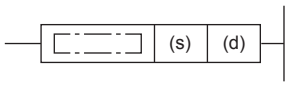
Converting single-precision real number angle to radian

RAD(P)/DRAD(P)

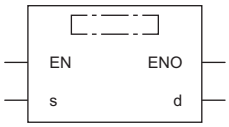
FX5S FX5UJ FX5U FX5UC

These instructions convert a unit of angle from degrees (DEG.) specified by (s) into radians, and store the converted angle in the device specified by (d).

The RAD(P) instructions can also be used as DRAD(P).

Ladder diagram	Structured text
	ENO:=RAD(EN,s,d); ENO:=RADP(EN,s,d);

FBD/LD



Setting data

■Descriptions, ranges, and data types

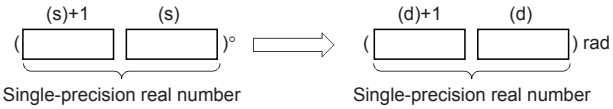
Operand	Description	Range	Data type	Data type (label)
(s)	A value in degrees to be converted into a value in radians or the start number storing the value in degrees	—	Single-precision real number	ANYREAL_32
(d)	Head device number storing a value in radians acquired by conversion	—	Single-precision real number	ANYREAL_32
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	$	
(s)	—	○	○	—	○	—	○	—	○	—	—
(d)	—	○	○	—	○	—	○	—	—	—	—

Processing details

- These instructions convert a unit of angle from degrees (DEG.) specified by (s) into radians, and store the converted angle in the device specified by (d).



- The conversion from degrees into radians is executed as follows:

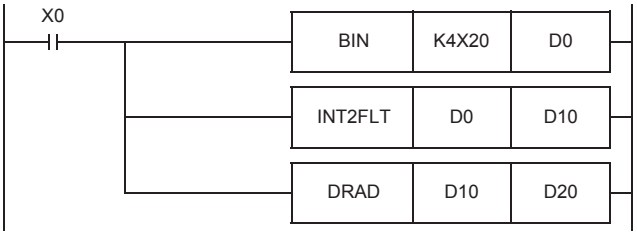
$$\text{Radians} = \text{Degrees} \times \frac{\pi}{180}$$

- The table below shows the related devices.

Device	Name	Description	
		Condition	Operation
SM700	Carry	The absolute value of the operation result ≥ 2^{128}	The value of (d) is the maximum value (2^{128}) of 32-bit real numbers and the carry flag SM700 turns on.
SM8020	Zero	The operation result is true "0". (The mantissa part is "0").	The zero flag SM8020 turns on.
SM8021	Borrow	The absolute value of the operation result < 2^{-126}	The value of (d) is the minimum value (2^{-126}) of 32-bit real numbers and the borrow flag SM8021 turns on.
SM8022	Carry	The absolute value of the operation result ≥ 2^{128}	The value of (d) is the maximum value (2^{128}) of 32-bit real numbers and the carry flag SM8022 turns on.

Program example

In the program example shown below, a 4-digit BCD value set in degrees in X20 to X37 is converted into a single-precision real number in radians, and stored to D20 and D21 when X0 turns ON.

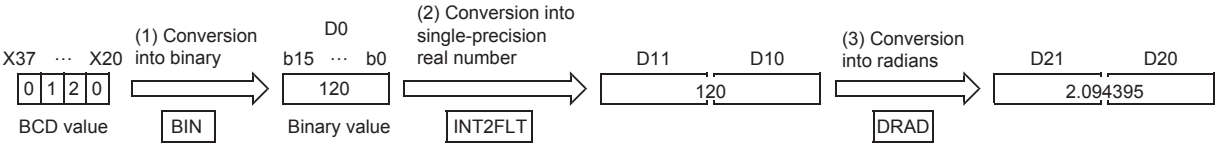


Angle to be converted into radians is input (1).

The input angle is converted into single-precision real number (2).

The angle is converted from degrees into radians (3).

- Operation when "120" is specified in X20 to X37



Operation error

Error code (SD0/SD8067)	Description
3402H	The specified device value is -0, denormalized number, NaN (not a number), or ±∞.