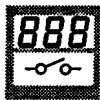
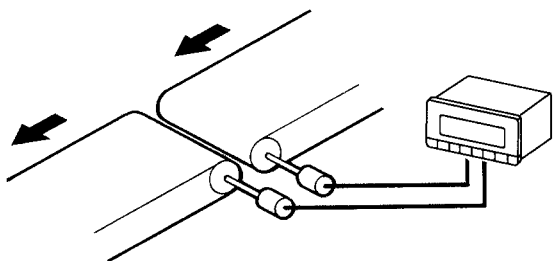


### 3-4 Rotational Difference: f4



FUNCTION

Application example



Measures the rotational difference of the conveyor belts.

#### Basic Operation

Displays the rotational difference of INA and INB. Obtain display value D as follows:

$$D \text{ (rpm)} = f_B \times 60 \times \beta - f_A \times 60 \times \alpha$$

$f_A$ : Input frequency of INA (Hz)

$f_B$ : Input frequency of INB (Hz)

$\alpha$ : Prescale value of INA

$\beta$ : Prescale value of INB



SETTING

Mode	Unit of display	Prescale value	
Rotational Difference	rpm	INA	1/60Na
		INB	1/60Nb
	Hz (Input pulse frequency)	INA	1/60
		INB	1/60
	mm/sec	INA	1000 $\pi$ da/60Na
		INB	1000 $\pi$ db/60Nb
	m/sec	INA	$\pi$ da/60Na
		INB	$\pi$ db/60Nb
	m/min	INA	$\pi$ da/Na
		INB	$\pi$ db/Nb

Where,

Na: Number of pulses per revolution from A input

Nb: Number of pulses per revolution from B input

$\pi$ da: Circumference (m) per revolution for A input

$\pi$ db: Circumference (m) per revolution for B input

Example:

Displaying error in frequency (Hz) using two rotary encoders each with 100 output pulses per revolution.

$$\text{Prescale value of INA } (\alpha) = 1/60 = 0.01666... \doteq 1.6666 \times 10^{-2}$$

$$\text{Prescale value of INB } (\beta) = 1/60 = 0.01666... \doteq 1.6666 \times 10^{-2}$$

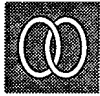
Prescale value =  $X \times 10^Y$  (X: mantissa, Y: exponent)

X (mantissa) of input A = 1.6666

Y (exponent) of input A = -2

X (mantissa) of input B = 1.6666

Y (exponent) of input B = -2



## REFERENCE

Refer to 4-2 *Setting Mode*.

### Hold Measured Value

When the HOLD input is turned ON, measurement stops and the input measured just before the HOLD input turned ON is held. While the HOLD input is ON, the K3NR holds display output, comparative output, and BCD output.

When the comparative output from the Output Board is connected to the HOLD input terminal, the value measured immediately after the occurrence of an error can be obtained.

### Performance Characteristics

<b>Accuracy of measurement</b>	$\pm 0.02\% \text{ rdg} \pm 1 \text{ digit}$ (ambient temperature: $23^\circ\text{C} \pm 5^\circ\text{C}$ )
<b>Measurement range</b>	Sensor with transistor output: 0.5 mHz to 50 kHz Sensor with relay output: 0.5 mHz to 30 Hz
<b>ON/OFF pulse width</b>	Sensor with transistor output: 9 $\mu\text{s}$ min. Sensor with relay output: 15 ms min.

Response time	Output configuration				
	Relay output	Transistor output	BCD and transistor output	Linear and transistor output	Communication and transistor output
<b>Comparative output</b>	200 ms max.				
<b>BCD output</b>	---	---	Refer to page 139.	---	---
<b>Linear output</b>	---	---	---	220 ms max.	---

## Available Functions

Available functions in this mode are indicated as “Yes” in the following table.

Menu	Function	Displayed Character	Availability	Reference page
---	Max./Min. value display and reset	---	Yes	121
	Estimated frequency calculation	---	Yes	153
sUset (See note 2)	Set value bank no. of set values	s.bank	Yes	60
	HH set value	sU*.hh		
	H set value	sU*. h		
	L set value	sU*. l		
	LL set value	sU*.ll		
pscl	Select bank no. of prescale value	p.bank	Yes	65
	Prescaling value of input A X (mantissa) Y (exponent)	ps*.ax ps*.ay	Yes	
	Prescaling value of input B X (mantissa) Y (exponent)	ps*.bx ps*.by	Yes	
	Decimal point position	dec.p.*	Yes	
setup	Operating mode	func	Yes	70
	Input A sensor type	ina	Yes	72
	Input B sensor type	inb	Yes	
	Auto zero time of input A X (mantissa) Y (exponent)	=ro.ax =ro.ay	Yes	74
	Auto zero time of input B X (mantissa) Y (exponent)	=ro.bx =ro.by	Yes	
	Display time unit	time	No	77
	Communications unit no. (See note 1)	u-no	Yes	79
	Baud rate (See note 1)	bps	Yes	
	Word length (See note 1)	len	Yes	82
	Stop bits (See note 1)	sbit	Yes	
opt	Parity bits (See note 1)	prty	Yes	85
	Process time for averaging measured value	aUg	Yes	
	Startup compensation time	stime	Yes	
	Power failure memory	memo	No	
	Hysteresis (See note 1)	hys	Yes	
	Comparative output pattern (See note 1)	c-out	Yes	
	H linear output range (See note 1)	lset.h	Yes	
	L Linear output range (See note 1)	lset.l	Yes	
	Remote/Local programming (See note 1)	r-l	Yes	101

- Note**
1. The availability of the parameters depends on the type of selected Output Board.
  2. The selected bank number will be displayed where an asterisk (\*) appears.