

**G** GLOBAL  
**C** CLIMATE  
**O** OBSERVING  
**S** SYSTEM



WMO



of UNESCO



UNEP



ICSU

WORLD METEOROLOGICAL  
ORGANIZATION

INTERGOVERNMENTAL  
OCEANOGRAPHIC COMMISSION

## **Practical Help for Compiling CLIMAT Reports**

**March 2009**

**GCOS - 127**

**(WMO/TD No. 1477)**

UNITED NATIONS  
ENVIRONMENT PROGRAMME

INTERNATIONAL COUNCIL FOR  
SCIENCE

© World Meteorological Organization, 2009

The right of publication in print, electronic and any other form and in any language is reserved by WMO. Short extracts from WMO publications may be reproduced without authorization provided that the complete source is clearly indicated. Editorial correspondence and requests to publish, reproduce or translate this publication (articles) in part or in whole should be addressed to:

Chairperson, Publications Board

World Meteorological Organization (WMO)

7 bis, avenue de la Paix

P.O. Box No. 2300

CH-1211 Geneva 2, Switzerland

Tel.: +41 (0)22 730 84 03

Fax: +41 (0)22 730 80 40

E-mail: [Publications@wmo.int](mailto:Publications@wmo.int)

#### NOTE

The designations employed in WMO publications and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of WMO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

Opinions expressed in WMO publications are those of the authors and do not necessarily reflect those of WMO. The mention of specific companies or products does not imply that they are endorsed or recommended by WMO in preference to others of a similar nature which are not mentioned or advertised.

This document is not an official publication of WMO and has not been subjected to its standard editorial procedures. The views expressed herein do not necessarily have the endorsement of the Organization.

## Practical help for compiling CLIMAT Reports

This document is intended to give an overview for meteorological services and others occupied with CLIMAT reporting to practically check/improve their CLIMAT Reports and reduce errors/uncertainties. It gives some general information for compiling CLIMAT Reports in code form FM 71-XII referring to the WMO Document *Manual on Codes* (WMO-No. 306 <sup>1</sup>), correct CLIMAT examples, and the most common mistakes that have been encountered by CLIMAT recipients. WMO World Weather Watch *Handbook on CLIMAT and CLIMAT TEMP Reporting* (WMO/TD No. 1188 <sup>2</sup>) contains a fully detailed description of the CLIMAT code and requirements for observations used for CLIMAT Reports but is currently under revision. Document WMO *Manual on Codes* (WMO-No. 306) has a very theoretical approach and as of its encyclopaedic nature is less helpful for practical applications.

### Contents

▶ Introduction to CLIMAT Reports _____	2
▶ Regulations for compiling CLIMAT Reports _____	4
▶ Comprehensive graphics _____	5

---

<sup>1</sup> [http://www.wmo.int/pages/prog/www/WMOCodes/Manual/WMO306\\_Vol-I-1-PartA.pdf](http://www.wmo.int/pages/prog/www/WMOCodes/Manual/WMO306_Vol-I-1-PartA.pdf)

<sup>2</sup> [http://www.wmo.int/pages/prog/www/OSY/Publications/TD1188/HandbookCLIMAT-CLIMATTEMP\\_en.pdf](http://www.wmo.int/pages/prog/www/OSY/Publications/TD1188/HandbookCLIMAT-CLIMATTEMP_en.pdf)

## ► Introduction to CLIMAT Reports

A CLIMAT Report contains climatological information of one specific meteorological station for one specific month<sup>3</sup>. When exchanged on the Global Telecommunication System (GTS), Reports of one or several stations for one month are contained in a so called 'CLIMAT Bulletin' which comprises the CLIMAT Report(s) and additional information of telecommunication-specific nature. These 'CLIMAT Bulletins' are not described in detail in this document because it is intended to give the reader practical information on how to compile CLIMAT Reports.

CLIMAT Reports are specific alignments of characters which can be identified through their syntax by a computer programme (software) that processes them. 'Syntax' in this context relates to the code form FM 71-XII described in *Manual on Codes* (WMO-No. 306) which defines rules that must be followed by the symbols within a code to be considered correctly and unequivocally by the computing device.

In order that the data be interpreted correctly, the software must identify so called 'Sections' of characters within the CLIMAT Report. A CLIMAT Report contains up to five of these Sections (the actual number depending on quality and detailing of the meteorological information the station operator has available) which go from 0 to 4, starting with Section 0. For identification, Sections 1 to 4 start with a specific number, the Section Identifier: "111" for Section 1, "222" for Section 2, "333" for Section 3 and "444" for Section 4. Section 0 has no Section Identifier. It is identified by the term "CLIMAT" at the very beginning of a Report. If CLIMAT Reports from two or more stations are combined, Section 0 of the second and the following Reports start with the respective station number (see below for variabilities within Section 0). The table below shows the subordinate theoretical structure of a CLIMAT Report with its contents.

---

<sup>3</sup> A month corresponds to local time except for precipitation where a month begins at 0600 UTC on the first day of the month and ends at 0600 UTC on the first day of the following month (WMO-No. 100, p. 8.5).

**Table 1: Section-based structure and description of the contents of a FM 71-XII CLIMAT Report.**

<b>Section Number</b>	<b>Section Identifier</b>	<b>Contents</b>
0	-	Code name (CLIMAT) and location of observation point in time (month and year) and space (station number). <b>This Section is mandatory.</b>
1	111	Monthly averaged meteorological values (pressure, temperature etc.) for the month and station referred to in Section 0, including number of days with missing data for the respective value. <b>This Section is mandatory.</b>
2	222	Normal climatological values for the month and station referred to in Section 0, averaged for the respective month over a defined reference period (usually 30 years, at least 10 years), including number of years with missing data for the respective month and value. <b>This Section is optional and shall only be reported if the reference period was changed, for the twelve months following that change.</b>
3	333	Number of days with parameters beyond certain thresholds for the month and station referred to in Section 0. <b>This Section is optional.</b>
4	444	Extreme values and frequency of thunderstorms and hail for the month and station referred to in Section 0. <b>This Section is optional.</b>
		End Identifier "=" to indicate the end of the Report, placed after the last Section of the Report without a space. <b>The End Identifier is mandatory.</b>

Each Section is made up of so called 'Groups' that contain the actual information. The Groups have to be identified by numbers, similarly to the Sections. For Groups these numbers are only composed of one digit (characters "0" to "9") at the beginning of each Group. The Groups are separated by a space (" "). Each Section comprises a specific predefined number of Groups so that the software has a clear 'expectation' of the size of every Section. In case of missing data, Groups may be omitted from a Section which does not pose any problem to the software because the Groups are identified by their Group Identifiers. (If, for example due to missing data, one Group within a Section cannot be reported, the Group can be omitted from this Section or slashes ("/") may be entered instead of numbers, and the computing device can still interpret the code correctly. For examples, see below.)

The table below shows the organisation of a CLIMAT Report and how many digits are contained in each Group and each Section. Shown are the Section Identifiers (2<sup>nd</sup> column) and the Group Identifiers within each Section with the following placeholders for the actual data (3<sup>rd</sup> column): Numbers "0" to "9" identify the Groups, and every non-indexed letter serves as a placeholder for one digit of data (indexed letters are used for the description of the placeholders (or "symbolic letters") and easier understanding, see examples below). Note that columns "Section Identifier" and "Contents" refer to actual coding material whereas column "Section Number" is for easier understanding of the table.

**Table 2: FM 71-XII CLIMAT code form.**

Section Number	Section Identifier	Contents
0		CLIMAT MMJJJ Iliii
1	111	1P <sub>0</sub> P <sub>0</sub> P <sub>0</sub> P <sub>0</sub> 2PPPP 3s <sub>n</sub> TTT <sub>s</sub> t <sub>s</sub> s <sub>t</sub> 4s <sub>n</sub> T <sub>x</sub> T <sub>x</sub> T <sub>x</sub> s <sub>x</sub> T <sub>n</sub> T <sub>n</sub> T <sub>n</sub> 5eee 6R <sub>1</sub> R <sub>1</sub> R <sub>1</sub> R <sub>1</sub> R <sub>d</sub> n <sub>r</sub> 7S <sub>1</sub> S <sub>1</sub> S <sub>1</sub> p <sub>s</sub> p <sub>s</sub> p <sub>s</sub> 8m <sub>p</sub> m <sub>p</sub> m <sub>p</sub> m <sub>p</sub> m <sub>T</sub> m <sub>T</sub> m <sub>T</sub> m <sub>T</sub> m <sub>T</sub> n 9m <sub>e</sub> m <sub>e</sub> m <sub>R</sub> m <sub>R</sub> m <sub>S</sub> m <sub>S</sub>
2	222	0Y <sub>b</sub> Y <sub>b</sub> Y <sub>c</sub> Y <sub>c</sub> 1P <sub>0</sub> P <sub>0</sub> P <sub>0</sub> P <sub>0</sub> 2PPPP 3s <sub>n</sub> TTT <sub>s</sub> t <sub>s</sub> s <sub>t</sub> 4s <sub>n</sub> T <sub>x</sub> T <sub>x</sub> T <sub>x</sub> s <sub>x</sub> T <sub>n</sub> T <sub>n</sub> T <sub>n</sub> 5eee 6R <sub>1</sub> R <sub>1</sub> R <sub>1</sub> R <sub>1</sub> n <sub>r</sub> 7S <sub>1</sub> S <sub>1</sub> S <sub>1</sub> 8y <sub>p</sub> y <sub>p</sub> y <sub>T</sub> y <sub>T</sub> y <sub>T</sub> x <sub>T</sub> x <sub>T</sub> x 9y <sub>e</sub> y <sub>e</sub> y <sub>R</sub> y <sub>R</sub> y <sub>S</sub> y <sub>S</sub>
3	333	0T <sub>25</sub> T <sub>25</sub> T <sub>30</sub> T <sub>30</sub> 1T <sub>35</sub> T <sub>35</sub> T <sub>40</sub> T <sub>40</sub> 2T <sub>n0</sub> T <sub>n0</sub> T <sub>x0</sub> T <sub>x0</sub> 3R <sub>01</sub> R <sub>01</sub> R <sub>05</sub> R <sub>05</sub> 4R <sub>10</sub> R <sub>10</sub> R <sub>50</sub> R <sub>50</sub> 5R <sub>100</sub> R <sub>100</sub> R <sub>150</sub> R <sub>150</sub> 6s <sub>00</sub> s <sub>00</sub> s <sub>01</sub> s <sub>01</sub> 7s <sub>10</sub> s <sub>10</sub> s <sub>50</sub> s <sub>50</sub> 8f <sub>10</sub> f <sub>10</sub> f <sub>20</sub> f <sub>20</sub> f <sub>30</sub> f <sub>30</sub> 9V <sub>1</sub> V <sub>1</sub> V <sub>2</sub> V <sub>2</sub> V <sub>3</sub> V <sub>3</sub>
4	444	0s <sub>n</sub> T <sub>xd</sub> T <sub>xd</sub> T <sub>xd</sub> y <sub>x</sub> y <sub>x</sub> 1s <sub>n</sub> T <sub>nd</sub> T <sub>nd</sub> T <sub>nd</sub> y <sub>n</sub> y <sub>n</sub> 2s <sub>n</sub> T <sub>ax</sub> T <sub>ax</sub> T <sub>ax</sub> y <sub>ax</sub> y <sub>ax</sub> 3s <sub>n</sub> T <sub>an</sub> T <sub>an</sub> T <sub>an</sub> y <sub>an</sub> y <sub>an</sub> 4R <sub>x</sub> R <sub>x</sub> R <sub>x</sub> R <sub>x</sub> y <sub>r</sub> y <sub>r</sub> 5i <sub>w</sub> f <sub>x</sub> f <sub>x</sub> f <sub>x</sub> y <sub>fx</sub> y <sub>fx</sub> 6D <sub>ts</sub> D <sub>ts</sub> D <sub>gr</sub> D <sub>gr</sub> 7i <sub>y</sub> G <sub>x</sub> G <sub>x</sub> G <sub>n</sub> G <sub>n</sub>
		=

**► Regulations for compiling CLIMAT Reports**

1. CLIMAT Reports of several stations may be combined. In this case, the Groups CLIMAT and MMJJJ shall only be included in the first Report and shall not be repeated for each (or any) Report that follows. These following Reports shall begin with Group Iliii (the respective station number).
2. In the case of a combination of CLIMAT Reports of several stations, the Reports shall all be for the same specific month only.
3. Monthly means shall be calculated on the basis of daily means.
4. Sections 0 and 1 are mandatory and shall always be reported.
5. Sections 2, 3 and 4 are optional and shall usually be included in the CLIMAT Report on the basis of national meteorological service rules and regulations.
6. The respective Section Identifier ("111", "222", "333" and "444") for Sections 1-4 has to be included in the CLIMAT Report if it contains any of the Groups from the corresponding Section.
7. Each Group has a Group Identifier, from "0" to "9", which has to be included in every Group.
8. If one or several parameters of a Group are missing, the fields for the missing parameters shall be encoded with the appropriate number of slashes ("/"). If all parameters of a Group are missing, the Group shall be omitted from the Report. The numbering of the following Group Identifiers shall not be altered in this case.

9. If all parameters for any of Sections 2-4 are missing, the corresponding Section shall be omitted. The numbering of the Section Identifiers of the remaining Sections shall not be altered in this case.
10. Groups with Group Identifiers "8" and "9" (number of days for which values of certain parameters are missing) shall always be included in Section 1 of the CLIMAT Report. If the number of missing days for any parameter exceeds 10, or if there is a period of five consecutive days without any observations, the respective parameter is not meaningful and should not be reported in the respective Group in Section 1.
11. If all Groups of Section 1 are missing, only Section 0 followed by a space (" ") and the word "NIL" shall be included in the CLIMAT Report (Sections 1-4 shall not be included).
12. If any parameters of Section 0 are missing, the CLIMAT Report shall not be transmitted.
13. The different Groups in the Report have to be separated from each other by a space (" "). No spaces shall be included within any Group.
14. The End Identifier ("=") has to be placed after the final Section of the Report without a space.
15. The WWW Regulations provide that CLIMAT Reports shall be transmitted by the fifth day of the month following the month to which the data refer, and not later than the eighth day.
16. The monthly data shall be encoded in the code form which was in force during the month to which the data refer (e.g. if a CLIMAT code change came into effect on 1 November, the CLIMAT data for October, transmitted in November, will be in the old code form; the first CLIMAT Report in the new code form will be for November data, transmitted in December).

### ► **Comprehensive graphics**

The following pages show notes, descriptions, examples and typical errors in a graphical way.

# ► Important Note

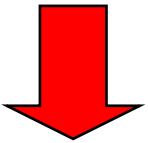
On numbers and symbolic letters in examples for CLIMAT Reports

A real CLIMAT Report always is composed of numbers and some symbols, and the only characters that shall appear in a CLIMAT Report are the word “CLIMAT” (or the word “NIL” when no data were available at all).

For descriptions of the contents of CLIMAT Reports, CLIMAT experts use symbolic letters in form of characters. For example, to describe that at a certain place the mean monthly air pressure shall be inserted, CLIMAT experts agreed to use the characters “P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>”.

The two examples below demonstrate the difference between descriptions of the CLIMAT Reports and real CLIMAT Reports.

**CLIMAT code form**



CLIMAT MMJJJ Illiii

111 1P<sub>0</sub>P<sub>0</sub>P<sub>0</sub> 2PPPP 3s<sub>n</sub>TTT<sub>s</sub>s<sub>s</sub> 4s<sub>n</sub>T<sub>x</sub>T<sub>x</sub>T<sub>x</sub>T<sub>n</sub>T<sub>n</sub> 5eee

6R<sub>1</sub>R<sub>1</sub>R<sub>1</sub>R<sub>d</sub>r<sub>r</sub> 7S<sub>1</sub>S<sub>1</sub>S<sub>1</sub>p<sub>s</sub>p<sub>s</sub>p<sub>s</sub> 8m<sub>p</sub>m<sub>p</sub>m<sub>T</sub>m<sub>T</sub>m<sub>T</sub>x

9m<sub>e</sub>m<sub>e</sub>m<sub>R</sub>m<sub>R</sub>m<sub>S</sub>

222 0Y<sub>b</sub>Y<sub>b</sub>Y<sub>c</sub>Y<sub>c</sub> 1P<sub>0</sub>P<sub>0</sub>P<sub>0</sub> 2PPPP 3s<sub>n</sub>TTT<sub>s</sub>s<sub>s</sub> 4s<sub>n</sub>T<sub>x</sub>T<sub>x</sub>T<sub>x</sub>T<sub>n</sub>T<sub>n</sub>

5eee 6R<sub>1</sub>R<sub>1</sub>R<sub>1</sub>R<sub>d</sub>r<sub>r</sub> 7S<sub>1</sub>S<sub>1</sub>S<sub>1</sub> 8y<sub>p</sub>y<sub>p</sub>y<sub>T</sub>y<sub>T</sub>y<sub>T</sub>x

9y<sub>e</sub>y<sub>e</sub>y<sub>R</sub>y<sub>R</sub>y<sub>S</sub>

333 0T<sub>25</sub>T<sub>25</sub>T<sub>30</sub>T<sub>30</sub> 1T<sub>35</sub>T<sub>35</sub>T<sub>40</sub>T<sub>40</sub> 2T<sub>n0</sub>T<sub>n0</sub>T<sub>x0</sub>T<sub>x0</sub> 3R<sub>01</sub>R<sub>01</sub>R<sub>05</sub>R<sub>05</sub>

4R<sub>10</sub>R<sub>10</sub>R<sub>50</sub>R<sub>50</sub> 5R<sub>100</sub>R<sub>100</sub>R<sub>150</sub>R<sub>150</sub> 6s<sub>00</sub>s<sub>00</sub>s<sub>01</sub>s<sub>01</sub> 7s<sub>10</sub>s<sub>10</sub>s<sub>50</sub>s<sub>50</sub>

8f<sub>10</sub>f<sub>10</sub>f<sub>20</sub>f<sub>20</sub>f<sub>30</sub>f<sub>30</sub> 9V<sub>1</sub>V<sub>1</sub>V<sub>2</sub>V<sub>2</sub>V<sub>3</sub>V<sub>3</sub>

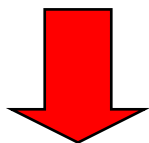
444 0s<sub>n</sub>T<sub>xd</sub>T<sub>xd</sub>T<sub>xd</sub>y<sub>x</sub> 1s<sub>n</sub>T<sub>nd</sub>T<sub>nd</sub>T<sub>nd</sub>y<sub>n</sub> 2s<sub>n</sub>T<sub>ax</sub>T<sub>ax</sub>T<sub>ax</sub>y<sub>ax</sub>

3s<sub>n</sub>T<sub>an</sub>T<sub>an</sub>T<sub>an</sub>y<sub>an</sub> 4R<sub>x</sub>R<sub>x</sub>R<sub>x</sub>R<sub>y</sub>y<sub>r</sub> 5i<sub>w</sub>f<sub>x</sub>f<sub>x</sub>f<sub>fx</sub>f<sub>fx</sub> 6D<sub>ts</sub>D<sub>ts</sub>D<sub>gr</sub>D<sub>gr</sub>

7i<sub>y</sub>G<sub>x</sub>G<sub>x</sub>G<sub>n</sub>G<sub>n</sub>

=

**Example of a real CLIMAT Report with numbers and symbols**



CLIMAT 07008

84140 111 10034 2//// 30243/// 402840211 5254 60008404

7057103 8000000 9000000

222 06190 10029 2//// 30233/// 402810199 5/// 6002302

7549 8090004 9300002

333 03005 30200 40000

444 2032828 3018431 4005413 5004051 60000=



# ► Correct CLIMAT example

Including full Reports from two stations, with explanations

There shall be no line break between the Station Number of Section 0 and Section 1. Between the other Sections and between Reports there shall be line breaks.

There shall be a line break within Section 0 of the first Report between the Month-Year-Identifier and the Station Number.

A CLIMAT Report is made up of Sections (indicated by colours in the sample below) which contain several Groups that are separated by a space (the line points to several Groups).

There shall be spaces before all Groups and after the last Group of each Section, except the last Group of Section 4.

## Code

## orientation help

Report 1

Report 2

```

CLIMAT 07008
84140 111 10034 2//// 30243/// 402840211 5254 60008404 7057103 8000000 9000000
222 06190 10029 2//// 30233/// 402810199 5/// 6002302 7549 8090004 9300002
333 03005 30200 40000
444 2032828 3018431 4005413 5004051 60000=
84270 111 1//// 2//// 30148/// 401920113 5123 60090/14 7102073 8//0000 9000000
222 07100 1//// 2//// 30148/// 401890116 5/// 6005609 7140 8300344 9300304
333 31408 40200
444 2023031 3006218 4014024 5010028 60000=
    
```

*Sec-  
tion 0 Section 1*  
*Section 2*  
*Section 3*  
*Section 4End Identifier*  
*Section 0 Section 1*  
*Section 2*  
*Section 3*  
*Section 4End Identifier*

Section 0 of Reports 2 and the following shall only contain the Station Number; "CLIMAT" and the Month-Year-Identifier shall be omitted.

Every single Report shall end with an equal sign "=" as End Identifier that shall follow the last Group of the last Section directly (with no space).

If no data are available, slashes ("/") shall be inserted instead. If no data are available at all, the respective Group may be omitted from the respective Section.

# ► Description of Section 1-4 contents

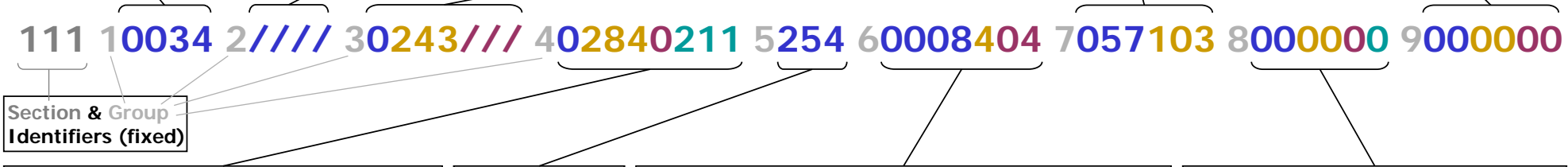
## General

- Each of the next four slides shows an example describing one of the Sections 1 to 4.
- A code-sample of the respective Section is shown in the middle.
- Boxes pointing to the Groups and elements of the sample explain the respective contents.
- Each Section starts with a fixed Section Identifier (the first three digits of a Section) which is followed by the Groups, starting with Group 1 (Section 1) and Group 0 (Sections 2, 3 and 4).
- Each Group starts with a fixed Group Identifier (the first digit of the Group).
- The digits following the Group Identifier are where the real data shall be inserted.
- Colours within the sample relate to the respective parameter of data explained in the boxes.
- The first example in each box demonstrates the composition of the sample.

# ► Description of Section 1 contents

Monthly data including number of days with missing values

<p><b>Group 1 data:</b> Mean monthly air pressure at station level, in 0.1 hPa. Omit thousands hPa digit if value ≥1000.0 hPa.</p> <p><u>Examples:</u></p> <ul style="list-style-type: none"> <li>• 1003.4 hPa → 0034</li> <li>• 995.3 hPa → 9953</li> <li>• 999.9 hPa → 9999</li> </ul>	<p><b>Group 2 data:</b> Mean monthly air pressure at sea level / agreed datum level, in 0.1 hPa, omit thousands hPa digit if value ≥1000.0 hPa; or height to next main pressure level (925, 850, 700, 500 hPa) in gpm (not 0.1 gpm!); as indicated in WMO-No. 9 Vol. A.</p> <p><u>Examples:</u></p> <ul style="list-style-type: none"> <li>• missing → //// (more examples: Group 1)</li> <li>• height to next mean pressure level 1543.3 gpm → 1543</li> </ul>	<p><b>Group 3 data:</b> +/- indicator (+ ► 0, - ► 1), value of mean monthly temperature and standard deviation, in 0.1 °C.</p> <p><u>Examples:</u></p> <ul style="list-style-type: none"> <li>• +24.3 °C and missing → 0243///</li> <li>• +5.0 °C and 0.8 °C → 0050008</li> <li>• -0.7 °C and 5.3 °C → 1007053</li> </ul>	<p><b>Group 7 data:</b> Total sunshine duration for the month in h (not 0.1 h !), and expressed as percentage of the 30-year normal.</p> <p><u>Examples:</u></p> <ul style="list-style-type: none"> <li>• 57 h and 103 % → 057103</li> <li>• 501 h and 096 % → 501096</li> <li>• 75 h and missing → 075///</li> </ul>	<p><b>Group 9 data:</b> Number of days (d) of month missing for data of daily vapour pressure, precipitation and sunshine duration.</p> <p><u>Examples:</u></p> <ul style="list-style-type: none"> <li>• 0 d and 0 d and 0 d → 000000</li> <li>• 2 d and 3 d and 5 d → 020305</li> <li>• 0 d and 10 d and 0 d → 001000</li> </ul>
--	---	---	---	---



<p><b>Group 4 data:</b> +/- indicator (+ ► 0, - ► 1), value of mean daily maximum temperature in 0.1 °C; and +/- indicator (+ ► 0, - ► 1), value of mean daily minimum temperature in 0.1 °C.</p> <p><u>Examples:</u></p> <ul style="list-style-type: none"> <li>• +28.4 and +21.1 °C → 02840211</li> <li>• -2.3 °C and -9.8 °C → 10231098</li> <li>• +23.0 °C and +15.5 °C → 02300155</li> <li>• 10 days missing and -0.5 °C → ////1005</li> </ul>	<p><b>Group 5 data:</b> Mean monthly value of mean daily partial vapour pressure at station level, in 0.1 hPa.</p> <p><u>Examples:</u></p> <ul style="list-style-type: none"> <li>• 25.4 hPa → 254</li> <li>• 2.3 hPa → 023</li> </ul>	<p><b>Group 6 data:</b> Precipitation equivalent for the month in mm (not 0.1 mm !), and associated quintile (frequency Group), and number of days with precipitation ≥1.0 mm. Enter "8899" if precipitation equivalent ≥8899 mm, "9999" if &gt;0 mm but &lt;1 mm, "0000" if the monthly total is 0 mm.</p> <p><u>Examples:</u></p> <ul style="list-style-type: none"> <li>• 80.5 mm and 4<sup>th</sup> quintile and 4 d → 0081404</li> <li>• 0 mm and '&lt; any 30-year value' and 0 d → 0000000</li> <li>• 11235 mm and '&gt; any 30-year value' and 23 d → 8899623</li> <li>• 0.4 mm and 1<sup>st</sup> quintile and 0 d → 9999100</li> </ul>	<p><b>Group 8 data:</b> Number of days (d) of month missing for pressure and for mean, maximum and minimum temperature. Enter "9" if 9 or more days of maximum and minimum temperature data are missing, respectively.</p> <p><u>Examples:</u></p> <ul style="list-style-type: none"> <li>• 0 d and 0 d and 0 d and 0 d → 000000</li> <li>• 2 d and 14 d and 12 d and 8 d → 021498</li> <li>• 0 d and 0 d and 0 d and 9 d → 000009</li> </ul>
---	--	--	---

# ► Description of Section 2 contents

Normal data over a defined reference period (usually 30 years, at least 10 years!)

**Group 0 data:**  
 First year (1<sup>st</sup> & 2<sup>nd</sup> digits) and last year (3<sup>rd</sup> & 4<sup>th</sup> digits) of the reference period for the calculation of the normal values. Omit thousand and hundred digits.  
Examples:  
 • 1961 and 1990 → 6190  
 • 1971 and 2000 → 7100  
 • 1976 and 2005 → 7605

**Group 1 data:**  
 Normal air pressure at station level, in 0.1 hPa. Omit thousands hPa digit if value ≥1000.0 hPa.  
Examples:  
 • 982.3 hPa → 9823  
 • 1014.2 hPa → 0142  
 • 1000.0 hPa → 0000

**Group 2 data:**  
 Normal air pressure at sea level or at agreed datum level, in 0.1 hPa, omit thousands hPa digit if value ≥1000.0 hPa; or height to next main pressure level (925, 850, 700, 500 hPa) in gpm (**not** 0.1 gpm!); as indicated in WMO-No. 9 Vol. A.  
Examples:  
 • 991.5 hPa → 9915 (more examples: Group 1)  
 • height to next mean pressure level 1543.3 gpm → 1543

**Group 5 data:**  
 Normal partial vapour pressure at station level, in 0.1 hPa.  
Examples:  
 • 1.2 hPa → 012  
 • 18.1 hPa → 181  
 • 0.4 hPa → 004

**Group 7 data:**  
 Normal monthly sunshine duration in h (**not** 0.1 h!).  
Examples:  
 • 16 h → 016  
 • 183 h → 183  
 • 287 h → 287

**Group 9 data:**  
 Number of years (y) missing for: Normal vapour pressure (1<sup>st</sup> & 2<sup>nd</sup> digits), normal precipitation (3<sup>rd</sup> & 4<sup>th</sup> digits) and normal sunshine duration (5<sup>th</sup> & 6<sup>th</sup> digits).  
Examples:  
 • 1 y and 2 y and 0 y → 010200  
 • 0 y and 0 y and 11 y → 000011  
 • 1 y and 0 y and 0 y → 010000

222 06190 19823 29915 30005007 400820001 5012 6000000 7016 8010002 9010200

**Section & Group Identifiers (fixed)**

**Group 3 data:**  
 +/- indicator (+ ► 0, - ► 1), value of normal temperature and normal standard deviation, in 0.1 °C.  
Examples:  
 • +0.5 °C and 0.7 °C → 0005007  
 • -21.3 °C and 3.4 °C → 1213034  
 • -0.7 °C and missing → 1007///

**Group 4 data:**  
 +/- indicator (+ ► 0, - ► 1), value of normal monthly maximum temperature, in 0.1 °C; and +/- indicator (+ ► 0, - ► 1), value of normal monthly minimum temperature, 0.1 °C.  
Examples:  
 • +8.2 °C and +0.1 °C → 00820001  
 • -16.2 °C and -36.2 °C → 10821001  
 • +26.1 °C and +21.7 °C → 02610217

**Group 6 data:**  
 Normal monthly precipitation in mm (**not** 0.1 mm!) and normal number of days per month with precipitation ≥1 mm. Enter "8899" if precipitation equivalent ≥8899 mm, "9999" if >0 mm but <1 mm, "0000" if the monthly total is 0 mm.  
Examples:  
 • 0 mm and 0 d → 000000  
 • 671 mm and 17 d → 067117  
 • 9107 mm and 21 d → 889921

**Group 8 data:**  
 Number of years (y) missing for: Normal pressure (1<sup>st</sup> & 2<sup>nd</sup> digits), normal mean temperatures (3<sup>rd</sup> & 4<sup>th</sup> digits) and extreme temperatures (5<sup>th</sup> & 6<sup>th</sup> digits).  
Examples:  
 • 1 y and 0 y and 2 y → 010002  
 • 10 y and 1 y and 5 y → 100105  
 • 3 y and 0 y and 12 y → 030012

# ► Description of Section 3 contents

Number of days with parameters beyond certain thresholds

**Group 0 data:**  
 Number of days (d) of month with maximum temperature  $\geq 25$  °C (1<sup>st</sup> & 2<sup>nd</sup> digits) and  $\geq 30$  °C (3<sup>rd</sup> & 4<sup>th</sup> digits). Omit Group if both values equal zero.  
Examples:  
 • 15 d and 09 d → 1509  
 • 2 d and 1 d → 0201  
 • 0 d and 0 d → omit Group

**Group 1 data:**  
 Number of days (d) of month with maximum temperature  $\geq 35$  °C (1<sup>st</sup> & 2<sup>nd</sup> digits) and  $\geq 40$  °C (3<sup>rd</sup> & 4<sup>th</sup> digits). Omit Group if both values equal zero.  
Examples:  
 • 3 d and 0 d → 0300  
 • 23 d and 21 d → 2321  
 • 0 d and 0 d → omit Group

**Group 2 data:**  
 Number of days (d) of month with minimum (1<sup>st</sup> & 2<sup>nd</sup> digits) & maximum (3<sup>rd</sup> & 4<sup>th</sup> digits) temperatures  $< 0$  °C. Omit Group if both values equal zero.  
Examples:  
 • 14 d and 3 d → 1403  
 • 5 d and 0 d → 0500  
 • 0 d and 0 d → omit Group

**Group 7 data:**  
 Number of days (d) of month with snow depth  $\geq 10$  cm (1<sup>st</sup> & 2<sup>nd</sup> digits) and  $\geq 50$  cm (3<sup>rd</sup> & 4<sup>th</sup> digits). Omit Group if both values equal zero.  
Examples:  
 • 12 d and 9 d → 1209  
 • 2 d and 0 d → 0200  
 • 0 d and 0 d → omit Group

**Group 9 data:**  
 Number of days (d) of month with horizontal visibility  $< 50$  m (1<sup>st</sup> & 2<sup>nd</sup> digits) and  $< 100$  m (3<sup>rd</sup> & 4<sup>th</sup> digits) and  $< 1000$  m (5<sup>th</sup> & 6<sup>th</sup> digits). Omit Group if all values equal zero.  
Examples:  
 • 1 d and 1 d and 19 d → 010119  
 • 31 d and 31 d and 31 d → 313131  
 • 0 d and 0 d and 0 d → omit Group

333 01509 10300 21403 31607 40303 50100 63029 71209 8100400 9010119

Section & Group Identifiers (fixed)

**Group 3 data:**  
 Number of days (d) of month with precipitation  $\geq 1$  mm (1<sup>st</sup> & 2<sup>nd</sup> digits) and  $\geq 5$  mm (3<sup>rd</sup> & 4<sup>th</sup> digits). Omit Group if both values equal zero.  
Examples:  
 • 16 d and 7 d → 1607  
 • 1 d and 0 d → 0100  
 • 0 d and 0 d → omit Group

**Group 4 data:**  
 Number of days (d) of month with precipitation  $\geq 10$  mm (1<sup>st</sup> & 2<sup>nd</sup> digits) and  $\geq 50$  mm (3<sup>rd</sup> & 4<sup>th</sup> digits). Omit Group if both values equal zero.  
Examples:  
 • 3 d and 3 d → 0303  
 • 31 d and 10 d → 3110  
 • 0 d and 0 d → omit Group

**Group 5 data:**  
 Number of days (d) of month with precipitation  $\geq 100$  mm (1<sup>st</sup> & 2<sup>nd</sup> digits) and  $\geq 150$  mm (3<sup>rd</sup> & 4<sup>th</sup> digits). Omit Group if both values equal zero.  
Examples:  
 • 1 d and 0 d → 0100  
 • 13 d and 8 d → 1308  
 • 0 d and 0 d → omit Group

**Group 6 data:**  
 Number of days (d) of month with snow depth  $> 0$  cm (1<sup>st</sup> & 2<sup>nd</sup> digits) and  $\geq 1$  cm (3<sup>rd</sup> & 4<sup>th</sup> digits). Omit Group if both values equal zero.  
Examples:  
 • 30 d and 29 d → 3029  
 • 7 d and 0 d → 0700  
 • 0 d and 0 d → omit Group

**Group 8 data:**  
 Number of days (d) of month with maximum wind speed  $\geq 10$  m/s (1<sup>st</sup> & 2<sup>nd</sup> digits) and  $\geq 20$  m/s (3<sup>rd</sup> & 4<sup>th</sup> digits) and  $\geq 30$  m/s (5<sup>th</sup> & 6<sup>th</sup> digits). Omit Group if all values equal zero.  
Examples:  
 • 10 d and 4 d and 0 d → 100400  
 • 23 d and 23 d and 4 d → 232304  
 • 0 d and 0 d and 0 d → omit Group

# ► Description of Section 4 contents

Extreme values and frequency of thunderstorms and hail; report only if there are data available for all days of month for the respective parameter.

**Group 0 data:**  
 +/- indicator (+ ► 0, - ► 1), value of highest mean daily temperature in 0.1 °C, day (D) of month of event (add 50 to first day if same temperature on several days).

Examples:

- +20.5 °C and D 12 → 020512
- -0.5 °C and D 3 → 100503
- +0.9 °C and D 2 & D 7 & D 21 → 000952

**Group 1 data:**  
 +/- indicator (+ ► 0, - ► 1), value of lowest mean daily temperature in 0.1 °C, day (D) of month of event (add 50 to first day if same temperature on several days).

Examples:

- +17.2 °C and D 24 → 017224
- -11.0 °C and D 11 & D 12 → 111061
- -0.2 °C and D 30 → 100230

**Group 2 data:**  
 +/- indicator (+ ► 0, - ► 1), value of highest temperature in 0.1 °C, day (D) of month of event (add 50 to first day if same temperature on several days).

Examples:

- +29.2 °C and D 11 → 029211
- +0.0 °C and D 1 → 000001
- -5.3 °C and D 23 → 105323

**Group 7 data:**  
 Measurement practice indicator (max/min thermometer ► 1, automatic weather station ► 2, thermograph ► 3)<sup>6)</sup>, time of daily reading of maximal, minimal temperatures (UTC hours).

Examples<sup>6)</sup>:

- max/min th. and 16 h and 04 h → 11604
- AWS and 9 h and 21 h → 21402
- thermogr. and 11 h and 23 h → 31123

444 0020512 1017224 2029211 3010104 4019629 5007320 60311 711604

**Section & Group Identifiers (fixed)**

**Group 3 data:**  
 +/- indicator (+ ► 0, - ► 1), value of lowest temperature in 0.1 °C, day (D) of month of event (add 50 to first day if same temperature on several days).

Examples:

- +10.1 °C and D 4 → 010104
- -42.1 °C and D 17 & D 19 → 142167
- -3.2 °C and D 26 → 103226

**Group 4 data:**  
 Highest daily precipitation in 0.1 mm, day (D) of month of event (add 50 to first day if same precipitation on several days). If no precipitation occurred during the entire month, insert 00 for the day (D) of month of event<sup>5)</sup>.

Examples:

- 19.6 mm and D 29 → 019629
- 340.1 mm and D 1 & D 6 → 340151
- 0.0 mm and entire month → 000000

**Group 5 data:**  
 Information source indicator (estimated [m/s] ► 0, anemometer [m/s] ► 1, estim. [knots] ► 3, anemo. [knots] ► 4)<sup>6)</sup>, highest wind gust speed in 0.1 m/s OR knots, day (D) of month of event (add 50 to first day if same wind gust speed on several days).

Examples<sup>6)</sup>:

- estim. [m/s] and 7.3 m/s and D 20 → 007320
- anemo. [knots] and 3.5 knots and D 3 → 403503
- anemo. [m/s] and 61.0 m/s and D 4 & D 6 → 161054

**Group 6 data:**  
 Number of days (d) with thunderstorms, number of days (d) with hail.

Examples:

- 3 d and 11 d → 0311
- 23 d and 14 d → 2314

<sup>5)</sup>Recommendation of GSN Monitoring centre at DWD, Germany

<sup>6)</sup>Abbreviations: max: maximum, min: minimum, UTC: Coordinated Universal Time, th.: thermometer, AWS: automatic weather station, thermogr.: thermograph, estim.: estimated, anemo.: anemometer

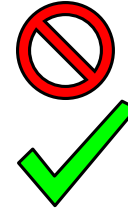
# ► Typical errors in Section 0

Keyword, Month-Year-Identifier, Station Identifier

Code form	<b>CLIMAT MMJJJ IIIII</b>		
Possible errors <b>TO BE AVOIDED !</b>	<p><b>Keyword</b></p> <ul style="list-style-type: none"> <li>• Typing mistakes (e.g. <b>Climat</b>, <b>KLIMAT</b>, <b>TEMP</b>, <b>AGRO</b>)</li> <li>• missing</li> </ul>	<p><b>Month-Year-Identifier</b></p> <ul style="list-style-type: none"> <li>• 50 added to month (e.g. for May instead of <b>05</b> → <b>55</b>)</li> <li>• too long (e.g. <b>MMJJJJ</b>)</li> <li>• month and year exchanged (e.g. <b>JJJMM</b>)</li> <li>• previous month</li> <li>• forthcoming month</li> <li>• exchanged with station number</li> <li>• missing</li> <li>• doubly</li> </ul>	<p><b>Station Identifier</b></p> <ul style="list-style-type: none"> <li>• exchanged with Month-Year-Identifier</li> <li>• exchanged with Group 111 of Section 1</li> <li>• station name added</li> </ul>

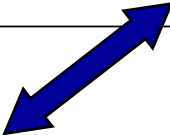
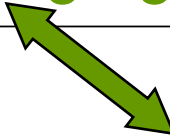
## Examples

- **incorrect:** MESSAGE CLIMAT MOIS :09/2007
- **correct:** CLIMAT 04008 10147



# ► Typical errors in Sections 1 - 4

Section Identifier, Groups

<p><b>Code form</b></p>	<p>e.g. <b>111 1P<sub>0</sub>P<sub>0</sub>P<sub>0</sub>P<sub>0</sub> ...</b></p>
<p><b>Possible errors</b></p> <p><b>TO BE AVOIDED !</b></p>	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p><b>Section Identifier</b></p> <ul style="list-style-type: none"> <li>• shortened (e.g. 1 or 11)</li> <li>• containing brackets (e.g. (111 or (111))</li> <li>• Roman numbered (e.g. I or II)</li> <li>• as a word (e.g. <b>one</b> or <b>seksi</b>)</li> <li>• missing</li> <li>• following Groups missing</li> </ul> </div> <div style="text-align: center;">  <p><b>Groups</b></p> <ul style="list-style-type: none"> <li>• doubly</li> <li>• missing</li> <li>• too short</li> <li>• too long</li> <li>• without Group Identifier</li> <li>• wrong Group Identifier</li> <li>• space to separate from following Group missing</li> <li>• more than one space to separate from following Group</li> <li>• space within Group</li> <li>• slashes ("/") missing for digits with missing data</li> </ul> </div> </div>