Briterencoder Linear Wire Displacement Sensor

BRT38X Series Incremental Output User Manual V202503

1. Product Model Description

Communication Protocal:

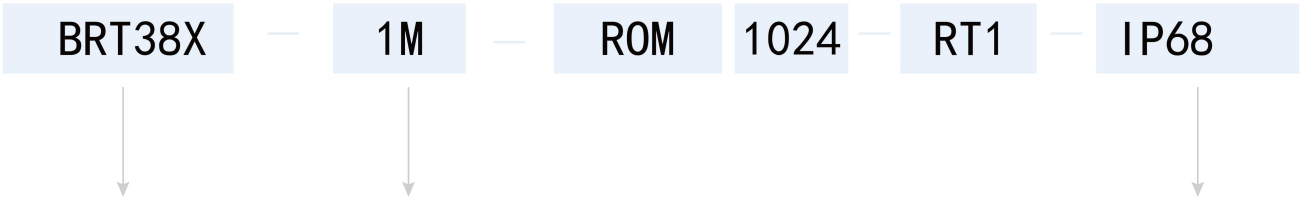
R0M=RS485 (Modbus RTU)
R2M=RS232(Modbus RTU)
R4M=RS422(Modbus RTU)
T0M=TTL(Modbus RTU)
C0M=CANbus
C2M=CANopen

S1M=SSI
S2M=BISS-C
A0M=4~20mA
V5M=0~5V
V10M=0~10V
K5M=0~5K

K10M=0~10K
R0&A0M=RS485&4~20mA
R0&V5M=RS485&0~5V
R0&V10M=RS485&0~10V

Resolution:
1024、4096

RT1=Side Outlet
AT1=Tail Outlet
(Default Cable Length 1~1.2M)



BRT=BriterEncoder
BRT38= OD.39mm
BRT50= OD50mm
BRT27=27*27mm
BRT38X=X series

Measuring range:0.3M、0.5M、1M、2M、3M、4M、5M、6M、7M、8M、9M、10M、11M、12M、13M、14M、15M、(Customizable)

IP54:Normal
IP68:Waterproof
(Usable 1m underwater)
EX:Explosion-proof

Model description:

1.Structural form of the encoder: e.g., BRT38 indicates an outer diameter of 38mm.
2.Measuring range: e.g., 1M indicates a measuring stroke range of 0 - 1000mm.
3.Communication interface: e.g., R0M indicates an electrical interface of RS485 and the communication protocol is Modbus RTU.
4.Resolution: e.g., 1024 means that the internal encoder and the winding wheel feed back 1024 data when rotating one circle. For a 1 - meter stroke, referring to the corresponding table parameters, if the diameter of the internal winding wheel is 100mm, it means that the encoder feeds back 1024 data when moving 100mm. The minimum displacement resolution: 100mm / 1024 = 0.098mm. That is, the displacement resolution of 1024 is 0.098mm.
5.Inventory: Some randomly combined models may be out of stock. Please consult in advance to ensure that the selected model is available.

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2. Wiring Definition (Voltage Output, NPN Open Collector Output, Push-Pull Output)

Wire Color	White	Green	Yellow	Red	Black
Wiring Definition	Output A Phase	Output B Phase	Output Z Phase	Power (+Vcc)	0V (COMMON)

3. Wiring Definition (for Linear Drive Output)

Wire Color	White	Green	Yellow	Red	Black	Brown	Gray	Orange
Wiring Definition	Output A	Output B	Output Z	Power (+Vcc)	0V (COMMON)	Output $\overline{A}$	Output $\overline{B}$	Output $\overline{C}$

4. Product Parameters

Table 1:

Measuring Range	Interface	Linear accuracy	Resolution 1024PPR	Resolution 4096PPR	Winding wheel diameter(mm)
500mm	Incremental	±0.1%	0.13mm	0.065mm	130
1000mm		±0.1%	0.13mm	0.065mm	130
2000mm		±0.1%	0.18mm	0.09mm	180
3000mm		±0.1%	0.23mm	0.115mm	230
4000mm		±0.1%	0.3mm	0.15mm	300
5000mm		±0.1%	0.385mm	0.1925mm	385
Pull Tension	2~3N		Drawstring diameter	0.6mm	
Max. Working Speed	1m/s		Pull rope material	Stranded steel wire	
Protection Grade	IP54, IP68waterproof, Explosion proof		Service times	>5million times	
Cable Length	1-1.2meters				
Body material	Aluminum alloy (anti-static), stainless steel head; IP68/ex-proof encoder in stainless steel.				

Table 2:

BRT Model	BRT38-P0T-**V-RT1	BRT38-P0T-**N-RT1	BRT38-P0S-**K-RT1	BRT38-P0T-**L-RT1	BRT38-P0T-**P-RT1
Matching Omron Model	E6B2-CWZ3E	E6B2-CWZ6C	E6B2-CWZ5B	E6B2-CWZ1X	E6B2-CWZ5G
Power Supply Voltage (Optical)	DC5V or DC7-24V	DC5V or DC7-24V	DC12V~24V	DC5V	DC7-30V
Power Supply Voltage (Magnetic)	5-24V	5-24V	DC12V~24V	DC5V	5-24V
Current Consumption	≤100mA	≤80mA	≤80mA	≤160mA	≤100mA
Output Type	Voltage Output	NPN Open Collector	PNP Open Collector	Line Driver Output	Push-Pull (HTL))

Output Capacity	Output resistance: 2kΩ Load current: max.20mA Residual voltage: max. 0.4V (At 20mA load current)	Applied voltage: max.DC 30V Load current:35mA Residual voltage: max. 0.4V (At 35mA load current)	Applied voltage: Max. DC 30V Load current: Max. 35mA Residual voltage: Max. 0.4V (At 35mA load current)	Equivalent to AM26LS31 Output current: H:IO=-20mA L:IS=20mA Output voltage: VO=Above 2.5V VS=max.0.5V	Applied voltage: Max. DC 30V Load current: Max. 35mA Residual voltage: Max. 0.4V (At 35mA load current)
Output Phase	A、B、Z phase	A、B、Z phase	A、B、Z phase	$\overline{A}$,A,$\overline{B}$,B,$\overline{Z}$,Zphase	A、B、Z phase
Phase Difference	A phase, B phase difference 90°±45°				
Max Response Frequency	200KHz (Magnetic)		Starting Torque:	≤ 0.98 mN·m	
Resolution (Pulses/Rev)	50、60、100、200、256、300、360、400、500、512、600、1000、1024、1200、1250、1500、1800、2000、2500、3000、3600、4000、4096（"*" in the model number represents the pulse count）				
Protection Rating	IP54、IP68、EX				
Output Voltage	1.Voltage / Push-Pull / PNP (requires pull-down resistor):The output voltage is equal to the supply voltage. 2.NPN:The output voltage depends on the pull-up voltage (e.g., commonly 3.3V or 5V) and is not affected by the encoder's supply voltage. 3.Line Driver (differential) output (three-phase or six-phase):Regardless of the supply voltage (default 5V), the output is always 5V.				
Moment of Inertia	≤1×10⁻⁶ kg·m² (≤3×10⁻⁷ kg·m² for 600P/R and below)				
Max Allowable Speed	6,000r/min				
Shaft Load Capacity	Radial: 30N / Axial: 20N				
Operating Temperature	-40 ~ +85°C (Magnetic)				
Cable	Standard screen cable (cable length 1~1.2m)				
Material	IP54: Aluminum Alloy; Stainless Steel optional IP68: Stainless Steel				
Net Weight	Approx. 120g				

5. Idicator Lights Description

Determine the encoder output type by the indicator light at the rear of the encoder:

Voltage Output	NPN Open Collector	PNP Open Collector	Line Driver Output	Push-Pull(HTL)）
Blue	Green	White	Orange	Yellow-green

Remarks:

1. Resolution: For example, 2000P indicates that the internal encoder and the reel rotate one full circle to provide 2000 data points. For a 1-meter stroke, referencing the corresponding table parameters, if the internal reel diameter is 100mm, displacing 100mm will result in the encoder outputting 2000 data points. The minimum displacement resolution is calculated as:100mm / 2000 = 0.050mm.

6. Precautions and warranty

● The displacement sensor of the pull rope is installed in a fixed position, and when the pull head is pulled out, it is strictly prohibited to let go and allow the pull rope to retract instantly.
● Movement needs to be kept unobstructed, and the cable should be pulled out vertically during installation.
● Non technical personnel are strictly prohibited from disassembling. If necessary, please disassemble and reassemble under the guidance of technical personnel;
● When installing the stainless steel ropes, attention should be paid to angle control. If necessary, pulleys can be added appropriately to change direction to ensure measurement accuracy and the service life of the steel rope, and to avoid friction between the wire and the outlet.
● Please confirm the power is turned off when wiring, and be aware that incorrect wiring may cause the encoder main board to burn out.
● The product is guaranteed for one year free of charge when used correctly.
● When exceed the warranty period, or the product is damaged due to improper use, the product can be sent back to the original factory for repair (only raw material cost is required when repair).

7. Contact us and technology support

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Technical documentation

Detailed version of the instruction manual;
PC software;
2D drawings and 3D model files;
Additional Video Tutorials;

WhatsApp

WeChat

For more details, please visit our website: **www.briterencoder.com.**