

1 Introduction

This technical note outlines the main changes to the interface of the JPA Designer SAP 2012 module for Part L 2013 for England, compared to the SAP 2009 module. The user manual for JPA Designer will be revised to include the SAP 2012 module. Note that the compliance arrangements for Part L 2014 for Wales (coming into force at the end of July 2014) will differ from those for Part L 2013 in England (in force from 6 April 2014).

This note does not describe the changes to compliance arrangements.

2 Managing SAP 2012 calculations

To start a new SAP 2012 calculation go to the **Insert** menu in the **Project Manager** window and select **Dwelling/SAP (V9.92 2012) calculation**.

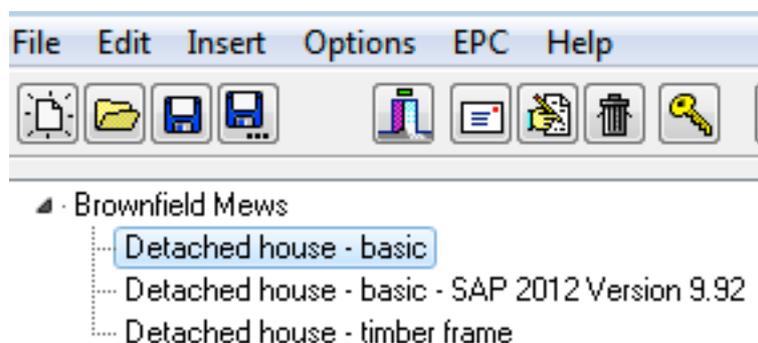


Figure 1: A SAP 2009 and its associated SAP 2012 calculation

To convert a SAP 2009 calculation to SAP 2012:

1. Select the calculation to convert in the **Project Manager** window.
2. From the **Edit** menu select **Copy selected SAP V9.90 2009 dwelling to a V9.92 2012 dwelling**.
3. A new SAP 2012 calculation is created, based on the existing one. It's name is the same as the original, but with - *SAP 2012 Version 9.92* added to the end (Figure 1).
Note: To convert a SAP 9.81 calculation to SAP 9.92 you must first convert it to SAP 9.90.

SAP 2012 calculations are opened in the same way as other calculations by double-clicking their name in the calculation list.

3 Main SAP window

The main **SAP window** is largely unchanged: the only new items being the *Dwelling Fabric Energy Efficiency (DFEE)* and *Target Fabric Energy Efficiency (TFEE)* values which are displayed alongside the *TER* and *DER* (see Figure 2). In order for a dwelling to comply with Part L 2013 the *DFEE* must be equal to or smaller than the *TFEE* and the *DER* equal to or smaller than the *TER*.



Figure 2: The key results for SAP 2012 on the toolbar

4 Project Information and Options dialogue

There are no changes to the data entered in this dialogue. However, you must now enter at least the first block of the post code. If you do not the program will show an error.

This is a result of a change to using post code based, local climate data for calculation of EPC ratings and improvements: without a valid post code the program is unable to calculate the EPC figures.

5 SAP worksheet

The data for the SAP calculation is still entered through the **SAP Worksheet values** dialogue. The order of the tabs and the general arrangement of the dialogue are unchanged.

5.1 Dimensions

There are no changes in the data required for the dwelling dimensions.

5.2 Ventilation

The only change in data entry for the **Ventilation** tab is an expansion of the boxes for specifying chimneys and flues. They can now be assigned to main heating, secondary heating or other systems (see Figure 3). However, it is still the total number which goes forward to the SAP calculation.

	main heating	secondary heating	other
Chimneys	0	0	0
Open flues	0	1	0
Flueless gas fires	0		
Sheltered sides	2.0		
Intermittent fans			3
Passive vents			0

Figure 3: The expanded ventilation selection

5.3 Walls, roofs and floors

There are no changes to the definition of elements, but there has been a small change in the **Calculate Htb** dialogue, where the **Junction type** column now shows the junction reference number, e.g. E14. The numbers match those in SAP 2012 Appendix K and Appendix R.

5.4 Openings

As a result of change in the method of calculating solar gain the calculation now requires the pitch of a rooflight when it is between 0 and 70°. The pitch is entered in the **Pitch**

Junction type	Accredited linear thermal transmittance (W/mK)	Achieved linear thermal transmittance (W/mK)	Detail length (m)	Linear thermal transmittance x Detail length (W/K)
E10 Eaves (insulation at ceiling level) [A]	0.060	0.060	20.000	1.200
E12 Gable (insulation at ceiling level) [A]	0.240	0.240	15.200	3.648

Figure 4: Reference numbers for junction types

box (Figure 5) on the **Doors, Windows and Rooflights** dialogue for each roof light. The pitch should be measured to the nearest 5°.

The pitch data only affects solar gain calculations and has no effect on the U-value of the roof light.

The image shows a software interface with three dropdown menus and one input field. The first dropdown is labeled 'Opening type' and has 'Rooflight at 70° or less' selected. The second dropdown is labeled 'Opening within' and has 'Pitched roofs insulated between joists, roof' selected. The third dropdown is labeled 'Glazing' and has 'Double-glazed, air-filled, low-E, E_n=0.1, soft coat' selected. To the right of these dropdowns is a text input field labeled 'Pitch' with the value '30' entered. The 'Pitch' field is highlighted with a red border.

Figure 5: New box for rooflight pitch data

5.5 Water heating

The **Water heating** tab has changes to the treatment of primary pipework and solar thermal systems.

5.5.1 Primary pipework

The calculation of losses from primary pipework (the pipework separating a source of domestic hot water from a storage vessel) has been revised and assessors must record the extent to which the pipework is insulated. The requirement applies to indirect cylinders and stores connected by *uninsulated pipework* or *more than 1.5 m of insulated pipework*: that includes

- *hot water storage tank* with boiler feed;
- *community heating scheme*;
- *multi-point water heater*;
- *boiler with thermal store*;

Hot water tank heater

Single immersion heater From 2nd main heating system
 Dual immersion heater From secondary heating system
 Boiler feed Summer immersion heater

Hot water only boiler
 [Dropdown menu]

Fuel [Dropdown menu]

Cylinder in heated space
 Cylinder thermostat* Override heat pump database values

DHW vessel within micro-CHP
 Separate timer for domestic hot water

Primary insulation* [Dropdown menu: Uninsulated primary pipework]

Figure 6: The **Primary insulation** list

- *CPSU*.

The **Primary insulation** (Figure 6) offers four levels for the insulation level of primary pipework.

5.5.2 Solar panels

There are two changes to the treatment of solar thermal panels which heat domestic hot water. First, the calculation method for panels has changed, following a move to use data conforming to BS EN 12975--2; the heat loss from the collector is now assessed by two heat loss coefficients, which should improve the accuracy of results for panels with less insulation and a sharper efficiency curve¹.

The solar panel data now includes a new field: **second order collector heat loss coefficient** (see Figure 7). The data for the second order coefficient should be provided on any data sheet for panels products. The value will be small, typically around 0.01–0.04. If you are using the default data for panels which is built into JPA Designer the program will still complete all the data fields for the panels.

¹For an explanation of the change see: http://www.viridiansolar.co.uk/Briefings/Solar_Panel_Efficiency_in%20SAP_2009_Second_Order_Coefficients.pdf

Solar panel details	
Aperture area of collector (net) (m ²)	2.40
Zero-loss collector efficiency	0.60
Collector heat loss coefficient	3.00
2nd order collector heat loss coef.	0.00000
Dedicated solar storage (litres)	30.00

Separate solar cylinder Declared values

Figure 7: The new **2nd order collector heat loss coefficient box**

In a second change, the benefit of water heating by solar thermal panels is now adjusted according to the type of showers present in the dwelling. The data is entered by selecting a value from the new **Showers** list (Figure 8). Values are:

- No shower (bath only)
- Non-electric shower(s) only
- Both electric and non-electric showers
- Electric showers only

The selection here is separate from any data entered for a Waste Water Heat Recovery System.

Direction <input checked="" type="radio"/> South <input type="radio"/> SE/SW <input type="radio"/> East/West <input type="radio"/> NE/NW <input type="radio"/> North	Overshading <input type="radio"/> Heavy (>80 % sky blocked) <input type="radio"/> Significant (>60-80 % sky blocked) <input type="radio"/> Modest (20-60 % sky blocked) <input checked="" type="radio"/> None or very little (<20 % sky blocked)
<input checked="" type="checkbox"/> Solar powered pump	Showers Both electric and non-electric st ▼

Figure 8: The **Showers** list

5.5.3 Dedicated community hot water systems

It is now possible to enter a calculated distribution loss value for a community heating scheme which provides only domestic hot water. To enter a calculated value:

1. In the **Distribution** list select *Calculated* (item 1 in Figure 9).
2. Enter the loss figure in the adjoining box (item 2 in Figure 9).

Figure 9: Setting a calculated distribution loss

5.6 Primary heating tab

There are a number of minor changes on the **Primary heating** tab.

5.6.1 Two main heating systems

Where dwellings have two main heating systems there is now an option for both systems to share the same central heating pump. This is indicated with a new tick box: **System 2 uses System 1's pump** (see Figure 10). Ticking the box will slightly reduce electricity use and emissions.

Figure 10: Setting two heating systems to share one pump

5.6.2 Central heating pumps

There are two other changes to the data for central heating systems with pumps:

- The item **Central heating pump in heated space** has been reworded (previously it was **Pump in heated space**).
- There is a new box **Central heating pump 2013 or later** (item (2) in Figure 11), which should be ticked for a new dwelling. Ticking the box will reduce the energy use for pumps and fans and reduce internal heat gains from the pump.

5.6.3 Design flow temperature

In SAP 2012 the use of wet heating systems with low distribution temperatures brings improvements in the operating efficiency of condensing boilers. Table 1 sets out the percentage improvements in efficiency associated with different temperatures. The improvements only apply to condensing boilers. The improvements associated with load and weather compensators are obtained from the PCDF record for the compensator.

Table 1: Efficiency adjustments for design flow temperatures

Boiler features	Efficiency adjustment (%)	
	Natural gas	Oil/LPG
Load and/or weather compensator	as database	
Flow temperature limited to 45°C	+2.4	+1.6
Flow temperature limited to 35°C	+3.0	+2.0
Boiler with thermal store	0	0

The temperature is set using the new **Design flow temperature** in the **Primary heating** tab (item (3) in Figure 11). Where there flow temperature is not limited to 45°C or there is no data you should select >45°C rather than *unknown*.

Reducing the design flow temperature will improve (reduce) the DER.

5.6.4 Heating controls

The **Heating controls** have also been expanded, with a new option for heating controls by device from database. This is to address compatibility of control devices with the chosen boiler.

In a minor revision of the software, the *Source of Efficiency* section is only displayed once the **System** has been specified.

Heat emitters

- Radiators
- Underfloor, pipes in concrete slab
- Underfloor, pipes in insulated timber floor
- Underfloor, pipes in screed above insulation
- Fan coil units

- Underfloor heating also has radiators
- Central heating pump in heated space **1**
- Central heating pump 2013 or later **2**

- Boiler has load or weather compensator
- Enhanced load compensator
- Boiler Interlock

- Separated conservatory with fixed heater

Design flow temp. **3**

Figure 11: Changes to heat emitter inputs

5.6.5 Boiler efficiency

For gas and oil boilers it is no longer acceptable to use a manufacturer's declared SEDBUK value for the *as-built* submission: the efficiency must either be the default value, or be taken from the PCDF (the *boiler database*).

5.6.6 Heat pumps

Where a heat pump which is not listed in the PCDF (the 'database') is installed under the Microgeneration certification scheme the default efficiency values given in SAP Table 4a are increased by installation factors which reflect the improved efficiency obtained by complying with the MIS installation standard MIS 3005. The factors, may only be applied when an MCS certificate has been supplied to the assessor by the installer.

To apply the installation factors in the SAP 2012 module tick the **MCS installed heat pump** box ((Figure 12).

5.6.7 Community heating schemes

It is now possible to use a calculated values for the distribution loss factor for community heating schemes where the default conditions given in Table 12c of the SAP document

Figure 12: Indicating a heat pump is installed to the MCS

do not apply.

Figure 13: Entering a calculated distribution loss factor

To apply calculated loss factor:

1. From the **Heat distribution system** list select *Calculated* (item 1 in Figure 13).
2. Enter the loss factor in the adjoining box (item 2 in Figure 13).

The method of calculating a distribution loss factor is set out in Appendix C3.1.

5.7 PV & Alt Tech

It is now possible to enter three different sets of PV panels. A new tick box is used to indicate if the output from the panels is connected to the electricity meter in the dwelling. This is to implement the conditions for SAP 2012 Appendix M1 for flats. Where panels are connected to the dwelling's meter the PV output will affect CO₂ and SAP ratings, otherwise the output of the panels only affects CO₂ ratings.

	Peak kW	Pitch	Direction	Overshading	Connected to electricity meter
1.	4	30 degrees	East/West	None or very little (<20 % sky blocked)	<input checked="" type="checkbox"/>
2.	0.00			Heavy (>80 % sky blocked)	<input type="checkbox"/>
3.	0.00			Heavy (>80 % sky blocked)	<input type="checkbox"/>

Figure 14: PV panels connected to electricity meter

6 Viewing results

The number of reports available via the **View** menu and the **Sections to print** dialogue has increased to include the following worksheets:

- EPC ratings;
- TER;
- DER;
- Compliance checklist;
- Overheating;
- DFEE;
- Standard case (CSH ENE7);
- Heat demand;
- EPC costs.

The **Sections to print** dialogue also includes the *Input data* report.

7 Further information

Information about JPA Designer may be found at <http://www.techlit.co.uk>.

Technical support by email only to support@techlit.co.uk.

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