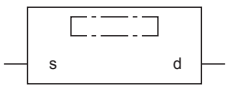
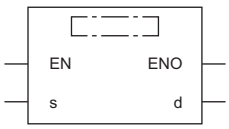
21.4 Calculating the Common Logarithm

LOG(_E)

FX5S FX5UJ FX5U FX5UC

These functions output the operation result of the common logarithm (the logarithm whose base is 10) of an input value.

Ladder diagram, FBD/LD		Structured text

[Without EN/ENO]
 
	[With EN/ENO]
	 
		[Without EN/ENO]
		d:=LOG(s);
		[With EN/ENO]
		d:=LOG_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 condition (TRUE: Normal, FALSE: Abnormal)	Output variable	BOOL
d(LOG(_E))	Output	Output variable	REAL

Processing details

■Operation processing

- These functions calculate the logarithm whose base is "10" 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".
  $B=\log_{10}A$
- A value input to (s) is the REAL type data value.
- Only a positive value can be set in (s). (The logarithm operation cannot be executed for a negative value).
- When the operation result is -0 or underflow occurs, the operation result is regarded as 0.

■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 value specified in (s) is -0, denormalized number, NaN (not a number), or ±∞.
3403H	The value of (d) exceeds the following range. (An overflow has occurred.) $\|(d)\|<2^{128}$
3405H	Data outside the allowable range was set to (s). • A negative value is specified. • "0" is specified.