

**BUFR Table C - Data description operators**

TABLE REFERENCE F X	OPERAND	OPERATOR NAME	OPERATION DEFINITION	Status
2 09	YYY	IEEE floating point representation	For elements in Table B other than CCITT IA5, Code tables, Flag tables and delayed descriptor replication factors, this operator shall indicate that values are represented in YYY bits IEEE floating point, where YYY can be set to 032 (single precision) or 064 (double precision). This operator shall override the scaling, reference value and data width from Table B. An operand of YYY=000 shall reinstate the Table B scaling, reference value and data width. (see Note x)	Validation

Notes:

- (x) IEEE single or double precision floating point representation is specified in the standard ISO/IEC 559-1985 and ANSI/IEEE 754-1985, which should be consulted for more details.

**Amendments to Regulations:****Insert a third sentence to Regulation 94.1.5:**

...deemed to be necessary. **Missing values for IEEE data (when use of operator 209YYY) shall be the largest IEEE floating-point number for YYY bits taken from the 209YYY operator.** This regulation....

**In 94.6.3 change note (2) as:**

- (2) Where more than one data subset is included in a single BUFR message, data compression may be used as follows:
- (i) Values for each data element are grouped into sets, and the sets shall be in the order defined by the data description; the first value in each set shall represent a minimum value for the set; for character data the first value in the set shall be set to all bits zero; however, if the character data values in all subsets are identical, the first value shall represent the character string; **for IEEE floating point data the first value in the set shall be set all bits to zero; however, if all IEEE data values are identical the first value shall represent the IEEE value;** this value is termed a "local reference value", R0, with respect to the subsequent set of data.
  - (ii) Local reference value shall be coded according to Regulation 94.6.2.
  - (iii) If all values of an element are missing, R0 shall be coded with all bits set to 1s. **In the case of IEEE data the local reference value shall be coded using YYY bits from the 209YYY operator and the value shall be the largest positive IEEE floating point number for YYY bits.**
  - (iv) The local reference value shall be followed by 6-bit quantity specifying the number of bits for each increment or for character data, specifying the number of octets representing the character string. **For IEEE data element it shall be the number of octets corresponding to YYY bits from the 209YYY operator.** However, if the character or IEEE data values in all subsets are identical, sub-note (vii) shall apply.
  - (v) Actual values, V, **for non IEEE data and non-character string,** will then be obtained as:  
..... *no change*
  - (vi) Missing values will be denoted by setting all bits of the corresponding I to 1s. **Missing values for IEEE data shall be the largest IEEE floating point number for YYY bits taken from the 209YYY operator.**
  - (vii) ..... *no change* .....

*In the:*

**Section 4 - Data section**

- (2) The binary data in compressed form may be described as follows:

.....

*Add:*

**If operator 209YYY is used, R10 local reference value shall be set to largest IEEE floating-point number for YYY bits (32 bits: hexadecimal: 7f7fffff) (64 bits: hexadecimal: 7feffffffffff). The NBINC shall contain the number of octets corresponding to YYY bits and increments shall contain the IEEE values of YYY bits. If the IEEE values in all subsets are identical, NBINC=0 and R10 shall contain the IEEE value. The IEEE values shall be represented as big endian IEEE floating point numbers.**