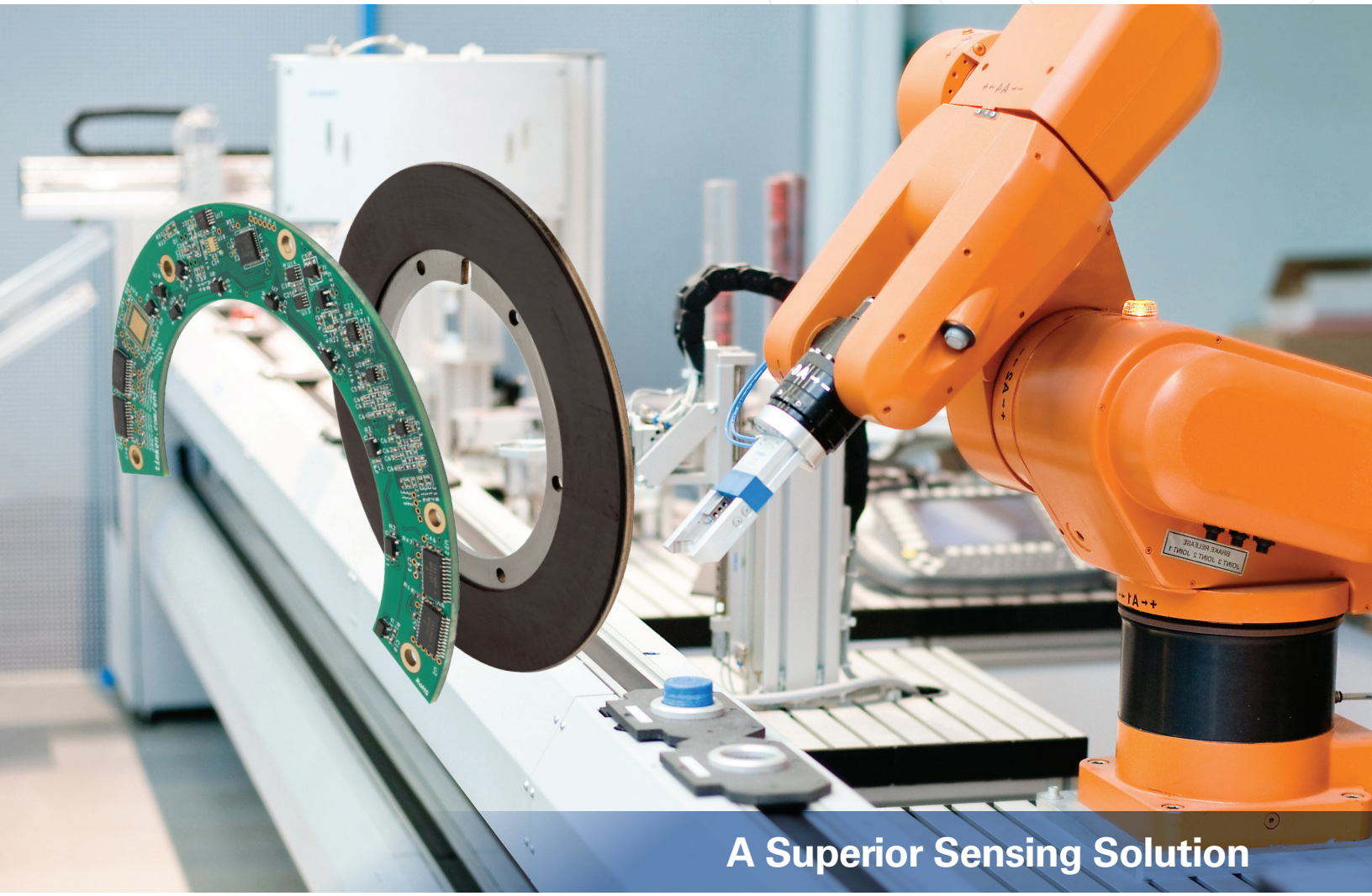
TIMKEN

100MM QUAD ABS KIT MAGNETIC ENCODERS



A Superior Sensing Solution

Timken® absolute position magnetic encoder technology offers clear operational and cost benefits over other commonly used technologies. Our superior sensing products provide reliable speed and position data even in demanding operating environments.

Greater reliability, ease of installation and a flexible, compact design are why you should select Timken® 100mm quad ABS kit magnetic encoders.

RELIABILITY: To ensure the product's reliability, target-to-shaft alignment must be accurate. We compensate for target-to-chip misalignment with our quad sensor design. The encoder's quad configuration has four opposing sensor chips (patent pending). The sensor chips combine and average signals for greater accuracy and reliability. With a high electrical noise immunity, the encoder can be placed in areas with potential electric and magnetic bias fields.

INSTALLATION: Easier installation is another plus for using Timken encoders. Standard encoders need to be calibrated at installation. Timken® 100mm quad ABS kit magnetic encoders are ready for installation. No calibration is needed.

FLEXIBLE DESIGN: The encoder's higher mechanical tolerance and wider air gap make it the right fit for compact joints. By making the design flexible, and increasing the encoder's mechanical tolerance, the product can operate with precision through an extended lifecycle.

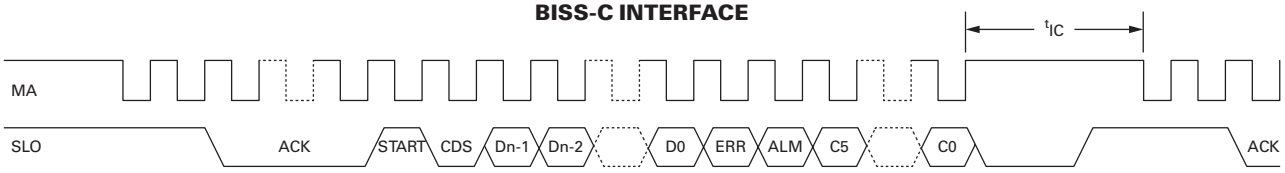
APPLICATIONS: Cobots and other robotic applications, and frameless servo motors where an absolute position encoder is required.

100MM QUAD ABS KIT MAGNETIC ENCODERS FULL DATA

MECHANICAL SPECIFICATIONS	Hub Material	400 series stainless steel	**Air Gap: Magnet to Sensor Chip** 128 Pole pair target designs Nominal: 0.20–0.40 mm Min: 0.10 mm; Max: 0.60 mm 64 PP Pole pair target designs Nominal: 0.30–0.70 mm Min: 0.15 mm; Max: 1.2 mm
	Magnet Material	Nitrile bonded ferrite	
	Connector	10 pin JST SM10B-SRSS-TB	
	Mating Connector	10 pin JST SHR-10V-S-B	
	Max Speed	4,000 RPM	
	Target Mass	80 g	
	PCB Mass	10 g	
ENVIRONMENTAL SPECIFICATIONS	Operating Temperature	-30° – 85°C	
	Humidity	0 - 90 % non-condensing	
	External Bias Field	12 mT (External fields over 50 mT can permanently damage the magnetic target)	
	ESD Protection	6kV	
SYSTEM SPECIFICATIONS	Protocol	BiSS, (Bi-directional BiSS used to reset +/- 90° turns counter)	* Based on factory filter selection
	Interface	SSI, BiSS	
	Resolution	16, 17, 18, 19, 20, 21, 22 bits	
	Positional Accuracy	+/- 0.06°	
	Max Sampling Rate	18 khz	
	Max Refresh Rate	44 khz	
	Signal Latency	50 , 150, 200 uS *	

		Min.	Typical	Max.	Units
ELECTRICAL SPECIFICATIONS	Supply Voltage	4.5	5.0	5.5	V
	Current Draw	102	132	152	mA
	Output Voltage	0	5.0	5.5	V
	Output Current			+/- 60	mA
	Data Clock	2.4	2.5	2.6	MHz
	Data Rate			44	kHz

BISS-C INTERFACE



BiSS-C Waveforms (N=resolution for single turn; n=16+resolution for multi turn)
*For bidirectional BiSS-C, please refer to: http://biss-interface.com/download/biss-c-protocol-description-english

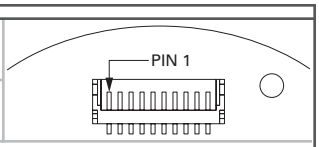
	Parameter	Symbol	Min.	Typical	Max.	Unit	Note
BISS-C TIMING CHARACTERISTICS	First Data Shifted to Output Oegister	t_{FE}	2.75			µs	
	Idle Time	t_{IC}	15			µs	
	Data Output Valid	t_{DO}			80	ns	
	Clock Pulse Width	$t_{CLK/2}$		400		ns	
	Clock Frequency	f_{CLK}	2.4	2.5	2.6	MHz	Other frequencies also available
	Line Delay			2.8		µs	
	ACK			7		Bits	At 2.5MHz

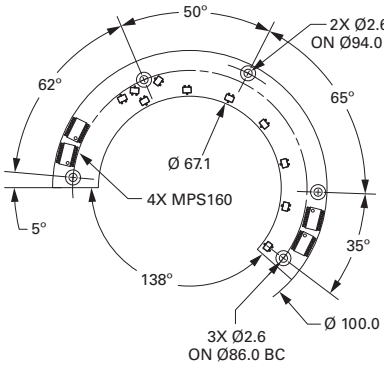
	Field	Description
DATA FRAME BIT DEFINITIONS	Dn-1:D0 n=22 for 22 bit single turn resolution n= 22+16 for 22 bit with 16 bit turns counter	ABS Data output, MSB first For Multi-turn output: Dn-1: Dn-16 are 16bit turn counter data; Dn-16: D0 are single turn ABS data
	ERR	Error Flag: signal error / Turn counter past 90° – LED goes Red
	ALM	Alarm Flag: ABS data Alarm – Air gap out of range – LED goes Red
	C5:C0	CRC Bits. CRC polynomial: $\chi^6 + \chi + 1$, inverted

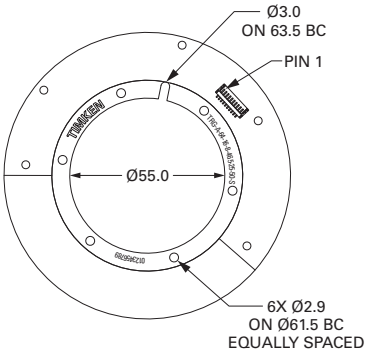
MULTI TURN COUNTER: The sensor will count turns when power is on. The sensor records its position when powered down. If the sensor is powered on within 90 degrees of the power down position the sensor will retain the turns counter information. If the sensor powers on more than 90 degrees from the power down position the sensor will set a turns counter flag, turn on the red LED and clear the turns count total. The user clears the turns counter flag through a BiSS command or by power cycling. **1.** Write 0xCD to register 0x48 | **2.** Write 0xCD to register 0x14.

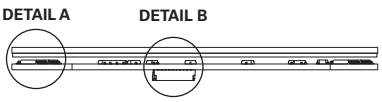
CONNECTOR PINOUT

Pin #	1	2	3	4	5	6	7	8	9	10
Symbol	NC	NC	SLO+	SLO-	MA+	MA-	V_{dd}	GND	NC	NC









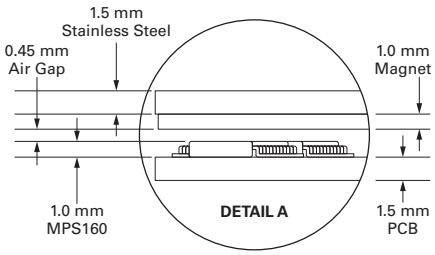
Air Gap: Magnet to Sensor Chip

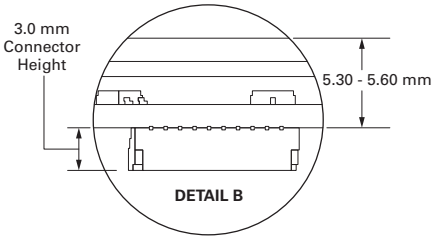
Nominal / Ideal:	0.30 – 0.60 mm
Minimum:	0.015 mm
Maximum:	0.80 mm

Mounting Recommendations

Sensor PCB	
Fastener:	M2.5 Screw, Low Profile Head
Torque (Max):	0.28 N–m
Magnetic Target	
Fastener:	M2.5 Screw
Torque (Max):	0.80 N–m

Revision 10 - 20





ORDERING INFORMATION

Configuration Example

ABS-100 - 22 - B - C - 4 - 100 - N - 0

Type	100 mm OD	Resolution (Bits)	Interface	Interface Description	Connection	Connection Description	Sensors	Filter Max RPM	Conformal Coating	Options
ABS	100	16	B	BiSS C	C	Connector	4	4000	N	0
		17	S	SPI			2	1000	Y	Custom #
		18	U	UART				100		
		19						10		
		20								
		21								
		22								

More details regarding specifications, installation and instructions available at **www.timkenencoders.com**.

TIMKEN

The Timken team applies their know-how to improve the reliability and performance of machinery in diverse markets worldwide. The company designs, makes and markets bearings, gear drives, automated lubrication systems, belts, brakes, clutches, chain, couplings, linear motion products and related power transmission rebuild and repair services.

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