

Absolute angle encoder  
Enclosed type

# RU77-4096

- Magnetic system enables use even in environments with condensation, oil, and other adverse conditions
- Enables direct communication using the protocol of each supporting manufacturer without the requirement of an amplifier
- Internal coupling allows for design and mounting flexibility

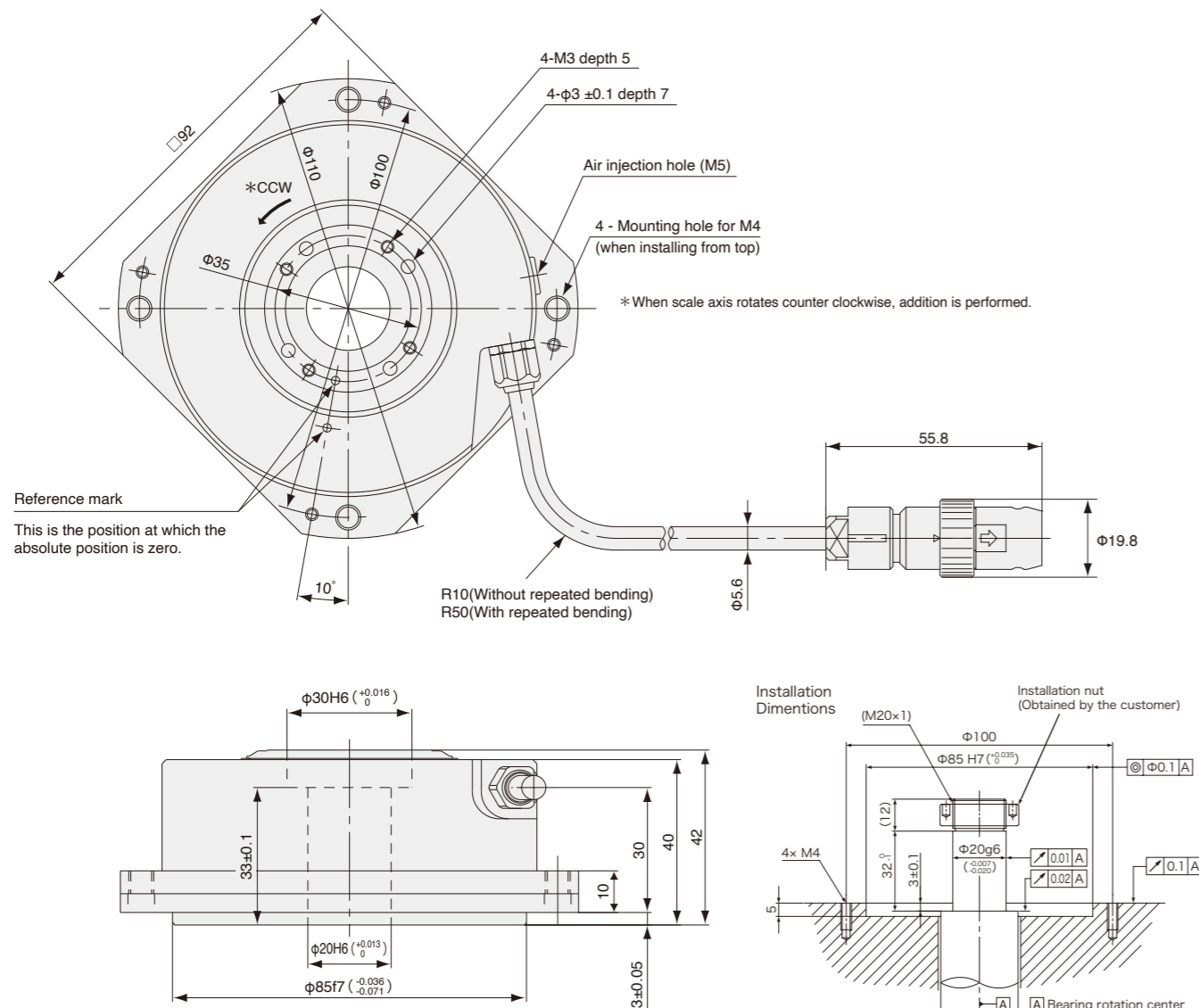


FANUC

Mitsubishi Electric

Yaskawa Electric

## Dimensions



## Specifications

Model name	RU77 - 4096A□A	RU77 - 4096A□B RU77 - 4096A□D	RU77 - 4096A□F
Output wave number	4,096 waves/revolution		
Through hole diameter	φ20 mm		
Accuracy(at 20°C)	±2.5"		
Output signal	Absolute serial bidirectional signal, compliant with EIA-485		
Compatible controllers	FANUC	Mitsubishi Electric	Yaskawa Electric
Maximum resolution	25bit (33,554,432 pulse/revolution)		21bit (2,097,152 pulse/revolution)
Maximum response revolutions	2,000 min <sup>-1</sup>		
Maximum mechanical revolutions	3,000 min <sup>-1</sup>		
Product Safety	FCC Part15 Subpart B Class A ICES-003 Class A Digital Device EN/BS 61000-6-2, EN/BS 61000-6-4		
Product Environment	EN/BS 63000		
Operating temperature range	0 to +60°C		
Storage temperature range	-10 to +60°C		
Vibration resistance	150 m/s <sup>2</sup> (50 Hz to 2000 Hz)		
Impact resistance	1,000 m/s <sup>2</sup> (11 ms)		
Protective design grade	IP65		
Power supply voltage range	DC4.75-5.25 V (with connecting terminal)		
Consumption current	200mA (at 120Ω termination)		
Moment of inertia	9.4×10 <sup>-5</sup> kgm <sup>2</sup> or less		
Starting torque (at 20°C)	0.1 Nm or less		
Mass	Approx. 1.2kg or less		
Standard compatible cable	CH33A-***, CE28A-***	CH33-***, CE28-***	
Maximum cable length	CH33A-*** : 30 m, CE28A-*** : 15 m	CH33-*** : 30 m, CE28A-*** : 15 m	

\*Magnescale reserves the right to change product specifications without prior notice.

## Details of model designation

### Scale

RU77 - 4096A□□★○○

### Resolution

Type	Resolution	Number of pulses/revolution	Number of partitions
A	Approx. 2.5°/1,000	131,072	1/32
B	Approx. 1°/1,000	262,144	1/64
C	Approx. 7°/10,000	524,288	1/128
D	Approx. 3.5°/10,000	1,048,576	1/256
E	Approx. 2°/10,000	2,097,152	1/512
F	Approx. 1°/10,000	4,194,304	1/1,024
G	Approx. 4.5°/100,000	8,388,608	1/2,048
H	Approx. 2°/100,000	16,777,216	1/4,096
J	Approx. 1°/100,000	33,554,432	1/8,192

\*Yaskawa Electric: D,F

### Connector

Connector	Description	Remarks
Metal water proofing	G	main cable length Max.9m, extension cable : CE28/CE28A ※Max cable length(main+extension) : 15m
Plastic water proofing	J	main cable length Max.1m, extension cable : CH33/CH33A ※Max cable length(main+extension) : 30m

### Cable

CH33 - □□○▽※#

CH33A- □□○▽※#

(CH33A : FANUC model only)

□□ Cable length  
Written by flush right,  
indication in "m" units,  
up to 30 m, 1 m pitch

Type	Cable length
07	7m
26	26m

Type	Conduit
C	With conduit
N	Without conduit

CE28 - □□□○※

CE28A- □□□○※

(CE28A : FANUC model only)

□□□ Cable length  
Written by flush right,  
indication in "10cm" units,  
up to 14m, 1m pitch

Type	Cable length
070	7m
090	9m
130	13m

Type	Conduit
C	With conduit
N	Without conduit

### Communication protocol

Type	Number of wires	NC manufacturer
A	4-wire	FANUC α interface
B	2-wire	Mitsubishi Electric
D	4-wire	Mitsubishi Electric
F	2-wire	Yaskawa Electric

### Cable length

Type	Cable length
10	1m

### Cable sheath (covering)

Type	Specification
P	PVC (Polyvinyl chloride)
E	PU (Polyurethane)

### Controller side connector

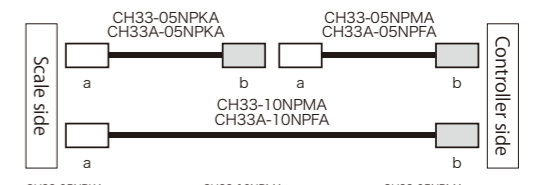
Type	Specification	Remarks
Without/With	Earth wire	
None -	Open-end	Standard
M -	10P made by Sumitomo 3M	Mitsubishi NC, J3, J4 (ABS)
F -	20P straight case made by Honda Tsushin Kogyo	FANUC (ABS)
G -	6P made by molex®	YASKAWA Electric (ABS)
J -	Horizontal drawing case made by HROSE Electric	FANUC (ABS)
K -	10P JN1 (Male) made by Japan Aviation Electronics Industry	Relay

### Controller side connector

Type	Specification	Remarks
Without/With	Earth wire	
Without -	Open-end	Standard
M -	10P made by Sumitomo 3M	Mitsubishi NC, J3, J4 (ABS)
F -	20P made by Honda Tsushin Kogyo	FANUC (ABS)
G -	6P made by molex®	YASKAWA Electric (ABS)
J -	10P (E1) made by Japan Aviation Electronics Industry	RU77 cable extension (standard)
K -	10P (JN1) made by Japan Aviation Electronics Industry	RU77 cable extension (standard)

### Scale side connector

Type	Specification	Remarks
A	10P JN2 (Female) made by Japan Aviation Electronics Industry	Relay



CH33-05NPMA  
CH33A-05NPMA  
example)  
Cable length 5m  
Without conduit  
Controller side connector  
10P (JN1) made by Japan Aviation Electronic Industry  
Scale side connector  
JN2D510SL2-R made by Japan Aviation Electronics Industry

CH33-10NPMA  
CH33A-10NPMA  
example)  
Cable length 10m  
Without conduit  
Controller side connector  
<CH33> 10P made by Sumitomo 3M  
<CH33A> 20P made by Honda Tsushin Kogyo  
Scale side connector  
JN2D510SL2-R made by Japan Aviation Electronics Industry

CH33-05NPMA  
CH33A-05NPMA  
example)  
Cable length 5m  
Without conduit  
Controller side connector  
<CH33> 10P made by Sumitomo 3M  
<CH33A> 20P made by Honda Tsushin Kogyo  
Scale side connector  
JN2D510SL2-R made by Japan Aviation Electronics Industry

SR67A  
SR7A  
SR84  
RS97-004E  
RS97-004N  
RU97-004E  
RU77-4096