

**SKVFS 2008:y**  
**Kassaregister** (name of  
regulation on cash  
registers)  
Released from printers  
\_\_\_\_ 2008

## Book of Statutes of the Department of



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### Regulation of the Department of Taxation on Control Units for Cash Registers;

decision taken on \_\_\_\_ 2008.

The Department of Taxation decrees the following based on Section 1 of the Decree on Cash Registers, etc. (2007:597).<sup>1</sup>

#### Chapter 1 Area of application

1. The Department of Taxation's regulation regarding requirements imposed on cash registers (SKVFS 2008:x) includes general stipulations regarding the requirements imposed on such cash registers as are meant in the Act On Cash Registers, etc. (2007:592). The general stipulations on the requirements imposed on cash registers state that a cash register must be connected to a control unit integrated in the system. This regulation includes specific stipulations concerning the control unit.

#### Chapter 2 Definitions

1. *Company* in this regulation means the party bearing the responsibility as per Section 2 of the Act on Cash Registers, etc. (2007:592).

<sup>1</sup> The notification was made in accordance with Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations (OJ L 204, 21.7.1998, p. 37, Celex 398L0034), as amended by Directive 98/48/EC of the European Parliament and of the Council (OJ L 217, 5.8.1998, p. 18, Celex 398L0048).

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*Registration* in this regulation means that the information involved in sales and other day-to-day use have been attended to with respect to a cash register so that the information can be included in the Z daily report.

**2.** *Control slip* and *journal memory* in this regulation have the same meaning as outlined in Section 7 of the Act on Cash Registers, etc. (2007:592).

**3.** *Receipt data* in this regulation means information which is read from the cash register to a control unit.

**4.** *Receipt control data* in this regulation means that part of the receipt data that provides the basis for generating the control data and the control code.

**5.** *Control data* in this regulation means the receipt control data and internal data which are stored/saved in a control unit. Only the Department of Taxation has access to the control data in a control unit.

**6.** *Control code* in this regulation means the unique code identifying the cash register receipts.

**7.** *Receipt type Normal* in this regulation means the cash register receipt and return receipt as per Sections 8 and 2 of the Department of Taxation Regulation on the requirements imposed on cash registers (SKVFS 2008:x).

**8.** *Receipt type Copy* in this regulation means a cash register receipt and return receipt as per Sections 8 and 2 of the Department of Taxation Regulation on the requirements imposed on cash registers (SKVFS 2008:x).

**9.** *Receipt type Practice* in this regulation means a practice receipt as per Section 2 of the Department of Taxation Regulation concerning the requirements imposed on cash registers (SKVFS 2008:x).

**10.** *Receipt type Profo* in this regulation means a proforma receipt as per Section 2 of the Department of Taxation Regulation concerning the requirements imposed on cash registers (SKVFS 2008:x).

**11.** *Serial number* in this regulation means a unique number composed of 17 alphanumeric characters, which identify the control unit and its manufacturer. The first five characters shall uniquely identify the manufacturer. These shall be followed by twelve characters, which uniquely identify the control unit.

**12.** *Version number* in this regulation means the unique identification of the software version, and the said number changes each time the software changes.

*Revision number* in this regulation means the unique identification of the hardware version, and the said number changes each time the hardware changes.

### **Chapter 3 General requirements imposed on a control unit**

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1. A control shall meet the requirements set out in this regulation.
  2. A control unit shall include only the functions set out in this regulation. Additional functions may be included should these be necessary to ensure the fulfilment of the requirements stated in this regulation.
  3. Should an accessory or some other piece of equipment be connected to a cash register, this shall be done so that no changes are made to a control unit.
  4. A control unit must be so constructed that it can remain functioning at the company's facilities at the same time as it transmits control data to the Department of Taxation in the manner set out in Chapter 10.
  5. A control unit must not print over or erase the control data. However, control data older than five years may be written over or erased. The same applies to the updating of the necessary parts of the internal data.
  6. A control unit shall be provided with the model marking and serial number as well as the version number of the software and the revision number of the hardware.

#### *Certification of a control unit*

7. Every model of a control unit must be certificated. The certification shall be performed by a certification body that has been accredited for the purpose as per the Technical Conformity Assessment Act (1992:1119).
8. The specifications shall indicate the operating environments for which the various control units are set to operate in. At least one type of operating environment shall be presented. The certification shall be performed taking into account the model and the given operating environment.
9. The certification shall include testing of functions, security, performance capacity, reliability and operating environment, together with the requirements imposed on manufacturing as presented in this regulation. The document for interpreting the requirements imposed on the software shall be the document WELMEC 7.2. Similarly, the document WELMEC 2.2 may also be used. As regards interpreting of the risk level of WELMEC, the risk level of D shall be adhered to.

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**10.** In the event that a certificated control unit's hardware or software is altered, the certification body shall be contacted to arrange an assessment for the renewal of the certification.

**11.** The Act on Cash Registers, etc. (2007:592) along with the Technical Conformity Assessment Act (1992:1119) states that a control unit shall be certificated by a certification body accredited for this task by the Swedish Board for Accreditation and Conformity Assessment, SWEDAC. The certification body shall fulfil the requirements set out in SWEDAC's regulation concerning bodies certificating products.

**12.** Certification may also be performed by a certification body based in some other Member State of the European Union, in Turkey or in the European Economic Area, assuming that the body meets the requirements of the standard SS-EN 45011:1998 (ISO /IEC Guide 65:1996) and has been accredited for the task by an accreditation body meeting the requirements of the standard SS-EN ISO/IEC 17011:2005, or by an accreditation body based in a Member State of the European Union, in Turkey or in the European Economic Area which otherwise offers corresponding guarantees in matters involving technical and professional competence together with a guarantee of being an independent body.

**13.** The basis for certification shall be provided by SS-EN 45011 General Requirements for Bodies Operating Product Certification Systems together with STAFS-2007:12<sup>2</sup> and STAFS 2007:21<sup>3</sup>.

*Department of Taxation's primary key*

**14.** A control unit may be used only if its individual encryption keys have been generated using a valid primary key offered by the Department of Taxation. The primary key given may be used only in accordance with the conditions issued separately by the Department of Taxation.

## **Chapter 4 Different control unit types**

**1.** A control unit shall be of the type A, B or C as laid down in this chapter.

*Control unit of type A*

**2.** A control unit of type A shall be provided with ports and connection points as shown in the following diagram.

<sup>2</sup> Regulation and general guideline of the Swedish Board for Accreditation and Conformity Assessment (SWEDAC) concerning accreditation of bodies certificating products.

<sup>3</sup> Regulation and general guideline of the Swedish Board for Accreditation and Conformity Assessment (SWEDAC) concerning accreditation of bodies certificating IT security.

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Power supply

Control unit  
Cash register  
Contact 1  
Port 1

Company Port 4 to be provided  
Contact 4  
Port 4

Department of Taxation  
Contact 3  
Port 3

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3. A control unit of type A is meant to be able to receive receipt data from a cash register via Port 1. It then sends back a control code to the cash register via Port 1. It is required to have a journal memory that can be read via Port 4.

*Control unit of type B*

4. A control unit of type B shall have ports and contacts as shown in the following diagram.

Power supply

Control unit  
Cash register  
Contact 1  
Port 1

Company Port 4 to be provided  
Contact 4  
Port 4

Printer  
Contact 2  
Port 2

Department of Taxation  
Contact 3  
Port 3

5. A control unit of type B is required to receive receipt data from a cash register via Port 1. It shall have a journal memory that can be read via Port 4. The receipts shall be printed out via Port 2.

*Control unit of type C*

6. A control unit of type C shall have ports and contacts as shown in the following diagram.

Power supply

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Control unit

Cash register  
Contact 1  
Port 1Company Port 4 to be provided  
Contact 4  
Port 4Department of Taxation  
Contact 3  
Port 3

7. A control unit of type C is required to be able to receive receipt data from more than one cash register. It is also required to receive receipt data from more than one company's registrations as per Section 20 of the Department of Taxation's Regulation concerning the requirements imposed on cash registers (SKVFS 2008:x).

8. A control unit of type C is required to receive receipt data via Port 1. It then sends back a control code to the cash register in question via Port 1. It is required to have a journal memory that can be read via Port 4.

**Chapter 5 Interface and clock***Logistical interface (ports)*

1. The ports of a control unit shall be required to transmit data solely in accordance with what is shown in the following table and only in the given direction.

Port	Interface to...	Permitted data
Port 1	Cash register	Input: - Receipt data or other data needed to be printed out - Queries about printer status  Output: - Printer status - Control code
Port 2	Printer	Input: - Printer status  Output: - Receipt data incl. control code or other data needed to be printed out
Port 3	Department of Taxation	Output: - Control data

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Port 4	Company	Output: - Journal memory
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*Port-specific functions*

2. Port 2 is provided only in control units of type B.

*Physical interface (contacts)*

3. The following applies to contacts.

Contact 1: This is located in front of Port 1. To be used for power supply.

Contact 2: This is located in front of Port 2.

Contact 3: This contact is located in front of Port 3 and it is constructed for the Secure Digital (SD) type of standard, which serves as a data file storage/saving facility under the FAT16 or FAT32 file system.

Contact 4: This is located in front of Port 4.

4. A control unit shall be provided with communications protocol in which the data formats for Port 1, Port 2 and Port 4 are defined.

5. The installation of Port 1 and Port 2 need to be configured in production.

The configuration parameters, which need to be set in connection with the hardware solution, are speed, bits, stop-bits and parity along with printer settings and communications protocol.

*Power supply*

6. A control unit needs to have its own power supply if no power supply can be arranged via the connected cash register.

*Clock*

7. A control unit shall have a real-time clock, and I shall showing the date and time of day according to the standard Swedish time.

## **Chapter 6                      Receipt data provided by a cash register and generating of receipt control data**

1. A control unit shall receive and process receipt-specific data from the cash register.

2. A control unit shall interpret and process receipt data before presenting receipt control data.

3. The necessary internal data contained by a control unit shall be updated with respect to each batch/record of receipt data that a control unit reads in.

4. The receipt control data shall be formed of the following part of the receipt data.

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<b>Data</b>	<b>Description</b>	<b>Format</b>
Date and time	Date and time of the day as per the sale transaction Section 28c, SKVFS 2008:x	12 numerals, format YYYYMMDDhhmm
ID code	Company's business ID code or personal ID code as per Section 28a, SKVFS 2008:x	10 numerals
Cash register marking	Cash register marking as per Section 10, SKVFS 2008:z	At maximum 16 alphanumeric characters
Run number	Run number as per Section 28d, SKVFS 2008:x	At maximum 12 numerals
Receipt type	Depending on the receipt type, the following text is output: - Normal - Copy - Practice - Profo	At maximum 6 alphanumeric characters
Return amount	Absolute value of summed up amount of the return batch/record on the receipt.	At maximum 14 characters incl. decimal point. *)
Sale amount	Amount for customer to pay, as per Section 28h, SKVFS 2008:x	At maximum 14 characters incl. decimal point. *)
VAT batch 1; VAT amount 1	First VAT batch as percentage; Amount of first VAT batch as per Section 28j, SKVFS 2008:x	<Percentage batch>;<Amount> Percentage batch: At maximum 5 characters incl. decimal point. *) Amount: At maximum 14 characters incl. decimal point. *) Field length: 20 characters incl. semicolon.
VAT batch 2; VAT amount 2	Second VAT batch as percentage;	<Percentage batch>;<Amount>

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	Amount of second VAT batch as per Section 28j, SKVFS 2008:x	Percentage batch: At maximum 5 characters incl. decimal point. *) Amount: At maximum 14 characters incl. decimal point. *) Field length: 20 characters incl. semicolon.
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<b>Data</b>	<b>Description</b>	<b>Format</b>
VAT batch 3; VAT amount 3	Third VAT batch as percentage; Amount of third VAT batch as per Section 28j, SKVFS 2008:x	<Percentage batch>;<Amount> Percentage batch: At maximum 5 characters incl. decimal point. *) Amount: At maximum 14 characters incl. decimal point. *) Field length: 20 characters incl. semicolon.
VAT batch 4; VAT amount 4	Fourth VAT batch as percentage; Amount of fourth VAT batch as per Section 28j, SKVFS 2008:x	<Percentage batch>;<Amount> Percentage batch: At maximum 5 characters incl. decimal point. *) Amount: At maximum 14 characters incl. decimal point. *) Field length: 20 characters incl. semicolon.
*) Values always to accuracy of two decimal places.		

5. The data shall be presented in ASCII format and right justified, and possibly filled in with blanks (spaces) in order to use up the given field length.

## **Chapter 7 Generating the control code**

1. A control unit shall generate a control code per receipt for the receipt types Normal and Copy. No control code shall be generated for the receipt types Practice and Profo.

2. A control unit shall use receipt control data as per Section 4, Chapter 6, as the basis for generating the control code.

3. The control code shall consist of two parts.

Part 1: Signature code, 32 characters

Part 2: Encryption code, 26 characters

The point separating Part 1 and Part 2 shall be indicated by a semicolon (;).

The combined length shall comprise 59 characters.

*Part 1: Signature code*

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The signature code shall be formed as follows (1-2).

1. The receipt control data as per Section 4, Chapter 6 shall be signed using an algorithm as per Section 6, Chapter 11. . The signature shall consist of 20 bytes.

2. The result shall be converted using base-32 encoding to create the signature code.

The signature code shall consist of 32 alphanumeric characters in ASCII format.

*Part 2: Encryption code*

The encryption code shall be formed as follows (1-3).

1. The basis for generating the encryption code shall consist of a 128-bit data batch/record with the following field:

<b>Field (bits)</b>	<b>Data</b>	<b>Calculation</b>
0-31 (length 32 bits)	32-bit whole number for total sale amount excl. VAT in thousands of Swedish crowns.	Calculator G (total sale amount) shall be reduced by Calculator H (total VAT). The result shall be rounded to the nearest thousand Swedish crowns and divided by 1000. If the result is negative, it shall be represented using a twos complement binary value.
32-47 (length 16 bits)	16-bit whole number containing the missing receipt calculator.	Value shown by Calculator B (number of missing receipts). If the value is greater than 65535, the field gets the value 65535.
48-95 (length 48 bits)	48-bit whole number containing the sale amount expressed in pennies.	Sale amount as per Section 4, Chapter 6 expressed in pennies from this receipt's receipt data. If the amount is negative, it shall be represented using a twos complement binary value.
96-127 (length 32 bits)	32-bit whole number containing the run number.	Run number as per Section 4, Chapter 6 from this receipt's receipt data. If the run number does not fit inside the 32 bits, the value of this field shall be 4294967295.

2. The basis for generating the encryption code (above table) shall be encrypted using the algorithm as per Section 5, Chapter 11. .

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3. The result shall be converted using base-32 encoding to create the encrypted control information.

The encryption code shall consist of 26 alphanumeric characters in ASCII format.

## **Chapter 8 Storage/Saving of internal data**

### *Storage/Saving of internal data*

1. A control unit shall save/store internal data which are needed for creating control data and at least save/store the tasks stated in Sections 2 – 15.

### *Calculators in a control unit*

2. A control unit shall include the following calculators.

Calculator A, transaction calculator.

Calculator B, calculator for the number of missing receipts.

Calculator C, calculator for the number of receipts of receipt type Normal.

Calculator D, calculator for the number of receipts of receipt type Copy.

Calculator E, calculator for the number of receipts of receipt type Practice.

Calculator F, calculator for the total of the amount to be returned.

Calculator G, calculator for the total of the sale amount.

Calculator H, calculator for the total of the VAT.

### *Calculator A: Transaction calculator.*

3. Calculator A shall calculate on a continual basis the number of batches/records of receipt data for receipt types Normal, Copy, Practice and Profo which are read into the control unit.

Calculator A shall begin with the value 1 for the first batch/record and then increase the value by 1 for each new batch/record.

### *Calculator B: Calculator for the number of missing receipts.*

4. Calculator B calculates the number of run numbers missing/lacking receipts of receipt type Normal. The calculation shall take place as is described in the following.

– If the difference between the current run number and the previous run number is 1, this shall not be taken into account.

– If the difference between the current run number and the previous run number is zero, this shall be given the value 1.

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– If the difference between the current run number and the previous run number is greater than 1, this shall be given the said value minus 1.

– If the difference between the current run number and the previous run number is less than zero, this shall be given the absolute value of the difference.

Calculator B shall begin with the value 0.

Calculator B shall not take into account the first receipt that is read.

*Calculator C: Calculator for the number of receipts of receipt type Normal*

**5.** Calculator C shall calculate on a continual basis the number of batches/records of receipt data for receipt type Normal, which are read into the control unit.

Calculator C shall begin with the value 1 for the first batch/record of receipt data and then increase the value by 1 for each new batch/record.

*Calculator D: Calculator for the number of receipts of receipt type Copy*

**6.** Calculator D shall calculate on a continual basis the number of batches/records of receipt data for receipt type Copy, which are read into the control unit.

Calculator D shall begin with the value 1 for the first batch/record of receipt data and then increase the value by 1 for each new batch/record.

*Calculator E: Calculator for the number of receipts of receipt type Practice.*

**7.** Calculator E shall calculate on a continual basis the number of batches/records of receipt data for receipt type Copy, which are read into the control unit.

Calculator E shall begin with the value 1 for the first batch/record of receipt data and then increase the value by 1 for each new batch/record.

*Calculator F: Calculator for the total of the amount to be returned*

**8.** Calculator F shall sum up on a continual basis the amount to be returned per receipt of receipt type Normal, which are read into the control unit.

Calculator F shall begin with the value 0.00 for the first batch/record of receipt data, which is read into the control unit.

*Calculator G: Calculator for the total of the sale amount***SKVFS 2008:y**

**9.** Calculator G shall sum up on a continual basis each batch/record of receipt data for receipts of type Normal, which are read into the control unit.

Calculator G shall begin with the value 0.00 for the first batch/record of receipt data, which is read into the control unit.

*Calculator H: Calculator for the total of the VAT*

**10.** Calculator H shall sum up on a continual basis the total of the VAT amount for each batch/record of receipt data for receipts of type Normal, which are read into the control unit.

Calculator H shall begin with the value 0.00 for the first batch/record of receipt data, which is read into the control unit.

*Further provisions concerning calculators*

**11.** The readings on Calculators A – H must not be made smaller nor set to zero. This does not apply to the actions set out in Chapter 3. 5 §.

**12.** As regards control unit of type C as per Section 6, Chapter 4, Calculators A – H shall be required for each cash register from which the control unit receives receipt data.

*Further provisions concerning internal data*

**13.** *The latest transaction calculators* containing the value of Calculator A (transaction calculator) with the time of day of the latest copying of control data to the Department of Taxation being saved/stored in the Control unit. This shall have the value 0 before the first copying.

**14.** *Time stamp of the latest copying* shall be saved/stored in the control unit and it shall contain notification of the time when the latest copying of control data was done. This shall have the value 0 before the first copying.

**15.** The control unit's serial number shall be saved/stored.

## **Chapter 9 Encryption and saving/storing of receipt control data**

**1.** The receipt control data for receipt types Normal and Copy, along with the associated control code and the time stamp, shall be encrypted and saved/stored. This is formed of encrypted control data per receipt.

**2.** Receipt control data shall be saved/stored in the order the data arrive in.

**3.** As regards control unit of type C as per Section 6, Chapter 4, the receipt control data shall also be sorted per cash register.

**SKVFS 2008:y***Encrypted control data per receipt*

4. A control unit of type shall encrypt and save/store batches/records of control data as shown in the following table.

<b>Data</b>	<b>Description</b>	<b>Format</b>
Date and time	Date and time of the day as per the sale transaction Section 28c, SKVFS 2008:x	12 numerals, format YYYYMMDDhhmm
ID code	Company's business ID code or personal ID code as per Section 28a, SKVFS 2008:x	10 numerals
Cash register marking	Cash register marking as per Section 10, SKVFS 2008:z	At maximum 16 alphanumeric characters
Run number	Run number as per Section 28d, SKVFS 2008:x	At maximum 12 numerals
Receipt type	Depending on the receipt type, the following text is produced: - Normal - Copy - Practice - Profo	At maximum 6 alphanumeric characters
Return amount	Absolute value of summed up amount returned on the receipt.	At maximum 14 characters incl. decimal point. *)
Sale amount	Amount for customer to pay, as per Section 28h, SKVFS 2008:x	At maximum 14 characters incl. decimal point. *)

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<b>Data</b>	<b>Description</b>	<b>Format</b>
VAT batch 1; VAT amount 1	First VAT batch as percentage; Amount of first VAT batch as per Section 28j, SKVFS 2008:x	<Percentage batch>;<Amount> Percentage batch: At maximum 5 characters incl. decimal point. *) Amount: At maximum 14 characters incl. decimal point. *) Field length: 20 characters incl. semicolon.
VAT batch 2; VAT amount 2	Second VAT batch as percentage; Amount of second VAT batch as per Section 28j, SKVFS 2008:x	<Percentage batch>;<Amount> Percentage batch: At maximum 5 characters incl. decimal point. *) Amount: At maximum 14 characters incl. decimal point. *) Field length: 20 characters incl. semicolon.
VAT batch 3; VAT amount 3	Third VAT batch as percentage; Amount of third VAT batch as per Section 28j, SKVFS 2008:x	<Percentage batch>;<Amount> Percentage batch: At maximum 5 characters incl. decimal point. *) Amount: At maximum 14 characters incl. decimal point. *) Field length: 20 characters incl. semicolon.
VAT batch 4; VAT amount 4	Fourth VAT batch as percentage; Amount of fourth VAT batch as per Section 28j, SKVFS 2008:x	<Percentage batch>;<Amount> Percentage batch: At maximum 5 characters incl. decimal point. *) Amount: At maximum 14 characters incl. decimal point. *) Field length: 20 characters incl. semicolon.
Total sale amount	Calculator G (total of the sale amount).	14 characters incl. decimal point.
Control code, Part 1	Signature code as per Chapter 7 for this receipt.	32 alphanumeric characters

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Control code, Part 2	Encryption code as per Chapter 7 for this receipt.	26 alphanumeric characters
Time stamp	Point in time as per control unit's clock.	12 numerals, format YYYYMMDDhhmm
*) Values always to accuracy of two decimal places.		

5. The data shall be presented in ASCII format and right justified, and possibly filled in with blanks (spaces) in order to use up the given field length.

*Encryption of control data*

6. Each batch/record of control data shall be encrypted. Encryption shall be done using the algorithm as per Section 5, Chapter 11.

### **Chapter 10 Transmission of control data to the Department of Taxation**

*Control data to the Department of Taxation*

1. A control unit shall generate log files with the control data and copy these to an external memory via Port 3 when this port is activated.

2. A control unit shall create the log files Serial.Log, TransHdr.Log, and Trans.Log.

*Serial.Log*

3. The log file Serial.Log shall be a text file and it shall contain the following data.

<b>Field</b>	<b>Description</b>	<b>Format</b>
Control unit's ID	Serial No. of control unit in plain text	17 (5+12) alphanumeric characters

*TransHdr.Log*

4. The log file TransHdr.Log shall be a binary file containing an encrypted data batch/record and a signature batch/record.

5. As regards control unit of type C as per Section 6, Chapter 4, A log file TransHdr\_X.Log shall be created for each cash register where X is a run number beginning with the value 1 and increasing by 1 for each cash register.

6. TransHdr.Log shall have the following partial batches / partial records which form a batch/record of fixed length.

Partial batch / Partial record	Content	Length
Encrypted data batch / data record	Encrypted data batch / data record as per Sections 7 – 10	176 bytes
Signature batch/record	Signature of encrypted data batch/record	20 bytes

**SKVFS 2008:y***Encrypted data batch / data record*

7. An encrypted data batch / data record shall be made up of the following data.

Field	Description	Format
Control unit's ID	The control unit's serial number as per Ch. 11, Section 3.	17 alphanumeric characters
Cash register marking	Cash register marking as per Section 10, SKVFS 2008:z	16 alphanumeric characters
Time stamp for copying of control data	Point in time at the beginning of the copying.	12 numerals, format YYYYMMDDhhmm
Transaction calculator	Value of Calculator A (transaction calculator) at the beginning of the copying.	10 numerals
Missing/Lacking receipt calculator	Value of Calculator B (number of missing/lacking receipts) at the beginning of the copying.	10 numerals
Number of receipts of the receipt type Normal	Value of Calculator C (number of receipts of the receipt type Normal) at the beginning of the copying.	10 numerals
Number of receipts of the receipt type Copy	Value of Calculator D (number of receipts of the receipt type Copy) at the beginning of the copying.	10 numerals
Number of receipts of the receipt type Practice	Value of Calculator E (number of receipts of the receipt type	10 numerals

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	Practice) at the beginning of the copying.	
Total returned amount	Value of Calculator F (total returned amount) at the beginning of the copying.	14 characters incl. decimal point. *)
Total sale amount	Value of Calculator G (total sale amount) at the beginning of the copying.	14 characters incl. decimal point. *)
Total VAT	Value of Calculator H (total VAT) at the beginning of the copying.	14 characters incl. decimal point. *)
Time stamp of latest copying	Value of <i>time stamp of latest copying</i> as per Chapter 8.	12 numerals, format YYYYMMDDhhmm
Transaction calculator's value at time of latest copying	Value of <i>latest transaction calculator</i> as per Chapter 8.	10 numerals
Number of batches/records in Trans.Log	Number of batches/records of control data contained in Trans.Log.	10 numerals
*) Values always to accuracy of two decimal places.		

**8.** The data shall be presented in ASCII format and right justified, and possibly filled in with blanks (spaces) in order to use up the given field length.

**9.** The data shall be encrypted using the algorithm as per Ch. 11, Section 5.

*Signature batch/record*

**10.** The encrypted data batch/record as per Section 9 shall be signed using an algorithm as per Ch 11, Section 6.

*Trans.Log*

**11.** The log file Trans.Log shall be a binary file containing an encrypted control data batch/record and a signature batch/record for each receipt saved/stored in the control unit.

12. For each receipt saved/stored in the control unit, Trans.Log shall have the following partial batches / partial records, which form a batch/record of fixed length.

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<b>Partial batches / Partial records</b>	<b>Content</b>	<b>Length</b>
Encrypted control data batch/record	Encrypted control data per receipt as per Ch. 9, Sections 4–6	256 bytes
Signature batch/record	Signature of encrypted control data batch/record	20 bytes

13. The batches/records shall be arranged in the same order as they were when read into and saved/stored in the control unit.

*Encrypted control data batch/record*

14. The encrypted control data batch/record shall be encrypted control data per receipt saved/stored in the control unit.

*Signature batch/record*

15. The signature batch/record shall be encrypted control data batch/record signed using the algorithm as per Section 6, Chapter 11.

## **Chapter 11 Encryption**

### **Individual encryption keys**

*Generating individual encryption keys*

1. A currently valid principal key issued by the Department of Taxation shall be used when generating individual encryption keys for each control unit.

2. The following three individual encryption keys shall be generated.

1. Individual encryption key: Insert capital letter "K" at the end of the serial number.

Individual encryption key =  
 HMAC-SHA256(<primary key>,<serial number>K)  
 This shall be composed of 256 bits.

2. Individual initialisation vector: Insert capital letter "I" at the end of the serial number.

Individual initialisation vector =  
 HMAC-SHA256(<primary key>,<serial number>I)

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Only the 128 least significant bits in the result shall be used.

3. Individual signature key: Insert capital letter "A" at the end of the serial number.

Individual signature key =

HMAC-SHA256(<primary key>,<serial number>A)

This shall be composed of 256 bits.

3. The serial number of each control unit shall be used.

The serial number shall have the following format:

Field	Format
Manufacturer's ID	5 alphanumeric characters.
Control unit's ID	12 alphanumeric characters.

4. The field shall be presented in ASCII format and right justified, and possibly filled in with blanks (spaces) in order to use up the given field length.

**Encryption algorithm**

5. The symmetrical encryption algorithm AES-256 in CBC position shall be used for encrypting the data in the control unit.

The individual encryption key as per Section, Subsection 1, and the individual initialisation vector as per Section 2, Subsection 2, shall be used in the algorithm.

Encrypted data shall be entered using zeros (0) to reach the necessary length.

**Signature algorithm**

6. The algorithm HMAC-SHA1 shall be used for the signature function.

The individual signature key as per Section 2, Subsection shall be used in the algorithm.

## **Chapter 12 The requirements concerning security, performance capacity, reliability, and the operating environment.**

**SKVFS 2008:y**

### **Security**

#### *Protecting the security functions and security-critical data*

1. The individual encryption keys shall be stored so that the risk of them becoming compromised is minimised.
2. The individual encryption keys shall be saved/stored in a memory that cannot be modified or read by unauthorised persons or read using an oscilloscope or some other tools.
3. Internal data and control data shall be saved/stored in a memory that cannot be modified or read by unauthorised persons.
4. Software shall be protected so that it cannot be modified, added to or read via a control unit.
5. Software for encryption and signing shall be located in a secure component constructed for that purpose.
6. Individual encryption keys, internal data and control data shall be saved/stored in a non-vaporising memory without any moving parts. The memory shall be such that it does not need electrical power for the saved/stored data to be retained.

#### *Transportation and storage*

7. A control unit shall be such that it can be transported and stored without individual encryption keys or internal data being altered or corrupted.

#### *Enclosure protection and security sealing*

8. A control unit shall be such that it cannot be opened. The control unit's construction shall be such that physical access and attempts at access shall leave signs visible to the naked eye.
9. A control unit shall be security sealed with security-sealing tape or some other such means, which shall withstand temperature conditions between  $-30^{\circ}\text{C}$  and  $+110^{\circ}\text{C}$ . If the security sealing is broken, a sign visible to the naked eye shall be left.
10. Contact 3 shall be security sealed with security-sealing tape or some other such means, which shall withstand temperature conditions between  $-30^{\circ}\text{C}$  and  $+110^{\circ}\text{C}$ . If the security sealing is broken, a sign visible to the naked eye shall be left.

**SKVFS 2008:y***Marking and identification*

**11.** The control unit's enclosure shall be marked with its serial number.

**Requirements concerning performance capacity and reliability***Continuous operation and performance capacity*

**12.** A control unit shall be such that it can complete the encrypting and saving/storage of control data even in the event of a power outage.

**13.** It shall be possible to save/store data for at least 7 years even if the control unit is without power supply.

**14.** A control unit's clock shall function for at least 7 years even if the control unit is without power supply.

**15.** A control unit shall have a service life of at least 7 years.

**16.** The memory used for saving/storing control data shall have such a capacity that it can provide the saving/storage functions for control data covering at least 5 years.

**17.** A control unit shall not delay the printing out of a cash register receipt such that it becomes apparent to the user or affects the user's workplace environment.

*User interface*

**18.** A control unit shall produce a signal as to whether it is functioning or not functioning.

**19.** A control unit shall produce a signal once the copying of control data to the external memory is completed.

A Control unit shall produce a signal if an error occurs during the copying function.

*Performance capacity clock*

**20.** A control unit's real-time clock shall be such that it does not deviate more than  $\pm 5$  minutes per year at room temperature ( $+20^{\circ}\text{C}$ ).

*Physical durability*

**21.** A control unit shall at least fulfil the requirements of IEC 721-3-7, Section 7. It shall withstand a free fall of  $< 1\text{kg}$  in Category 7M2.

**SKVFS 2008:y***Temperature*

22. A control unit shall withstand the operating environment it is set for and at least withstand the temperature range of +5°C ---- +40°C.

*Air humidity*

23. A control unit shall withstand the operating environment it is set for and at least withstand the air humidity range of 10-85% without condensation causing damage to the unit.

*EMC (Electromagnetic Compatibility, immunity and emission)*

24. A control unit shall at least meet the immunity requirement set out in SS-EN 55024, immunity from electromagnetic disturbances. It shall at least be able to withstand the demagnetisation equipment used in the control unit's operating environment.

25. A control unit shall at least meet the emission requirement of Category B set out in SS-EN 55022, limit values with respect to radio disturbances.

*Electrical safety*

26. A control unit shall at least meet the electrical safety requirement set out in SS-EN 60 950-1.

**Operating environment**

27. A description shall be provided setting out the operating environment for a particular control unit. The description shall at least cover the specification imposed by the requirements as per Sections 20 – 26.

**Chapter 13 Manufacturing, testing and documentation****Manufacturing of the control unit***Installation of the clock*

1. A control unit's clock shall be installed set to Swedish standard time and the current date. The installation shall be done with the control unit switched off.

**SKVFS 2008:y***Serial number and encryption key*

2. The serial number shall be saved/stored in the control unit while it is switched off.
3. The individual encryption key shall be saved/stored in the control unit while it is switched off.
4. The Department of Taxation's primary key is not to be saved/stored in the control unit.

*Compliance*

5. The manufactured control unit shall comply with a certificated version of the product.

**Testing and testing documentation**

6. Each model of a control unit shall be validated as fulfilling the requirements of this regulation.

The validation process shall consist of the following.

- a. Testing of the functions set out in Chapters 4–11 of this regulation.
  - b. Testing to see that the requirements concerning security, performance capacity, reliability and operating environment as set out in Chapter 12 of this regulation are fulfilled.
7. Testing documentation shall be made available for validation purposes. Testing documentation shall include descriptions of the testing procedure and of the testing event and of the operating environment as per Chapter 12, Section 27. If so requested, the documentation must be made available to the Department of Taxation.

**Documentation on the control unit**

8. Detailed documentation must be available on the control unit's software and hardware including functional descriptions and the operating environment.

If so requested, the documentation must be made available to the Department of Taxation.

9. Documentation shall be available regarding instructions on how to install the control unit.
10. Documentation (user manual) shall be available regarding all of the control unit's functions. The user manual shall be available in

Swedish or in English, and it must accompany the delivered control unit.

**SKVFS 2008:y**

\_\_\_\_\_ 2008.  
This regulation shall come into effect on \_\_\_\_\_ 2008.

On behalf of the Department of Taxation

DIRECTOR-GENERAL

Head of the Unit

(Production Section, Unit)