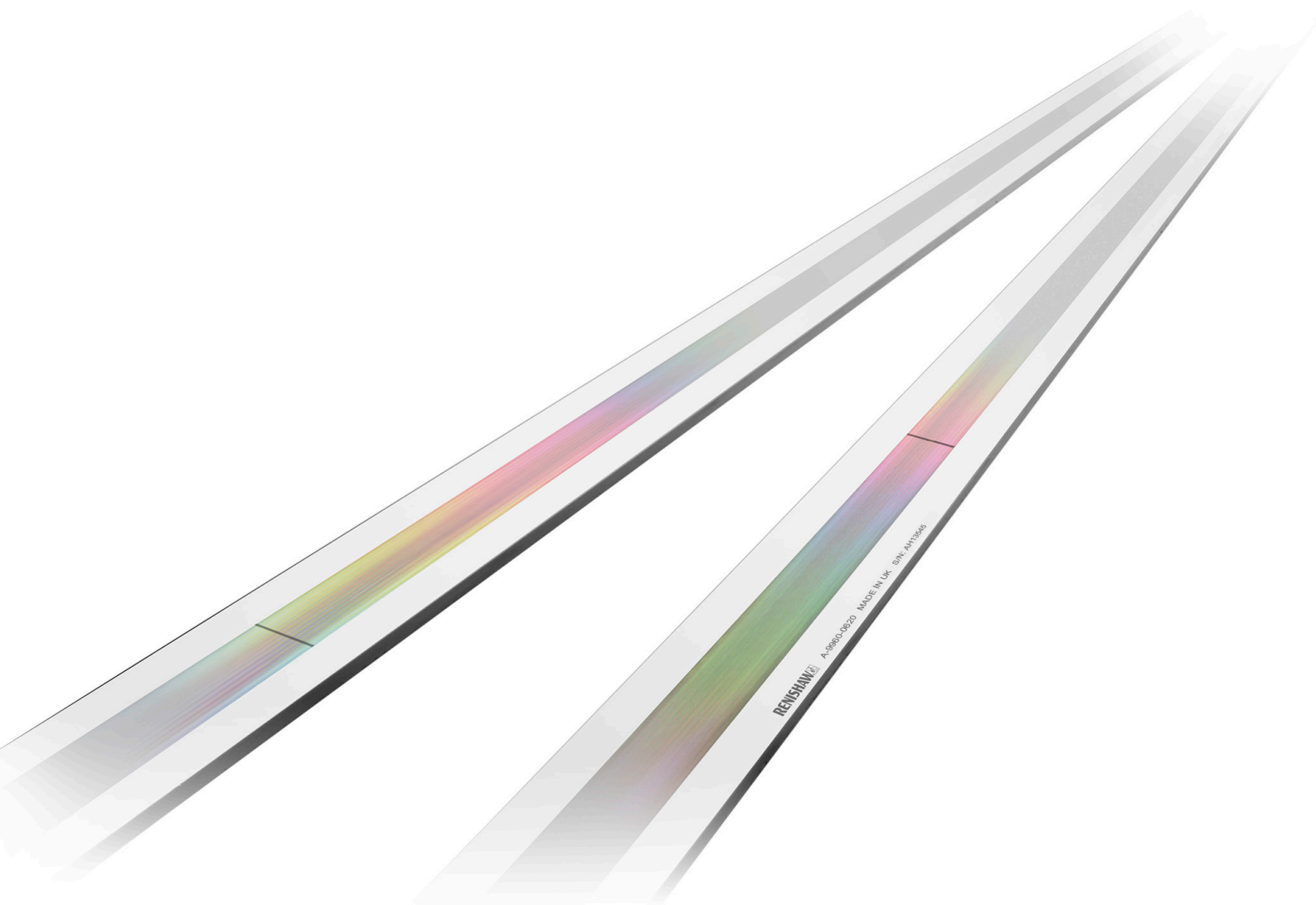


## RELM20 high accuracy incremental linear scale



**RELM20 ZeroMet™ scale is manufactured from near zero thermal expansion material, ensuring the high level of accuracy is maintained across the full temperature range.**

It can be mounted direct to your machine, either mechanically or by the use of a self-adhesive backing tape. RELM20 scale also features the *IN-TRAC*™ optical reference mark allowing fast auto-phasing.

RELM20 is a 20 µm pitch scale and is compatible with Renishaw's VIONiC™ and TONiC™ range of encoders, offering levels of performance previously only available from delicate fine pitch systems.

- High accuracy, certified to  $\pm 1 \mu\text{m}$  up to 1 m, calibrated against International Standards
- Robust ZeroMet offers  $0.75 \pm 0.35 \mu\text{m}/\text{m}/^\circ\text{C}$  @ 20 °C thermal expansion plus ease of handling and installation
- Scale mounting with self-adhesive or clips and clamps
- *IN-TRAC* bi-directional auto-phase optical reference mark
- Dual limits provide on-scale end of travel indication

## RELM20 scale specifications

<b>Form (H × W)</b>	1.6 mm × 14.9 mm
<b>Scale lengths (L)</b>	20 mm to 1.5 m (available in increments of 10 mm)
<b>Pitch</b>	20 µm
<b>Accuracy</b>	Certified to ±1 µm for lengths up to 1 m, ±1 µm/m for lengths >1 m to 1.5 m Calibrated traceable to International Standards
<b>Material</b>	ZeroMet. High stability, low-expansion nickel-iron alloy
<b>Coefficient of thermal expansion (at 20 °C)</b>	0.75 ±0.35 µm/m/°C
<b>Mounting</b>	Epoxy datum point and adhesive tape or datum clamp and mounting clips Adhesive backing tape is included with all scale (nominal thickness 0.2 mm)
<b>Mass</b>	184 g/m

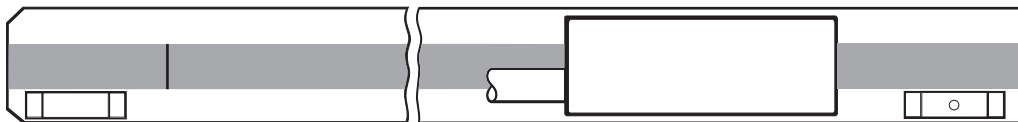
## Reference mark

<b>Type</b>	<i>IN-TRAC</i> optical reference mark
<b>Position</b>	RELM20 – midpoint of scale length RELE20 – 20 mm from end of scale
<b>Phasing</b>	Auto-phased by readhead calibration routines
<b>Repeatability</b>	Repeatability to unit of resolution throughout specified temperature and speed range

**NOTE:** When using a VIONIC or TONIC system the readhead should be ordered so all reference marks are output; no actuator magnet is required.

## Limit switches

<b>Type</b>	Magnetic actuators; with dimple triggers Q limit, without dimple triggers P limit (see image below)
<b>Trigger point</b>	The limit output is nominally asserted when the readhead limit switch sensor passes the limit magnet leading edge, but can trigger up to 3 mm before that edge
<b>Mounting</b>	Customer placed at desired locations
<b>Repeatability</b>	<0.1 mm




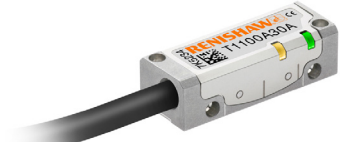
P limit (10 mm, A-9653-0138)

Q limit (10 mm, A-9653-0139)

Limit magnets are available in 10 mm, 20 mm and 50 mm lengths and supplied on a back plate with self-adhesive tape.

**NOTE:** Use of limits will affect the available measuring length (see page 6).

## Compatible readheads

	VIONiC	TONiC
		
<b>Outputs</b>	Digital resolutions from 5 µm to 2.5 nm direct from the readhead	Analogue 1 Vpp only. RS422 digital resolutions from 5 µm to 1 nm available when connected to a Ti, TD or DOP interface
<b>SDE (typical)</b>	<±15 nm	±30 nm
<b>Jitter (RMS)</b>	down to 1.6 nm	down to 0.5 nm
<b>Maximum speed</b>	12 m/s	10 m/s

## Readhead features

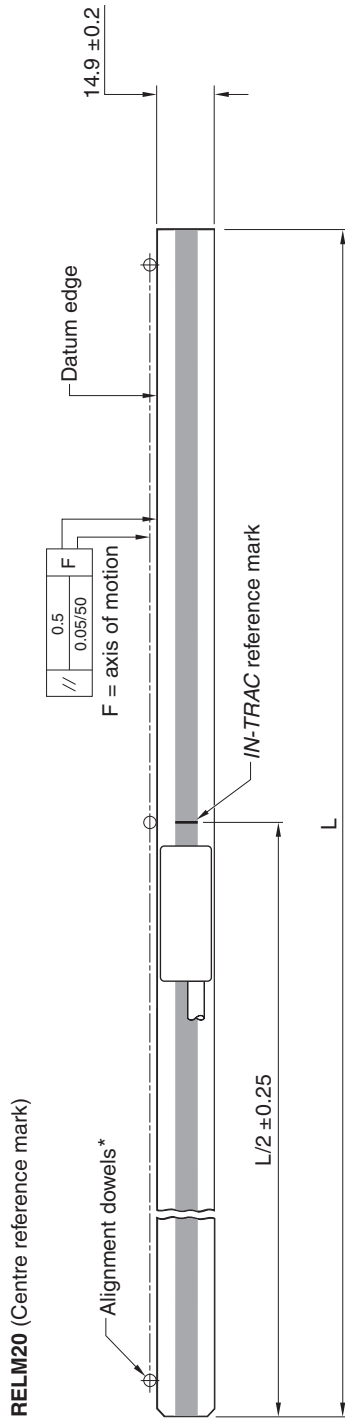
- ▶ Filtering optics and Auto Gain Control for high reliability and solid Lissajous signals.
- ▶ Dynamic signal processing ensures ultra-low Sub-Divisional Error (SDE).  
Result: smoother scanning performance.
- ▶ High signal-to-noise ratio provides ultra-low jitter for optimum positional stability.
- ▶ Auto-phasing of *IN-TRAC* reference mark.
- ▶ Clocked outputs ensure optimised speed performance for all resolutions, for a wide variety of industry-standard controllers.
- ▶ DOP Dual output interfaces available to provide simultaneous analogue and digital outputs (TONiC systems only).

**RELM20 scale installation drawing** (adhesive mounting method shown)

For further details please refer to relevant system installation guides

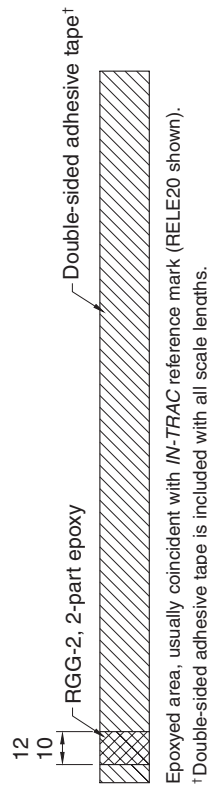
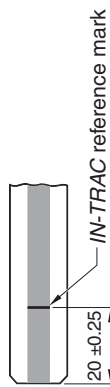


Dimensions and tolerances in mm



\*When scale is to be mounted vertically, position the dowels so that the datum edge is supported.

**RELE20 (End reference mark)**



**NOTE:** Adhesive mounted scale should not be reused after installation.

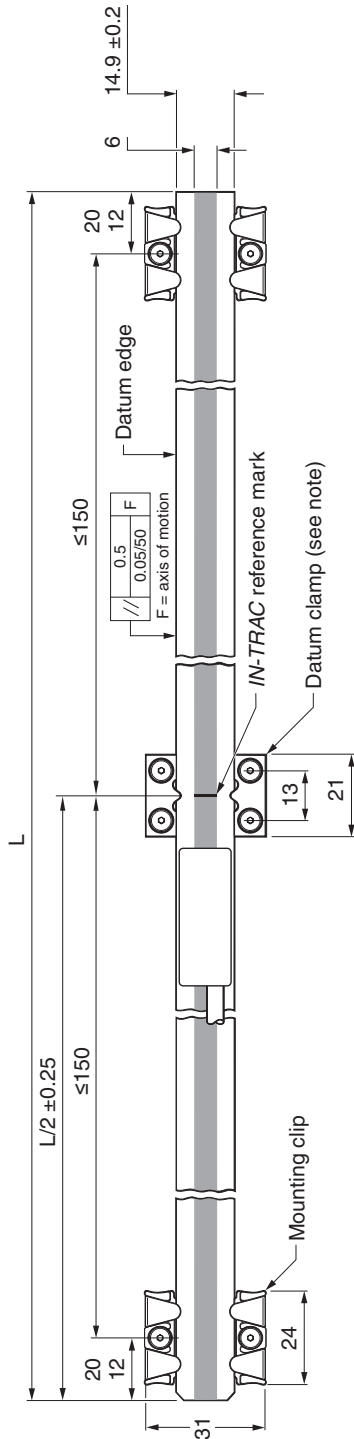
**RELM20 scale installation drawing** (clip/clamp mounting method shown)

For further details please refer to relevant system installation guides

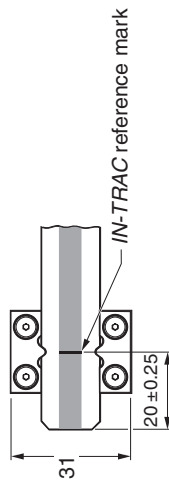


Dimensions and tolerances in mm

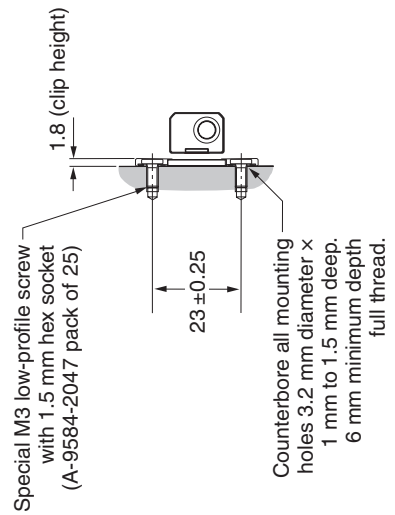
**RELM20** (centre reference mark)



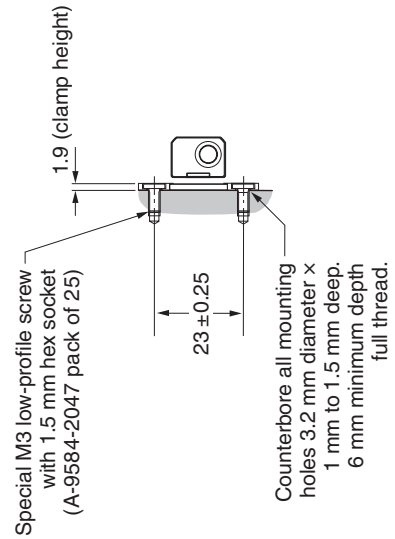
**RELE20** (End reference mark)



**Mounting clip**  
(A-9584-2049)



**Datum clamp**  
(A-9584-2050)



**NOTES:**

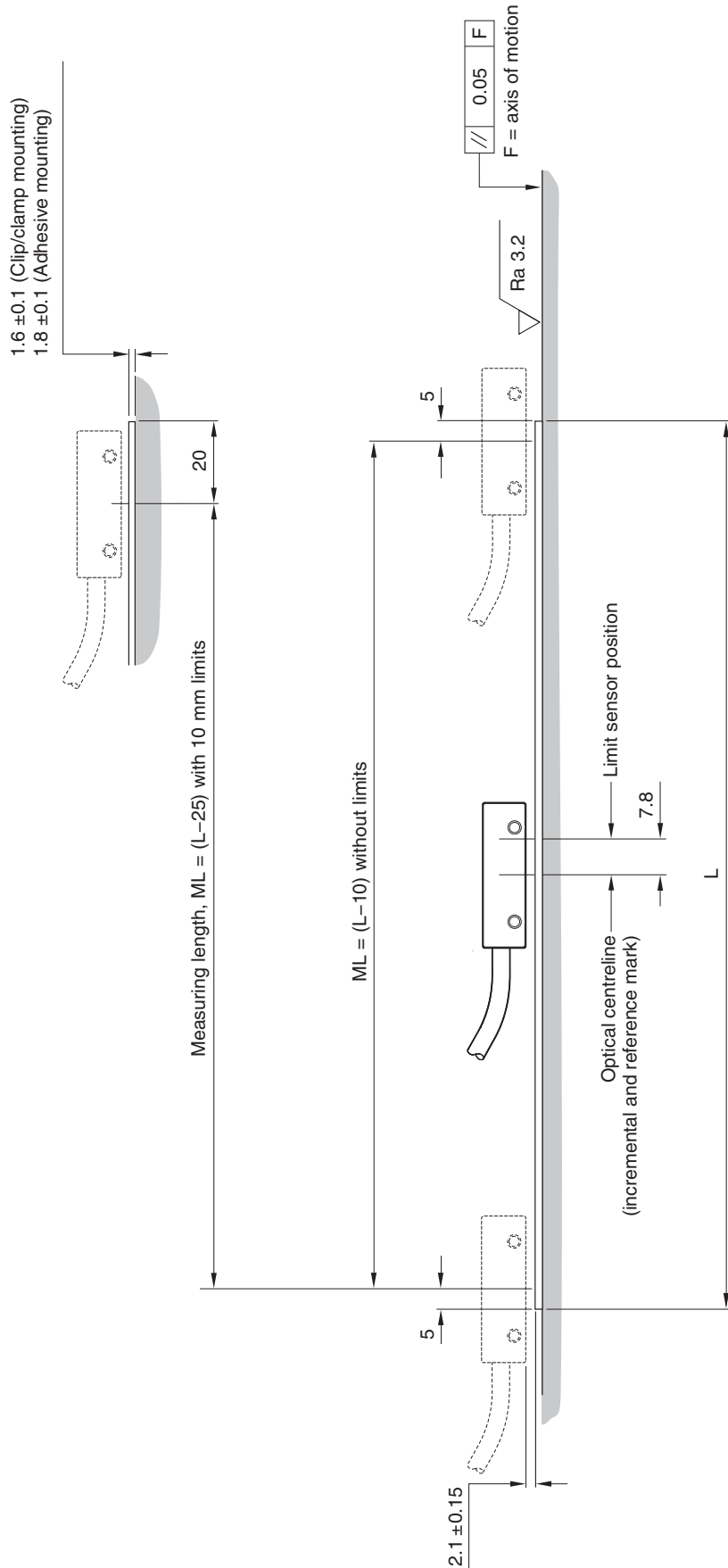
- ▲ Datum clamp usually coincident with selected *IN-TRAC* reference mark. However, the position is user selectable depending upon application.
- ▲ For lengths  $80 \leq L \leq 190$  ensure scale is clamped or clipped in the middle as well as at both ends.
- ▲ For optimum performance the readhead should be installed close to nominal geometry.
- ▲ Care should be taken to ensure sufficient clearance between the readhead/mounting bracket and clips/datum clamp.
- ▲ Only special low-profile screws should be used. Screws are provided with all clips/datum clamps and spares can be supplied if required.

## RELM20 scale measuring lengths

For further details please refer to relevant system installation guides



Dimensions and tolerances in mm



## Data sheet

RELM20 high accuracy incremental linear scale

## Scale part numbers

### RELM20

20 µm pitch ZeroMet spar scale with single *IN-TRAC* reference mark at mid-point of scale length.

Part number	Available lengths	Available in increments of	Ordering instructions
A-9660-xxxx	20 mm to 1500 mm	10 mm	xxxx is the length in mm. Ordering A-9660-0450 for example will result in a length of 450 mm.




### RELE20

20 µm pitch ZeroMet spar scale with single *IN-TRAC* reference mark 20 mm from scale end.

Part number	Available lengths	Available in increments of	Ordering instructions
A-9661-xxxx	30 mm to 1500 mm	10 mm	xxxx is the length in mm. Ordering A-9661-0450 for example will result in a length of 450 mm.





## Accessory part numbers

### Limit switch magnets\*

Part description	Part number	Product image
10 mm Q limit switch actuator magnet Adhesive mounted	A-9653-0139	
10 mm P limit switch actuator magnet Adhesive mounted	A-9653-0138	
Magnet applicator device (Aids positioning)	A-9653-0201	

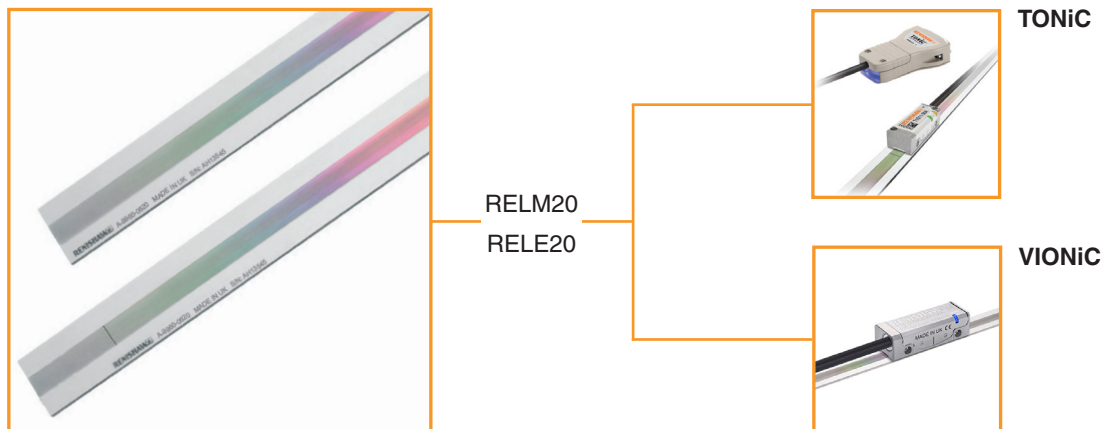
\*Longer limit magnets are available. Contact your local subsidiary for more information.

### Clip/clamp mounting accessories†

Part description	Part number	Product image
Mounting clips	A-9584-2049	
Datum clamp kit	A-9584-2050	
Replacement M3 screws (pack of 25)	A-9584-2047	
Spare clip setting shim	M-9584-0928	

†UHV and extra wide clip/clamp accessories are available. Contact your local subsidiary for more information.

## Compatible products



For worldwide contact details, visit [www.renishaw.com/contact](http://www.renishaw.com/contact)

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