PHOTOELECTRIC ROTARY ENCODER KIT

AR34M

Absolute Encoder

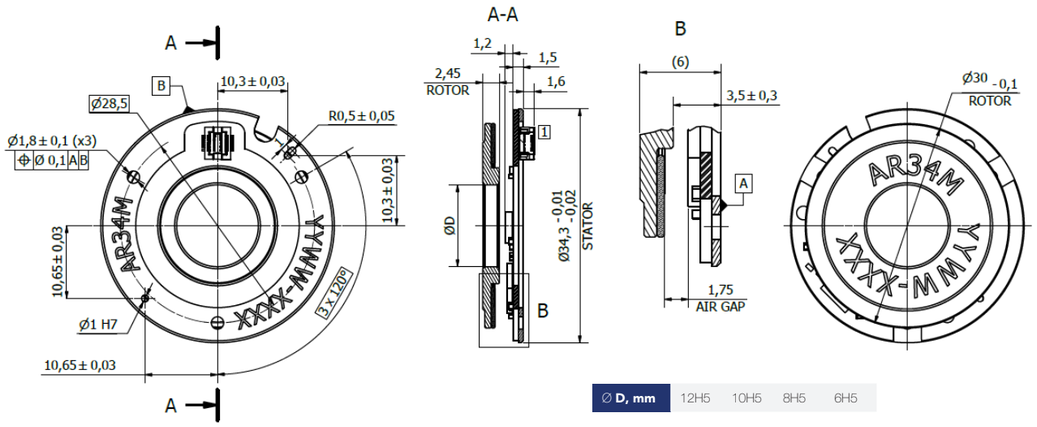
SSI protocol

High Resolutions

Modular

BiSS protocol

This is a photoelectric absolute rotary encoder kit that can have up to 22 bit singleturn resolution and BISS C output signal interface.



∅ D, mm	12H5	10H5	8H5	6H5

MECHANICAL DATA

Airgap	$1.5^{+0.6}_{-0.1}$ mm
Radial Misalignment between rotor and stator	< 0.3 mm
Tangential Misalignment between rotor and stator	< 0.3 mm
Runout sensitivity (mechanical only - customer shaft)	< 0.05 mm
Weight	< 15 g
Ambient Temperature	-40°C to +85°C
Storage Time	15 years
Relative Humidity	70%RH
Vibrations:	
- operational	3.17 G`s RMS| 20÷2000 [Hz] for 5 [min], along three major axes
- storage	15 G`s RMS| 10÷2000 [Hz] for 4 [hour], along three major axes
Mechanical Shock	180 g, 20 ms, 1/2 sine, along 3 major axes in both directions

ELECTRICAL DATA

Counts per turn	4.194.304 (2^{22})
Accuracy*	±0.2° (per 360°) ±0.1° (for partial arc of 90°)
Measurement Noise (at static position)	< ±2LSB
Repeatibility	< ±2LSB
Micro-linearity error (DNL)	< ±4LSB
Data Latency Nominal Value	< 20 µs
Data Latency Nominal Uncertainty	< 5 µs
Rotation Speed	5000 RPM (mechanical survival) Up to 300 RPM - full electrical performance
Encoder input voltage	5 ±0.25 V
Current draw	< 150 mA
Data output format	BiSS + ABZ
BiSS clock frequency	1 < fclock < 20 MHz
Power up to full performance time	< 20 ms
Sensors refresh rate	20 KHz
Sampling rate	< 50 KHz

*Encoder`s accuracy will be within the acceptance range under the maximum rotation speed.

INSTALLATION ERROR

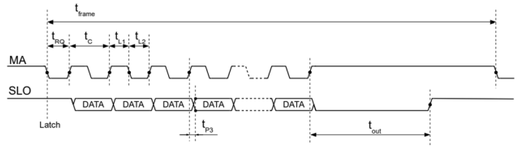
Due to dimensional and form error of the customer's shaft as well as its radial runout and fit tolerances with encoder disc / hub assembly the unwanted runout of the circular scale appears and leads to increased angle measurement error. The following installation error ΔΦ relationship between the radial runout **r** and the mean diameter **D** of the graduation is expressed:

$\Delta\Phi = \pm 412 \times 0.5r / D$ D = 25,92 mm

INTERFACE

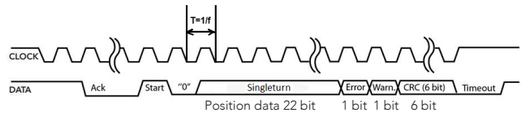
ABSOLUTE DIGITAL INTERFACE

SSI SYNCHRONOUS SERIAL INTERFACE



BiSS INTERFACE

DESCRIPTION	DATA
$T_{timeout}$	Typ. 20 us
Clock frequency	62.4 kHz - 20 MHz



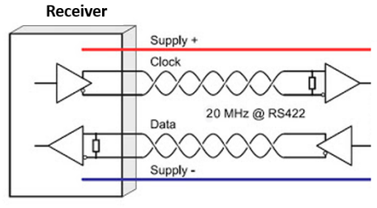
(HEXADECIMAL)	POLYNOME (BINARY)	(POLYNOMAL)	MAX.DATA LENGTH	HAMMING DISTANCE	APPLICATION
0x43	0b100.0011	$X^6+X^1+X^0$	up to 57 bit	3	Sensor data (SCD)

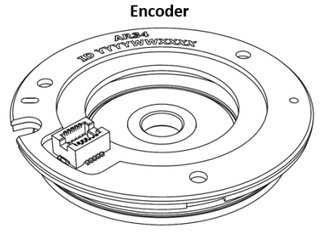
More detailed information (BiSS-Interface AN3: CYCLIC REDUNDANCY CODES)
All values are transmitted MSB first.

	MIN.	TYP.	MAX.	
Adaptive Slave Timeout at DATA	0.075	t_{init} + 0.2*	24	us
Fixed Slave Timeout at DATA	16	20	24	us

*t_{init} measured as first 1.5 · T(MA) each frame

TYPICAL OPERATING CIRCUIT FOR BISS





SIGNAL	PIN. NO
Gnd	5
Vdd(+5V)	6
Clk-	3
Clk+	4
Data-	1
Data+	2
NC	7
Z	8
B	9
A	10

PIN-OUT DESCRIPTION

CONNECTOR

Hirose connector: DF12NC(3.0)-10DP-0.5V(51)

ORDER FORM

AR34M - **X1** - **X2** - **X3** - **X4** - **X5** - **X6**

Interface (X1):	Singleturn bit number (X2):	Code (X3):	Single-ended Incremental Signal Resolution (X4)	Cable length (X5):	Connector type (X6):
S - SSI **B** - BiSS C	**B1** - 1 ...-... **B22** - 22	**B** - Binary **G** - Gray (only for SSI interface)		**T100** - 0.1 m ...-... **T1000** - 1 m (standard) ...-... **T4500** - 4.5 m (maximum)	**D9** - flat, 9 pins (standard) **W** - without connector **B12** - round, 12 pins **C9** -round, 9 pins **C12** - round, 12 pins **RS10** - round, 10 pins **ONC** - round, 10 pins

ORDER EXAMPLE: 1) AR34M-S-B22-B-X-T100-W