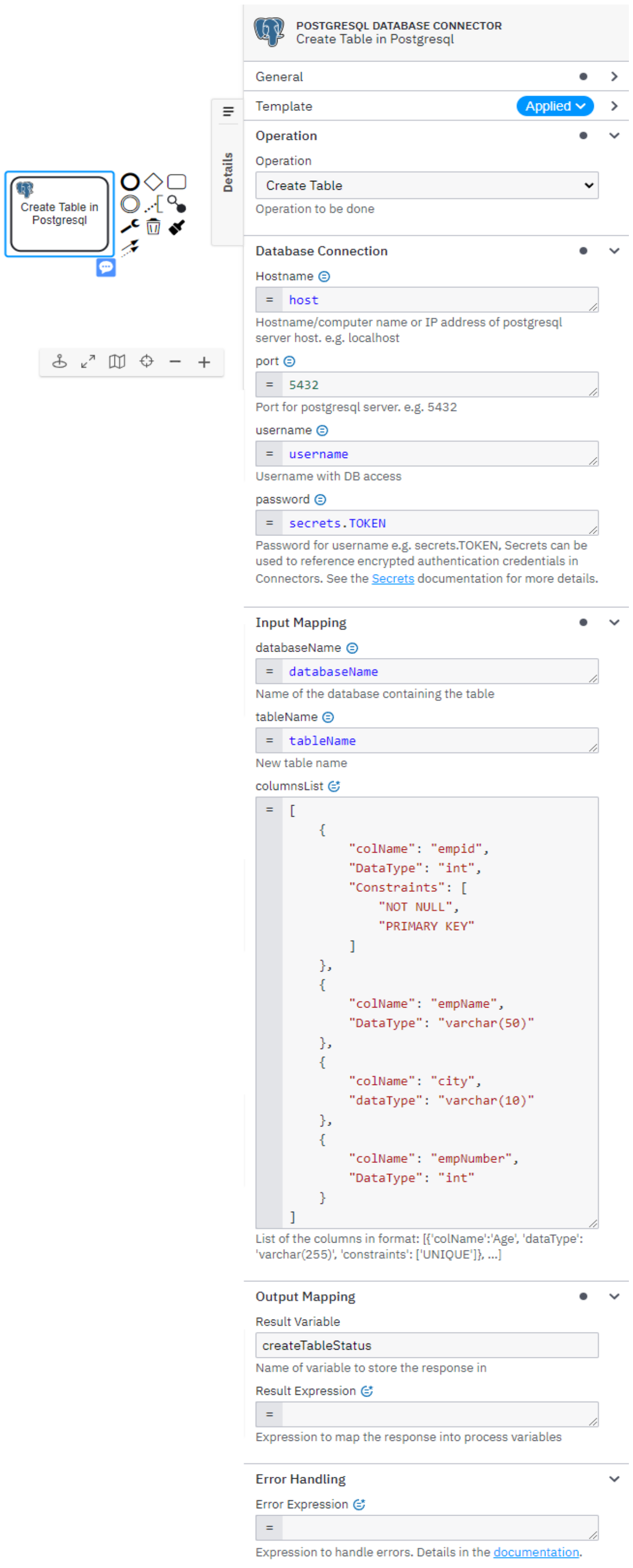
1. In the **Operation** section, set the field value **Operation** as **Create Database**.
2. Set the required parameters and credentials in the **Database Connection** section. See the relevant appendix entry to find out more.
3. In the **Input Mapping** section, set the field **databaseName** as the desired name of a database you wish to create. For example, `MyNewDatabase`. Alternatively, you could use a FEEL expression.

Create Database operation respons

You can use an output mapping to map the response:

1. Use **Result Variable** to store the response in a process variable. For example, `createDatabaseStatus`.

Create a new table



POSTGRESQL DATABASE CONNECTOR
Create Table in Postgresql

General

Template Applied

Operation

Operation

Create Table

Operation to be done

Database Connection

Hostname

= host

Hostname/computer name or IP address of postgresql server host. e.g. localhost

port

= 5432

Port for postgresql server. e.g. 5432

username

= username

Username with DB access

password

= secrets.TOKEN

Password for username e.g. secrets.TOKEN, Secrets can be used to reference encrypted authentication credentials in Connectors. See the Secrets documentation for more details.

Input Mapping

databaseName

= databaseName

Name of the database containing the table

tableName

= tableName

New table name

columnsList

```
= [
      {
          "colName": "empid",
          "DataType": "int",
          "Constraints": [
              "NOT NULL",
              "PRIMARY KEY"
          ]
      },
      {
          "colName": "empName",
          "DataType": "varchar(50)"
      },
      {
          "colName": "city",
          "dataType": "varchar(10)"
      },
      {
          "colName": "empNumber",
          "DataType": "int"
      }
  ]
```

List of the columns in format: [{'colName':'Age', 'dataType': 'varchar(255)', 'constraints': ['UNIQUE']}, ...]

Output Mapping

Result Variable

createTableStatus

Name of variable to store the response in

Result Expression

=

Expression to map the response into process variables

Error Handling

Error Expression

=

Expression to handle errors. Details in the documentation.

To create a table, take the following steps:

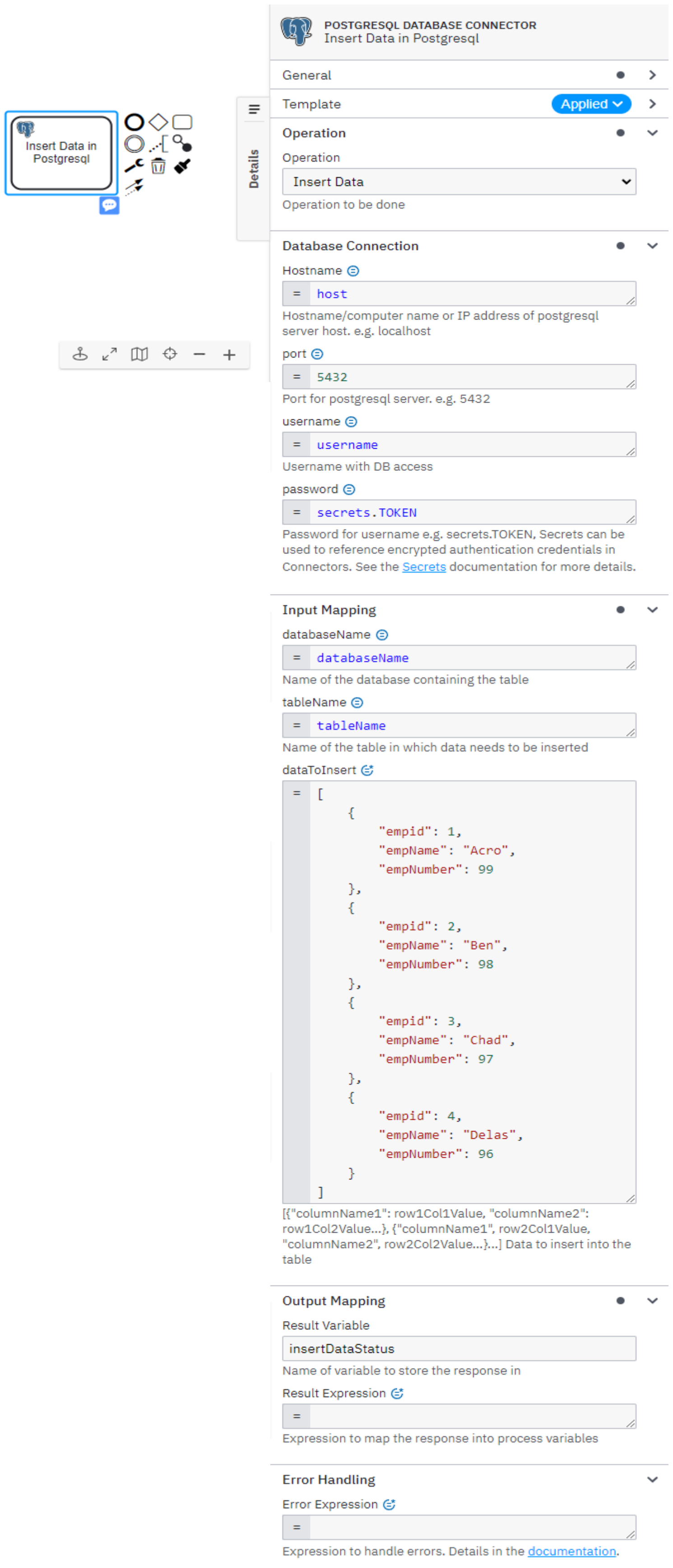
1. In the **Operation** section, set the field value **Operation** as **Create Table**.
2. Set the required parameters and credentials in the **Database Connection** section. See the relevant appendix entry to find out more.
3. In the **Input Mapping** section, set the field **databaseName, tableName** as the desired name of a table you wish to create. For example, `MyNewTable`. Alternatively, you could use a FEEL expression.
4. Set **columnsList**, using FEEL expression as List of columns details, which is a List of context having keys as colName, datatype and constraints.

Create Table operation response

You can use an output mapping to map the response:

1. Use **Result Variable** to store the response in a process variable. For example, `createTableStatus`.

Insert data into the table



POSTGRESQL DATABASE CONNECTOR
Insert Data in Postgresql

General

Template Applied

Operation

Operation

Insert Data

Operation to be done

Database Connection

Hostname

```
= host
```

Hostname/computer name or IP address of postgresql server host. e.g. localhost

port

```
= 5432
```

Port for postgresql server. e.g. 5432

username

```
= username
```

Username with DB access

password

```
= secrets.TOKEN
```

Password for username e.g. secrets.TOKEN, Secrets can be used to reference encrypted authentication credentials in Connectors. See the Secrets documentation for more details.

Input Mapping

databaseName

```
= databaseName
```

Name of the database containing the table

tableName

```
= tableName
```

Name of the table in which data needs to be inserted

dataToInsert

```
= [
    {
        "empid": 1,
        "empName": "Acro",
        "empNumber": 99
    },
    {
        "empid": 2,
        "empName": "Ben",
        "empNumber": 98
    },
    {
        "empid": 3,
        "empName": "Chad",
        "empNumber": 97
    },
    {
        "empid": 4,
        "empName": "Delas",
        "empNumber": 96
    }
  ]
```

[{"columnName1": row1Col1Value, "columnName2": row1Col2Value...}, {"columnName1", row2Col1Value, "columnName2", row2Col2Value...}...] Data to insert into the table

Output Mapping

Result Variable

insertDataStatus

Name of variable to store the response in

Result Expression

```
=
```

Expression to map the response into process variables

Error Handling

Error Expression

```
=
```

Expression to handle errors. Details in the documentation.

To insert data into the table, take the following steps:

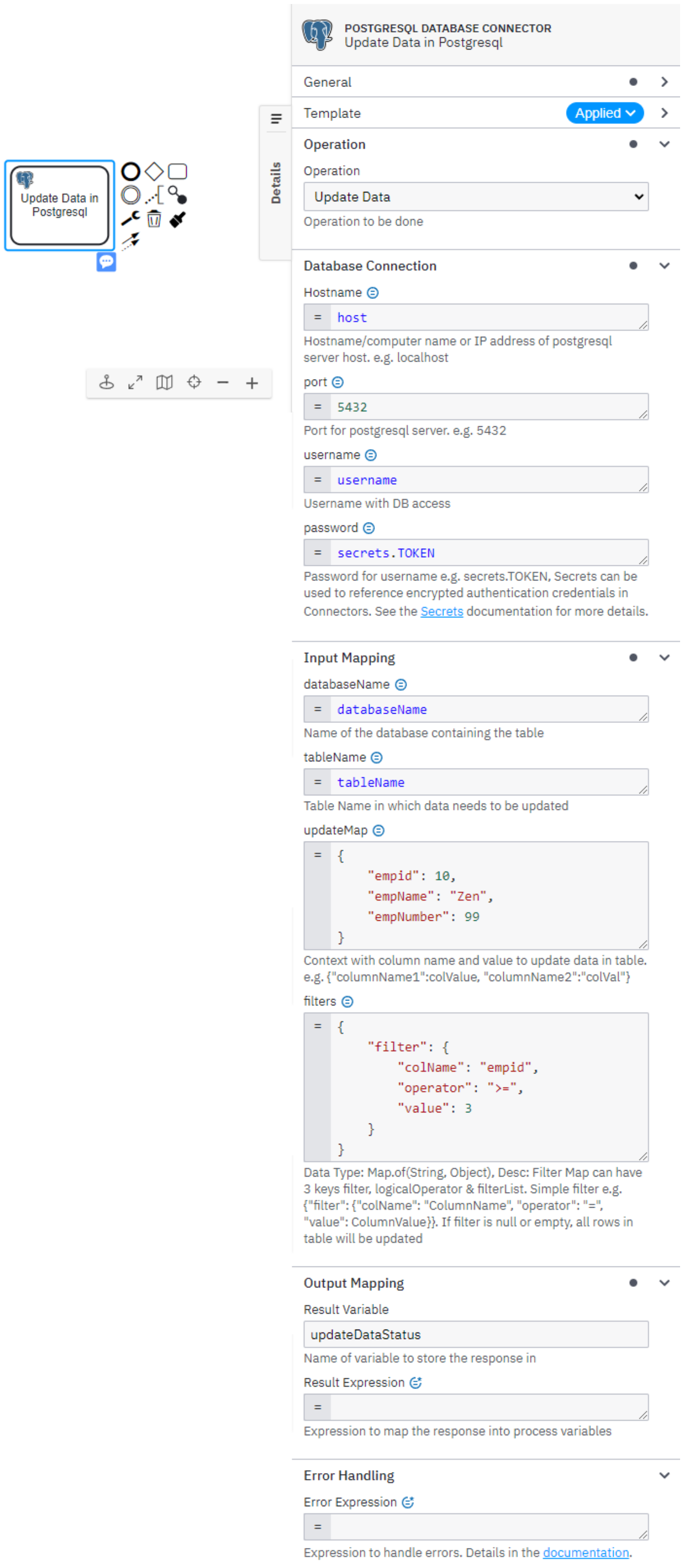
1. In the **Operation** section, set the field value **Operation** as **Insert Data**.
2. Set the required parameters and credentials in the **Database Connection** section. See the relevant appendix entry to find out more.
3. In the **Input Mapping** section, set the field **databaseName, tableName**.
4. Set **dataToInsert**, using FEEL expression as List of columns details, which is a List of context having keys as name, datatype and constraint.
5. We are following Insert syntax - **INSERT INTO tableName (columnNames) VALUES (*)** where columnNames is list of comma-separated column names extracted from keyset of first item in the dataToInsert List.

Insert Data operation response

You can use an output mapping to map the response:

2. Use **Result Variable** to store the response in a process variable. For example, `insertDataStatus`.

Update table Data



POSTGRESQL DATABASE CONNECTOR
Update Data in Postgresql

General

Template Applied

Operation

Operation
Update Data
Operation to be done

Database Connection

Hostname
= host
Hostname/computer name or IP address of postgresql server host. e.g. localhost

port
= 5432
Port for postgresql server. e.g. 5432

username
= username
Username with DB access

password
= secrets.TOKEN
Password for username e.g. secrets.TOKEN, Secrets can be used to reference encrypted authentication credentials in Connectors. See the Secrets documentation for more details.

Input Mapping

databaseName
= databaseName
Name of the database containing the table

tableName
= tableName
Table Name in which data needs to be updated

updateMap
```
= {
      "empid": 10,
      "empName": "Zen",
      "empNumber": 99
  }
```
Context with column name and value to update data in table. e.g. {"columnName1":colValue, "columnName2":"colVal"}

filters
```
= {
      "filter": {
          "colName": "empid",
          "operator": ">=",
          "value": 3
      }
  }
```
Data Type: Map.of(String, Object), Desc: Filter Map can have 3 keys filter, logicalOperator & filterList. Simple filter e.g. {"filter": {"colName": "ColumnName", "operator": "=", "value": ColumnValue}}. If filter is null or empty, all rows in table will be updated

Output Mapping

Result Variable
updateDataStatus
Name of variable to store the response in

Result Expression
=
Expression to map the response into process variables

Error Handling

Error Expression
=
Expression to handle errors. Details in the documentation.

To update table data, take the following steps:

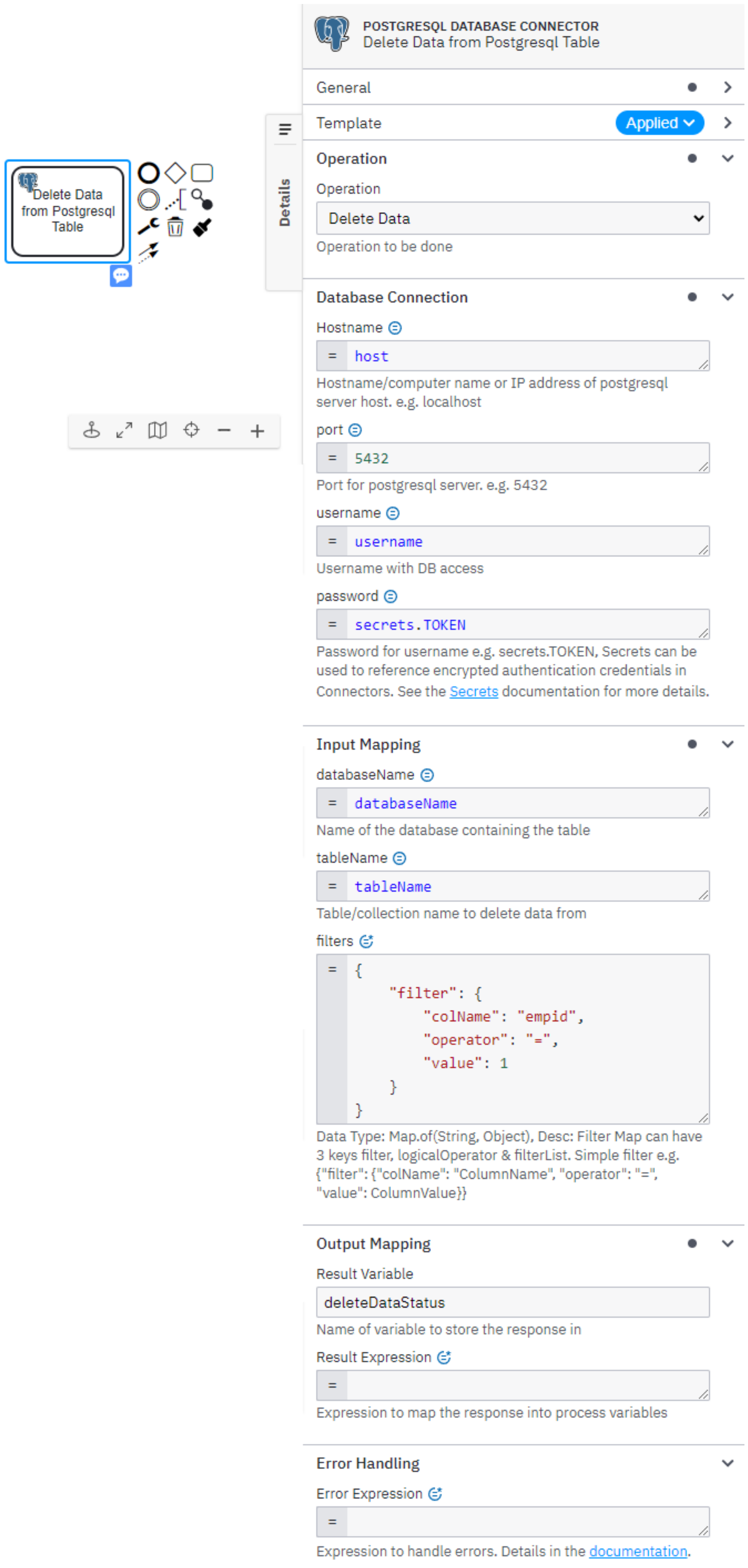
1. In the **Operation** section, set the field value **Operation** as **Update Data**.
2. Set the required parameters and credentials in the **Database Connection** section. See the relevant appendix entry to find out more.
3. In the **Input Mapping** section, set the field **databaseName, tableName**.
4. Set **updateMap**, using FEEL expression as context with key-value pairs for *columnName* & *value*. e.g. {"empAddress": "Krypton", "empName": "Kal-El"}
   These fields will update for all the rows which match the filter condition.
5. Set **filters**, using FEEL expression as context with keys as - filter, logicalOperator & filterList. e.g. {"filter":{"colName": "alias","operator": "like","value": "%superman%"}}
   These will used to construct the where clause for the SQL query.

Update Table Data operation response

You can use an output mapping to map the response:

1. Use **Result Variable** to store the response in a process variable. For example, `updateDataStatus`.

Delete table Data



POSTGRESQL DATABASE CONNECTOR
Delete Data from Postgresql Table

General

Template Applied

Operation

Operation
Delete Data
Operation to be done

Database Connection

Hostname
= host
Hostname/computer name or IP address of postgresql server host. e.g. localhost

port
= 5432
Port for postgresql server. e.g. 5432

username
= username
Username with DB access

password
= secrets.TOKEN
Password for username e.g. secrets.TOKEN, Secrets can be used to reference encrypted authentication credentials in Connectors. See the Secrets documentation for more details.

Input Mapping

databaseName
= databaseName
Name of the database containing the table

tableName
= tableName
Table/collection name to delete data from

filters

```
{
    "filter": {
        "colName": "empid",
        "operator": "=",
        "value": 1
    }
}
```

Data Type: Map.of(String, Object), Desc: Filter Map can have 3 keys filter, logicalOperator & filterList. Simple filter e.g. {"filter": {"colName": "ColumnName", "operator": "=", "value": ColumnValue}}

Output Mapping

Result Variable
deleteDataStatus
Name of variable to store the response in

Result Expression
=
Expression to map the response into process variables

Error Handling

Error Expression
=
Expression to handle errors. Details in the documentation.

To delete table data, take the following steps:

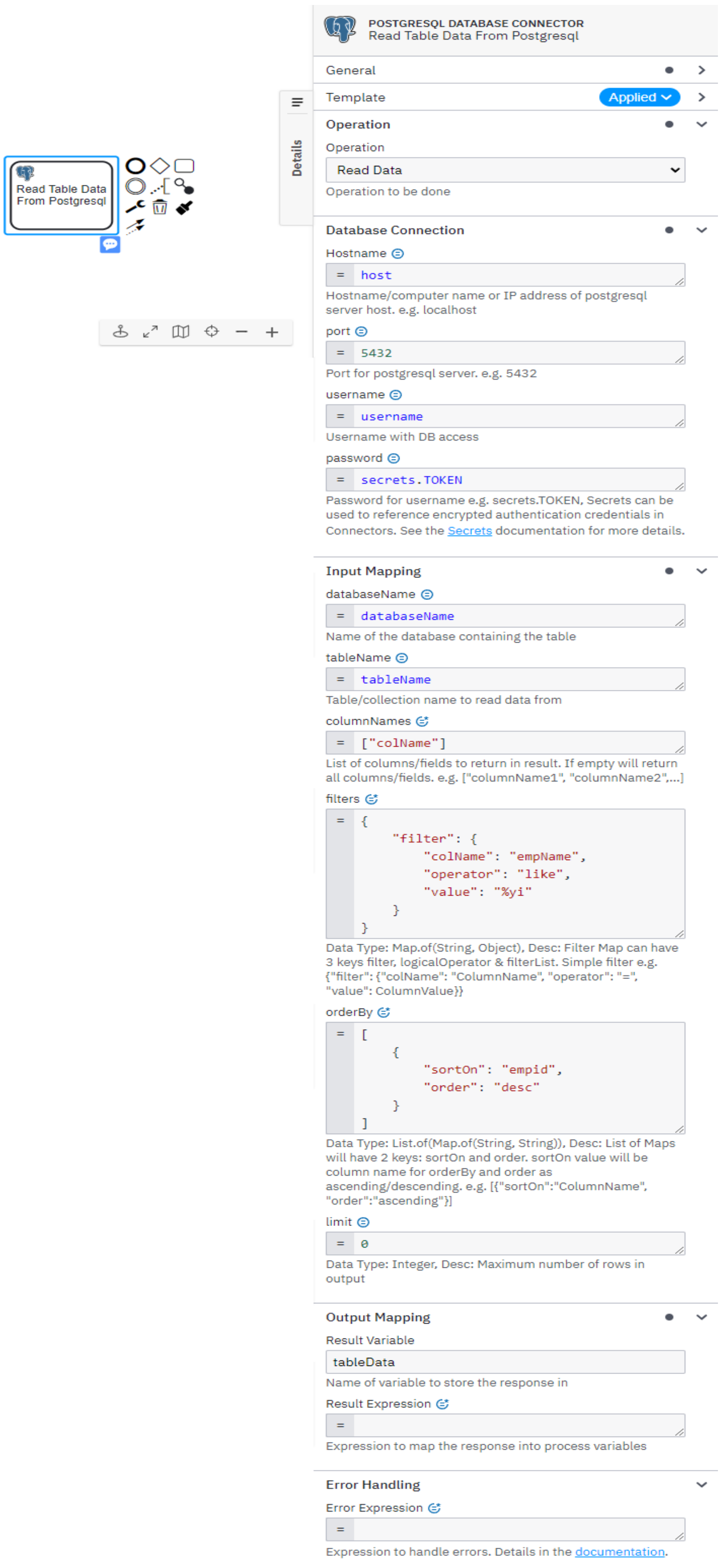
1. In the **Operation** section, set the field value **Operation** as **Delete Data**.
2. Set the required parameters and credentials in the **Database Connection** section. See the relevant appendix entry to find out more.
3. In the **Input** section, set the field **databaseName, tableName**.
4. Set **filters**, using FEEL expression as context with keys as - filter, logicalOperator & filterList. e.g. {"filter":{"colName": "alias","operator": "like","value": "%superman%"}} These will used to construct the where clause for the SQL query. All the matched rows will be deleted.

Delete Table Data operation response

You can use an output mapping to map the response:

1. Use **Result Variable** to store the response in a process variable. For example, `deleteDataOutput`.

Read table Data



POSTGRESQL DATABASE CONNECTOR
Read Table Data From Postgresql

General

Template Applied

Operation

Operation
Read Data
Operation to be done

Database Connection

Hostname
= host
Hostname/computer name or IP address of postgresql server host. e.g. localhost

port
= 5432
Port for postgresql server. e.g. 5432

username
= username
Username with DB access

password
= secrets.TOKEN
Password for username e.g. secrets.TOKEN, Secrets can be used to reference encrypted authentication credentials in Connectors. See the Secrets documentation for more details.

Input Mapping

databaseName
= databaseName
Name of the database containing the table

tableName
= tableName
Table/collection name to read data from

columnNames
= ["colName"]
List of columns/fields to return in result. If empty will return all columns/fields. e.g. ["columnName1", "columnName2",...]

filters

```
= {
      "filter": {
          "colName": "empName",
          "operator": "like",
          "value": "%yi"
      }
  }
```

Data Type: Map.of(String, Object), Desc: Filter Map can have 3 keys filter, logicalOperator & filterList. Simple filter e.g. {"filter": {"colName": "ColumnName", "operator": "=", "value": ColumnValue}}

orderBy

```
= [
      {
          "sortOn": "empid",
          "order": "desc"
      }
  ]
```

Data Type: List.of(Map.of(String, String)), Desc: List of Maps will have 2 keys: sortOn and order. sortOn value will be column name for orderBy and order as ascending/descending. e.g. [{"sortOn":"ColumnName", "order":"ascending"}]

limit
= 0
Data Type: Integer, Desc: Maximum number of rows in output

Output Mapping

Result Variable
tableData
Name of variable to store the response in

Result Expression
=
Expression to map the response into process variables

Error Handling

Error Expression
=
Expression to handle errors. Details in the documentation.

To read table data, take the following steps:

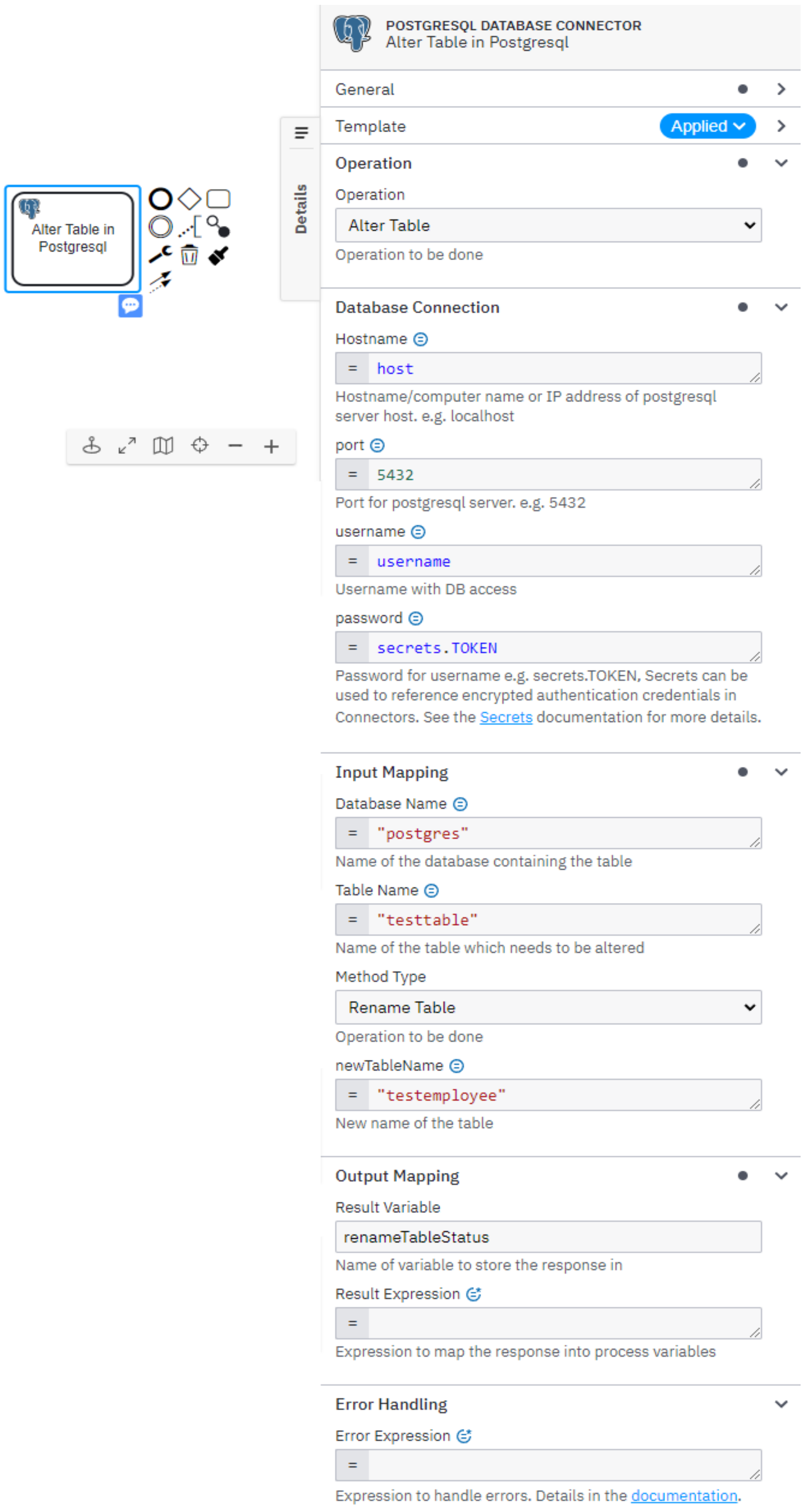
1. In the **Operation** section, set the field value **Operation** as **Read Data**.
2. Set the required parameters and credentials in the **Database Connection** section. See the relevant appendix entry to find out more.
3. In the **Input Mapping** section, set the field **databaseName, tableName**.
4. Set **columnNames**, using FEEL expression as List of columns to get in the output variable. e.g. [“col1”, “col2”]
5. Set **filters**, using FEEL expression as context with keys as - filter, logicalOperator & filterList. e.g. {"filter":{"colName": "alias","operator": "like","value": "%superman%"}} These will used to construct the where clause for the SQL query. All the matched rows will be returned in the output.
6. Set **orderBy**, using FEEL expression as list of context with keys – sortOn and order. e.g. [{"sortOn": "powers","order": "descending"}]
   These will used to construct the orderBy clause for the SQL query. The order of rows in output.
7. Set **limit**, the maximum number of rows in output.

Read Table Data operation response

You can use an output mapping to map the response:

1. Use **Result Variable** to store the response in a process variable. For example, `readDataOutput`. It’s a List of Maps with keys as column name and value as respective row data.

Alter table



POSTGRESQL DATABASE CONNECTOR
Alter Table in Postgresql

General

Template Applied

Operation

Operation
Alter Table
Operation to be done

Database Connection

Hostname
= host
Hostname/computer name or IP address of postgresql server host. e.g. localhost

port
= 5432
Port for postgresql server. e.g. 5432

username
= username
Username with DB access

password
= secrets.TOKEN
Password for username e.g. secrets.TOKEN, Secrets can be used to reference encrypted authentication credentials in Connectors. See the Secrets documentation for more details.

Input Mapping

Database Name
= "postgres"
Name of the database containing the table

Table Name
= "testtable"
Name of the table which needs to be altered

Method Type
Rename Table
Operation to be done

newTableName
= "testemployee"
New name of the table

Output Mapping

Result Variable
renameTableStatus
Name of variable to store the response in

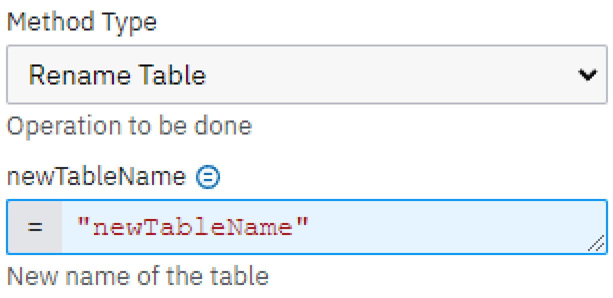
Result Expression
=
Expression to map the response into process variables

Error Handling

Error Expression
=
Expression to handle errors. Details in the documentation.

To alter table, take the following steps:

1. In the **Operation** section, set the field value **Operation** as **Alter Table**.
2. Set the required parameters and credentials in the **Database Connection** section. See the relevant appendix entry to find out more.
3. In the **Input Mapping** section, set the field **databaseName, tableName**.
4. Set **Method Type**, types of alter operations –
    1. Rename Table



Method Type

Rename Table

Operation to be done

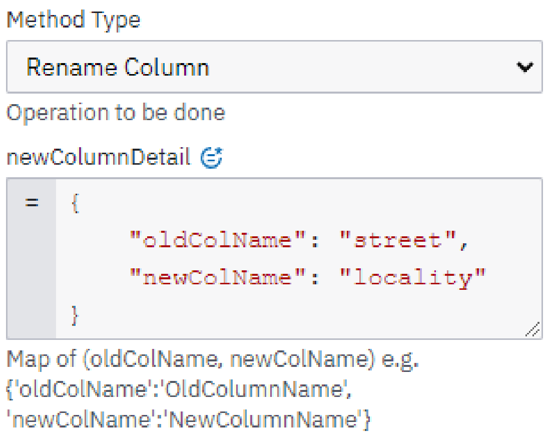
newTableName

```
= "newTableName"
```

New name of the table

Rename table to **newTableName**

    2. Rename Column



Method Type

Rename Column

Operation to be done

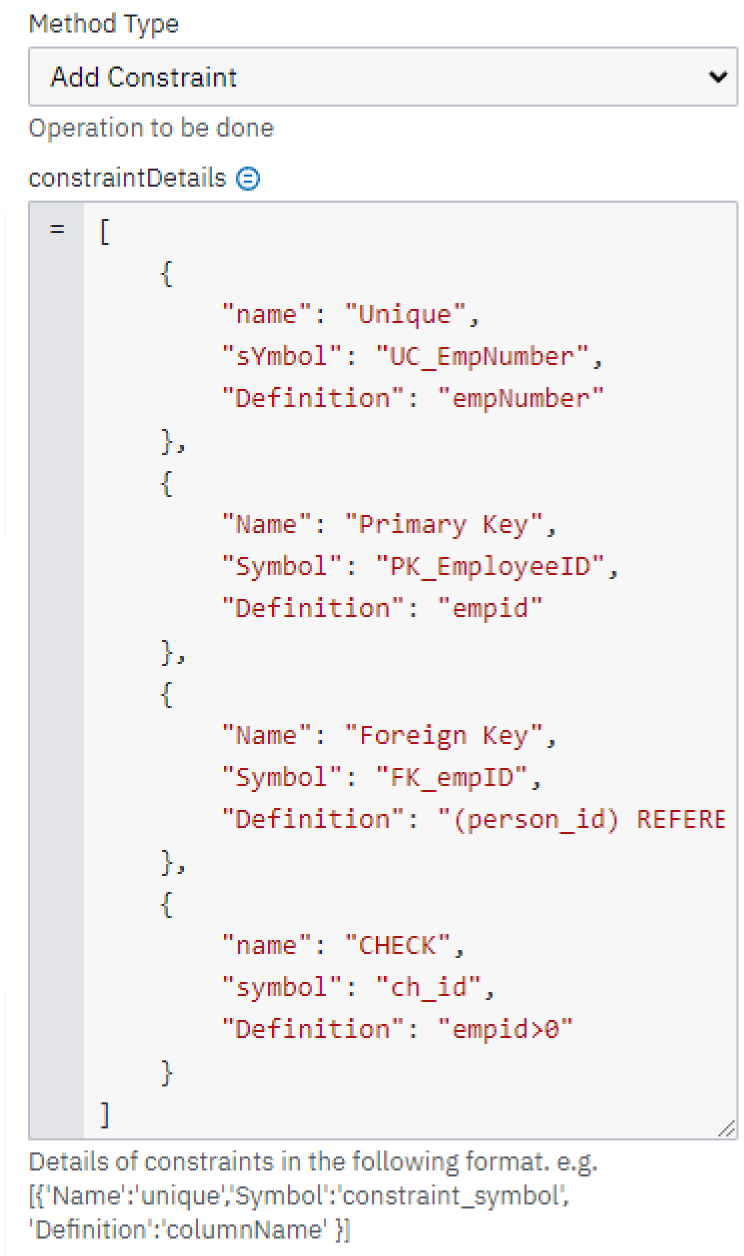
newColumnDetail

```
= {
      "oldColName": "street",
      "newColName": "locality"
  }
```

Map of (oldColName, newColName) e.g. {'oldColName':'OldColumnName', 'newColName':'NewColumnName'}

Rename column (**oldColName**) to new name (**newColName**)

    3. Add Constraint



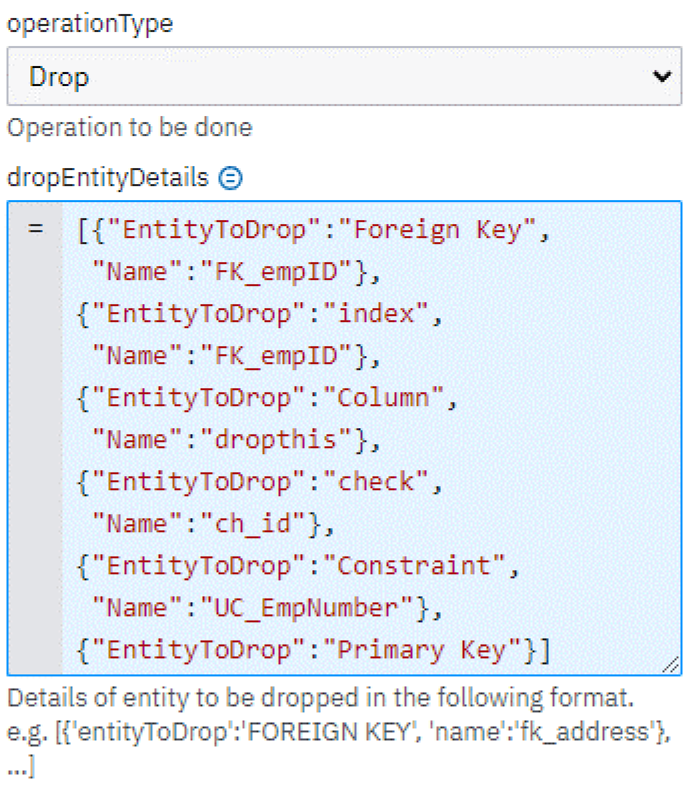
```
= [
      {
          "name": "Unique",
          "sYmbol": "UC_EmpNumber",
          "Definition": "empNumber"
      },
      {
          "Name": "Primary Key",
          "Symbol": "PK_EmployeeID",
          "Definition": "empid"
      },
      {
          "Name": "Foreign Key",
          "Symbol": "FK_empID",
          "Definition": "(person_id) REFERE
      },
      {
          "name": "CHECK",
          "symbol": "ch_id",
          "Definition": "empid>0"
      }
  ]
```

Details of constraints in the following format. e.g. [{'Name':'unique','Symbol':'constraint_symbol', 'Definition':'columnName' }]

Add constraints to the table, use FEEL expression to provide input **constraintDetails** as List of contexts with keys as – name, symbol, and definition.

Name – Type of constraint e.g. UNIQUE, PRIMARY KEY, FOREIGNKEY or CHECK
Symbol – The constraint name e.g. pk_id, fk_cin
Definition – Column name on which constraint needs to be applied

4. Drop


operationType

Drop

Operation to be done

dropEntityDetails

```
= [{"EntityToDrop":"Foreign Key",
   "Name":"FK_empID"},
  {"EntityToDrop":"index",
   "Name":"FK_empID"},
  {"EntityToDrop":"Column",
   "Name":"dropthis"},
  {"EntityToDrop":"check",
   "Name":"ch_id"},
  {"EntityToDrop":"Constraint",
   "Name":"UC_EmpNumber"},
  {"EntityToDrop":"Primary Key"}]
```

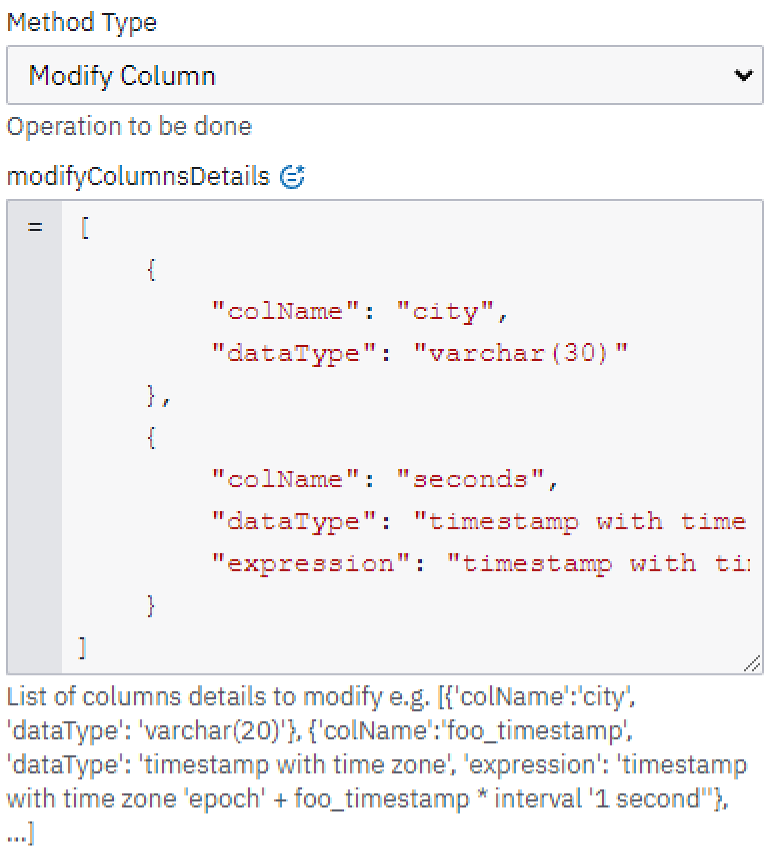
Details of entity to be dropped in the following format. e.g. [{'entityToDrop':'FOREIGN KEY', 'name':'fk_address'}, ...]

Provide input **dropEntityDetails**, using FEEL expression as List of contexts. Each context should have keys as **entityToDrop** and **name.**

Where **entityToDrop** is Constraint type, such as - Column, Check, Index, Primary Key, Foreign Key or Constraint.

name is the constraint name given at the time of adding the constraint such as - check_employee_salary, fk_cin. In-case of Primary key, constraint name is optional.

5. Modify Column


Method Type

Modify Column

Operation to be done

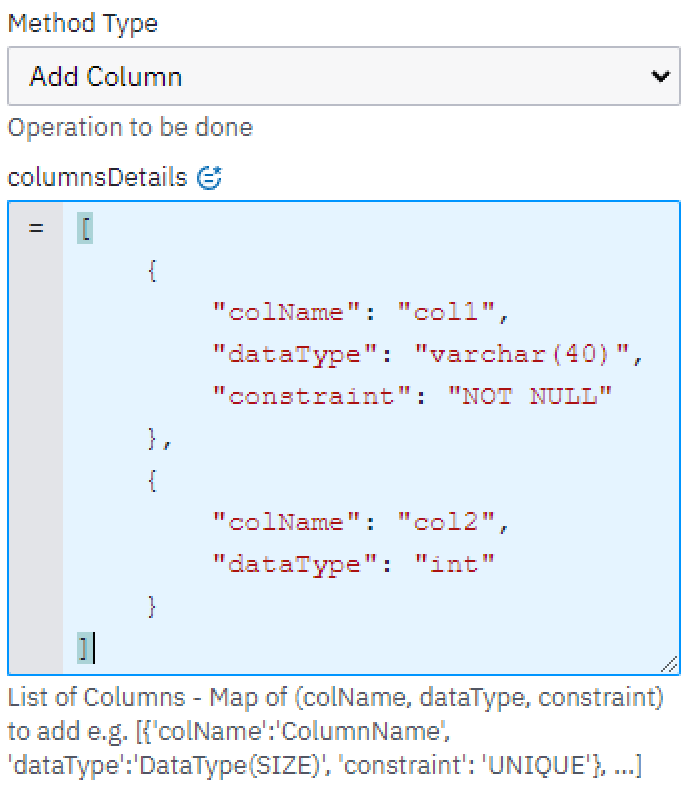
modifyColumnsDetails

```
= [
      {
          "colName": "city",
          "dataType": "varchar(30)"
      },
      {
          "colName": "seconds",
          "dataType": "timestamp with time
          "expression": "timestamp with ti
      }
  ]
```

List of columns details to modify e.g. [{'colName':'city', 'dataType': 'varchar(20)'}, {'colName':'foo_timestamp', 'dataType': 'timestamp with time zone', 'expression': 'timestamp with time zone 'epoch' + foo_timestamp * interval '1 second''}, ...]

Set **modifyColumnsDetails**, using FEEL expression as List of contexts. Each context can have keys as – **colName**, **dataType** and **constraint**.
colName is mandatory and datatype or constraint can be provided to update.

6. Add Column



```
= [
      {
          "colName": "col1",
          "dataType": "varchar(40)",
          "constraint": "NOT NULL"
      },
      {
          "colName": "col2",
          "dataType": "int"
      }
  ]
```

List of Columns - Map of (colName, dataType, constraint) to add e.g. [{'colName':'ColumnName', 'dataType':'DataType(SIZE)', 'constraint': 'UNIQUE'}, ...]

Set **columnsDetails**, using FEEL expression as List of contexts. Each context can have keys as **colName**, **dataType and constraint.**
name and dataType are mandatory.

Alter Table operation response

You can use an output mapping to map the response:

1. Use **Result Variable** to store the response in a process variable. For example, `alterTableOutput`.

Appendix & FAQ

Database Connection – Params values

Database connection group have 4 params – host, port, username, and password. These values will be used to connect to the database server.

How can I authenticate my Connector?

The **PostgreSQL Connector** needs the database credentials for connection. Hostname (host) – of the server where database is hosted, Port (port) – on which database server is running, Username (username) – User with proper privilege for operation and Password (password) – User password, which need to be saved as a Token in Secret vault and input can be provided as: secrets.TOKEN_NAME

What is filters input parameter?

Filters input is Map with keys – **filter**, **logicalOperator** and **filterList**.

1. `filter key’s` value is a Map with keys – **colName**, **operator** and **value**.

colName – is column name to apply condition on.

Supported operators are –
[=, ==, equals, <>, not equals, <, less than, >, greater than, <=, less than or equals, >=, greater than or equals, like, in, is, not in, starts with, ends with]

value - is an Object and can be anything.

2. `logicalOperator key’s` value can be OR, AND or NOT

3. `filterList key’s` value is a list of Map with key filter. And value for this filter key must follow 1st point.

filter key can exist individually or with **optional logicalOperator** (value - NOT).
But **filterList and logicalOperator** both must be present, logicalOperator value will be used to club all filters in the filterList.

If **filterList** key is present in the main map, **filter** key will be **ignored**.

Internally it is being used for constructing **where clause** for SQL query.

Filters can be of two type –

1. Simple Filter – It will contain just one condition and may be a negation.
2. Complex Filter – It is collection of simple filters, clubbed using logical operator like AND/OR.

Examples:

Simple filter without negation

```
{"filter": {"colName": "alias", "operator": "like", "value": "%superman%"} }
```

Simple filter with negation

```
{"filter": {"colName": "alias", "operator": "like", "value": "%superman%"},
"logicalOperator": "NOT"}
```

Complex filter

```
{"logicalOperator": "AND", "filterList": [
        {"filter": {"colName": "empAddress","operator": "=","value": "Krypton"}},
        {"filter": {"colName": "empName","operator": "like","value": "%superman%"}},
        {"filter": {"colName": "age","operator": ">","value": 28}}
      ]
}
```

What is orderBy input parameter?

orderBy input is a List of Map with keys – sortOn and order. As the name suggests, internally it is being used to construct **order by clause**.

sortOn – contains the column name
order – a/asc/ascending **OR** d/desc/descending

```
[
    {
        "sortOn": "empId",
        "order": "descending"
    }
]
```

What is limit input parameter?

Limit is the maximum number of rows for operation.
In case of read data it's maximum number of rows to return in the output.