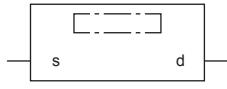


21.3 Natural Logarithm Operation

LN(_E)

FX5S FX5UJ FX5U FX5UC

These functions output the natural logarithm operation result of an input value.

Ladder diagram, FBD/LD	Structured text
[Without EN/ENO]  [With EN/ENO] 	[Without EN/ENO] d:=LN(s); [With EN/ENO] d:=LN_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	REAL
ENO	Output status (TRUE: Normal, FALSE: Abnormal)	Output variable	BOOL
d(LN(_E))	Output	Output variable	REAL

Processing details

■Operation processing

- These functions calculate the logarithm whose base is "e" of the REAL type data input to (s), and output from (d).
- These functions are expressed as follows when the input value is "A" and the output operation result is "B".
 $B = \log_e A$
- In the natural logarithm operation, the base "e" is set to "2.71828".

■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	(d)
EN TRUE (Executes operation)	TRUE (Operation error did not occur)	Operation output 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

Error code (SD0/SD8067)	Description
3405H	A negative value is input.