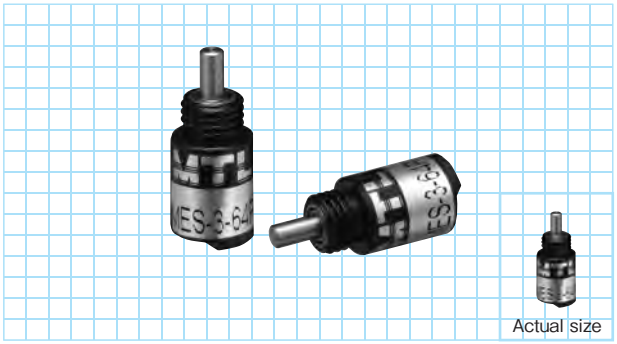
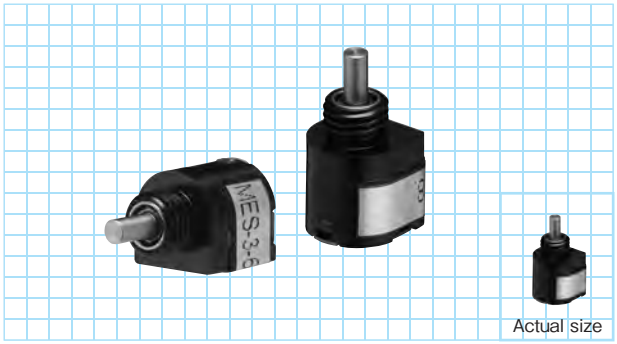
MES-3P series
[Square Wave/Incremental]



Specifications

Item		Type name MES-3-64P
Supply voltage		DC3.2±0.1V
Current consumption		15mA or less
Detection system		Incremental
Output	Output pulse number (Standard) 〔Pulse number/rotation〕	64P／R、100P／R
	Output phase	A, B, Z phase
	Output form	Square wave, Voltage output
	Output capacity	Signal Type : C-MOS Compatible Current : IOL =+8mA, IOH=−2mA Voltage : VOL≦0.3V(at IOL=+1mA) VOH≧Vcc−0.3V (at IOL=−1mA) Load Voltage : 3.3V max(≦Vcc)
	Maximum response frequency (response pulse number)	100kHz
	Output phase difference	A, B phase difference :T／4±T／8 Z phase:T±0.5T
	Waveform rise/fall time	2μs or less (At150mm flex. cable +300mm AWG30 cable)
Starting torque		5×10⁻⁴N·m or less(5gf·cm)or less
Allowable load of shaft (electrical)	Radial	0.98N(100gf)
	Thrust	0.98N(100gf)
Maximum allowable revolutions (mechanical)		6,000rpm
Working ambient temperature/ humidity		0°C～60°C RH35%～90% no dewing
Storing ambient temperature		−20°C～80°C
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions
Impact resistance		Durability 500m/s² (about 50G) 3 times each in X, Y, and Z directions
Cable		Flexible cable:About 150mm in length
Mass		5g(include a flexible cable)

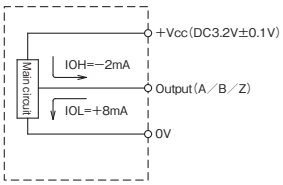
MES-3PST series
[Square Wave/Incremental]



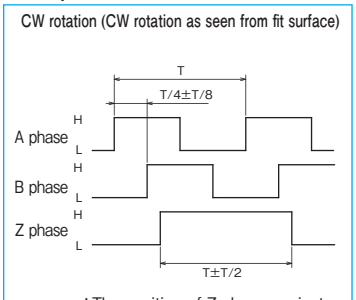
Specifications

Item		Type name MES-3-64PST16
Supply voltage		DC3.2±0.1V
Current consumption		20mA or less
Detection system		Incremental
Output	Output pulse number (Standard) 〔Pulse number/rotation〕	1024P／R (64P/R × 16 inner interpolatory)
	Output phase	A, B, Z phase
	Output form	Square wave, Voltage output
	Output capacity	Signal Type : C-MOS Compatible Current : IOL =+8mA, IOH=−2mA Voltage : VOL≦0.3V(at IOL=+1mA) VOH≧Vcc−0.3V (at IOL=−1mA) Load Voltage : 3.3V max(≦Vcc)
	Maximum response frequency (response pulse number)	100kHz
	Output phase difference	A/B phase difference : T/4±T/8 phase deviation : T±0.35T Z width : 1T
	Waveform rise/fall time	2μs or less (At 150mm flex. cable +300mm AWG30 cable)
Starting torque		5×10⁻⁴N·m or less(5gf·cm) or less
Allowable load of shaft (electrical)	Radial	0.98N(100gf)
	Thrust	0.98N(100gf)
Maximum allowable revolutions (mechanical)		6,000rpm
Working ambient temperature/ humidity		0°C～60°C RH35%～90% no dewing
Storing ambient temperature		−20°C～80°C
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions
Impact resistance		Durability 500m/s² (about 50G) 3 times each in X, Y, and Z directions
Cable		Flexible cable:About 150mm in length
Mass		5g(include a flexible cable)

Output circuit diagram(ME−3P、ME−3PST)

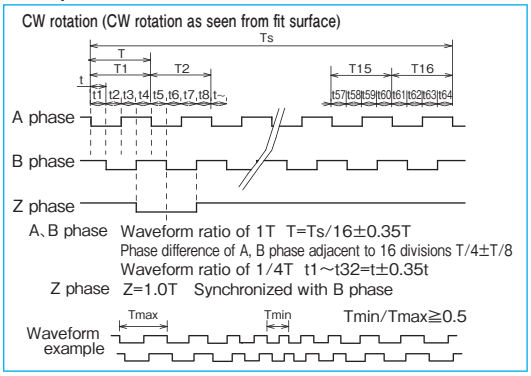


Output waveform(ME−3P)



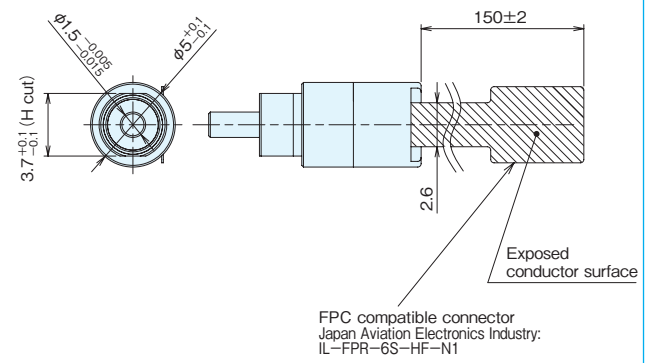
*The position of Z phase against A, B phase is not specified.

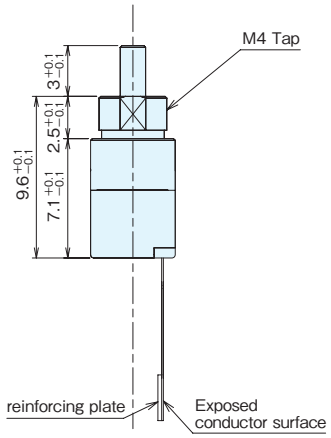
Output waveform(ME−3PST)

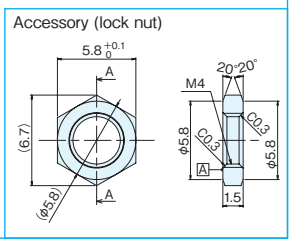


Outside dimensions

MES-3P

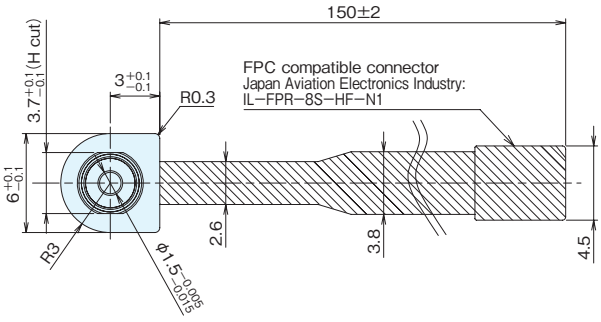


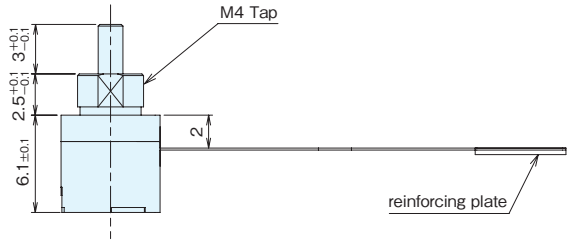


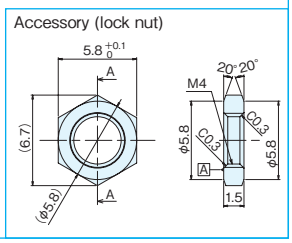


Outside dimensions

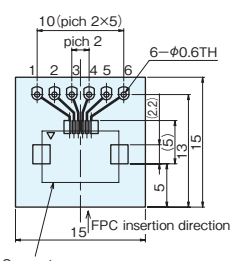
MES-3PST







Connection board (accessory)

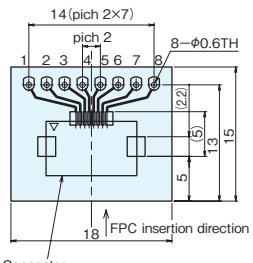


Connector
Japan Aviation Electronics Industry: IL-FPR-6S-HF-N1

Wiring list

TH No.	Signal name
1	Vcc(DC3.2V±0.1V)
2	Z phase
3	0V
4	A phase
5	B phase
6	0V

Connection board (accessory)



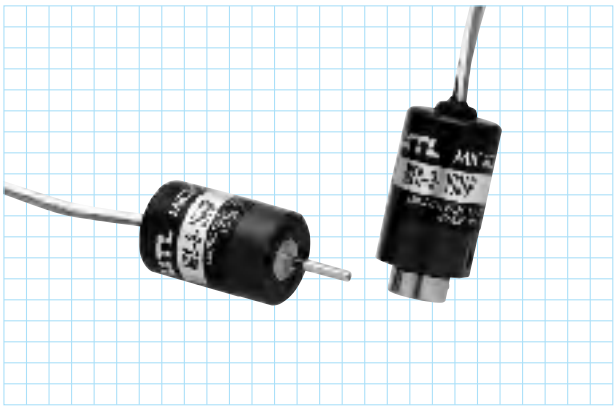
Connector
Japan Aviation Electronics Industry: IL-FPR-8S-HF-N1

Wiring list

TH No.	Signal name
1	Vcc(DC3.2V±0.1V)
2	No connection
3	No connection
4	Vcc(DC3.2V±0.1V)
5	Z phase
6	B phase
7	A phase
8	0V

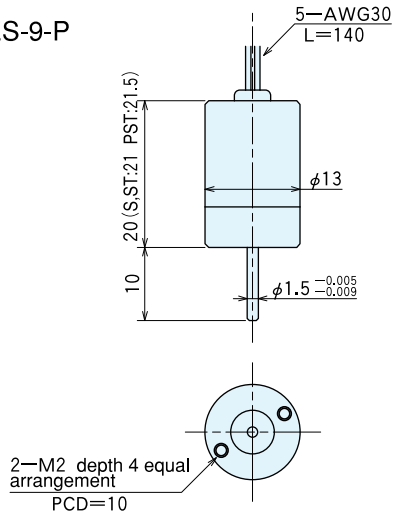
ME-9-P series

[Square Wave/Incremental]

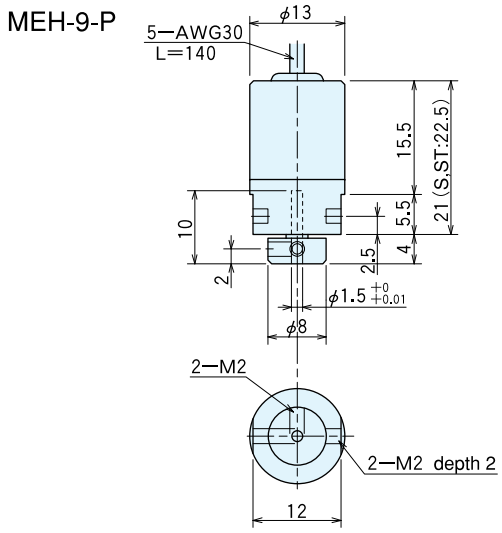


Outside dimensions

MES-9-P



MEH-9-P

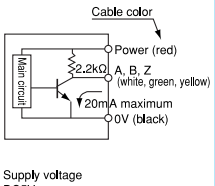


Specifications

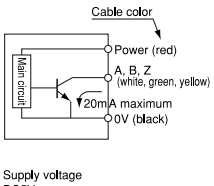
Item			
Type name	ME□-9-□P□ Shaft shape ●S=single shaft ●H=hollow shaft Pulse number Output circuit ●No entry=voltage output ●C=open collector output ●E=line driver output ●S=sine wave output ●ST=built-in multiplication circuit		
Supply voltage	DC5V ±10%		
Current consumption	40mA or less (under no load)		
Detection system	Incremental		
Output	Output pulse number (Standard) [Pulse number/rotation]	100 200 256 300 360 500	900 1,000 1,024
Output	Output phase	A, B, Z phase (Z="H")	
Output	Output form	Square wave	
Output	Output capacity	Sink current: 20mA Residual voltage: 0.5V or less (at 10mA)	
Output	Maximum response frequency (response pulse number)	100kHz	
Output	Output phase difference	A, B phase difference 90°±45° (T/4±T/8) Z phase T±T/2 (see Output Waveform)	
Output	Waveform rise/fall time	2μs or less (output cable 140mm or less)	
Starting torque		1×10⁻³N·m (10gf·cm) or less	
Allowable load of shaft (electrical)	Radial	1.9N (200gf)	0.98N (100gf)
Allowable load of shaft (electrical)	Thrust	1.9N (200gf)	0.98N (100gf)
Maximum allowable revolutions (mechanical)		6,000r/min	
Working ambient temperature/humidity		0°C~60°C RH35%~90% no dewing	
Storing ambient temperature		-20°C~80°C	
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions	
Impact resistance		Durability 500m/s² (about 50G) 3 times each in X, Y, and Z directions	
Cable		Vinyl wire (AWG30) Cable length 140mm	
Mass		10g	

Output circuit diagram

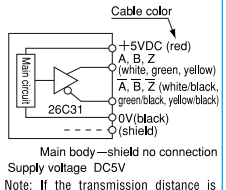
Voltage output (standard type)



Open collector output (option)

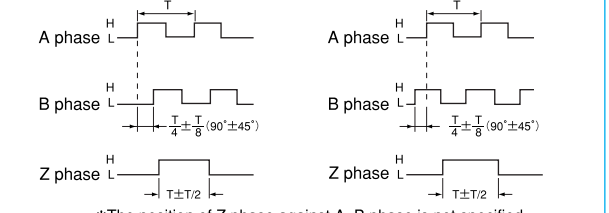


Line driver output (option)



Note: If the transmission distance is long, it should be so considered that the specified voltage occurs at the input portion of the encoder cable end.

Output waveform



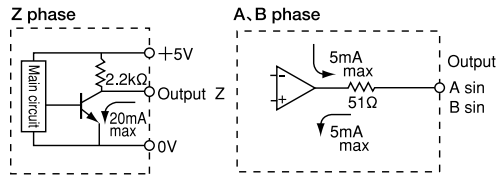
*The position of Z phase against A, B phase is not specified.

Specifications/Sine wave

Supply voltage		DC5V ±10%
Current consumption		40mA or less (under no load)
Detection system		Sine wave・Incremental
Output	Output pulse number (Standard) 〔Pulse number/rotation〕	1,000
	Output phase	A、B、Z phase
	Output form	Square wave
	A, B, Z phase output	SIN wave 1.5 Vp-p±0.3 V offset 2.0V±0.2V
		OP amp output current 5 mA MAX
		Harmonic distortion factor to be within 10% (Measuring condition to be within 20 kHz, effective value mean distortion factor measuring instrument)
	Maximum response frequency	100kHz
	Output phase difference	A, B phase difference 90°±45° (T/4±T/8) Z phase T±T/2 (see Output Waveform)
	Waveform rise/fall time	2μs or less (output cable 140mm or less)
Starting torque		1×10^{-3}N・m (10gf・cm) or less
Allowable load of shaft (electrical)	Radial	0.98N (100gf)
	Thrust	0.98N (100gf)
Maximum allowable revolutions (mechanical)		6,000r/min
Working ambient temperature/ humidity		0°C～60°C RH35%～90% no dewing
Storing ambient temperature		-20°C～80°C
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions
Impact resistance		Durability 500m/s^2 (about 50G) 3 times each in X, Y, and Z directions
Cable		Vinyl wire (AWG30) Cable length 140mm
Mass		10g

Output circuit diagram

Sine wave output (option)

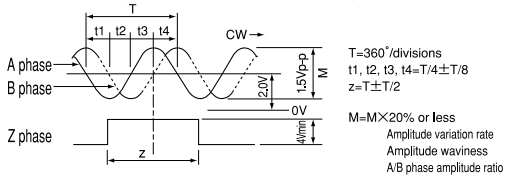


Signal name	Lead wire color
Vcc	Red
0V	Black
A phase	White
B phase	Green
Z phase	Yellow

A capacitor (0.1μF) is connected between 0V and FG (frame ground).

Output waveform

Sine wave output (option)
CW rotation (CW rotation as seen from fit surface)

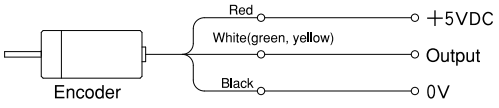


*The position of Z phase against A, B phase is not specified.

Specifications Built-in multiplication circuit (×2・×4・×8・×16)

Supply voltage		DC5V ±5%
Current consumption		40mA or less (under no load)
Detection system		Incremental
Output	Output pulse number (Standard) 〔Pulse number/rotation〕	EX 1,000×2 (2,000) 1,000×4 (4,000) 1,000×8 (8,000) 1,000×16 (16,000)
	Output phase	A、B、Z phase
	Output form	Square wave, Open collector output *Line driver output
	Maximum response frequency	Open collector output:100kHz
	Output phase difference	See the diagram below.
	Waveform rise/fall time	1μs or less (output cable 140mm or less)
Starting torque		1×10^{-3}N・m (10gf・cm) or less
Allowable load of shaft (electrical)	Radial	0.98N (100gf)
	Thrust	0.98N (100gf)
Maximum allowable revolutions (mechanical)		6,000r/min
Working ambient temperature/ humidity		0°C～60°C RH35%～90% no dewing
Storing ambient temperature		-20°C～80°C
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions
Impact resistance		Durability 500m/s^2 (about 50G) 3 times each in X, Y, and Z directions
Cable		Vinyl wire (AWG30) Cable length 140mm
Mass		10g

Output connection diagram

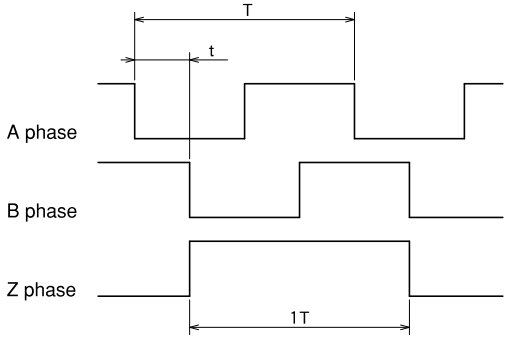


Cable color	Red	Black	White	Green	Yellow	Brown	Blue	Orange
Signal	+5V	0V	A phase	B phase	Z phase	$\overline{A}$ phase	$\overline{B}$ phase	$\overline{Z}$ phase

*Line driver output.

Output waveform

CW rotation (CW rotation as seen from fit surface)



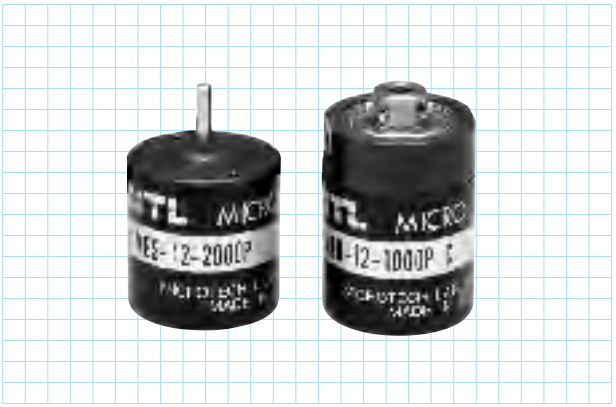
Synchronous with 1T of B phase

T: Waveform ratio of 1T T=T±0.5 (−T16)
T±0.4 (−T8)
T±0.3 (−T4,−T2)

t: Phase difference between adjacent A and B phases
t=T/4±1/8T

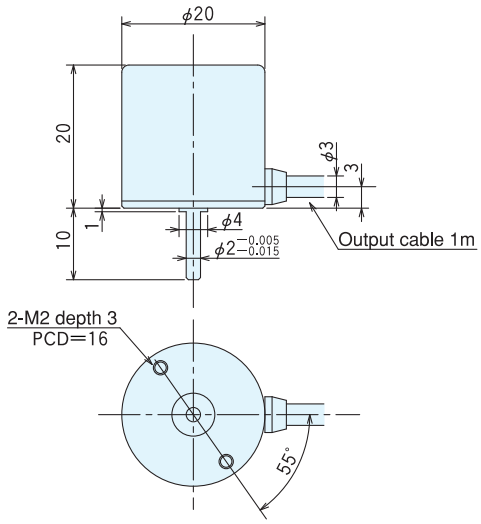
ME-12-P series

[Square Wave/Incremental]

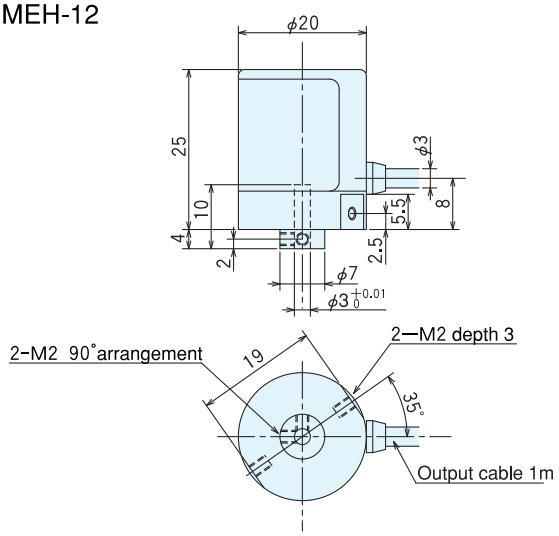


Outside dimensions

MES-12



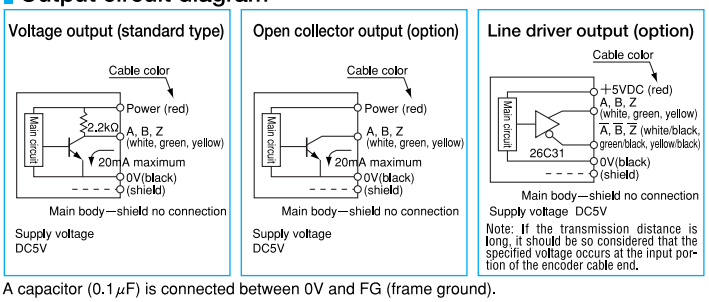
MEH-12



Specifications

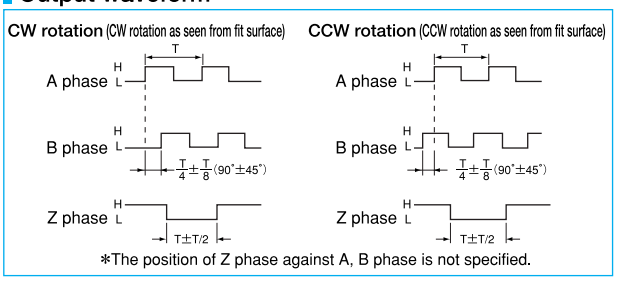
Item			
Type name	ME□-12-□P□ Shaft shape ●S=single shaft ●H=hollow shaft Pulse number Output circuit ●No entry=voltage output ●C=open collector output ●E=line driver output ●S=sine wave output ●ST=built-in multiplication circuit		
Supply voltage	DC5V ±10%		
Current consumption	40mA or less (under no load)		
Detection system	Incremental		
Output	Output pulse number (Standard) [Pulse number/rotation]	100 200 256 300 360 / 500 600 900 1,000 1,024	1,500 1,800 2,000 2,048
Output	Output phase	A, B, Z phase	
Output	Output form	Square wave	
Output	Output capacity	Sink current: 20mA Residual voltage: 0.5V or less (at 10mA)	
Output	Maximum response frequency (response pulse number)	100kHz	
Output	Output phase difference	A, B phase difference 90°±45° (T/4±T/8) Z phase T±T/2 (see Output Waveform)	
Output	Waveform rise/fall time	2μs or less (output cable 1m or less)	
Starting torque		1×10^{-3}N·m (10gf·cm) or less	
Allowable load of shaft (electrical)	Radial	1.9N (200gf)	0.98N (100gf)
Allowable load of shaft (electrical)	Thrust	1.9N (200gf)	0.98N (100gf)
Maximum allowable revolutions (mechanical)		6,000r/min	
Working ambient temperature/ humidity		-10°C~70°C RH35%~90% no dewing	
Storing ambient temperature		-20°C~80°C	
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions	
Impact resistance		Durability 500m/s² (about 50G) 3 times each in X, Y, and Z directions	
Cable		Outside diameter φ3 5-core vinyl wire Insulated shield cable (length 1m)	
Mass		40g	

Output circuit diagram



A capacitor (0.1μF) is connected between 0V and FG (frame ground).

Output waveform



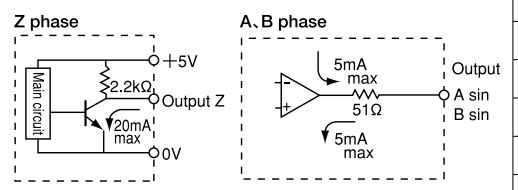
*The position of Z phase against A, B phase is not specified.

Specifications/Sine wave

Supply voltage		DC5V ±10%
Current consumption		40mA or less (under no load)
Detection system		Sine wave・Incremental
Output	Output pulse number (Standard) 〔Pulse number/rotation〕	1,000 2,000 1,500 2,048 1,800
	Output phase	A, B, Z phase
	Output form	A, B phase SIN wave, Z phase square wave
	A, B, Z phase output	SIN wave 1.5 Vp-p±0.3 V offset 2.0V±0.2V
		Opamp output current 5mA Max.
		Harmonic distortion factor to be within 10% (Measuring condition to be within 20 kHz, effective value mean distortion factor measuring instrument)
	Maximum response frequency	50kHz
	Output phase difference	A, B phase difference 90°±45° (T/4±T/8) Z phase T±T/2 (see Output Waveform)
	Waveform rise/fall time	2μs or less (output cable 1m or less)
Starting torque		1×10⁻³N・m or less
Allowable load of shaft (electrical)	Radial	0.98N (100gf)
	Thrust	0.98N (100gf)
Maximum allowable revolutions (mechanical)		6,000r/min
Working ambient temperature/ humidity		0°C～50°C RH35%～90% no dewing
Storing ambient temperature		-20°C～80°C
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions
Impact resistance		Durability 500m/s² (about 50G) 3 times each in X, Y, and Z directions
Cable		Outside diameter φ3 5-core vinyl wire Insulated shield cable (length 1m)
Mass		40g

Output circuit diagram

Sine wave output (option)

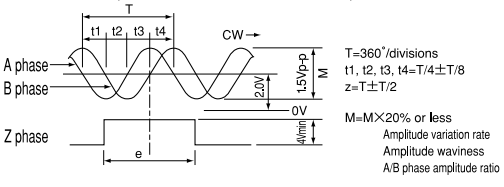


Signal name	Lead wire color
Vcc	Red
0V	Black
A phase	White
B phase	Green
Z phase	Yellow

A capacitor (0.1μF) is connected between 0V and FG (frame ground).

Output waveform

Sine wave output (option)
CW rotation (CW rotation as seen from fit surface)

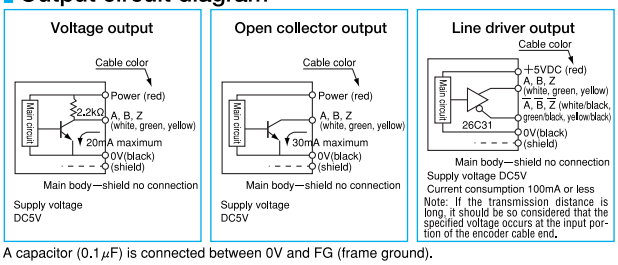


*The position of Z phase against A, B phase is not specified.

Specifications Built-in multiplication circuit (×2・×4・×8・×16)

Supply voltage		DC5V ±5%
Current consumption		60mA or less (under no load)
Detection system		Incremental
Output	Output pulse number (Standard) 〔Pulse number/rotation〕	EX 2,000×2 (4,000) 2,000×4 (8,000) 2,000×8 (16,000) 2,000×16 (32,000)
	Output phase	A, B, Z phase
	Output form	Square wave
	Maximum response frequency	Line driver output:50kHz× (by multiplication) Voltage output・Open collector output:100kHz
	Output phase difference	See the diagram below.
	Waveform rise/fall time	2μs or less (output cable 1m or less)
Starting torque		1×10⁻³N・m or less
Allowable load of shaft (electrical)	Radial	0.98N (100gf)
	Thrust	0.98N (100gf)
Maximum allowable revolutions (mechanical)		6,000r/min
Working ambient temperature/ humidity		-10°C～70°C RH35%～90% no dewing
Storing ambient temperature		-20°C～80°C
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions
Impact resistance		Durability 500m/s² (about 50G) 3 times each in X, Y, and Z directions
Cable		Outside diameter φ3 5-core vinyl wire Insulated shield cable (length 1m)
Mass		40g

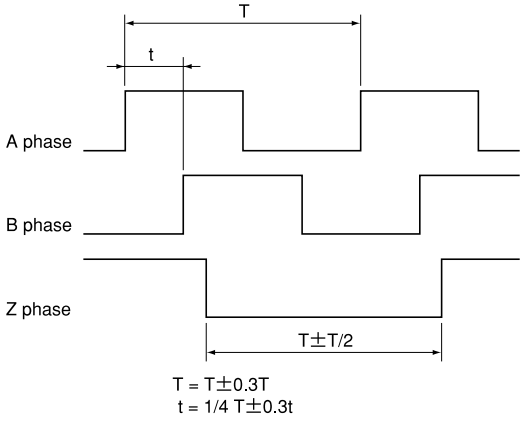
Output circuit diagram



A capacitor (0.1μF) is connected between 0V and FG (frame ground).

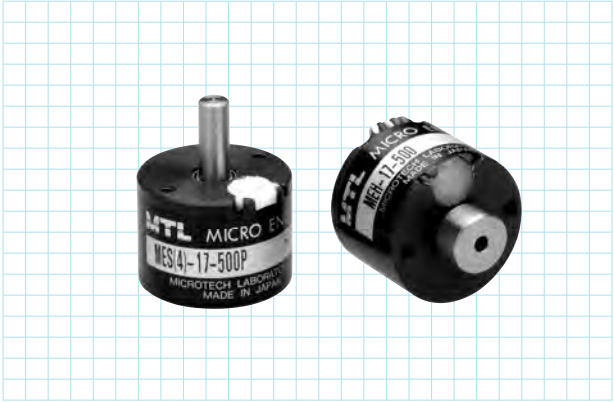
Output waveform

CW rotation (CW rotation as seen from fit surface)

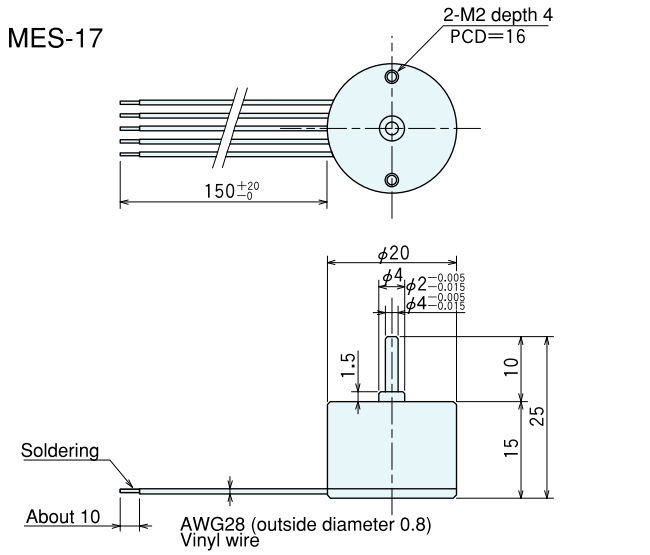


ME-I7-P series

[Square Wave/Incremental]



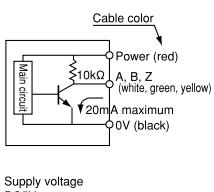
Outside dimensions



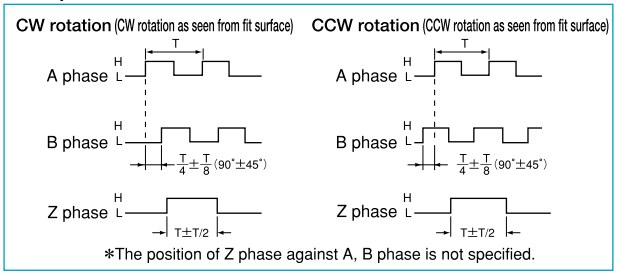
Specifications

Item		Type name: ME□-17-□P (Shaft shape: ●S(2)=φ2 single shaft, ●S(4)=φ4 single shaft, ●H=hollow shaft; Pulse number)
Supply voltage		DC5V ±10%
Current consumption		30mA or less (under no load)
Detection system		Incremental
Output	Output pulse number (Standard) [Pulse number/rotation]	100 300 400 200 360 500
Output	Output phase	A, B, Z phase (Z="H")
Output	Output form	Square wave, voltage output only Pull-up resistance 10kΩ
Output	Output capacity	Sink current: 20mA Residual voltage: 0.4V or less (at 10mA)
Output	Maximum response frequency (response pulse number)	50kHz
Output	Output phase difference	A, B phase difference 90°±45° (T/4±T/8) Z phase T±T/2 (see Output Waveform)
Output	Waveform rise/fall time	2μs or less
Starting torque		1×10⁻³N·m (10gf·cm) or less
Allowable load of shaft (electrical)	Radial	1.9N (200gf)
Allowable load of shaft (electrical)	Thrust	1.9N (200gf)
Maximum allowable revolutions (mechanical)		6000r/min
Working ambient temperature/ humidity		0°C~50°C RH35%~90% no dewing
Storing ambient temperature		-20°C~80°C
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions
Impact resistance		Durability 500m/s² (about 50G) 3 times each in X, Y, and Z directions
Cable		Vinyl wire AWG28 150mm
Mass		20g

Output circuit diagram



Output waveform



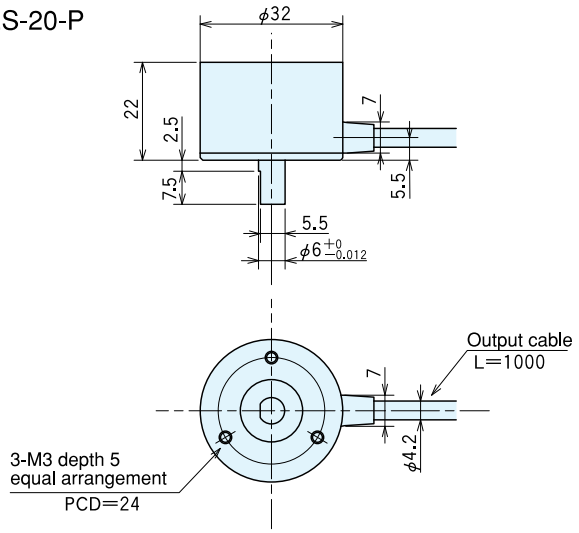
*The position of Z phase against A, B phase is not specified.

ME-20-P series

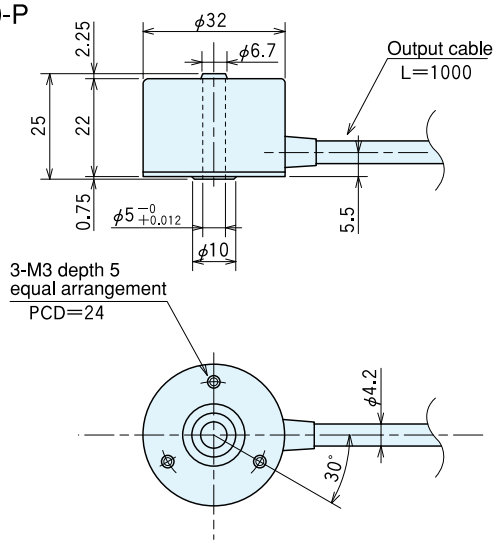
[Square Wave/Incremental]

Outside dimensions

MES-20-P



MEH-20-P

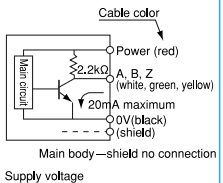


Specifications

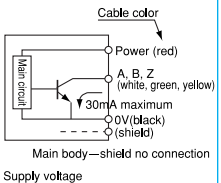
Item			
Type name	ME□-20-□P□ Shaft shape ●S=single shaft ●H=hollow shaft ●D=double shaft Pulse number Output circuit ●No entry=voltage output ●C=open collector output ●C4=open collector output DC24V ●E=line driver output ●S=sine wave output ●ST=built-in multiplication circuit		
Supply voltage	DC5～12V ±10% DC24V±10%(open collector output only)		
Current consumption	50mA or less (under no load)		
Detection system	Incremental		
Output	Output pulse number (Standard) 〔Pulse number/rotation〕	40 50 60 100 200 250 256 300 360 400 500 512 600 800 1,000 1,024 1,200 1,500 1,800 2,000 2,048 2,500 3,600 5,400 7,200	
Output	Output phase	A, B, Z phase	
Output	Output form	Square wave	
Output	Output capacity	Sink current: 20mA Residual voltage: 0.5V or less (at 10mA)	
Output	Maximum response frequency (response pulse number)	100kHz	
Output	Output phase difference	A, B phase difference 90°±45° (T/4±T/8) Z phase T±T/2 (see Output Waveform)	
Output	Waveform rise/fall time	2μs or less (output cable 1m or less)	
Starting torque		2×10⁻³N·m (20gf·cm) or less	
Allowable load of shaft (electrical)	Radial	19.6N (2kgf)	14.7N (1.5kgf)
Allowable load of shaft (electrical)	Thrust	9.8N (1kgf)	4.9N (0.5kgf)
Maximum allowable revolutions (mechanical)		6,000r/min	
Working ambient temperature/ humidity		-10°C～70°C RH35%～90% no dewing	
Storing ambient temperature		-20°C～80°C	
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions	
Impact resistance		Durability 500m/s² (about 50G) 3 times each in X, Y, and Z directions	
Cable		Outside diameter ϕ4.2 5-core vinyl wire Insulated shield cable (length 1m)	
Mass		70g	

Output circuit diagram

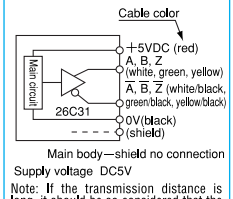
Voltage output (standard type)



Open collector output (option)



Line driver output (option)

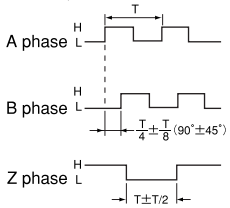


Note: If the transmission distance is long, it should be so considered that the specified voltage occurs at the input portion of the encoder cable end.

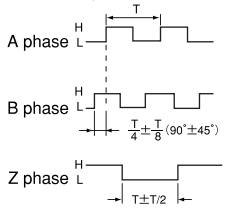
A capacitor (0.1μF) is connected between 0V and FG (frame ground).

Output waveform

CW rotation (CW rotation as seen from fit surface)



CCW rotation (CCW rotation as seen from fit surface)



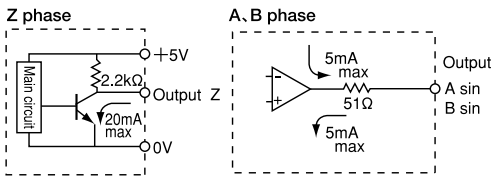
*The position of Z phase against A, B phase is not specified.

Specifications/Sine wave

Supply voltage		DC5V ±5%
Current consumption		40mA or less (under no load)
Detection system		Sine wave・Incremental
Output	Output pulse number (Standard) 〔Pulse number/rotation〕	1,000 2,000 2,500
	Output phase	A, B, Z phase
	Output form	A, B phase SIN wave, Z phase square wave
	A, B, Z phase output	SIN wave 1.5 Vp-p±0.3 V offset 2.0V±0.2V
		Opamp output current 5mA Max.
		Harmonic distortion factor to be within 10% (Measuring condition to be within 20 kHz, effective value mean distortion factor measuring instrument)
	Maximum response frequency	50kHz
	Output phase difference	A, B phase difference 90°±45° (T/4±T/8) Z phase T±T/2 (see Output Waveform)
Starting torque		2×10^{-3}N・m (20gf・cm) or less
Allowable load of shaft (electrical)	Radial	14.7N (1.5kgf)
	Thrust	4.9N (0.5kgf)
Maximum allowable revolutions (mechanical)		6,000r/min
Working ambient temperature/ humidity		0°C～50°C RH35%～90% no dewing
Storing ambient temperature		-20°C～80°C
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions
Impact resistance		Durability 500m/s^2 (about 50G) 3 times each in X, Y, and Z directions
Cable		Outside diameter ϕ4.2 5-core vinyl wire Insulated shield cable (length 1m)
Mass		70g

Output circuit diagram

Sine wave output (option)

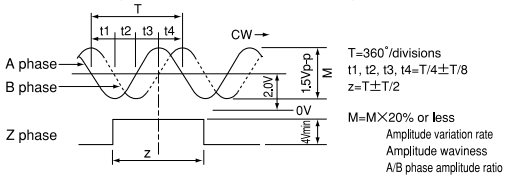


Signal name	Lead wire color
Vcc	Red
0V	Black
A phase	White
B phase	Green
Z phase	Yellow

A capacitor (0.1μF) is connected between 0V and FG (frame ground).

Output waveform

Sine wave output (option)
CW rotation (CW rotation as seen from fit surface)

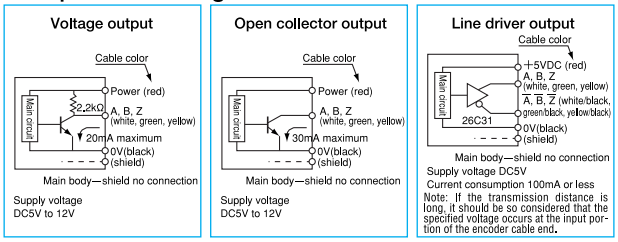


*The position of Z phase against A, B phase is not specified.

Specifications Built-in multiplication circuit (×2・×4・×8・×16)

Supply voltage		Voltage／Open collector:DC5V-5%～12V+10% Line driver:DC5V±5%
Current consumption		60mA or less (under no load)
Detection system		Incremental
Output	Output pulse number (Standard) 〔Pulse number/rotation〕	EX 2,500×2 (5,000) 2,500×4 (10,000) 2,500×8 (20,000) 2,500×16 (40,000)
	Output phase	A, B, Z phase
	Output form	Square wave
	Output capacity	Open collector out put:load voltage DC13.2V max
	Maximum response frequency	Line driver output:50kHz× (by multiplication) Voltage output・Open collector output:100kHz
	Output phase difference	See the diagram below.
Starting torque		2×10^{-3}N・m (20gf・cm) or less
Allowable load of shaft (electrical)	Radial	14.7N (1.5kgf)
	Thrust	4.9N (0.5kgf)
Maximum allowable revolutions (mechanical)		6,000r/min
Working ambient temperature/ humidity		-10°C～70°C RH35%～90% no dewing
Storing ambient temperature		-20°C～80°C
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions
Impact resistance		Durability 500m/s^2 (about 50G) 3 times each in X, Y, and Z directions
Cable		Outside diameter ϕ4.2 5-core vinyl wire Insulated shield cable (length 1m)
Mass		70g

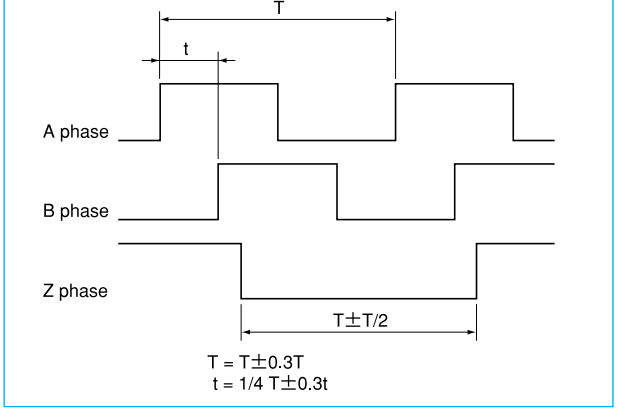
Output circuit diagram



A capacitor (0.1μF) is connected between 0V and FG (frame ground).

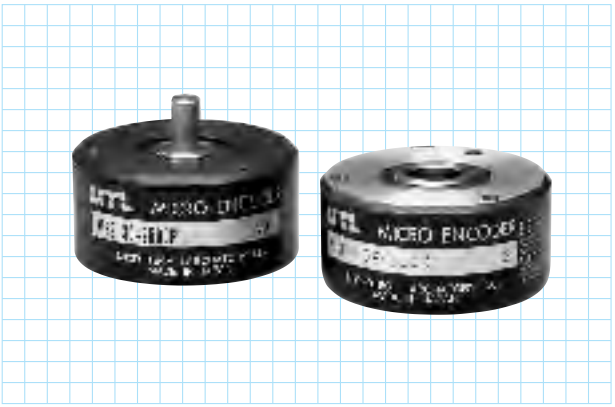
Output waveform

CW rotation (CW rotation as seen from fit surface)



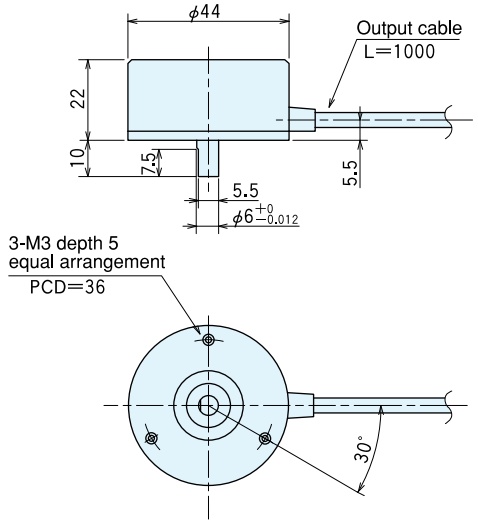
ME-30-P series

[Square Wave/Incremental]

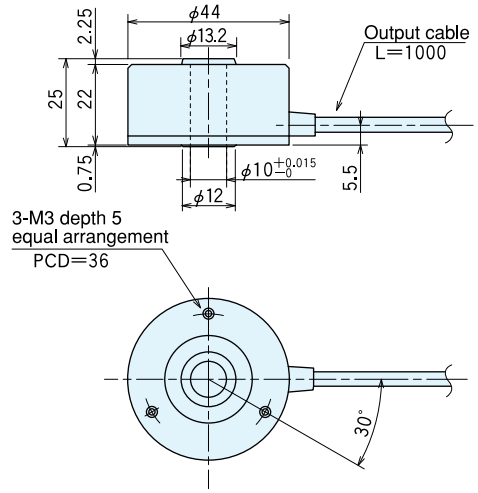


Outside dimensions

MES-30-P



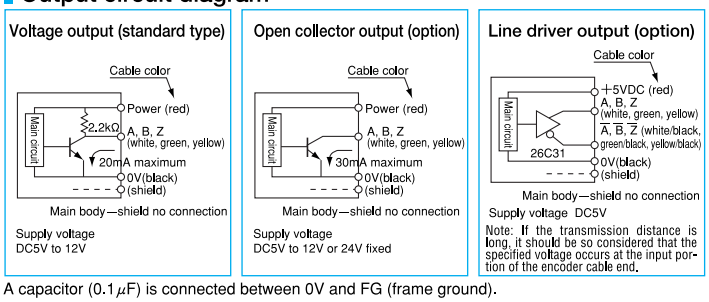
MEH-30-P



Specifications

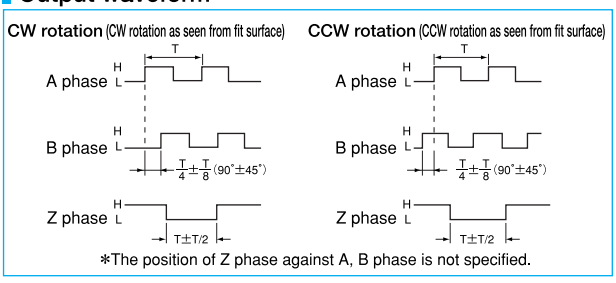
Item					
Type name	ME□-30-□P□ Shaft shape: ●S=single shaft ●H=hollow shaft ●D=double shaft; Pulse number; Output circuit: ●No entry=voltage output ●C=open collector output ●C4=open collector output DC24V ●E=line driver output ●S=sine wave output ●ST=built-in multiplication circuit				
Supply voltage	DC5～12V ±10% DC24V±10%(open collector output only)				
Current consumption	50mA or less (under no load)				
Detection system	Incremental				
Output	Output pulse number (Standard) 〔Pulse number/rotation〕	40 50 60 100 200	250 300 360 400 450	500 512 600	720 800 1,000 1,024 1,200 1,500 1,800 / 2,000 2,048 2,500 3,600 4,500 9,000 10,000
	Output phase	A, B, Z phase			
	Output form	Square wave			
	Output capacity	Sink current: 20mA Residual voltage: 0.5V or less (at 10mA)			
	Maximum response frequency (response pulse number)	100kHz			
	Output phase difference	A, B phase difference 90°±45° (T/4±T/8) Z phase T±T/2 (see Output Waveform)			
	Waveform rise/fall time	2μs or less (output cable 1m or less)			
Starting torque		2×10⁻³N·m (20gf·cm) or less			
Allowable load of shaft (electrical)	Radial	19.6N (2kgf)		14.7N (1.5kgf)	
	Thrust	9.8N (1kgf)		4.9N (0.5kgf)	
Maximum allowable revolutions (mechanical)		6,000r/min			
Working ambient temperature/ humidity		-10°C～70°C RH35%～90% no dewing			
Storing ambient temperature		-20°C～80°C			
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions			
Impact resistance		Durability 500m/s² (about 50G) 3 times each in X, Y, and Z directions			
Cable		Outside diameter ϕ4.2 5-core vinyl wire Insulated shield cable (length 1m)			
Mass		140g			

Output circuit diagram



A capacitor (0.1μF) is connected between 0V and FG (frame ground).

Output waveform



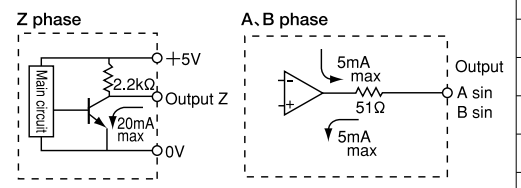
*The position of Z phase against A, B phase is not specified.

Specifications/Sine wave

Supply voltage		DC5V ±5%
Current consumption		40mA or less (under no load)
Detection system		Sine wave・Incremental
Output	Output pulse number (Standard) 〔Pulse number/rotation〕	1,000 2,048 1,500 3,600 1,800 4,500 2,000
	Output phase	A, B, Z phase
	Output form	A, B phase SIN wave, Z phase square wave
	A, B, Z phase output	SIN wave 1.5 Vp-p±0.3 V offset 2.0V±0.2V
		Opamp output current 5mA Max.
		Harmonic distortion factor to be within 10% (Measuring condition to be within 20 kHz, effective value mean distortion factor measuring instrument)
	Maximum response frequency	50kHz
	Output phase difference	A, B phase difference 90°±45° (T/4±T/8) Z phase T±T/2 (see Output Waveform)
Starting torque		2×10^{-3}N・m (20gf・cm) or less
Allowable load of shaft (electrical)	Radial	14.7N (1.5kgf)
	Thrust	4.9N (0.5kgf)
Maximum allowable revolutions (mechanical)		6,000r/min
Working ambient temperature/ humidity		0°C～50°C RH35%～90% no dewing
Storing ambient temperature		-20°C～80°C
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions
Impact resistance		Durability 500m/s^2 (about 50G) 3 times each in X, Y, and Z directions
Cable		Outside diameter φ4.2 5-core vinyl wire Insulated shield cable (length 1m)
Mass		140g

Output circuit diagram

Sine wave output (option)

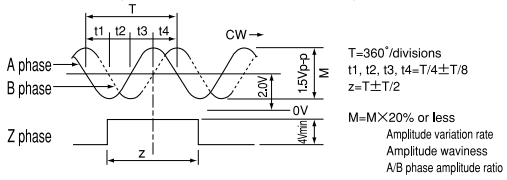


Signal name	Lead wire color
Vcc	Red
0V	Black
A phase	White
B phase	Green
Z phase	Yellow

A capacitor (0.1μF) is connected between 0V and FG (frame ground).

Output waveform

Sine wave output (option)
CW rotation (CW rotation as seen from fit surface)

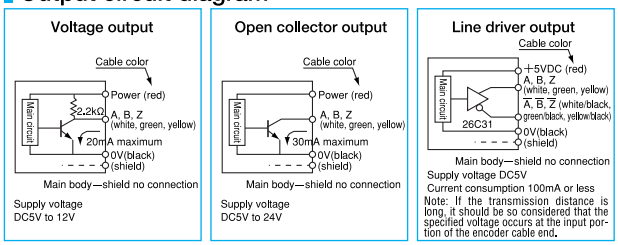


*The position of Z phase against A, B phase is not specified.

Specifications Built-in multiplication circuit (×2・×4・×8・×16)

Supply voltage		Voltage:DC5V-5%～12V+10% Open collector:DC5V-5%～24V+10% Line driver:DC5V±5%
Current consumption		80mA or less (under no load)
Detection system		Incremental
Output	Output pulse number (Standard) 〔Pulse number/rotation〕	EX 4,500×2 (9,000) 4,500×4 (18,000) 4,500×8 (36,000) 4,500×16 (72,000)
	Output phase	A, B, Z phase
	Output form	Square wave
	Maximum response frequency	Line driver output:50kHz× (by multiplication) Voltage output・Open collector output:100kHz
	Output phase difference	See the diagram below.
Starting torque		2×10^{-3}N・m (20gf・cm) or less
Allowable load of shaft (electrical)	Radial	14.7N (1.5kgf)
	Thrust	4.9N (0.5kgf)
Maximum allowable revolutions (mechanical)		6,000r/min
Working ambient temperature/ humidity		-10°C～70°C RH35%～90% no dewing
Storing ambient temperature		-20°C～80°C
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions
Impact resistance		Durability 500m/s^2 (about 50G) 3 times each in X, Y, and Z directions
Cable		Outside diameter φ4.2 5-core vinyl wire Insulated shield cable (length 1m)
Mass		140g

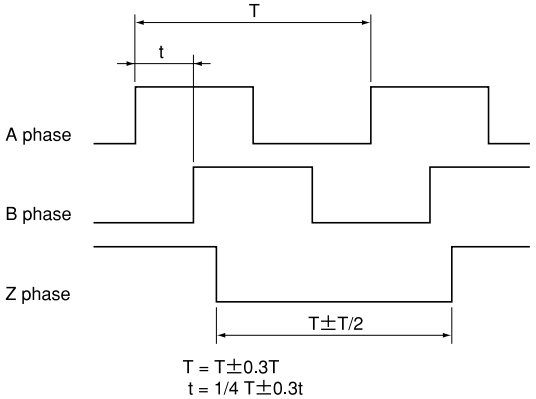
Output circuit diagram



A capacitor (0.1μF) is connected between 0V and FG (frame ground).

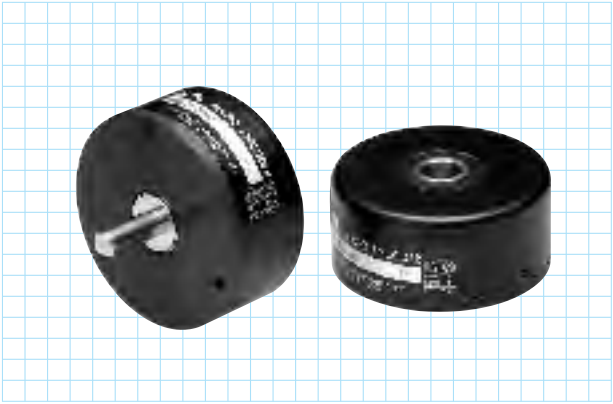
Output waveform

CW rotation (CW rotation as seen from fit surface)



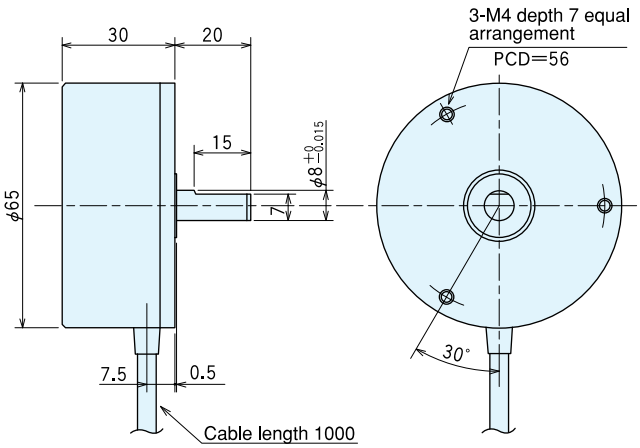
ME-50 series

[Square Wave/Incremental]

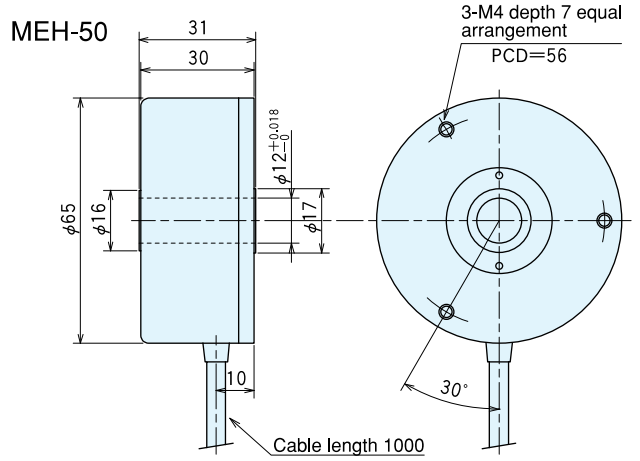


Outside dimensions

MES-50



MEH-50

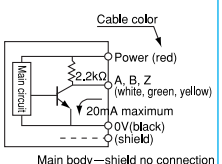


Specifications

Item			
Type name	ME□-50-□ □ (Shaft shape ●S=single shaft ●H=hollow shaft; Pulse number; Output circuit ●No entry=voltage output ●C=open collector output ●C4=open collector output DC24V ●E=line driver output ●S=sine wave output ●ST=built-in multiplication circuit ●P2=Two head detection)		
Supply voltage	DC5～12V ±10% DC24V±10% (option)		
Current consumption	60mA or less (under no load)		
Detection system	Incremental		
Output	Output pulse number (Standard) 〔Pulse number/rotation〕	500 1,000 1,024 2,000 3,000 3,600 4,096	5,000 5,400 6,000 10,000 10,800
Output	Output phase	A, B, Z phase	
Output	Output form	Square wave	
Output	Output capacity	Sink current: 20mA Residual voltage: 0.5V or less (at 10mA)	
Output	Maximum response frequency (response pulse number)	100kHz In case of voltage output, load resistance shall be 2.2kΩ. (Refer to the output circuit diagram.)	
Output	Output phase difference	A, B phase difference 90°±45° (T/4±T/8) Z phase T±T/2 (see Output Waveform)	
Output	Waveform rise/fall time	2μs or less (output cable 1m or less)	
Starting torque		10×10⁻³N·m(100gf·cm) or less(no oil seal)	
Allowable load of shaft (electrical)	Radial	19.6N (2kgf)	9.8N (1kgf)
Allowable load of shaft (electrical)	Thrust	9.8N (1kgf)	4.7N (0.5kgf)
Maximum allowable revolutions (mechanical)		6,000r/min	
Working ambient temperature/humidity		0°C～60°C RH35%～90% no dewing	
Storing ambient temperature		-20°C～80°C	
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions	
Impact resistance		Durability 500m/s² (about 50G) 3 times each in X, Y, and Z directions	
Cable		Outside diameter φ4.2 5-core vinyl wire Insulated shield cable (length 1m)	
Mass		220g	

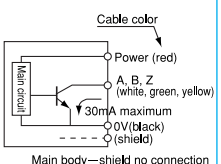
Output circuit diagram

Voltage output (standard type)



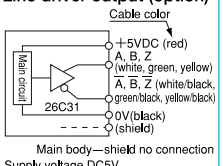
Supply voltage
DC5V to 12V

Open collector output (option)



Supply voltage
DC5V to 12V or 24V fixed

Line driver output (option)

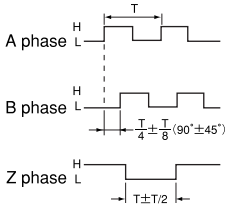


Supply voltage DC5V
Current consumption 150mA or less
Note: If the transmission distance is long, it should be so considered that the specified voltage occurs at the input portion of the encoder cable end.

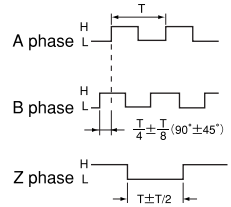
A capacitor (0.1μF) is connected between 0V and FG (frame ground).

Output waveform

CW rotation (CW rotation as seen from fit surface)



CCW rotation (CCW rotation as seen from fit surface)



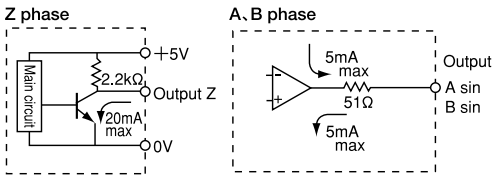
*The position of Z phase against A, B phase is not specified.

Specifications/Sine wave

Supply voltage		DC5V ±5%
Current consumption		40mA or less (under no load)
Detection system		Sine wave・Incremental
Output	Output pulse number (Standard) 〔Pulse number/rotation〕	5,000 10,000 10,800
	Output phase	A, B, Z phase
	Output form	A, B phase SIN wave, Z phase square wave
	A, B, Z phase output	SIN wave 1.5 Vp-p±0.3 V offset 2.0V±0.2V
		Opamp output current 5mA Max.
		Harmonic distortion factor to be within 10% (Measuring condition to be within 20 kHz, effective value mean distortion factor measuring instrument)
	Maximum response frequency	50kHz
	Output phase difference	A, B phase difference 90°±45° (T/4±T/8) Z phase T±T/2 (see Output Waveform)
Starting torque		10×10^{-3}N・m (100gf・cm) or less
Allowable load of shaft (electrical)	Radial	9.8N (1kgf)
	Thrust	4.9N (0.5kgf)
Maximum allowable revolutions (mechanical)		6,000r/min
Working ambient temperature/ humidity		0°C～50°C RH35%～90% no dewing
Storing ambient temperature		-20°C～80°C
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions
Impact resistance		Durability 500m/s² (about 50G) 3 times each in X, Y, and Z directions
Cable		Outside diameter φ4.2 5-core vinyl wire Insulated shield cable (length 1m)
Mass		220g

Output circuit diagram

Sine wave output (option)

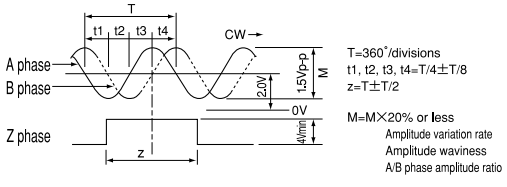


Signal name	Lead wire color
Vcc	Red
0V	Black
A phase	White
B phase	Green
Z phase	Yellow

A capacitor (0.1μF) is connected between 0V and FG (frame ground).

Output waveform

Sine wave output (option)
CW rotation (CW rotation as seen from fit surface)

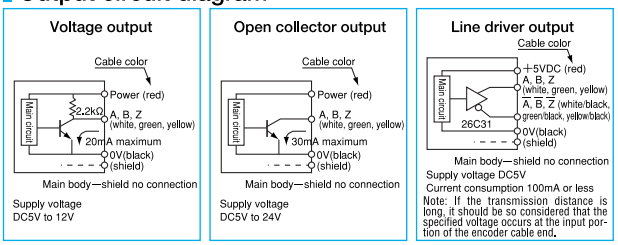


*The position of Z phase against A, B phase is not specified.

Specifications Built-in multiplication circuit (×2・×4・×8・×16)

Supply voltage		Voltage:DC5V-5%～12V+10% Open collector:DC5V-5%～24V+10% Line driver:DC5V±5%
Current consumption		80mA or less (under no load)
Detection system		Incremental
Output	Output pulse number (Standard) 〔Pulse number/rotation〕	EX 10,000×2 (20,000) 10,000×4 (40,000) 10,000×8 (80,000) 10,000×16 (160,000)
	Output phase	A, B, Z phase
	Output form	Square wave
	Maximum response frequency	Line driver output:50kHz× (by multiplication) Voltage output・Open collector output:100kHz
	Output phase difference	See the diagram below.
Starting torque		10×10^{-3}N・m (100gf・cm) or less
Allowable load of shaft (electrical)	Radial	9.8N (1kgf)
	Thrust	4.9N (0.5kgf)
Maximum allowable revolutions (mechanical)		6,000r/min
Working ambient temperature/ humidity		-10°C～70°C RH35%～90% no dewing
Storing ambient temperature		-20°C～80°C
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions
Impact resistance		Durability 500m/s² (about 50G) 3 times each in X, Y, and Z directions
Cable		Outside diameter φ4.2 5-core vinyl wire Insulated shield cable (length 1m)
Mass		220g

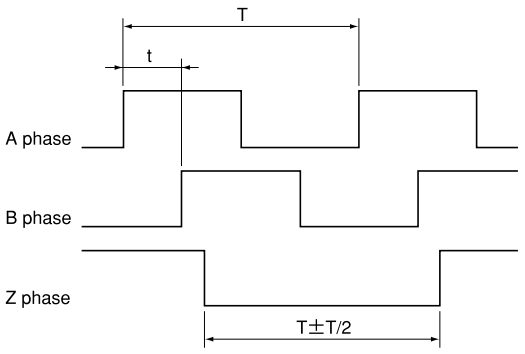
Output circuit diagram



A capacitor (0.1μF) is connected between 0V and FG (frame ground).

Output waveform

CW rotation (CW rotation as seen from fit surface)



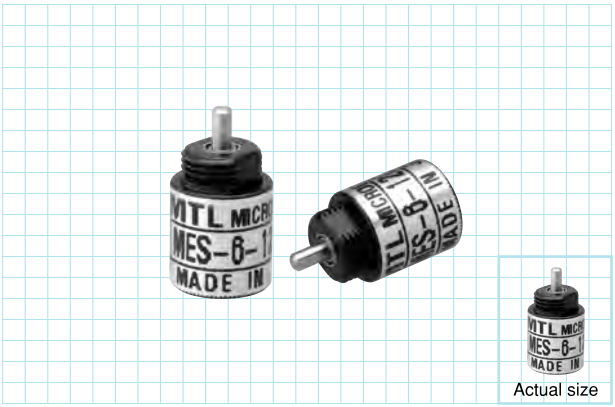
T = T±0.3T
t = 1/4 T±0.3t

MES-6-P series

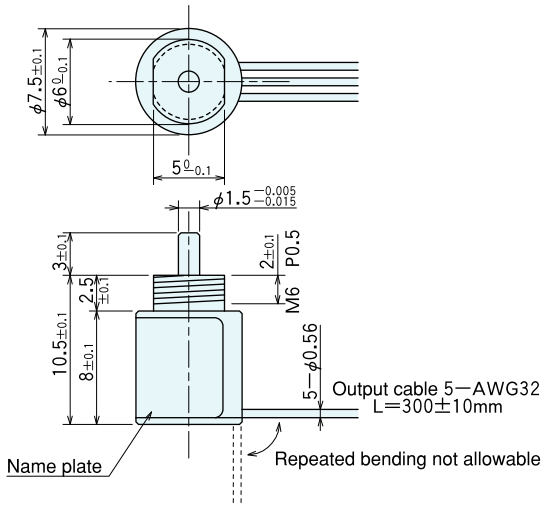
[Square Wave/Incremental]

KANAGAWA HIGH-TECH. GRAND-PRIX

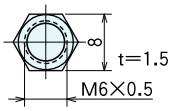
19th Kanagawa High-tech Grand-prix
Product that won the grand prize



Outside dimensions



Accessory (lock nut)

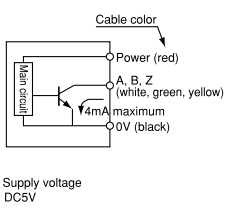


Specifications

Item		Type name: MES-6-□PC (□: Pulse number)
Supply voltage		DC5V ±10%
Current consumption		30mA or less (under no load)
Detection system		Incremental
Output	Output pulse number (Standard) 〔Pulse number/rotation〕	100 120 200 300 360
Output	Output phase	A, B, Z phase
Output	Output form	Square wave, open collector output
Output	Output capacity	Sink current: 4mA (output voltage resistance 7V) Residual voltage: 0.4V or less
Output	Maximum response frequency (response pulse number)	100kHz
Output	Output phase difference	A, B phase difference 90°±45° (T/4±T/8) Z phase T±T/2(see Output Waveform)
Output	Waveform rise/fall time	2μs or less (output cable 300mm or less)
Starting torque		0.3×10⁻³N·m (3gf·cm) or less
Allowable load of shaft (electrical)	Radial	1.9N (200gf)
Allowable load of shaft (electrical)	Thrust	0.98N (100gf)
Maximum allowable revolutions (mechanical)		6000r/min
Working ambient temperature/ humidity		0°C~60°C RH35%~90% no dewing
Storing ambient temperature		-20°C~80°C
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions
Impact resistance		Durability 500m/s² (about 50G) 3 times each in X, Y, and Z directions
Cable		Vinyl wire (AWG32) Cable length 300mm
Mass		5g

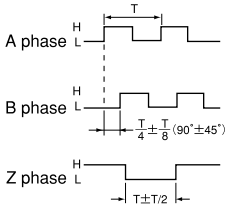
Output circuit diagram

Open collector output

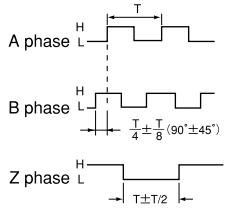


Output waveform

CW rotation (CW rotation as seen from fit surface)



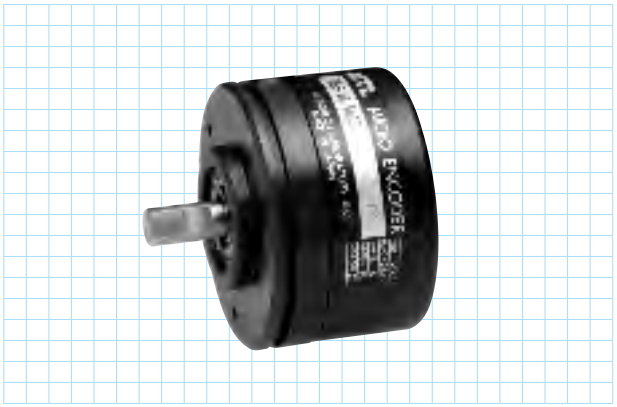
CCW rotation (CCW rotation as seen from fit surface)



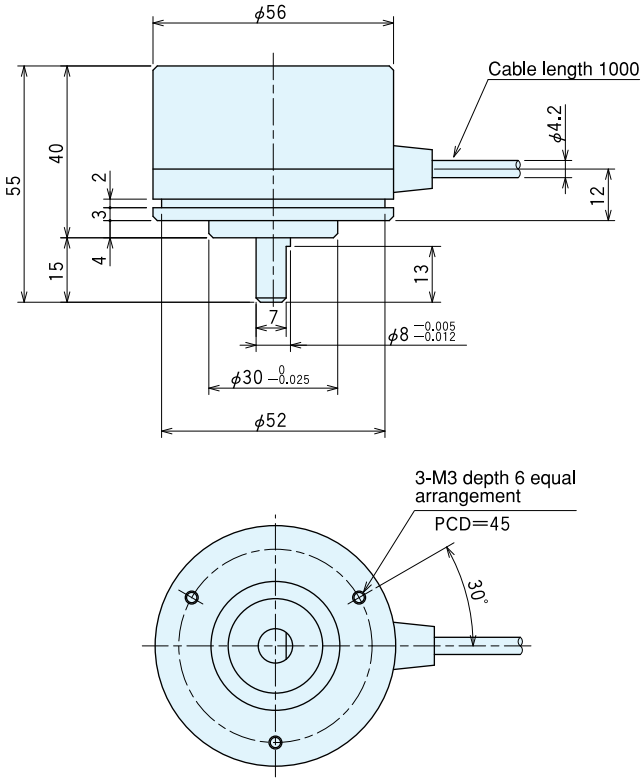
*The position of Z phase against A, B phase is not specified.

MES-40-P series

[Square Wave/Incremental]



Outside dimensions

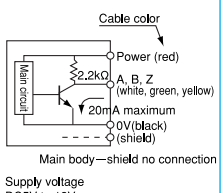


Specifications

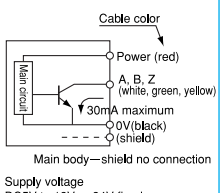
Item					
Type name	MES-40-□P□ (Pulse number; Output circuit: ●No entry=voltage output ●C=open collector output ●C4=open collector output DC24V ●E=line driver output ●S=sine wave output ●ST=built-in multiplication circuit ●P2=Two head detection)				
Supply voltage	DC5～12V ±10% DC24V±10% (option)				
Current consumption	40mA or less (under no load)				
Detection system	Incremental				
Output	Output pulse number (Standard) 〔Pulse number/rotation〕	100 200 360 500 512 600	1,000 1,024 2,000 3,600 4,000 4,094	5,000 5,400 6,000 8,192 9,000 10,000	10,800 11,250 15,000
Output	Output phase	A, B, Z phase			
Output	Output form	Square wave			
Output	Output capacity	Sink current: 20mA Residual voltage: 0.5V or less (at 10mA)			
Output	Maximum response frequency (response pulse number)	100kHz			
Output	Output phase difference	A, B phase difference 90°±45° (T/4±T/8) Z phase T±T/2 (see Output Waveform)			
Output	Waveform rise/fall time	2μs or less (output cable 1m or less)			
Starting torque		3×10^{-3}N·m (30gf·cm) or less 5×10^{-3}N·m (50gf-cm) or less (drip-proof)			
Allowable load of shaft (electrical)	Radial	49N (5kgf)			
Allowable load of shaft (electrical)	Thrust	29.4N (3kgf)			
Maximum allowable revolutions (mechanical)		6,000r/min			
Working ambient temperature/ humidity		-10°C～70°C RH35%～90% no dewing			
Storing ambient temperature		-20°C～80°C			
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions			
Impact resistance		Durability 500m/s² (about 50G) 3 times each in X, Y, and Z directions			
Cable		Outside diameter φ4.2 5-core vinyl wire Insulated shield cable (length 1m)			
Mass		200g			

Output circuit diagram

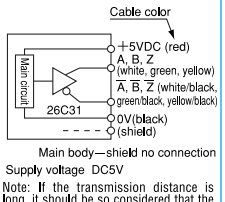
Voltage output (standard type)



Open collector output (option)

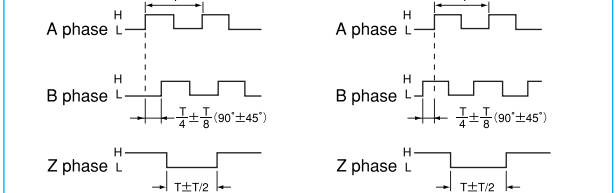


Line driver output (option)



A capacitor (0.1μF) is connected between 0V and FG (frame ground).

Output waveform



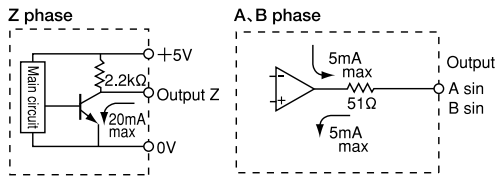
*The position of Z phase against A, B phase is not specified.

Specifications/Sine wave

Supply voltage		DC5V ±5%
Current consumption		40mA or less (under no load)
Detection system		Sine wave・Incremental
Output	Output pulse number (Standard) 〔Pulse number/rotation〕	1,000 2,000 5,000
	Output phase	A, B, Z phase
	Output form	A, B phase SIN wave, Z phase square wave
	A, B, Z phase output	SIN wave 1.5 Vp-p±0.3 V offset 2.0V±0.2V
		Opamp output current 5mA Max.
		Harmonic distortion factor to be within 10% (Measuring condition to be within 20 kHz, effective value mean distortion factor measuring instrument)
	Maximum response frequency	50kHz
	Output phase difference	A, B phase difference 90°±45° (T/4±T/8) Z phase T±T/2 (see Output Waveform)
Starting torque		3×10^{-3}N・m (30gf・cm) or less 5×10^{-3}N・m (50gf-cm) or less (drip-proof)
Allowable load of shaft (electrical)	Radial	49N (5kgf)
	Thrust	29.4N (3kgf)
Maximum allowable revolutions (mechanical)		6,000r/min
Working ambient temperature/ humidity		0°C～50°C RH35%～90% no dewing
Storing ambient temperature		-20°C～80°C
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions
Impact resistance		Durability 500m/s² (about 50G) 3 times each in X, Y, and Z directions
Cable		Outside diameter φ4.2 5-core vinyl wire Insulated shield cable (length 1m)
Mass		200g

Output circuit diagram

Sine wave output (option)

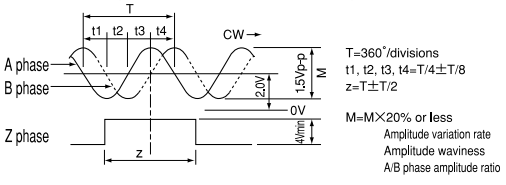


Signal name	Lead wire color
Vcc	Red
0V	Black
A phase	White
B phase	Green
Z phase	Yellow

A capacitor (0.1μF) is connected between 0V and FG (frame ground).

Output waveform

Sine wave output (option)
CW rotation (CW rotation as seen from fit surface)

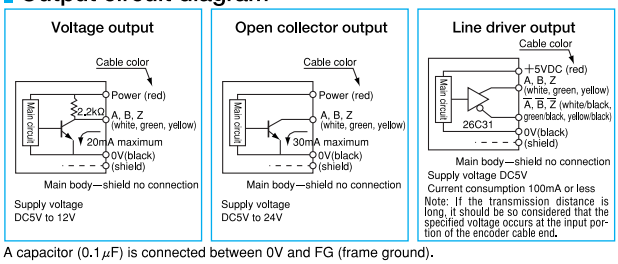


*The position of Z phase against A, B phase is not specified.

Specifications Built-in multiplication circuit (×4・×8・×16)

Supply voltage		Voltage:DC5V-5%～12V+10% Open collector:DC5V-5%～24V+10% Line driver:DC5V±5%
Current consumption		80mA or less (under no load)
Detection system		Incremental
Output	Output pulse number (Standard) 〔Pulse number/rotation〕	EX 5,000×4 (20,000) 5,000×8 (40,000) 5,000×16 (80,000)
	Output phase	A, B, Z phase
	Output form	Square wave
	Maximum response frequency	Line driver output:50kHz× (by multiplication) Voltage output・Open collector output:100kHz
	Output phase difference	See the diagram below.
Starting torque		3×10^{-3}N・m (30gf・cm) or less 5×10^{-3}N・m (50gf-cm) or less (drip-proof)
Allowable load of shaft (electrical)	Radial	49N (5kgf)
	Thrust	29.4N (3kgf)
Maximum allowable revolutions (mechanical)		6,000r/min
Working ambient temperature/ humidity		-10°C～70°C RH35%～90% no dewing
Storing ambient temperature		-20°C～80°C
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions
Impact resistance		Durability 500m/s² (about 50G) 3 times each in X, Y, and Z directions
Cable		Outside diameter φ4.2 5-core vinyl wire Insulated shield cable (length 1m)
Mass		200g

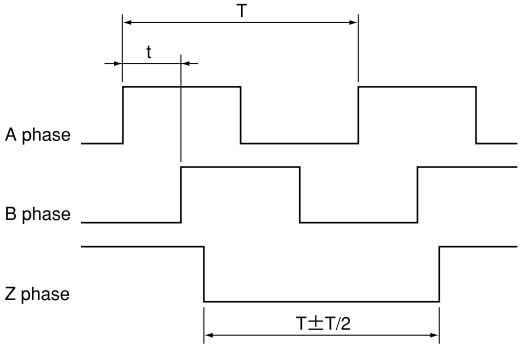
Output circuit diagram



A capacitor (0.1μF) is connected between 0V and FG (frame ground).

Output waveform

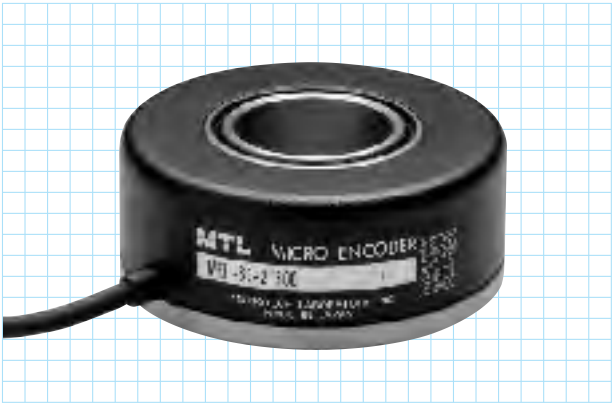
CW rotation (CW rotation as seen from fit surface)



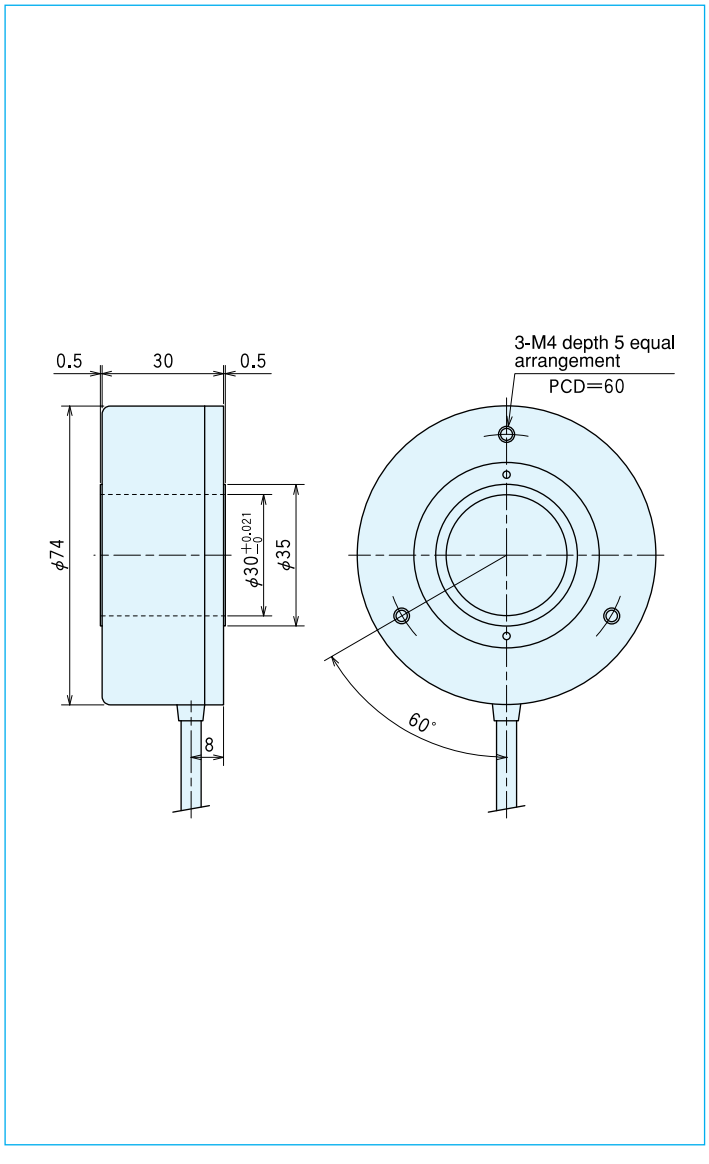
T = T±0.3T
t = 1/4 T±0.3t

MEH-60 series

[Square Wave/Incremental]



Outside dimensions

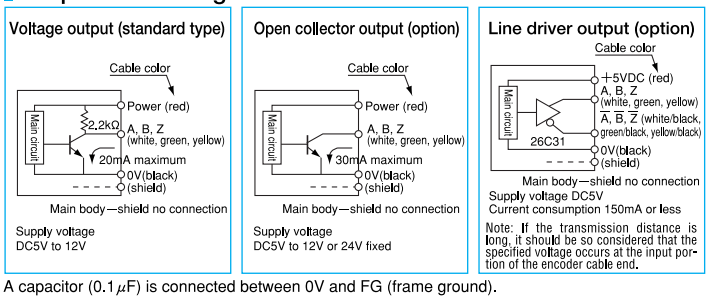


Specifications

Item				
Type name	MEH-60-□ □ (Pulse number; Output circuit: ●No entry=voltage output ●C=open collector output ●C4=open collector output DC24V ●E=line driver output ●S=sine wave output ●ST=built-in multiplication circuit ●P2=Two head detection)			
Supply voltage	DC5～12V ±10%(* 5V fixed) DC24V±10%(option)			
Current consumption	60mA or less *120mA or less(under no load)			
Detection system	Incremental			
Output	Output pulse number (Standard) [Pulse number/rotation]	180 200 360 400 500	600 1,000	1,800 2,000 4,000 5,000 5,400 9,000	10,000 10,800 *20,250 *21,600
	Output phase	A, B, Z phase			
	Output form	Square wave			
	Output capacity	Sink current: 20mA Residual voltage: 0.5V or less (at 10mA)			
	Maximum response frequency (response pulse number)	100kHz In case of voltage output, load resistance shall be 2.2kΩ. (Refer to the output circuit diagram.)			
	Output phase difference	A, B phase difference 90°±45° (T/4±T/8) Z phase T±T/2 (see Output Waveform)			
	Waveform rise/fall time	2μs or less (output cable 1m or less)			
Starting torque		20×10^{-3}N·m(200gf·cm) or less(no oil seal)			
Allowable load of shaft (electrical)	Radial	19.6N (2kgf)		9.8N (1kgf)	
	Thrust	9.8N (1kgf)		4.7N (0.5kgf)	
Maximum allowable revolutions (mechanical)		3,000r/min			
Working ambient temperature/ humidity		0°C～60°C RH35%～90% no dewing			
Storing ambient temperature		-20°C～80°C			
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions			
Impact resistance		Durability 500m/s^2 (about 50G) 3 times each in X, Y, and Z directions			
Cable		Outside diameter φ4.2 5-core vinyl wire Insulated shield cable (length 1m)			
Mass		320g *430g			

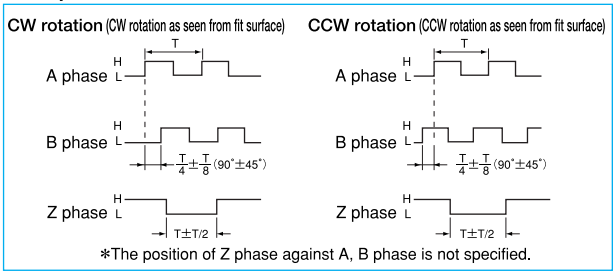
Note) Electrically divided

Output circuit diagram



A capacitor (0.1μF) is connected between 0V and FG (frame ground).

Output waveform



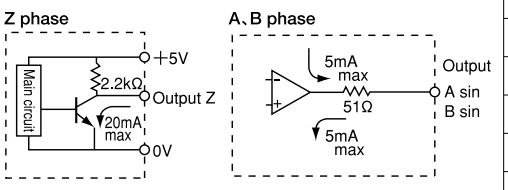
*The position of Z phase against A, B phase is not specified.

Specifications/Sine wave

Supply voltage		DC5V ±5%
Current consumption		40mA or less (under no load)
Detection system		Sine wave・Incremental
Output	Output pulse number (Standard) 〔Pulse number/rotation〕	5,000 10,000 9,000 ※20,250 ※21,600
	Output phase	A, B, Z phase
	Output form	A, B phase SIN wave, Z phase square wave
	A, B, Z phase output	SIN wave 1.5 Vp-p±0.3 V offset 2.0V±0.2V
		Opamp output current 5mA Max.
		Harmonic distortion factor to be within 10% (Measuring condition to be within 20 kHz, effective value mean distortion factor measuring instrument)
	Maximum response frequency	50kHz
	Output phase difference	A, B phase difference 90°±45° (T/4±T/8) Z phase T±T/2 (see Output Waveform)
Starting torque		20×10^{-3}N・m (200gf・cm) or less
Allowable load of shaft (electrical)	Radial	9.8N (1kgf)
	Thrust	4.9N (0.5kgf)
Maximum allowable revolutions (mechanical)		3,000r/min
Working ambient temperature/ humidity		0°C～50°C RH35%～90% no dewing
Storing ambient temperature		-20°C～80°C
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions
Impact resistance		Durability 500m/s^2 (about 50G) 3 times each in X, Y, and Z directions
Cable		Outside diameter φ4.2 5-core vinyl wire Insulated shield cable (length 1m)
Mass		320g ※430g

Output circuit diagram

Sine wave output (option)

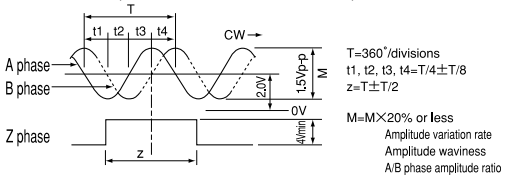


Signal name	Lead wire color
Vcc	Red
0V	Black
A phase	White
B phase	Green
Z phase	Yellow

A capacitor (0.1μF) is connected between 0V and FG (frame ground).

Output waveform

Sine wave output (option)
CW rotation (CW rotation as seen from fit surface)

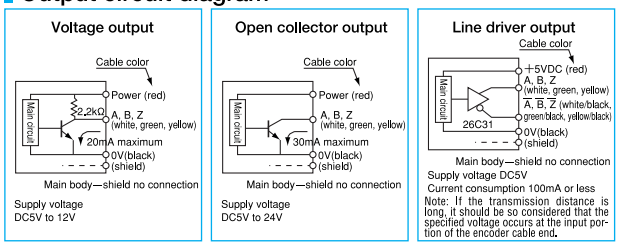


*The position of Z phase against A, B phase is not specified.

Specifications Built-in multiplication circuit (X2・X4・X8・X16)

Supply voltage		Voltage:DC5V-5%～12V+10% Open collector:DC5V-5%～24V+10% Open collector output:20,250, 21,600:DC5V-5% Line driver:DC5V±5%
Current consumption		80mA or less (under no load)
Detection system		Incremental
Output	Output pulse number (Standard) 〔Pulse number/rotation〕	EX 21,600×2 (43,200) 21,600×4 (86,400) 21,600×8 (172,800) 21,600×16 (345,600)
	Output phase	A, B, Z phase
	Output form	Square wave
	Maximum response frequency	Line driver output:50kHz× (by multiplication) Voltage output・Open collector output:100kHz
	Output phase difference	See the diagram below.
Starting torque		20×10^{-3}N・m (200gf・cm) or less
Allowable load of shaft (electrical)	Radial	9.8N (1kgf)
	Thrust	4.9N (0.5kgf)
Maximum allowable revolutions (mechanical)		3,000r/min
Working ambient temperature/ humidity		-10°C～70°C RH35%～90% no dewing
Storing ambient temperature		-20°C～80°C
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions
Impact resistance		Durability 500m/s^2 (about 50G) 3 times each in X, Y, and Z directions
Cable		Outside diameter φ4.2 5-core vinyl wire Insulated shield cable (length 1m)
Mass		430g

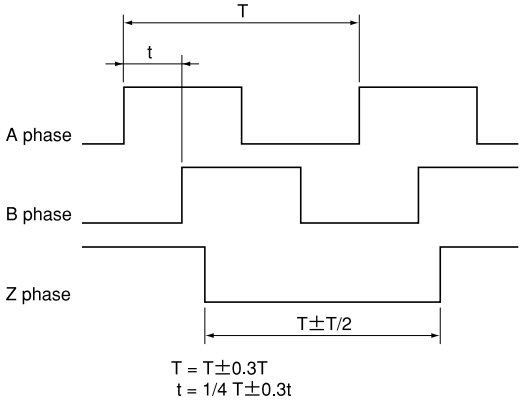
Output circuit diagram



A capacitor (0.1μF) is connected between 0V and FG (frame ground).

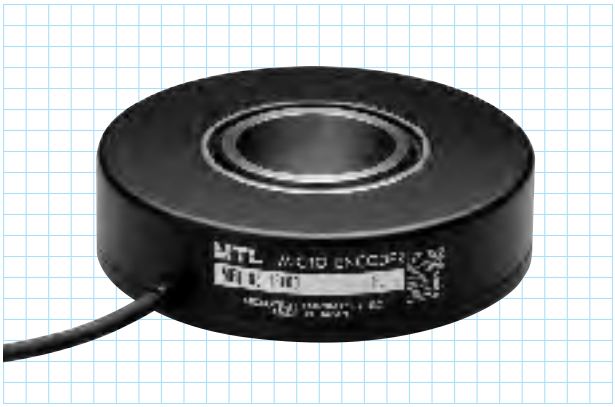
Output waveform

CW rotation (CW rotation as seen from fit surface)



MEH-85 series

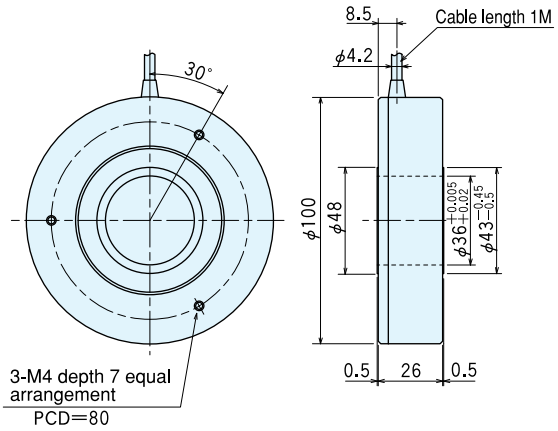
[Square Wave/Incremental]



Outside dimensions

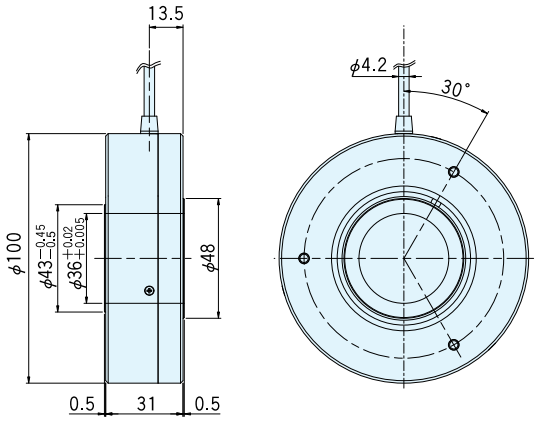
MEH-85

※1,024 pulse or less



MEH-85P,PS,PST

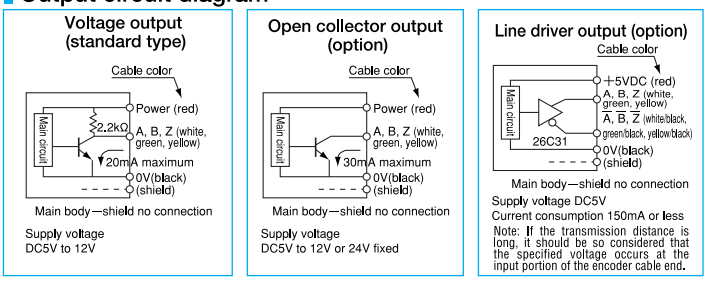
※3,600 pulse or more



Specifications

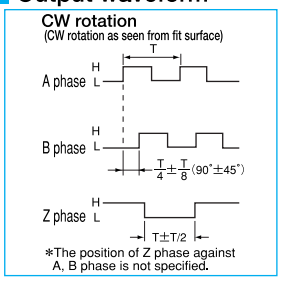
Item			
Type name	MEH-85-□ □ (Pulse number; Output circuit: ●No entry=voltage output ●C=open collector output ●C4=open collector output DC24V ●E=line driver output ●S=sine wave output ●ST=built-in multiplication circuit ●P2=Two head detection)		
Supply voltage	DC5～12V ±10% DC24V±10%(option)		
Current consumption	60mA or less(under no load)		
Detection system	Incremental		
Output	Output pulse number (Standard) 〔Pulse number/rotation〕	200 500 1,000 1,024 3,600	4,500 5,400 7,200 10,800 11,250	18,000 20,250 21,600
Output	Output phase	A, B, Z phase		
Output	Output form	Square wave		
Output	Output capacity	Sink current: 20mA Residual voltage: 0.5V or less (at 10mA)		
Output	Maximum response frequency (response pulse number)	100kHz In case of voltage output, load resistance shall be 2.2kΩ. (Refer to the output circuit diagram.)		
Output	Output phase difference	A, B phase difference 90°±45° (T/4±T/8) Z phase T±T/2 (see Output Waveform)		
Output	Waveform rise/fall time	2μs or less (output cable 1m or less)		
Starting torque		40×10^{-3}N·m(400gf·cm) or less(no oil seal)		
Allowable load of shaft (electrical)	Radial	9.8N (1kgf)		
Allowable load of shaft (electrical)	Thrust	4.7N (0.5kgf)		
Maximum allowable revolutions (mechanical)		3,000r/min		
Working ambient temperature/ humidity		0°C～60°C RH35%～90% no dewing		
Storing ambient temperature		-20°C～80°C		
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions		
Impact resistance		Durability 500m/s^2 (about 50G) 3 times each in X, Y, and Z directions		
Cable		Outside diameter φ4.2 5-core vinyl wire Insulated shield cable (length 1m)		
Mass		520g		

Output circuit diagram



A capacitor (0.1μF) is connected between 0V and FG (frame ground).

Output waveform



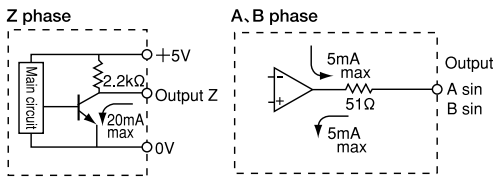
*The position of Z phase against A, B phase is not specified.

Specifications/Sine wave

Supply voltage		DC5V ±5%
Current consumption		40mA or less (under no load)
Detection system		Sine wave・Incremental
Output	Output pulse number (Standard) 〔Pulse number/rotation〕	18,000
	Output phase	A, B, Z phase
	Output form	A, B phase SIN wave, Z phase square wave
	A, B, Z phase output	SIN wave 1.5 Vp-p±0.3 V offset 2.0V±0.2V
		Opamp output current 5mA Max.
		Harmonic distortion factor to be within 10% (Measuring condition to be within 20 kHz, effective value mean distortion factor measuring instrument)
	Maximum response frequency	50kHz
	Output phase difference	A, B phase difference 90°±45° (T/4±T/8) Z phase T±T/2 (see Output Waveform)
Starting torque		40×10^{-3}N・m (400gf・cm) or less
Allowable load of shaft (electrical)	Radial	9.8N (1kgf)
	Thrust	4.9N (0.5kgf)
Maximum allowable revolutions (mechanical)		3,000r/min
Working ambient temperature/ humidity		0°C～50°C RH35%～90% no dewing
Storing ambient temperature		-20°C～80°C
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions
Impact resistance		Durability 500m/s² (about 50G) 3 times each in X, Y, and Z directions
Cable		Outside diameter φ4.2 5-core vinyl wire Insulated shield cable (length 1m)
Mass		520g

Output circuit diagram

Sine wave output (option)

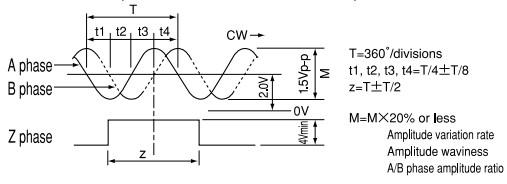


Signal name	Lead wire color
Vcc	Red
0V	Black
A phase	White
B phase	Green
Z phase	Yellow

A capacitor (0.1μF) is connected between 0V and FG (frame ground).

Output waveform

Sine wave output (option)
CW rotation (CW rotation as seen from fit surface)

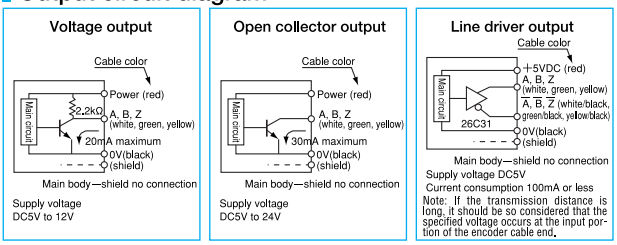


*The position of Z phase against A, B phase is not specified.

Specifications Built-in multiplication circuit (×2・×4・×8・×16)

Supply voltage		Voltage:DC5V-5%～12V+10% Open collector:DC5V-5%～24V+10% Line driver:DC5V±5%
Current consumption		140mA or less (under no load)
Detection system		Incremental
Output	Output pulse number (Standard) 〔Pulse number/rotation〕	EX 18,000×2 (36,000) 18,000×4 (72,000) 18,000×8 (144,000) 18,000×16 (288,000)
	Output phase	A, B, Z phase
	Output form	Square wave
	Maximum response frequency	Line driver output:75kHz× (by multiplication) Voltage output・Open collector output:100kHz
	Output phase difference	See the diagram below.
Starting torque		40×10^{-3}N・m (400gf・cm) or less
Allowable load of shaft (electrical)	Radial	9.8N (1kgf)
	Thrust	4.9N (0.5kgf)
Maximum allowable revolutions (mechanical)		3,000r/min
Working ambient temperature/ humidity		0°C～60°C RH35%～90% no dewing
Storing ambient temperature		-20°C～80°C
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions
Impact resistance		Durability 500m/s² (about 50G) 3 times each in X, Y, and Z directions
Cable		Outside diameter φ4.2 5-core vinyl wire Insulated shield cable (length 1m)
Mass		1,300g

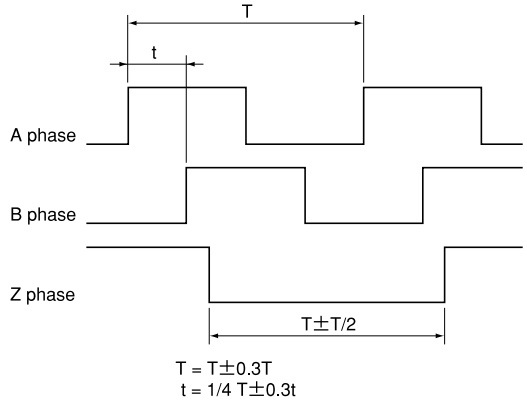
Output circuit diagram



A capacitor (0.1μF) is connected between 0V and FG (frame ground).

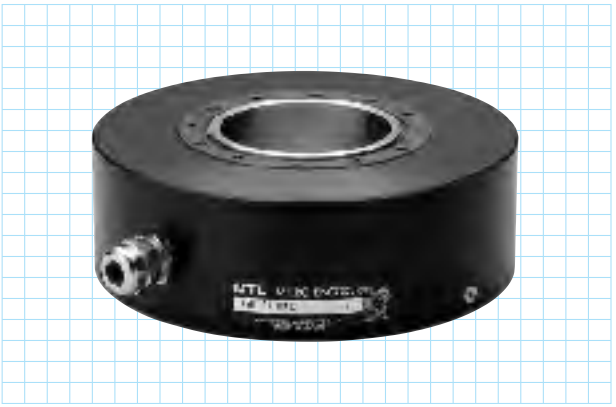
Output waveform

CW rotation (CW rotation as seen from fit surface)



MEH-130 series

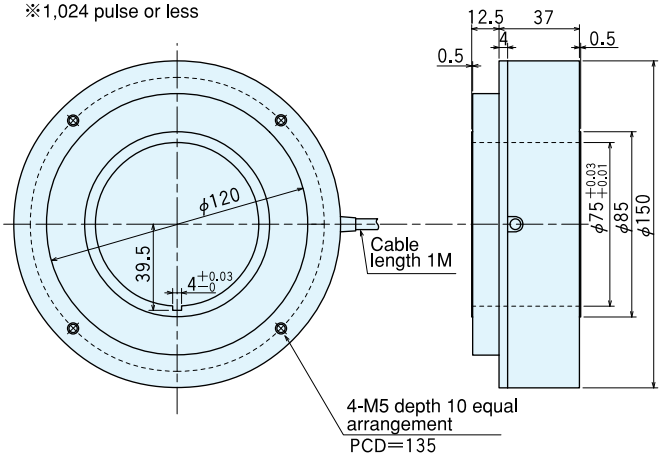
[Square Wave/Incremental]



Outside dimensions

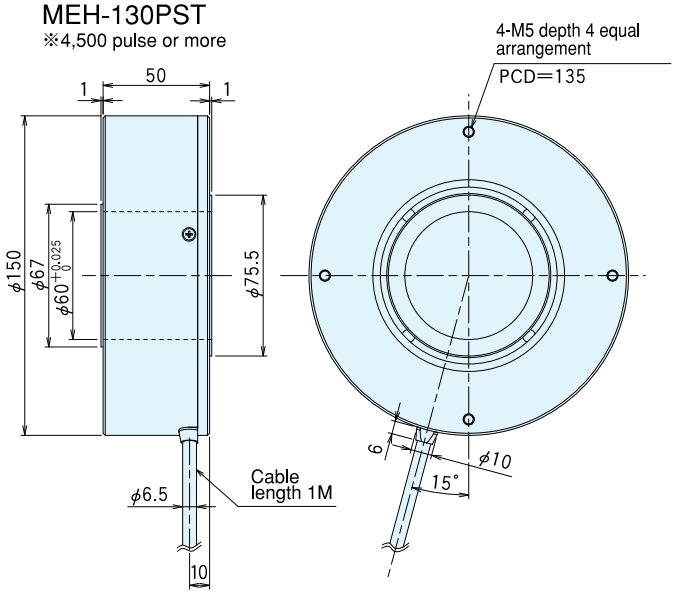
MEH-130

※1,024 pulse or less



MEH-130PST

※4,500 pulse or more

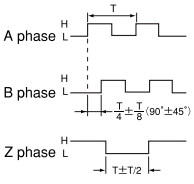


Specifications

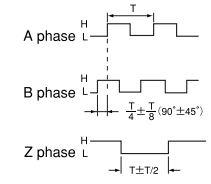
Item			
Type name		MEH-130-□□ (Pulse number; Output circuit: ●No entry=voltage output ●C=open collector output ●C4=open collector output DC24V ●E=line driver output)	
Supply voltage/ Current consumption		DC5～12V ±10% DC24V±10%(option)	
Detection system		Incremental	
Output	Output pulse number (Standard) 〔Pulse number/rotation〕	360 600 1,024 4,500 5,000	9,000 11,250 20,250 25,000 28,125 32,400
Output	Output phase	A, B, Z phase	
Output	Output form	Square wave	
Output	Output capacity	Sink current: 20mA Residual voltage: 0.5V or less (at 10mA)	
Output	Maximum response frequency (response pulse number)	100kHz In case of voltage output, load resistance shall be 2.2kΩ. (Refer to the output circuit diagram.)	
Output	Output phase difference	A, B phase difference 90°±45° (T/4±T/8) Z phase T±T/2 (see Output Waveform)	
Output	Waveform rise/fall time	2μs or less (output cable 1m or less)	
Starting torque		50×10^{-3}N·m(500gf·cm) or less(no oil seal)	
Allowable load of shaft (electrical)	Radial	19.6N (2kgf)	
	Thrust	9.8N (1kgf)	
Maximum allowable revolutions (mechanical)		2,000r/min	
Working ambient temperature/ humidity		0°C～60°C RH35%～90% no dewing	
Storing ambient temperature		-20°C～80°C	
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions	
Impact resistance		Durability 500m/s^2 (about 50G) 3 times each in X, Y, and Z directions	
Cable		Outside diameter φ6.5 14-core vinyl wire Insulated shield cable (length 1m)	
Mass		3kg	

Output waveform

CW rotation (CW rotation as seen from fit surface)



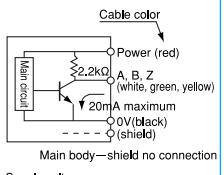
CCW rotation (CCW rotation as seen from fit surface)



*The position of Z phase against A, B phase is not specified.

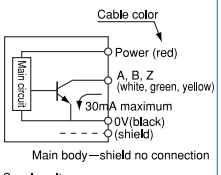
Output circuit diagram

Voltage output (standard type)



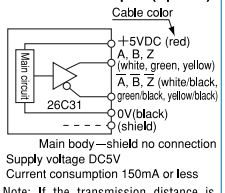
Supply voltage
DC5V to 12V

Open collector output (option)



Supply voltage
DC5V to 12V or 24V fixed

Line driver output (option)



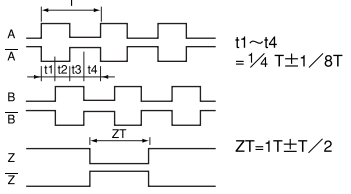
Supply voltage DC5V
Current consumption 150mA or less

Note: If the transmission distance is long, it should be so considered that the specified voltage occurs at the input portion of the encoder cable end.

A capacitor (0.1μF) is connected between 0V and FG (frame ground).

Output waveform(E:Line driver)

CW direction as seen from the fitting surface

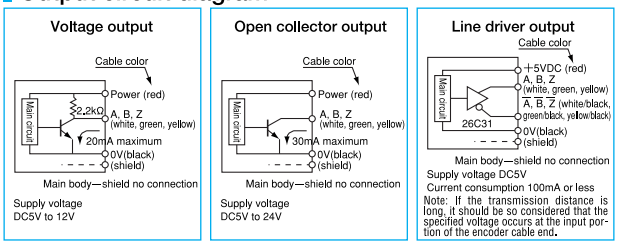


*The position of Z phase against A, B phase is not specified.

Specifications Built-in multiplication circuit (X2・X4・X8・X16) NEW

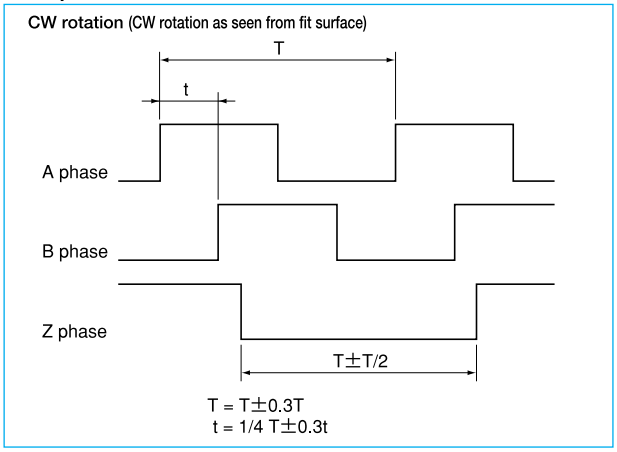
Supply voltage		Voltage:DC5V-5%～12V+10% Open collector:DC5V-5%～24V+10% Line driver:DC5V±5%
Current consumption		150mA or less (under no load)
Detection system		Incremental
Output	Output pulse number (Standard) 〔Pulse number/rotation〕	EX 32,400×2 (64,800) 32,400×4 (129,600) 32,400×8 (259,200) 32,400×16 (518,400)
Output	Output phase	A, B, Z phase
Output	Output form	Square wave
Output	Maximum response frequency	Line driver output:75kHz× (by multiplication) Voltage output・Open collector output:100kHz
Output	Output phase difference	See the diagram below.
Starting torque		50×10^{-3}N・m (500gf・cm) or less
Allowable load of shaft (electrical)	Radial	19.6N (2kgf)
Allowable load of shaft (electrical)	Thrust	9.8N (1kgf)
Maximum allowable revolutions (mechanical)		2,000r/min
Working ambient temperature/ humidity		0˚C～60˚C RH35%～90% no dewing
Storing ambient temperature		-20˚C～80˚C
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions
Impact resistance		Durability 500m/s^2 (about 50G) 3 times each in X, Y, and Z directions
Cable		Outside diameter ϕ6.5 14-core vinyl wire Insulated shield cable (length 1m)
Mass		3kg

Output circuit diagram



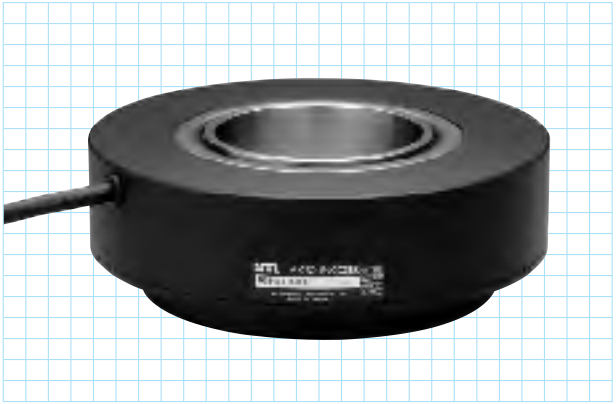
A capacitor (0.1μF) is connected between 0V and FG (frame ground).

Output waveform

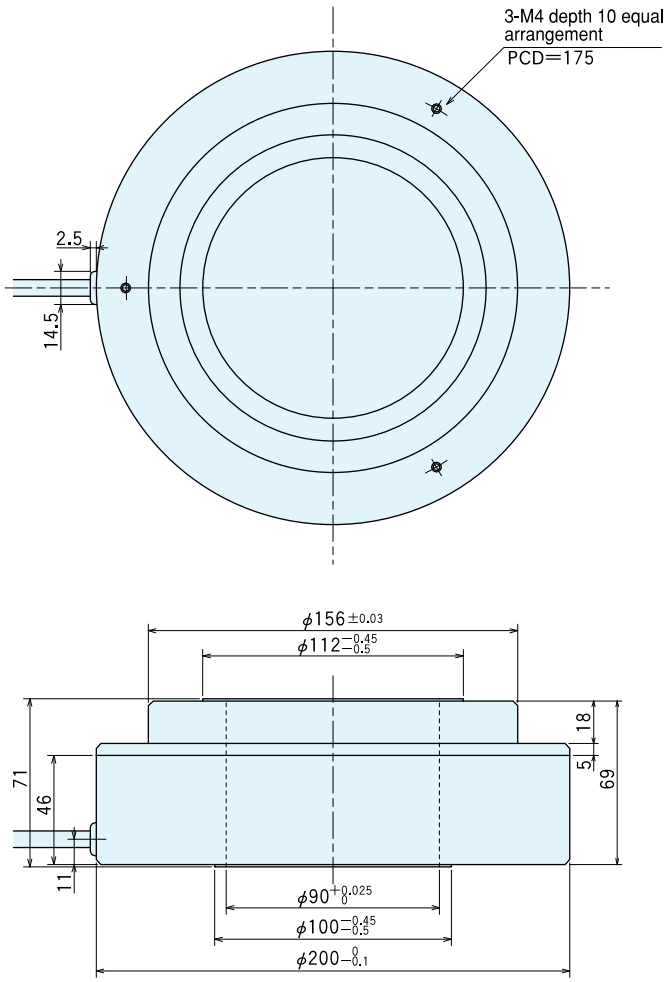


MEH-180 series

[Square Wave/Incremental]



Outside dimensions

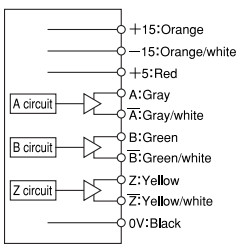


Output circuit diagram

Line driver output
Output IC
26LS31 (Mitsubishi)

Output line
φ8.2 composite 7 paired shield cables
Red, black AWG22
Others AWG28

Note: When the transmission distance is long, it should be so considered that the specified voltage occurs at the input portion of the encoder cable end.



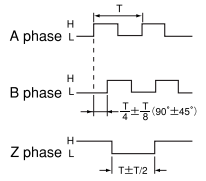
A capacitor (0.1μF) is connected between 0V and FG (frame ground).

Specifications

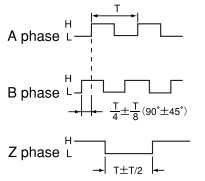
Item		Type name: MEH-180-□-□ (Pulse number)
Supply voltage/ Current consumption		DC5～12V ±10% DC24V±10%（option） Line driver:DC5V ±5%
Detection system		Incremental
Output	Output pulse number (Standard) 〔Pulse number/rotation〕	36,000 54,000
Output	Output phase	A, B, Z phase
Output	Output form	Square wave Line driver output
Output	Output capacity	V_{OL}=0.5Vmax V_{OH}=2.5Vmin I_O=±20mA
Output	Maximum response frequency (response pulse number)	300kHz
Output	Output phase difference	A, B phase difference 90°±45°（T/4±T/8） Z phase T±T/2 (see Output Waveform)
Output	Waveform rise/fall time	0.5μs or less (output cable 1m or less)
Starting torque		80×10⁻³N·m(800gf·cm) or less(no oil seal)
Allowable load of shaft (electrical)	Radial	29.4N（3kgf）
Allowable load of shaft (electrical)	Thrust	19.6N（2kgf）
Maximum allowable revolutions (mechanical)		300r/min
Working ambient temperature/ humidity		0°C～50°C RH35%～90% no dewing
Storing ambient temperature		-20°C～80°C
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions
Impact resistance		Durability 500m/s² (about 50G) 3 times each in X, Y, and Z directions
Cable		Outside diameter φ6.5 14-core Insulated shield cable (length 1m)
Mass		5kg

Output waveform

CW rotation (CW rotation as seen from fit surface)



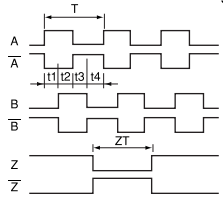
CCW rotation (CCW rotation as seen from fit surface)



*The position of Z phase against A, B phase is not specified.

Output waveform(E:Line driver)

CW direction as seen from the fitting surface

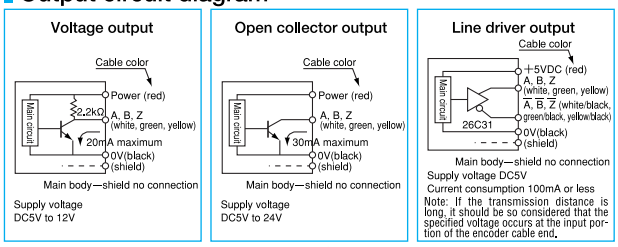


*The position of Z phase against A, B phase is not specified.

Specifications Built-in multiplication circuit (X2・X4・X8・X16) NEW

Supply voltage		Voltage: DC5V-5%～12V+10% Open collector: DC5V-5%～24V+10% Line driver: DC5V±5%
Current consumption		150mA or less (under no load)
Detection system		Incremental
Output	Output pulse number (Standard) [Pulse number/rotation]	EX 36,000×2 (72,000) 36,000×4 (144,000) 36,000×8 (288,000) 36,000×16 (576,000)
Output	Output phase	A, B, Z phase
Output	Output form	Square wave
Output	Maximum response frequency	Line driver output: 75kHz× (by multiplication) Voltage output・Open collector output: 100kHz
Output	Output phase difference	See the diagram below.
Starting torque		80×10^{-3}N・m (800gf・cm) or less
Allowable load of shaft (electrical)	Radial	29.4N (3kgf)
Allowable load of shaft (electrical)	Thrust	19.6N (2kgf)
Maximum allowable revolutions (mechanical)		300r/min
Working ambient temperature/ humidity		0˚C～50˚C RH35%～90% no dewing
Storing ambient temperature		-20˚C～80˚C
Vibration resistance		Durability 55Hz, double amplitude 1.5mm 2 hours each in X, Y, and Z directions
Impact resistance		Durability 500m/s^2 (about 50G) 3 times each in X, Y, and Z directions
Cable		Outside diameter ϕ6.5 14-core vinyl wire Insulated shield cable (length 1m)
Mass		5kg

Output circuit diagram



A capacitor (0.1μF) is connected between 0V and FG (frame ground).

Output waveform