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ISO 7168-2

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Air quality — Exchange of data —

Part 2:
Condensed data format

Qualité de l'air — Échange de données —

Partie 2: Format condensé de données

Reference number
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Contents

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 7168-2 was prepared by Technical Committee ISO/TC 146, *Air quality*, Subcommittee SC 4, *General aspects*.

ISO 7168 consists of the following parts, under the general title *Air quality — Exchange of data*:

— *Part 1: General data format*

— *Part 2: Condensed data format*

The first editions of the several parts of ISO 7168 together cancel and replace the first edition (ISO 7168:1985), which has been technically revised.

Annexes A, B, C and D form a normative part of this part of ISO 7168. Annexes E, F and G are for information only.

Introduction

For the interpretation or comparison of air quality data, the data themselves are usually not sufficient. Other information may be needed for a proper evaluation, e.g. basic information on the measurement, such as

— object of the measurements,

— place of sampling,

— date of sampling,

or additional information, such as

— the measuring method used,

— sampling period of a single measurement,

— characteristics of the sampling site,

— validity of the data.

In some cases, the user will need other information to be compared with the measured data in conformity with regulations or to enable certain complex processing operations to be performed, e.g.

— additional meteorological data,

— geographical and economic data,

— data on localised or diffuse atmospheric emissions.

The transmission of such information in a data file is not mandatory. Where necessary and possible, this supplementary information may be attached to a data file as comment.

ISO 7168-1 specifies the general data format for the exchange of air quality data. This general data format supports both the direct readability and the automated processing of data files. Each information presented in a data file prepared in accordance with ISO 7168-1 is related to a defined keyword and therefore consistently self-explanatory. The general data format is intended for the international exchange of air quality data.

ISO 7168-2 specifies a condensed data format which is intended only for the exchange of data files between automatic data processing systems. A good knowledge of the file structure is necessary for the interpretation of these data files.

Air quality — Exchange of data —

Part 2:
Condensed data format

1 Scope

This part of ISO 7168 specifies a condensed data format for presentation of air quality data. Contrary to the general data format specified in ISO 7168-1, the condensed data format reduces the file size. This format is intended particularly for exchanging files between automatic data processing systems. Therefore, it is restricted to the minimum information necessary for processing data.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 7168. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 7168 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 1000:1992, *SI units and recommendations for the use of their multiples and of certain other units.*

ISO 3166-1:1997, *Codes for the representation of names of countries and their subdivisions.*

ISO 3534-1:1993, *Statistics — Vocabulary and symbols — Part 1: Probability and general statistical terms.*

ISO 4226:1993, *Air quality — General aspects — Units of measurement.*

ISO 6709:1983, *Standard representation of latitude, longitude and altitude for geographic points location.*

ISO 6879:1995, *Air quality — Performance characteristics and related concepts for air quality measuring methods.*

ISO 7168-1:1998, *Air quality — Exchange of data — Part 1: General data format.*

ISO 8756:1994, *Air quality — Handling of temperature, pressure and humidity data.*

ISO/IEC 646:1991, *Information technology — ISO 7-bit coded character set for information interchange.*

3 Terms and definitions

For the purposes of this part of ISO 7168, the terms and definitions given in ISO 6879 and the following apply.

3.1
air quality characteristic
one of the quantifiable properties relating to an air mass under investigation, for example, concentration of a constituent

3.2
air quality data
values of the air quality characteristic

3.3
data
air quality data and general data

3.4
general data
additional data other than air quality data needed for a proper evaluation of the air quality data transmitted

4 Symbols and abbreviated terms

CR	Carriage return
dec	decimal
LF	Line feed
RNL	Return to new line
UT	Universal time

5 File format

5.1 Overview

The data file is divided into four groups:

a) The identification group (see 7.1) gives the name and address of the institution transmitting the air quality data and defines the number of description blocks and data blocks.

b) The description group (see 7.2) consists of description blocks, which present in a measurand record information on each measurand, e.g. the measurement method used, and in one or more site records details of the sampling sites.

c) The data group (see 7.3) consists of data blocks. Each data block has a data control record (see 7.3.1) which summarizes the frequency and type of values given in the following data record (see 7.3.2).

d) The comment group (see 7.4) provides a comment control record and the comments in the comment record.

5.2 Construction of data files

Data files shall be constructed in accordance with the following rules:

a) The data file shall be in compliance with the international information exchange code defined in ISO/IEC 646 (see Annex A). Specific national characters shall not be used for the presentation of air quality data. Furthermore, certain control characters shall not be used in the data file (shaded characters in Table A.1).

b) A *return to new line* (RNL) code shall be placed at the beginning of the file and at the end of each line. The RNL consists of a line feed plus carriage return (decimal codes 13 and 10) to enable the processing of the files on different operating systems.

6 Specifications

6.1 Creation of file names

6.1.1 General

The file name is deliberately restricted to eight characters plus one full stop plus three characters (i.e. eleven characters). Parametering of the file name enables identification of the content of the file. This includes information about the measurement location and the date of the measurement. The parameters used for the construction of file names are defined in Table 1.

Table 1 — Parameters for constructing file names

Parameter	Description	Number of characters	Value / Format[a]
SSSSS	Measuring station	5	<alphanumerical>
YY	Year of measurement date	2	00 to 99
MM	Month of measurement date	2	01 to 12
DDD	Day number within the year of the measurement date	3	001 to 366
X	Unused field in the file name	1	- {hyphen} or letter A to Z
Q	File qualifier	1	see Table 2

[a] Permissible formats are presented in angle brackets.

6.1.2 Formatted file names

The formatted file name consists of eight characters plus one full stop plus three characters. The most righthand position in the file name is reserved for the file qualifier which specifies the internal status of the file according to Table 2.

Table 2 — Values of file qualifier *Q*

Value of *Q*	Description
V	Validated data file
U	Unvalidated data file
I	Internal incomplete data file

6.1.2.1 Daily file

A daily file includes information within a day. The file name shall be constructed in the following way:

S	*S*	*S*	*S*	*S*	*D*	*D*	*D*	.	*Y*	*Y*	*Q*

EXAMPLE "13241046.96V"

a) Daily file with validated data from 15th February 1996

b) Station code: 13241

6.1.2.2 Monthly file

A monthly file includes information within a month. Different files may be distinguished by letters A to Z in unused fields (*X*). The file name shall be constructed in the following way:

S	*S*	*S*	*S*	*S*	*X*	*M*	*M*	.	*Y*	*Y*	*Q*

EXAMPLE "XD345A12.97V" and "XD345C12.97V"

a) Monthly files A and C with validated data from December 1997

b) Station code: XD345

6.1.2.3 Annual file

An annual file includes information within a year. Different files may be distinguished by letters A to Z in unused fields (*X*). The file name shall be constructed in the following way:

S	*S*	*S*	*S*	*S*	*X*	*X*	*X*	.	*Y*	*Y*	*Q*

EXAMPLE "00787---.98U"

a) Annual file with unvalidated data from year 1998

b) Station code: 00787

6.1.2.4 Multiannual file

A multiannual file includes information covering more than a year. Different files may be distinguished by letters A to Z in unused fields (*X*). The file name shall be constructed in the following way:

S	*S*	*S*	*S*	*S*	*X*	*X*	*X*	.	*X*	*X*	*Q*

EXAMPLE "GF78I-XA.--I" and "GF78I-XB.--I"

a) Multiannual files XA and XB with an incomplete data set; time information is specified in the data file.

b) Station code: GF78I

6.1.3 File names for other purposes

Other file names may be used in situations where the use of file names formatted in accordance with 6.1.1 is not appropriate. In such cases, the most righthand character shall be different from the characters specified in Table 2.

6.2 Formats for presentation of data

6.2.1 General data

General data are generally formatted in a fixed numerical format, a fixed alphanumerical format or a variable alphanumerical format.

The descriptors of these formats (symbols N, A and V) relating to the nature of the information placed in the fields are not expressed in the alphanumeric sequence (the nature of information is only interpreted through the identification of the position of the field in the sequence).

6.2.1.1 Fixed numerical format: [*n*] N [*p*]

n: zone repetition number. *n* is optional if it equals 1.

p: total number of characters in the reserved zone. There shall only be numerical characters (0 to 9), signs and spaces in this field. The numerical value shall be right-justified and spaces shall be placed in the remaining part on the field.

6.2.1.2 Fixed alphanumerical format: [*n*] A [*p*]

n: zone repetition number. *n* is optional if it equals 1.

p: total number of characters within a reserved zone. When the length of the information is less than *p*, the message shall be left-justified and the remaining part shall be filled with spaces.

6.2.1.3 Variable alphanumerical format: [*n*] V [*p*]

n: zone repetition number. *n* is optional if it equals 1.

p: total number of characters in the reserved zone. When the length of the information is less than *p*, even zero, the length of this field will be reduced to the length of the information.

6.2.1.4 Other formats

The longitude, latitude and altitude field shall conform with the specifications of Annex D.

Time information shall be presented according to the following alphanumerical field:

Y	*Y*	*M*	*M*	*D*	*D*	*h*	*h*	*m*	*m*

where

YY is the year

MM is the month

DD is the day

hh is the hour

mm is the minute

If formats other than those recommended here are used, they shall be provided in the comment section.

6.2.2 Air quality data

6.2.2.1 General

The air quality data shall always be presented as integers, in the units specified in ISO 4226 or ISO 1000. The necessary multiplication factor is represented by the exponent to the base 10 and shall be stated in the data control record.

Each datum is linked to a quality code which indicates the validity of the data. These quality codes are listed in Table 3 and specified in 6.2.2.2.

Table 3 — Data qualifier values

Data qualifier	Value
calibration_drift	D
calibration_mode	C
corrected_datum	O
estimated_datum	E
faulty_measurement	F
invalid_datum	I
maintenance_mode	M
no_datum	N
usable_datum	U
zero_mode	Z

6.2.2.2 Data qualifiers

6.2.2.2.1 calibration drift

This data qualifier indicates that the measured datum is incorrect between two calibrations. The only permitted value is "D".

6.2.2.2.2 calibration mode

This data qualifier indicates that the measurement instrument operates in a calibration mode. During calibration a reference gas mixture is introduced for calibration purposes. The only permitted value is "C".

6.2.2.2.3 corrected datum

This data qualifier indicates that the following datum has been corrected. The only permitted value is "O".

6.2.2.2.4 estimated datum

This data qualifier specifies that the following datum is an estimate. The datum did not exist before estimation, it was faulty or invalid. The only permitted value is "E".

6.2.2.2.5 faulty measurement

This data qualifier indicates a failure detected in the data acquisition chain. The only permitted value is "F".

6.2.2.2.6 invalid datum

This data qualifier indicates that the following datum is invalid and should not be taken into account. The only permitted value is "I".

6.2.2.2.7 maintenance mode

This data qualifier indicates that the datum was acquired during maintenance operations on a measurement device. In this case the measurement is generally invalid. The only permitted value is "M".

6.2.2.2.8 no datum

This qualifier indicates that the datum is absent. The following data field is empty. The only permitted value is "N".

6.2.2.2.9 usable datum

This qualifier indicates an usable datum. The only permitted value is "U".

6.2.2.2.10 zero mode

This data qualifier indicates that a zero test was conducted or a complementary gas free of measurands was introduced. The only permitted value is "Z".

7 File contents

The meaning of the data fields presented in a data file and their formats are specified in Table 4. Furthermore, the complete format and the number of lines used by a record are specified. The file structure is shown in Annex F. An example of a data file is presented in Annex G.

Table 4 — Definition and formats of data fields

Field	Format	Number of lines
a) **Identification group** The identification group provides information on the institution record and the header record.		
1) **Data supplier record** The institution record provides all relevant information about the institution providing the data.	4V72	4
— Name of the institution Name of the organization exchanging the air quality data or the name of the authority performing the measurements.	V72	
— Address of the institution Full address of the institution, in correct order for postal use.	2V72	
— Country of the institution Short name of the country of the institution, in the English language and in accordance with ISO 3166 (see examples in Annex D).	V72	
2) **Header record** The header record provides information on the number of description and data blocks included in the data file.	2N5	1
— Number of description blocks	N5	
— Number of data blocks	N5	
b) **Description group** The description group consists of description blocks.		
— Description block The description block presents a measurand record and one or more site records.		
1) **Measurand record** The measurand record provides detailed information on the measurand.	N3, A3, A16, A10, A18, N5, A5, 2N6	1
— Number of sites Number of site records following the measurand record.	N3	
— Measurand code Code of the measurand in accordance with Annex B.	A3	
— Measurand name Name of the measurand in the English language and in accordance with Annex B.	A16	
— Measurand unit Unit of the measured quantity in accordance with the text representation of ISO 4226 or ISO 1000.	A10	

Field	Format	Number of lines
— Measurement method Procedure for determining the individual air quality characteristic shall be identified, preferably by reference to relevant standards. If standards do not exist, reference shall be given to documentation of the method used or a list of performance characteristics (see ISO 6879) shall be given separately as comments. The description of the measurement method shall be given in the English language.	A18	
— Sampling height Height of air intake or sampling point above ground level, in metres.	N5	
— No entry Unused field filled with spaces.	A5	
— Upper limit Highest value of a quantity (e.g. air quality characteristic, temperature, wind speed, etc.) which can be measured within specified limits of performance characteristics. For an air quality characteristic, the upper limit is identical with the upper limit of measurement (see ISO 6879).	N6	
— Lower limit Lowest value of a quantity (e.g. air quality characteristic, temperature, wind speed, etc.) which can be measured within specified limits of performance characteristics. For an air quality characteristic, the lower limit is identical with the detection limit (see ISO 6879).	N6	
2) **Site record** The site record contains information about a sampling site.	N5, A20, N4, A10, A11, 2N5	1
— Site code Code used for identification of the sampling site.	A5	
— Site name Name of the sampling site.	A20	
— Site time minus UT Difference between site-related time and UT, in hours and multiplied by 10.	N4	
— Site latitude Latitude of the sampling site in compliance with Annex C.	A10	
— Site longitude Longitude of the sampling site in compliance with Annex C.	A11	
— Site altitude Altitude above mean sea level (geodetic reference datum) in compliance with Annex C.	N5	
— Site scale Scale of the site, described by the sum of the following numerical values: 0 no classification 1 local 2 regional 4 national 8 international		
EXAMPLE: For a local and national site the numerical value of is five (5 = 1 + 4)	N5	

Field	Format	Number of lines
c) **Data group** The data group consists of data blocks.		
— Data block The data block consists of a data control record and a data record.		
1) **Data control record** The data control record provides information on the data record.	A3, N5, N3, N2, 4(5N2), 2N4, N5	1
— Measurand code Code of the measurand as specified in the corresponding measurand record.	A3	
— Site code Code of the site as specified in the corresponding site record. If the site code equals zero, the following data record is listed in spatial order, according to the sequence specified by the preceding site records for this measurand.	A5	
— Data type parameter Derived value or statistical parameter reported for the specified interval of time of sampling, coded according to Annex D.	N3	
— Data type code Code of the data type in accordance with the specification in Annex D.	N2	
— Data start time Start time of the first measuring interval of the delivered data, in the format YYMMDDhhmm.	5N2	
— Data duration Duration between the start time of the first measuring interval and the end time of the last measuring interval of delivered data, in the format YYMMDDhhmm.	5N2	
— Data time interval Interval of time covering each datum, e.g. averaging time, in the format YYMMDDhhmm.	5N2	
— Sampling time Interval of time in which a single sample is taken, in the format YYMMDDhhmm.	5N2	
— Samples per time interval Number of measurements which have been used for calculating a single datum. For example, a half-hourly mean value can consist of three 10-minute values.	N4	
— Multiplication factor exponent Exponent, to the base ten, of the multiplication factor used to obtain the data in the units stated in the measurand record.	N4	
— Data number Number of data in the data record allocated to the data control record.	N5	

Field	Format	Number of lines
2) **Data record** The data record provides the air quality data transmitted.	12(A1, N5)	*L*
— Data sequence Each air quality datum consists of its quality code (A1) and its value (N5). The data are given in temporal order, if the site code in the data control record is different from zero. The data are presented in spatial order, if the site code equals zero. The number of lines *L* in the data record is calculated by: $L = 1 + \text{INT}[(N-1)/12]$. where *N* is the number of data given in the data control record. EXAMPLE: With *N* = 31 data, the number of lines in the data record is *L* = 1+INT(30/12) = 1+2 = 3.	A1, N5	
d) **Comment group** The comment group consists of the comment control record and the comment record providing additional information on the data transmitted.		
1) **Comment control record**	N5	1
— Comment lines Number of lines *M* in the comment record.	N5	
2) **Comment record**	V72	*M*
— Comment text Free text with additional information. The length of the lines may vary between 0 and 72 characters.	V72	

Annex A
(normative)

7-bit coded character set

Table A.1 — 7-bit coded character set in compliance with ISO/IEC 646

Dec code	Symbol	Dec code	Symbol	Dec code	Symbol	Dec code	Symbol
0	NUL	32	SP	64	@	96	`
1	SOH	33	!	65	A	97	a
2	STX	34	"	66	B	98	b
3	ETX	35	#	67	C	99	c
4	EOT	36	$	68	D	100	d
5	ENQ	37	%	69	E	101	e
6	ACQ	38	&	70	F	102	f
7	BEL	39	'	71	G	103	g
8	BS	40	(	72	H	104	h
9	HAT	41	)	73	I	105	i
10	LF	42	*	74	J	106	j
11	VT	43	+	75	K	107	k
12	FF	44	,	76	L	108	l
13	CR	45	–	77	M	109	m
14	SO	46	.	78	N	110	n
15	SI	47	/	79	O	111	o
16	DLE	48	0	80	P	112	p
17	DC1	49	1	81	Q	113	q
18	DC2	50	2	82	R	114	r
19	DC3	51	3	83	S	115	s
20	DC4	52	4	84	T	116	t
21	NAK	53	5	85	U	117	u
22	SYN	54	6	86	V	118	v
23	ETB	55	7	87	W	119	w
24	CAN	56	8	88	X	120	x
25	EM	57	9	89	Y	121	y
26	SUB	58	:	90	Z	122	z
27	ESC	59	;	91	[	123	{
28	IS4	60	<	92	\	124	|
29	IS3	61	=	93	]	125	}
30	IS2	62	>	94	^	126	~
31	IS1	63	?	95	_	127	DEL

Annex B
(normative)

Measurand codes

Table B.1 specifies measurand names and measurand codes defined in ISO 7168-1. These names and codes should generally be used.

The measurand code consists of two alphanumerical characters (A2). An additional alphanumerical character (A1) is added behind the measurand code to distinguished between different measurements. This may be necessary, e.g., for different

— measurement units,

— measurement methods,

— heights of sampling or measurement point above ground level,

— detection limits,

— upper limits of measurement,

— data types.

EXAMPLE Two different ozone measurements may be distinguished by the following codes:

— measurand_code = 081

— measurand_code = 082

If a measurand is not included in Table B.1, then the user may specify the measurand name and allocate a measurand code. The user-defined code shall begin with letters "X", "Y" or "Z" in the first position of the code.

Table B.1 — Measurand names and codes

Measurand name	Code	Formula	Remark or IUPAC name
Gaseous pollutants			
Ammonia	21	NH_3	
Black smoke	11		
Carbon dioxide	17	CO_2	
Carbon monoxide	04	CO	
Elemental carbon	18	C	
Hydrogen chloride	07	HCl	
Hydrogen fluoride	06	HF	
Hydrogen oxides	12	H_2O_2	
Hydrogen sulfide	05	H_2S	
Methane	16	CH_4	
Nitric acid	37	HNO_3	
Nitrogen dioxide	03	NO_2	

Table B.1 (continued)

Measurand name	Code	Formula	Remark or IUPAC name
Nitrogen monoxide	02	NO	
Nitrogen oxides	35	NO_X	NO + NO_2
Nitrous oxide	36	N_2O	
Non-methane hydrocarbons	20		measured as methane equivalent
Ozone	08	O_3	
Peroxyacetylnitrate	09	$CH_3C(O)OONO_2$	
Strong acidity	10		SO_2 equivalent
Sulfur dioxide	01	SO_2	
Sulfur trioxide	13	SO_3	
Sulfuric acid	38	H_2SO_4	
Total chlorine	98	Cl	
Total fluoride	99	F	
Total hydrocarbons	15		measured as methane equivalent
Particulates			
Particulate aluminium	91	Al	
Particulate arsenic	80	As	
Particulate beryllium	81	Be	
Particulate cadmium	82	Cd	
Particulate chrome	83	Cr	
Particulate copper	84	Cu	
Particulate iron	86	Fe	
Particulate lead	19	Pb	
Particulate magnesium	89	Mg	
Particulate manganese	90	Mn	
Particulate mercury	85	Hg	
Particulate nickel	87	Ni	
Particulate sulfur	14	S	
Particulate tin	57	Sn	
Particulate vanadium	92	V	
Particulate zinc	88	Zn	
PM10	24		
PM2,5	39		
Sedimentary dusts	23		
Soot	70		
Total suspended particulates	22		
Particulates in rain water			
Aluminium	B1	Al	
Cadmium	B3	Cd	

Table B.1 (continued)

Measurand name	Code	Formula	Remark or IUPAC name
Calcium	B2	Ca	
Iron	B4	Fe	
Lead	B7	Pb	
Magnesium	B5	Mg	
Manganese	B6	Mn	
Zinc	B8	Zn	
Substances soluble in rain water			
Aluminium ion	A1	Al^{3+}	
Ammonium ion	48	NH_4^+	
Cadmium ion	A2	Cd^{2+}	
Calcium ion	43	Ca^{2+}	
Chloride ion	40	Cl^-	
Hydrogen ion	44	H^+	
Iron ion	A3	Fe^{3+}	
Lead ion	A5	Pb^{2+}	
Magnesium ion	46	Mg^{2+}	
Manganese ion	A4	Mn^{2+}	
Nitrate ion	41	NO_3^-	
Potassium ion	45	K^+	
Sodium ion	47	Na^+	
Sulfate ion	42	SO_4^{2-}	
Zinc ion	A6	Zn^{2+}	
Volatile organic compounds (VOC)			
1,3-butadiene	V0	C_4H_6	1,3-butadiene
1-butene	V1	C_4H_8	but-1-ene
trans-2-butene	V2	C_4H_8	*trans*-but-2-ene
Acetylene	V3	C_2H_2	ethyne
Benzene	V4	C_6H_6	benzene
Isobutane	V5	C_4H_{10}	2-methylpropane
n-butane	V6	C_4H_{10}	n-butane
cis-2-butene	V7	C_4H_8	(*Z*)-but-2-ene
Ethane	V8	C_2H_6	ethane
Ethene	V9	C_2H_4	ethene
Ethylbenzene	VA	C_8H_{10}	ethylbenzene
Formaldehyde	VB	CH_2O	methanal
n-heptane	VC	C_7H_{16}	n-heptane
n-hexane	VD	C_6H_{14}	n-hexane
1-hexene	VE	C_6H_{12}	hex-1-ene

Table B.1 (continued)

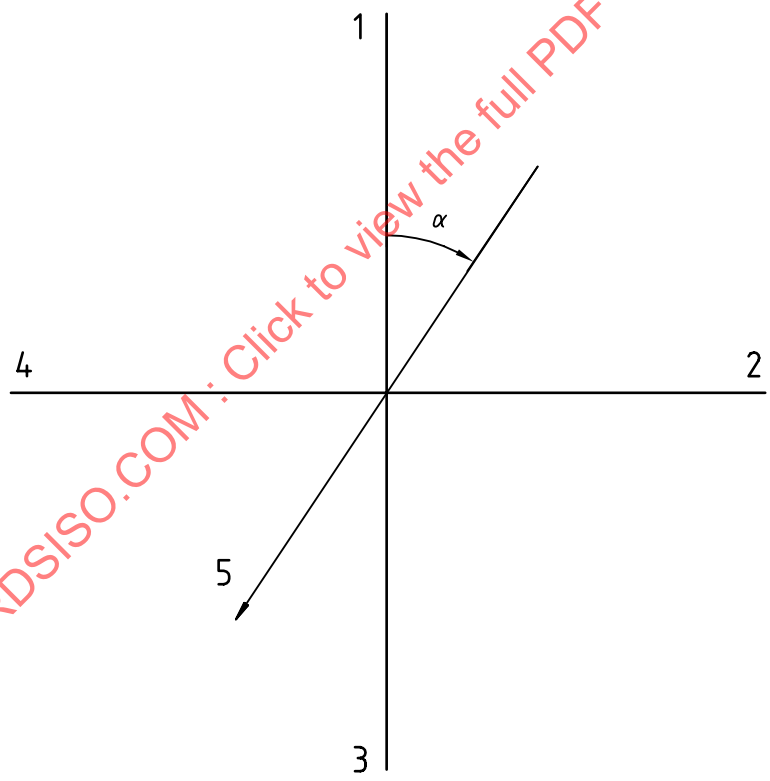
Measurand name	Code	Formula	Remark or IUPAC name
Isoprene	VF	C_5H_8	2-methyl-1,3-butadiene
Iso-octane	VG	C_8H_{18}	2,2,4-trimethylpentane
n-octane	VH	C_8H_{18}	n-octane
Isopentane	VI	C_5H_{12}	2-methylbutane
n-pentane	VK	C_5H_{12}	n-pentane
1-pentene	VL	C_5H_{10}	pent-1-ene
2-pentene	VM	C_5H_{10}	pent-2-ene
Propane	VN	C_3H_8	propane
Propene	VP	C_3H_6	propene
Toluene	VQ	C_7H_8	methylbenzene
1,2,3-trimethylbenzene	VR	C_9H_{12}	1,2,3-trimethylbenzene
1,2,4-trimethylbenzene	VS	C_9H_{12}	1,2,4-trimethylbenzene
1,3,5-trimethylbenzene	VT	C_9H_{12}	1,3,5-trimethylbenzene
m-, p-xylene	VU	C_8H_{10}	*m-, p*-xylene
o-xylene	VV	C_8H_{10}	*o*-xylene
Chlorinated hydrocarbons			
Trichloromethane	H0	$CHCl_3$	trichloromethane
1,1,1-trichloroethane	H1	CH_3CCl_3	1,1,1-trichloroethane
Tetrachloromethane	H2	CCl_4	tetrachloromethane
Trichloroethylene	H3	$ClCHCCl_2$	trichloroethene
Tetrachloroethylene	H4	C_2Cl_4	tetrachloroethene
Polycyclic aromatic hydrocarbons (PAH) in air			
Benzo(a)pyrene	P0	BaP	in air
Benzo(e)pyrene	P1	BeP	in air
Benzo(a)anthracene	P2	BaA	in air
Dibenzo(a,h)anthracene	P3	DBahA	in air
Benzo(ghi)perylene	P4	BghiP	in air
Coronen	P5	COR	in air
Polycyclic aromatic hydrocarbons (PAH) in particulates			
Benzo(a)pyrene	P6	BaP	in particulates
Benzo(e)pyrene	P7	BeP	in particulates
Benzo(a)anthracene	P8	BaA	in particulates
Dibenzo(a,h)anthracene	P9	DBahA	in particulates
Benzo(ghi)perylene	Pa	BghiP	in particulates
Coronen	Pb	COR	in particulates
Carbonyl compounds			
Formaldehyde	VB	CH_2O	methanal
Acetaldehyde	C1	C_2H_4O	ethanal

Table B.1 (continued)

Measurand name	Code	Formula	Remark or IUPAC name
Propanal	C2	C_3H_6O	propanal
Butanal	C3	C_4H_8O	butanal
n-hexanal	C4	$C_6H_{12}O$	n-hexanal
Acroleine	C5	C_3H_4O	2-propenal
Crotonaldehyde	C6	C_4H_6O	2-butenal
Acetone	C7	C_3H_6O	propanone
Benzaldehyde	C8	C_7H_6O	benzenecarbaldehyde
Acetophenone	C9	C_8H_8O	phenyl-1-ethanone
Meteorological parameters			
Absolute humidity	55		
Mixing height	56		
Precipitation	60		
Pressure	53		
Relative humidity	58		
Temperature	54		
Volume of air	64		
Wind component west to east	62		wind from west to east: + sign
Wind component south to north	61		wind from south to north: + sign
Wind component vertical	63		upwards: + sign
Wind direction	52		see Figure B.1
Wind velocity	51		
Duration of sunlight	59		
Direct solar IR radiation	71		
Direct solar UV radiation	72		
Direct solar visible radiation	77		
Direct solar radiation	73		
Global radiation	74		
Diffused radiation	75		
Reflected radiation	76		
Other			
Conductivity	49		
pH	50		
Traffic			
Noise	66		
Vehicles	65		
Vehicle coverage	6a		
Radioactivity			
Aerosol gamma activity	34		

Table B.1 (end)

Measurand name	Code	Formula	Remark or IUPAC name
Artificial alpha activity	25		
Artificial beta activity	26		
Beta activity	29		
Iodine-131 activity	27		
Radon activity	28		
Dose of absorbed ambient gamma rays	32		
Dose equivalent of absorbed ambient gamma rays	30		
Dose rate of absorbed ambient gamma rays	31		
Ambient gamma activity	33		



Key

1 North
2 East
3 South
4 West
5 Wind flow

Figure B.1 — Angle α of wind direction

Annex C
(normative)

Presentation of latitude, longitude and altitude data

C.1 General

This annex specifies a variable-length format for the representation of latitude, longitude and altitude. It allows the use of normal sexagesimal notations involving degrees, minutes and seconds as well as various combinations of sexagesimal and decimal notations:

— degrees and decimal degrees;

— degrees, minutes and decimal minutes;

— degrees, minutes, seconds and decimal seconds.

The format uses the numeric characters 0 to 9, the graphic characters plus (+) and minus (−) and the comma as the decimal separator. In the data file, the latitude, longitude and altitude data are presented as text.

The presentation of each, (latitude, longitude or altitude) shall be in accordance with ISO 6709.

C.2 Latitude

C.2.1 The latitude string shall be presented left-justified in a 10-character field. Unused character fields shall be filled with spaces.

C.2.2 Latitudes north of the equator and the equator itself shall be designated by use of the plus sign (+), latitudes south of the equator shall be designated by use of the minus sign (−).

C.2.3 The first two digits of the latitude string shall represent degrees. Subsequent digits shall represent minutes, seconds or decimal fractions according to the following convention, in which the decimal separator (comma) indicates the transition from the sexagesimal system to the decimal system. The number of digits behind the data separator shall be chosen in such a way that the location is specified with sufficient precision.

a) Degrees (*D*) and decimal degrees:

±	*D*	*D*	,	*D*	*D*	*D*	*D*		

b) Degrees (*D*), minutes (*M*) and decimal minutes:

±	*D*	*D*	*M*	*M*	,	*M*	*M*	*M*	

c) Degrees (*D*), minutes (*M*), seconds (*S*) and decimal seconds:

±	*D*	*D*	*M*	*M*	*S*	*S*	,	*S*	*S*

C.2.4 Leading zeros shall be inserted for degree values less than ten, and zeros shall be embedded in proper position when minutes or seconds are less than ten.