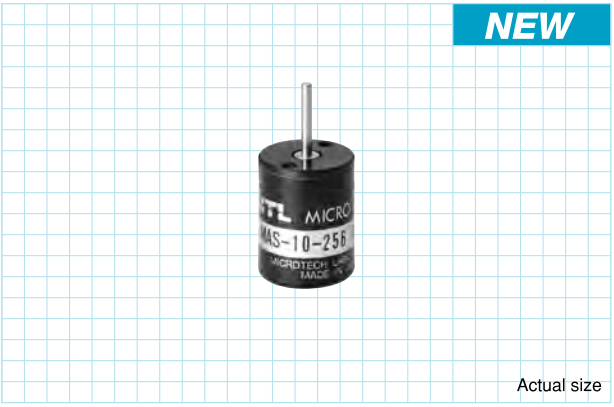
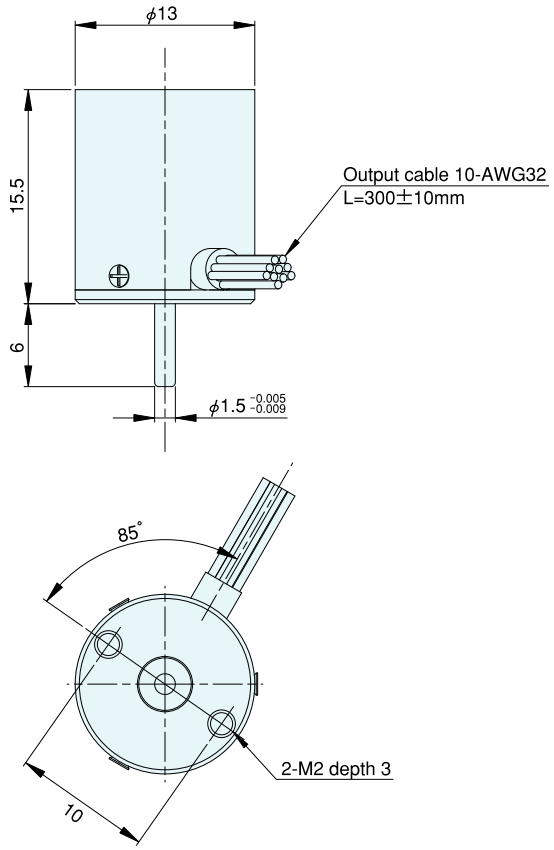
MAS-10 series

[Absolute]

- Ultra compact absolute encoder
- φ13×H15.5
- Resolution 256 (8-bit)



Outside dimensions



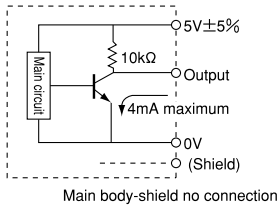
Specifications

Item \ Type name		MAS-10-256G
Supply voltage		DC5V ±5%
Current consumption		40mA or less (under no load)
Output code		G: gray code
Logic		Nagative logic (H=0、L=1)
Resolution		256 (8 bits/rotation)
Output circuit		Voltage output
Output capacity		Sink current each bit 4mA max
Allowable load of shaft (electrical)	Radial	0.98N (100gf)
	Thrust	0.98N (100gf)
Maximum revolutions (mechanical)		6000r/min
Maximum response frequency		20kHz
Working temperature/humidity		0°C～+60°C／RH35%～90% no dewing
Storage 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
Mass		10g

Connection

Cable color	MAS-10-256 G
Black	0V (COMMON)
Red	5V±5%
Brown	Output 2^0
Orange	Output 2^1
Yellow	Output 2^2
Green	Output 2^3
Blue	Output 2^4
Purple	Output 2^5
Gray	Output 2^6
White	Output 2^7

I/O circuit diagram



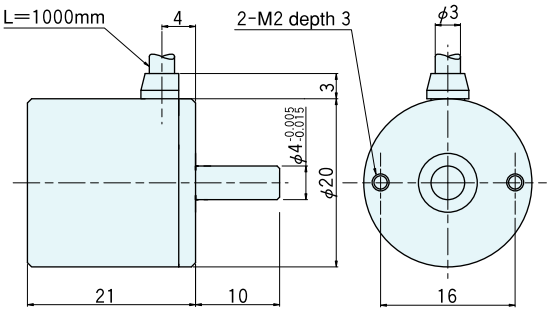
Main body-shield no connection

MA-I7 series

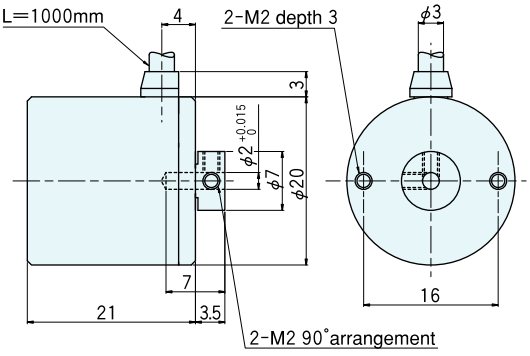
[Absolute]

Outside dimensions

MAS-17

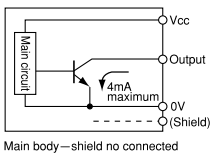


MAH-17



Output circuit diagram

Each output circuit



Main body—shield no connected

Specifications

Item \ Type name	MA□-17-□ □ (Shaft shape ●S=single shaft ●H=hollow shaft; Pulse number; G1 N1 B1)	
Supply voltage	DC5V ±5%	
Current consumption	70mA or less (under no load)	
Output code	G:gray code, N:Pure binary code, B:BBC code	
Logic	Negative logic (H=0, L=1)	
Resolution	G、N	B
	256 (8 bits) 512(9 bits) 1024 (10 bits)	1000
Output circuit	NPN open collector	
Output capacity	Sink current each bit 4mA (output voltage resistance 7V)	
Allowable load of shaft (electrical) Radial	1.9N (200gf)	
Allowable load of shaft (electrical) Thrust	1.9N (200gf)	
Maximum revolutions	6000r/min	
Maximum response frequency	20kHz	
Starting torque	1×10^{-3}N·m(10gf·cm) or less	
Working temperature/humidity	0°C～70°C／RH35%～90% no dewing	
Storage 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	256:Outside diameter φ3 10-core vinyl wire Insulated shield cable (length 1m)	
	512:1024:1000:Vinyl wire(AWG30) Cable length 300mm	
Mass	30g	

Connection

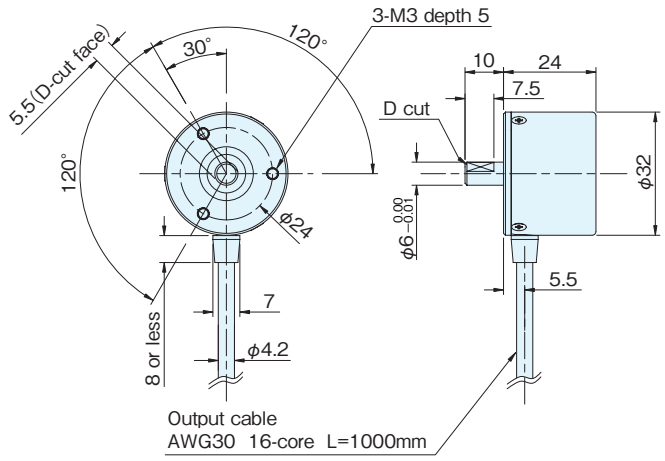
Type cable color	MA□-17-1024 G1	MA□-17-1024 N1	MA□-17-1000 B1
Black	0V (COMMON)		
Red	5V ±5%		
Brown	Output 2^0		Output 2^0
Brown/black	Output 2^1		Output 2^1
Orange	Output 2^2		Output 2^2
Orange/black	Output 2^3		Output 2^3
Yellow	Output 2^4		Output $2^0\times10$
Yellow/black	Output 2^5		Output $2^1\times10$
Green	Output 2^6		Output $2^2\times10$
Green/black	Output 2^7		Output $2^3\times10$
Blue	Output 2^8		Output $2^0\times10^2$
Blue/black	Output 2^9		Output $2^1\times10^2$
Purple	—		Output $2^2\times10^2$
Purple/black	—		Output $2^3\times10^2$

MA-20 series

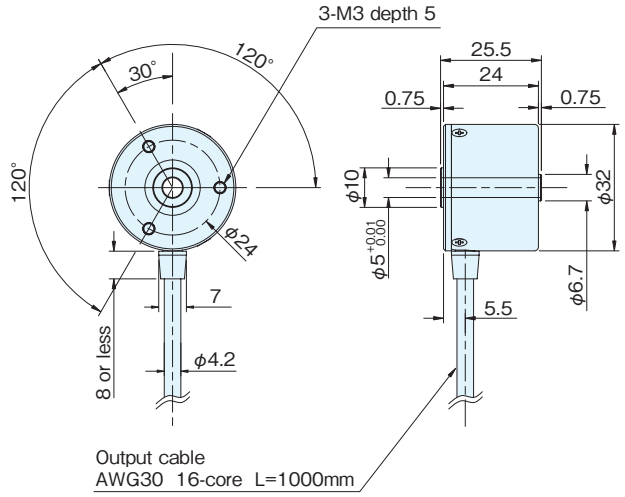
[Absolute]

Outside dimensions

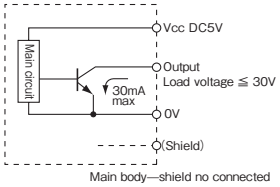
MAS-20



MAH-20



Output circuit diagram



※A capacitor(0.33μF) is connected between 0V and FG (frame ground).

Specifications

Item		Type name: MA□-20-□ □1 (Shaft shape: ●S=single shaft ●H=hollow shaft; Pulse number; Output code※: ●G=gray code ●N=pure binary code ●B=BCD code)	
Supply voltage		DC5V±5%	
Current consumption		100mA or less(under no load)	
Output code		G: gray code N: pure binary code	B: BCD code
Logic		Negative logic(H=0、L=1)	
Resolution		256 1,024 4,096 512 2,048	3,600
Output circuit		NPN open collector	
Output capacity		Sink current:30mAmax、load voltage:30Vmax、 Output residual voltage:0.5V or less (Cable length 1m、Sink current: at 30mA)	
Allowable load of shaft (electrical)	Radial	14.7N(1.5kgf)	
	Thrust	4.9N(0.5kgf)	
Maximum revolutions (mechanical)		6,000r/min	
Maximum response frequency		10kbit/s	
Starting torque		2×10^{-3}N·m(20gf·cm) or less	
Working temperature/ humidity		−10°C～70°C／35%～90%RH no dewing	
Storage 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 16-core vinyl wire Insulated shield cable (length 1m)	
Mass		150g(excluding cable)	

(※)Output code"B" is selectable only in Shaft shape "S "

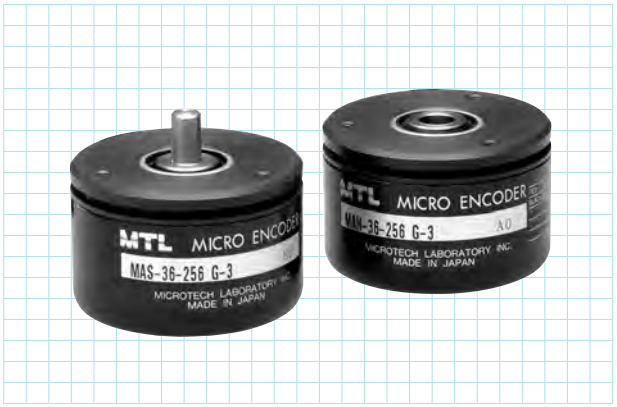
Connection

Type / cable color	Output signal		
	MA-20-□G1	MA-20-□N1	MA-20-□B1
Brown	2^0		2^0
Brown/black	2^1		2^1
Orange	2^2		2^2
Orange/black	2^3		2^3
Yellow	2^4		$2^0\times10^1$
Yellow/black	2^5		$2^1\times10^1$
Green	2^6		$2^2\times10^1$
Green/black	2^7		$2^3\times10^1$
Blue	2^8		$2^0\times10^2$
Blue/black	2^9		$2^1\times10^2$
Purple	2^{10}		$2^2\times10^2$
Purple/black	2^{11}		$2^3\times10^2$
Gray	N.C.		$2^0\times10^3$
White	N.C.		$2^1\times10^3$
Red	Vcc(DC5V)		
Black	0V		

Note: The shield is in the encoder and not connected. A capacitor (0.1mF) is connected between 0V and FG.

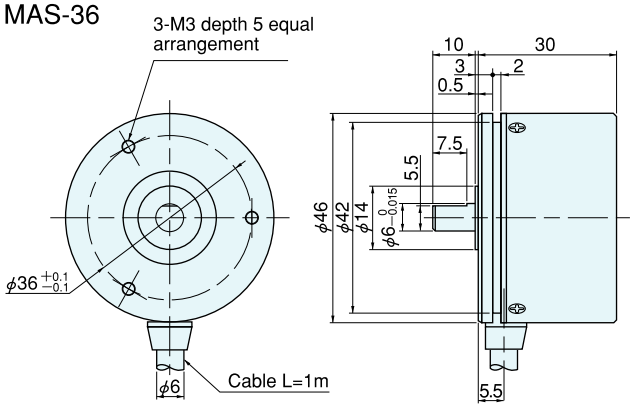
MA-36 series

[Absolute]

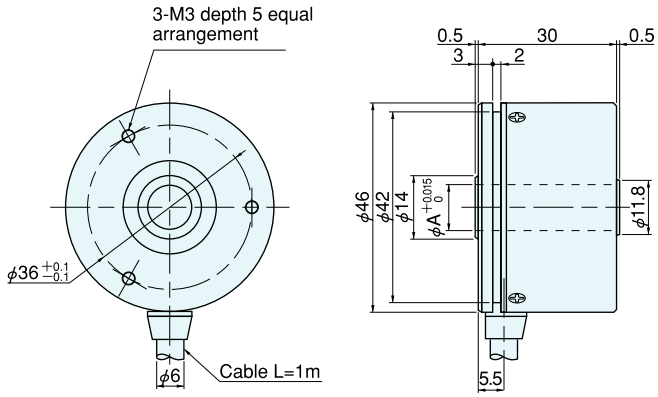


Outside dimensions

MAS-36



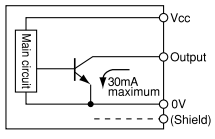
MAH-36



φA=φ7
=φ8
=φ10

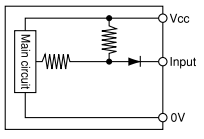
Output circuit diagram

Each output circuit



Main body—shield no connected

Direction indication input circuit



When input/Vcc short or free, CW increases count.
When input/0V short, CCW increases count.

Specifications

Item		Type name: MA□-36-□□ □ (Shaft shape: ●S=single shaft ●H=hollow shaft; Output code: ●G=gray code ●N=pure binary code; Supply voltage: ●3=DC5～12V ●4=DC24V)
Supply voltage		3:DC+5～12V±10% 4:DC24V±10%
Current consumption		70mA or less (under no load)
Output code		G:gray code N:pure binary code
Logic		Negative logic (H=0, L=1)
Resolution		256, 360, 512, 720, 1024
Output circuit		NPN open collector
Output capacity		Sink current each bit 30mA
Allowable load of shaft (electrical)	Radial	19.6N (2kgf)
	Thrust	9.8N (1kgf)
Maximum revolutions		6000r/min
Maximum response frequency		10kHz
Starting torque		5X10^{-3}N·m(50gf·cm) or less(no oil seal)
Working temperature/humidity		0°C～60°C／RH35%～90% no dewing
Storage 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 φ6.0 16-core vinyl wire Insulated shield cable (length 1m)
Mass		180g

Connection

Type / cable color	Output signal MA36P-G	Output signal MA36P-N
Brown	2^0	2^0
Brown/black	2^1	2^1
Orange	2^2	2^2
Orange/black	2^3	2^3
Yellow	2^4	2^4
Yellow/black	2^5	2^5
Green	2^6	2^6
Green/black	2^7	2^7
Blue	2^8	2^8
Blue/black	2^9	2^9
Purple	NC	NC
Purple/black	NC	NC
Red/black	NC	Rotating direction indication input
Red	Power	
Black	0V (COMMON)	
Black	0V (COMMON)	

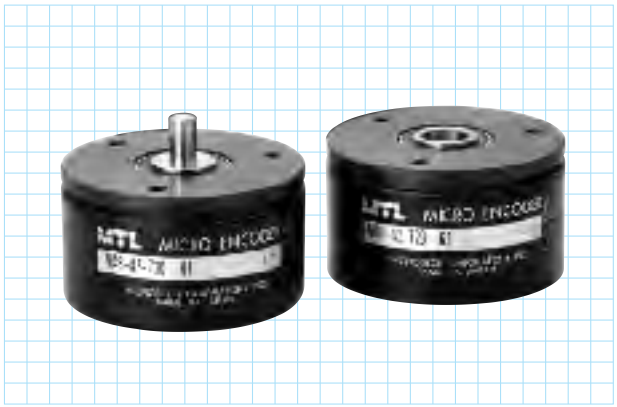
Note: The shield is in the encoder and not connected. A capacitor (0.1mF) is connected between 0V and FG.

Resolution and code No.

Resolution	Code No.
256	0～255
360	76～435
512	0～511
720	152～871
1024	0～1023

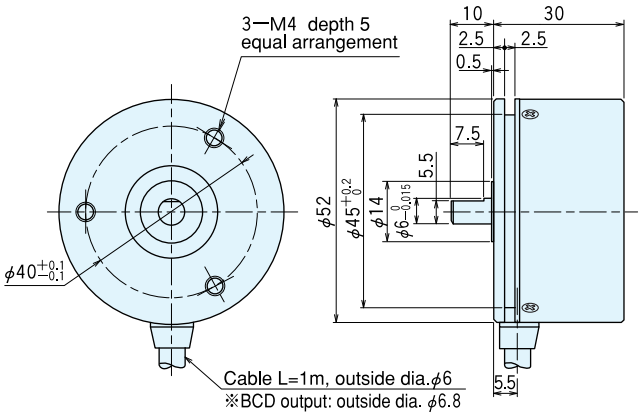
MA-42 series

[Absolute]

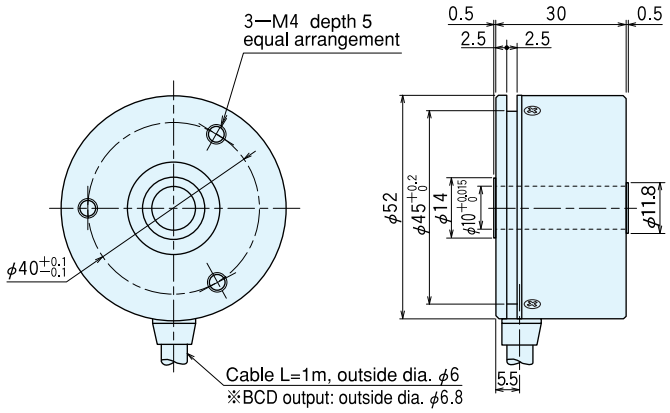


Outside dimensions

MAS-42

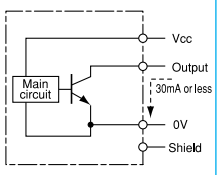


MAH-42

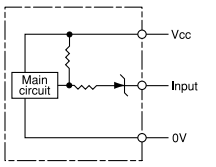


I/O circuit diagram

NPN open collector output



Rotating direction indication input circuit



Note) When input is open, CW increases count.
When input is 0V short, CCW increases count.

Specifications

Item	Type name: MA□-42-□□□ (Shaft shape: ●S=single shaft, ●H=hollow shaft / Pulse number / Output code: ●G=gray code, ●N=pure binary code, ●B=BCD code / Supply voltage: ●1=DC5V, ●5=DC12V-24V)	
Supply voltage	1:DC5V±10% 5:DC12V-10%～24V+15%	
Current consumption	100mA or less (under no load)	
Output code	G: gray code N: pure binary code	B: BCD code
Logic	Nagative logic (H=0、L=1)	
Resolution	256 512 1,024 4,096 360 720 2,048	1,000 3,600
Output circuit	NPN open collector	
Output capacity	Sink current each bit 30mA	
Allowable load of shaft (electrical) — Radial	19.6N (2kgf)	
Allowable load of shaft (electrical) — Thrust	9.8N (1kgf)	
Maximum revolutions (mechanical)	6,000r/min	
Maximum response frequency	10kHz	
Starting torque	10×10^{-3}N·m(100gf·cm) or less (no oil seal)	
Working temperature/ humidity	-10°C～70°C／RH95%or less no dewing	
Storage temperature	-25°C～85°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(G, N: φ6, 16 cores/B: φ6.8, 19 cores) vinyl wire Insulated shield cable (length 1m)	
Mass	300g or less (excluding cable)	

Connection

Cable color \ Type	Output signal		
	MA42-G	MA42-N	MA42-B
Brown	2^0	2^0	2^0
Brown/black	2^1	2^1	2^1
Orange	2^2	2^2	2^2
Orange/black	2^3	2^3	2^3
Yellow	2^4	2^4	$2^0\times10$
Yellow/black	2^5	2^5	$2^1\times10$
Green	2^6	2^6	$2^2\times10$
Green/black	2^7	2^7	$2^3\times10$
Blue	2^8	2^8	$2^0\times100$
Blue/black	2^9	2^9	$2^1\times100$
Purple	2^{10}	2^{10}	$2^2\times100$
Purple/black	2^{11}	2^{11}	$2^3\times100$
Gray	—	—	$2^0\times1000$
Gray/black	—	—	$2^1\times1000$
White	—	—	Not connected
White/black	—	—	Not connected
Red/black	Not connected	Rotating direction indication input	
Red	Supply power		
Black	0V (COMMON)		
Black	0V (COMMON)		—

Note: The shield is in the encoder and not connected. A capacitor (0.1mF) is connected between 0V and FG.

Resolution and code No.

Resolution	Code No.
256	0～255
360	76～435
512	0～511
720	152～871
1,000	0～999

Resolution	Code No.
1,024	0～1,023
2,048	0～2,047
3,600	0～3,599
4,096	0～4,095