"MERGED" BUFR TEMPLATE FOR SURFACE OBSERVATIONS FROM ONE-HOUR PERIOD AND FOR REPORTING SYNOP DATA IN BUFR (REVISED, JUNE 2006)

This template is proposed to be used for representation of surface observation data from both automatic stations and manned stations. This template is also suitable for SYNOP observation data, by including parameters covering periods longer than one hour.
Descriptors used by both templates are not marked.
Descriptors used from the SYNOP BUFR template are indicated by an asterisk *.
Descriptors used from the AWS BUFR template are indicated by an asterisk *.

3 01 090		**SYNOP**	**AWS**	**Surface station identification; time, horizontal and vertical co-ordinates**	
3 01 004				**Surface station identification**	
	0 01 001			WMO block number	Numeric
	0 01 002			WMO station number	Numeric
	0 01 015			Station or site name	CCITT IA5
	0 02 001			Type of station	Code table
3 01 011	0 04 001			Year	Year
	0 04 002			Month	Month
	0 04 003			Day	Day
3 01 012	0 04 004			Hour	Hour
	0 04 005			Minute	Minute
3 01 021	0 05 001			Latitude (high accuracy)	Degree, scale 5
	0 06 001			Longitude (high accuracy)	Degree, scale 5
0 07 030				Height of station ground above mean sea level	m, scale 1
0 07 031				Height of barometer above mean sea level	m, scale 1
0 08 010				Surface qualifier (for temperature data)	Code table
3 01 091			*	***Surface station instrumentation***	
	0 02 180		*	*Main present weather detecting system*	*Code table*
	0 02 181		*	*Supplementary present weather sensor*	*Flag table*
	0 02 182		*	*Visibility measurement system*	*Code table*
	0 02 183		*	*Cloud detection system*	*Code table*
	0 02 184 *0 02 179*		* *	*Type of lightning detection sensor* *Type of sky condition algorithm*	*Code table* *Code table*
	0 02 186		*	*Capability to detect precipitation phenomena*	*Flag table*
	0 02 187		*	*Capability to detect other weather phenomena*	*Flag table*
	0 02 188		*	*Capability to detect obscuration*	*Flag table*
	0 02 189		*	*Capability to discriminate lightning strikes*	*Flag table*
				Pressure data	
3 02 001	0 10 004			Pressure	Pa, scale –1
	0 10 051			Pressure reduced to mean sea level	Pa, scale –1
	0 10 061			3-hour pressure change	Pa, scale –1
	0 10 063			Characteristic of pressure tendency	Code table
0 10 062		*		*24-hour pressure change* $p_{24}p_{24}p_{24}$	*Pa, –1*
0 07 004				Pressure (standard level)	Pa, scale –1
0 10 009				Geopotential height of the standard level	gpm
3 02 072				**Temperature and humidity data**	
	0 07 032			Height of sensor above local ground	m, scale 2
	0 07 033		*	*Height of sensor above water surface*	*m, scale 1*
	0 12 101 0 12 103			Temperature/dry-bulb temperature (scale 2) Dew-point temperature (scale 2)	K, scale 2 K, scale 2
	0 13 003			Relative humidity	%

1 01 005			*	*Replicate one descriptor five times*	
3 07 063	*0 07 061*		*	*Depth below land surface*	*m, scale 2*
	0 12 130		*	*Soil temperature (scale 2)*	*K, scale 2*
3 02 069				**Visibility data**	
	0 07 032			Height of sensor above local ground	m, scale 2
	0 07 033		*	*Height of sensor above water surface*	*m, scale 1*
	0 33 041		*	*Attribute of following value*	*Code table*
	0 20 001			Horizontal visibility	m, scale –1
0 07 032			*	***Height of sensor above local ground*** *(set to missing to cancel the previous value)*	*m, scale 2*
0 07 033 *0 20 031*			* *	*Height of sensor above water surface (set to missing to cancel the previous value)* *Ice deposit (thickness)*	*m, scale 1* *m, scale 2*
0 20 032			*	*Rate of ice accretion*	*Code table*
0 02 038			*	*Method of sea surface temperature measurement*	*Code table*
0 22 043			*	*Sea/water temperature (scale 2)*	*K, scale 2*
3 02 021	*0 22 001*		*	*Direction of waves*	*Degree true*
	0 22 011		*	*Period of waves*	*S*
	0 22 021		*	*Height of waves*	*m, scale 1*
3 02 078				**State of ground and snow depth measurement**	
	0 02 176		*	*Method of state of ground measurement*	*Code table*
	0 20 062			State of ground (with or without snow)	Code table
	0 02 177		*	Method of snow depth measurement	Code table
	0 13 013			Total snow depth	m, scale 2
0 12 113		*		*Ground minimum temperature (scale2), past 12 hours* $s_nT_gT_g$	*K, 2*
				Cloud data	
3 02 004	0 20 010			Cloud cover (total)	%
Useful considering the following cloud layers? See comment 1	*0 08 002* *0 20 011* *0 20 013* *0 20 012* *0 20 012* *0 20 012*	* * * * * *		*Vertical significance* *Cloud amount (of low or middle clouds)* N_h *Height of base of cloud* h *Cloud type (low clouds C_L)* C_L *Cloud type (middle clouds C_M)* C_M *Cloud type (high clouds C_H)* C_H	*Code table, 0* *Code table, 0* *m, –1* *Code table, 0* *Code table, 0* *Code table, 0*
1 05 004			*	*Replicate 5 descriptors four times*	
0 08 002				Vertical significance	Code table
0 20 011				Cloud amount	Code table
0 20 012				Cloud type	Code table
0 33 041			*	*Attribute of following value*	*Code table*
0 20 013				Height of base of cloud	m, scale -1
		*		***Clouds with bases below station level***	
3 02 036	*1 05 000*	*		*Delayed replication of 5 descriptors*	
	0 31 001	*		*Delayed descriptor replication factor*	*Numeric, 0*
	0 08 002	*		*Vertical significance*	*Code table, 0*
	0 20 011 *0 20 012*	* *		*Cloud amount* N' *Cloud type* C'	*Code table, 0* *Code table, 0*
	0 20 014	*		*Height of top of cloud* $H'H'$	*m, -1*
	0 20 017	*		*Cloud top description* C_t	*Code table, 0*
		*		***Direction of cloud drift*** $6D_LD_MD_H$	
3 02 047	*1 02 003*	*		*Replicate 2 descriptors 3 times*	

	0 08 002	*		Vertical significance 7= low cloud, 8= middle cloud, 9 = high cloud	Code table, 0
	0 20 054	*		True direction from which clouds are moving $D_L D_M D_H$	Degree true, 0
0 08 002		*		Vertical significance (set to missing to cancel the previous value)	Code table, 0
		*		**Direction and elevation of cloud 57CD$_a$e$_C$**	
3 02 048	0 05 021	*		Bearing or azimuth D_a	Degree true, 2
	0 07 021	*		Elevation angle e_C	Degree, 2
	0 20 012	*		Cloud type C	Code table, 0
	0 05 021	*		Bearing or azimuth (set to missing to cancel the previous value)	Degree true, 2
	0 07 021	*		Elevation angle (set to missing to cancel the previous value)	Degree, 2
				Present and past weather	
0 20 003				Present weather[3]	Code table
1 03 002				Replicate 3 descriptors 2 times	
0 04 025				Time period (= - 60 minutes in the first replication, -x minutes in the second replication, corresponding to the duration of the period W1W2 in the SYNOP report)	Minute
0 20 004				Past weather (1)	Code table
0 20 005				Past weather (2)	Code table
3 02 075			*	**Intensity of precipitation, size of precipitation element**	
	0 08 021		*	Time significance (= 2 (time averaged))	Code table
	0 04 025		*	Time period (= - 10 minutes)	Minute
	0 13 055		*	Intensity of precipitation	kg m^{-2}s^{-1},scale 4
	0 13 058		*	Size of precipitation element	m, scale 4
	0 08 021		*	Time significance (= missing value)	Code table
0 04 025			*	Time period (= - 10 minutes)	Minute
3 02 076			*	Precipitation, obscuration and other phenomena	
	0 20 021		*	Type of precipitation	Flag table
	0 20 022		*	Character of precipitation	Code table
	0 26 020		*	Duration of precipitation (4)	Minute
	0 20 023		*	Other weather phenomena	Flag table
	0 20 024		*	Intensity of phenomena	Code table
	0 20 025		*	Obscuration	Flag table
	0 20 026		*	Character of obscuration	Code table
0 04 025			*	Time period (= - 10 minutes)	Minute
0 13 059			*	Number of flashes **Wind data**	Numeric
0 07 032				Height of sensor above local ground	m, scale 2
0 07 033				Height of sensor above water surface	m, scale 1
0 08 021				Time significance (= 2 (time averaged))	Code table
0 04 025				Time period (= - 10 minutes, or number of minutes after a significant change of wind, if any)	Minute
0 11 001				Wind direction	Degree true
0 11 002				Wind speed	m s-1
0 08 021				Time significance (= missing value)	Code table
1 03 003				Replicate next 3 descriptors 3 times	
0 04 025		*		Time period (= - 10 minutes in the first replication,	Minute

				= - 60 minutes in the second replication = - 60*3 or 60*6 minutes in the third replication)	
0 11 043				Maximum wind gust direction	Degree true
0 11 041				Maximum wind gust speed	m s-1
0 04 025			*	Time period (= - 10 minutes)	Minute
0 11 016			*	Extreme counterclockwise wind direction of a variable wind	Degree true
0 11 017			*	Extreme clockwise wind direction of a variable wind	Degree true
~~3 02 077~~				**Extreme temperature data**	
0 07 032				Height of sensor above local ground	m, scale 2
0 07 033			*	Height of sensor above water surface	m, scale 1
1 06 002 0 04 024		*		Replicate 6 descriptors 2 times Time period or displacement (= - 1 hour in the first replication, = - 12 or - 24 or – x hours in the second replication)	 Hour, 0
0 04 024		*		Time period or displacement (see Notes 1 and 2)	Hour, 0
0 12 111				Maximum temperature (scale 2) at height and over period specified	K, scale 2
0 04 024		*		Time period or displacement (= - 1 hour in the first replication, = - 12 or - 24 or – x hours in the second replication)	Hour, 0
0 04 024		*		Time period or displacement (see Note 2)	Hour, 0
0 12 112 0 07 032			 *	Minimum temperature (scale 2) at height and over period specified Height of sensor above local ground (for ground temperature)	K, scale 2 m, scale 2
0 04 025			*	Time period (= - 60 minutes)	Minute
0 12 112			*	Minimum temperature (scale 2) at height and over period specified (for ground temperature)	K, scale 2
0 07 033			*	Height of sensor above water surface (set to missing to cancel the previous value)	m, scale 1
				Precipitation measurement	
0 07 032				Height of sensor above local ground	m, scale 2
0 02 175			*	Method of precipitation measurement	Code table
0 02 178			*	Method of liquid water content measurement of precipitation	Code table
1 02 004 0 04 024				Replicate 2 descriptors 4 times Time period in hours t_R (= - 1 hour in the first replication, = - 3, -6, -12 or - 24 hours in the next replications)	 Hour, 0
0 13 011				Total precipitation / total water equivalent of snow	kg m^{-2}, scale 1
0 07 032			*	**Height of sensor above local ground** (set to missing to cancel the previous value)	m, scale 2
				Evaporation measurement	
0 02 185			*	**Method of evaporation measurement**	Code table
1 01 002 **3 02 044**	0 04 024	*		Replicate 1 descriptor 2 times Time period in hours (= -1 hour in the first replication,	 Hour, 0

				= -24 hours in the second replication)	
	0 02 004 0 13 033	*		Type of instrument for evaporation measurement or type of crop Evaporation /evapotranspiration	*Code table* kg m^{-2}
				Total sunshine data	
1 01 002		*		*Replicate 1 descriptor 2 times*	
3 02 039	*0 04 024*	*		*Time period in hours* *(= -1 hour in the first replication,* *= -x hours in the second replication)*	*Hour, 0*
	0 14 031			Total sunshine	Minute
				Radiation data	
1 01 002		*		*Replicate 1 descriptor 2 times*	
3 02 045	*0 04 024*	*		*Time period in hours* *(= -1 hour in the first replication,* *= -24 hours in the second replication)*	Hour, 0
	0 14 002			*Long-wave radiation, integrated over period specified*	J m-2, scale -3
	0 14 004			*Short-wave radiation, integrated over period specified*	J m-2, scale -3
	0 14 016			*Net radiation, integrated over period specified*	J m-2, scale -4
	0 14 028			*Global solar radiation (high accuracy), integrated over period specified*	J m-2, scale -2
	0 14 029 *0 14 030*			*Diffuse solar radiation (high accuracy), integrated over period specified* *Direct solar radiation (high accuracy), integrated over period specified*	J m-2, scale -2 J m-2, scale -2
3 02 046		*		***Temperature change*** *gr.* $54g_0s_nd_T$	
	0 04 024	*		*Time period or displacement*	Hour, 0
	0 04 024	*		*Time period or displacement (see Note 5)*	Hour, 0
	0 12 049	*		*Temperature change over period specified* s_nd_T	K, 0
3 02 083			*	*First order statistics of P, W, T, U data*	
	0 04 025		*	*Time period (= -10 minutes)*	Minute
	0 08 023		*	*First order statistics* *(= 9 (best estimate of standard deviation))* *(6)*	Code table
	0 10 004		*	*Pressure*	Pa, scale –1
	0 11 001		*	*Wind direction*	Degree true
	0 11 002		*	*Wind speed*	m s-1
	0 12 101		*	*Temperature/dry-bulb temperature (scale 2)*	K, scale 2
	0 13 003		*	*Relative humidity*	%
	0 08 023		*	*First order statistics (= missing value)*	Code table
0 33 005 0 33 006			* *	*Quality information (AWS data)* *Internal measurement status information (AWS)*	Flag table Code table

Notes:

1) Within RA-IV, the maximum temperature at 1200 UTC is reported for the previous calendar day (i.e. the ending time of the period is not equal to the nominal time of the report). To construct the required time range, descriptor 004024 has to be included two times. If the period ends at the nominal time of the report, value of the second 004024 shall be set to 0.

2) Within RA-III, the maximum day-time temperature and the minimum night-time temperature is reported (i.e. the ending time of the period may not be equal to the nominal time of the report). To construct the required time range, descriptor 004024 has to be included two times. If the period ends at the nominal time of the report, value of the second 004024 shall be set to 0.

3) Present weather shall be always represented by 0 20 003. When encoding present weather reported from an automatic weather station, the sequence of descriptors (proposed under 3 02 076) should be used, when applicable.

4) Duration of precipitation represents number of minutes in which precipitation was registered.

5) To construct the required time range, descriptor 004024 has to be included two times.

6) Best estimate of standard deviation is counted out of a set of samples (signal measurements) recorded within the period specified; it should be reported as a missing value, if the measurements of the relevant element are not available from a part of the period specified by 0 04 025.

BUFR TEMPLATE FOR AWS DATA FROM N-MINUTE PERIOD

3 01 090		**Surface station identification; time, horizontal and vertical co-ordinates**	
	3 01 004	**Surface station identification**	
		WMO block number	Numeric
		WMO station number	Numeric
		Station or site name	CCITT IA5
		Type of station	Code table
	3 01 011	Year	Year
		Month	Month
		Day	Day
	3 01 012	Hour	Hour
		Minute	Minute
	3 01 021	Latitude (high accuracy)	Degree, scale 5
		Longitude (high accuracy)	Degree, scale 5
	0 07 030	Height of station ground above mean sea level	m, scale 1
	0 07 031	Height of barometer above mean sea level	m, scale 1
0 08 010		Surface qualifier (for temperature data)	Code table
3 01 091		**Surface station instrumentation**	
	0 02 180	Main present weather detecting system	Code table
	0 02 181	Supplementary present weather sensor	Flag table
	0 02 182	Visibility measurement system	Code table
	0 02 183	Cloud detection system	Code table
	0 02 184	Type of lightning detection sensor	Code table
	0 02 179	Type of sky condition algorithm	Code table
	0 02 186	Capability to detect precipitation phenomena	Flag table
	0 02 187	Capability to detect other weather phenomena	Flag table
	0 02 188	Capability to detect obscuration	Flag table
	0 02 189	Capability to discriminate lightning strikes	Flag table
0 04 015		Time increment (= - n minutes)	Minute
0 04 065		Short time increment (= 1 minute)	Minute
1 14 n		**Replicate 14 descriptors n - times**	
		E.g.: 1 14 006 in case of 6-minute period, *1 14 010 in case of 10-minute period*	
0 10 004		Pressure	Pa, scale –1
3 02 070		**Wind data**	
	0 07 032	Height of sensor above local ground	m, scale 2
	0 07 033	Height of sensor above water surface	m, scale 1
	0 11 001	Wind direction	Degree true
	0 11 002	Wind speed	m s^{-1}, scale 1
	0 11 043	Maximum wind gust direction	Degree true
	0 11 041	Maximum wind gust speed	m s^{-1}, scale 1
	0 11 016	Extreme counterclockwise wind direction of a variable wind	Degree true
	0 1 1 017	Extreme clockwise wind direction of a variable wind	Degree true
3 02 072		**Temperature and humidity data**	
	0 07 032	Height of sensor above local ground	m, scale 2
	0 07 033	Height of sensor above water surface	m, scale 1
	0 12 101	Temperature/dry-bulb temperature (scale 2)	K, scale 2
	0 12 103	Dew-point temperature (scale 2)	K, scale 2
	0 13 003	Relative humidity	%
0 07 032		Height of sensor above local ground	m, scale 2
0 12 101		Temperature/dry-bulb temperature (scale 2)	K, scale 2

		(for ground temperature)	
1 01 005		Replicate one descriptors five times	
3 07 063	0 07 061 0 12 130	Depth below land surface Soil temperature (scale 2)	m, scale 2 K, scale 2
3 02 069		**Visibility data**	
	0 07 032	Height of sensor above local ground	m, scale 2
	0 07 033	Height of sensor above water surface	m, scale 1
	0 33 041	Attribute of following value	Code table
	0 20 001	Horizontal visibility	m, scale –1
0 07 032		Height of sensor above local ground (set to missing to cancel the previous value)	m, scale 2
0 07 033		Height of sensor above water surface (set to missing to cancel the previous value)	m, scale 1
3 02 073		**Cloud data**	
	0 20 010	Cloud cover (total)	%
	1 05 004	Replicate 5 descriptors four times	
	0 08 002	Vertical significance	Code table
	0 20 011	Cloud amount	Code table
	0 20 012	Cloud type	Code table
	0 33 041	Attribute of following value	Code table
	0 20 013	Height of base of cloud	m, scale –1
3 02 076		**Precipitation, obscuration and other phenomena**	
	0 20 021	Type of precipitation	Flag table
	0 20 022 0 26 020	Character of precipitation Duration of precipitation	Code table Minute
	0 20 023	Other weather phenomena	Flag table
	0 20 024	Intensity of phenomena	Code table
	0 20 025	Obscuration	Flag table
	0 20 026	Character of obscuration	Code table
0 13 055		Intensity of precipitation	$kgm^{-2}s^{-1}$,scale 4
0 13 058		Size of precipitation element	m, scale 4
		(end of the replicated sequence)	
0 20 031		Ice deposit (thickness)	m, scale 2
0 20 032		Rate of ice accretion	Code table
3 02 078		**State of ground and snow depth measurement**	
	0 02 176	Method of state of ground measurement	Code table
	0 20 062	State of ground (with or without snow)	Code table
	0 02 177	Method of snow depth measurement	Code table
	0 13 013	Total snow depth	m, scale 2
3 02 079		**Precipitation measurement**	
	0 07 032	Height of sensor above local ground	m, scale 2
	0 02 175	Method of precipitation measurement	Code table
	0 02 178	Method of liquid water content measurement of precipitation	Code table
	0 04 025 0 13 011	Time period (= - n minutes) Total precipitation / total water equivalent of snow	Minute kg m^{-2}, scale 1
0 07 032		Height of sensor above local ground (set to missing to cancel the previous value)	m, scale 2

3 02 080		**Evaporation measurement**	
	0 02 185	Method of evaporation measurement	Code table
	0 04 025	Time period or displacement (= - n minutes)	Minute
	0 13 033	Evaporation /evapotranspiration	kg m^{-2}
3 02 081		**Total sunshine data**	
	0 04 025	Time period (= - n minutes)	Minute
	0 14 031	Total sunshine	Minute
3 02 082		**Radiation data**	
	0 04 025	Time period (= - n minutes)	Minute
	0 14 002	Long-wave radiation, integrated over period specified	J m^{-2}, scale -3
	0 14 004	Short-wave radiation, integrated over period specified	J m^{-2}, scale -3
	0 14 016	Net radiation, integrated over period specified	J m^{-2}, scale -4
	0 14 028	Global solar radiation (high accuracy), integrated over period specified	J m^{-2}, scale –2
	0 14 029	Diffuse solar radiation (high accuracy), integrated over period specified	J m^{-2}, scale –2
	0 14 030	Direct solar radiation (high accuracy), integrated over period specified	J m^{-2}, scale -2
0 04 025		Time period (= - n minutes)	Minute
0 13 059		Number of flashes	Numeric
3 02 083		**First order statistics of P, W, T, U data**	
	0 04 025	Time period (= - n minutes)	Minute
	0 08 023	First order statistics (= 9; best estimate of standard deviation)	Code table
	0 10 004	Pressure	Pa, scale –1
	0 11 001	Wind direction	Degree true
	0 11 002	Wind speed	m s^{-1}, scale 1
	0 12 101	Temperature/dry-bulb temperature (scale 2)	K, scale 2
	0 13 003	Relative humidity	%
	0 08 023	First order statistics (= missing value)	Code table
0 33 005		Quality information (AWS data)	Flag table
0 33 006		Internal measurement status information (AWS)	Code table

Notes:

1) The time identification refers to the end of the n-minute period.

2) Duration of precipitation (in minutes) represents number of minutes in which any precipitation was registered.

3) Best estimate of standard deviation of standard deviation is counted out of a set of samples (signal measurements) recorded within the period specified; it should be reported as a missing value, if the measurements of the relevant element are not available from a part of the period specified by 0 04 025.

BUFR TEMPLATE FOR SURFACE OBSERVATIONS FROM ONE-HOUR PERIOD

This template is proposed to be used for representation of surface observation data from both automatic stations and manned stations.

3 01 090		**Surface station identification; time, horizontal and vertical co-ordinates**	
	3 01 004	**Surface station identification**	
		WMO block number	Numeric
		WMO station number	Numeric
		Station or site name	CCITT IA5
		Type of station	Code table
	3 01 011	Year	Year
		Month Day	Month Day
	3 01 012	Hour	Hour
		Minute	Minute
	3 01 021	Latitude (high accuracy)	Degree, scale 5
		Longitude (high accuracy)	Degree, scale 5
	0 07 030	Height of station ground above mean sea level	m, scale 1
	0 07 031	Height of barometer above mean sea level	m, scale 1
0 08 010		Surface qualifier (for temperature data)	Code table
3 01 091		**Surface station instrumentation**	
	0 02 180	Main present weather detecting system	Code table
	0 02 181	Supplementary present weather sensor	Flag table
	0 02 182	Visibility measurement system	Code table
	0 02 183	Cloud detection system	Code table
	0 02 184	Type of lightning detection sensor	Code table
	0 02 179	Type of sky condition algorithm	Code table
	0 02 186	Capability to detect precipitation phenomena	Flag table
	0 02 187 0 02 188	Capability to detect other weather phenomena Capability to detect obscuration	Flag table Flag table
	0 02 189	Capability to discriminate lightning strikes	Flag table
3 02 001	0 10 004	Pressure	Pa, scale –1
	0 10 051	Pressure reduced to mean sea level	Pa, scale –1
	0 10 061	3-hour pressure change (2)	Pa, scale –1
	0 10 063	Characteristic of pressure tendency (2)	Code table
0 07 004		Pressure (standard level)	Pa, scale –1
0 10 009		Geopotential height of the standard level	gpm
3 02 072		**Temperature and humidity data**	
	0 07 032	Height of sensor above local ground	m, scale 2
	0 07 033	Height of sensor above water surface	m, scale 1
	0 12 101	Temperature/dry-bulb temperature (scale 2)	K, scale 2
	0 12 103	Dew-point temperature (scale 2)	K, scale 2
	0 13 003	Relative humidity	%
1 01 005		Replicate one descriptor five times	
3 07 063	0 07 061	Depth below land surface	m, scale 2
	0 12 130	Soil temperature (scale 2)	K, scale 2
3 02 069		**Visibility data**	
	0 07 032	Height of sensor above local ground	m, scale 2
	0 07 033	Height of sensor above water surface	m, scale 1
	0 33 041	Attribute of following value	Code table
	0 20 001	Horizontal visibility	m, scale –1

0 07 032		Height of sensor above local ground (set to missing to cancel the previous value)	m, scale 2
0 07 033		Height of sensor above water surface (set to missing to cancel the previous value)	m, scale 1
0 20 031		Ice deposit (thickness)	m, scale 2
0 20 032		Rate of ice accretion	Code table
0 02 038		Method of sea surface temperature measurement	Code table
0 22 043		Sea/water temperature (scale 2)	K, scale 2
3 02 021	0 22 001	Direction of waves	Degree true
	0 22 011	Period of waves	s
	0 22 021	Height of waves	m, scale 1
3 02 078		**State of ground and snow depth measurement**	
	0 02 176	Method of state of ground measurement	Code table
	0 20 062	State of ground (with or without snow)	Code table
	0 02 177	Method of snow depth measurement	Code table
	0 13 013	Total snow depth	m, scale 2
3 02 073		**Cloud data**	
	0 20 010	Cloud cover (total)	%
	1 05 004	Replicate 5 descriptors four times	
	0 08 002	Vertical significance	Code table
	0 20 011	Cloud amount	Code table
	0 20 012	Cloud type	Code table
	0 33 041	Attribute of following value	Code table
	0 20 013	Height of base of cloud	m, scale -1
3 02 074		**Present and past weather**	
	0 20 003	Present weather(3)	Code table
	0 04 025	Time period (= - 60 minutes)	Minute
	0 20 004	Past weather (1) (3)	Code table
	0 20 005	Past weather (2) (3)	Code table
3 02 075		**Intensity of precipitation, size of precip. element**	
	0 08 021	Time significance (= 2 (time averaged))	Code table
	0 04 025	Time period (= - 10 minutes)	Minute
	0 13 055	Intensity of precipitation	$kgm^{-2}s^{-1}$,scale 4
	0 13 058	Size of precipitation element	m, scale 4
	0 08 021	Time significance (= missing value)	Code table
0 04 025		Time period (= - 10 minutes)	Minute
3 02 076		**Precipita tion, obscuration and other phenomena**	
	0 20 021 0 20 022	Type of precipitation Character of precipitation	Flag table Code table
	0 26 020	Duration of precipitation (4)	Minute
	0 20 023	Other weather phenomena	Flag table
	0 20 024	Intensity of phenomena	Code table
	0 20 025	Obscuration	Flag table
	0 20 026	Character of obscuration	Code table
3 02 071		**Wind data from one-hour period**	
	0 07 032	Height of sensor above local ground	m, scale 2
	0 07 033	Height of sensor above water surface	m, scale 1
	0 08 021	Time significance (= 2 (time averaged))	Code table
	0 04 025	Time period (= - 10 minutes, or number of minutes after a significant change of wind, if any)	Minute
	0 11 001	Wind direction	Degree true
	0 11 002	Wind speed	$m\ s^{-1}$, scale 1
	0 08 021	Time significance (= missing value)	Code table
	1 03 002	Replicate next 3 descriptors 2 times	

	0 04 025	Time period (= - 10 minutes in the first replication, = - 60 minutes in the second replication)	Minute
	0 11 043	Maximum wind gust direction	Degree true
	0 11 041	Maximum wind gust speed	m s^{-1}, scale 1
	0 04 025	Time period (= - 10 minutes)	Minute
	0 11 016	Extreme counterclockwise wind direction of a variable wind	Degree true
	0 11 017	Extreme clockwise wind direction of a variable wind	Degree true
3 02 077		**Extreme temperature data**	
	0 07 032	Height of sensor above local ground	m, scale 2
	0 07 033	Height of sensor above water surface	m, scale 1
	0 04 025	Time period (= - 60 minutes)	Minute
	0 12 111 0 12 112	Maximum temperature (scale 2) at height and over period specified Minimum temperature (scale 2) at height and over period specified	K, scale 2 K, scale 2
	0 07 032	Height of sensor above local ground (for ground temperature)	m, scale 2
	0 04 025	Time period (= - 60 minutes)	Minute
	0 12 112	Minimum temperature (scale 2) at height and over period specified (for ground temperature)	K, scale 2
0 07 033		Height of sensor above water surface (set to missing to cancel the previous value)	m, scale 1
3 02 079		**Precipitation measurement**	
	0 07 032	Height of sensor above local ground	m, scale 2
	0 02 175	Method of precipitation measurement	Code table
	0 02 178 0 04 025	Method of liquid water content measurement of precipitation Time period (= - 60 minutes)	Code table Minute
	0 13 011	Total precipitation / total water equivalent of snow	kg m^{-2}, scale 1
0 07 032		Height of sensor above local ground (set to missing to cancel the previous value)	m, scale 2
3 02 080		**Evaporation measurement**	
	0 02 185	Method of evaporation measurement	Code table
	0 04 025	Time period (= - 60 minutes)	Minute
	0 13 033	Evaporation /evapotranspiration	kg m^{-2}
3 02 081	 0 04 025	**Total sunshine data** Time period (= - 60 minutes)	 Minute
	0 14 031	Total sunshine	Minute
3 02 082		**Radiation data**	
	0 04 025	Time period (= - 60 minutes)	Minute
	0 14 002	Long-wave radiation, integrated over period specified	J m^{-2}, scale -3
	0 14 004	Short-wave radiation, integrated over period specified	J m^{-2}, scale -3
	0 14 016	Net radiation, integrated over period specified	J m^{-2}, scale -4
	0 14 028 0 14 029	Global solar radiation (high accuracy), integrated over period specified Diffuse solar radiation (high accuracy), integrated over period specified	J m^{-2}, scale -2 J m^{-2}, scale -2
	0 14 030	Direct solar radiation (high accuracy), integrated over period specified	J m^{-2}, scale -2
0 04 025		Time period (= - 10 minutes)	Minute
0 13 059		Number of flashes	Numeric
3 02 083		**First order statistics of P, W, T, U data**	
	0 04 025	Time period (= -10 minutes)	Minute

	0 08 023	First order statistics (= 9 (best estimate of standard deviation)) (5)	Code table
	0 10 004 0 11 001	Pressure Wind direction	Pa, scale –1 Degree true
	0 11 002	Wind speed	m s^{-1}, scale 1
	0 12 101	Temperature/dry-bulb temperature (scale 2)	K, scale 2
	0 13 003	Relative humidity	%
	0 08 023	First order statistics (= missing value)	Code table
0 33 005		Quality information (AWS data)	Flag table
0 33 006		Internal measurement status information (AWS)	Code table
		Nominal values	
2 23 000		Substituted values operator	
2 36 000		Backward reference bit map	
1 01 000		Delayed replication of 1 descriptor	
0 31 001		Delayed descriptor replication factor = number of element descriptors	Numeric
0 31 031		Data present indicator	Numeric
0 01 033		Indication of originating/generating centre	Code table
0 01 032		Generating application	Code table
0 08 083		Nominal value indicator	Flag table
1 01 000		Delayed replication of 1 descriptor	
0 31 001		Delayed descriptor replication factor	Numeric
2 23 255		Substituted values	
1 08 000		Delayed replication of 1 descriptor	
0 31 001		Delayed descriptor replication factor	Numeric
2 23 000		Substituted values operator	
2 37 000		Use previously defined bit map	
0 01 033 0 01 032		Indication of originating/generating centre Generating application	Code table Code table
0 08 083		Nominal value indicator	Flag table
1 01 000		Delayed replication of 1 descriptor	
0 31 001		Delayed descriptor replication factor	Numeric
2 23 255		Substituted values	

Notes: (1) The time identification refers to the end of the one-hour period.

(2) 0 10 061 (3-hour pressure change) and 0 10 063 (Characteristic of pressure tendency) are included in this template, although they refer to 3-hour period preceding the time of observation.

(3) Present weather may be represented only by 0 20 003, especially if reported from a manned non-automated station. When encoding present weather reported from an automatic weather station, the sequence of descriptors (proposed under 3 02 076) should be used, if applicable.

(4) Duration of precipitation (in minutes) represents number of minutes in which any precipitation was registered.

(5) Best estimate of standard deviation is counted out of a set of samples (signal measurements) recorded within the period specified; it should be reported as a missing value, if the measurements of the relevant element are not available from a part of the period specified by 0 04 025.