



BER Assessors - DEAP 4.2 Release Bulletin

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Introduction

A number of changes have been made to the DEAP methodology. These changes will be introduced in the DEAP 4.2 software, so BERs published using DEAP 4.2 will have to take account of them.

The most significant changes to the process of carrying out a BER are as follows:

- **Water Heating:** in DEAP 4.2 the showers and baths present in a dwelling are now recorded in the BER – these changes are described in Section 1;
- **Lighting:** in DEAP 4.2 a more-detailed calculation of lighting energy is introduced based on the light bulbs present in the dwelling – these changes are described in Section 2.

1. Water Heating

Up until now, the calculation of the Hot Water requirement in DEAP was based on the floor area of the dwelling. It took no account of showers or baths present in the dwelling. This will change in DEAP 4.2. This section defines the information about showers and baths that must be gathered in the BER survey, and describes how it is entered into the DEAP 4.2 software.

1.1. Common Shower Systems

There are a number of types of shower system commonly used in Ireland. As these different systems use different amounts of hot water, BER Assessors will need to be able to identify them in order to account for them correctly in DEAP.

In this section we describe the most common systems, including key features that will help identify the system type in the BER survey.

1.1.1. *Vented hot water system*

This is the most common system in Irish homes. It is shown schematically in the Figure 1.

In this system the HW cylinder is heated by a boiler or heat pump or immersion, or a combination of these systems. It may also be heated by a solar thermal system.

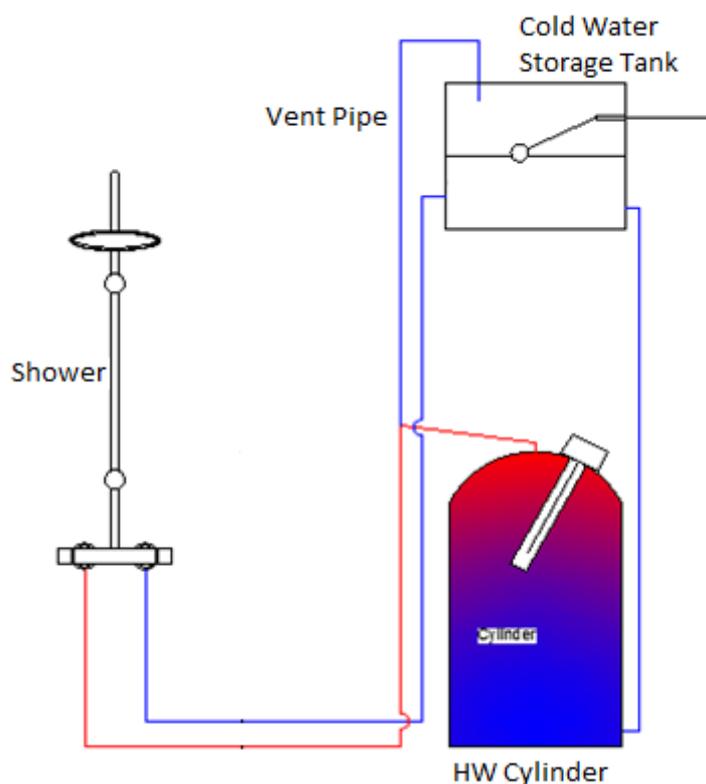


Figure 1 - A schematic diagram of a Vented Hot Water system.

The key feature for identification is the Vent Pipe which rises from the pipework adjacent to the hot water cylinder and terminates over the cold water storage tank.

The key features for identification of the Vented HW system are as follows:

A Vent Pipe: Water is drawn from the cylinder through a horizontal pipe exiting at or near the top of the cylinder. In a vented system this pipe will connect to a vent pipe, which extends vertically upwards (Figure 2). The vent pipe is there to allow any excess hot water to drain off safely into the cold water tank and to let any trapped air escape.

The vent pipe terminates over the cold water storage tank (Figure 3).

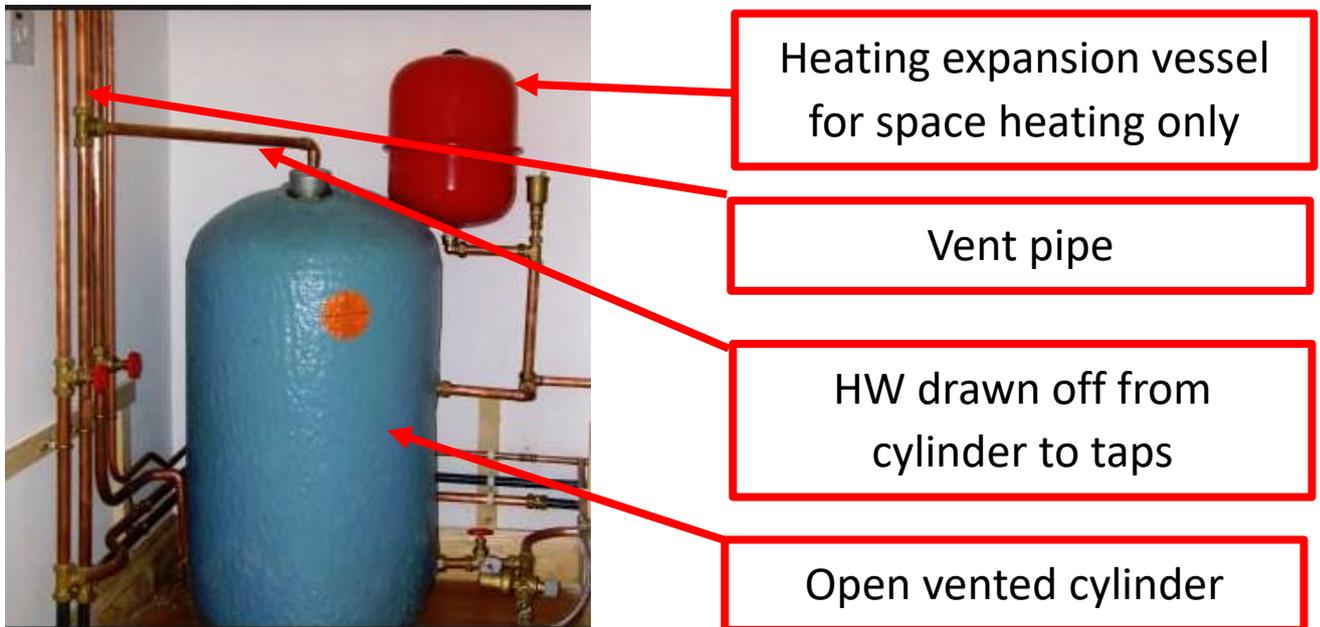


Figure 2 - A photograph of a Vented Hot Water system.

Note,

- the HW Cylinder,
- the horizontal pipe through which hot water is drawn-off from the cylinder,
- the Vent Pipe which rises from the pipework adjacent to the hot water cylinder and terminates over the cold water storage tank.



Figure 3 - A vent pipe terminating over the cold water storage tank.

The presence of the vent pipe indicates that this is a vented system.

Hot Water Pump: The vented system can work with or without a pump. Assume the most conservative value, i.e. that there is a pump on the shower, unless you can show otherwise.

1.1.2. Unvented hot water system

The unvented hot water system is less common in Ireland than the vented system but it is seen in newer installations often in combination with newer technologies such as heat pumps. The unvented hot water system is shown schematically in Figure 4.

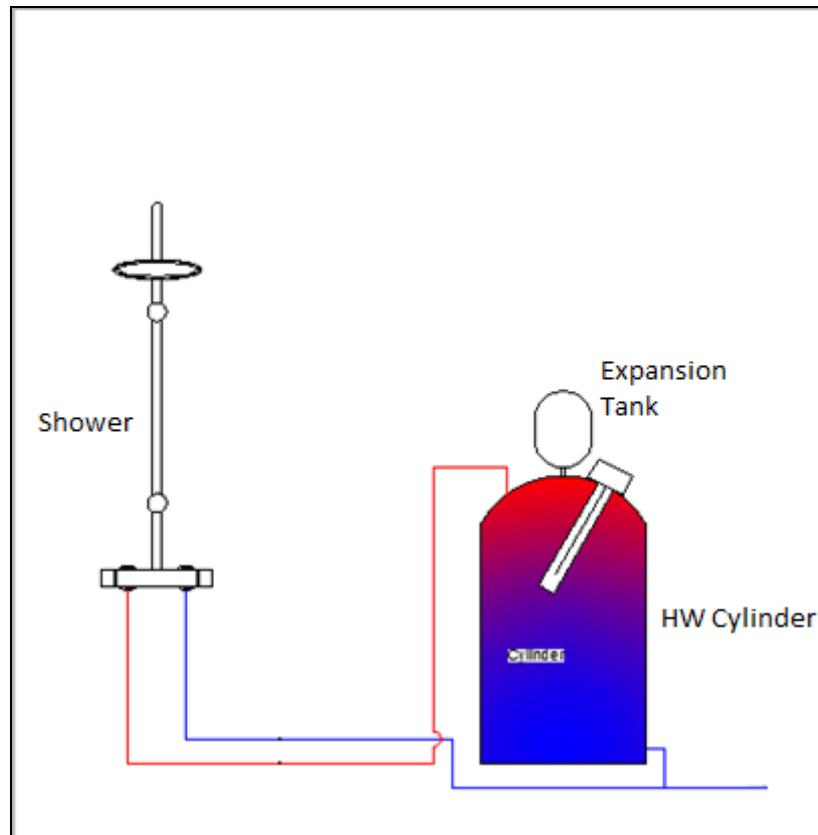


Figure 4 – A schematic diagram of an Unvented Hot Water system.

The key features for identification of the unvented HW system are as follows (see Figure 6):

- **No vent pipe:** As it is not a vented system there will not be a vent pipe rising to the cold water storage tank.
- **Expansion Vessels:** There should be an expansion vessel present to allow for the expansion of water as it heats. Expansion vessels on the space heating system are usually red whereas expansion vessels on unvented water heating systems would usually be blue or white, as in the picture below. However, it is best to double check which pipework the expansion vessel is connected to.



Figure 5 – Expansion vessels for unvented systems. The white and blue vessels are used on water heating systems whereas the red is used for space heating.

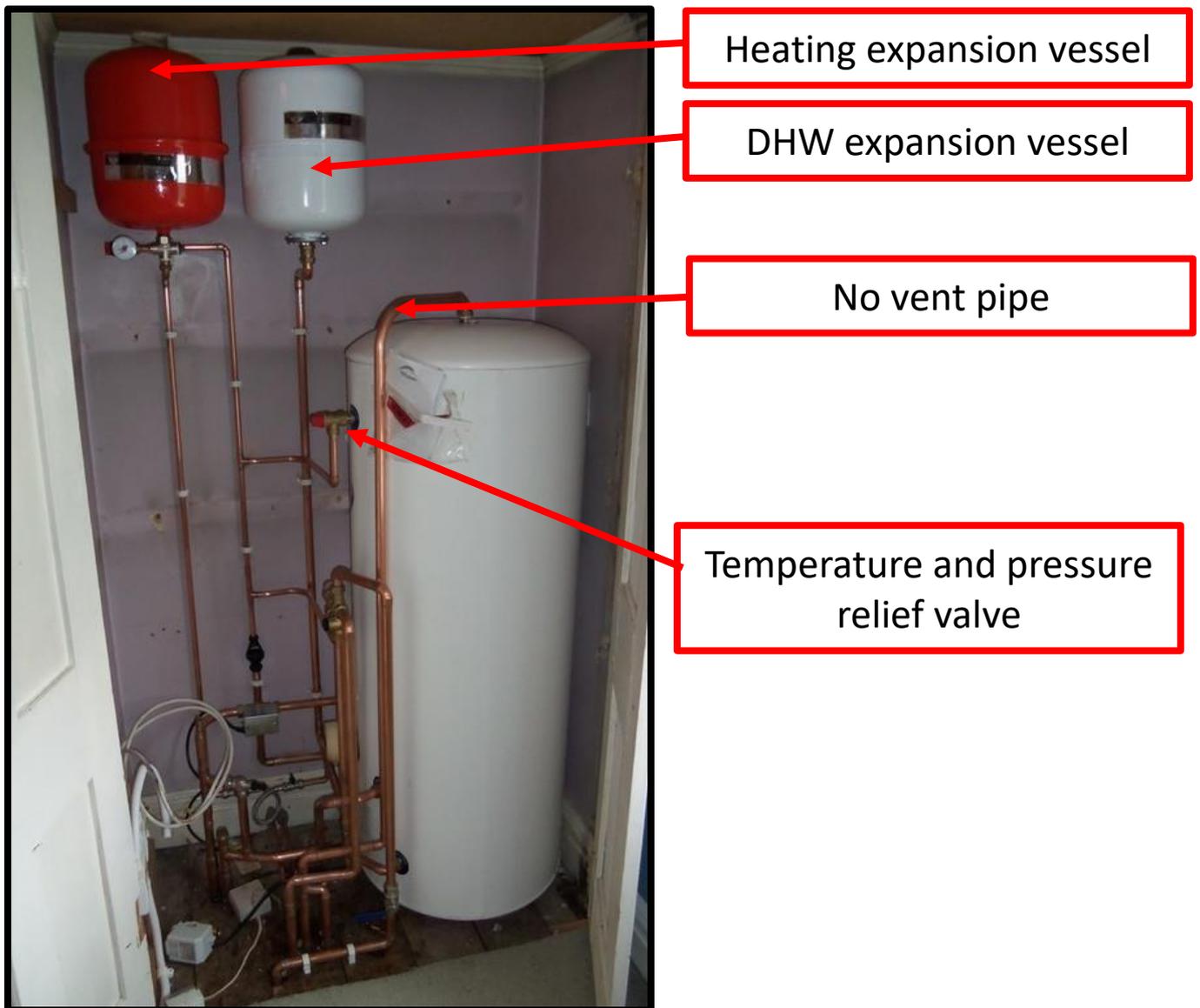


Figure 6 – An Unvented Hot Water System

- **Temperature and Pressure Relief Valve:** In order to prevent the water pressure from building to unsafe temperature and pressure levels, the system has a relief valve installed on the cylinder.



Figure 7 – A Relief Valve installed on a hot water cylinder.

- An unvented system can operate with or without a cold water storage tank, so this is not generally a decisive factor in identifying the system type.

1.1.3. Instantaneous electric shower

An electric shower is a device which uses electrical power to heat *cold* water at the point-of-use, i.e. cold water is heated in the shower unit which is generally located on the shower wall. It does not draw water from a hot water cylinder. The electric shower system is shown schematically in Figure 8.

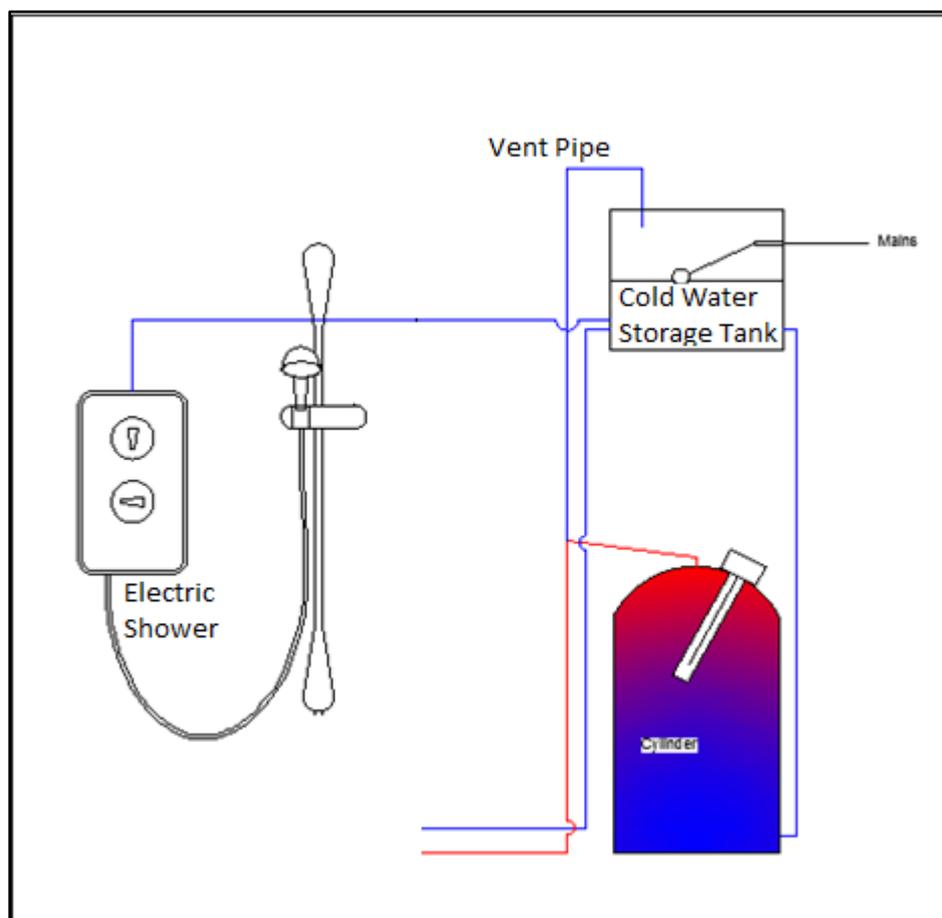


Figure 8 – A schematic diagram of an Electric Shower.

The key features for identification of the Electric Shower system are as follows:

- **Wall unit:** There will be a unit on the shower wall, with controls to adjust the temperature and flow-rate of the water. See Figure 9.
- **Single supply pipe:** An electric shower has a cold water supply only, i.e. it does not take hot water from the DHW cylinder (or from any other source). If the pipework is visible then there should only be one pipe supplying water to the unit.



Figure 9 – An electric shower.

The wall unit in which the water is heated.

- **Isolator Switch:** Because of the high power rating of electrical showers there will typically be an isolator unit present. It is often located on the ceiling and switched on using a pull-cord, or it can be located on a wall at the entrance to the bathroom/en-suite as shown in Figure 10.



Figure 10 – A wall-mounted isolator switch (left), and a ceiling-mounted isolator switch (right) for an electric shower.

1.1.4. Power Showers

A power shower is a unit that pumps hot and cold water to the shower.

It does not heat the water. As such it is a mixer shower; it is not an electric shower.

It should be entered as a Mixer Shower – Vented hot water system + pump.

It can be difficult to distinguish between power showers and electric showers.

If the pipework is visible, a power shower has 2 supply pipes (hot and cold) whereas an electric shower only has one (cold).

Otherwise the best approach is to look for a manual, which are widely available online.

1.1.5. Shower heated by a Combi boiler or CPSU

A shower that gets its hot water from a Combi boiler or CPSU should be entered as a Mixer Shower supplied by an Unvented Hot Water system.

1.1.6. Shower supplied by a Thermal Store

A shower that receives its hot water from a thermal store rather than a cylinder should be entered as a Mixer Shower supplied by an Unvented Hot Water system.

1.2. Entering Default shower Data into DEAP 4.2

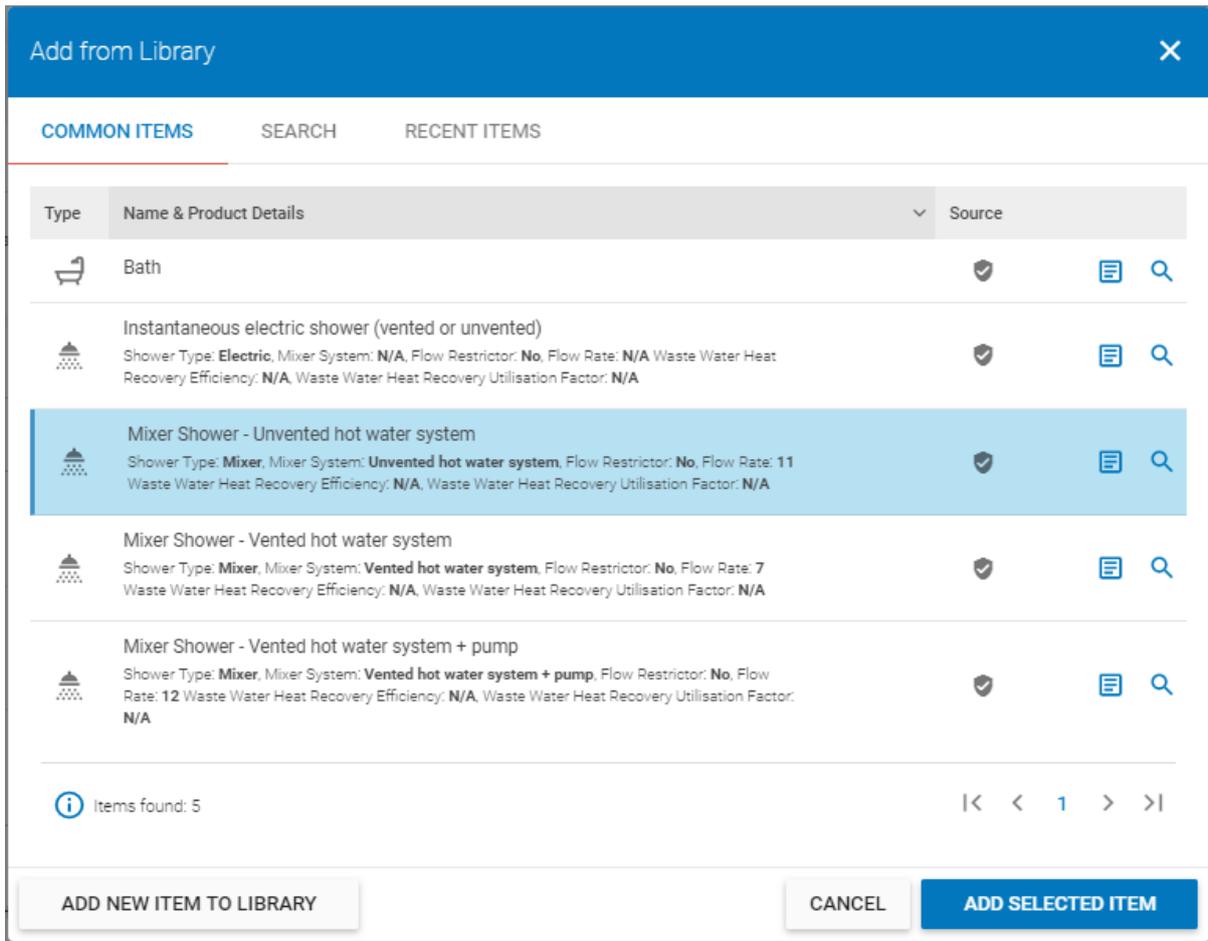
In most BERs, particularly for existing dwellings, there is likely to be little or no information available on the showers in a dwelling. To simplify data entry for those cases, there are 4 default shower types available in the DEAP Library:

- Instantaneous electric shower,
- Mixer Shower – Vented hot water system,
- Mixer Shower – Vented hot water system + pump,
- Mixer Shower – Unvented hot water system.

To add a shower, in Water Heating select the option to “Add Showers & Baths”:

The screenshot shows the 'Showers & Baths' section of the DEAP 4.2 software. At the top, there are tabs for 'OPTIONS & STORAGE', 'SOLAR', and 'HEAT SOURCE'. Below these, the 'Showers & Baths' section is active, displaying a table with the following columns: Count (with a dropdown arrow), Room, Name, Description, Type, Mixer System, Flow Restrictor, Flow Rate, Waste Water Heat Recovery Efficiency, and Waste Water Heat Recovery Utilisation Factor. A red box highlights the '+ ADD SHOWERS & BATHS' button located at the bottom right of the table area.

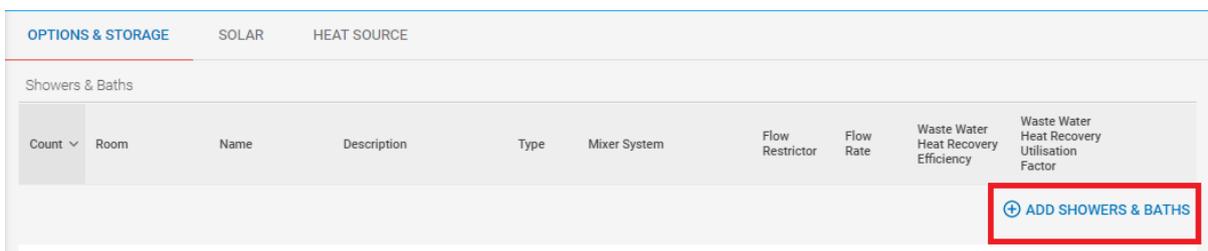
In the search screen that pops up select the appropriate line,



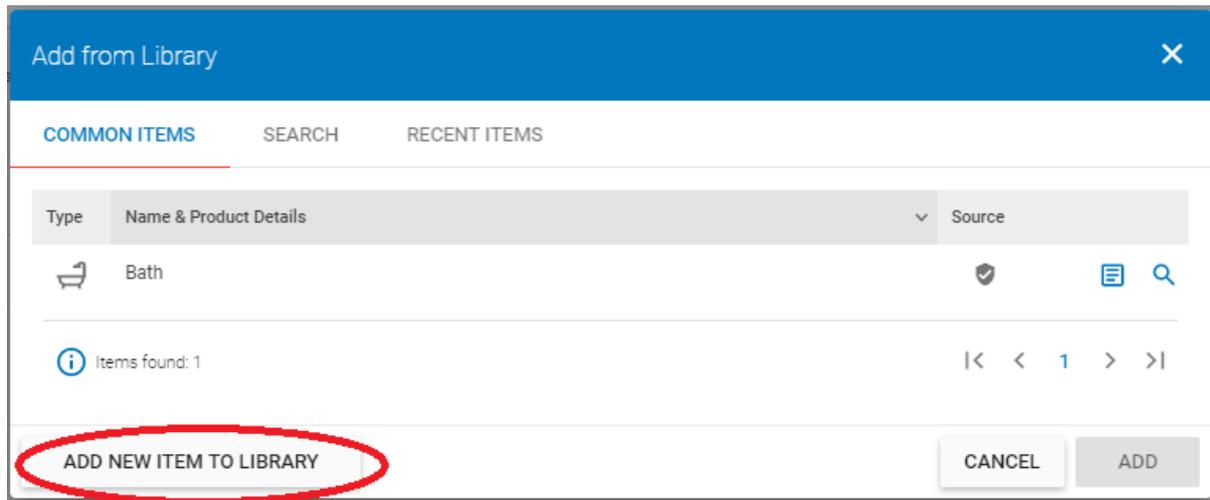
and click “Add Selected Item” to add it to the BER.

1.3. Entering Non-Default Shower Data into DEAP 4.2

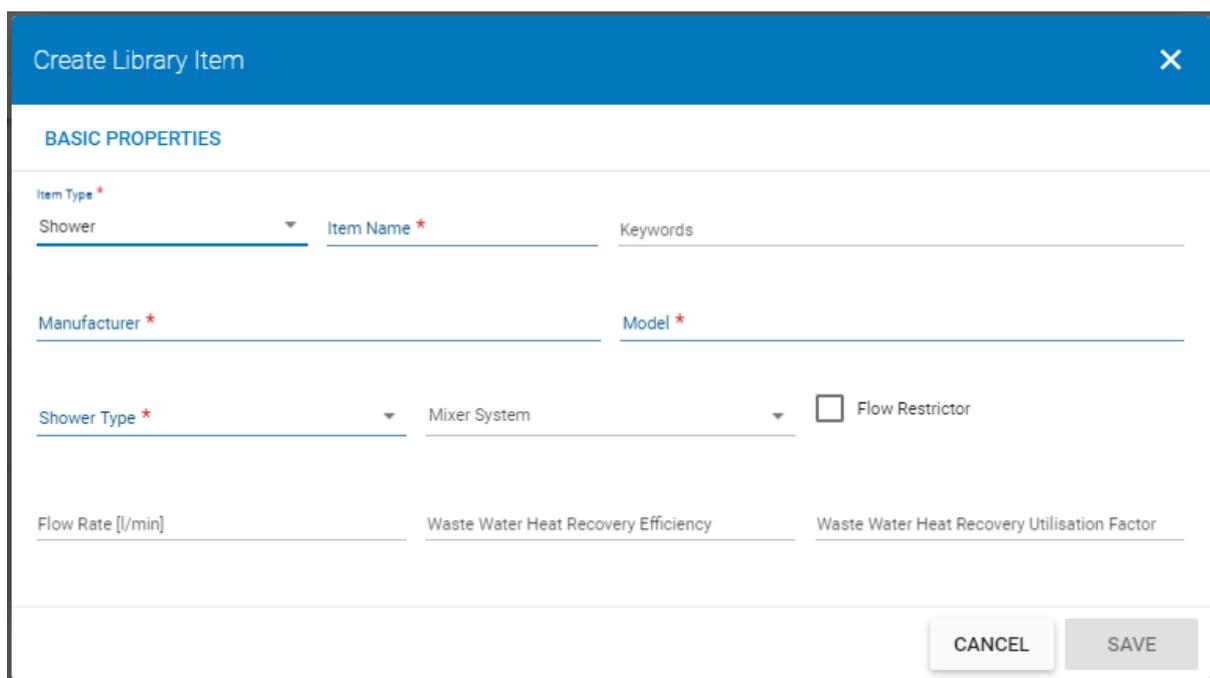
To add a shower, in Water Heating select the option to “Add Showers & Baths”:



In the Search screen that pops up, to create a new shower select the option “Add New Item to Library”:



The data entry page for a shower is as follows:



The following fields are text descriptions of the shower:

- Item Name – the name given to this shower in the DEAP Library,
- Manufacturer – the shower manufacturer,
- Model – the shower model.

Shower Type

There are 2 options in the dropdown:

- Electric – select this option for instantaneous electric showers;
- Mixer – select this option for all other shower types.

Note that for instantaneous electric showers no further information is required.

Mixer System

When you select ‘Mixer’ as the Shower Type you will need to select the Mixer System. There are 3 options to choose from based on the identification of the system as described in Section 1.1:

- Vented Hot Water System,
- Vented Hot Water System + Pump,
- Unvented Hot Water System.

Flow Rate

The flow rate is the amount of water flowing through a shower, measured in litres/minute.

When you choose a mixer type, DEAP will set a default Flow Rate for the shower, as follows:

Mixer System	Default Flow Rate (l/min)
Vented Hot Water System	7
Vented Hot Water System + Pump	12
Unvented Hot Water System	11

It is possible to enter a *non-default* flow rate for a shower as described later in this section.

Flow Restrictors

A Flow Restrictor is a device used to reduce the rate of water flow through a shower. In order to be considered in DEAP, a flow restrictor must be permanently fitted, i.e. cannot be removed without the use of tools. The European Water Label product database - see <http://www.europeanwaterlabel.eu/> - has a database of flow restrictors.

In DEAP, where a flow restrictor has been fitted permanently to a shower, the “Flow Restrictor” checkbox should be ticked.

This sets the default Flow Rate to 6 litres/minute for all mixer types.

A non-default Flow Rate can be used when there is evidence to substantiate it, e.g. a technical data sheet with a CE-marking, or, where the product is listed on the European Water Label product database.

Create Library Item

BASIC PROPERTIES

Item Type * Shower
Item Name * Test Shower #1
Keywords Mixer shower

Manufacturer * Test Manufacturer
Model * Test Shower Model

Shower Type * Mixer
Mixer System Vented hot water system
 Flow Restrictor

Flow Rate (l/min) 6
Waste Water Heat Recovery Efficiency
Waste Water Heat Recovery Utilisation Factor

CANCEL SAVE

Non-default Flow Rates

Where sufficient data is available it is possible to use a non-default flow rate for a shower.

The flow rate depends on the shower unit and on the pressure of the water supplied to the unit. So, in order to use a non-default flow rate for a shower, an Assessor would typically need the following,

- Shower data sheet – showing the flow rate across a range of pressures – and with;
 - A CE-marking;
 - Test standard - EN 1112:2008.
 - European Water Label product database - see <http://www.europeanwaterlabel.eu/>
- Pump datasheet – showing the water pressure the pump is capable of providing – and with,
 - A CE-marking;
 - Test standard - BS 5000-11:2008.
 - European Water Label product database - see <http://www.europeanwaterlabel.eu/>

Example

In a house where the following shower and pump installed:

EUPHORIA SYSTEM 160
Shower system with thermostat
for wall mounting
MODEL # 27296000

*Pure Freude
an Wasser*

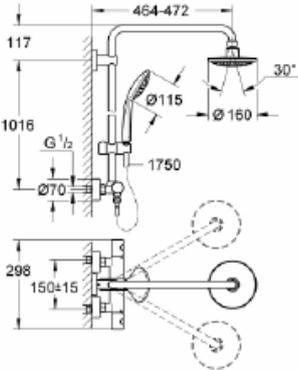




Product Description:
EUPHORIA SYSTEM 160
Shower system with thermostat for wall mounting

Standard Specification:
consisting of:
horizontal swivable 450 mm shower arm
exposed thermostat with Aquadimmer function
allows change between:
head shower Euphoria Cosmopolitan 160
(28 232 000)
spray pattern: Rain
with ball joint
rotation angle ± 15°
hand shower Euphoria 110 Mono (27 265 000)
adjustable in height with gliding element (12 140 000)
Silverflex shower hose 1750 mm (28 388)
minimum flow rate 7 l/min
GROHE DreamSpray perfect spray pattern
GROHE StarLight chrome finish
GROHE TurboStat compact cartridge with wax
thermoelement
SpeedClean anti-lime system
suitable for instantaneous heaters from 18 kW/h

Color:
 27296000 chrome



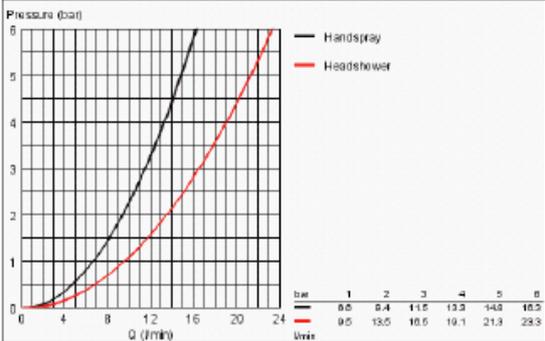


Figure 11 – The shower system.

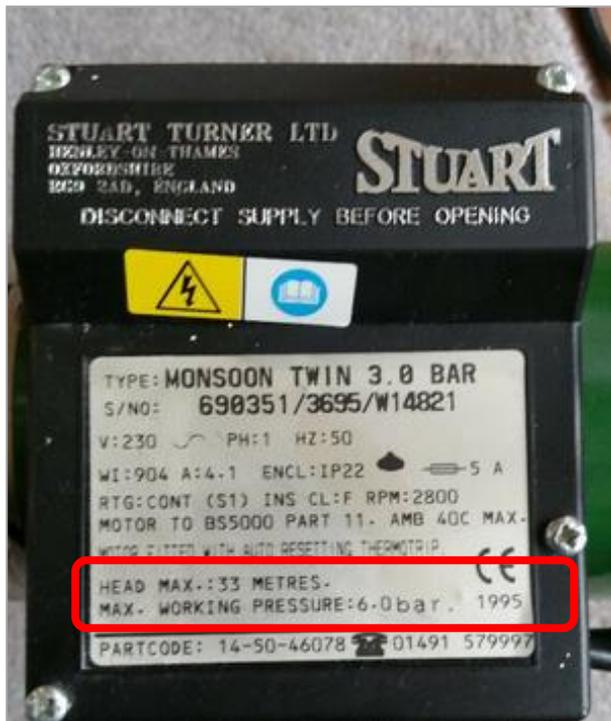


Figure 12 - The pump data plate – Maximum Pressure is 6 bar.

The pump brochure has the following graph of Flow vs. Pressure:

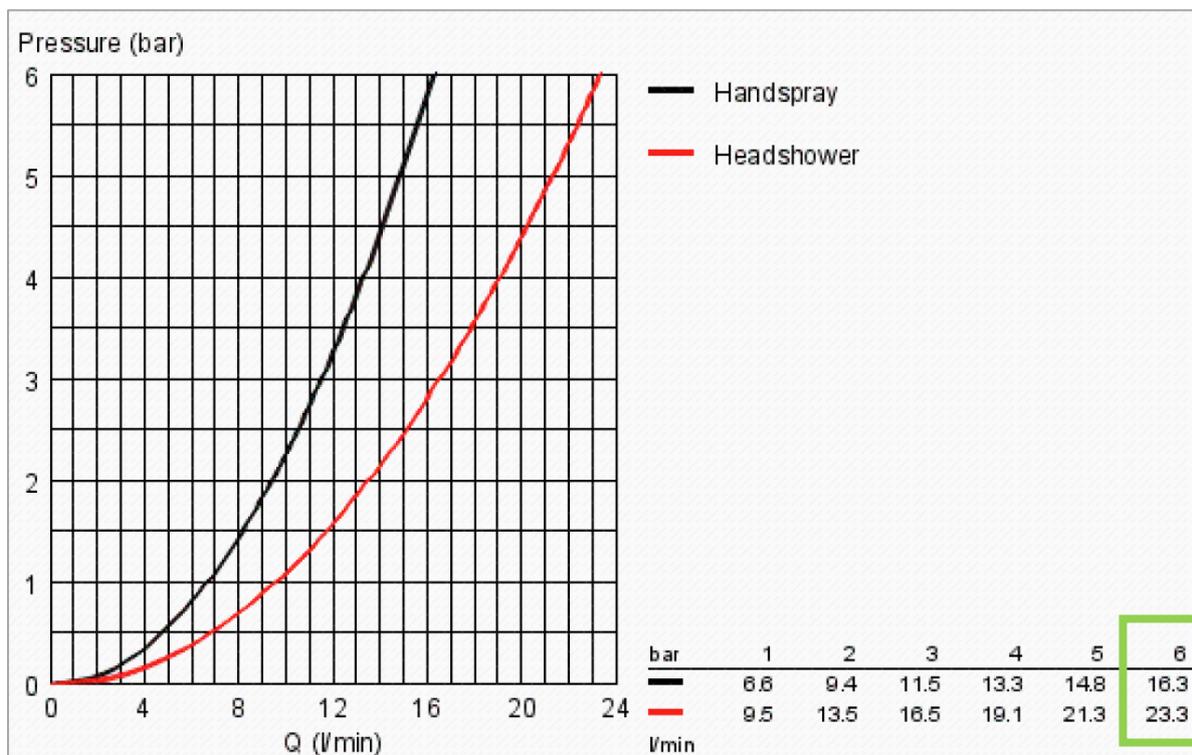


Figure 13 – The pump’s performance graph

At a pressure of 6 bar (the maximum pressure from the pump) the flow rate is 23.3 l/s.

In this case the shower has 2 outlets: a fixed shower head, and, a hand held shower head, which have different flow rates. In such scenarios the larger flow rate should be used.

This can be entered in DEAP 4.2 as follows:

Figure 14 – Entering the non-default flow rate

Note that the Flow Rate must be a whole number so 23.3 is rounded to 23 litres/min.

Waste Water Heat Recovery

A waste water heat recovery system uses a heat exchanger to recover heat from waste warm water as it flows through the waste plumbing system. It uses the recovered heat to pre-heat the cold water feed of a shower and a combi boiler or mains pressure hot water system (thermal store or unvented cylinder).

The energy recovered depends on the temperature of the cold water feed to the dwelling and type of systems that are installed.

WWHR systems are accounted for in DEAP 4.2 where they are linked to mixer showers, not for electric showers. There are three types of plumbing arrangements for WWHR systems:

- **System A:** output of the heat exchanger is fed to *both* the shower *and* the combi boiler or hot water system;
- **System B:** output of the heat exchanger is fed to the shower only;
- **System C:** output of the heat exchanger is fed to the combi boiler or hot water system but not to the shower.

To account for a WWHR system in DEAP 4.2 the following data is required:

- **Efficiency of WWHR:** this measures the efficiency of the heat recovery unit;
- **Utilisation Factor:** this takes account of shut-down and start-up losses. It is expressed as a factor between 0 and 1.

A WWHR system can only be entered in DEAP 4.2 if it is listed on the Product Characteristics Database (PCDB): <https://www.ncm-pcdb.org.uk/sap/index.jsp>

For each product listed on the PCDB, the data is given for each of the 3 possible system arrangements described: System A, System B, System C.

Example

For a New-Provisional BER, the specification, signed-off by the Architect, states that the shower in the main bathroom will use a Megaflo SHRU 60 WWHR system in a “System B” configuration. This system is listed on the PCDB:

Type	Index number	Status
Waste water	080106	Normal
Brand	Model name	Model qualifier
Megaflo	SHRU 60	System B
Efficiency (%) [2009]	46.2	
Efficiency (%) [2012]	44.9	
Utilisation factor [2009]	0.968	
Utilisation factor [2012]	0.963	

Figure 15 – WWHR data from the PCDB

which would be entered in DEAP 4.2 as follows, with the numbers rounded to 2 decimal places.

Figure 16 – Entering WWHR data

For a New Provisional or New Final BER, the presence of the WWHR system may be substantiated in a specification document signed-off by the architect, engineer, or assigned certifier for the dwelling.

For an Existing BER, the presence of the WWHR system may be substantiated by invoices/receipts that clearly identify the system and dwelling address, or, a signed-off statement on headed-paper from the installer detailing the same.

1.4. Baths

In DEAP 4.2 each bath present in the dwelling should be accounted for.

To add a bath, in Water Heating select the option to “Add Showers & Baths”:

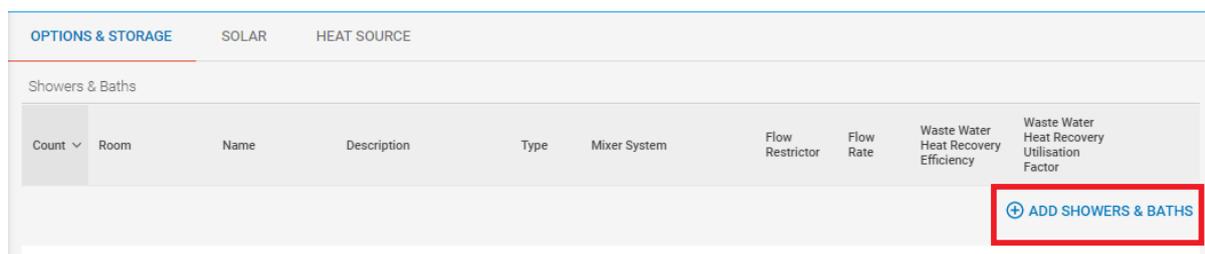


Figure 17 – Adding a bath

In the Search screen that pops up, “Bath” is one of the “Common Items” listed.

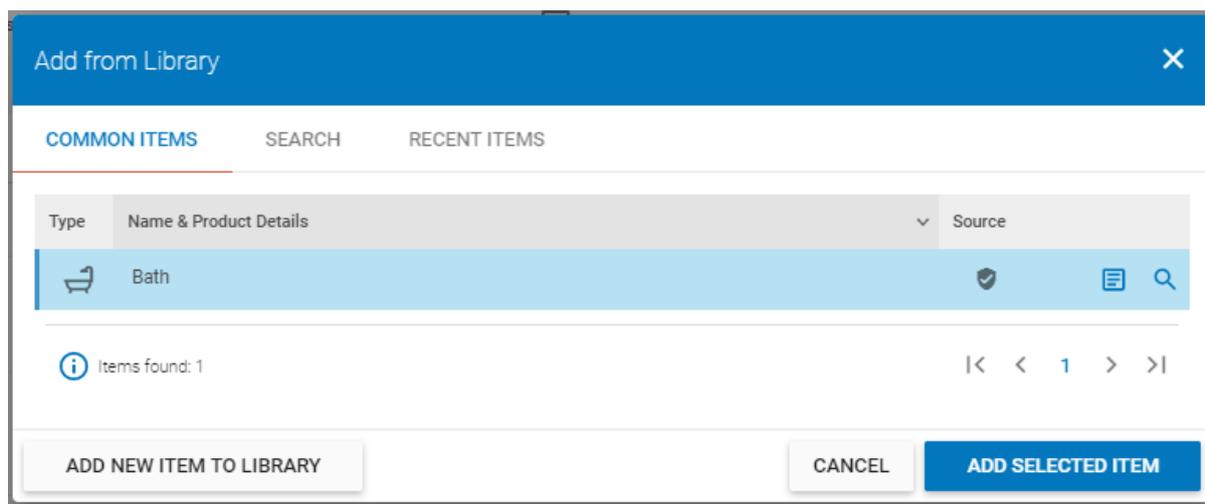


Figure 18 – Adding a bath

Select it and click “Add Selected Item” to continue.

The bath will be added to the dwelling. No further information is required – DEAP will make the necessary adjustments in the background to account for the presence of the bath.

1.5. Low Water Usage

Hot Water Usage in DEAP is reduced by 5% if the dwelling is designed to achieve a water use target of not more than 125 litres per person per day (all water use, hot and cold). The Water Efficiency Calculation Tool (see <https://www.seai.ie/energy-in-business/ber-assessor-support/deap/>) is to be used to assess the water use within the dwelling.

Note that *this is an optional calculation* and does not have to be carried out as part of a BER for a dwelling.

2. Lighting

The method for calculating the energy required for lighting has changed in DEAP 4.2. The new approach accounts for the bulbs present in a dwelling in greater detail and as a result additional information is entered in comparison to previous versions of DEAP.

The information entered into DEAP 4.2 depends on whether the Lighting Design of the dwelling is known. In most cases the Lighting Design will not be known so that case will be dealt with first.

2.1. Lighting Design Not Known

In this case you should *only enter default data for the light bulbs* in the dwelling. Non-default bulb data should not be used.

There are 5 default bulb types in the DEAP Library that must be used in this scenario:

- Default Linear fluorescent,
- Default LED/CFL,
- Default Halogen LV (low voltage),
- Default Halogen Lamp,
- Default Incandescent.

If no bulb is present assume Default Incandescent.

If its not possible to distinguish between a Halogen and Halogen LV (low voltage) lamp, select Halogen.

2.1.1. Entry into DEAP 4.2

In the Lighting page of DEAP, “Is lighting design known?” is left unticked.

On the right hand side of the page, select “Add bulb”:

Count	Name	Description	Room	Bulb Type	Efficiency [lm/W]
<input type="checkbox"/> Is lighting design known?					
<input type="button" value="ADD BULB"/>					

Figure 19 – Lighting Design

This will allow you to add a default bulb from the DEAP Library.

In the DEAP Library a default bulb has been set up for each of the bulb types as can be seen in Figure 20. To add a bulb, select the relevant line in the list and then click “Add Selected Item”:

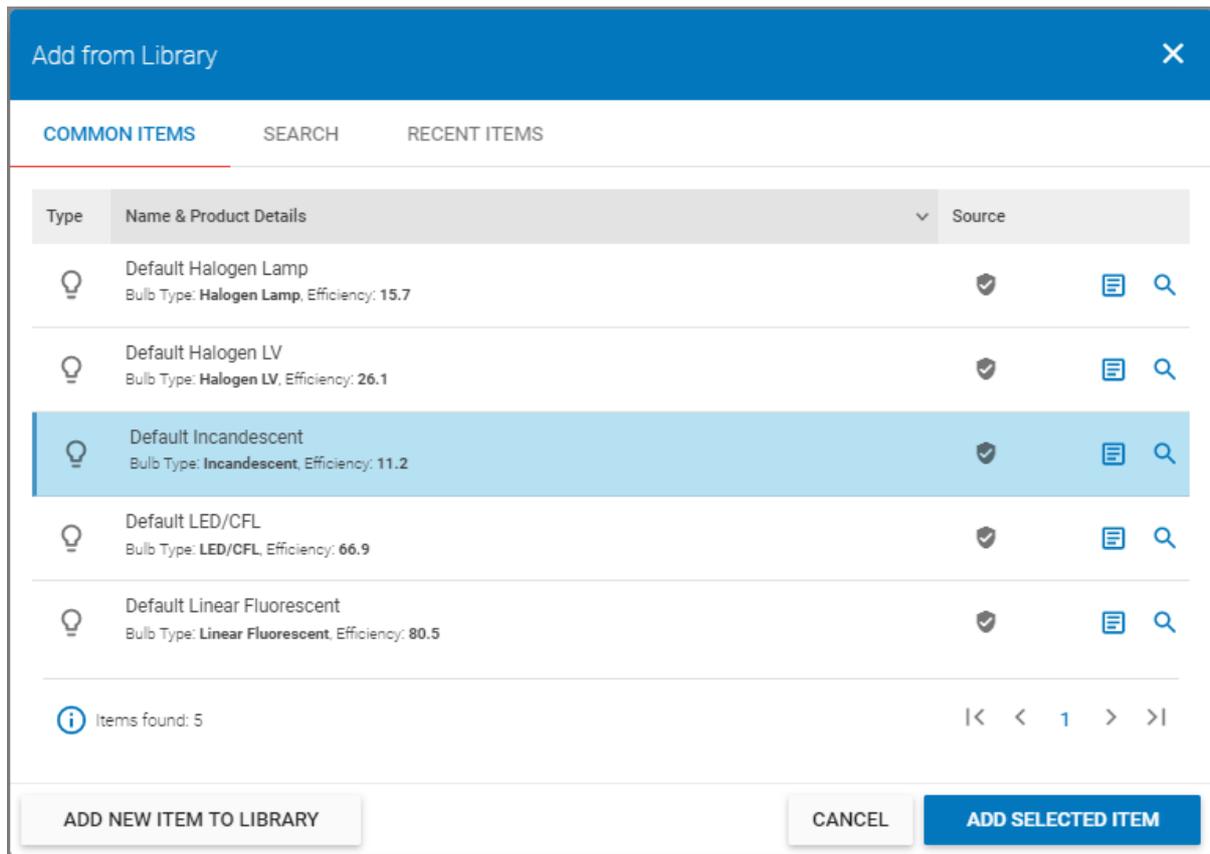


Figure 20 – Adding a Default Bulb

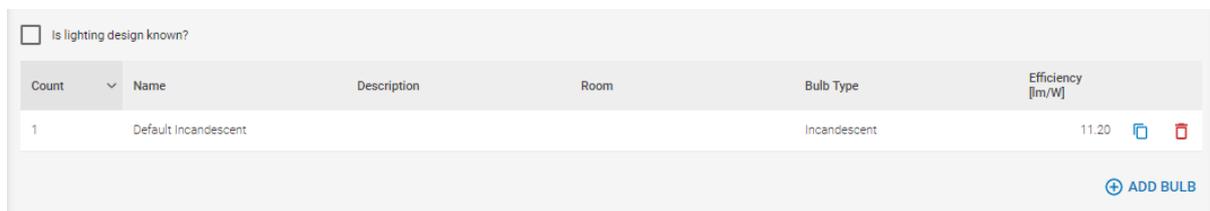


Figure 21 – Bulb has been added

In this example a Default Incandescent bulb has been selected and is then added to the dwelling.

By default it is added with a Bulb Count = 1.

If the number of incandescent bulbs in the house is not equal to 1 then this must be changed.

To do this, click on the item to open the “Edit Bulb” page where you can change the number of bulbs.

Figure 22 – Changing the Number of Bulbs

In this example it has been changed to 5. Click “Save” to save the changes.

This process should be followed for all bulb types identified in the survey of the dwelling.

2.2. Lighting Design Is Known

Where the lighting design is known a similar approach is taken but additional information is required.

2.2.1. Substantiating evidence required

The lighting design for a dwelling should include the following information:

- Lighting Plan: drawings for the dwelling indicating the location of all fixed light fittings.
- Lighting Schedule: this should document the bulb used in each of the fixed light fittings identified in the Lighting Plan.
- Supporting technical documentation: non-default data can only be used where there is supporting documentation indicating the Bulb Power (in Watts) and Bulb Efficiency (in Lumens /Watt). Documentation for bulb efficiency should meet the normal requirements of DEAP, i.e. it should be either,
 - Manufacturer’s documentation with a CE-marking and stating a relevant test standard, or,
 - Accredited test data, as defined in the DEAP Manual, referencing the relevant EN standards.
- The above documentation should be signed-off by the Architect, Engineer or Assigned Certifier.

In a New Final BER survey, if it is clear that the information provided in the Lighting Design does not match the installed lighting, then for the purposes of the BER the lighting design is not known and the guidance in Section 2.1 should be followed.

For example, in all of the following cases, the lighting design is considered to be invalid and default data should be used as per Section 2.1:

- The number of fixed light fittings specified in the lighting design is different from the number identified in the survey;
- Some of the fixed light fittings do not have bulbs installed;
- One or more of the bulbs does not match the lighting design, e.g. what was specified as CFL actually has an LED.

2.2.2. Entry into DEAP 4.2

In the Lighting page of DEAP, “Is lighting design known?” is selected.

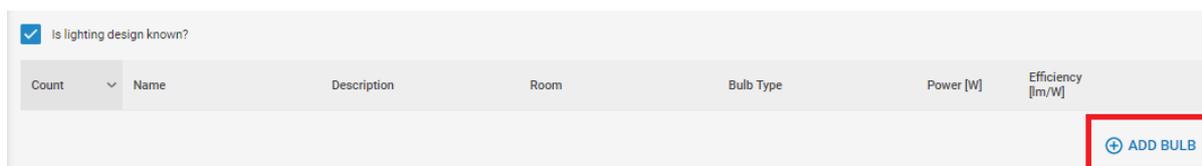


Figure 23 – Adding a Bulb (Lighting Design is known)

As before, to add a bulb select the “Add Bulb” option on the right hand side of the page.

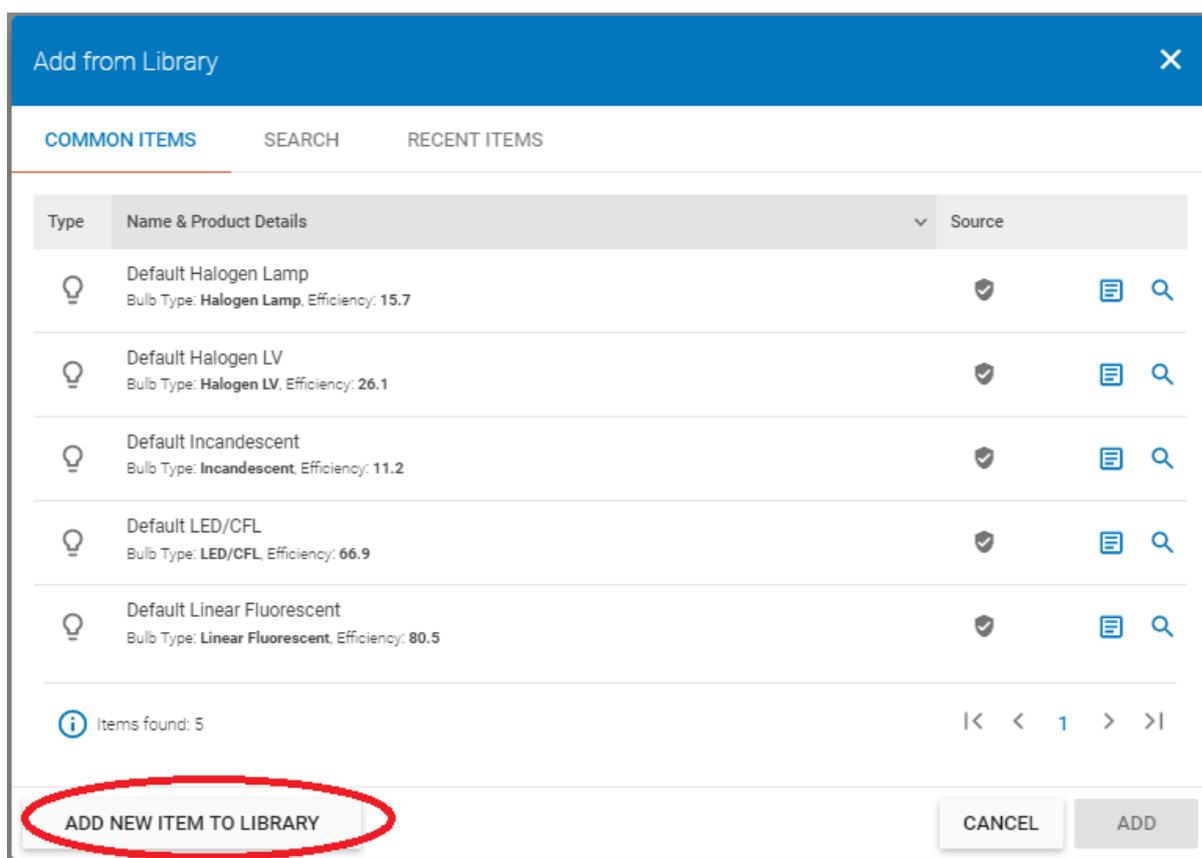
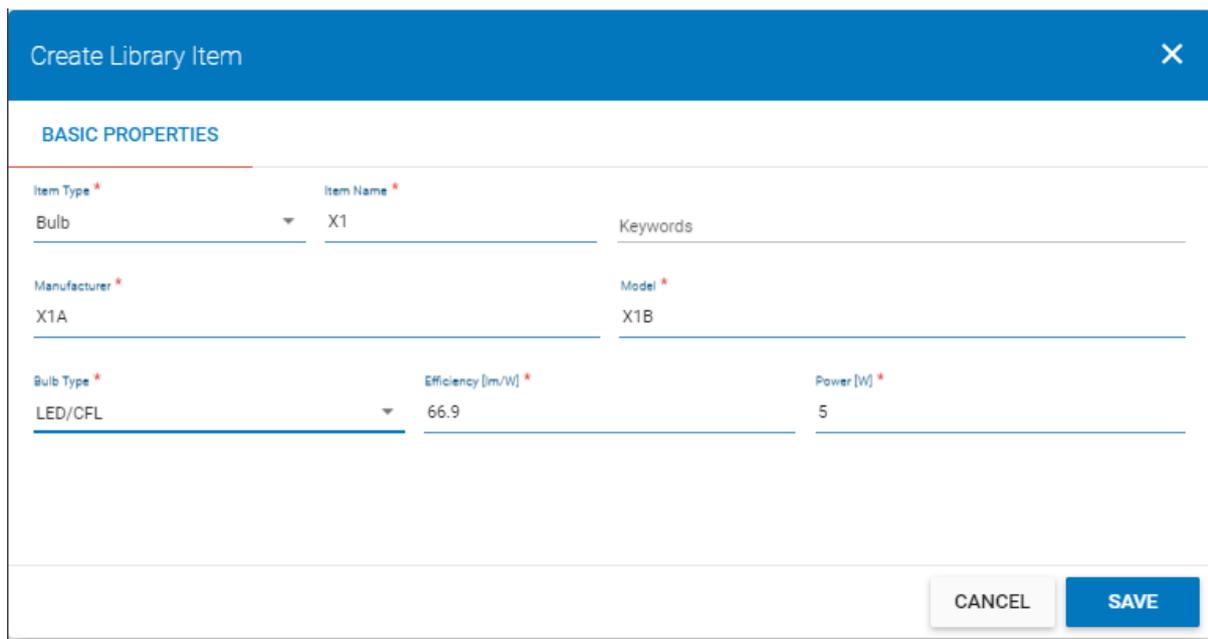


Figure 24 – Adding a new bulb to the DEAP Library

Click “Add New Item to Library” to add a new bulb and then enter the data for the light bulb.

If you have previously added a bulb to the library, you will not have to add it again – you can just search for it in the Search tab. But, for the purposes of this exercise we will go through how to add a new bulb to the Library.



The screenshot shows a 'Create Library Item' dialog box with a blue header and a close button (X) in the top right corner. Below the header is a section titled 'BASIC PROPERTIES'. The form contains several fields:

Item Type *	Item Name *	Keywords
Bulb	X1	

Manufacturer *	Model *
X1A	X1B

Bulb Type *	Efficiency [lm/W] *	Power [W] *
LED/CFL	66.9	5

At the bottom right of the dialog box are two buttons: 'CANCEL' and 'SAVE'.

Figure 25 – Entering non-default bulb data

In order to add a bulb with non-default data you will need to specify,

- Bulb Efficiency (in lumens/Watt)
- Bulb Power (in Watts),

based on data from an appropriate source, as described in Section 2.2.1.

Click “Save” and then “Add Selected Item” to add this bulb to the dwelling.

As before, by default the bulb is added with a Bulb Count = 1.

If the number of these bulbs is not equal to 1 then this must be changed. To do this, click on the item to open the “Edit Bulb” page where you can change the number of bulbs.