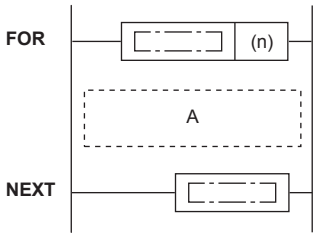
# 8.4 Structuring Instruction

## FOR to NEXT

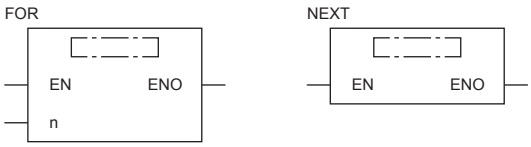
### FOR, NEXT

FX5S FX5UJ FX5U FX5UC

When the processing between the FOR and NEXT instructions is executed (n) times without any condition, the processing of the step following the NEXT instruction is executed.

| Ladder diagram | Structured text |
|---|---|
|  <br>A: Repetition program | Not supported |

**FBD/LD**




#### Setting data

##### ■Descriptions, ranges, and data types

| Operand | Description | Range | Data type | Data type (label) |
|---|---|---|---|---|
| (n) | Number of repetitions of the loop between FOR and NEXT instructions | 1 to 32767 | 16-bit signed binary | ANY16 |
| EN | Execution condition | — | Bit | BOOL |
| ENO | Execution result | — | Bit | BOOL |

##### ■Applicable devices

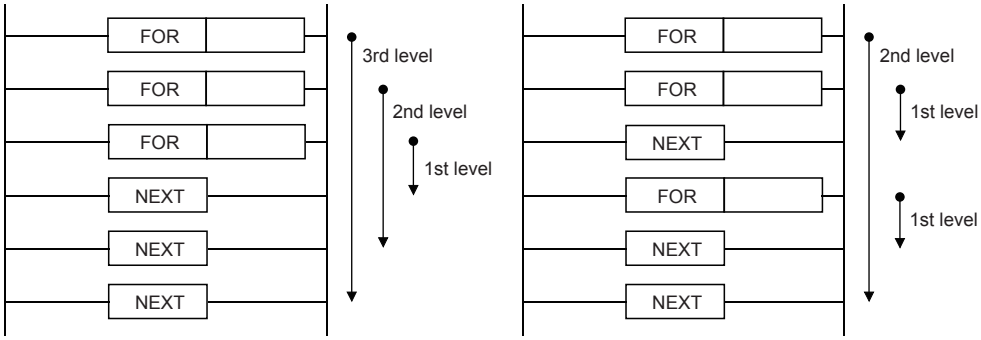
| Operand | Bit | Word | | | Double word | | Indirect specification | Constant | | | Others |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | X, Y, M, L, SM, F, B, SB, S | T, ST, C, D, W, SD, SW, R | U□\G□ | Z | LC | LZ | | K, H | E | $ | |
| (n) | ○ | ○ | ○ | ○ | — | — | ○ | ○ | — | — | — |

#### Processing details

- When the processing between the FOR and NEXT instructions is executed (n) times without any condition, the processing of the step following the NEXT instruction is executed.
- In (n), any of 1 to 32767 can be specified. If any of -32768 to 0 is specified, the processing of (n)=1 is applied.
- To skip the processing between the FOR and NEXT instructions, jump the program execution with the CJ instruction.
- Up to 16 FOR instructions can be nested.

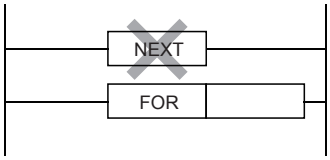
## Precautions

- The FOR-NEXT loop can be nested up to 16 levels.

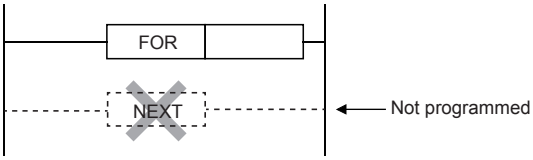



- The FOR-NEXT loop cannot be interrupted by the I, IRET, SRET, RET, FEND, or END instruction.
- When FOR-NEXT loop is repeated many times, the operation cycle is too long, and a watchdog timer error may occur. In such a case, change the watchdog timer time or reset the watchdog timer.
- The following programs are regarded as errors.

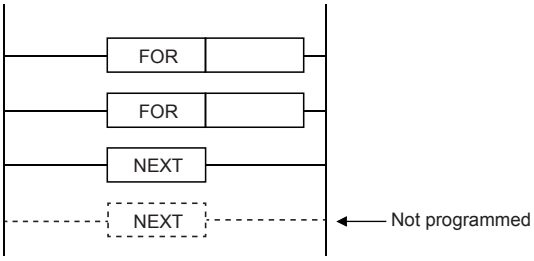
When the NEXT instruction is located before FOR



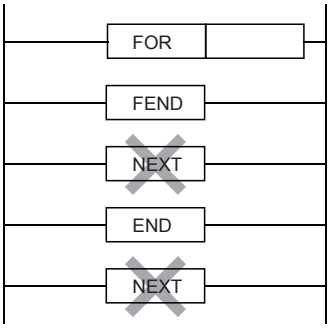

No NEXT instruction




When the number of FOR instructions is not equivalent to the number of NEXT instructions

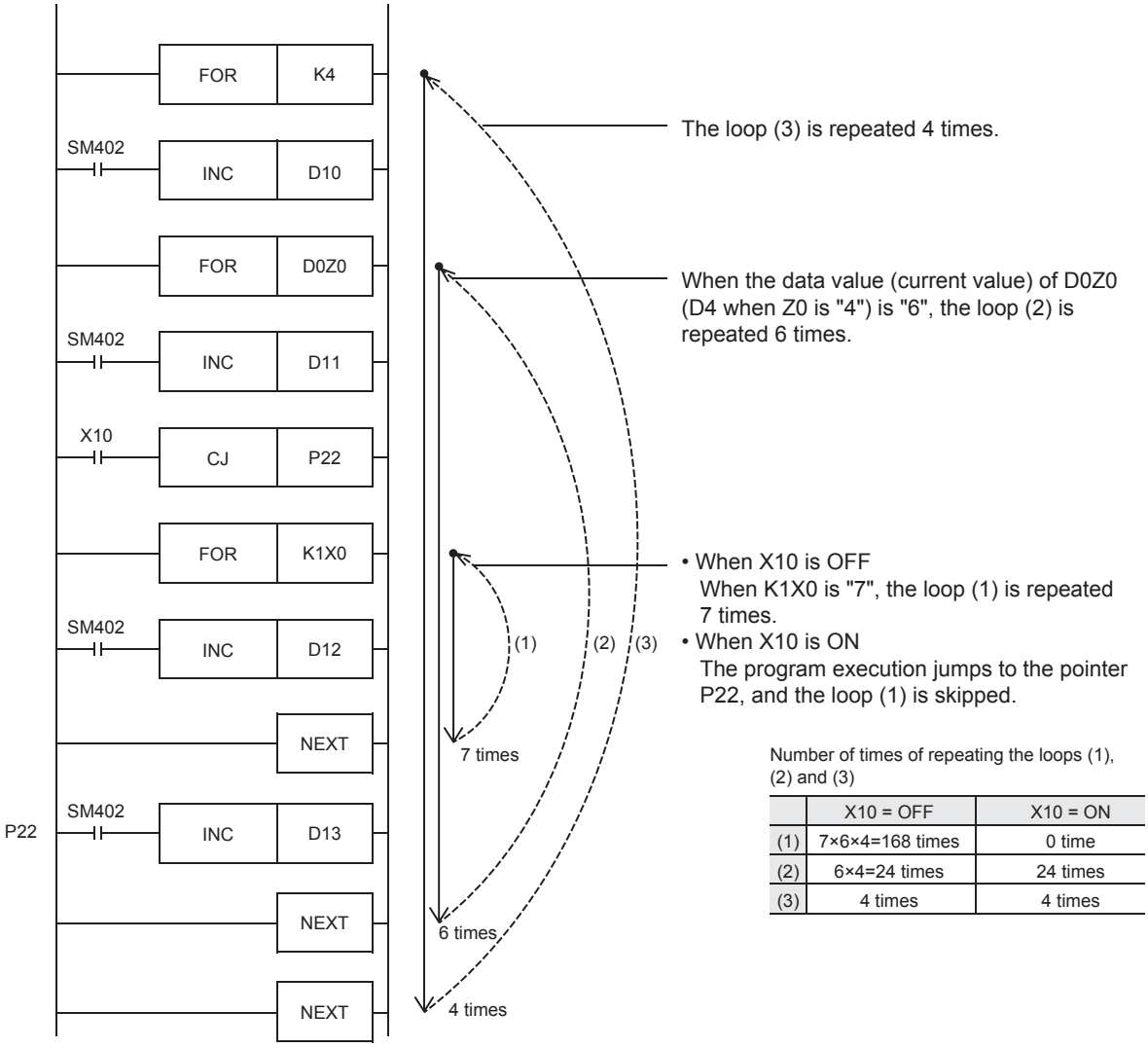



When the NEXT instruction is located after the FEND or END instruction



## Program example

- Program with three FOR-NEXT loops




Number of times of repeating the loops (1), (2) and (3)

| | X10 = OFF | X10 = ON |
|---|---|---|
| (1) | 7×6×4=168 times | 0 time |
| (2) | 6×4=24 times | 24 times |
| (3) | 4 times | 4 times |

## Operation error

| Error code (SD0/SD8067) | Description |
|---|---|
| 3340H | After the FOR instruction is executed, the END or GOEND instruction is executed before the NEXT instruction is executed. |
| 3361H | When the FOR instruction is nested, the 17th level is executed. |
| 33E3H | A program is written where the nesting of the FOR to NEXT instructions exceeds 16 levels. |

**Point**

- To terminate the FOR to NEXT instruction loop halfway, use the BREAK instruction. (☞ Page 458 Forcibly terminating the FOR to NEXT instruction loop)