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## Mandatory Data Section

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**Bold type below indicates that the element may include data originating from NCEI's NCEI SURFACE HOURLY/ASOS/AWOS or from AFCCC's USAF SURFACE HOURLY. Otherwise, data originated from USAF SURFACE HOURLY.**

**Note:** For the quality code fields with each data element, the following may appear in data which were processed through NCEI's Interactive QC system (manual interaction), for selected parameters:

- A** – Data value flagged as suspect, but accepted as good value.
- U** – Data value replaced with edited value.
- P** – Data value not originally flagged as suspect, but replaced by validator.
- I** – Data value not originally in data, but inserted by validator.
- M** – Manual change made to value based on information provided by NWS or FAA.
- C** – Temperature and dew point received from Automated Weather Observing Systems (AWOS) are reported in whole degrees Celsius. Automated QC flags these values, but they are accepted as valid.
- R** – Data value replaced with value computed by NCEI software.

**POS: 61-63**

**WIND-OBSERVATION direction angle**

The angle, measured in a clockwise direction, between true north and the direction from which the wind is blowing.

MIN: 001      MAX: 360      UNITS: Angular Degrees

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).

999 = Missing. If type code (below) = V, then 999 indicates variable wind direction.

**POS: 64-64**

**WIND-OBSERVATION direction quality code**

The code that denotes a quality status of a reported WIND-OBSERVATION direction angle.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

4 = Passed gross limits check, data originate from an NCEI data source

5 = Passed all quality control checks, data originate from an NCEI data source

6 = Suspect, data originate from an NCEI data source

7 = Erroneous, data originate from an NCEI data source

9 = Passed gross limits check if element is present

**POS: 65-65**

**WIND-OBSERVATION type code**

The code that denotes the character of the WIND-OBSERVATION.

DOM: A specific domain comprised of the characters in the ASCII character set.

A = Abridged Beaufort

B = Beaufort

C = Calm

H = 5-Minute Average Speed

N = Normal

R = 60-Minute Average Speed

Q = Squall

T = 180 Minute Average Speed

V = Variable

9 = Missing

NOTE: If a value of 9 appears with a wind speed of 0000, this indicates calm winds.

**POS: 66-69**

**WIND-OBSERVATION speed rate**

The rate of horizontal travel of air past a fixed point.

MIN: 0000      MAX: 0900      UNITS: meters per second

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

9999 = Missing.

**POS: 70-70**

**WIND-OBSERVATION speed quality code**

The code that denotes a quality status of a reported WIND-OBSERVATION speed rate.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
  - 1 = Passed all quality control checks
  - 2 = Suspect
  - 3 = Erroneous
  - 4 = Passed gross limits check, data originate from an NCEI data source
  - 5 = Passed all quality control checks, data originate from an NCEI data source
  - 6 = Suspect, data originate from an NCEI data source
  - 7 = Erroneous, data originate from an NCEI data source
  - 9 = Passed gross limits check if element is present
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**POS: 71-75**

**SKY-CONDITION-OBSERVATION ceiling height dimension**

The height above ground level (AGL) of the lowest cloud or obscuring phenomena layer aloft with 5/8 or more summation total sky cover, which may be predominantly opaque, or the vertical visibility into a surface-based obstruction. Unlimited = 22000.

MIN: 00000 MAX: 22000 UNITS: Meters

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).

99999 = Missing.

**POS: 76-76**

**SKY-CONDITION-OBSERVATION ceiling quality code**

The code that denotes a quality status of a reported ceiling height dimension.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 4 = Passed gross limits check, data originate from an NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source
- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI data source
- 9 = Passed gross limits check if element is present

**POS: 77-77**

**SKY-CONDITION-OBSERVATION ceiling determination code**

The code that denotes the method used to determine the ceiling.

DOM: A specific domain comprised of the characters in the ASCII character set.

- A = Aircraft
- B = Balloon
- C = Statistically derived
- D = Persistent cirriform ceiling (pre-1950 data)
- E = Estimated
- M = Measured
- P = Precipitation ceiling (pre-1950 data)
- R = Radar
- S = ASOS augmented
- U = Unknown ceiling (pre-1950 data)
- V = Variable ceiling (pre-1950 data)
- W = Obscured
- 9 = Missing

**POS: 78-78**

**SKY-CONDITION-OBSERVATION CAVOK code**

The code that represents whether the 'Ceiling and Visibility Okay' (CAVOK) condition has been reported.

DOM: A specific domain comprised of the characters in the ASCII character set.

- N = No
- Y = Yes
- 9 = Missing

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**POS: 79-84**

**VISIBILITY-OBSERVATION distance dimension**

The horizontal distance at which an object can be seen and identified.

MIN: 000000 MAX: 160000 UNITS: Meters

DOM: A general domain comprised of the numeric characters (0-9).

Missing = 999999

NOTE: Values greater than 160000 are entered as 160000

**POS: 85-85**

**VISIBILITY-OBSERVATION distance quality code**

The code that denotes a quality status of a reported distance of a visibility observation.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

4 = Passed gross limits check, data originate from an NCEI data source

5 = Passed all quality control checks, data originate from an NCEI data source

6 = Suspect, data originate from an NCEI data source

7 = Erroneous, data originate from an NCEI data source

9 = Passed gross limits check if element is present

**POS: 86-86**

**VISIBILITY-OBSERVATION variability code**

The code that denotes whether or not the reported visibility is variable.

DOM: A specific domain comprised of the characters in the ASCII character set.

N = Not variable

V = Variable

9 = Missing

**POS: 87-87**

**VISIBILITY-OBSERVATION quality variability code**

The code that denotes a quality status of a reported VISIBILITY-OBSERVATION variability code.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

4 = Passed gross limits check, data originate from an NCEI data source

5 = Passed all quality control checks, data originate from an NCEI data source

6 = Suspect, data originate from an NCEI data source

7 = Erroneous, data originate from an NCEI data source

9 = Passed gross limits check if element is present

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**POS: 88-92**

**AIR-TEMPERATURE-OBSERVATION air temperature**

The temperature of the air.

MIN: -0932 MAX: +0618 UNITS: Degrees Celsius

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9), a plus sign (+), and a minus sign (-).

+9999 = Missing.

**POS: 93-93**

**AIR-TEMPERATURE-OBSERVATION air temperature quality code**

The code that denotes a quality status of an AIR-TEMPERATURE-OBSERVATION.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
  - 1 = Passed all quality control checks
  - 2 = Suspect
  - 3 = Erroneous
  - 4 = Passed gross limits check, data originate from an NCEI data source
  - 5 = Passed all quality control checks, data originate from an NCEI data source
  - 6 = Suspect, data originate from an NCEI data source
  - 7 = Erroneous, data originate from an NCEI data source
  - 9 = Passed gross limits check if element is present
  - A = Data value flagged as suspect, but accepted as a good value
  - C = Temperature and dew point received from Automated Weather Observing System (AWOS) are reported in whole degrees Celsius. Automated QC flags these values, but they are accepted as valid.
  - I = Data value not originally in data, but inserted by validator
  - M = Manual changes made to value based on information provided by NWS or FAA
  - P = Data value not originally flagged as suspect, but replaced by validator
  - R = Data value replaced with value computed by NCEI software
  - U = Data value replaced with edited value
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**POS: 94-98**

**AIR-TEMPERATURE-OBSERVATION dew point temperature**

The temperature to which a given parcel of air must be cooled at constant pressure and water vapor content in order for saturation to occur.

MIN: -0982 MAX: +0368 UNITS: Degrees Celsius

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9), a plus sign (+), and a minus sign (-).  
+9999 = Missing.

**POS: 99-99**

**AIR-TEMPERATURE-OBSERVATION dew point quality code**

The code that denotes a quality status of the reported dew point temperature.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
  - 1 = Passed all quality control checks
  - 2 = Suspect
  - 3 = Erroneous
  - 4 = Passed gross limits check, data originate from an NCEI data source
  - 5 = Passed all quality control checks, data originate from an NCEI data source
  - 6 = Suspect, data originate from an NCEI data source
  - 7 = Erroneous, data originate from an NCEI data source
  - 9 = Passed gross limits check if element is present
  - A = Data value flagged as suspect, but accepted as a good value
  - C = Temperature and dew point received from Automated Weather Observing System (AWOS) are reported in whole degrees Celsius. Automated QC flags these values, but they are accepted as valid.
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  - R = Data value replaced with value computed by NCEI software
  - U = Data value replaced with edited value
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**POS: 100-104**

**ATMOSPHERIC-PRESSURE-OBSERVATION sea level pressure**

The air pressure relative to Mean Sea Level (MSL).

MIN: 08600 MAX: 10900 UNITS: Hectopascals

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).  
99999 = Missing.

**POS: 105-105**

**ATMOSPHERIC-PRESSURE-OBSERVATION sea level pressure quality code**

The code that denotes a quality status of the sea level pressure of an

ATMOSPHERIC-PRESSURE-OBSERVATION.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

4 = Passed gross limits check, data originate from an NCEI data source

5 = Passed all quality control checks, data originate from an NCEI data source

6 = Suspect, data originate from an NCEI data source

7 = Erroneous, data originate from an NCEI data source

9 = Passed gross limits check if element is present