



**INTERNATIONAL STANDARD ISO 13584-20:1998**  
**TECHNICAL CORRIGENDUM 1**

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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

**Industrial automation systems and integration — Parts  
library —**

Part 20:

**Logical resource: Logical model of expressions**

TECHNICAL CORRIGENDUM 1

*Systèmes d'automatisation industrielle et intégration — Bibliothèque de composants —  
Partie 20: Ressource logique: Modèle logique d'expressions*

RECTIFICATIF TECHNIQUE 1

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*The purpose of the modifications to the text of ISO 13584-20:1998 is to integrate the various SEDS reports that have been collected since its publication.*

## Modifications to the text of ISO 13584-20:1998

### Clause 6 Schema name, p8

The schema name shall be written using lowercase letters. Update the EXPRESS schema name as follows:

```
SCHEMA iso13584_generic_expressions_schema;
```

Additionally, all the references to the schema name (both in the text and in the EXPRESS code) is also updated.

### Clause 6.3.1 Is\_acyclic function, p13

A RETURN statement is not included between the final END\_IF statement and the end of the function, resulting in possible invalid results. Consequently, the 'result' variable shall be initialized. Update the EXPRESS specification with the following:

```
FUNCTION acyclic (arg1: generic_expression;
                 arg2: SET OF generic_expression): BOOLEAN;

LOCAL
    result: BOOLEAN := TRUE;
END_LOCAL;
...
    REPEAT i := 1 TO
        SIZEOF (arg1\multiple_arity_generic_expression.operands);
        result := result AND
            acyclic(arg1\multiple_arity_generic_expression.operands[i],
                arg2+[arg1]);
    END_REPEAT;

    RETURN (result);
END_IF;

RETURN (result);

END_FUNCTION; -- acyclic
```

### Clause 7 Schema name, p15

The schema name shall be written using lower case letters. Update the EXPRESS schema name as follows:

```
SCHEMA iso13584_expressions_schema;
```

Additionally, all the references to the schema name (both in the text and in the EXPRESS code) is also updated.

### Clause 7.4.6 Odd\_Function, WR1, p35

The EXPRESS declaration for WR1 is not in compliance with the English description. Replace the WR1 specification with the following:

```
WR1: is_int_expr(operand);
```

#### Clause 7.4.13, Comparison\_expression, WR1, p38

There is an error in the express for rule **WR1** of entity **comparison\_expression**. Replace the rule with the following:

```
WR1: (('ISO13584_EXPRESSIONS_SCHEMA.NUMERIC_EXPRESSION'
      IN TYPEOF(SELF\binary_generic_expression.operands[1]))
     AND
      ('ISO13584_EXPRESSIONS_SCHEMA.NUMERIC_EXPRESSION'
      IN TYPEOF(SELF\binary_generic_expression.operands[2])))
OR
(('ISO13584_EXPRESSIONS_SCHEMA.BOOLEAN_EXPRESSION'
  IN TYPEOF(SELF\binary_generic_expression.operands[1]))
 AND
  ('ISO13584_EXPRESSIONS_SCHEMA.BOOLEAN_EXPRESSION'
  IN TYPEOF(SELF\binary_generic_expression.operands[2])))
OR
(('ISO13584_EXPRESSIONS_SCHEMA.STRING_EXPRESSION'
  IN TYPEOF(SELF\binary_generic_expression.operands[1]))
 AND
  ('ISO13584_EXPRESSIONS_SCHEMA.STRING_EXPRESSION'
  IN TYPEOF(SELF\binary_generic_expression.operands[2])))
;
```

#### Clause 7.4.21 Interval\_expression, WR2, p41

The types of the expressions to be compared in the **interval\_expression** shall evaluate to comparable expressions. But, when an **interval\_expression** is specified based on numeric expressions, **WR2** restricts the type of the **interval\_low** attribute to be a string expression, what is erroneous. Change the **WR2** specification with the following:

```
WR2: (('ISO13584_EXPRESSIONS_SCHEMA.STRING_EXPRESSION'
      IN TYPEOF (SELF.interval_low))
     AND ('ISO13584_EXPRESSIONS_SCHEMA.STRING_EXPRESSION'
          IN TYPEOF (SELF.interval_high))
     AND ('ISO13584_EXPRESSIONS_SCHEMA.STRING_EXPRESSION'
          IN TYPEOF (SELF.interval_item)))
OR
(('ISO13584_EXPRESSIONS_SCHEMA.NUMERIC_EXPRESSION'
  IN TYPEOF(SELF.interval_low))
 AND ('ISO13584_EXPRESSIONS_SCHEMA.NUMERIC_EXPRESSION'
      IN TYPEOF(SELF.interval_item))
 AND ('ISO13584_EXPRESSIONS_SCHEMA.NUMERIC_EXPRESSION'
      IN TYPEOF(SELF.interval_high)));
```

#### Clause 7.6.1 Is\_int\_expr, p48

The local variable *i* is declared, but never used. It shall be removed from the EXPRESS specification.

#### Clause 7.6.2 Is\_SQL\_mappable, p50

The local variable *i* is declared, but never used. It shall be removed from the EXPRESS specification.

### Clause 7.6.3, *used\_functions* function, p53

When the type of the **arg** formal parameter is an 'ISO13584\_EXPRESSIONS\_SCHEMA.LIKE\_EXPRESSION', the function is recursively called twice with some bad partial entity instance references. Replace with the following:

```
FUNCTION used_functions (arg : expression) : SET OF defined_function;
...
IF 'ISO13584_EXPRESSIONS_SCHEMA.LIKE_EXPRESSION' IN TYPEOF (arg)
THEN
    RETURN (used_functions (arg\comparison_expression.operands[1])
            + used_functions (arg\comparison_expression.operands[2]));
END_IF;
```

### Annex A, Table A.1, p56

In Table A.1, some short names are missing for the entities whose first letter is between 'i' and 'r'. Replace Table A.1 by the following:

**Table A.1 — Short names of entities**

Long name	Short name
ABS_FUNCTION	ABSFNC
ACOS_FUNCTION	ACSFNC
AND_EXPRESSION	ANDEXP
ASIN_FUNCTION	ASNFNC
ATAN_FUNCTION	ATNFNC
BINARY_BOOLEAN_EXPRESSION	BNBLEX
BINARY_FUNCTION_CALL	BNFNCL
BINARY_GENERIC_EXPRESSION	BNGNEX
BINARY_NUMERIC_EXPRESSION	BNNMEX
BOOLEAN_DEFINED_FUNCTION	BLDFFN
BOOLEAN_EXPRESSION	BLNEXP
BOOLEAN_LITERAL	BLNLTR
BOOLEAN_VARIABLE	BLNVRB
COMPARISON_EQUAL	CMPEQL
COMPARISON_EXPRESSION	CMPEXP
COMPARISON_GREATER	CMPGRT
COMPARISON_GREATER_EQUAL	CMGREQ
COMPARISON_LESS	CMPLESS
COMPARISON_LESS_EQUAL	CMLSEQ
COMPARISON_NOT_EQUAL	CMNTEQ
CONCAT_EXPRESSION	CNCEXP
COS_FUNCTION	CSFNC
DEFINED_FUNCTION	DFNFNC

DIV_EXPRESSION	DVEXP
ENVIRONMENT	ENVRNM
EQUALS_EXPRESSION	EQLEXP
EXP_FUNCTION	EXPFNC
EXPRESSION	EXPRSS
FORMAT_FUNCTION	FRMFNC
GENERIC_EXPRESSION	GNREXP
GENERIC_LITERAL	GNRLTR
GENERIC_VARIABLE	GNRVRB

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Table A.1 (continued)

Long name	Short name
INDEX_EXPRESSION	INDEXP
INT_LITERAL	INTLTR
INT_NUMERIC_VARIABLE	INNMRV
INT_VALUE_FUNCTION	INVLFN
INTEGER_DEFINED_FUNCTION	INDFFN
INTERVAL_EXPRESSION	INTEXP
LENGTH_FUNCTION	LNGFNC
LIKE_EXPRESSION	LKEXP
LITERAL_NUMBER	LTRNMB
LOG_FUNCTION	LGFNC
LOG10_FUNCTION	LG1FNC
LOG2_FUNCTION	LG2FNC
MAXIMUM_FUNCTION	MXMFNC
MINIMUM_FUNCTION	MNMFNC
MINUS_EXPRESSION	MNSEXP
MINUS_FUNCTION	MNSFNC
MOD_EXPRESSION	MDEXP
MULT_EXPRESSION	MLTEXP
MULTIPLE_ARITY_BOOLEAN_EXPRESSION	MABE
MULTIPLE_ARITY_FUNCTION_CALL	MAFC
MULTIPLE_ARITY_GENERIC_EXPRESSION	MAGE
MULTIPLE_ARITY_NUMERIC_EXPRESSION	MANE
NOT_EXPRESSION	NTEXP
NUMERIC_DEFINED_FUNCTION	NMDFFN
NUMERIC_EXPRESSION	NMREXP
NUMERIC_VARIABLE	NMRVRB
ODD_FUNCTION	ODDFNC
OR_EXPRESSION	OREXP
PLUS_EXPRESSION	PLSEXP
POWER_EXPRESSION	PWREXP
REAL_DEFINED_FUNCTION	RLDFFN
REAL_LITERAL	RLLTR
REAL_NUMERIC_VARIABLE	RLNMVR

Table A.1 (continued)

Long name	Short name
SIMPLE_BOOLEAN_EXPRESSION	SMBLEX
SIMPLE_GENERIC_EXPRESSION	SMGNEX
SIMPLE_NUMERIC_EXPRESSION	SMNMEX
SIMPLE_STRING_EXPRESSION	SMSTEX
SIN_FUNCTION	SNFNFC
SLASH_EXPRESSION	SLSEXP
SQL_MAPPABLE_DEFINED_FUNCTION	SMDF
SQUARE_ROOT_FUNCTION	SQRTFN
STRING_DEFINED_FUNCTION	STDFFN
STRING_EXPRESSION	STREXP
STRING_LITERAL	STRLTR
STRING_VARIABLE	STRVRB
SUBSTRING_EXPRESSION	SBSEXP
TAN_FUNCTION	TNFNC
UNARY_BOOLEAN_EXPRESSION	UNBLEX
UNARY_FUNCTION_CALL	UNFNCL
UNARY_GENERIC_EXPRESSION	UNGNEX
UNARY_NUMERIC_EXPRESSION	UNNMEX
VALUE_FUNCTION	VLFNFC
VARIABLE	VRBL
VARIABLE_SEMANTICS	VRBSMN
XOR_EXPRESSION	XREXP

### ***Annex C – EXPRESS-G diagrams, p59***

Some EXPRESS-G diagrams are not in line with the textual EXPRESS specification:

- Figure C.7: replace *integer\_defined\_function* with (ABS) *integer\_defined\_function*;
- Figure C.7: replace *real\_defined\_function* with (ABS) *real\_defined\_function*;
- Figure C.9: replace *binary\_function\_call* with (ABS) *binary\_function\_call*;
- Figure C.13: replace *comparaison\_expression* with *comparison\_expression*.

Consequently, EXPRESS-G diagrams in Annex C are replaced with the followings:

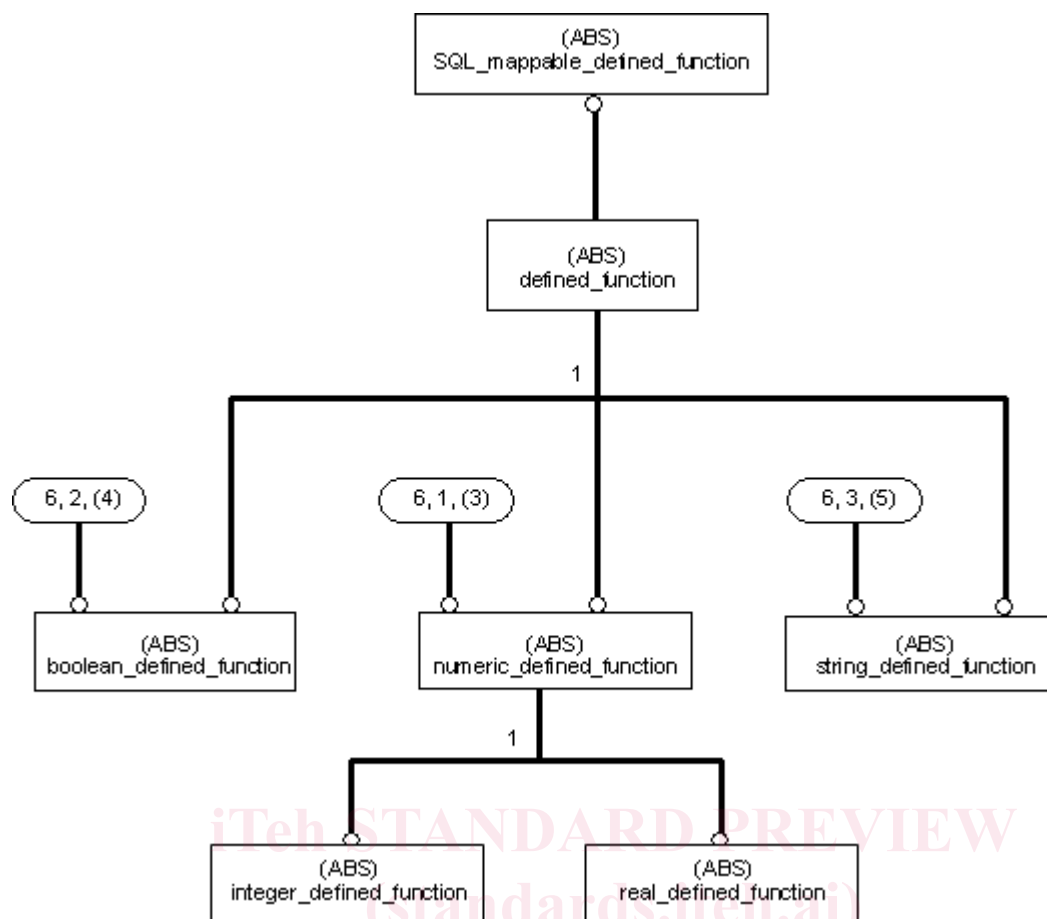


Figure C.1 — iso13584\_expressions\_schema - EXPRESS-G diagram 6 of 12 -  
defined\_function

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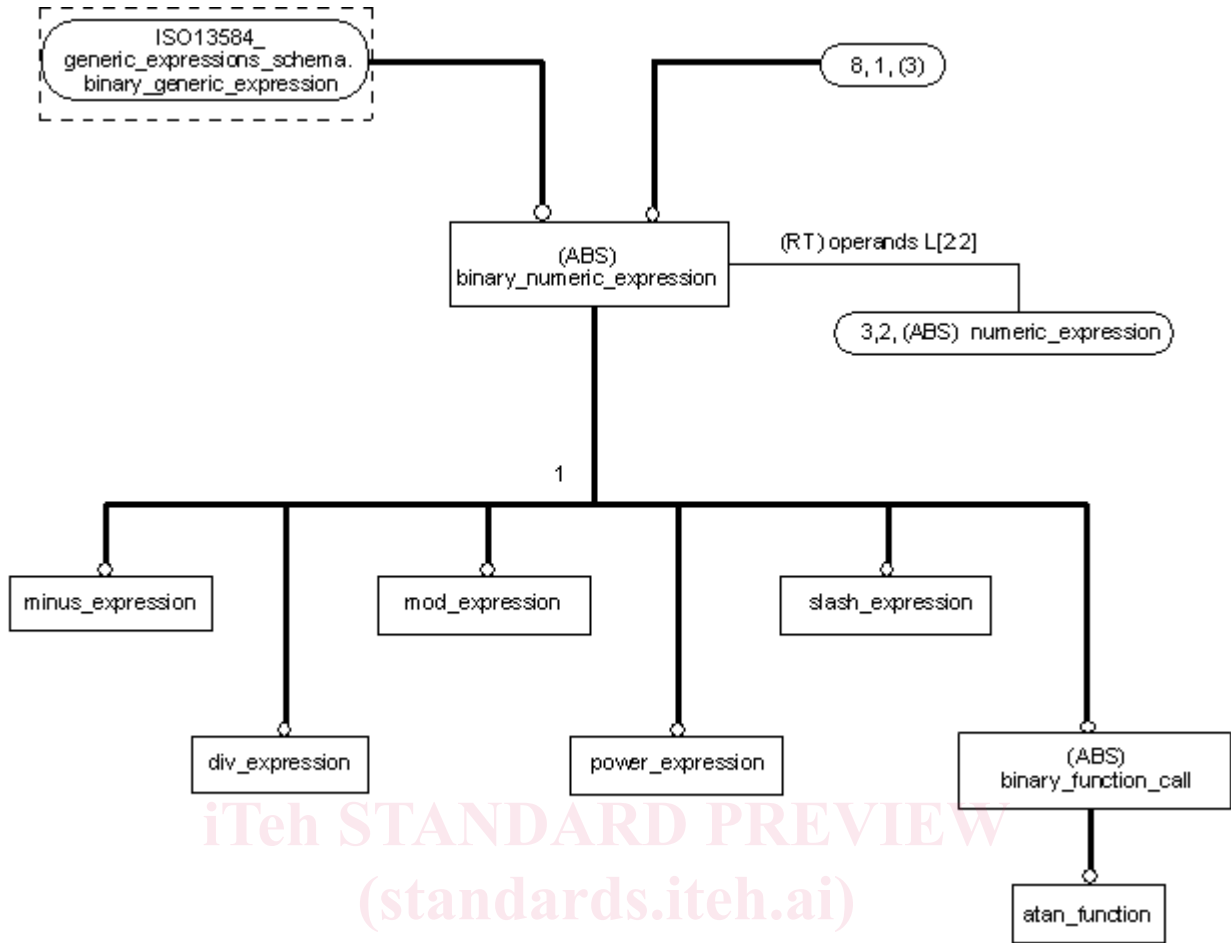


Figure C.9 — iso13584\_expressions\_schema - EXPRESS-G diagram 8 of 12-  
Binary numeric expressions

<https://standards.iteh.ai/catalog/standards/sist/4067788-4e27-4110-b740-77aa6139f058/iso-dis-10303-239>

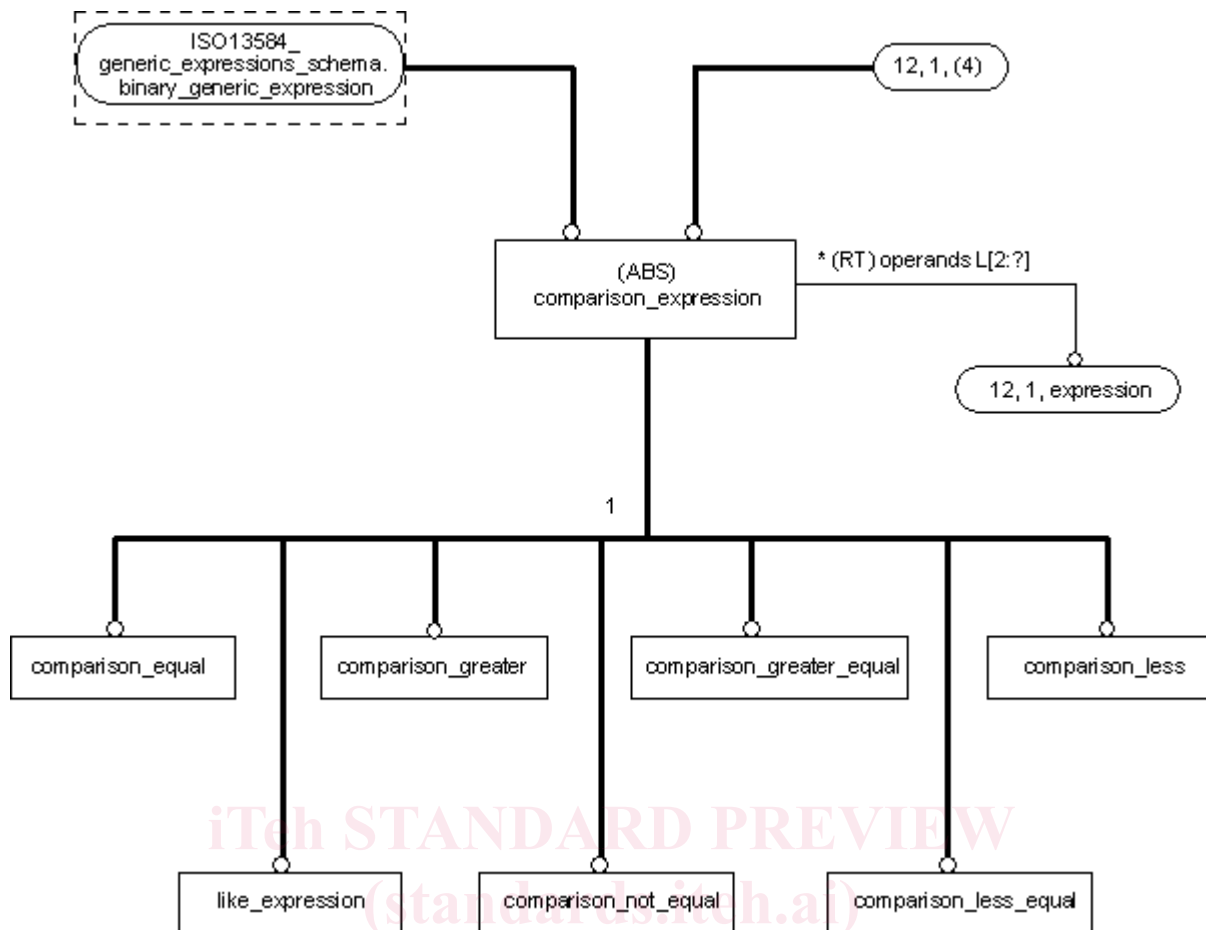


Figure C.13 — iso13584\_expressions\_schema - EXPRESS-G diagram 12 of 12- Comparison expressions

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**Annex C, Caption of Figure C.2, p61**

The phrase "String typing of expressions" in the caption for Figure C.2 does not make sense. "String typing" shall be replaced by "Strong typing". Replace with the following caption:

Figure C.2 — iso13584\_expressions\_schema - EXPRESS-G diagram 1 of 12- Strong typing of expressions