## Specifications $1 / 4$

- Incremental Type (Hollow shaft, blind hole and through hole)
- Feature: general,small,optional various output mode,long service life,low price,etc
- Application: textile industry, packing machinery, production line,etc,for automation control
- External dimensions: external diameter $\varnothing 38 \mathrm{~mm}$,thickness 38 mm ,
- Diameter of shaft: $\varnothing 5, ~ \varnothing 6 \mathrm{~mm}, ~ \varnothing 8 \mathrm{~mm}($ depth 18 mm$)$; through hole $\varnothing 6, ~ \varnothing 6.35 \mathrm{~mm}$
- Resolution: up to 16384P/R
- Supply voltage: DC5V; DC8-30V
- Protection: IP50; IP65
- Cable length: 1000 mm
- Weight: about 140 g



## - Model Guide

Model form (filled required parameters in the box as following)


- Must choose supply voltage: DC5V; DC8-30V
- leaf spring 38T45
- Output Mode

| Output type | Output circuit | Output wave form | Connection |
| :---: | :---: | :---: | :---: |
| OC <br>  <br> Push-Pull |  |  | $\begin{aligned} & \begin{array}{l} 0=\mathrm{GND} \\ 1=\mathrm{red}=\mathrm{DC} 5 \mathrm{~V} ; \\ \quad \text { DC8-30V } \end{array} \\ & 2=\text { black=OV } \\ & 3=\text { white=A } \\ & 4=\text { green=B } \\ & 5=\text { yellow=Z } \end{aligned}$ |
| Voltage |  |  |  |
| TTL <br> HTL |  |  | $\begin{aligned} & 0=\text { shielding=GND } \\ & 1=\text { red }=\mathrm{DC} 5 \mathrm{~V} ; \\ & \quad \text { DC8-30V } \\ & 2=\text { black }=\mathrm{OV} \\ & 3=\text { white }=\mathrm{A} \\ & 4=\text { green }=\mathrm{B} \\ & 5=\text { yellow }=\mathrm{Z} \\ & 6=\text { white } / \mathrm{black}=\overline{\mathrm{A}} \\ & 7=\text { green } / \mathrm{black}=\overline{\mathrm{B}} \\ & 8=\text { yellow/black } \overline{\mathrm{Z}} \end{aligned}$ |

－Electrical Characteristics

|  |  |  | OC | Voltage | Push－pull | TTL | HTL |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Supply voltage |  |  | DC $+5 \mathrm{~V} \pm 5 \%$ ；DC8V | $\pm 5 \%$ |  | $\mathrm{DC}+5 \mathrm{~V} \pm 5 \%$ | DC8－30V $\pm 5 \%$ |
| Consumption current |  |  | 100mA Max |  |  |  |  |
| Allowable ripple |  |  | $\leq 3 \% \mathrm{rms}$ |  |  |  |  |
| Top response frequency |  |  | 100 KHz |  |  | 200 KHz | 300 KHz |
|  | Output | Input | $\leq 30 \mathrm{~mA}$ | Load resistance 2．2K | $\leq 30 \mathrm{~mA}$ | $\leq \pm 20 \mathrm{~mA}$ | $\leq \pm 50 \mathrm{~mA}$ |
|  | current | Output | － |  | $\leq 10 \mathrm{~mA}$ |  |  |
|  | Output voltage | ＂H＂ | － | － | $\geq[($ Supply voltage）－2．5V］ | $\geq 2.5 \mathrm{~V}$ | $\geq \mathrm{Vcc}-3 \mathrm{Vdc}$ |
|  |  | ＂L＂ | $\leq 0.4 \mathrm{~V}$ | $\leq 0.7 \mathrm{~V}$（less than 20 mA ） | $\leq 0.4 \mathrm{~V}(30 \mathrm{~mA})$ | $\leq 0.5 \mathrm{~V}$ | $\leq 1 \mathrm{~V}$ Voc |
|  | Load voltage |  | SDC30V | － |  | － |  |
| Rise \＆Fall time |  |  | Less than 2us（cable length： 2 m ） |  |  | Less than 1us （Cable length：2m） | S100ns |
| Insulation strength |  |  | AC500V 60s |  |  |  |  |
| Insulation resistance |  |  | $10 \mathrm{M} \Omega$ |  |  |  |  |
| Mark to space ratio |  |  | 45\％to 55\％ |  |  |  |  |
| Phase shift between A \＆B |  |  | $90^{\circ} \pm 10^{\circ}$（ low speed，frequency $\leq 1000 \mathrm{~Hz}$ ） |  |  |  |  |
|  |  |  | $90^{\circ} \pm 20^{\circ}$（ high speed，frequency $>1000 \mathrm{~Hz}$ ） |  |  |  |  |
| Origin motion |  |  | Low level available | High level available | Low level available | － |  |
| GND |  |  | not connect to encoder |  |  |  |  |

## ■ Mechanical Characteristics

| Shaft | $\varnothing 5 \mathrm{~mm} ; ~ \varnothing 6 \mathrm{~mm} ; \varnothing 6.35 \mathrm{~mm} ; \varnothing 8 \mathrm{~mm}$（stainless steel） |
| :--- | :--- |
| Starting torque | Less than $9.8 \times 10^{-3} \mathrm{~N} \cdot \mathrm{~m}$ |
| Inertia moment | Less than $6.5 \times 10^{-6} \mathrm{~kg} \cdot \mathrm{~m}^{2}$ |
| Shaft load | Radial $40 \mathrm{~N} ;$ Axial 20 N |
| Slew speed | $\leq 5000 \mathrm{rpm} ;$ IP65 $\leq 3000 \mathrm{rpm}$ |
| Bearing Life | $1.5 \times 10^{9}$ revs at rated load（100000hrs at 2500 RPM ） |
| Shell | Die cast aluminum |
| Weight | about 140 g |

## Environmental Specifications

| Environmental temperature | Operating：$-20 \sim+90^{\circ} \mathrm{C}$（repeatable winding cable：$-10^{\circ} \mathrm{C}$ ）；Storage：$-25 \sim+100^{\circ} \mathrm{C}$ |
| :--- | :--- |
| Environmental humidity | Operating and storage： $35 \sim 85 \% \mathrm{RH}$（noncondensing） |
| Vibration（endure） | Amplitude $0.75 \mathrm{~mm}, 5 \sim 55 \mathrm{~Hz}, 2 \mathrm{~h}$ for $\mathrm{X}, \mathrm{Y}, \mathrm{Z}$ direction individually |
| Shock（endure） | $490 \mathrm{~m} / \mathrm{s}^{2} 11 \mathrm{~ms}$ three times for $\mathrm{X}, \mathrm{Y}, \mathrm{Z}$ direction individually |
| Protection | IP50；IP65 |

## －Basic Dimensions




## Assembling requirement

－Blind hole（B）


| B | $\mathrm{B}^{*}$ |
| :---: | :---: |
| $\varnothing 5^{\mathrm{H7}}$ | $\varnothing 5_{\mathrm{g} 4}$ |
| $\varnothing 6^{\mathrm{H7}}$ | $\varnothing 6_{\mathrm{g} 4}$ |
| $\varnothing 8^{\mathrm{H7}}$ | $\varnothing 8_{\mathrm{g} 4}$ |

－Through hole（Q）


20（effective）

Inner hexagon screw M3＊10 with flat gasket and spring ring is



Q＊Motor shaft
diameter tolerance

Unit：mm


38T45 $=$ Leaf Spring
\＆＝Rotate direction of signal output shaft

About vibration
Vibration act on encoder always cause wrong pulse ，so we should pay attention to working place．More pulse per revolution，narrower groovy spacing of grating ，more effect to encoder by vibration，when rev is low or stop ，vibration act on shaft or main body would cause grating vibrating ，so encoder might make wrong pulse．

