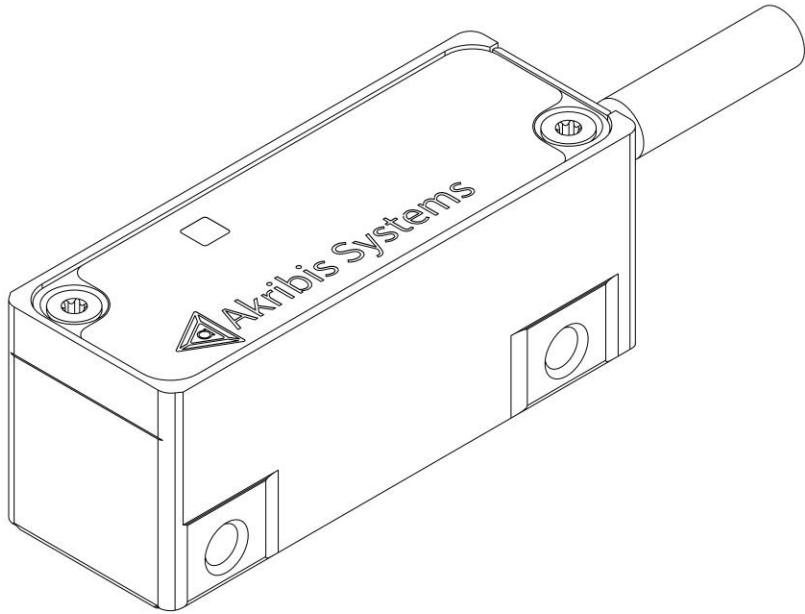


ABA-50 Optical, Absolute Encoder



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Revision History

Revision No.	Date	Changelog
1.0	Jan 2020	Initial Release
2.0	11 May 2020	<p>ABA-50 Readhead Installation Drawing & SA50-S-L Scale Installation – page 2 & 3</p> <p>-Change of encoder image, added Indicator LED</p> <p>ABA-50 Quick-start Guide – page 6</p> <p>-Added in installation description</p> <p>Readhead LED Diagnostics – page 8</p> <p>-Added in diagnostics table</p>
2.1	19 June 2020	<p>-Change page numbering format</p> <p>Pinout – Page 9</p> <p>-Change '0V' to 'GND'</p> <p>-Added '(Short with Pin 2)' on Pin 10</p> <p>-Added '(Short with Pin 4)' on Pin 12</p> <p>General Specifications – Page 11</p> <p>-Added 'C1' to Connector Options</p>
2.2	9 July 2020	<p>General Specification – Page 11</p> <p>-Added 'Interpolation Error $\pm 2 \mu\text{m}$'</p>
2.3	4 August 2020	<p>Pinout – Page 9</p> <p>-Removal of "Not Connected" pins</p>
2.4	3 September 2020	<p>Readhead LED Diagnostics – Page 8</p> <p>-Added for Panasonic & BiSS C</p> <p>Pinout – Page 9 & 10</p> <p>-Added Page 10</p> <p>-Change 'SLO' & 'MA' to 'Data' & 'Clock'</p> <p>-Added BiSS C & Panasonic pinout pins</p> <p>-Added cable colour for reserved pins</p>
2.5	11 November 2020	<p>General Specification – Page 12</p> <p>-Change Interpolation Error from '$\pm 2 \mu\text{m}$' to '$\pm 1 \mu\text{m}$'</p>

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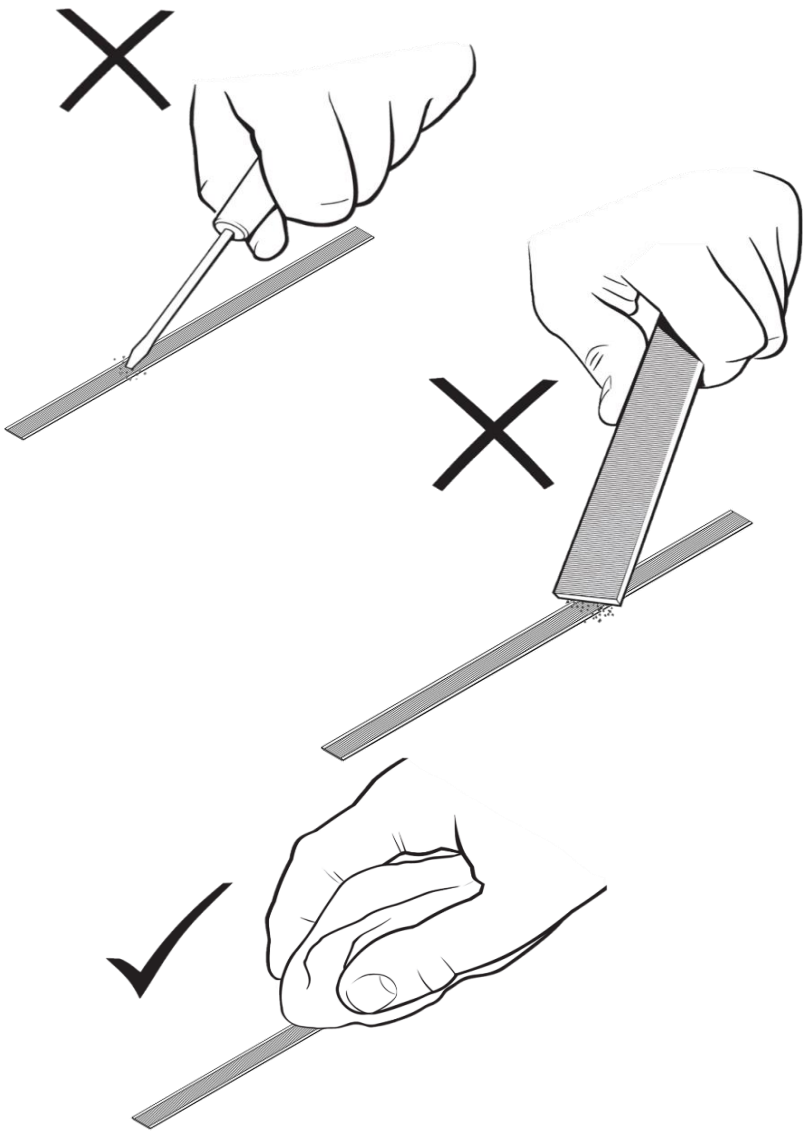
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2.6	20 November 2020	Power Supply – Page 12 -Change to '100 mA (Typical)' Communication Interface – Page 12 -Change 'Mitsubishi high speed interface communication interface' to 'Mitsubishi (Mit03-2)' and added 'Panasonic (Pana02), BiSS C (BiSS/Cu)'
2.7	9 February 2021	Power Supply – Page 12 -Change to '5V \pm 10%' to '3.6V DC to 14V DC'
2.8	27 May 2021	Scale Specifications – Page 12 -Updated Scale Length to 'Standard length of 6 m with a maximum of 27 m' -Added '(Includes Adhesive)' in Weight -Added 'Grating Period 100 μ m'
2.9	27 July 2021	
3.0	31 August 2022	Replaced Readhead Installation Drawing with Readhead Dimension – Page 2 Added Glass Scale Installation Drawing – Page 3 Replaced Steel scale installation Drawing with new drawing – Page 4 Change Header from Scale Application to Steel Scale Application – Page 6 Added Glass Scale Application instruction – Page 7 Scale Technical Specifications – Page 14 – Added Robax Scale Length – Added Robax Form H*W – Added Robax substrate material – Added Expansion Coefficient of Robax Glass – Added Robax Weight

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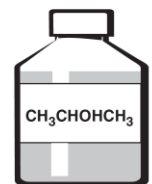
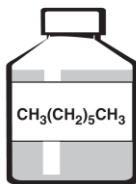
Storage and Handling



Scale and Readhead

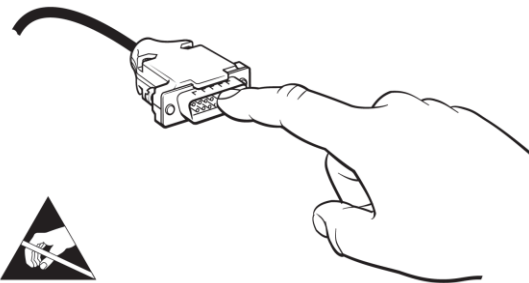
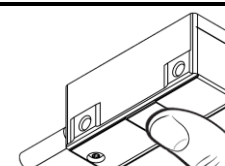
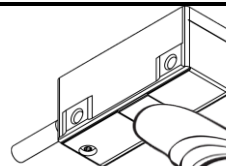
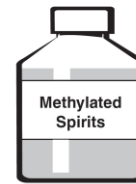
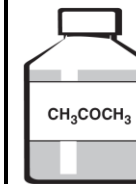
N-heptane

Propan-2-ol



Readhead Only

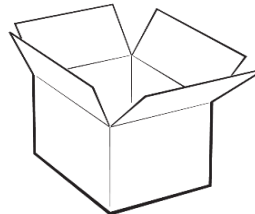
Acetone



Storage



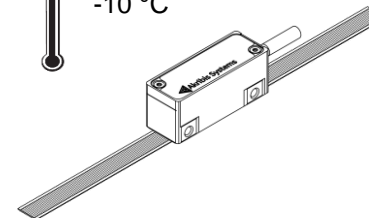
+70 °C
-20 °C



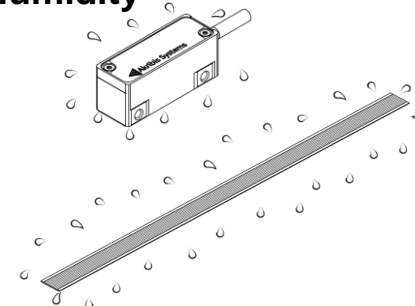
Operating



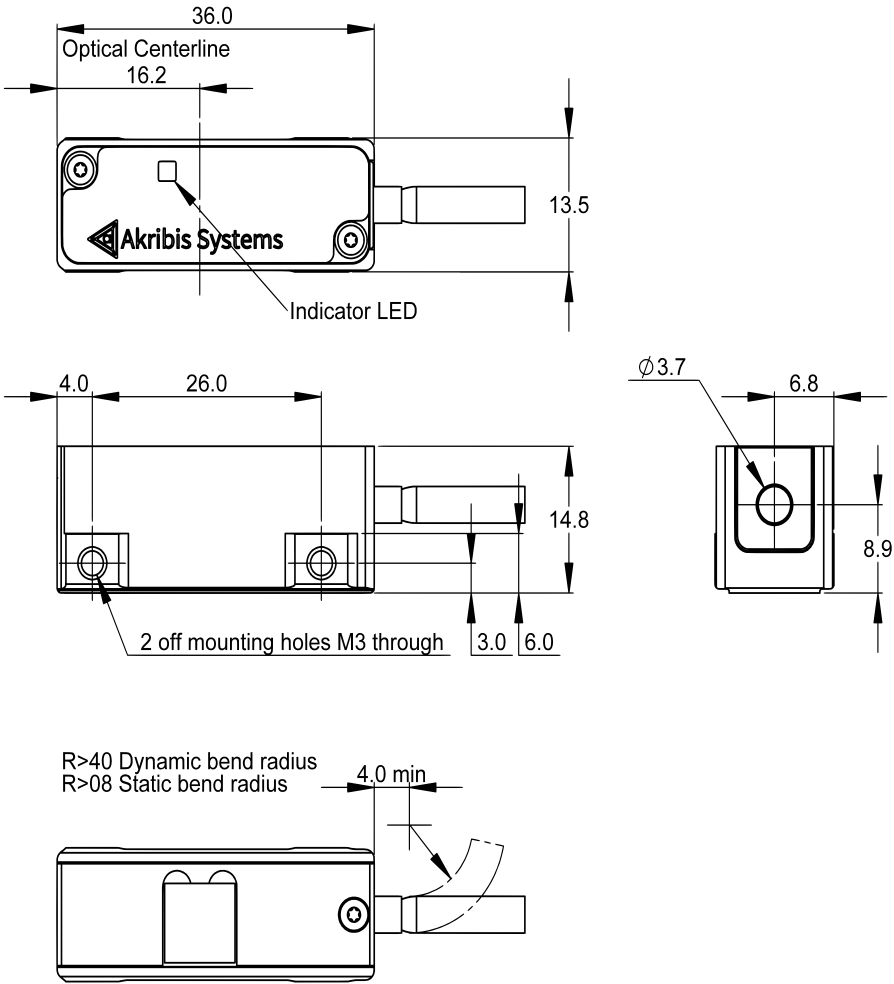
+50 °C
-10 °C



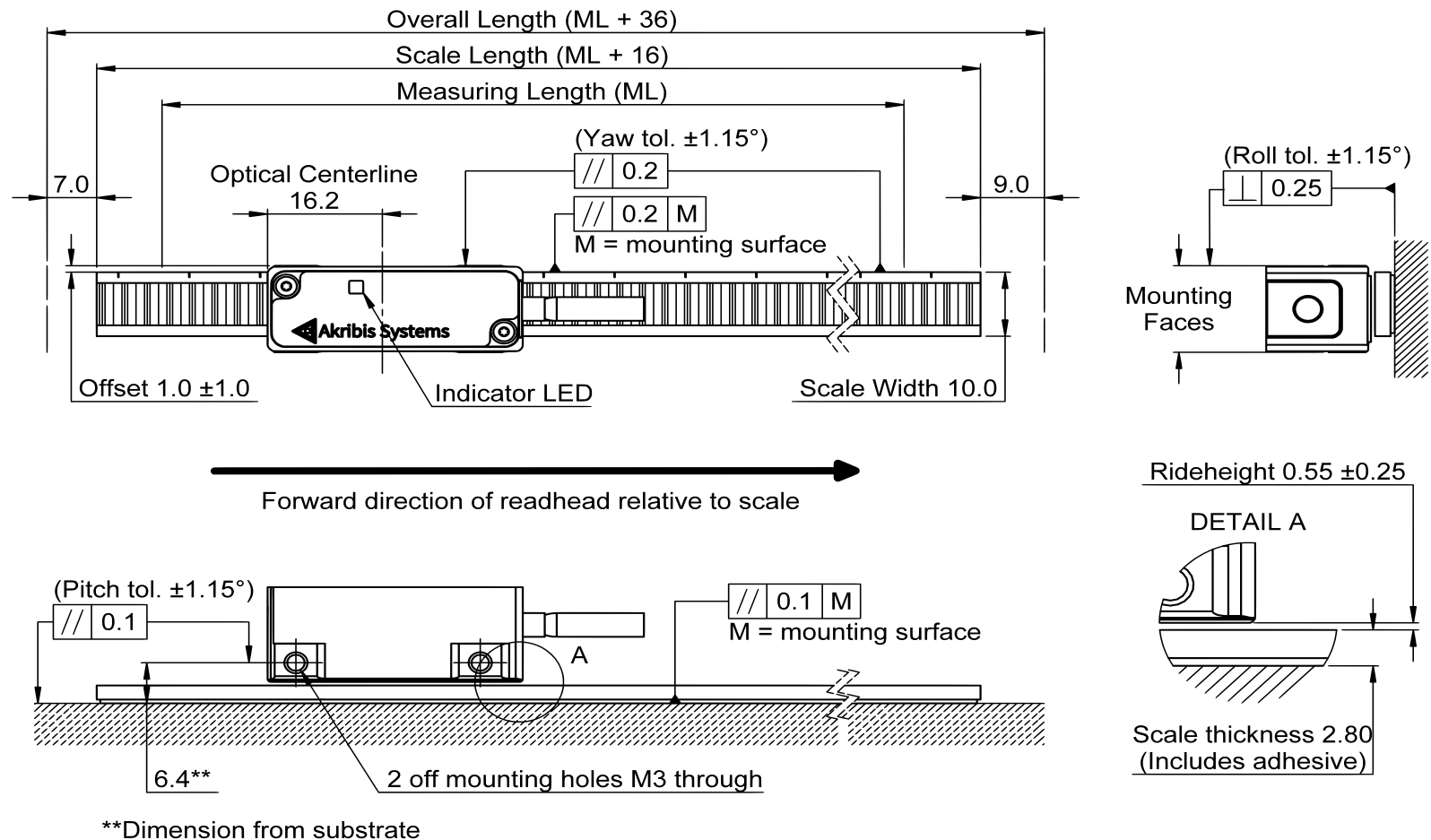
Humidity



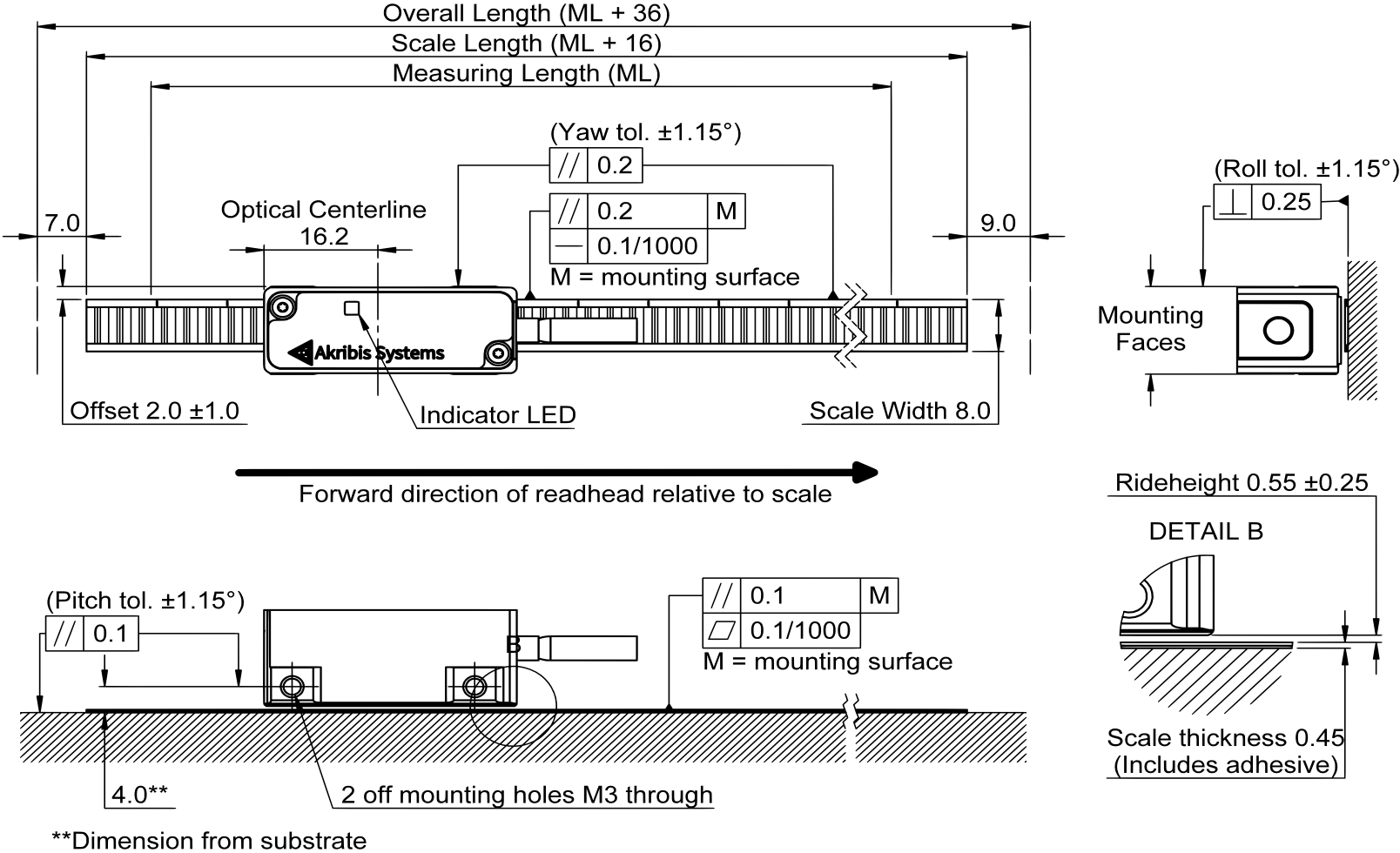
ABA-50 Readhead Dimension



SA50-G0-L Installation Drawing



SA50-S-L Installation Drawing



Suggested Extension Cable

Please seek sales team for advice.

Strain Relief

Avoid torque or tensile, please always use strain relief, whenever necessary.

Handling Precautions

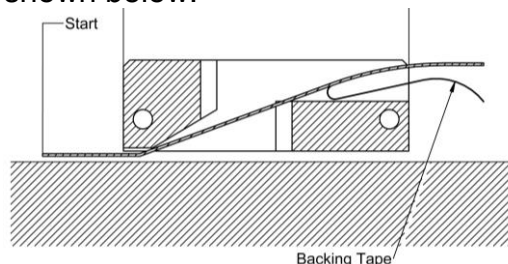
To avoid damaging the cable, apply force only to the connector during pulling or insertion. Ensure to tighten both screws of the connectors.

Steel Scale Application

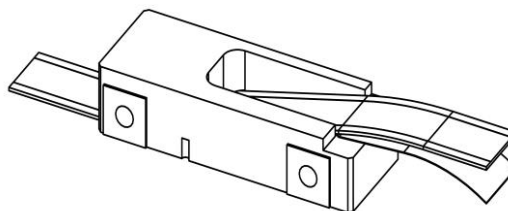
Scale mounting tool (908016-01) is designed for use with SA50-S-L scale.

1. Allow scale to acclimatise to installation environment prior to installation.
2. Mark out the 'START' and 'FINISH' points for the scale on the axis substrate.
3. Thoroughly clean and degrease the substrate using recommended solvents (see 'Storage and Handling'). Allow substrate to dry before applying scale.
4. Mount the scale mounting tool to the readhead mounting bracket using M3 screws. Place the spacer supplied with the readhead between the mounting tool and substrate to set the nominal height. NOTE: Scale mounting tool can be mounted either way round to enable easiest orientation for scale installation.

5. Move axis to scale 'START' position, leaving enough room for the scale to be inserted through the mounting tool, as shown below.

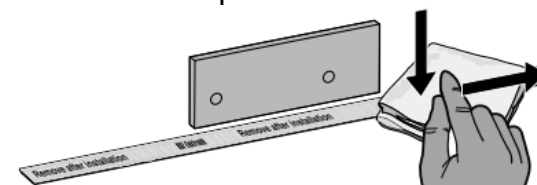


6. Begin to remove the backing paper from the scale and insert scale into the mounting tool up to the 'START' point.
7. Apply finger pressure to the scale at the 'START' point, using a clean lint-free cloth, to ensure scale end adheres well to the substrate.

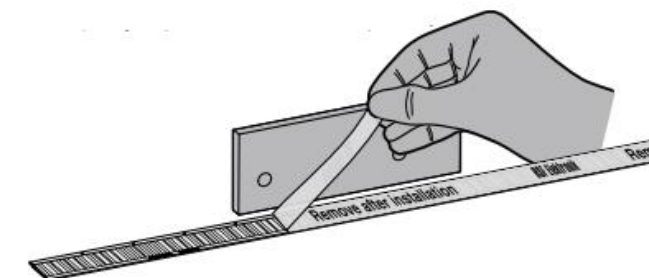


8. Slowly and smoothly move the mounting tool through the entire axis of travel.

9. Remove mounting tool and, if necessary, adhere the remaining scale manually. Apply firm finger pressure via a clean lint-free cloth along the length of the scale after application to ensure complete adhesion.



10. Strip away the protective foil of the scale.



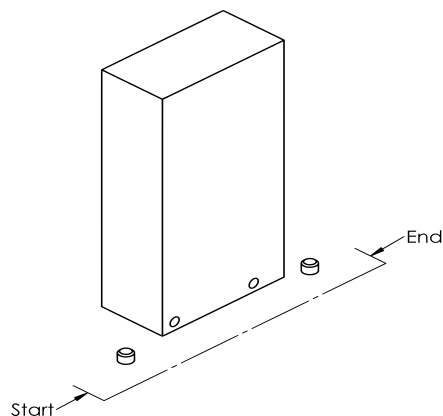
11. Clean scale using N-heptane and Propan-2-ol or a clean, dry, lint-free cloth.
12. Allow 24 hours for complete adhesion of scale.

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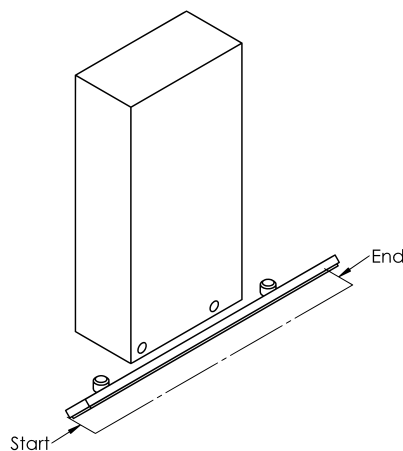
Glass Scale Application

1. Allow scale to acclimatise to installation environment prior to installation.
2. Mark out the 'START' and 'FINISH' points for the scale on the axis substrate.
3. Thoroughly clean and degrease the substrate using recommended solvents (see 'Storage and Handling'). Allow substrate to dry before applying scale.



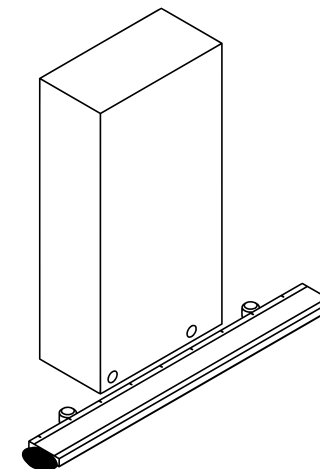
4. Mount the dowel pins to support the scale during installation.

5. Remove the backing paper from the scale (if any). Tilt the scale by 45° to assist in alignment to dowel pins. Slowly press down the scale while using dowel pins as a support.



6. Apply firm finger pressure via a clean lint-free cloth along the length of the scale after application to ensure complete adhesion.
7. Clean scale using N-heptane and Propan-2-ol or a clean, dry, lint-free cloth.

8. Apply your preferred epoxy to the reference point of the scale. Make sure the epoxy does not interfere with the readhead.



9. Allow 24 hours for complete adhesion of scale.

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ABA-50 Quick-start Guide

This section is a quick start guide to installing an ABA-50 system.

INSTALLATION



Ensure scale, readhead optical window and mounting faces are clean and free from obstructions.



Install the readhead on the bracket.



Connect readhead to receiving driver or controller and indicator LED will power-up.



Check the readhead status through the indicator LED and run with driver or controller.

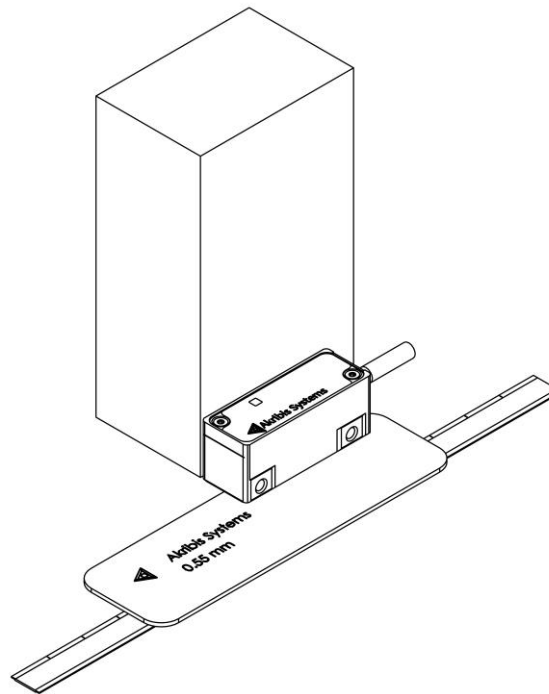
Readhead Mounting and Alignment

Mounting brackets

The bracket must have a flat mounting surface and should provide adjustment to enable conformance to the installation tolerances, allow adjustment to the rideheight of the readhead, and be sufficiently stiff to prevent deflection or vibration of the readhead during operation.

Readhead set-up

Ensure that the scale, readhead optical window and mounting face are clean and free from obstructions. To set nominal rideheight, place the spacer under the readhead during set-up procedure.



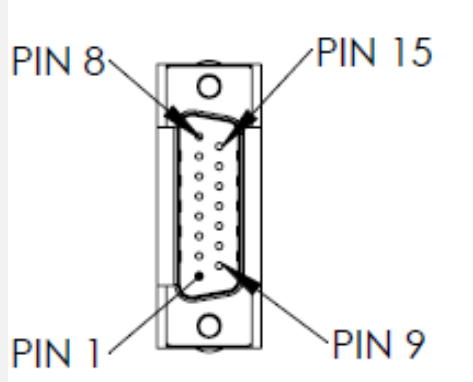
Readhead LED Diagnostics

LED	BiSS C	EnDat 2.2	Mitsubishi	Panasonic	Status
Green	✓	✓	✓	✓	Readhead is working normally. Signal strength is optimal.
Yellow	✓	✓		✓	Readhead is working normally. Signal strength is not optimal.
Red	✓	✓	✓	✓	Readhead is not in normal working condition

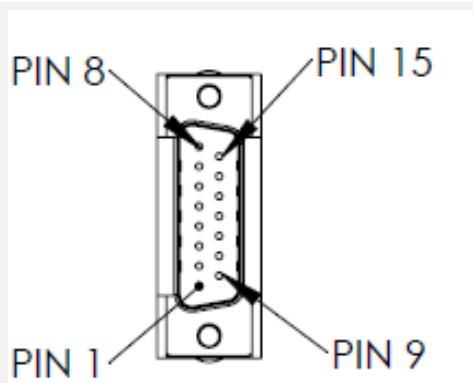
Note : Please place the encoder on the scale before power up. When there is error occur (LED light shows either Yellow or Red), please power reset.

Pinout (15 Way D-Type – Male)

ABA-50B

I/O Connector	Pinout	Signal	Function	Colour
	Pin 2	GND	Encoder Supply (0V)	White/Green
	Pin 4	5V	Encoder Supply (5V)	Brown/Green
	Pin 5	SLO +	SLO +	Grey
	Pin 8	MA +	MA +	Violet
	Pin 10	GND (Short with Pin 2)	Encoder Supply (0V)	White
	Pin 12	5V (Short with Pin 4)	Encoder Supply (5V)	Blue
	Pin 13	SLO –	SLO –	Pink
	Pin 15	MA –	MA –	Yellow
	Case	Shield	Shield	–

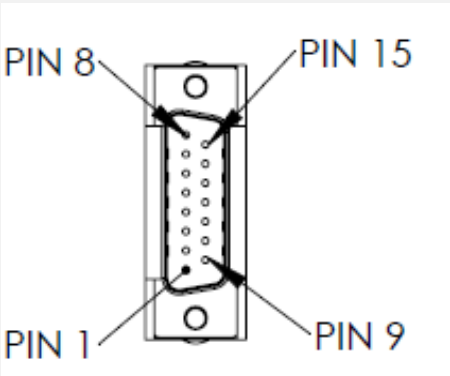
ABA-50E

I/O Connector	Pinout	Signal	Function	Colour
	Pin 2	GND	Encoder Supply (0V)	White/Green
	Pin 4	5V	Encoder Supply (5V)	Brown/Green
	Pin 5	Data +	Data +	Grey
	Pin 8	Clock +	Clock +	Violet
	Pin 10	GND (Short with Pin 2)	Encoder Supply (0V)	White
	Pin 12	5V (Short with Pin 4)	Encoder Supply (5V)	Blue
	Pin 13	Data –	Data –	Pink
	Pin 15	Clock –	Clock –	Yellow
	Case	Shield	Shield	–

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ABA-50M / ABA-50P

I/O Connector	Pinout	Signal	Function	Colour
	Pin 2	GND	Encoder Supply (0V)	White/Green
	Pin 4	5V	Encoder Supply (5V)	Brown/Green
	Pin 5	RSV	Reserved	Grey
	Pin 8	Request /Data +	Request /Data +	Violet
	Pin 10	GND (Short with Pin 2)	Encoder Supply (0V)	White
	Pin 12	5V (Short with Pin 4)	Encoder Supply (5V)	Blue
	Pin 13	RSV	Reserved	Pink
	Pin 15	Request /Data –	Request /Data –	Yellow
	Case	Shield	Shield	–

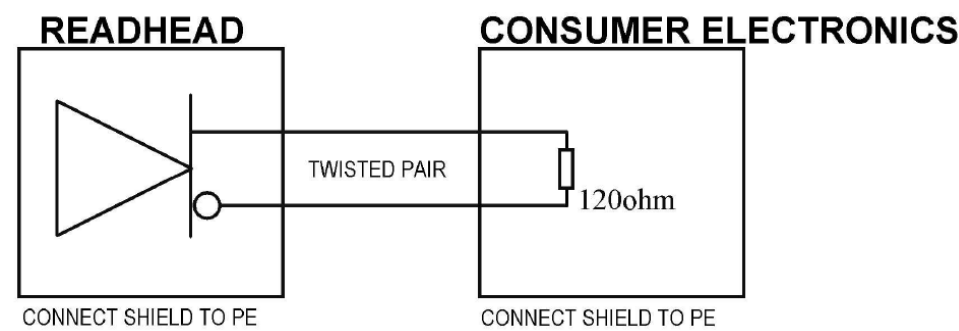
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Speed

Parameter	Max speed (m/s)
Linear	10

Electrical Connections



IMPORTANT: The shield should be connected to the machine earth (Field Ground)

Maximum readhead cable length: 5 m

General Specifications

Power Supply	3.6V DC to 14V DC	100 mA (Typical)
Communication Interface		BiSS C (BiSS/Cu) EnDat 2.2 Mitsubishi (Mit03-2) Panasonic (Pana02)
Temperature	Storage Operating	-20 °C to +70 °C -10 °C to +50 °C
Humidity		10 to 80% @ RH (Non-Condensing)
Acceleration	Operating	500 m/s ² , 3 Axes
Shock	Non-Operating	1000 m/s ² , 6 ms
Vibration	Operating	500 m/s ² Max @ 55 to 2000 Hz
Mass	Readhead Cable	18 g 20 g/m
Bending Radius Static/Dynamic		8 mm/40 mm
Cable		8 Cores, Single Shielded
Connector Options	C1	15 Way D-Type – Male
Dimension		L36 mm * W13.5 mm * H14.8 mm
Sealing		IP40
Measuring Step		50 nm
Interpolation Error		±1 µm

Scale Technical Specifications

Grating Compatibility		Absolute Linear
Scale Length	Robax Stainless Steel	Up to 1.5m Standard length of 6 m with a maximum of 27 m
Accuracy		±15 µm/m
Form	Robax Stainless Steel	W10.00 mm * H2.80mm (Includes Adhesive) W8.0 mm * H0.45 mm (Includes Adhesive)
Substrate Material		Robax Glass Stainless Steel
Expansion Coefficient		0 ppm/°C (Glass Scale) 11 ppm/°C (Steel Scale)
Temperature	Storage Operating	-20 °C to 70 °C @ RH < 95% (Non-Condensing) -10 °C to 50 °C @ RH < 95% (Non-Condensing)
Weight	Robax Stainless Steel	57 g/m (Without Adhesive) 20 g/m (Includes Adhesive)
Grating Period		100 µm

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