Data sheet
L-9517-9778-07-D

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QUANTiC™ series encoder system

The QUANTiC™ encoder series provides robust incremental position measurement for linear, partial arc and rotary systems with excellent metrology and wide installation tolerances. This reduces or eliminates the need for mounting adjustment during the installation process.

QUANTiC encoders include Renishaw's high-performance integrated interpolation technology, removing the need for additional adaptors or separate interfaces. This provides stable and reliable position signals for a wide range of demanding measurement and motion control applications.

The easy-to-use built-in installation and calibration functions can be enhanced with the optional Advanced Diagnostic Tool ADTi-100, providing comprehensive real-time encoder feedback during installation and diagnostics.

In addition to Renishaw's proven unique filtering optics, QUANTiC encoders have a new detector design which gives superior signal purity and dirt immunity. They are combined in a compact readhead body, joining the VIONiC™ and TONiC™ family of encoders.

- **Compact, all-in-one, optical encoder with analogue or digital output**
- **Wide tolerances**
  - **Rideheight from ±0.3 mm**
  - **Yaw ±0.9°**
- **Compatible with a wide range of linear, partial arc and rotary scales with *IN-TRAC*™ auto-phase reference mark (datum)**
- **Maximum speed to 24 m/s (3.63 m/s at 0.1 µm resolution)**
- **Excellent dirt immunity**
- **Resolutions from 10 µm to 50 nm**
- **Integrated set-up LED for ease of installation**
- **Auto Gain Control (AGC), Auto Balance Control (ABC) and Auto Offset Control (AOC) ensure consistent signal strength for long-term reliability**
- **Integrated dual limits (linear only)**
- **Optional Advanced Diagnostic Tool ADTi-100 to optimise set-up and assist with system diagnostics**

System features

In-built reliability and ease of installation

- **Robust position measurement over contamination**

  QUANTiC encoder readheads ensure excellent motion control performance in a wide range of applications by minimising positional error over scale contamination. A new detector design provides an additional layer of signal filtering which helps to eliminate non-harmonic signal frequencies, ensuring low sub-divisional error (SDE) and minimal signal variation over dirt or contamination on the scale.

- **Easy installation and setup**

  The advanced optical design and signal processing of the QUANTiC encoder provides increased installation and operational tolerances whilst maintaining metrological performance. Low cost of ownership is achieved through reduced installation and setup times.

- **High speed performance**

  With best-in-class signal processing and optimum detector design, QUANTiC can achieve speeds up to 24 m/s to meet the most demanding motion control requirements. This enables end users to increase system throughput reducing cost per part to the end user.

Optional Advanced Diagnostic Tool ADTi-100*

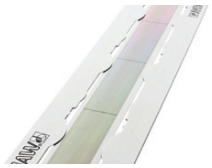
The QUANTiC encoder system is compatible with the Advanced Diagnostic Tool ADTi-100 and ADT View software. They provide comprehensive real-time encoder data feedback to aid more challenging installations and diagnostics. The intuitive software interface can be used for:

- Remote calibration
- Signal optimisation over the entire axis length
- Readhead pitch indication
- Limit and reference mark indication
- Readout of encoder position (relative to scale)
- Monitoring velocity
- Exporting and saving data

* For more information refer to *Advanced Diagnostic Tool ADTi-100* data sheet (Renishaw part no. L-9517-9699).

Compatible scales

Linear scales

	RTLC40-S	RTLC40 / *FASTRACK*™	RKLC40-S†
	Self-adhesive mounted stainless steel tape scale	Stainless steel tape scale and self-adhesive mounted carrier	Self-adhesive mounted stainless steel tape scale
			
Form (H × W)	0.4 mm × 8 mm including adhesive	RTLC40 scale: 0.2 mm × 8 mm *FASTRACK* carrier: 0.4 mm × 18 mm including adhesive	0.15 mm × 6 mm including adhesive
Accuracy (includes slope and linearity)	RTLC40-S: ±15 µm/m RTLC40H-S: ±5 µm/m	RTLC40: ±15 µm/m RTLC40H: ±5 µm/m	RKLC40-S: ±15 µm/m RKLC40H-S: ±5 µm/m
Linearity (Figures achievable with two-point error correction)	RTLC40-S: ±5 µm/m RTLC40H-S: ±2.5 µm/m	RTLC40: ±5 µm/m RTLC40H: ±2.5 µm/m	RKLC40-S: ±3 µm/m RKLC40H-S: ±2.5 µm/m
Maximum length	10 m* (> 10 m available on request)	10 m (> 10 m available on request)	20 m (> 20 m available on request)
Coefficient of thermal expansion (at 20 °C)	10.1 ±0.2 µm/m/°C	10.1 ±0.2 µm/m/°C	Matches that of substrate material when scale ends fixed by epoxy mounted end clamps

* For RTLC40-S axis lengths > 2 m, *FASTRACK* carrier with RTLC40 is recommended
† Suitable for partial arc applications. For more information refer to *RKL scale for partial arc applications* data sheet (Renishaw part no. L-9517-9897)

Rotary scales

	RESM40
	Stainless steel ring
	
Typical installed accuracy‡	±1.9 arc second (550 mm diameter RESM40 ring)
Ring diameters	52 mm to 550 mm
Coefficient of thermal expansion (at 20 °C)	15.5 ±0.5 µm/m/°C

For more information about the scales refer to the relevant scale data sheet which can be downloaded from **www.renishaw.com/quanticdownloads**.

‡ 'Typical' installations are a result of graduation and installation errors combining and, to some magnitude, cancelling.

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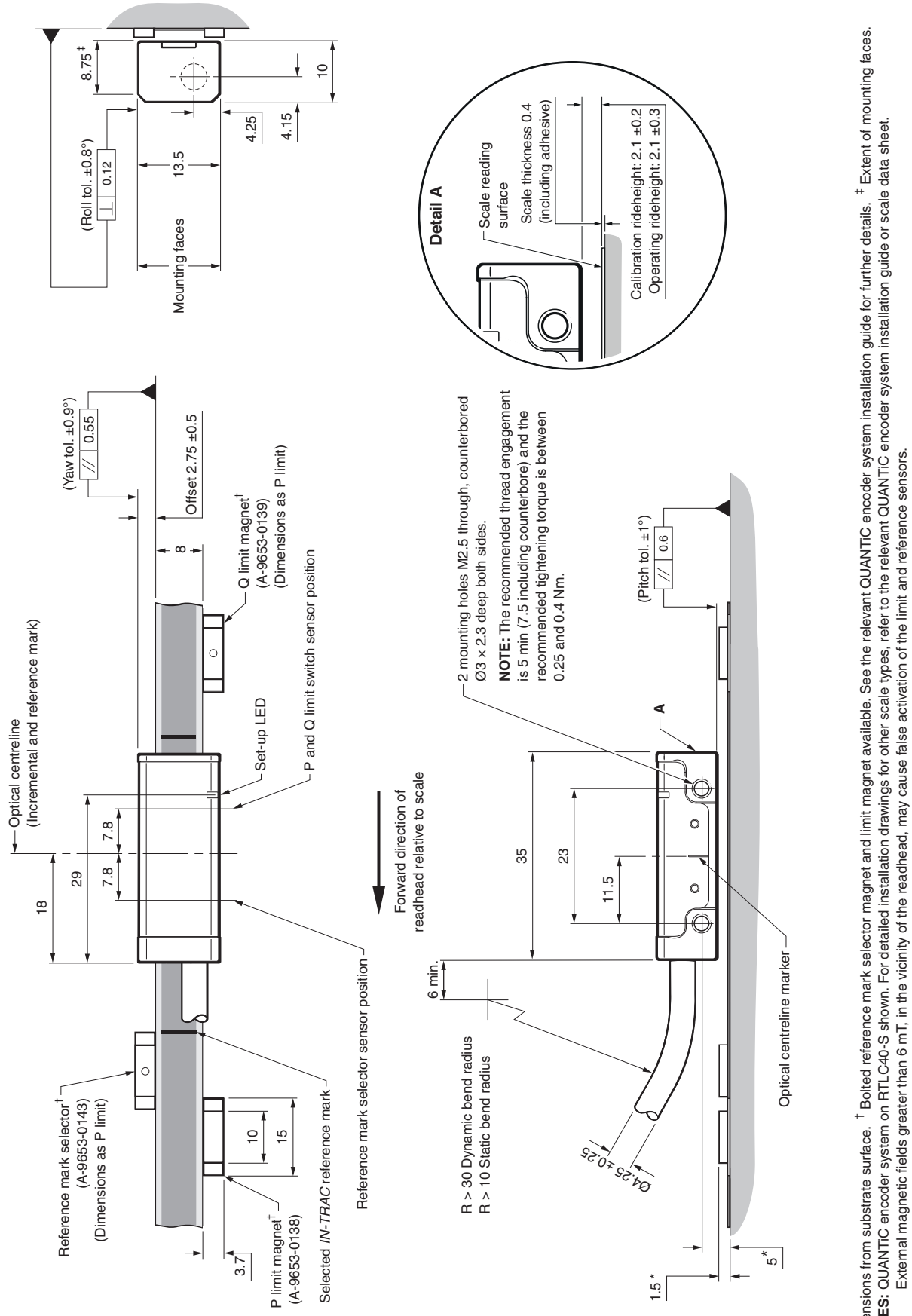
QUANTiC encoder system installation drawing (on RTLC40-S scale)

Dimensions and tolerances in mm



* Dimensions from substrate surface. † Bolted reference mark selector magnet and limit magnet available. See the relevant QUANTiC encoder system installation guide for further details. ‡ Extent of mounting faces.

NOTES: QUANTiC encoder system on RTLC40-S shown. For detailed installation drawings for other scale types, refer to the relevant QUANTiC encoder system installation guide or scale data sheet.

External magnetic fields greater than 6 mT, in the vicinity of the readhead, may cause false activation of the limit and reference sensors.

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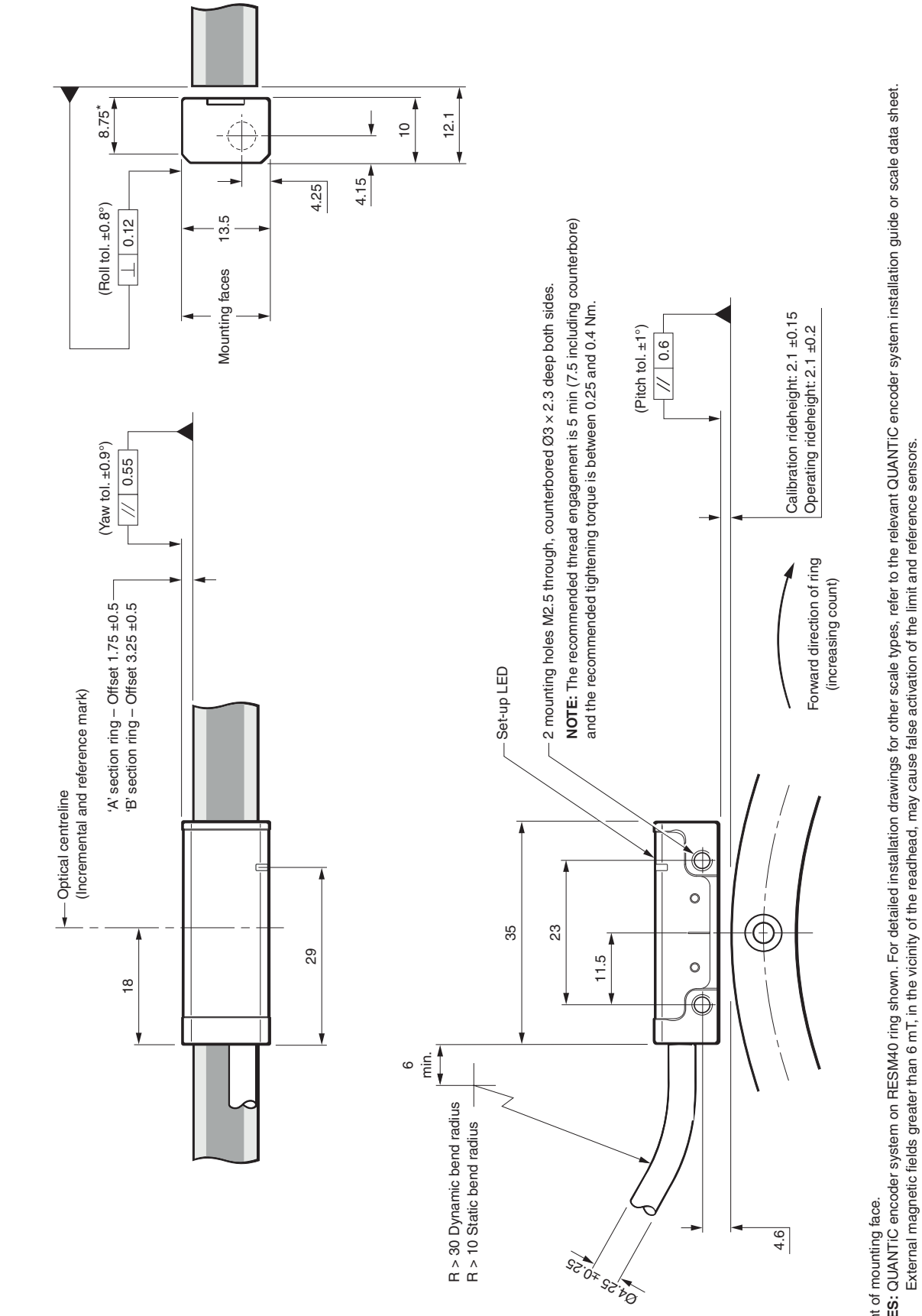
QUANTiC encoder system installation drawing (on RESM40 ring)

Dimensions and tolerances in mm



* Extent of mounting face.

NOTES: QUANTiC encoder system on RESM40 ring shown. For detailed installation drawings for other scale types, refer to the relevant QUANTiC encoder system installation guide or scale data sheet.
External magnetic fields greater than 6 mT, in the vicinity of the readhead, may cause false activation of the limit and reference sensors.

General specifications

Power supply	5 V –5%/+10%	Typically 150 mA fully terminated (analogue output)	
		Typically 200 mA fully terminated (digital output)	
		Power from a 5 Vdc supply complying with the requirements for SELV of standard IEC 60950-1	
	Ripple	200 mVpp maximum @ frequency up to 500 kHz	
Temperature (system)	Storage	–20 °C to +70 °C	
	Operating	0 °C to +70 °C	
Humidity (system)		95% relative humidity (non-condensing) to IEC 60068-2-78	
Sealing		IP40	
Acceleration	Operating	400 m/s², 3 axes	
Shock	Operating	500 m/s², 11 ms, ½ sine, 3 axes	
Vibration	Operating	100 m/s² max @ 55 Hz to 2000 Hz, 3 axes	
Mass	Readhead	9 g	
	Cable	26 g/m	
EMC compliance		IEC 61326-1	
Readhead cable		Single-shielded, outside diameter 4.25 ±0.25 mm	
		Flex life > 20 × 10^6 cycles at 30 mm bend radius	
		UL recognised component	
	Maximum cable length*	5 m (analogue output)	
		3 m (digital output)	
Connector options		**Code - connector type**	
		A - 9-way D-type - Digital output only	
		L - 15-way D-type (standard pin-out) - Analogue output only	
		D - 15-way D-type (standard pin-out) - Digital output only	
		H - 15-way D-type (alternative pin-out)	
		X - 12-way circular connector - Digital output only	
		J - 14-way JST connector	

Typical sub-divisional error (SDE)	**Analogue output** †	**Digital output**
Linear	< ±120 nm	< ±80 nm
Rotary ≤ ∅135 mm	< ±120 nm	< ±80 nm
Rotary > ∅135 mm	< ±150 nm	< ±150 nm

* Extension cables available. Contact your local Renishaw representative for further details.

† SDE has been measured when used with a Ti interface.

Speed

Digital readheads

Clocked output option (MHz)	Maximum speed (m/s)							Minimum edge separation* (ns)
	T (10 µm)	D (5 µm)	X (1 µm)	Z (0.5 µm)	W (0.2 µm)	Y (0.1 µm)	H (50 nm)	
50	24	24	24	18.13	7.25	3.626	1.813	25.1
40	24	24	24	14.50	5.80	2.900	1.450	31.6
25	24	24	18.13	9.06	3.63	1.813	0.906	51.0
20	24	24	16.11	8.06	3.22	1.611	0.806	57.5
12	24	24	10.36	5.18	2.07	1.036	0.518	90.0
10	24	24	8.53	4.27	1.71	0.853	0.427	109
08	24	24	6.91	3.45	1.38	0.691	0.345	135
06	24	24	5.37	2.69	1.07	0.537	0.269	174
04	24	18.13	3.63	1.81	0.73	0.363	0.181	259
01	9.06	4.53	0.91	0.45	0.18	0.091	0.045	1038

Analogue readheads

Maximum speed: 20 m/s (–3dB)†

Angular speeds

Angular speed depends on ring diameter – use the following equation to convert to rev/min:

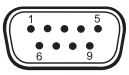
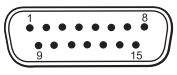
$$\text{Angular speed (rev/min)} = \frac{V \times 1000 \times 60}{\pi D}$$

Where V = maximum linear speed (m/s) and
D = external diameter of RESM40 ring (mm).

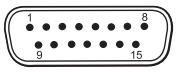
* For a readhead with a 1 m cable.
† At speeds > 20 m/s, SDE may be affected.

Output signals

Digital outputs

							
Function	**Signal**		**Colour**	**9-way D-type (A)**	**15-way D-type (D)**	**15-way D-type alternative pin-out (H)**	**12-way circular connector† (X)**	**14-way JST‡ (J)**
Power	5 V		Brown	5	7, 8	4, 12	G	10
	0 V		White	1	2, 9	2, 10	H	1
Incremental	A	+	Red	2	14	1	M	7
		–	Blue	6	6	9	L	2
	B	+	Yellow	4	13	3	J	11
		–	Green	8	5	11	K	9
Reference mark	Z	+	Violet	3	12	14	D	8
		–	Grey	7	4	7	E	12
Limits	P		Pink	-	11	8	A	14
	Q		Black	-	10	6	B	13
Alarm	E	–	Orange	-	3	13	F	3
Remote CAL*	CAL		Clear	9	1	5	C	4
Shield	-		Screen	Case	Case	Case	Case	Ferrule

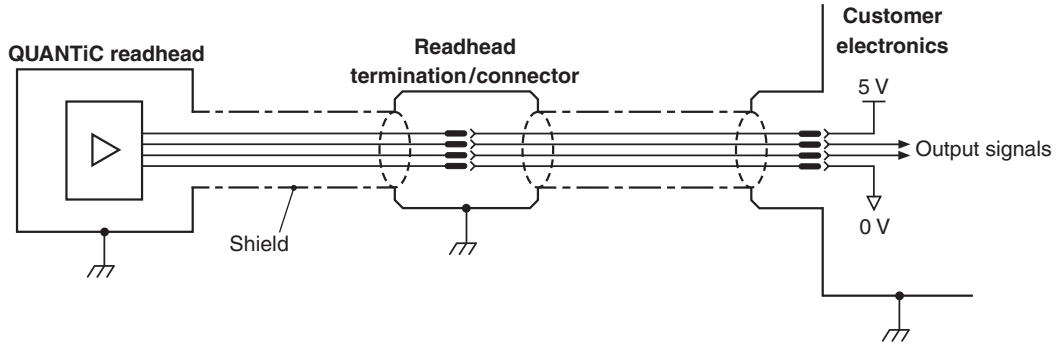
Analogue outputs

						
Function		**Signal**		**Colour**	**15-way D-type (L)**	**15-way D-type alternative pin-out (H)**	**14-way JST‡ (J)**
Power		5 V		Brown	4, 5	4, 12	10
		0 V		White	12, 13	2, 10	1
Incremental	**Cosine**	V_1	+	Red	9	1	7
			–	Blue	1	9	2
	Sine	V_2	+	Yellow	10	3	11
			–	Green	2	11	9
Reference mark		V_0	+	Violet	3	14	8
			–	Grey	11	7	12
Limits		V_p		Pink	7	8	14
		V_q		Black	8	6	13
Setup		V_x		Clear	6	13	6
Remote CAL*		CAL		Orange	14	5	4
Shield		-		Screen	Case	Case	Ferrule

* Remote CAL line must be connected for use with ADTi-100
† 12-way circular Binder mating socket - A-6195-0105.
‡ Pack of 5 14-way JST SH mating sockets: A-9417-0025 - Bottom mount; A-9417-0026 - Side mount.

Electrical connections

Grounding and shielding



IMPORTANT: The shield should be connected to the machine earth (Field Ground).
For JST variants the ferrule should be connected to the machine earth.

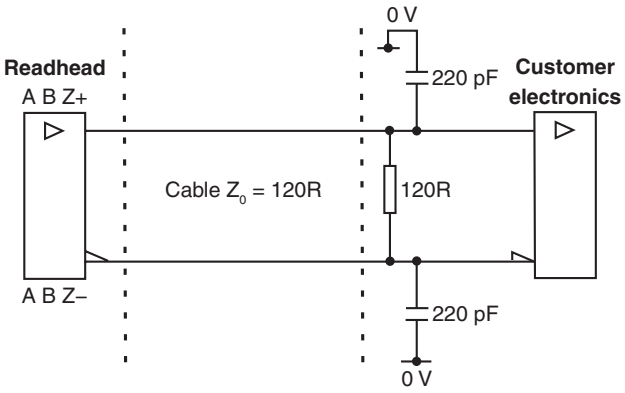
Maximum cable length

	Analogue	Digital
Readhead cable	5 m	3 m
Maximum extension cable length	Dependent on cable type, readhead cable length and clocked output option. Contact your local Renishaw representative for more information.	
Readhead to ADTi-100	5 m	3 m

Electrical connections (continued)

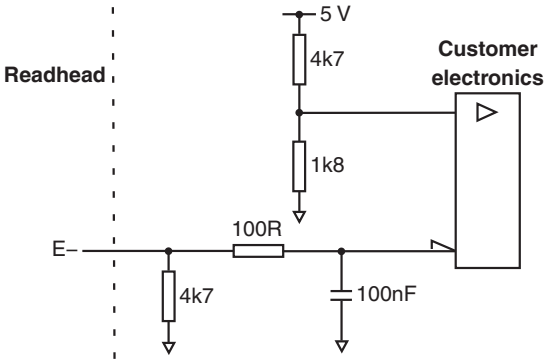
Recommended signal termination

Digital outputs

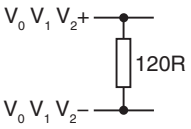


Standard RS422A line receiver circuitry.
Capacitors recommended for improved noise immunity.

Single ended alarm signal termination
(Not available with 'A' cable termination)



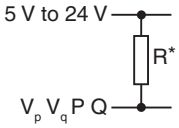
Analogue outputs



NOTE: 120R termination on the analogue output signals is essential for correct AGC operation.

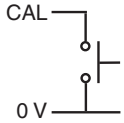
Limit output

(Not available with 'A' cable termination)



* Select R so that maximum current does not exceed 20 mA.
Alternatively, use a suitable relay or opto-isolator.

Remote CAL operation



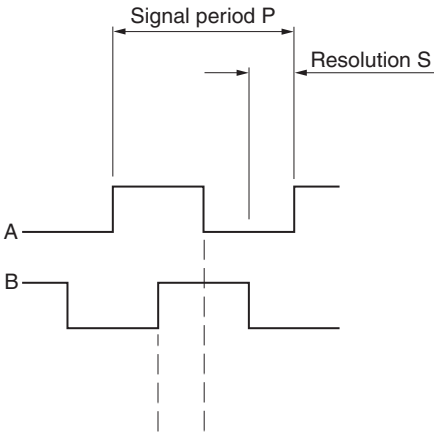
Remote operation of the CAL/AGC is possible via CAL signal.

Output specifications

Digital output signals

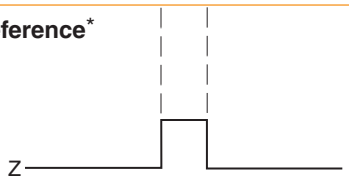
Form – Square wave differential line driver to EIA RS422A (except limits P and Q)

Incremental* 2 channels A and B in quadrature (90° phase shifted)



Resolution option code	P (µm)	S (µm)
T	40	10
D	20	5
X	4	1
Z	2	0.5
W	0.8	0.2
Y	0.4	0.1
H	0.2	0.05

Reference*



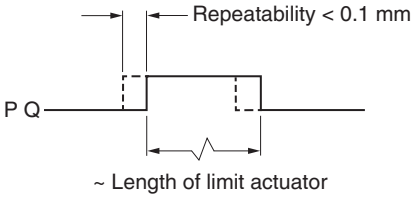
Synchronised pulse Z, duration as resolution. Bi-directionally repeatable.†

NOTE: A wide reference mark option, outputting a reference pulse for the duration of the signal period is available. Contact your local Renishaw representative for more information.

Limits

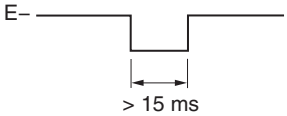
Open collector output, asynchronous pulse
(Not available with 'A' cable termination)

Active high



Alarm

Line driven (Asynchronous pulse)
(Not available with 'A' cable termination)



Alarm asserted when:
– Signal amplitude < 20% or > 135%
– Readhead speed too high for reliable operation

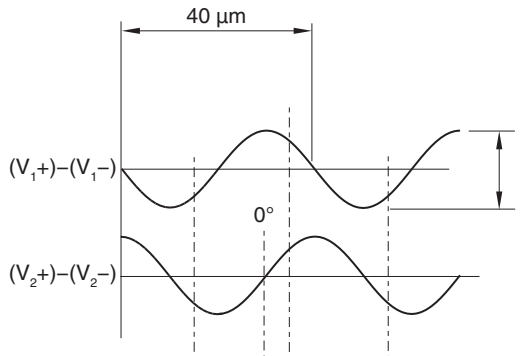
or 3-state alarm
Differentially transmitted signals forced open circuit for > 15 ms when alarm conditions valid.

* Inverse signals not shown for clarity.
† Only calibrated reference mark is bi-directionally repeatable.

Output specifications (continued)

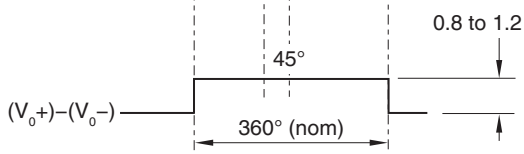
Analogue output signals

Incremental 2 channels V_1 and V_2 differential sinusoids in quadrature, centred on ~1.65 V (90° phase shifted)



0.7 to 1.35 Vpp with Green LED (AGC off) and Blue LED (AGC on) indication (readhead) and 120R termination.

Reference

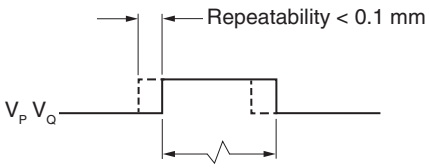


Bi-directionally repeatable.*
Differential pulse V_0 centred on 45°.

Limits

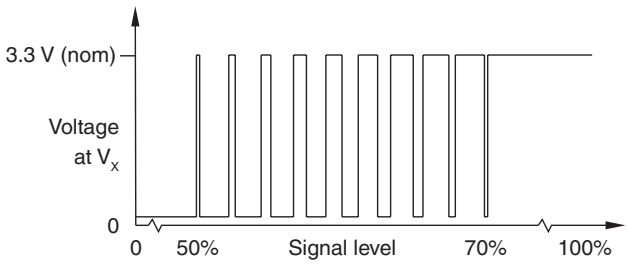
Open collector output, asynchronous pulse

Active high



~ Length of limit actuator

Set-up†



Between 50% and 70% signal level, V_x is a duty cycle.
Time spent at 3.3 V increases with incremental signal level.
At > 70% signal level V_x is nominal 3.3 V.

* Only calibrated reference mark is bi-directionally repeatable.
† Set-up signal as shown is not present during calibration routine.

Digital linear readhead part numbers

Q4 B C Y 30 D 50 A

Readhead series

Q4 - 40 µm QUANTiC

Readhead type

B - Linear

Scale type compatibility

C - RTLC40 / RTLC40-S / RKLC40-S

Resolution

T - 10 µm
D - 5 µm
X - 1 µm
Z - 0.5 µm
W - 0.2 µm
Y - 0.1 µm
H - 50 nm

Cable length*

02 - 0.2 m (not available with 'J' cable termination)
05 - 0.5 m
10 - 1 m
15 - 1.5 m (not available with 'J' cable termination)
20 - 2 m (not available with 'J' cable termination)
30 - 3 m

Cable termination

A - 9-way D-type plug ('E' and 'F' Reference mark options / Alarm format only)
D - 15-way D-type plug (standard pin-out)
H - 15-way D-type plug (alternative pin-out)
X - 12-way circular connector
J - 14-way JST connector (0.5 m, 1 m and 3 m cables only)

Clocked output options†

50 - 50 MHz
40 - 40 MHz
25 - 25 MHz
20 - 20 MHz
12 - 12 MHz
10 - 10 MHz
08 - 8 MHz
06 - 6 MHz
04 - 4 MHz
01 - 1 MHz

Reference mark options‡ / Alarm format

A - Customer selectable reference mark / Line driven alarm (not available with 'A' cable termination)
B - All reference marks are output / Line driven alarm (not available with 'A' cable termination)
E - Customer selectable reference mark / 3-state alarm
F - All reference marks are output / 3-state alarm

* Extension cables available. Contact your local Renishaw representative for further details.
† Additional clocked ouput options available. Contact your local Renishaw representative for further details.
‡ A or E– 'Customer selectable reference mark' - Reference pulse triggered only with selector magnet. Allows activation of specific reference mark when scale has multiple *IN-TRAC* reference marks.
B or F– 'All reference marks are output' - Reference pulse triggered without selector magnet. Recommended for scale with single *IN-TRAC* reference mark. Only calibrated reference mark is bi-directionally repeatable.

NOTE: Not all combinations are valid. Check valid options online at www.renishaw.com/epc

Digital rotary readhead part numbers

Q4 B J X 30 D 50 B

Readhead series
Q4 - 40 µm QUANTiC

Readhead type
B - Rotary > ∅135 mm ('J' scale type compatibility only)
C - Rotary ≤ ∅135 mm ('K' and 'L' scale compatibility only)

Scale type compatibility
J - RESM40 > ∅135 mm ('B' readhead type only)
K - RESM40 ∅60 mm to ∅135 mm ('C' readhead type only)
L - RESM40 < ∅60 mm ('C' readhead type only)

Resolution
T - 10 µm
D - 5 µm
X - 1 µm
Z - 0.5 µm
W - 0.2 µm
Y - 0.1 µm
H - 50 nm

Cable length*
02 - 0.2 m (not available with 'J' cable termination)
05 - 0.5 m
10 - 1 m
15 - 1.5 m (not available with 'J' cable termination)
20 - 2 m (not available with 'J' cable termination)
30 - 3 m

Cable termination
A - 9-way D-type plug ('F' Reference mark options / Alarm format only)
D - 15-way D-type plug (standard pin-out)
H - 15-way D-type plug (alternative pin-out)
X - 12-way circular connector
J - 14-way JST connector (0.5 m, 1 m and 3 m cables only)

Clocked output options†
50 - 50 MHz
40 - 40 MHz
25 - 25 MHz
20 - 20 MHz
12 - 12 MHz
10 - 10 MHz
08 - 8 MHz
06 - 6 MHz
04 - 4 MHz
01 - 1 MHz

Reference mark options / Alarm format
B - All reference marks are output / Line driven alarm (not available with 'A' cable termination)
F - All reference marks are output / 3-state alarm

* Extension cables available. Contact your local Renishaw representative for further details.
† Additional clocked ouput options available. Contact your local Renishaw representative for further details.

NOTE: Not all combinations are valid. Check valid options online at www.renishaw.com/epc

Digital partial arc readhead part numbers

Q4 B R X 30 D 50 B

Readhead series
Q4 - 40 µm QUANTiC

Readhead type
B - Partial arc radius > 67.5 mm ('R' scale type compatibility only)
C - Partial arc radius ≤ 67.5 mm ('S' and 'T' scale compatibility only)

Scale type compatibility
R - RKLC40-S partial arc radius > 67.5 mm ('B' readhead type only)
S - RKLC40-S partial arc radius 30 mm to 67.5 mm ('C' readhead type only)
T - RKLC40-S partial arc radius 26 mm to 29 mm ('C' readhead type only)

Resolution

T - 10 µm	W - 0.2 µm
D - 5 µm	Y - 0.1 µm
X - 1 µm	H - 50 nm
Z - 0.5 µm	

Cable length*

02 - 0.2 m (not available with 'J' cable termination)	15 - 1.5 m (not available with 'J' cable termination)
05 - 0.5 m	20 - 2 m (not available with 'J' cable termination)
10 - 1 m	30 - 3 m

Cable termination
A - 9-way D-type plug ('F' Reference mark options / Alarm format only)
D - 15-way D-type plug (standard pin-out)
H - 15-way D-type plug (alternative pin-out)
X - 12-way circular connector
J - 14-way JST connector (0.5 m, 1 m and 3 m cables only)

Clocked output options†

50 - 50 MHz	10 - 10 MHz
40 - 40 MHz	08 - 8 MHz
25 - 25 MHz	06 - 6 MHz
20 - 20 MHz	04 - 4 MHz
12 - 12 MHz	01 - 1 MHz

Reference mark options‡ / Alarm format
B - All reference marks are output / Line driven alarm (not available with 'A' cable termination)
F - All reference marks are output / 3-state alarm

For more information on partial arc refer to *RKL scale for partial arc applications* data sheet (Renishaw part no. L-9517-9897).

* Extension cables available. Contact your local Renishaw representative for further details.
† Additional clocked ouput options available. Contact your local Renishaw representative for further details.
‡ Only calibrated reference mark is bi-directionally repeatable.

NOTE: Not all combinations are valid. Check valid options online at www.renishaw.com/epc

Analogue linear readhead part numbers

Q4 B C A 30 L 00 T

Readhead series

Q4 - 40 µm QUANTiC

Readhead type

B - Linear

Scale type compatibility

C - RTLC40 / RTLC40-S / RKLC40-S

Output

A - 1 Vpp differential analogue signal

Cable length*

02 - 0.2 m (not available with 'J' cable termination)
05 - 0.5 m
10 - 1 m
15 - 1.5 m (not available with 'J' cable termination)
20 - 2 m (not available with 'J' cable termination)
30 - 3 m
50 - 5 m (not available with 'J' cable termination)

Cable termination

L - 15-way D-type plug (standard pin-out)
H - 15-way D-type plug (alternative pin-out)
J - 14-way JST connector (0.5 m, 1 m, 3 m and 5 m cables only)

Clocked output option

00 - No clock

Reference mark options†

T - Customer selectable reference mark
U - All reference marks are output

* Extension cables available. Contact your local Renishaw representative for further details.
† T– 'Customer selectable reference mark' - Reference pulse triggered only with selector magnet. Allows activation of specific reference mark when scale has multiple *IN-TRAC* reference marks.
U– 'All reference marks are output' - Reference pulse triggered without selector magnet. Recommended for scale with single *IN-TRAC* reference mark. Only calibrated reference mark is bi-directionally repeatable.

NOTE: Not all combinations are valid. Check valid options online at www.renishaw.com/epc

Analogue rotary readhead part numbers

Q4 B J A 30 L 00 U

Readhead series

Q4 - 40 µm QUANTiC

Readhead type

B - Rotary > ∅135 mm ('J' scale type compatibility only)
C - Rotary ≤ ∅135 mm ('K' and 'L' scale compatibility only)

Scale type compatibility

J - RESM40 > ∅135 mm ('B' readhead type only)
K - RESM40 ∅60 mm to ∅135 mm ('C' readhead type only)
L - RESM40 < ∅60 mm ('C' readhead type only)

Output

A - 1 Vpp differential analogue signal

Cable length*

02 - 0.2 m (not available with 'J' cable termination)
05 - 0.5 m
10 - 1 m
15 - 1.5 m (not available with 'J' cable termination)
20 - 2 m (not available with 'J' cable termination)
30 - 3 m
50 - 5 m (not available with 'J' cable termination)

Cable termination

L - 15-way D-type plug (standard pin-out)
H - 15-way D-type plug (alternative pin-out)
J - 14-way JST connector (0.5 m, 1 m, 3 m and 5 m cables only)

Clocked output option

00 - No clock

Reference mark options

U - All reference marks are output

* Extension cables available. Contact your local Renishaw representative for further details.

NOTE: Not all combinations are valid. Check valid options online at www.renishaw.com/epc

Analogue partial arc readhead part numbers

Q4 B R A 30 L 00 U

Readhead series

Q4 - 40 µm QUANTiC

Readhead type

B - Partial arc radius > 67.5 mm ('R' scale type compatibility only)
C - Partial arc radius ≤ 67.5 mm ('S' and 'T' scale compatibility only)

Scale type compatibility

R - RKLC40-S partial arc radius > 67.5 mm ('B' readhead type only)
S - RKLC40-S partial arc radius 30 mm to 67.5 mm ('C' readhead type only)
T - RKLC40-S partial arc radius 26 mm to 29 mm ('C' readhead type only)

Output

A - 1 Vpp differential analogue signal

Cable length*

02 - 0.2 m (not available with 'J' cable termination)
05 - 0.5 m
10 - 1 m
15 - 1.5 m (not available with 'J' cable termination)
20 - 2 m (not available with 'J' cable termination)
30 - 3 m
50 - 5 m (not available with 'J' cable termination)

Cable termination

L - 15-way D-type plug (standard pin-out)
H - 15-way D-type plug (alternative pin-out)
J - 14-way JST connector (0.5 m, 1 m, 3 m and 5 m cables only)

Clock output option

00 - No clock

Reference mark options†

U - All reference marks are output

For more information on partial arc refer to *RKL scale for partial arc applications* data sheet (Renishaw part no. L-9517-9897).

* Extension cables available. Contact your local Renishaw representative for further details.
† Only calibrated reference mark is bi-directionally repeatable.

NOTE: Not all combinations are valid. Check valid options online at www.renishaw.com/epc

Optional Advanced Diagnostic Tool ADTi-100

Part description	Part number	Product image
ADTi-100	A-6195-0100	
ADT View software	Free to download from www.renishaw.com/adt	
Termination tool (analogue readheads only)	A-6195-2132	

Adaptor cables

Digital readheads

Cable termination	Pin-out	Part number
A	9-way D-type	A-6195-0102
H	15-way D-type (alternative pin-out)	A-6195-0103
X	12-way circular	A-6195-0104
J	14-way JST	A-6195-2073

NOTE: Standard 15-way D-type readheads can be plugged directly into the ADT. No adaptor cable is required.

Analogue readheads

Cable termination	Pin-out	Part number
L	15-way D-type (standard pin-out)	A-6637-1540
H	15-way D-type (alternative pin-out)	A-6195-0103
J	14-way JST	A-6195-2073

For more information on the ADT refer to the *Advanced Diagnostic Tool ADTi-100* data sheet (Renishaw part no. L-9517-9699), *Advanced Diagnostic Tool ADTi 100 and ADT View software* user guide (Renishaw part no. M-6195-9413) and *Advanced Diagnostic Tool ADTi 100 and ADT View software* quick-start guide (Renishaw part no. M-6195-9321).

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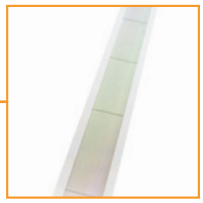
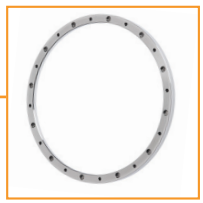


RTLC40-S self-adhesive tape scale

RTLC40 tape scale and *FASTRACK* carrier

RKLC40-S self-adhesive mastered tape scale (linear)

RKLC40-S self-adhesive tape scale (partial arc)



RESM40 stainless steel ring

Optional Advanced Diagnostic Tool ADTi-100 (A-6195-0100)

For more information about the ADTi-100 and the scale refer to the relevant data sheets and installation guides which can be downloaded from www.renishaw.com/quanticdownloads.

For worldwide contact details, visit www.renishaw.com/contact

Part no.: L-9517-9778-07-D
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