21 SINGLE NUMBER VARIABLE FUNCTIONS

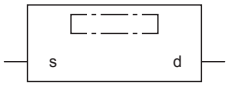
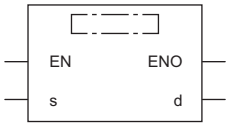
21.1 Absolute Value

ABS(_E)

FX5S FX5UJ FX5U FX5UC

These functions output the absolute value of an input value.

Ladder diagram, FBD/LD		Structured text

[Without EN/ENO]
 
	[With EN/ENO]
	 
		[Without EN/ENO]
		d:=ABS(s);
		[With EN/ENO]
		d:=ABS_E(EN,ENO,s);

Setting data

■Descriptions, types, and data types

Argument	Description	Type	Data type
EN	Execution condition (TRUE: Execution, FALSE: Stop)	Input variable	BOOL
s(IN)	Input	Input variable	ANY_NUM
ENO	Output status (TRUE: Normal, FALSE: Abnormal)	Output variable	BOOL
d(ABS(_E))	Output	Output variable	ANY_NUM

Processing details

■Operation processing

- These functions output the absolute value of the INT, DINT, or REAL type data input to (s) in the same data type as (s) from (d).
- These functions are expressed as follows when the input value is "A" and the output operation result is "B".
  $B=|A|$
- A value input to (s) is the INT, DINT, or REAL type data value.
- When -32768 is input while the data type of (s) is INT, -32768 is output from (d).
- When -2147483648 is input while the data type of (s) is DINT, -2147483648 is output from (d). (An operation error does not occur. "ABS_E" outputs "TRUE" from output variable ENO.)

■Operation result

1. Function without EN/ENO

The following table lists the operation results.

Operation result	(d)
No operation error occurred	Operation output value
An operation error occurred	Indefinite value

2. Function with EN/ENO

The following table lists the execution conditions and operation results.

Execution condition	Operation result	
EN	ENO	(d)
TRUE (Executes operation)	TRUE (Operation error did not occur)	Operation output value
	FALSE (Operation error occurred)*1	Indefinite value
FALSE (Stops operation)	FALSE*1	Indefinite value

*1 When FALSE is output from ENO, data output from (d) is undefined. In that case, modify a program so that the data output from (d) is not used.

Operation error

- When (s) is REAL

Error code (SD0/SD8067)	Description
3402H	The data specified by (s) is -0, denormalized number, NaN (not a number), or ±∞.
3403H	(d) exceeds the following range. (An overflow has occurred.) $\|(d)\|<2^{128}$