PRODUCT CHARACTERISTICS DATA FILE

Version 6b

SPECIFICATION

BRE

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PRODUCT CHARACTERISTICS DATA FILE: SPECIFICATION

CONTENTS

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1 The Product Characteristics Database

1.1 Databases are maintained to help SAP assessors find the correctly calculated seasonal efficiency and other characteristics for heating and other products, and to reduce risk of miscalculation and confusion with other data. They hold data in separate Tables for various products. Entries contain fields to aid product identification, and other technical data relevant to SAP calculations.

1.2 The databases hold information on both current products and obsolete products. Data are submitted by manufacturers. Current products may later be marked as obsolete at the request of the manufacturer.

2 The Product Characteristics Data File

2.1 The Product Characteristics Data File is published monthly and contains data on products in a form readable by SAP software. The structure and contents of the Product Characteristics Data File are defined in Appendix A of this document.

2.2 The Product Characteristics Data File is intended only to assist SAP assessments, and is provided solely for SAP assessors to download to their energy rating computer programs. It holds data in separate Tables on the following product types:

(i) boilers, fired by gas, LPG or oil
(ii) solid fuel boilers, fired by a variety of solid fuels
(iii) cooker boilers with twin burners, fired by gas, LPG or oil
(iv) micro-cogen (also known as micro-CHP), fired by gas, LPG, oil or solid fuel
(v) heat pumps
(vi) warm air heating systems
(vii) storage heaters
(viii) flue gas heat recovery systems (FGHRS)
(ix) heating controls
(x) mechanical ventilation systems
(xi) waste water heat recovery systems (WWHRS)

Both current and obsolete products may be included. Future revisions may include data on other product types. The data file can also include other data that may need to be amended during the currency of a given SAP version, such as fuel prices and in-use factors.

2.3 For boilers, although other data are included, the most important items of information in the Product Characteristics Data File are the SAP winter and summer seasonal efficiencies. For gas and oil boilers, if test data are not available the SAP seasonal efficiencies will be type efficiencies, as given in Table 4b of the SAP specification[1].

2.4 The Product Characteristics Data File is held in computer-readable form on the Internet website **www.boilers.org.uk**, whence it can be downloaded to a SAP assessor's personal computer on request (see also Appendix B of this document).

[1] The Government's Standard Assessment Procedure for Energy Rating of Dwellings, 2012 Edition (version 9.92)

2.5 The Product Characteristics Data File is updated monthly. Each new edition is published on the last working day of each month. Control lines included in the file will make clear the revision number and the date of issue, as explained in A.3. See also 10.5.

2.6 It is essential that SAP assessors use only the latest edition of the Product Characteristics Data File, as new editions may contain not just new entries but corrections to previous ones. Use of an edition more than one month old is a breach of quality control requirements, as consistency between surveys cannot then be assured and calculated SAP results may be invalid.

2.7 For systems whose characteristics are not included in the Product Characteristics Data File, the data needed for calculations are the default values as given the SAP specification[1].

3 SEDBUK

3.1 SEDBUK (*Seasonal Efficiency of Domestic Boilers in the UK)* is a method for calculating the seasonal efficiency of gas and oil central heating boilers, developed and agreed with boiler manufacturers. Its purpose is to identify differences in efficiency between different boilers in such a way that they are recognised and treated fairly in the SAP. The method uses efficiency test results obtained by manufacturers to demonstrate compliance with the European Boiler Efficiency Directive.

3.2 SEDBUK means a seasonal efficiency value for gas and oil boilers that has been obtained using data from specified test procedures and has been calculated in accordance with the method defined in SAP Appendix D. SEDBUK is not applicable to the various other products that are included, or that may be included in the future, within the database. Examples of the latter are:

a gas or oil boiler whose efficiency has been estimated on a generic basis;
a solid fuel boiler;
a micro-CHP unit.

Accordingly the acronym "SEDBUK" should be used only in connection with gas and oil boilers whose seasonal efficiency has been calculated by the prescribed method.

3.3 The basis of the calculation of SEDBUK values was revised for SAP 2009.

4 Efficiency Data for gas and oil boilers (including cooker boilers)

4.1 Although the database will contain other descriptive and technical details as well, all entries must include a SAP seasonal efficiency value. For gas and oil boilers, each entry for a SAP seasonal efficiency value has an “efficiency category”, defined as follows :

(a) *Efficiency category 1 :* SEDBUK based on validated and certified data

Efficiency has been calculated by the SEDBUK method from the results of standard tests defined in the Boiler Efficiency Directive. The results of the standard tests must have been certified by a suitably qualified Notified Body (i.e. an independent test house deemed competent under European rules for boiler testing). The test results have been further amended by a validation process to reduce excessive measurement uncertainties. Subject to verification, the database manager will then calculate seasonal efficiency in accordance with the SEDBUK method and create an entry in the database.

(b) *Efficiency category 2 :* SEDBUK based on certified data

Efficiency has been calculated by the SEDBUK method from the results of standard tests defined in the Boiler Efficiency Directive. The results of the standard tests must have been

certified by a suitably qualified Notified Body (i.e. an independent test house deemed competent under European rules for boiler testing). Subject to verification, the database manager will then calculate seasonal efficiency in accordance with the SEDBUK method and create an entry in the database.

(c) *Efficiency category 3 :* Estimated

Efficiency has been taken from SAP Table 4b, based on boiler type. An earlier version of SAP may have been used. Entries with efficiency category 3 are for obsolete boilers only, which may not comply with the provisions of the Boiler Efficiency Directive.

5 Efficiency data for solid fuel boilers

5.1 Entries can include a SAP seasonal efficiency value. If so, each entry for a SAP seasonal efficiency value has an “efficiency category”, defined as follows :

(a) *Efficiency category 1 :* SAP efficiency from HETAS declaration

Efficiency has been calculated from the results of standard tests and confirmed by HETAS.

(b) *Efficiency category 2 :* SAP efficiency based on certified data

Efficiency has been calculated from the results of standard tests. The results of the standard tests must have been certified by a suitably qualified Notified Body (ie, an independent test house deemed competent under European rules for boiler testing). Subject to verification, the database manager will then calculate seasonal efficiency and create an entry in the database.

(c) *Efficiency category 3 :* Estimated

Efficiency has been taken from SAP Table 4a, based on boiler type. Entries with efficiency category 3 are for obsolete boilers only.

6 Data Tables

6.1 The Data File consists of a number of tables, as follows:

TABLES IN THE DATA FILE		
Table no.	Name	Current format no.
011	Database Amendments Table	021
102	Manufacturers Table	207
105	Gas and Oil Boiler Table	210
122	Solid Fuel Boiler Table	224
131	Cooker Boiler Table	233
143	CoGen Table	243
172	Postcode Table	272
181	Indicative Costs Table	283
191	Fuel Price Table	292
301	Manufacturers Table #2	207
313	Flue Gas Heat Recovery System Table	413
322	Decentralised MEV Table	427
323	Centralised MEV and MVHR Table	426
329	MV In-use Factors Table	430
341	MVHR Duct Table	441
353	Waste Water Heat Recovery System Table	453
362	Heat Pump Table	464
371	Heating Controls Table	471
372	Heating Control Requirements Table	472
381	Warm Air System Table	481
391	Storage Heaters Table	491
501	Community Heat Networks Table	601

Any of the tables may appear more than once; see rules in A.7. In particular, if a table has two or more occurrences with the same format number each instance is read and their contents merged.

7 Identification of products

7.1 Index numbers

Tables 105, 122, 131, 143, 313, 322, 323, 341, 353, 362, 371, 381 and 391 in the data file describe products, and an index number is assigned to each data record within them. The index numbers in these tables form a set with no duplicates. A single product appearing in multiple data records (e.g. a boiler that can be used with different fuels; an exhaust air heat pump which appears in both the heap pump table and the mechanical ventilation table) will have a different index number in each case. Index numbers assigned to products in the database are always 6 digits (with leading zeros added as necessary). They will not be altered and so will appear consistently through all issues of the Product Characteristics Data File. An index number freed as a result of entry deletion will not be re-assigned to another product.

7.2 Product names – boilers and CoGen

Unique identification of a product for the purposes of SAP requires consideration of more than one data field in the database. Within any one table of the database defined in Appendix A of this document, the concatenation of

fuel + manufacturer name + brand name + model name + model qualifier

defines a unique record.

For single-fuel products within any one table, the concatenation of

brand name + model name + model qualifier

is unique in most cases. An (unlikely) exception is when a new manufacturer takes over an existing brand name and sells a different product with the same brand name, model name, and model qualifier as previously. In that case the concatenation of

manufacturer name + brand name + model name + model qualifier

is unique.

For multi-fuel products (e.g. mains gas and LPG, or anthracite and wood), the manufacturer might not alter the model name or model qualifier according to the fuel. In that case the concatenation of

fuel + brand name + model name + model qualifier

is unique, and

brand name + model name + model qualifier

will be unique after a particular fuel has been selected.

See further information in Appendix C.

7.3 Product names – mechanical ventilation systems

The concatenation of

duct type + brand name + model name + model qualifier

defines a unique record.

If the duct type (rigid or flexible) is specified then

brand name + model name + model qualifier

is unique.

7.4 Product names – flue gas heat recovery systems

The concatenation of

brand name + model name + model qualifier

defines a unique record.

7.5 Product names – waste water heat recovery systems

The concatenation of

brand name + model name + model qualifier

defines a unique record.

7.6 Product names – heat pumps

The concatenation of

fuel + emitter + brand name + model name + model qualifier

defines a unique record.

If the fuel has been defined (e.g. electricity) the concatenation of
emitter + brand name + model name + model qualifier
defines a unique record.

If the emitter has also been defined (e.g. radiators) the concatenation of
brand name + model name + model qualifier
defines a unique record.

7.7 Manufacturers

Tables 102 and 301 give the current manufacturer details for products. Both tables should be read and their contents treated as if it were all in a single table. Field 2 of a product record links the product to a current manufacturer record. Within any given issue of the Data File the index numbers in these tables form a set with no duplicates and can be regarded as if they were a single table. Index numbers in these tables are always 6 digits (with leading zeros as needed) but may be changed in different issues of the Data File.

8 Status of products

8.1 The database includes 'illustrative' products: gas, oil and solid fuel boilers, micro-CHP, heat pumps, FGHRS, WWHRS and others. These are not actual products but have characteristics comparable to currently available products.

8.2 Illustrative products are included to enable SAP software to run scenarios, for example to examine the effect of improvement measures.

8.3 Illustrative products are used within SAP calculations solely for the purpose stated in 8.2. They must not be offered to users of SAP software as selectable items; only actual products are to be visible. Illustrative products are used only in the context of defined scenario calculations.

8.4 Actual products have a status of normal, under investigation or not valid. The significance of these are:

Normal. The product data can be used for SAP assessments.

Under investigation. There are issues with some of the data in the record. This status is temporary and will either revert to normal or change to not valid when the investigation is completed. The product data can be used for SAP assessments but is subject to change.

Not valid. It has been established that one or more of the data is incorrect. The product data must not be used for new assessments. It is permissible to use the data for a re-calculation of a previous assessment.

Methodology under review. The methodology is currently being reviewed. This status is temporary and will either revert to normal or change to not valid when the review is completed. The product data can be used for SAP assessments but is subject to change.

9 Treatment of data within SAP software

9.1 See Appendix C for information regarding product selection.

9.2 The data tables within the data file are intended for use with software implementing SAP 2012.

9.3 Software implementing SAP 2005 should use the Boiler Efficiency Data File whose contents are described in "Boiler Efficiency and Product Characteristics Data File, version 4, revision 5".

9.4 Software implementing SAP 2009 should use the SAP 2009 version of the data file whose contents are described in “Product Characteristics Data File, version 5, revision 6".

10 URL

10.1 The following URLs are for use only by SAP software implementing automatic downloads. For manual download see B.3.

10.2 The Product Characteristics Data File for SAP 2012 is at the URL www.sedbuk.com/data1/pcdf2012.dat.

10.3 The Product Characteristics Data File for SAP 2009 is at the URL www.sedbuk.com/data1/pcdf2009.dat.

10.4 The Boiler Efficiency Data File for SAP 2005 is at the URL www.sedbuk.com/data1/bedf2005.dat.

10.5 In addition small files are maintained to allow software to check that it is using the current version of the relevant PCDF. These are text files consisting of a single line giving the revision numbers of the above PCDFs. The URLs are respectively:
www.sedbuk.com/data1/pcdf2012version.dat
www.sedbuk.com/data1/pcdf2009version.dat
www.sedbuk.com/data1/bedf2005version.dat

Appendix A: Data Definition for the Product Characteristics Data File

A.1 The Product Characteristics Data File will contain sufficient descriptive and technical data to allow SAP assessors to identify a particular product and find its characteristics needed for the SAP calculations. The Data File is provided for the purposes of undertaking SAP calculations and not for any other purpose. The file is stored on an Internet web site for public access (see 10.2, whence it may be downloaded for subsequent processing.

A.2 File contents

The file is text consisting of any number of comment lines, control lines, and data lines.

A control line followed by a sequence of data lines is described as a table. The table is terminated when the next control line is reached. There may be several tables within the file and they may be placed in any order. A table may include any number of data lines, including zero.

All lines commencing # are to be treated as comments and disregarded by the receiving program, wherever they occur within the file.

All lines commencing $ are control lines and must be recognised by the receiving program. Control lines are used to introduce and terminate data tables and give information about the formats used and dates issued.

All lines commencing with other characters are data lines, forming the contents of data tables. The data lines for a table may be in any order.

Any table with an unrecognised table number (i.e. not listed in 6.1) must be ignored. A file error must not be reported.

A.3 Control lines

Control lines commence with $ and are followed by a 3-digit type number. Depending on type number, additional information may be provided on the same line. Some control lines introduce data tables. At present the following control lines have been defined:

CONTROL LINES		
Type	Example	Description
001	`$001,123,1998,8,31`	Database revision information. Example indicates revision no. 123 of the database produced on 31 Aug 1998. As each new issue is published, the revision number is incremented and the date changed.
102	`$102,207,109,2010,4,16,1`	Introduces Table 102, known as the Manufacturers Table. Example indicates that the subsequent data lines conform to defined format no. 207 (formats are specified below); the Table is revision no. 109; and that it was last revised on 16 April 2010. As each new revision of the Table is published, the revision number is incremented and the revision date set to the date of the latest alteration to data contained in the Table. The last field signifies the data source and is to be included in all tables for SAP 2012; codes are 1 Gastec, 2 BRE.
The other data tables listed in 6.1, using the same syntax as 102.		
998	`$998`	Signifies that the data file is a special version created for testing purposes. Files placed on the web for normal use will not have $998.
999	`$999`	End of file. The receiving program should not read beyond this point.

nnn	where ‘nnn’ is any value not given above or in 6.1. This control line, together with all subsequent lines until the next control line is reached, must be ignored.

A.4 Data lines

Each data line is one record of the table introduced in the preceding control line. The format and meaning of the data in any table is defined by the format number given in the preceding control line. Description of the current format numbers are given in A.9 to A.28.

Any future change in format or meaning will always be given a new format number, so that receiving programs may check internally that they are reading data in a known format.

A.5 Data syntax

Data will conform to the following syntax rules:

- Each item of data contains only the visible characters (32-126, 160-255).
- Each item of data within a record is separated from the next by a comma.
- The final item of data in each record may or may not be terminated by a comma.
- No item of data will contain an embedded comma.
- The first item of data in each record will not commence with # or $.
- Leading and trailing spaces are not allowed.
- Null items of data are permissible and may be construed as minimum value (“blank” or zero according to context).
- Short records are permissible; ie, a trailing sequence of null data items (a succession of commas) may be truncated.

A.6 File structure

The Product Characteristics Data File will commence with control line type 001 and terminate with control line type 999.

In between there will be any number of tables, introduced by control lines as defined under A.3. The end of a table is recognised when the next control line (of any type) is reached.

Comment lines may occur anywhere in the file, and must be ignored by the receiving program.

A.7 Data tables

Tables may be of zero length, i.e. contain no data.

The format specification of the data tables may be varied from time to time. Each such format specification will bear a unique format number.

The Product Characteristics Data File may contain tables that are not defined in this specification, or it may contain a defined table with a format number that is not defined in this

specification. The purpose of this is to allow new tables or amended formats of existing tables to be added (which may be used in future SAP revisions or other applications). In order that existing SAP software is not broken by the additional tables or additional formats, the parsing routines must adopt the following rules:

a) If the receiving program encounters an unknown table number, it should skip (read and ignore) all lines in the data file until the next control line is reached.

b) If the program encounters a recognised table number with an unknown format number, it should skip all lines in the data file until the next control line is reached. If, having read the whole file, the program has encountered one or more instances of a recognised table number, but none of them has a known format number, it must report the situation to the user.

c) If more than one occurrence of a table with the same table number and the same recognised format number is encountered within the file, the receiving software should read each one and treat all records as being within a single table.

d) If more than one occurrence of a table with the same table number but differing recognised format number is encountered within the file, the receiving program should retain the data from the occurrence of the table with the highest recognised format number, and discard any data in the table with other format numbers.

A.8 Data format specification : Database Amendments Table

The current specification has format number 021 and is shown below.

FORMAT 021 (for database amendments)		
Field	Field name	Description
1	Index (6 digits)	Product index number of item amended
2	Amendment number (up to 3 digits)	The amendment number for the product identified in field 1. The amendment number starts at 1 and is incremented for each amendment for the product concerned.
3	Amendment date (yyyy/mmm/dd)	Date and time when amendment made by the database administrator. This is the date on which the amendment was made to the product table, not to this table.
4	DB changed (yyyy/mmm/dd hh:mm)	Date and time this record was created or last amended by the database administrator.
5	Amendment (up to 255 chs.)	Description of amendment
6	Web link (up to 63 chs)	URL of document giving further details of the amendment. Blank if not applicable (i.e. all details provided in field 5).

Notes to Database Amendments Table

An entry is put in this table whenever a non-trivial alteration is made to a data record. Field 6 is used when the amendment cannot be fully described in field 5 or it is relevant to provide additional information.

A.9 Data format specification : Manufacturers Table for SAP 2009/2012

The current specification has format number 207 and is shown below.

FORMAT 207 (for Manufacturers Table)		
Field	Field name	Description
1	Index (6 digits)	Unique index number for each record, assigned automatically by database software and used for control and reference purposes.
2	Current name (up to 50 chs.)	Current name of manufacturer, or company responsible for the product in the UK, which may not be the same as the original name.
3-10	Address (up to 365 chs.)	Address of manufacturer, or company responsible for the product in the UK. For addresses in the UK the format will normally be as recommended in BS 7666 Part 3 Section 2 Table 1. If the company does not have a UK address then a foreign address is entered, matching the UK format so far as possible. The elements of the address are shown below.
3		Secondary addressable object name (up to 60 chs.)
4		Primary addressable object name (up to 60 chs.)
5		Designated street name (up to 100 chs.)
6		Locality name (up to 35 chs.)
7		Town name (up to 30 chs.)
8		Administrative area name (up to 30 chs.)
9		Postcode (up to 20 chs.)
10		Country if not UK (up to 30 chs.)
11	Phone number (up to 25 chs.)	Phone number of manufacturing company, including international code if not in UK.
12	URL (up to 75 chs.)	Website address to provide hotlink to manufacturer's website.
13	DB entry updated (yyyy/mmm/dd hh:mm)	Date and time this record was created or last amended by the database administrator.

A.10 Data format specification : Gas and Oil Boiler Table for SAP 2012

The current specification has format number 210 and is shown below. Data from the fields marked X in the second column are needed when carrying out a calculation to the SAP 2012 specification. In addition, the following must be read and included in any printout: 6, 7, 8.

SAP software implementing SAP 2012 should contain an option to display to the software user at least all the data marked X in the second column for any specified data record (this is because the data might be required in connection with an Appendix Q procedure).

FORMAT 210 (for Gas and Oil Boiler Table for SAP 2012)			
Field	X	Field name	Description
1		Product index number (6 digits)	Unique index number for each record, assigned automatically by database software and used for control and reference purposes. (See 7.1).
2		Manufacturer reference no. (6 digits)	Reference to current name of manufacturer *(see field 2 in Manufacturers Table)*.
3	X	Status (one digit)	Status of the data record, encoded as 0=normal status for an actual product, 1=illustrative (non-existent) product, 2=under investigation, 3=not valid, 4=methodology under review. (See 8.1 to 8.4).
4		DB entry updated (yyyy/mmm/dd hh:mm)	Date and time this record was created or last amended by the database administrator.
5		Manufacturer name (up to 50 chs.)	The original name of the manufacturer, which may be different from the current name.
6		Brand name (up to 50 chs.)	Name of brand, as shown on the boiler. If none the original manufacturer name will be inserted instead. If the same boiler model is sold under more than one brand name then separate entries for each will appear in the database.

7		Model name (up to 50 chs.)	Name of boiler model, as it appears on the boiler casing or leaflet of owners' instructions. For boilers that comply with EN 483 this should be "the trade name of the appliance" shown on the data plate, as specified in clause 8.1.2 of EN 483:1999. If the same boiler is sold under more than one model name then separate entries for each will appear in the database. See note 1 below.
8		Model qualifier (up to 30 chs.)	Qualifier to model name, if needed in addition to the model name to discriminate between different versions of same model.
9		Boiler ID (up to 40 chs.)	Boiler identifier. It may be GC (formerly Gas Council) number for a gas boiler or OFTEC Registration number for an oil boiler, but if not available the manufacturer may choose another identifier marked on the boiler.
10		First year of manufacture (up to 4 chs.)	First year of manufacture, if known; otherwise blank.
11		Final year of manufacture (up to 8 chs.)	Final year of manufacture, or "current" if still in production. If no longer produced but date production ceased is unknown, then "obsolete".
12	X	Fuel (up to 2 digits)	Fuel type, which is any one of the fuel codes for a gaseous or liquid fuel as specified in SAP Table 12 under sub-headings "gas" or "oil". If the same boiler may use more than one type of fuel then separate entries for each appear in the database, except that a boiler listed for bulk LPG is also applicable to bottled LPG and LPG subject to special condition 18.
13		Mounting position (1 digit)	Boiler mounting position, which is one of "unknown", "floor", "wall", "either floor or wall", or "back boiler". These are encoded as 0, 1, 2, 3 or 4.
14		Exposure rating (1 digit)	Exposure rating, which is one of "unknown", "indoor only", or "outdoor". These are encoded as 0, 1 or 2.
15	X	Main type (1 digit)	Main boiler type, for the purpose of SAP efficiency calculation. It is one of "regular" (see SAP 2012 Appendix D clause D1.3), "combi" (clause D1.6), or "CPSU" (clause D1.13). These are encoded as 1, 2 or 3. If not known it is encoded as 0. Note: If an unknown value is encountered, skip record and treat the boiler as non-existent. Do not report a file format error.
16	X	Subsidiary type (1 digit)	Subsidiary type, for the purpose of indicating the presence of special features. It is one of "normal" or "with integral PFGHRD", encoded as 0 or 1 respectively. See note 2 below table. Other values may be introduced later. Note: If an unknown value is encountered, treat as if it were 0. Do not report a file data error.
17	X	Subsidiary type table (3 digits)	The table number within the database holding data for boiler special features, if special features have been indicated in "Subsidiary type" and it is necessary to refer to additional data. Otherwise this field is blank.
18	X	Subsidiary type index (6 digits)	The product index number of an entry within the database table number that has been indicated by "Subsidiary type table". If "Subsidiary type table" is blank then this field is blank.
19	X	Condensing (1 digit)	Either "non-condensing" or "condensing" (see SAP 2012 Appendix D clause D1.2), encoded as 1 or 2. If not known it is encoded as 0.
20	X	Flue type (1 digit)	Flue type, which is one of "unknown", "open", "room-sealed", or "open or room-sealed" encoded as 0, 1, 2 or 3.
21	X	Fan assistance (1 digit)	Whether or not flue is fan assisted. It is one of "unknown", "no fan", or "fan". These are encoded as 0, 1 or 2.
22		Boiler power (bottom of range) (number, up to 7 chs; eg "nnn.nnn")	Output power (to water) of the boiler in kW. For range rated boilers it is the lower of the range of values for which the efficiency test results are valid. For other boilers this is the same as field 23.
23	X	Boiler power (top of range) (number, up to 7 chs; eg "nnn.nnn", or text ">70kW")	Output power (to water) of the boiler in kW. For BED-compliant boilers this is the rated output as required for the purpose of Council of the European Communities Directive 92/42/EEC. If the power was originally quoted in BTU/hr then it will have been converted using the factor 1 BTU/hr = 0.000293 kW. For range rated boilers this is the top of the range of values for which the efficiency test results are valid. Where the upper limit of the range exceeds 70kW this is shown as ">70kW" instead of the exact value. (Not used at present but might be needed in connection with a future App.Q assessment.)
24		Energy efficiency class (up to 4 chs.)	The energy efficiency class as defined for the proposed European energy label. Definition and format have not yet been decided. This field is being left blank until the European energy labelling scheme has been defined.
25		Annual seasonal efficiency (number, up to 4 chs; eg "nn.n")	Annual seasonal efficiency, expressed as a percentage and rounded to the nearest 0.1%. This will have been obtained by one of the methods defined for the efficiency category (see field 31 and Note 3.) In the case of efficiency categories 1 and 2 the annual seasonal efficiency will be the SEDBUK(2009) value. Not used for SAP 2012 calculations (use fields 26 and 27 instead).
26	X	SAP winter seasonal efficiency (number, up to 4 chs; eg "nn.n")	Winter seasonal efficiency for use in SAP, expressed as a percentage and rounded to the nearest 0.1%. This will have been obtained by one of the methods defined for the efficiency category (see field 31 and Note 3.)

27	X	SAP summer seasonal efficiency (number, up to 4 chs; eg “nn.n”)	Summer seasonal efficiency for use in SAP, expressed as a percentage and rounded to the nearest 0.1%. If separate DHW tests (see field 48) this will have been derived from those tests, otherwise it will have been obtained by one of the methods defined for the efficiency category (see field 31 and Note 3.)
28		Hot water efficiency 1 (number, up to 4 chs; eg “nn.n”)	Hot water efficiency for comparative purposes (not used by SAP). See Note 7 below table. If this field is blank the value is taken from field 29 instead.
29		Hot water efficiency 2 (number, up to 4 chs; eg “nn.n”)	Hot water efficiency for comparative purposes (not used by SAP). See Note 7 below the table. This value is calculated by the database and is recorded in this field only if field 28 is blank. This field may also be blank.
30		SAP 2005 seasonal efficiency (number, up to 4 chs; eg “nn.n”)	The annual seasonal efficiency used in SAP 2005, expressed as a percentage and rounded to the nearest 0.1%. This will have been obtained by one of the methods defined for the efficiency category (see field 31 and Note 3.) In the case of efficiency categories 1 and 2 the annual seasonal efficiency will be the SEDBUK(2005) value. Can be used for a SAP 2005 calculation.
31		Efficiency category (1 digit)	Category of annual seasonal efficiency, encoded as 0=unknown, 1=SEDBUK based on validated and certified data, 2=SEDBUK based on certified data, 3=estimated (for obsolete boilers only). See Note 3. For category 3 the SAP equation used (in field 34) is entered as 0.
32		Test gas for LPG (1 digit)	This applies only to a LPG boiler with efficiency category 1 or 2. If the efficiency tests from which SEDBUK was calculated were carried out using LPG, this is 0. If the tests were carried out using natural gas and the modified calculation procedure, this is 1. If inapplicable, this is blank.
33		Test correction for LPG (1 digit)	This applies only to a LPG boiler tested with LPG. The test procedure allows for a correction to be applied. In some cases this is applied by the test laboratory before results are shown on the test certificate. If the correction was not applied to the results on the test certificate this field is 0; if the correction was applied it is 1. If inapplicable, this is blank.
34	X	SAP equation used (up to 3 digits)	The number of the SEDBUK equation used to calculate annual seasonal efficiency. Number 0 indicates that no SEDBUK calculation has been performed. Other numbers are as shown in SAP 2012 Appendix D Tables D2.5 and D2.6. The equation number corresponds to the boiler type and other properties (whether gas/oil, instantaneous/storage/CPSU, condensing/non-condensing, and on-off/modulating). (Not used at present but might be needed in connection with a future App.Q assessment.)
35		Ignition (1 digit)	Whether or not has permanent pilot light, encoded as 0=unknown, 1=no, 2=yes.
36		Burner control (1 digit)	Whether on-off or variable, encoded as 0=unknown, 1=on-off, 2=variable (stepped or modulating).
37		Electrical power while boiler is firing (up to 4 digits)	See Note 4. Average electrical power consumed while the boiler is firing, in watts. This includes fans, motors, heaters, and other electrical equipment but excludes any pump used to circulate water *outside* the boiler. If unknown or inapplicable, this field is blank.
38		Electrical power while boiler is not firing (up to 4 digits)	See Note 4. Average electrical power consumed while the boiler is not firing, in watts. This includes fans, motors, heaters, and other electrical equipment but excludes any pump used to circulate water *outside* the boiler. If unknown or inapplicable, this field is blank.
39	X	Store type (1 digit)	See Note 5. For a storage combination boiler, this is 1 if the internal hot water store contains mainly primary water or 2 if it contains mainly secondary water. For a CPSU, it is 3. If unknown or inapplicable, it is 0.
40		Store loss in test (1 digit)	See Notes 4 and 5. If heat loss from the internal hot water store has been *excluded* in the efficiency test values reported, this is 1. If *included* then this is 2. If unknown or inapplicable, it is blank.
41		Separate store (1 digit)	See Note 5. If the hot water store is within the boiler casing (an ‘internal hot water store’) then this is 0; otherwise it is 1. If unknown or inapplicable, this is blank.
42	X	Store boiler volume (number, up to 7 chs; eg “nnn.nnn”)	See Note 5. The water volume of the internal hot water store that is capable of being heated by the boiler, in litres. This is the total volume of the store less the store solar volume (field 43). May be a real number to 3 decimal places. If unknown or inapplicable, this is blank.
43	X	Store solar volume (number, up to 7 chs; eg “nnn.nnn”)	If the internal hot water store includes a dedicated solar zone, the water volume of the dedicated solar zone in litres. May be a real number to 3 decimal places. If unknown or inapplicable, this is 0.0.
44	X	Store insulation thickness (up to 3 digits)	See Note 5. The thickness of the insulation applied to the internal hot water store in mm. If unknown or inapplicable, this is blank.
45		Store insulation type (1 digit)	See Notes 4 and 5. The material used to insulate the internal hot water store. This is 1 for mineral wool (rock), 2 for polyurethane foam, or 3 for mineral wool (glass). For other insulants the following values signify that the thermal conductivity is: 4 closest to MW (rock), 5 closest to PU, 6 closest to MW (glass). If unknown or inapplicable, it is blank.
46		Store temperature (2 digits)	See Notes 4 and 5. The average temperature of the hot water in contact with the exterior walls of the internal hot water store in degrees Celsius. If unknown or inapplicable, this is blank.
47		Store heat loss rate (up to 5 digits)	See Notes 4 and 5. The measured heat loss from the hot water store in watts. Not used at present (this figure may be used in a future SAP specification in place of calculations based on fields 43-44). If unknown or inapplicable, this is blank.

48	X	Separate DHW tests (1 digit)	Hot water tests carried out on a combi boiler in accordance with EN 13203-2 (gas) or OPS 26 (oil). Encoded as: 0 = none or not applicable; 1= one test, using schedule 2; 2 = two tests, using schedules 2 and 3; 3 = two tests, using schedules 2 and 1.
49		Fuel energy for HW test 1 (number, up to 6 chs, possibly including decimal point eg "123.45")	Fuel input energy (corrected) in kWh/day for domestic hot water test 1 carried out on a combi boiler in accordance with EN 13203-2 (gas) or OPS 26 (oil). Hot water test 1 means tested under draw-off schedule no. 2 as defined in the standard. If the boiler is not a combi, or if domestic hot water test 1 has not been carried out, this is blank.
50		Electrical energy for HW test 1 (number, up to 6 chs, possibly including decimal point eg "123.45")	Electrical input energy (corrected) in kWh/day for domestic hot water test 1 carried out on a combi boiler in accordance with EN 13203-2 (gas) or OPS 26 (oil). Hot water test 1 means tested under draw-off schedule no. 2 as defined in the standard. If the boiler is not a combi, or if domestic hot water test 1 has not been carried out, this is blank.
51	X	Rejected energy r_1 in HW test 1 (number, up to 6 chs, eg "0.1234")	Proportion of energy, expressed as a decimal number in the range 0 to 1, rejected in domestic hot water test 1 carried out on a combi boiler in accordance with EN 13203-2 (gas) or OPS 26 (oil). If the boiler is not a combi, or if domestic hot water test 1 has not been carried out, this is blank.
52	X	Storage loss factor F_1 (number, up to 7 chs, e.g. 400.123)	Loss factor F_1 in kWh/day related to domestic hot water test 1 for use in conjunction with SAP 2012 Table 3b. If the boiler is not a combi, or if domestic hot water test 1 has not been carried out, this is blank.
53		Fuel energy for HW test 2 (number, up to 6 chs, possibly including decimal point eg "123.45")	Fuel input energy (corrected) in kWh/day for domestic hot water test 2 carried out on a combi boiler in accordance with EN 13203-2 (gas) or OPS 26 (oil). If "Separate DHW tests" (field 48) is 2 then hot water test 2 means tested under draw-off schedule no. 3 as defined in the standard. If "Separate DHW tests" (field 48) is 3 then hot water test 2 means tested under draw-off schedule no. 1 as defined in the standard. If the boiler is not a combi, or if domestic hot water test 2 has not been carried out, this is blank..
54		Electrical energy for HW test 2 (number, up to 6 chs, possibly including decimal point eg "123.45")	Electrical input energy (corrected) in kWh/day for domestic hot water test 2 carried out on a combi boiler in accordance with EN 13203-2 (gas) or OPS 26 (oil). If "Separate DHW tests" (field 48) is 2 then hot water test 2 means tested under draw-off schedule no. 3 as defined in the standard. If "Separate DHW tests" (field 48) is 3 then hot water test 2 means tested under draw-off schedule no. 1 as defined in the standard. If the boiler is not a combi, or if domestic hot water test 2 has not been carried out, this is blank.
55		Rejected energy r_2 in HW test 2 (number, up to 6 chs, eg "0.1234")	Proportion of energy, expressed as a decimal number in the range 0 to 1, rejected in domestic hot water test 2 carried out on a combi boiler in accordance with EN 13203-2 (gas) or OPS 26 (oil). If the boiler is not a combi, or if domestic hot water test 2 has not been carried out, this is blank. This is not used in SAP assessments, only r_1.
56	X	Storage loss factor F_2 (number, up to 7 chs, e.g. 400.123)	Loss factor F_2 in kWh/day related to domestic hot water tests 1 and 2 for use in conjunction with SAP 2012 Table 3c. If the boiler is not a combi, or if domestic hot water test 2 has not been carried out, this is blank.
57	X	Rejected factor F_3 (number, up to 7 chs, e.g. -0.0003)	Rejected factor F_3 in litres^{-1} related to domestic hot water tests 1 and 2 for use in conjunction with SAP 2012 Table 3c (can be negative). If the boiler is not a combi, or if domestic hot water test 2 has not been carried out, this is blank.
58	X	"Keep-hot" facility (1 digit)	See Note 6. The type of "keep-hot" facility, intended to keep the internal store hot while not in use. This is 0 if there is no "keep-hot" facility; 1 if there is a "keep-hot" facility fuelled by gas/oil only; 2 if there is a "keep-hot" facility powered by electricity; or 3 if there is a "keep-hot" facility both fuelled by gas/oil and powered by electricity. If inapplicable, this is blank.
59	X	"Keep-hot" timer (1 digit)	See Note 6. Where there is a "keep-hot" facility, this is 1 if there is a time-switch control which turns off the facility overnight. If there is no such control this is 0. If unknown or inapplicable, this is blank.
60	X	"Keep-hot" electric heater (up to 5 digits)	The power rating of the electric heating element in the internal hot water store, in watts. This is 0 if no electric heating element is fitted. If unknown or inapplicable, this is blank.
61	X	Control capabilities (4 or 8 hex digits)	Values that indicate features that are relevant for heating controls. See Note 8..

Notes to the Gas and Oil Boiler Table for SAP 2012:

Note 1. The model name does not repeat the brand name. If the brand name matches the leading characters of the model name, the leading characters of the model name will be removed to avoid repetition.

Note 2. If the boiler has an integral PFGHRD[2] there are two possibilities:

[2] For definitions of PFGHRD and FGHRS see SAP Appendix G

a) The energy performance characteristics of the integral PFGHRD are given in another data record. In that case the number of the data table and the product index number of the relevant entry within it are given in fields 17 and 18. This occurs when the PFGHRD has an internal heat store. The data in the boiler record are for the boiler include the direct heat recovered by the PFGHRD (and so the data record for the PFGHRD has zero for direct heat recovered) and the effect of the PFGHRD internal store should be allowed for as described in SAP 2012 Appendix G.
b) The energy performance characteristics of the integral PFGHRD have been incorporated in the test data used to create the boiler record, In that case fields 17 and 18 are blank. This occurs in the case of an integral PFGHRD without a heat store. The data in the boiler record are for the boiler with the PFGHRD and no adjustment for the PFGHRD is made within the SAP calculation.

In either case SAP software should indicate that a PFGHRD has been included and must prevent the user from separately selecting an FGHRS (or indicate an error condition if that happens).

Note 3. Definitions of efficiency category are given in section 4.

Note 4 The information in these fields is not used in the current version of SAP, but may be used in later versions.

Note 5. These fields are relevant only for Storage Combination Boilers and CPSUs, as defined in SAP Appendix D Section 1. For other boiler types they are zero or blank.

Note 6. These fields are relevant only for Instantaneous Combination Boilers. For other boiler types they are blank.

Note 7. This field is not used in SAP calculations but may be displayed as an aid to those seeking to compare hot water energy performance.

Note 8. This is constructed as 32 boolean values, for example 453C is 0100010100111100. Control capabilities are defined in the Heating Control Requirements Table. See also the format for the Heating Controls Table.

A.11 Data format specification : Solid Fuel Boiler Table

The current specification has format number 224 and is shown below. Data from the fields marked X in the second column are needed when carrying out a calculation to the SAP 2012 specification. In addition, the following must be read and included in any printout: 6, 7, 8.

SAP software implementing SAP 2012 should contain an option to display to the software user at least all the data marked X in the second column for any specified data record (this is because the data might be required in connection with an Appendix Q procedure).

FORMAT 224 (for Solid Fuel Boiler Table)			
Field	X	Field name	Description
1		Product index number (6 digits)	Unique index number for each record, assigned automatically by database software and used for control and reference purposes. (See 7.1).
2		Manufacturer reference no. (6 digits)	Reference to current name of manufacturer *(see field 2 in Manufacturers Table)*.

3	X	Status (one digit)	Status of the data record, encoded as 0=normal status for an actual product, 1=illustrative (non-existent) product, 2=under investigation, 3=not valid, 4=methodology under review. (See 8.1 to 8.4).
4		DB entry updated (yyyy/mmm/dd hh:mm)	Date and time this record was created or last amended by the database administrator.
5		Manufacturer name (up to 50 chs.)	The original name of the manufacturer, which may be different from the current name
6		Brand name (up to 50 chs.)	Name of brand, as shown on the boiler. If none the original manufacturer name will be inserted instead. If the same boiler is sold under more than one brand name then separate entries for each will appear in the database.
7		Model name (up to 50 chs.)	Name of boiler model, as it appears on the boiler casing or leaflet of owners' instructions. If the same boiler is sold under more than one model name then separate entries for each will appear in the database.
8		Model qualifier (up to 30 chs.)	Qualifier to model name, if needed in addition to the model name to discriminate between different versions of same model.
9		Boiler ID (up to 40 chs.)	Boiler identifier, which, in conjunction with manufacturer name, is unique for the model and all other characteristics affecting efficiency. Where known this provides a short cut for identification. The manufacturer may choose any suitable identifier marked on the boiler.
10		First year of manufacture (up to 4 chs.)	First year of manufacture, if known; otherwise blank.
11		Final year of manufacture (up to 8 chs.)	Final year of manufacture, or "current" if still in production. If no longer produced but date production ceased is unknown, then "obsolete".
12	X	Fuel (2 digits)	Fuel type, encoded 11 "house coal", 12 "smokeless fuel", 15 "anthracite", 20 "wood logs", 21 "wood chips" or 23 "wood pellets". If the same boiler may use more than one type of fuel then separate entries for each appear in the database.
13	X	Main type (1 digit)	Main boiler type, for the purpose of SAP efficiency calculation. It is one of "open fire with boiler", "closed room heater with boiler", or "independent boiler", encoded as 1 to 3 respectively. Note: If an unknown value is encountered, skip record and treat the boiler as non-existent. Do not report a file format error.
14	X	Flue type (1 digit)	Flue type, which is one of "unknown", "open", "room-sealed", "open or room-sealed", or "open chimney" encoded as 0, 1, 2, 3 or 4.
15		Fan assistance (1 digit)	Whether or not flue is fan assisted. It is one of "unknown", "no fan", or "fan". These are encoded as 0, 1 or 2.
16	X	Fuel feed	Fuel feed, which is one of "unknown", "manual feed", "gravity feed", "screw feed", "other" encoded as 0, 1, 2, 3 or 4. Blank if not applicable.
17		Boiler power (bottom of range) (number, up to 7 chs; eg "nnn.nnn")	Output power (to water) of the boiler in kW. For range rated boilers it is the lower of the range of values for which the efficiency test results are valid. For other boilers this is the same as field 18.
18		Boiler power (top of range) (number, up to 7 chs; eg "nnn.nnn", or text ">70kW")	Output power (to water) of the boiler in kW. If the power was originally quoted in BTU/hr then it will have been converted using the factor 1 BTU/hr = 0.000293 kW. For range rated boilers this is the top of the range of values for which the efficiency test results are valid. Where the upper limit of the range exceeds 70kW this is shown as ">70kW" instead of the exact value.
19		Boiler power at minimum burn rate (number, up to 7 chs; eg "nnn.nnn")	Output power of the boiler in kW at the minimum burn rate at which the fire can be sustained.
20		Energy efficiency class (up to 4 chs.)	The energy efficiency class as defined for the proposed European energy label. Definition and format have not yet been decided. This field is being left blank until the European energy labelling scheme has been defined.
21	X	SAP seasonal efficiency of boiler (number, up to 4 chs; eg "nn.n")	Seasonal efficiency for use in SAP, expressed as a percentage and rounded to the nearest 0.1%.
22		Efficiency category (1 digit)	Category of SAP efficiency, which is one of 1 = HETAS approved, 2 = certified measurement to BS EN standard, 3 = estimated as SAP default value.
23	X	Measured fuel input at nominal output power (number, up to 7 chs; eg "nnn.nnn")	Certified rate of fuel input energy, measured at gross calorific value, when boiler is operating at nominal output power, in kW. The database administrator will require independently certified evidence. If no evidence is submitted this field will be left blank. See Note 1.
24	X	Measured heat to water at nominal output power (number, up to 7 chs; eg "nnn.nnn")	Certified rate of heat output to water when boiler is operating at nominal output power, in kW. This must be measured in the same test as the measurement of rate of fuel input given in field 23. The database administrator will require independently certified evidence. If no evidence is submitted this field will be left blank.

25	X	Measured heat to room at nominal output power (number, up to 7 chs; eg “nnn.nnn”)	Certified rate of heat output to room when boiler is operating at nominal output power, in kW. This must be measured in the same test as the measurement of rate of fuel input given in field 23. The database administrator will require independently certified evidence. If no evidence is submitted this field will be left blank.
26	X	Measured fuel input at part output power (number, up to 7 chs; eg “nnn.nnn”)	Certified rate of fuel input energy, measured at gross calorific value, when boiler is operating at part output power, in kW. The database administrator will require independently certified evidence. If no evidence is submitted this field will be left blank.
27	X	Measured heat to water at part output power (number, up to 7 chs; eg “nnn.nnn”)	Certified rate of heat output to water when boiler is operating at part output power, in kW. This must be measured in the same test as the measurement of rate of fuel input given in field 26. The database administrator will require independently certified evidence. If no evidence is submitted this field will be left blank.
28	X	Measured heat to room at part output power (number, up to 7 chs; eg “nnn.nnn”)	Certified rate of heat output to room when boiler is operating at part output power, in kW. This must be measured in the same test as the measurement of rate of fuel input given in field 26. The database administrator will require independently certified evidence. If no evidence is submitted this field will be left blank.
29		Ple test method (2 digits)	Method used for part-load efficiency test. Coding not yet defined: at present, all entries are set to 0.
30		Burner control (1 digit)	0=unknown, 1=manual, 2=electrical. Code 2 means capable of being switched between full and minimum burn rate (or off) by electrical signal from a thermostat or time switch.
31		Electrical power while boiler is firing (up to 4 digits)	Average electrical power consumed while the boiler is firing, in watts. This includes fans, motors, heaters, and other electrical equipment but excludes any pump used to circulate water *outside* the boiler. If unknown or inapplicable, this field is blank.
32		Electrical power while boiler is not firing (up to 4 digits)	Average electrical power consumed while the boiler is not firing, in watts. This includes fans, motors, heaters, and other electrical equipment but excludes any pump used to circulate water *outside* the boiler. If unknown or inapplicable, this field is blank.
33		Additional ventilation rate (number, up to 4 chs; eg “nn.n”)	Ventilation rate in m³/h for appliances that are not room-sealed. If unknown or inapplicable, this field is blank.

Notes to Solid Fuel Boiler Table:

Note 1. Nominal output is total heat output of the device quoted by the manufacturer and achieved under defined test conditions when burning a specified test fuel.

A.12 Data format specification : Cooker Boiler Table

The current specification has format number 233 and is shown below. Data from the fields marked X in the second column are needed when carrying out a calculation to the SAP 2012 specification. In addition, the following must be read and included in any printout: 6, 7, 8.

SAP software implementing SAP 2012 should contain an option to display to the software user at least all the data marked X in the second column for any specified data record (this is because the data might be required in connection with an Appendix Q procedure).

FORMAT 233 (for Cooker Boiler Table)			
Field	X	Field name	Description
1		Product index number (6 digits)	Unique index number for each record, assigned automatically by database software and used for control and reference purposes. (See 7.1).
2		Manufacturer reference no. (6 digits)	Reference to current name of manufacturer *(see field 2 in Manufacturers Table)*.
3	X	Status (one digit)	Status of the data record, encoded as 0=normal status for an actual product, 1=illustrative (non-existent) product, 2=under investigation, 3=not valid, 4=methodology under review. (See 8.1 to 8.4).
4		DB entry updated (yyyy/mmm/dd hh:mm)	Date and time this record was created or last amended by the database administrator.
5		Manufacturer name (up to 50 chs.)	The original name of the manufacturer, which may be different from the current name.

6		Brand name (up to 50 chs.)	Name of brand, as shown on the product. If none the original manufacturer name will be inserted instead. If the same product is sold under more than one brand name then separate entries for each will appear in the database. See note 1 below.
7		Model name (up to 50 chs.)	Name of product model, as it appears on the casing or leaflet of owners' instructions. If the same product is sold under more than one model name then separate entries for each will appear in the database. See note 1 below.
8		Model qualifier (up to 30 chs.)	Qualifier to model name, if needed in addition to the model name to discriminate between different versions of same model.
9		Product ID (up to 40 chs.)	Product identifier, which, in conjunction with manufacturer name, is unique for the model and all other characteristics affecting efficiency. Where known this provides a short cut for identification. It may be GC (formerly Gas Council) number for a gas product or OFTEC Registration number for an oil product, but if not available the manufacturer may choose another identifier marked on the product.
10		First year of manufacture (up to 4 chs.)	First year of manufacture, if known; otherwise blank.
11		Final year of manufacture (up to 8 chs.)	Final year of manufacture, or "current" if still in production. If no longer produced but date production ceased is unknown, then "obsolete".
12	X	Fuel (1 digit)	Fuel type, which is any one of the fuel codes for a gaseous or liquid fuel as specified in SAP Table 12 under sub-headings "gas" or "oil". If the same product may use more than one type of fuel then separate entries for each appear in the database, except that a boiler listed for bulk LPG is also applicable to bottled LPG and LPG subject to special condition 18.
13		Main type (1 digit)	Main product type, for the purpose of SAP efficiency calculation. At present this is encoded as 1, meaning "cooker boiler with separately controlled twin burners". Note: If an unknown value is encountered, skip record and treat the boiler as non-existent. Do not report a file format error.
14	X	Condensing (1 digit)	Either "non-condensing" or "condensing" (see SAP 2012 Appendix D clause D1.2), encoded as 1 or 2. If not known it is encoded as 0.
15	X	Flue type (1 digit)	Flue type, which is one of "unknown", "open", "room-sealed", or "open or room-sealed" encoded as 0, 1, 2 or 3.
16	X	Fan assistance (1 digit)	Whether or not flue is fan assisted. It is one of "unknown", "no fan", or "fan". These are encoded as 0, 1 or 2.
17		Boiler power (bottom of range) (number, up to 7 chs; eg "nnn.nnn")	Output power (to water) of the boiler part of the cooker in kW. For range rated boilers it is the lower of the range of values for which the efficiency test results are valid. For other boilers this is the same as field 18.
18		Boiler power (top of range) (number, up to 7 chs; eg "nnn.nnn", or text ">70kW")	Output power (to water) of the boiler part of the cooker in kW. For BED-compliant boilers this is the rated output as required for the purpose of Council of the European Communities Directive 92/42/EEC. If the power was originally quoted in BTU/hr then it will have been converted using the factor 1 BTU/hr = 0.000293 kW. For range rated products this is the top of the range of values for which the efficiency test results are valid. Where the upper limit of the range exceeds 70kW this is shown as ">70kW" instead of the exact value.
19	X	Case loss at full output (number, up to 7 chs; eg "nnn.nnn")	The case loss from the product, measured in kW, when the boiler part only is operating at full output power. This must not include contribution from the cooker part.
20	X	Full output power (number, up to 7 chs; eg "nnn.nnn")	Output power of the boiler alone, measured in kW, at which the case loss has been measured.
21		Energy efficiency class (up to 4 chs.)	The energy efficiency class as defined for the proposed European energy label. Definition and format have not yet been decided. This field is being left blank until the European energy labelling scheme has been defined.
22		Annual seasonal efficiency (number, up to 4 chs; eg "nn.n")	Annual seasonal efficiency, expressed as a percentage and rounded to the nearest 0.1%. This will have been obtained by one of the methods defined for the efficiency category (see field 27 and Note 2). In the case of efficiency categories 1 and 2 the annual seasonal efficiency will be the SEDBUK(2009) value. Not used for SAP 2012 calculations (use fields 23 and 24 instead).
23	X	SAP winter seasonal efficiency (number, up to 4 chs; eg "nn.n")	Winter seasonal efficiency for use in SAP, expressed as a percentage and rounded to the nearest 0.1%. This will have been obtained by one of the methods defined for the efficiency category (see field 27 and Note 2.)
24	X	SAP summer seasonal efficiency (number, up to 4 chs; eg "nn.n")	Summer seasonal efficiency for use in SAP, expressed as a percentage and rounded to the nearest 0.1%. This will have been obtained by one of the methods defined for the efficiency category (see field 27 and Note 2.)
25		Hot water efficiency (number, up to 4 chs; eg "nn.n")	Hot water efficiency for comparative purposes (not used by SAP). See Note 3 below table. This field may be blank.

26		SAP 2005 seasonal efficiency (number, up to 4 chs; eg “nn.n”)	The annual seasonal efficiency used in SAP 2005, expressed as a percentage and rounded to the nearest 0.1%. This will have been obtained by one of the methods defined for the efficiency category (see field 27 and Note 2). In the case of efficiency categories 1 and 2 the annual seasonal efficiency will be the SEDBUK(2005) value. Can be used for a SAP 2005 calculation.
27		Efficiency category (1 digit)	Category of SAP efficiency, encoded as 0=unknown, 1=SEDBUK based on validated and certified data, 2=SEDBUK based on certified data, 3=estimated (ie SAP default). For category 3 the SAP equation used (in field 29) is entered as 0.
28		Test gas for LPG (1 digit)	This applies only to a LPG product with efficiency category 1 or 2. If the efficiency tests from which SEDBUK was calculated were carried out using LPG, this is 0. If the tests were carried out using natural gas and the modified calculation procedure, this is 1. If inapplicable, this is blank.
29		SAP equation used (up to 3 digits)	The number of the SEDBUK equation used to calculate SAP efficiency. Number 0 indicates that no SEDBUK calculation has been performed. Other numbers are as shown in SAP 2012 Appendix D Tables D2.4 and D2.5. The equation number corresponds to the boiler type and other properties (whether gas/oil, instantaneous/storage/CPSU, and on-off/modulating).
30		Ignition (1 digit)	Whether or not has permanent pilot light, encoded as 0=unknown, 1=no, 2=yes.
31		Burner control (1 digit)	Whether on-off or variable, encoded as 0=unknown, 1=on-off, 2=variable (stepped or modulating).
32		Electrical power while boiler is firing (up to 4 digits)	Average electrical power consumed while the boiler part only is firing, in watts. This includes fans, motors, heaters, and other electrical equipment but excludes any pump used to circulate water *outside* the boiler. If unknown or inapplicable, this field is blank.
33		Electrical power while boiler is not firing (up to 4 digits)	Average electrical power consumed while the boiler part is not firing, in watts. This includes fans, motors, heaters, and other electrical equipment but excludes any pump used to circulate water *outside* the boiler. If unknown or inapplicable, this field is blank.

Notes to Cooker Boiler Table:

Note 1. The model name does not repeat the brand name, if one has been specified. If the brand name matches the leading characters of the model name, the leading characters of the model name will be removed to avoid repetition.

Note 2. Definitions of efficiency category are given in section 4.

Note 3. This field is not used in SAP calculations but may be displayed as an aid to those seeking to compare hot water energy performance.

A.13 Data format specification : CoGen Table for SAP 2009/2012

The current specification has format number 243 and is shown below. Data from the fields marked X in the second column are needed when carrying out a calculation to the SAP 2012 specification. In addition, the following must be read and included in any printout: 7, 8, 9.

SAP software implementing SAP 2012 should contain an option to display to the software user at least all the data marked X in the second column for any specified data record (this is because the data might be required in connection with an Appendix Q procedure).

FORMAT 243 (for CoGen Table for SAP 2009/2012)			
Field	X	Field name	Description
1		Product index number (6 digits)	Unique index number for each record, assigned automatically by database software and used for control and reference purposes. (See 7.1).
2		Manufacturer reference number (6 digits)	Reference to current name of manufacturer *(see field 2 in Manufacturers Table)*.
3	X	Status (one digit)	Status of the data record, encoded as 0=normal status for an actual product, 1=illustrative (non-existent) product, 2=under investigation, 3=not valid, 4=methodology under review. (See 8.1 to 8.4).
4		DB entry updated (yyyy/mmm/dd hh:mm)	Date and time this record was created or last amended by the database administrator.

5		APM version number (up to 5 chs, eg nn.nn)	Version number of the Annual Performance Method used to generate the data record from test data.
6		Manufacturer name (up to 50 chs.)	The original name of the manufacturer, which may be different from the current name
7		Brand name (up to 50 chs.)	Name of brand, as shown on the cogen package. If none the original manufacturer name will be inserted instead. If the same cogen model is sold under more than one brand name then separate entries for each will appear in the database.
8		Model name (up to 50 chs.)	Name of cogen model, as it appears on the cogen unit casing or leaflet of owners' instructions. If the same cogen package is sold under more than one model name then separate entries for each should appear in the database.
9		Model qualifier (up to 30 chs.)	Qualifier to model name, if needed in addition to the model name to discriminate between different versions of same model.
10		First year of manufacture (up to 4 chs.)	First year of manufacture, if known; otherwise blank.
11		Final year of manufacture (up to 8 chs.)	Final year of manufacture, or "current" if still in production. If no longer produced but date production ceased is unknown, then "obsolete".
12	X	Fuel (1 or 2 digits)	Fuel type, Fuel type, which is any one of the fuel codes specified in SAP Table 12 under sub-headings "gas", "oil" or "solid fuel". If the same cogen package may use more than one type of fuel then separate entries for each appear in the database, except that a boiler listed for bulk LPG is also applicable to bottled LPG and LPG subject to special condition 18.
13	X	Condensing (1 digit)	Either "non-condensing" or "condensing", encoded as 1 or 2. If not known it is encoded as 0.
14	X	Flue type (1 digit)	Flue type, which is one of "unknown", "open", "room-sealed", or "open or room-sealed" encoded as 0, 1, 2 or 3.
15	X	Service provision (1 digit)	Service provision, encoded as : 0 unknown; 1 space and water heating all year; 2 space and water heating during heating season only; 3 space heating only; 4 water heating only.
16	X	HW vessel (1 digit)	Hot water storage vessel, encoded as: 1 integral within package; 3 separate cylinder; 4 none (service provision code 3).
17		Energy efficiency class (up to 4 chs.)	The energy efficiency class as defined for the proposed European energy label. Definition and format have not yet been decided. This field is being left blank until the European energy labelling scheme has been defined.
18	X	Water heating efficiency (sch.2) (nnnn.n)	Water heating efficiency from number 2 test schedule as defined in EN 13203-2 (% gross). Blank if service provision code is 3.
19	X	Net specific electricity consumed (HW sch.2) (number eg "±nn.nnn")	Specific electricity consumed (-ve if generated) during water heating efficiency test number 2 schedule, kWh_e per kWh_h. Blank if service provision code is 3.
20	X	Water heating efficiency (sch.3) (nnnn.n)	Water heating efficiency from number 3 test schedule as defined in EN 13203-2 (% gross). Blank if service provision code is 3 or not tested to this schedule.
21	X	Net specific electricity consumed (HW sch.3) (number eg "±nn.nnn")	Specific electricity consumed (-ve if generated) during water heating efficiency test number 3 schedule, kWh_e per kWh_h. Blank if service provision code is 4 or not tested to this schedule.
The remaining items are omitted for service provision code 4 (hot water provision only)			
22		Cogen package power (bottom of range) (number, up to 7 chs; eg "nnn.nnn")	Output power (to water) of the cogen package in kW. For range rated cogen packages it is the lower of the range of values for which the test results are valid. For other cogen packages this is the same as field 23.
23	X	Cogen package power (top of range) (number, up to 7 chs; eg "nnn.nnn", or text ">70kW")	Output power (to water) of the cogen package in kW. For range rated cogen packages this is the top of the range of values for which the test results are valid. Where the upper limit of the range exceeds 70 kW this is shown as ">70kW" instead of the exact value.
24	X	Heating duration (2 digits or V)	Coded 24 for continuous; 16 for 16 hours/day; 11 for 9 hours in the week and 24 at weekends; V for variable – same as 11 but switches to 16 or 24 hours on colder days before supplementary heating is applied.
25	X	Separate circulator (1 digit)	Whether the cogen package contains within it a water circulator for the emission system, or a separate system circulator must be installed outside the package. This must be confirmed on the test certificate. Encoded as: 0 unknown; 1 within; 2 separate. If within the package the net electricity consumed includes the circulator.
26	X	Number of plant size ratios (up to 2 digits)	The number of plant size ratios for which data are provided in the record (maximum 7).
27	X	A: Plant size ratio (up to 4 chs; eg n.nn)	Group A: This field introduces a set of results known as group A. It contains the plant size ratio to which the other data in group A relate.
28	X	A: Space heating efficiency (number, up to 6 chs; eg "nnn.n")	Group A: Space heating thermal efficiency expressed (% gross).

29	X	A: Net specific electricity consumed (space heating) (number eg “±nn.nnn”)	Group A: specific electricity consumed (negative if generated) during space heating, kWh_e per kWh_h.
30 to 26+3n	X	Group B, C, D, etc	Group B, C, D … Sets of results in the same format as those for group A for other plant size ratios. Plant size ratios are listed in the record in ascending order. n is the value in field 26.

See Appendix D for combinations of service provision and DHW vessel.

A.14 Data format specification : Postcode Table

The current specification has format number 272 and is shown below. Data from the fields marked X in the second column are needed when carrying out a calculation to the SAP 2012 specification using local weather.

FORMAT 272 (for Postcode Table)			
Field	X	Field name	Description
1		Area (1 or 2 characters)	Postcode area. See Note 1
2		District (1 or 2 characters)	Postcode district. See Note 1. For each postcode area there is a record with * for the district, to be used in cases where the district does not exist in the table.
3		DB entry updated (yyyy/mmm/dd hh:mm)	Date and time this record was created or last amended by the database administrator.
4	X	Climate region (1 or 2 digits)	Region code as defined in the SAP specification (map in Appendix U). 0 if unknown. See Note 2
5	X	Country (1 digit)	Country in which postcode is located, encoded as 2 Scotland, 3 Northern Ireland, 4 England, 5 Wales. Any other value means that the data record is not valid for SAP purposes. See Note 3.
6		District or area (1 digit)	Whether the data following are for the postcode district or postcode area, encoded as 0 district, 1 area. In most cases the data are for the postcode district; data for postcode area are given for non-geographical postcodes and in those records with * for the district.
7		Height above sea level (up to 4 digits)	Typical height above sea level for the postcode in metres. Blank if unknown. See Note 4
8	X	Latitude (up to 4 chs, e.g. 57.6)	Latitude in ° north of the equator.
9		Longitude (up to 5 chs, e.g. -10.7)	Longitude in ° east of the Greenwich meridian. Locations west of the Greenwich meridian have negative values. See Note 4.
10	X	Temperature for January (up to 4 chs, e.g. -10.3)	Mean external temperature for the month of January in °C.
11 to 21	X		Mean external temperature for months February to December.
22	X	Wind speed for January (up to 4 chs, e.g. 12.4)	Mean wind speed for the month of January in m/s.
23 to 33	X		Mean wind speed for months February to December.
34	X	Solar radiation for January (up to 3 digits)	Mean global solar irradiance on a horizontal plane for the month of January in W/m².
35 to 45	X		Mean global solar irradiance for months February to December.

Notes to Postcode Table:

Note 1. This table uses the first part of the postcode, e.g. B1 or AB24 in which B and AB are areas and 1 and 24 are districts. The area is one or two letters. The district is usually an integer in the range 0 to 99 but in London it can be a numeral and a letter, e.g. SW1V.

Note 2. The data may include regions not used in SAP; these have region code greater than 21.

Note 3. SAP regions 8 and 9 are in both England and Scotland. SAP regions 5 and 7 are in both England and Wales. The data may include territories that are not part of the UK; these have country code greater than 5.

Note 4. Height above sea level and longitude are not used SAP and are provided for information only.

A.15 Data format specification : Indicative Costs Table

The current specification has format number 283 and is shown below.

FORMAT 283 (for Indicative Costs Table)		
Field	Field name	Description
1	Improvement type or interest rate (1 or 2 characters)	Improvement type as defined in SAP Appendix T or other documentation. If this is the @ symbol field 5 gives the current interest rate. If an unrecognised improvement type is encountered, skip the record and continue at the next record; do not report a file format error.
2	Recommendation number (up to 2 digits)	Recommendation number as defined in SAP Appendix T. If it is 0 the indicative cost applies to all recommendations of the type in field 1.
3	Cost range (1 digit)	Whether the cost is to be given as a single figure or as a range, encoded as: 1 – cost to be given as a single figure 2 – cost to be given as a range.
4	Cost type (1 digit)	Cost type encoded as 1, 2, see Note 1. 1 – cost data B is not applicable 2 – cost data B is applicable
5	Bottom of range cost data A (up to 6 chs, e.g. nnn.nn)	Cost data A, applies to bottom of range if cost range is 2. Can be zero. If field 1 is @ this is the interest rate to be used for calculation of annual repayments.
6	Bottom of range cost data B (up to 6 chs, e.g. nnn.nn)	Cost data B, applies to bottom of range if cost range is 2. Blank if not applicable.
7	Top of range cost data A (up to 6 chs, e.g. nnn.nn)	Cost data A, applies to top of range. Blank if not applicable
8	Top of range cost data B (up to 6 chs, e.g. nnn.nn)	Cost data B, applies to top of range. Blank if not applicable.
9	Lifetime for Green Deal assessment (1 or two digits)	Lifetime of the measure in years for GD assessment. If field 1 is @ then: - if this field is blank there is no over-riding maximum - if it is not blank it is the maximum period for calculation of repayments.
10	Cost for Green Deal assessment (up to 5 digits)	Cost to be used for the calculation of Green Deal annual repayments. If blank this cost is the middle of the range determined by fields 3 to 8.
11	Eligible for Green Deal (1 digit)	Whether the improvement is eligible for Green Deal finance, encoded as 0=no, 1=yes. Blank if not applicable.
12	In-use factor for SAP (up to 4 chs, e.g. 0.90)	Factor multiplying the energy saving from the measure in RdSAP assessment Blank if not applicable
13	In-use factor for OA (up to 4 chs, e.g. 0.90)	Factor multiplying the energy saving from the measure in Occupancy Assessment Blank if not applicable
14	Minimum SAP increase (up to 4 chs, e.g. x.xx)	Minimum increase in SAP rating as a result of the measure in order for it to be recommended on an EPC. Blank if not applicable.
15	DB entry updated (yyyy/mmm/dd hh:mm)	Date and time this record was created or last amended by the database administrator.

Notes to Indicative Costs Table:

Note 1. If cost type is 1, the indicative cost is generated from cost data A only. If cost type is 2, the indicative cost is calculated as A + B x <variable> where <variable> depends on the measure.

A.16 Data format specification : Fuel Prices Table

The current specification has format number 292 and is shown below.

FORMAT 292 (for Fuel Prices Table)		
Field	Field name	Description
1	Fuel category (up to 2 digits)	One of gas, oil, solid fuel, electricity, community heating not CHP, community heating CHP, coded as 1 to 6 respectively. See Notes 1, 2 and 3.
2	Fuel or heat source (up to 3 digits)	For fuel categories 1 to 4, fuel type encoded with the same codes as in SAP 2012 Table 12. For fuel category 5 it is 47 and for fuel category 6 it is 48.
3	Standing charge (up to 3 digits)	Standing charge in £/year
4	Fuel price (up to 5 chs; eg nn.nn)	Fuel price in p/kWh
5	DB entry updated (yyyy/mmm/dd hh:mm)	Date and time this record was created or last amended by the database administrator.

Notes to Fuel Prices Table:

Note 1. The standing charge for community heating is given in the record for fuel category 5. This standing charge applies to all cases of community heating.

Note 2. The price given for fuel category 5 applies when the community heat source is a boiler or heat pump. The price given for fuel category 6 applies when the community heat source is CHP, waste heat from power station or geothermal.

Note 3. The footnotes to SAP 2012 Table 12 apply where relevant.

A.17 Data format specification : Flue Gas Heat Recovery Systems Table

The current specification has format number 413 and is shown below. Data from the fields marked X in the second column are needed when carrying out a calculation to the SAP 2012 specification. In addition, the following must be read and included in any printout: 6, 7, 8.

SAP software implementing SAP 2012 should contain an option to display to the software user at least all the data marked X in the second column for any specified data record (this is because the data might be required in connection with an Appendix Q procedure).

FORMAT 413 (for FGHRS Table)			
Field	X	Field name	Description
1		Index (6 digits)	Unique index number for each record, assigned automatically by database software and used for control and reference purposes. (See 7.1).
2		Manufacturer reference number (6 digits)	Reference to current name of manufacturer *(see field 2 in Manufacturers Table)*.
3	X	Status (one digit)	Status of the data record, encoded as 0=normal status for an actual product, 1=illustrative (non-existent) product, 2=under investigation, 3=not valid, 4=methodology under review. (See 8.1 to 8.4).
4		DB entry updated (yyyy/mmm/dd hh:mm)	Date and time this record was created or last amended by the database administrator.
5		Manufacturer name (up to 50 chs.)	The original name of the manufacturer, which may be different from the current name.
6		Brand name (up to 50 chs.)	Name of brand, as shown on the heat recovery device. If none the original manufacturer name will be inserted instead. If the same system is sold under more than one brand name then separate entries for each will appear in the database.
7		Model name (up to 50 chs.)	Name of model of heat recovery device, as it appears on the boiler casing or leaflet of owner's instructions. If the same system is sold under more than one model name then separate entries for each will appear in the database.
8		Model qualifier (up to 30 chs.)	Qualifier to model name, if needed in addition to the model name to discriminate between different versions of same model.
9		First year of manufacture (up to 4 chs.)	First year of manufacture, if known; otherwise blank.

10		Final year of manufacture (up to 8 chs.)	Final year of manufacture, or "current" if still in production. If no longer produced but date production ceased is unknown, then "obsolete".
11	X	Applicable fuel (one digit)	Fuel to which the data apply, which is any one of the fuel codes specified in SAP Table 12 under sub-headings "gas", "oil". If the same device may be used with more than one type of fuel then separate entries for each appear in the database, except that a boiler listed for bulk LPG is also applicable to bottled LPG and LPG subject to special condition 18.
12		Test fuel (1 digit)	Fuel used to obtain the test data, which is one of "gas", "LPG", or "oil", encoded as 1, 2 or 4. If this differs from the fuel in field 11, the data have been adjusted.
13	X	Applicable boiler types (up to 6 chs, eg RCS)	Between one and six letters indicating which boiler types the system can be used with: R – regular boiler C – instantaneous combi without keep-hot facility and without external store K – instantaneous combi with keep-hot facility E – instantaneous combi with close-coupled external store S – storage combi P – CPSU These can be in any order.
14	X	Integral only (1 digit)	Whether the FGHRS is used only as an integral part of a boiler. This is 1 if it is integral only and 0 if not. See Note 1.
15	X	Heat store (1 digit)	Whether or not the device has a heat store. This is 1 if it has no store, 2 if it has an internal heat store and 3 if it has a close-coupled external store. Heat store = 3 is valid only with an instantaneous combi boiler with close-coupled external store (applicable boiler type E).
16	X	Heat store total volume (up to 3 digits)	Total volume of close-coupled external heat store in litres, 0 if no close-coupled external store.
17	X	Heat store recaptured volume (up to 3 digits)	Volume of heat store heated by the recovered heat, 0 if no store. For single purpose stores this is the same as the total volume. For multiple purpose stores it is the volume below main heating coil.
18	X	Heat store loss rate (up to 5 chs, eg x.xx)	Heat loss rate from close-coupled external store measured according to BS 1566, in kWh/day. Blank if not applicable.
19	X	Direct total heat recovered (up to 5 chs, eg x.xxx)	Total fraction of heat recovered by the device in a hot-water-only test using a combi boiler without keep-hot facility.
20	X	Direct useful heat recovered (up to 5 chs, eg x.xxx)	Useful fraction of heat recovered by the device in a hot-water-only test using a combi boiler without keep-hot facility. Blank if not applicable
21	X	Power consumption (up to 5 chs, eg x.x)	Annual power consumption of any electrical components in kWh/year (for example a pump). Blank if not applicable
22	X	Photovoltaic module (1 digit)	Whether the device includes a PV module connected to a close-coupled external store. This is 1 if it has a PV module and 0 if not. Valid only if Heat store = 3.
23	X	Cable loss (up to 5 chs, eg x.xxx)	Fraction of PV power dissipated in cable connecting PV array to immersion heater. Blank if not applicable.
24	X	Number of equations (up to 2 digits)	The number of equations. If the device has no heat store (field 15 = 1) this field is zero and the remaining fields of the record are blank.
25	X	A: Space heating requirement from boiler system, up to 6 digits	This field introduces the parameters for equation A It contains the monthly space heating requirement from the boiler in kWh as calculated by SAP (before application of boiler efficiency)
26	X	A: coefficient a (sign and number, up to 7 chs; eg "-x.xxx")	Coefficient a for equation A, instantaneous combi without keep-hot facility and without external store Fields 26, 27 and 28 are blank if the system does not apply to an instantaneous combi without keep-hot facility and without external store
27	X	A: coefficient b (sign and number, up to 7 chs; eg "-xxxx.x")	Coefficient b for equation A, instantaneous combi without keep-hot facility and without external store
28	X	A: coefficient c (sign and number, up to 7 chs; eg "-xxxx.x")	Coefficient c for equation A, instantaneous combi without keep-hot facility and without external store
29	X	A: coefficient a (sign and number, up to 7 chs; eg "-x.xxx")	Coefficient a for equation A, other boilers Fields 29, 30 and 31 are blank if the system applies only to an instantaneous combi without keep-hot facility
30	X	A: coefficient b (sign and number, up to 7 chs; eg "-xxxx.x")	Coefficient b for equation A, other boilers
31	X	A: coefficient c (sign and number, up to 7 chs; eg "-xxxx.x")	Coefficient c for equation A, other boilers
32 to 24+7n	X	Groups B, C, D, etc	Groups B, C, D, …: Equations in the same format as Group A. n is the value in field 24.

Notes to the Flue Gas Heat Recovery System Table:

Note 1. The following rules apply to an integral PFGHRD

- if a boiler with integral PFGHRD has been selected (as determined by the entry in the boiler table), SAP software must not permit a FGHRS to be selected by the assessor. The list of available FGHRS must not be presented to the assessor. The SAP software must select the linked PFGHRD automatically (implicit selection).

- if the assessor selected a FGHRS first (explicit selection) and then a boiler with integral PFGHRD, his selection of the FGHRS is to be cancelled automatically by SAP software and a warning given. The SAP software then selects the linked PFGHRD automatically.

- if a boiler with integral PFGHRD was selected and is then changed for a different boiler, the implicit selection of the PFGHRD to which the first boiler was linked is to be cancelled automatically by SAP software.

- a PFGHRD for which field 14 in the FGHRS table is set to 1 is never shown to the SAP assessor as available to select. It can be applied in the SAP calculation only by choosing a boiler with integral PFGHRD that is linked to it.

A.18 Data format specification : Centralised Mechanical Ventilation Systems Table

This table includes centralised systems that are extract-only, supply-only, and balanced supply and extract.

The current specification has format number 426 and is shown below. Data from the fields marked X in the second column are needed when carrying out a calculation to the SAP 2012 specification. In addition, the following must be read and included in any printout: 6, 7, 8.

SAP software implementing SAP 2012 should contain an option to display to the software user at least all the data marked X in the second column for any specified data record (this is because the data might be required in connection with an Appendix Q procedure).

FORMAT 426 (for Centralised MEV and MVHR systems)			
Field	X	Field name	Description
1		Index (6 digits)	Unique index number for each record, assigned automatically by database software and used for control and reference purposes. (See 7.1).
2		Manufacturer reference no. (6 digits)	Reference to current name of manufacturer *(see field 2 in Manufacturers Table)*.
3	X	Status (one digit)	Status of the data record, encoded as 0=normal status for an actual product, 1=illustrative (non-existent) product, 2=under investigation, 3=not valid, 4=methodology under review. (See 8.1 to 8.4).
4		DB entry updated (yyyy/mmm/dd hh:mm)	Date and time this record was created or last amended by the database administrator.
5		Manufacturer name (up to 50 chs.)	The original name of the manufacturer, which may be different from the current name.
6		Brand name (up to 50 chs.)	Name of brand, as shown on the ventilation unit. If none the original manufacturer name will be inserted instead. If the same system is sold under more than one brand name then separate entries for each will appear in the database.
7		Model name (up to 50 chs.)	Name of model of ventilation unit, as it appears on the unit's casing or leaflet of owners' instructions. If the same system is sold under more than one model name then separate entries for each will appear in the database.
8		Model qualifier (up to 30 chs.)	Qualifier to model name, if needed in addition to the model name to discriminate between different versions of same model.
9		First year of manufacture (up to 4 chs.)	First year of manufacture, if known; otherwise blank.

10		Final year of manufacture (up to 8 chs.)	Final year of manufacture, or “current” if still in production. If no longer produced but date production ceased is unknown, then “obsolete”.
11	X	Main type (1 digit)	Main product type, which is one of "centralised mechanical extract ventilation", "balanced whole-house mechanical ventilation with heat recovery", "balanced whole-house mechanical ventilation without heat recovery" or “positive input ventilation” coded as 1, 3, 4 and 5 respectively. Note: If an unknown value is encountered, skip record and treat the ventilation system as non-existent. Do not report a file format error.
12	X	Integral only (1 digit)	Whether the MEV or MVHR is used only as an integral part of an exhaust air heat pump system. This is 1 if it is integral only and 0 if not. See Note 1.
13	X	Flexible or rigid ducting	Whether tested using flexible or rigid ducting, coded as 1 and 2 respectively. Any other value means the data record is not valid. If the same system has been tested for both flexible and rigid ducting then separate entries for each appear in the database.
14	X	Test duct size (1 digit)	Coded as 1 for 125 mm diameter or 204 x 60 rectangular or larger, coded as 2 for 100 mm diameter or 100 x 50 rectangular. If the same system has been tested with both sizes then separate entries for each will appear in the database. See Note 2.
15	X	Summer by-pass	Whether an MVHR has a by-pass of the heat recovery unit which can be used during summer, encoded as 0=unknown; 1=no; 2=optional; 3=yes. Optional means that the unit is available both with and without a by-pass. Blank if not applicable.
16	X	Number of exhaust terminal configurations (up to 2 digits)	The number of different configurations tested. This will include the kitchen and at least one other wet room.
17		Test flow rates basis	For MVHR, whether the test flow rates were those for SAP 2005/2009 or SAP 2012, indicated as 2005 or 2012 respectively. If the tests were done for SAP 2005/2009 flow rates, the SFP and efficiency will have been adjusted to the SAP 2012 rates. Blank if not applicable.
18	X	A: number of additional wet rooms (up to 2 digits)	This field introduces a set of test results known as group A. It contains the number of additional wet rooms (i.e. in addition to the kitchen) to which the other data in group A relate.
19		A: Test flow rate (up to 5 chs e.g. nn.n)	Test flow rate in litres/sec
20		A: Fan speed setting (up to 30 chs)	The fan speed setting for the test, as marked on the MEV or MVHR unit.
21		A: Applicable flow rate (up to 5 chs e.g. nn.n)	Flow rate for the values in the next two fields.
22	X	A: Specific fan power (up to 4 chs e.g. n.nn)	Specific fan power in watts per (litre per second)..
23	X	A: Heat exchanger efficiency (up to two digits)	Heat exchanger efficiency in %. MVHR only, blank if not applicable.
24 to 17+6n	X	Groups B, C, D, etc	Groups B, C, D, …: Sets of results in the same format as Group A. n is the value in field 15

Notes to the Centralised Mechanical Ventilation Systems Table:

Note 1. If the MEV/MVHR is integral only its characteristics are applied only when the system is specified by the data record for an exhaust air heat pump. Either:
- it must not appear in a list of systems selectable by users of SAP software, or
- SAP software must generate an error if the heating system and mechanical ventilation system are incompatible.

Note 2. The test data are valid provided that the installed duct size is at least as great as the test duct size.

A.19 Data format specification : Decentralised Mechanical Extract Ventilation Systems Table

A decentralised MEV system extracts air from wet rooms via an extract fan in each wet room. Fans can be through-the-wall with no ducting, or within short lengths of ducting.

The current specification has format number 427 and is shown below. Data from the fields marked X in the second column are needed when carrying out a calculation to the SAP 2012 specification. In addition, the following must be read and included in any printout: 6, 7, 8.

SAP software implementing SAP 2012 should contain an option to display to the software user at least all the data marked X in the second column for any specified data record (this is because the data might be required in connection with an Appendix Q procedure).

FORMAT 427 (for Decentralised MEV systems)			
Field	X	Field name	Description
1		Index (digits)	Unique index number for each record, assigned automatically by database software and used for control and reference purposes. (See 7.1).
2		Manufacturer reference no. (digits)	Reference to current name of manufacturer *(see field 2 in Manufacturers Table)*.
3	X	Status (one digit)	Status of the data record, encoded as 0=normal status for an actual product, 1=illustrative (non-existent) product, 2=under investigation, 3=not valid, 4=methodology under review. (See 8.1 to 8.4).
4		DB entry updated (yyyy/mmm/dd hh:mm)	Date and time this record was created or last amended by the database administrator.
5		Manufacturer name (up to 50 chs.)	The original name of the manufacturer, which may be different from the current name.
6		Brand name (up to 50 chs.)	Name of brand, as shown on the ventilation unit. If none the original manufacturer name will be inserted instead. If the same system is sold under more than one brand name then separate entries for each will appear in the database.
7		Model name (up to 50 chs.)	Name of model of ventilation unit, as it appears on the unit's casing or leaflet of owners' instructions. If the same system is sold under more than one model name then separate entries for each will appear in the database.
8		Model qualifier (up to 30 chs.)	Qualifier to model name, if needed in addition to the model name to discriminate between different versions of same model.
9		First year of manufacture (up to 4 chs.)	First year of manufacture, if known; otherwise blank.
10		Final year of manufacture (up to 8 chs.)	Final year of manufacture, or "current" if still in production. If no longer produced but date production ceased is unknown, then "obsolete".
11	X	Main type (1 digit)	Main product type, which is "decentralised mechanical extract ventilation" coded as 2. Note: If an unknown value is encountered, skip record and treat the ventilation system as non-existent. Do not report a file format error.
12	X	Flexible or rigid ducting	Whether tested using flexible or rigid ducting, coded as 1 and 2 respectively. This is for "in-room" and "in duct" configurations. Any other value means the data record is not valid. If the same system has been tested for both flexible and rigid ducting then separate entries for each appear in the database.
13	X	Number configurations (up to 2 digits)	The number of different configurations tested. At present this is 6 (two types of wet room and three types of fan location)
14	X	A: configuration	This field introduces a set of test results known as group A. It defines the configuration which the other data in group A relate, encoded as: 1 In-room fan, kitchen 2 In-room fan, other wet room 3 In-duct fan, kitchen 4 In-duct fan, other wet room 5 Through-wall fan, kitchen 6 Through-wall fan, other wet room
15		A: Test flow rate (up to 5 chs e.g. nn.n)	Test flow rate in litres/sec. Blank if this configuration has not been tested, see Note 1
16		A: Fan speed setting (up to 30 chs)	The fan speed setting for the test, as marked on the fan unit. Blank if this configuration has not been tested, see Note 1.
17	X	A: Specific fan power (up to 4 chs e.g. n.nn)	Specific fan power in watts per (litre per second) in minimum flow rate test. Blank if this configuration has not been tested, see Note 1.
18 to (13+4 n)	X	Groups B, C, D, etc	Groups B, C, D, …: Sets of results in the same format as Group A. n is the value in field 12.

Notes to the Decentralised MEV Table:

Note 1. For some products data may not be provided for certain configurations. Such configurations are not a valid selection for SAP calculations.

For decentralised MEV systems the data in the table refers to a package of individual extract fans.

A.20 Data format specification : MV In-use Factors Table

The current specification has format number 430 and is shown below.

FORMAT 430 (for MV In-use Factors table)		
Field	Field name	Description
1	System type (up to 2 digits)	Main product type to which adjustments are applicable, which is one of "centralised mechanical extract ventilation", "decentralised mechanical extract ventilation", "balanced whole-house mechanical ventilation with or without heat recovery", “positive input ventilation” or "default data" coded as 1, 2, 3, 5 and 10 respectively. If any other value the record should be disregarded.
2	SFP adjustment 1 for flexible ducting (up to 5 chs e.g. n.nnn)	Multiplying factor to be applied to specific fan power when unit is used with flexible ducting when system is not installed under an approved installation scheme.
3	SFP adjustment 1 for rigid ducting (up to 5 chs e.g. n.nnn)	Multiplying factor to be applied to specific fan power when unit is used with rigid ducting.
4	SFP adjustment 1 for no ducting (up to 5 chs e.g. n.nnn)	Multiplying factor to be applied to specific fan power when unit is used with no ducting (through-the-wall type) when system is not installed under an approved installation scheme. Blank if not applicable.
5	MVHR efficiency adjustment 1 for uninsulated ducting (up to 5 chs e.g. n.nnn)	Multiplying factor to be applied to MVHR efficiency when unit is used with uninsulated ducting when system is not installed under an approved installation scheme. Blank if not applicable.
6	MVHR efficiency adjustment 1 for insulated ducting (up to 5 chs e.g. n.nnn)	Multiplying factor to be applied to MVHR efficiency when unit is used with insulated ducting when system is not installed under an approved installation scheme. Blank if not applicable.
7	SFP adjustment 2 for flexible ducting (up to 5 chs e.g. n.nnn)	Multiplying factor to be applied to specific fan power when unit is used with flexible ducting when system is installed under an approved installation scheme.
8	SFP adjustment 2 for rigid ducting (up to 5 chs e.g. n.nnn)	Multiplying factor to be applied to specific fan power when unit is used with rigid ducting when system is installed under an approved installation scheme.
9	SFP adjustment 2 for no ducting (up to 5 chs e.g. n.nnn)	Multiplying factor to be applied to specific fan power when unit is used with no ducting (through-the-wall type) when system is installed under an approved installation scheme. Blank if not applicable.
10	MVHR efficiency adjustment 2 for uninsulated ducting (up to 5 chs e.g. n.nnn)	Multiplying factor to be applied to MVHR efficiency when unit is used with uninsulated ducting when system is installed under an approved installation scheme. Blank if not applicable.
11	MVHR efficiency adjustment 2 for insulated ducting (up to 5 chs e.g. n.nnn)	Multiplying factor to be applied to MVHR efficiency when unit is used with insulated ducting when system is installed under an approved installation scheme. Blank if not applicable.
12	DB entry updated (yyyy/mmm/dd hh:mm)	Date and time this record was created or last amended by the database administrator.

Notes to the MV In-use Factors Table:

The factors for system types 1, 2, 3 and 5 are used for the applicable system where the specific fan power and efficiency are based on test data applicable to SAP. The factors for system 10 are used where the specific fan power and efficiency are taken from SAP Table 4g.

Balanced whole-house mechanical ventilation without heat recovery is system type 3 (in field 1) for the purposes of this table. In this case only the SFP adjustment is relevant (the heat recovery efficiency is given as zero).

If there is no applicable approved installation scheme the values for with and without scheme are the same.

A.21 Data format specification : MVHR Duct Table

The current specification has format number 441 and is shown below. The following fields must be read and included in any printout: 6, 7, 8.

FORMAT 441 (for MVHR ducts)			
Field	X	Field name	Description
1		Index (digits)	Unique index number for each record, assigned automatically by database software and used for control and reference purposes. (See 7.1).
2		Manufacturer reference no. (digits)	Reference to current name of manufacturer *(see field 2 in Manufacturers Table)*.
3	X	Status (one digit)	Status of the data record, encoded as 0=normal status for an actual product, 1=illustrative (non-existent) product, 2=under investigation, 3=not valid, 4=methodology under review. (See 8.1 to 8.4).
4		DB entry updated (yyyy/mmm/dd hh:mm)	Date and time this record was created or last amended by the database administrator.
5		Manufacturer name (up to 50 chs.)	The original name of the manufacturer, which may be different from the current name.
6		Brand name (up to 50 chs.)	Name of brand, as shown on the duct system and MHVR unit. If the same system is sold under more than one manufacturer name then separate entries for each will appear in the database.
7		Model name (up to 50 chs.)	Name of model of duct system, as shown on the duct system and MHVR unit.
8		Model qualifier (up to 30 chs.)	Qualifier to model name, if needed in addition to the model name to discriminate between different versions of same model.
9		First year of manufacture (up to 4 chs.)	First year of manufacture, if known; otherwise blank.
10		Final year of manufacture (up to 8 chs.)	Final year of manufacture, or “current” if still in production. If no longer produced but date production ceased is unknown, then “obsolete”.
11	X	Duct type (1 digit)	Type of ducting: flexible, rigid or semi-rigid, coded as 1, 2 and 3 respectively. Any other value means the data record is not valid.

A.22 Data format specification : Waste Water Heat Recovery System Table

The current specification has format number 453 and is shown below. Data from the fields marked X in the second column are needed when carrying out a calculation to the SAP 2012 specification. In addition, the following must be read and included in any printout: 6, 7, 8.

SAP software implementing SAP 2012 should contain an option to display to the software user at least all the data marked X in the second column for any specified data record (this is because the data might be required in connection with an Appendix Q procedure).

FORMAT 453 (for WWHRS)			
Field	X	Field name	Description
1		Product index number (digits)	Unique index number for each record, assigned automatically by database software and used for control and reference purposes. (See 7.1).
2		Manufacturer reference no. (digits)	Reference to current name of manufacturer *(see field 2 in Manufacturers Table)*.
3	X	Status (one digit)	Status of the data record, encoded as 0=normal status for an actual product, 1=illustrative (non-existent) product, 2=under investigation, 3=not valid, 4=methodology under review. (See 8.1 to 8.4).
4		DB entry updated (yyyy/mmm/dd hh:mm)	Date and time this record was created or last amended by the database administrator.
5		Manufacturer name (up to 50 chs.)	The original name of the manufacturer, which may be different from the current name.
6		Brand name (up to 50 chs.)	Name of brand, as shown on the device. If the same system is sold under more than one brand name then separate entries for each will appear in the database.

7		Model name (up to 50 chs.)	Name of model of device, as it appears on the shower casing or leaflet of owner's instructions. If the same unit is sold under more than one model name then separate entries for each will appear in the database.
8		Model qualifier (up to 30 chs.)	Qualifier to model name, if needed in addition to the model name to discriminate between different versions of same model. For an instantaneous WWHRS, this is ”System A”, “System B” or “System C”.
9		First year of manufacture (up to 4 chs.)	First year of manufacture, if known; otherwise blank.
10		Final year of manufacture (up to 8 chs.)	Final year of manufacture, or “current” if still in production. If no longer produced but date production ceased is unknown, then “obsolete”.
11	X	Instantaneous or storage (1 digit)	Whether an instantaneous or storage WWHRS, encoded as 1 and 2 respectively.
12	X	System type (1 char or blank)	For an instantaneous WWHRS, this is A, B or C as defined in the SAP specification. If data are available for more than one system type, a record for each will be included. For a storage WWHRS this is blank.
13	X	Storage type (1 char or blank)	For a storage WWHRS, this is “combined” or “separate”, encoded as 1 or 2. For an instantaneous WWHRS this is blank.
14	X	Efficiency (up to 5 chs, e.g. nnn.n)	Heat recovery efficiency of system (%)
15	X	Utilisation factor (up to 5 chs, e.g. n.nnn)	Utilisation factor for system (fraction between 0 and 1)
16	X	Waste water fraction (up to 5 chs, e.g. n.nnn)	Fraction of total bathing waste water that is routed through the heat recovery system.
17		Test dedicated volume (up to 4 chs, e.g. nnnn)	Dedicated storage volume used in efficiency test in litres. For an instantaneous WWHRS this is blank.
18	X	Low dedicated volume (up to 4 chs, e.g. nnnn)	Low end of validity range of dedicated storage in litres. For an instantaneous WWHRS this is blank.
19	X	High dedicated volume (up to 4 chs, e.g. nnnn)	High end of validity range of dedicated solar volume. For an instantaneous WWHRS this is blank
20	X	Electricity consumption (up to 6 chs, e.g. n.nnnn)	Daily electricity consumption of a storage WWHRS in kWh/day. For an instantaneous WWHRS this is zero.

A.23 Data format specification : Heat pump Table

The current specification has format number 464 and is shown below. Data from the fields marked X in the second column are needed when carrying out a calculation to the SAP 2012 specification. In addition, the following must be read and included in any printout: 7, 8, 9.

SAP software implementing SAP 2012 should contain an option to display to the software user at least all the data marked X in the second column for any specified data record (this is because the data might be required in connection with an Appendix Q procedure).

FORMAT 464 (for Heat Pump Table)			
Field	X	Field name	Description
1		Product index number (6 digits)	Unique index number for each record, assigned automatically by database software and used for control and reference purposes. (See 7.1).
2		Manufacturer reference number (6 digits)	Reference to current name of manufacturer *(see field 2 in Manufacturers Table)*.
3	X	Status (one digit)	Status of the data record, encoded as 0=normal status for an actual product, 1=illustrative (non-existent) product, 2=under investigation, 3=not valid, 4=methodology under review. (See 8.1 to 8.4).
4		DB entry updated (yyyy/mmm/dd hh:mm)	Date and time this record was created or last amended by the database administrator.

5		APM version number (up to 5 chs, eg nn.nn)	Version number of the Annual Performance Method used to generate the data record from test data.
6		Manufacturer name (up to 50 chs.)	The original name of the manufacturer, which may be different from the current name.
7		Brand name (up to 50 chs.)	Name of brand, as shown on the heat pump package. If none the original manufacturer name will be inserted instead. If the same heat pump package is sold under more than one brand name then separate entries for each will appear in the database.
8		Model name (up to 50 chs.)	Name of heat pump model, as it appears on the heat pump unit casing or leaflet of owners' instructions. If the same heat pump package is sold under more than one model name then separate entries for each should appear in the database.
9		Model qualifier (up to 30 chs.)	Qualifier to model name, if needed in addition to the model name to discriminate between different versions of same model.
10		First year of manufacture (up to 4 chs.)	First year of manufacture, if known; otherwise blank.
11		Final year of manufacture (up to 8 chs.)	Final year of manufacture, or "current" if still in production. If no longer produced but date production ceased is unknown, then "obsolete".
12		Data quality (1 digit)	Data quality encoded as: 1 UKAS or equivalent, 2 MCS accredited on or after 1 Nov 2009; 3 MCS accredited before 1 Nov 2009.
13	X	Fuel (1 or 2 digits)	Fuel type, which is 39 for electricity or any one of the fuel codes specified in SAP Table 12 under sub-headings "gas" or "oil". If the heat pump package can use than one type of fuel then separate entries for each appear in the database, except that a heat pump listed for bulk LPG is also applicable to bottled LPG and LPG subject to special condition 18.
14	X	Heat distribution type (1 digit)	Space heat distribution, encoded as: 1 wet system, flow temperature 55°C; 2 wet system, flow temperature 45°C; 3 wet system, flow temperature 35°C; 4 warm air system. Blank if not applicable (service provision code 4). If the heat pump package has been tested for more than one heat distribution type then separate entries for each appear in the database.
15	X	Flue type (1 digit)	Flue type, which is one of "unknown", "open", "room-sealed", "open or room-sealed", "none" encoded as 0, 1, 2, 3 or 4. For electric heat pumps it is 4.
16	X	Heat source (1 digit)	Heat source encoded as: 1 ground, 3 air, 4 exhaust air MEV, 5 exhaust air MVHR, 6 mixed exhaust air MEV and outside air, 7 ground water, 8 surface water, 9 solar assisted.
17	X	Service provision (1 digit)	Service provision, encoded as: 0 unknown; 1 space and water heating all year, 2 space and water heating during heating season only; 3 space heating only; 4 water heating only.
18	X	HW vessel (1 digit)	Hot water storage vessel, encoded as: 1 integral; 2 separate and specified vessel (in fields 19, 20, 21); 3 separate but unspecified vessel; 4 none (service provision code 3).
19	X	Vessel volume (number nnnn)	Hot water storage vessel volume. In the case of HW vessel code 2 this is the minimum volume of the separate vessel to which the performance data relates (a reduced water heating efficiency applies in the SAP calculation if the actual vessel is smaller). Blank for HW vessel code 3 or 4.
20	X	Vessel heat loss (number nnn.nnn)	Declared vessel heat loss rate at 45K rise above ambient. In the case of HW vessel code 2 this is the maximum heat loss rate of the separate vessel to which the performance data relates (a reduced water heating efficiency applies in the SAP calculation if the actual vessel has a higher heat loss rate). Blank for HW vessel code 3 or 4.
21	X	Vessel heat exchanger area (number nnn.nnn)	Minimum vessel heat exchanger area of the separate vessel to which the performance data relates (a reduced water heating efficiency applies in the SAP calculation if the actual vessel has a lower heat transfer area). Blank for HW vessel code 3 or 4, may be blank for HW vessel code 1.
22		Energy efficiency class (up to 4 chs.)	The energy efficiency class as defined for the proposed European energy label. Definition and format have not yet been decided. This field is being left blank until the European energy labelling scheme has been defined.
23	X	Water heating efficiency (sch.2) (number nnnn.n)	Water heating efficiency from number 2 test schedule (% gross). Blank if service provision code is 3.
24	X	Net specific electricity consumed (sch.2) (number eg "±nn.nnn")	Specific electricity consumed during water heating efficiency test number 2 schedule, kWh_e per kWh_h. Blank if service provision code is 3. This value is zero for heat pumps powered solely by electricity.
25	X	Water heating efficiency (sch.3) (nnnn.n)	Water heating efficiency from number 3 test schedule (% gross). Blank if service provision code is 3 or not tested to this schedule.
26	X	Net specific electricity consumed (sch.3) (number eg "±nn.nnn")	Specific electricity consumed (negative if generated) during water heating efficiency test number 3 schedule, kWh_e per kWh_h. Blank if service provision code is 3 or not tested to this schedule. This value is zero for heat pumps powered solely by electricity.
27	X	Control capabilities (4 or 8 hex digits)	Values that indicate features that are relevant for heating controls. See Note 2.
The remaining items are omitted for service provision code 4 (hot water provision only)			
28	X	Reversible (1 digit)	Whether the heat pump is reversible to as to provide cooling in summer. Coded as 0=unknown, 1=no, 2=yes.

29	X	EER (up to 5 chs eg "nn.nn"	The Energy Efficiency Ratio of the heat pump in cooling mode. Blank if unknown or inapplicable.
30	X	Maximum output (number, up to 7 chs; eg “nnn.nnn”)	Maximum heat output of the heat pump in kW. Note this varies by emitter type.
31	X	Heating duration (2 digits or V)	Coded 24 for continuous; 16 for 16 hours/day; 11 for 9 hours on weekdays and 24 at weekends; V for variable – same as 11 but switches to 16 or 24 hours on colder days before supplementary heating is applied.
32	X	MEV or MVHR product index (6 digits)	The MVHR or MEV for which the space heating data applies. Blank if heat source code is not 4, 5 or 6. See Note 1.
33		Compensator effect (1 digit)	Weather compensator or enhanced load compensator included in the results (1 yes; 2 no)
34	X	Separate circulator (1 digit)	Whether the package contains within it a water circulator for the emission system or a separate system circulator must be installed outside the package. This must be confirmed on the test certificate. Encoded as: 0 unknown; 1 within; 2 separate. Blank if not applicable. If within the package the net electricity consumed includes the circulator.
35	X	Number of air flow rates (1 digit)	(2 or 3 or blank) Number of air flow rates for which the group of space heating results apply. Blank if heat source code is not 4, 5 or 6.
36	X	Air flow air 1 (number nnn.n)	Lowest or lower air flow rate in l/s when tested for which the groups of results apply. Blank if heat source code is not 4, 5 or 6.
37	X	Air flow rate 2 (number nnn.n)	Medium or higher flow rate in l/s for which the group of results. Blank if heat source code is not 4, 5 or 6.
38	X	Air flow rate 3 (number nnn.n)	Highest air flow rate in l/s when tested for which the groups of space heating results apply. Blank if heat source code is not 4, 5 or 6.
39	X	Number of plant size ratios (1 digit)	The number of plant size ratios for which data are provided in the record (maximum 7). If there is more than one flow rate (field 34 = 2 or 3), this number is the same for each flow rate in the record.
40	X	A: Plant size ratio (nn.nn)	Group A: This field introduces a set of results known as group A. It contains the plant size ratio to which the other data in group A relate. If there is more than one flow rate the plant size ratios for each flow rate are the same.
41	X	A: space heating efficiency (number, up to 5 chs; eg “nnn.n”)	Group A: space heating thermal efficiency expressed (% gross).
42	X	A: specific electricity consumed (space heating) (number eg “±nn.nnn”)	Group A: specific electricity consumed during space heating, kWh_e per kWh_h. If the heat pump is powered solely by electricity this is zero.
43	X	A: Running hours (number nnnn)	Group A: heat pump running hours per year. For heat source code 1, 2 or 3 this is blank.
44 to 39+4n	X	Group B, C, D, etc	Group B, C, D … Set of results in the same format as those for group A for other plant size ratios. Plant size ratios are listed in the record in ascending order. n is the value in field 38
40+4n to 39+8n	X		PSR-dependent results (i.e. Groups A, B etc) for air flow rate 2. n is the value in field 38. Omitted if not applicable
40+8n to 39+12n	X		PSR-dependent results (i.e. Groups A, B etc) for air flow rate 3. n is the value in field 38. Omitted if not applicable

Notes to the Heat Pump Table:

Note 1. Exhaust air heat pumps consist of a heat pump and a MEV or MVHR system that are tested together and the database contains data for both heat pump and MV performance. Field 32 provides the product index in the MEV/MVHR table.
If such a heat pump is selected SAP software should indicate in its ventilation data section that the mechanical ventilation is part of the system and must prevent the user from selecting an alternative mechanical system or alternative ventilation type (or indicate an error condition if that happens).

Note 2. This is constructed as 32 boolean values, for example 453C is 0100010100111100. Control capabilities are defined in the Heating Control Requirements Table. See also the format for the Heating Controls Table.

See Appendix D for combinations of service provision and DHW vessel.

A.24 Data format specification : Heating Controls Table

The current specification has format number 471 and is shown below. Data from the fields marked X in the second column are needed when carrying out a calculation to the SAP 2012 specification. In addition, the following must be read and included in any printout: 6, 7, 8.

SAP software implementing SAP 2012 should contain an option to display to the software user at least all the data marked X in the second column for any specified data record (this is because the data might be required in connection with an Appendix Q procedure).

The table is used for (a) compensating controls for boilers and (b) time and temperature zone control for boilers and heat pumps.

FORMAT 471 (for Heating Controls)			
Field	X	Field name	Description
1		Index (digits)	Unique index number for each record, assigned automatically by database software and used for control and reference purposes. (See 7.1).
2		Manufacturer reference no. (digits)	Reference to current name of manufacturer *(see field 2 in Manufacturers Table)*.
3	X	Status (one digit)	Status of the data record, encoded as 0=normal status for an actual product, 1=illustrative (non-existent) product, 2=under investigation, 3=not valid, 4=methodology under review. (See 8.1 to 8.4).
4		DB entry updated (yyyy/mmm/dd hh:mm)	Date and time this record was created or last amended by the database administrator.
5		Manufacturer name (up to 50 chs.)	The original name of the manufacturer, which may be different from the current name.
6		Brand name (up to 50 chs.)	Name of brand, as shown on the installed product. If the same system is sold under more than one brand name then separate entries for each will appear in the database.
7		Model name (up to 50 chs.)	Name of model of installed product, as it appears on the unit's casing If the same unit is sold under more than one model name then separate entries for each will appear in the database.
8		Model qualifier (up to 30 chs.)	Qualifier to model name, if needed in addition to the model name to discriminate between different versions of same model.
9		First year of manufacture (up to 4 chs.)	First year of manufacture, if known; otherwise blank.
10		Final year of manufacture (up to 8 chs.)	Final year of manufacture, or “current” if still in production. If no longer produced but date production ceased is unknown, then “obsolete”.
11	X	Controller type (1 or 2 digits)	Type of control provided, encoded as 1 weather and/or load compensation, 2 time and temperature zone control, 3 both of these.
12	X	Heating system category (1 or 2 digits)	Category of heating system to which the control is applicable. Categories are defined in Table 4a of the SAP specification. If the unit is applicable to more than one category, separate entries for each will appear in the database.
13	X	Fuel (up to 2 digits)	Fuel used by heat generator to which the record applies to, which is any one of the fuel codes specified in SAP Table 12. If the same controller may be used with more than one fuel then separate entries for each appear in the database. Blank if not applicable (in which case the control applies to any fuel).
14	X	Heat generator control requirements (4 or 8 hex digits)	Values that must be in the "Control type" field of the record for the heat generator (e.g. boiler) for the control to be assigned a benefit. See Notes 1 and 2. If zero the control applies to any heat generator of the category in field 12 subject to any restrictions given in the SAP specification.
15	X	Efficiency adjustment for boiler (up to 4 chs, e.g. xx.x)	Adjustment to space heating efficiency of a boiler provided by the control, in %. Blank if not applicable.
16	X	Hours heating off (up to 4 chs, e.g. xx.x	For a time and temperature zone control, the number of daytime hours that the heating is off in zone 2. This field should be disregarded for a record with control type = 1.
17	X	Delayed start (1 digit)	One of “no”, “yes”, “incompatible with separate control device”. These are encoded as 0, 1 or 2. “yes” or “incompatible” means that a separate delayed start cannot be specified.

Notes to Heating Controls Table:

Note 1. This is a bit-wise comparison of two 32-bit values using the boolean 'and' operator. Example: The 'Control compatibilities' field of a boiler is 453C and 'Heat generator control requirements' of the heating control is 0008. In binary these are:
0100010100111100
0000000000001000
The condition is fulfilled in this case because the control's required feature, 4th digit from the right, is present in the heat generator.

Note 2 Control requirements are defined in the Heating Control Requirements Table.

A.25 Data format specification : Heating Control Requirements Table

The current specification has format number 472 and is shown below.

SAP software implementing SAP 2012 should contain the means to display to the software user the explanation of any incompatibility between a heat generator's capabilities and a controller's requirements as given in field 2.

FORMAT 472 (for Heating Control Requirements)			
Field	X	Field name	Description
1	X	Bit number (up to 2 digits)	Bit number in Control capabilities of a heating system table or the Heat generator control requirements of the Heating controls table. Bit numbers are counted from 0 upwards starting with the least significant.
2	X	Description (up to 63 chs)	Short description of the feature.
3		DB entry updated (yyyy/mmm/dd hh:mm)	Date and time this record was created or last amended by the database administrator.

A.26 Data format specification : Warm Air Systems Table

The current specification has format number 481 and is shown below. Data from the fields marked X in the second column are needed when carrying out a calculation to the SAP 2012 specification. In addition, the following must be read and included in any printout: 6, 7, 8.

SAP software implementing SAP 2012 should contain an option to display to the software user at least all the data marked X in the second column for any specified data record (this is because the data might be required in connection with an Appendix Q procedure).

FORMAT 481 (for Warm Air Systems Table for SAP 2012)			
Field	X	Field name	Description
1		Product number (6 digits)	Unique index number for each record, assigned automatically by database software and used for control and reference purposes. (See 7.1).
2		Manufacturer reference no. (6 digits)	Reference to current name of manufacturer *(see field 2 in Manufacturers Table)*.
3	X	Status (one digit)	Status of the data record, encoded as 0=normal status for an actual product, 1=illustrative (non-existent) product, 2=under investigation, 3=not valid, 4=methodology under review. (See 8.1 to 8.4).
4		DB entry updated (yyyy/mmm/dd hh:mm)	Date and time this record was created or last amended by the database administrator.
5		Manufacturer name (up to 50 chs.)	The original name of the manufacturer, which may be different from the current name.
6		Brand name (up to 50 chs.)	Name of brand, as shown on the warm air unit. If none the original manufacturer name will be inserted instead. If the same model is sold under more than one brand name then separate entries for each will appear in the database.
7		Model name (up to 50 chs.)	Name of model, as it appears on the unit casing or leaflet of owners' instructions. If the same unit is sold under more than one model name then separate entries for each will appear in the database.
8		Model qualifier (up to 30 chs.)	Qualifier to model name, if needed in addition to the model name to discriminate between different versions of same model.
9		First year of manufacture (up to 4 chs.)	First year of manufacture, if known; otherwise blank.
10		Final year of manufacture (up to 8 chs.)	Final year of manufacture, or "current" if still in production. If no longer produced but date production ceased is unknown, then "obsolete".
11	X	Fuel (up to 2 digits)	Fuel type, which is any one of the fuel codes for a gaseous or liquid fuel as specified in SAP Table 12 under sub-headings "gas" or "oil". If the same unit may use more than one type of fuel then separate entries for each appear in the database, except that a unit listed for bulk LPG is also applicable to bottled LPG and LPG subject to special condition 18.
12		Mounting position (1 digit)	Mounting position, which is one of "unknown", "floor", "wall" or "either floor or wall",. These are encoded as 0, 1, 2, or 3 respectively.
13		Heat exchanger type (1 digit)	Whether heating is provided by a combustion products to warm air heat exchanger or by a secondary heat exchanger (water to warm air) encoded as 1 primary air to air, 2 secondary (water to air).
14	X	Condensing (1 digit)	Either "non-condensing" or "condensing", encoded as 1 or 2.
15	X	Flue type (1 digit)	Flue type, which is one of "unknown", "open", "room-sealed", or "open or room-sealed" encoded as 0, 1, 2 or 3.
16	X	Fan assistance (1 digit)	Whether or not flue is fan assisted. It is one of "unknown", "no fan", or "fan". These are encoded as 0, 1 or 2.
17	X	Fan position	If fan flue assisted, position of combustion fan position upstream or downstream of heat exchanger encoded (0 no fan, 1 upstream and 2 downstream). Will be 0 if field 16 is 1.
18		Flow direction (1 digit)	Flow direction within the unit, which is one of "unknown", "upflow" or "downflow", encoded as 0, 1 or 2 respectively.
19		Output power (bottom of range) (number, up to 7 chs; eg "nnn.nnn")	Output power of the unit in kW. For range rated units it is the lower of the range of values for which the efficiency test results are valid. For other units this is the same as field 20.
20	X	Output power (top of range) (number, up to 7 chs; eg "nnn.nnn", or text ">70kW")	Output power of the unit in kW. For range rated units this is the top of the range of values for which the efficiency test results are valid. Where the upper limit of the range exceeds 70kW this is shown as ">70kW" instead of the exact value.

21		Energy efficiency class (up to 4 chs.)	The energy efficiency class as defined for the proposed European energy label. Definition and format have not yet been decided. This field is being left blank until the European energy labelling scheme has been defined.
22	X	Integral warm air distribution fan (1 digit)	Whether system contains a warm air distribution fan, encoded 1 = no, 2= yes
23	X	Specific fan power (number, up to 6 chs; eg “nn.nnn”)	Specific fan power in W/(l/s), inclusive of in-use factor. Blank if field 22 is 1.
24	X	Water pump 1 digit)	Whether system requires a water pump, encoded 1=no, 2=yes. This will be usually no for heat exchanger type 1 and yes for heat exchanger type 2.
25	X	Pump electricity (up to 5 digits eg xxx.x)	Annual electricity used by water pump. Blank if not applicable.
26		Ignition (1 digit)	Whether or not has permanent pilot light, encoded as 0=unknown, 1=no, 2=yes.
27		Burner control (1 digit)	Whether on-off or variable, encoded as 0=unknown, 1=on-off, 2=variable (stepped or modulating).
28		Maximum firing rate (number, up to 7 chs; eg “nnn.nnn”)	Heat output at maximum firing rate in during efficiency measurements in kW
29		Minimum firing rate (number, up to 7 chs; eg “nnn.nnn”)	Heat output at minimum firing rate, if any, during efficiency measurements in kW. For on-off burner control this is blank.
30		Measured efficiency at full load (number, up to 7 chs; eg “nnn.nnn”)	Measured heating efficiency at full load (% gross)
31		Measured efficiency at minimum load (number, up to 7 chs; eg “nnn.nnn”)	Measured heating efficiency at part load, if any (% gross). This is blank for on-off burner control.
32	X	Seasonal heating efficiency (number, up to 4 chs; eg “nn.n”)	Heating seasonal efficiency based on the gross calorific value, expressed as a percentage and rounded to the nearest 0.1%, derived from laboratory measurements above.
33		Electrical power while firing (up to 4 digits)	Average electrical power consumed while the unit is firing, in watts. This includes fans, motors, heaters, and other electrical equipment but excludes any fan used to distribute warm air *outside* the unit. If unknown or inapplicable, this field is blank.
34		Electrical power while not firing (up to 4 digits)	Average electrical power consumed while the unit is not firing, in watts. This includes fans, motors, heaters, and other electrical equipment but excludes any fan used to distribute warm air *outside* the unit. If unknown or inapplicable, this field is blank.
35	X	Hot water service	Whether the unit provides domestic hot water, encoded as 0=no, 1=yes.
The remaining items are omitted for hot water service code 0 (hot water not provided)			
36	X	Hot water service type (1 digit)	Hot water service type regular or instant combi or storage combi encoded as 1=regular, 2=instant combi, 3=storage combi
37		(not defined)	This field is undefined at present and is blank
38		Store volume (number, up to 7 chs; eg “nnn.nnn”)	The water volume of the internal hot water store that is capable of being heated by the warm air unit, in litres. If unknown or inapplicable, this is blank.
39		Store insulation thickness (up to 3 digits)	The thickness of the insulation applied to the internal hot water store in mm. If not a storage combi, it is blank.
40	X	Store loss factor (up to 5 chs e.g. x.xxx)	Store loss factor in kWh/day. If not a storage combi, it is blank
41	X	Water heating efficiency (up to five chs e.g. nnn.n)	Water heating efficiency based on the gross calorific value (%) derived from the data below or from obtained by methods deemed to satisfy European Council Directive 92/42/EEC
42	X	Separate DHW tests (1 digit)	Hot water tests carried out on a combi type in accordance with EN 13203-2 (gas) or OPS 26 (oil). Encoded as: 0 = not applicable; 1= one test, using schedule 2; 2 = two tests, using schedules 2 and 3; 3 = two tests, using schedules 2 and 1. This must not be 0 or blank for hot water service type instant combi or storage combi.
43		Fuel energy for HW test 1 (number, up to 6 chs, possibly including decimal point eg "123.45”)	Fuel input energy (corrected) in kWh/day for domestic hot water test 1 carried out on a combi type in accordance with EN 13203-2 (gas) or OPS 26 (oil), based on gross calorific value. Hot water test 1 means tested under draw-off schedule no. 2 as defined in the standard. If the unit is not a combi, this is blank.
44		Electrical energy for HW test 1 (number, up to 6 chs, possibly including decimal point eg "123.45”)	Electrical input energy (corrected) in kWh/day for domestic hot water test 1 carried out on a combi in accordance with EN 13203-2 (gas) or OPS 26 (oil). Hot water test 1 means tested under draw-off schedule no. 2 as defined in the standard. If the unit is not a combi this is blank.

45	X	Rejected energy r_1 in HW test 1 (number, up to 6 chs, eg "0.1234")	Proportion of energy, expressed as a decimal number in the range 0 to 1, rejected in domestic hot water test 1 carried out on a combi in accordance with EN 13203-2 (gas) or OPS 26 (oil). If the unit is not a combi this is blank.
46	X	Storage loss factor F_1 (number, up to 7 chs, e.g. 400.123)	Loss factor F_1 in kWh/day related to domestic hot water test 1 for use in conjunction with SAP 2012 Table 3b. If not a combi this is blank.
47		Fuel energy for HW test 2 (number, up to 6 chs, possibly including decimal point eg "123.45")	Fuel input energy (corrected) in kWh/day for domestic hot water test 2 carried out on a combi appliance in accordance with EN 13203-2 (gas) or OPS 26 (oil), based on gross calorific value. If "Separate DHW tests" (field 37) is 2 then hot water test 2 means tested under draw-off schedule no. 3 as defined in the standard. If "Separate DHW tests" (field 37) is 3 then hot water test 2 means tested under draw-off schedule no. 1 as defined in the standard. If the appliance is not a combi, or if domestic hot water test 2 has not been carried out, this is blank.
48		Electrical energy for HW test 2 (number, up to 6 chs, possibly including decimal point eg "123.45")	Electrical input energy (corrected) in kWh/day for domestic hot water test 2 carried out on a combi appliance in accordance with EN 13203-2 (gas) or OPS 26 (oil). If "Separate DHW tests" (field 37) is 2 then hot water test 2 means tested under draw-off schedule no. 3 as defined in the standard. If "Separate DHW tests" (field 37) is 3 then hot water test 2 means tested under draw-off schedule no. 1 as defined in the standard. If the appliance is not a combi, or if domestic hot water test 2 has not been carried out, this is blank.
49		Rejected energy r_2 in HW test 2 (number, up to 6 chs, eg "0.1234")	Proportion of energy, expressed as a decimal number in the range 0 to 1, rejected in domestic hot water test 2 carried out on a combi appliance in accordance with EN 13203-2 (gas) or OPS 26 (oil). If the appliance is not a combi, or if domestic hot water test 2 has not been carried out, this is blank. This is not used in SAP assessments, only r_1.
50	X	Storage loss factor F_2 (number, up to 7 chs, e.g. 400.123)	Loss factor F_2 in kWh/day related to domestic hot water tests 1 and 2 for use in conjunction with SAP 2012 Table 3c. If the appliance is not a combi, or if domestic hot water test 2 has not been carried out, this is blank.
51	X	Rejected factor F_3 (number, up to 9 chs, e.g. -0.000031)	Rejected factor F_3 in litres^{-1} related to domestic hot water tests 1 and 2 for use in conjunction with SAP 2012 Table 3c (can be negative). If the unit is not a combi, or if domestic hot water test 2 has not been carried out, this is blank.

A.27 Data format specification : Storage Heaters Table

The current specification has format number 491 and is shown below. Data from the fields marked X in the second column are needed when carrying out a calculation to the SAP 2012 specification. In addition, the following must be read and included in any printout: 6, 7, 8.

SAP software implementing SAP 2012 should contain an option to display to the software user at least all the data marked X in the second column for any specified data record (this is because the data might be required in connection with an Appendix Q procedure).

FORMAT 491 (for Electric Storage Heaters Table)			
Field	X	Field name	Description
1		Product index number (6 digits)	Unique index number for each record, assigned automatically by database software and used for control and reference purposes. (See 7.1).
2		Manufacturer reference no. (6 digits)	Reference to current name of manufacturer *(see field 2 in Manufacturers Table)*.
3	X	Status (one digit)	Status of the data record, encoded as 0=normal status for an actual product, 1=illustrative (non-existent) product, 2=under investigation, 3=not valid, 4=methodology under review. (See 8.1 to 8.4).
4		DB entry updated (yyyy/mmm/dd hh:mm)	Date and time this record was created or last amended by the database administrator.
5		Manufacturer name (up to 50 chs.)	The original name of the manufacturer, which may be different from the current name.
6		Brand name (up to 50 chs.)	Name of brand, as shown on the heater. If the same model is sold under more than one brand name then separate entries for each will appear in the database.
7		Model name (up to 50 chs.)	Name of model, as it appears on the heater casing or leaflet of owners' instructions. If the same unit is sold under more than one model name then separate entries for each will appear in the database.
8		Model qualifier (up to 30 chs.)	Qualifier to model name, if needed in addition to the model name to discriminate between different versions of same model.
9		First year of manufacture (up to 4 chs.)	First year of manufacture, if known; otherwise blank.
10		Final year of manufacture (up to 8 chs.)	Final year of manufacture, or "current" if still in production. If no longer produced but date production ceased is unknown, then "obsolete".
11	X	Storage capacity (up to 5 chs; eg xx.xx)	Maximum heat storage capacity in kWh
12	X	Output power (up to 5 chs; eg nnnnn)	Nominal output power from stored heat in W
13	X	Boost output (up to 5 chs; eg nnnnn)	Output power from in-built boost heater in W. Blank if not applicable.
14	X	Heat retention	Heat retention in % as defined in EN 60531.
15	X	High heat retention	Whether heater qualifies as high heat retention, encoded as 0 = no, 1 = yes.

A.28 Data format specification : Community Heat Networks Table

The current specification has format number 601 and is shown below. Data from the fields marked X in the second column are needed when carrying out a calculation to the SAP 2012 specification. In addition, the following must be read and included in any printout: 6, 7.

SAP software implementing SAP 2012 should contain an option to display to the software user at least all the data marked X in the second column for any specified data record (this is because the data might be required in connection with an Appendix Q procedure).

FORMAT 601 (for Community Heat Networks Table)			
Field	X	Field name	Description
1		Community heat network index number (digits)	Unique index number for each network, assigned automatically by database software and used for control and reference purposes. (See 7.1).
2	X	Community heat network version number (2 digits)	Network version for the network identified in field 1 It is numbered from 1 upwards and incremented if the network is extended and when equipment data is amended (for example a change to a heat generator) or if the energy use information is updated.
3		DB entry updated (yyyy/mmm/dd hh:mm)	Date and time this record was created or last amended by the database administrator.
4		Description of network (up to 255 chs)	A short description identifying the dwellings to which the network version applies. Where the network is constructed in phases this may also indicate which phases are connected.
5	X	Validity end date (yyyy/mmm/dd)	The last day of validity of this data record. Dwellings assessed after this date use a data record with a higher network version number (in the case of new dwellings the applicable assessment date is that of the as-designed assessment). Blank if there is no record with a higher network version number.
6		Community heat network name (up to 50 chs.)	The name by which the community heat network is known.
7		Postcode of the Primary Energy Centre (up to 8 chs)	The postcode of the energy centre providing heat for the network. Where there is more than one energy centre, it is the postcode for the energy centre supplying the largest amount of heat
8		Locality (up to 35 chs.)	The locality in which the community heat network is situated. May be blank.
9		Town name (up to 30 chs.)	The post town nearest to the community heat network.
10		Administrative area (up to 30 chs.)	The administrative area in which the community heat network is situated. May be blank.
11		Date of initial operation (yyyy/mmm/dd)	The date on which the energy centre was commissioned (or re-commissioned if the network is extended) to serve all dwellings included in the assessment. Blank if it is not yet operational or if the assessment includes dwellings not yet connected.
12		Total number of dwellings included (up to 5 digits)	The total number of dwellings included in the assessment of the heat network.
13		Number of flats (up to 5 digits)	The number of flats included in the assessment of the heat network
14		Non-domestic floor area connected (up to 6 digits)	The floor area of any non-domestic buildings connected to the heat network.
15		Total number of existing dwellings (up to 5 digits)	The number of dwellings which have been constructed. This can be less than the number in field 12 if the assessment included dwellings not yet constructed.
16	X	Service provision (1 digit)	Service provision, encoded as: 1 space and water heating; 3 space heating only; 4 water heating only. If a network has separate systems for space heating and water heating, there will be a record for each.
17	X	Provisional or actual data (1 digit)	Whether the record represents provisional (estimated) data or actual recorded data, encoded as 1 or 2 respectively. Provisional data may be assigned to new networks for which recorded data are not yet available.
18	X	Year (up to 4 digits)	The calendar year to which the data relates. Blank if provisional data.
19		Heat metering on supply to network (1 digit)	Whether the heat supplied to the network from the energy centre is metered. 1 for yes. 0 for no
20		Total MWh of heat per annum supplied to network (up to 6 digits)	The annual amount of heat supplied to the network by the plant in the energy centre.
21		Total MWh of heat per annum delivered to customers (up to 6 digits)	The annual amount of heat delivered to all customers (dwellings and non-domestic), thereby indicating the scale of the network.

22		Individual dwelling heat metering (1 digit)	Whether the supply of heat to each individual dwelling is metered.1 for yes, 0 for no.
23		Total MWh of heat per annum delivered to dwellings (up to 6 digits)	The annual amount of heat delivered to dwellings.
24		Distribution route length in metres (up to 6 digits)	The total length of the network heat distribution pipework route. In the case of underground pipework it is the total trench length containing pipework. It includes both flow and return water pipes i.e. it is not the sum of the flow and return pipework.
25		Linear loss (up to 7 digits eg xxx.xxx)	The average heat loss per metre length of network heat distribution pipework route in W/m.
26	X	Distribution loss factor (up to 4 chs, e.g. x.xx)	Factor that allows for losses from the heat distribution network, see SAP section C3. Applicable to all connected premises.
27		Pumping electrical energy (up to 6 digits, e.g. xxxxxx)	Annual electrical energy for pumping in the heat distribution network in kWh/year.
28	X	Pumping electrical energy per dwelling (up to 6 digits, e.g. xxxx.xx)	Annual electrical energy for pumping in the heat distribution network attributed to each dwelling, in kWh/year.
29		Carbon dioxide intensity of heat (up to 6 digits e.g. xx.xxx	The average carbon dioxide intensity of the heat delivered to customers. in kg/kWh. This value takes into account all factors which influence the emissions associated with the heat supplied. It is based on the heat delivered to individual dwellings, and to the building in the case of non-domestic premises.
30		Primary energy factor of heat up to 5 digits e.g. xx.xx)	The average primary energy factor of the heat delivered to customers. This value takes into account all factors which influence the primary energy associated with the heat supplied. It is based on the heat delivered to individual dwellings, and to the building in the case of non-domestic premises.
31	X	Number of heat sources (1 digit)	Number of separate heat sources (between 1 and 5). Heat sources are considered separate if they differ in heat source type or fuel. A set of e.g. boilers each using the same fuel are treated as one source with efficiency as defined in C2 of the SAP specification.
32	X	A: Heat source type (1 digit)	Group A: Type of heat generator, encoded as 1: CHP; 2: boilers; 3: heat pump; 4: waste heat from power station; 5: geothermal. If CHP is part of the installation it is given as Group A.
33	X	A: Community fuel (2 digits)	Group A: The community fuel to which the data relates, either one of community fuel codes in SAP Table 12, or 99 in the case of a fuel not in SAP Table 12.
34	X	A: Fuel description (up to 30 chs)	Group A: Description of the fuel in the preceding field. May be blank if field 33 is not 99.
35	X	A: Heat efficiency (up to 4 digits, e.g. xx.x)	Group A: Heat efficiency of heat source in % gross.
36	X	A: Power efficiency (up to 4 digits, e.g. xx.x)	Group A: Power efficiency of CHP plant in % gross. Blank if not applicable.
37	X	A: Heat fraction (up to 5 digits, e.g. x.xxx)	Group A: The fraction of heat supplied by the community heat network attributable to the heat source.
38	X	A: Community fuel CO_2 emission factor (up to 5 chs, e.g. xxx.x)	Group A: The CO_2 emission factor in kg/kWh for the fuel. Blank when field 33 is not 99.
39	X	A: Community fuel primary energy factor (up to 4 chs, e.g. x.xx	Group A: The primary energy factor for the fuel (dimensionless). Blank when field 33 is not 99.
40 to 31+8n	X	Group B, C, D, E	Group B, C, D, E. Set of data in the same format as those for group A for other heat sources. n is the value in field 31.

Appendix B : Additional Notes

B.1 SAP software should read the data file and present the data in a suitable manner that enables the user to select a product on the basis of its description (see section 7, Identification of products). Generally SAP software should require the user to make an explicit choice of brand name, model and model qualifier, so that responsibility for the choice lies with the user in each individual case.

B.2 The data used for calculations should be the following (in order of preference):

obtained from database
manufacturer's value (not applicable to all product types)
from SAP Table 4a/4b

Output from SAP programs should state the source of the efficiency value and, if from the database, the database revision number and date (month and year).

B.3 To download the Product Characteristics Data File using a web browser, users should go to

www.boilers.org.uk

and then to the link "Download the Product Characteristics Data File".

It is provided as an unzipped file, a zip file and a self-extracting zip file.

The web site offers the alternatives of the SAP 2005 data file, the SAP 2009 data file and the SAP 2012 data file. Users should choose the one appropriate to the SAP software they are using.

For users with a fast internet connection, the simplest course is to download the unzipped file. To do this, right-click on the download button and select Save As. [Depending on the browser used, this may show as "Save Target As…" or "Save Link As…" or similar.]

Users with a slow internet connection may prefer to use the zipped form of the file which is about one-fifth of the size. The self-extracting one is recommended. Again, right-click, Save As (anywhere), and when complete go where it was download to, double click on pcdf20xx.exe, Browse to the directory appropriate to the SAP software concerned, then Unzip.

B.4 If SAP software itself handles the downloading of the data file, the URL is as given in 10.2.

However, users may not have access to the Internet on a computer they are using for SAP assessments. Therefore they must be told how to download the file using a web browser per B.3 above and where to put in on their computer.

B.5 Programs should compare the revision date of the data file presently on the computer with the current date and advise the user if an update should be undertaken. SAP software should do this date check either whenever the program starts, or at the first time the user seeks to use the database. See 2.5. The data file in use should be dated the current month or the previous month, except between 1 and 5 January when the data file can be dated two months previously (i.e. November).

B.6 If Table 191 is encountered, the fuel prices in it must not overwrite the fuel prices in SAP 2012 Table 12. The prices in Table 12 are to be used for the calculation of SAP ratings throughout the currency of SAP 2012. Table 191 is used for calculating running costs and savings for Energy Performance Certificates and similar purposes (e.g. Green Deal).

Appendix C : Product identification and selection

The starting point for presenting product lists is:

Brand name … Model name … Model qualifier

Brand name is name of brand, as shown on the product (or if a brand name has not been supplied to the database manager the original manufacturer name will be inserted instead). The model name does not repeat the brand name.

The original manufacturer name is not suitable to construct a list for product selection as several products will not be found.

There are three circumstances when the above might not be unique.

Firstly for heating products that can use more than one fuel (in which case there is more than one entry in the database for the heating product). This happens in many cases for gas/LPG. Here the manufacturer has the option of modifying the model qualifier to distinguish between them, but is not obliged to do so. Thus there are entries in the database where brand+model+qualifier is the same for two boilers, one of them being gas and the other LPG. If a particular fuel (and emitter in the case of heat pumps, see next paragraph) has been selected brand+model+qualifier should be unique, but otherwise it will be necessary to, for example, append the fuel to the model qualifier to clarify the difference between the two cases. A similar situation arises with solid fuel boilers. Therefore it is recommended that SAP software encourages users **first to choose the fuel** and then offers a selection based on brand/model/qualifier.

Secondly for heat pumps there can be more than one entry in the database for different heat emitter types (underfloor, radiators, etc). In that case (for a given fuel) emitter+brand+model+qualifier is unique. Therefore it is recommended that SAP software encourages users **first to choose the fuel and the heat emitter** and then offers a selection based on brand/model/qualifier.

Thirdly it is possible for a new manufacturer to take over an existing brand name and sell a different product with the same brand name, model name, and model qualifier as previously. This situation is considered unlikely and there are no instances of this in the database at present, but it could occur.

The manufacturer tables (102 and 301) give the name and contact details for the manufacturer currently responsible for the product concerned. In many cases the current manufacturer is the same as the original manufacturer but differs in cases e.g. where one firm has taken over another. This table is not relevant to product identification or selection. It is included as additional information, e.g. if a SAP assessor needs to contact the manufacturer with some query.

The appropriate entry from Table 102 or 301 can be used to provide information to the user once a product has been selected. A list built up from Table 102 or 301 is of no use for product identification or selection and **SAP software must not offer a list based on Table 102 or 301**.

Appendix D : Micro-CHP and Heat Pumps – Service and Vessel Combinations

Micro-CHP SAP 2012

Service / HW vessel	1 all year	2 season only	3 space only	4 water only
1 integral*	OK	OK, see note 2	n/a	OK, see note 3
2 ERROR	n/a			
3 separate	OK	OK, see note 4	n/a	OK, see note 3
4 none	n/a	n/a	OK, see note 4	n/a

Heat pumps SAP 2012

Service / HW vessel	1 all year	2 season only	3 space only	4 water only
1 integral*	OK	OK, see note 2	n/a	OK
2 separate, specified	OK	OK, see note 2	n/a	OK
3 separate, unspecified	OK	OK, see note 2	n/a	OK
4 none	n/a	n/a	OK, see note 4	n/a

*Integral to the package, not necessarily in the same case.

Notes to the above

Note 1. The combinations shown as n/a should not occur. It this does occur, the data record has an error; SAP software should report the situation to the user.

Note 2. If the package provides hot water in the heating season only, the DHW store (whether integral or separate) should be assumed to contain an immersion for summer use. The energy used by the immersion is calculated for months in which the space heating requirement is zero. If a micro-CHP or heat pump is made for which that treatment is not adequate, it will be handled via Appendix Q.

Note 3. Service provision 4, hot-water only, is not allowed for at present in the case of micro-CHP. If such a micro-CHP is made it will be handled via Appendix Q.

Note 4. Separate water heating system to be specified.