HOLLOW TYPE

HEF Model

Heavy Duty 39mm Diameter Encoder

•Most Advanced IP65 Encoder.

Model

HEF - □□ - 2M □ - □□□ - □□□ - □ 00E

Resolution

002	20P/R	05	500P/R
003	30P/R	0512	512P/R
0032	32P/R	06	600P/R
004	40P/R	08	800P/R
005	50P/R	09	900P/R
006	60P/R	10	1000P/R
01	100P/R	1024	1024P/R
0125	125P/R	12	1200P/R
02	200P/R	15	1500P/R
025	250P/R	18	1800P/R
0256	256P/R	20	2000P/R
03	300P/R	2048	2048P/R
036	360P/R	25	2500P/R
04	400P/R	36	3600P/R

Hollow Shaft Diameter
- 500 : ϕ5
- 600 : ϕ6
- 635 : ϕ6.35
- 800 : ϕ8
- 9525 : ϕ9.525

Cable Length
- 050 : 500mm (Standard)
- 100 : 1000mm
- 300 : 3000mm

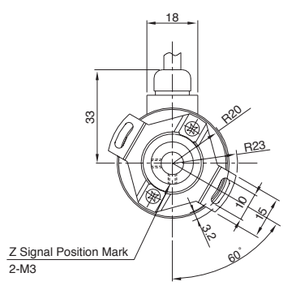
- No Indication: Other than D output
- No Indication: D output with LS
- C : D output with C-MOS

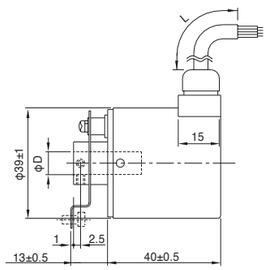
Complying with RoHS

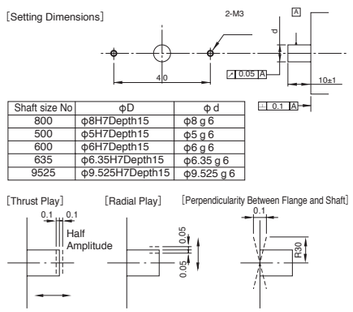
Output Mode
- No Indication : Voltage Output
- C : Open Collector Output
- HC : Open Collector Output / High Voltage
- HCP : PNP Mode Open Collector Output / High Voltage
- HT : Push-Pull Output / High Voltage
- D : Line Driver Output
  Low Power Consumption C-MOS Output Available

Signals — 2M : AB90˚ Phase Difference + Index Signal

External Dimension

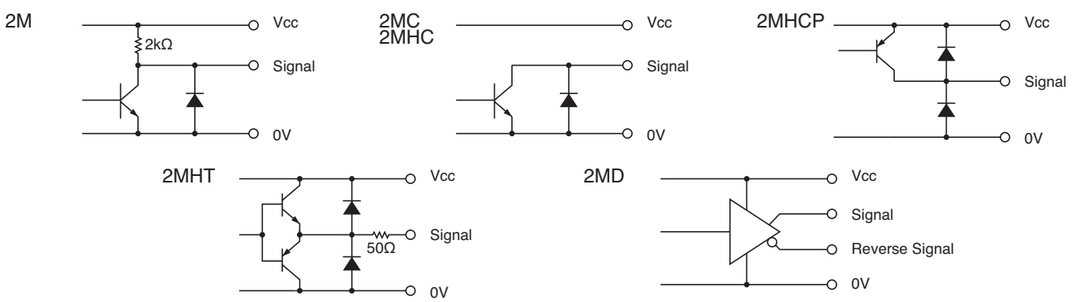






Shaft size No	ϕD	ϕ d
800	ϕ8H7Depth15	ϕ8 g 6
500	ϕ5H7Depth15	ϕ5 g 6
600	ϕ6H7Depth15	ϕ6 g 6
635	ϕ6.35H7Depth15	ϕ6.35 g 6
9525	ϕ9.525H7Depth15	ϕ9.525 g 6

Output Circuit



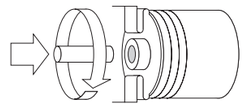
Electrical Spec

※1) at Maximum Sink Current ※2) Maximum Source Current

TYPE		2M	2MC	2MHC	2MHCP	2MHT	2MD
Power Supply(Vcc)		DC4.5～13.2 V		DC10.8～26.4 V			DC4.75～5.25V
Current Consumption		80 mA Max	60 mA Max		100 mA Max	60 mA Max	150 mA Max
Output Voltage	"H"	Vcc-1V Min	———		Vcc-1V Min ※2	Vcc-3V Min	2.5 V Min
	"L" ※1	0.5 V Max			———	3 V Max	0.5 V Max
Maximum Sink Current		20 mA				40 mA	20 mA
Rise & Fall Time		1 μs Max					200 ns Max
Maximum Frequency Response		200 kHz			50 kHz	200 kHz	
Withstanding Voltage of Output Tr.		———	50 V Max.		———		

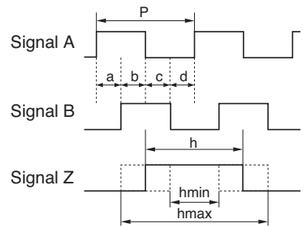
Wave Form

CW → Rotating Toward Clockwise Viewed from an Arrow



Rising point of A-Signal is always at one point while Z-Signal is at H-Level in CW.

2M
2MC
2MHC
2MHCP
2MHT

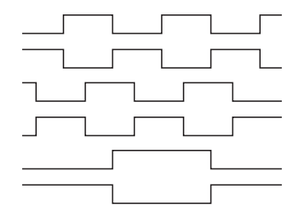


$P = \frac{1}{\text{Resolution}}$

$a, b, c, d = \frac{P}{4} \pm \frac{P}{8}$ $\quad \frac{P}{2} \leqq h \leqq \frac{3P}{2}$

Wave Ratio (Duty); 50 ± 25 (%)

2MD



Electrical Connections

2M
2MC
2MHC
2MHCP
2MHT

Color	Signal
Red	Power Supply(Vcc)
Black	0V
Green or Blue	Signal A
White	Signal B
Yellow	Signal Z
Shield	NC

2MD

Color	Signal	Color	Signal
Red	Power Supply(Vcc)	White	Signal B
Black	0V	Gray	Signal B̄
Green	Signal A	Yellow	Signal Z
Blue	Signal Ā	Orange	Signal Z̄
Shield	NC		

Mechanical Spec

Starting Torque		4.9×10^{-3}N・m Max
Angular Acceleration		1×10^{5} rad/s^2
Shaft Loading	Thrust	9.8N
	Radial	19.6N
Moment of Inertia		1.2×10^{-6}kg・m^2
Maximum Permissible Speed		5000min^{-1}
Net Weight		300g Max

Environmental Spec

Operating Temperature	–10˚C～+70˚C
Storage Temperature	– 30˚C～+80˚C
Humidity	RH 85% Max No Condensation
Vibration	10～55 Hz / 1.5mm X,Y,Z Each 2h
Shock	294m/s^2,11ms X, Y, Z Each 3 times
Ingress Protection	IP65