INTERNATIONAL STANDARD ISO 13584-20:1998
TECHNICAL CORRIGENDUM 1

Published 2014-07-01

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

Technical corrigendum 1 to International Standard ISO 13584-20:1998 was prepared by Technical Committee ISO/TC 184,*Automation systems and integration*, Subcommittee SC 4, *Industrial data*.

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.

ICS 25.040.40 **Ref. No. ISO 13584-20:1998/Cor.1:2014(E)**

Published in Switzerland

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	CMPLSS
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

Table A.1 (continued)

Long name	Short name
INDEX_EXPRESSION	INDEXP
INT_LITERAL	INTLTR
INT_NUMERIC_VARIABLE	INNMVR
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	SNFNC
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	VLFNC
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:

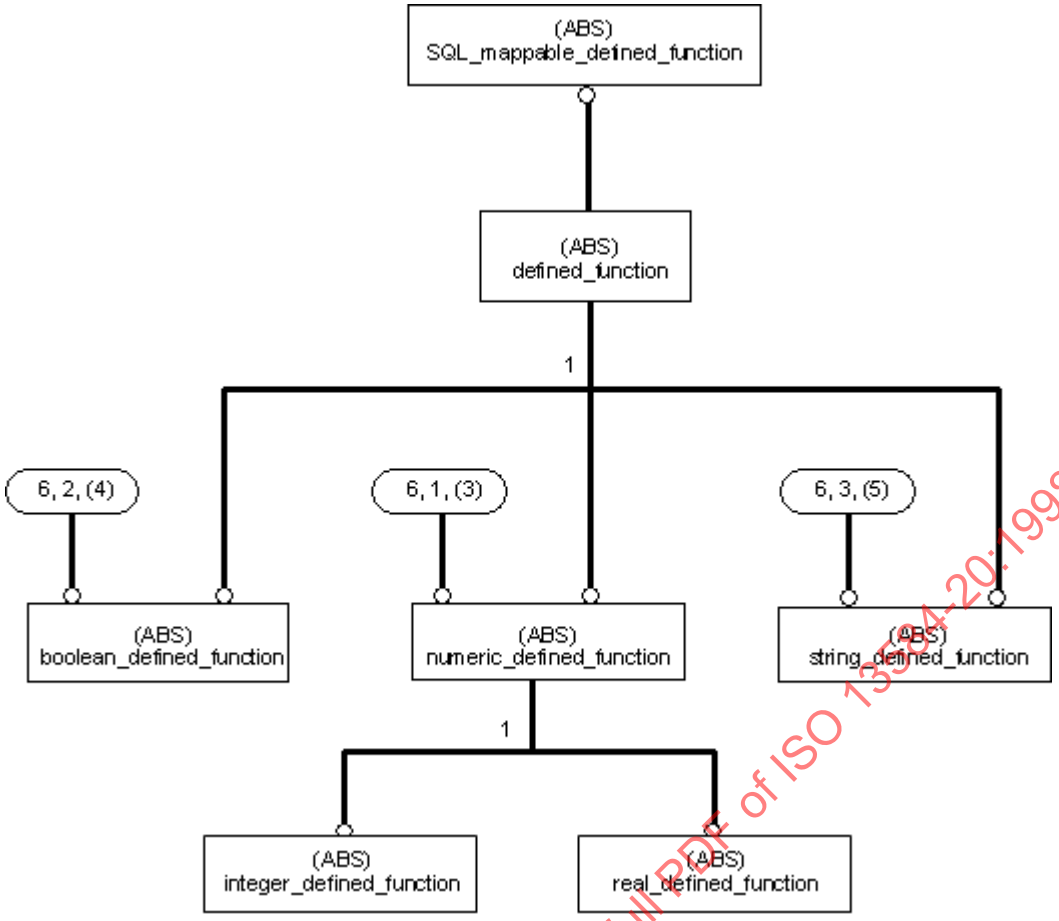

Figure C.1 — iso13584_expressions_schema - EXPRESS-G diagram 6 of 12 - defined_function

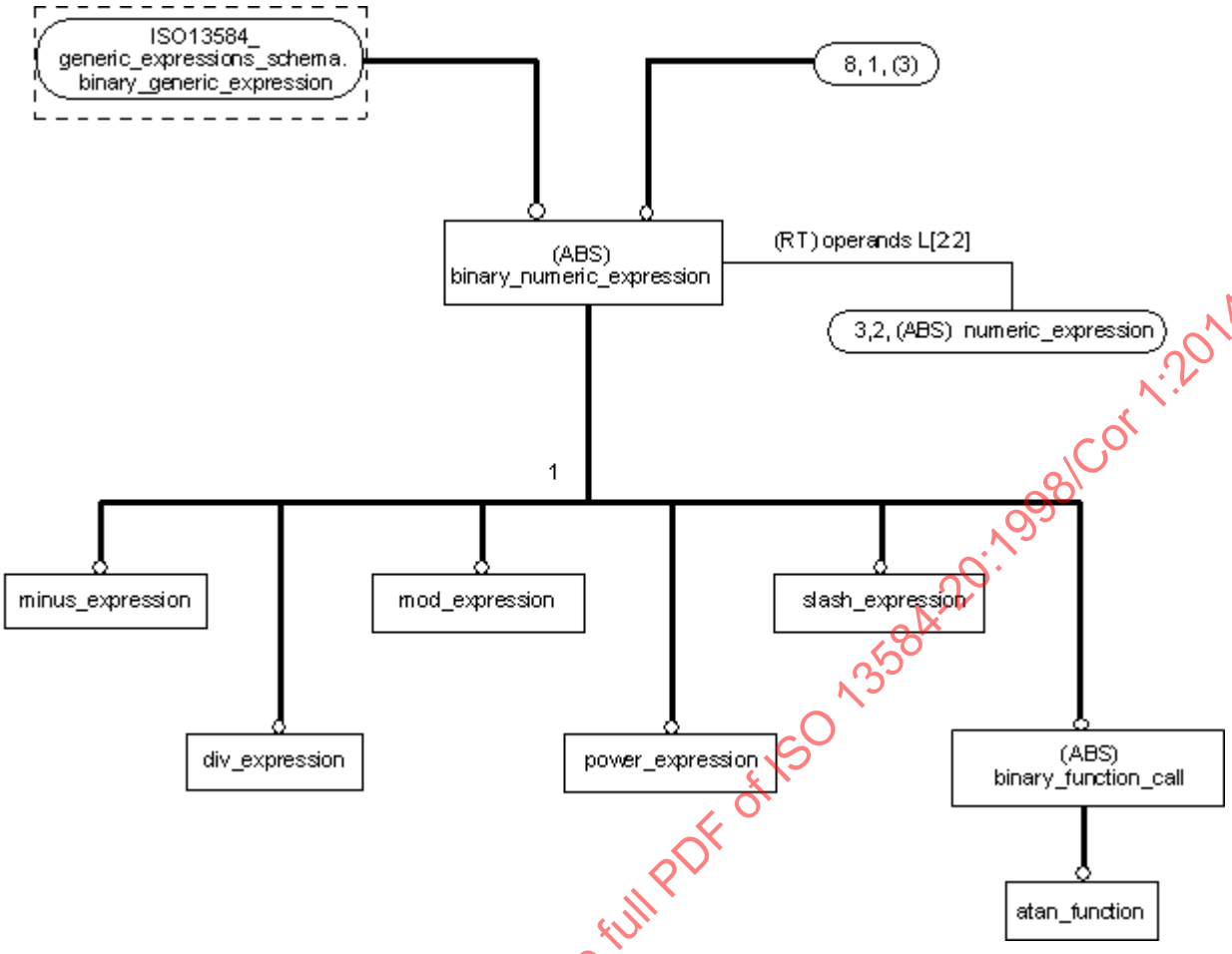

Figure C.9 — iso13584_expressions_schema - EXPRESS-G diagram 8 of 12- Binary numeric expressions