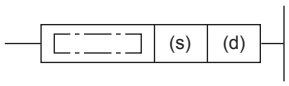
Calculating the tangent of single-precision real number

TAN(P)/DTAN(P)

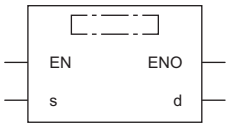
FX5S FX5UJ FX5U FX5UC

These instructions calculate the tangent of the angle specified by (s), and store the operation result in the device specified by (d).

The TAN(P) instructions can also be used as DTAN(P).

Ladder diagram	Structured text*1
	ENO:=TANP(EN,s,d);

FBD/LD*1



*1 The TAN instruction is not supported by the ST language and the FBD/LD language. Use TAN of the standard function.
☞ Page 1292 TAN(_E)

Setting data

■Descriptions, ranges, and data types

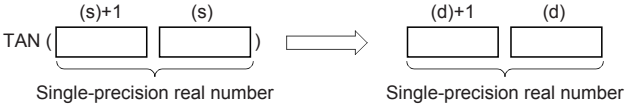
Operand	Description	Range	Data type	Data type (label)
(s)	Angle data or head device number where the angle data is stored	—	Single-precision real number	ANYREAL_32
(d)	Head device number for storing the operation result	—	Single-precision real number	ANYREAL_32
EN	Execution condition	—	Bit	BOOL
ENO	Execution 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 calculate the tangent of the angle specified by (s), and store the operation result in the device specified by (d).



- Set the angle data in radians (angle×π÷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.

Device	Name	Description	
		Condition	Operation
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.

Precautions

When the angle specified by (s) is π/2 radian or (3/2)π radian, no error occurs because an operation error occurs in a radian value.

Operation error

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

Point

For the angle↔radian conversion, refer to the DRAD(P) and DDEG(P) instructions.
(☞ Page 716 Converting single-precision real number angle to radian, Page 718 Converting single-precision real number radian to angle)