Flexible
manufacturing systems

RFK
DRZ
RFN
MCC

HELLER solutions: **Knowing how it's done.**

Systematic full-service made by HELLER

Building on the knowledge gained throughout more than 120 years, HELLER sees itself not only as a machine manufacturer but also as a solutions provider catering to the complex requirements of modern manufacturing and with the ability to respond to the questions and challenges of its customers.

With its high-quality machine tools and manufacturing systems for the manufacturing industry, HELLER has been a leading system supplier to the automotive industry and its suppliers for many years.
As a full-service partner, HELLER also offers all the services required for the operation of the machinery.

One of the core competencies of HELLER is the development of solutions for the complete machining of crankshafts and camshafts – from single process machines and manufacturing sections through to entire manufacturing lines.

HELLER is among the few manufacturers worldwide, providing extensive experience throughout the entire process chain. With the RFK and RFN range, the DRZ turn-chasing centres and a host of machining centre models, we offer all core technologies for the pre-machining of crankshafts and camshafts. The powerful special-purpose machines can be equipped for stand-alone operation or for linkage to a manufacturing line.

Due to customised process engineering and project management, customer care and support are guaranteed throughout the entire course of a project. Already in the planning phase, simultaneous engineering helps to optimise the process capability and productivity of the systems, resulting in valuable time savings.

For more information go to:
https://www.heller.biz/en/products/automotive-applications

RFK

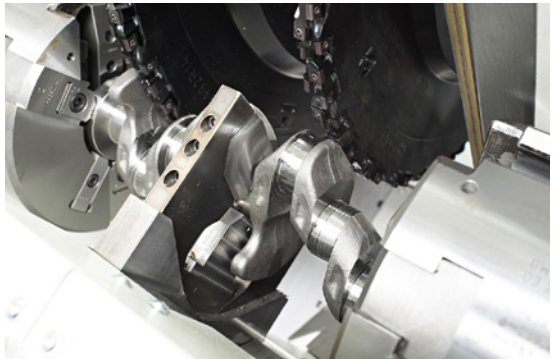
External milling of crankshafts

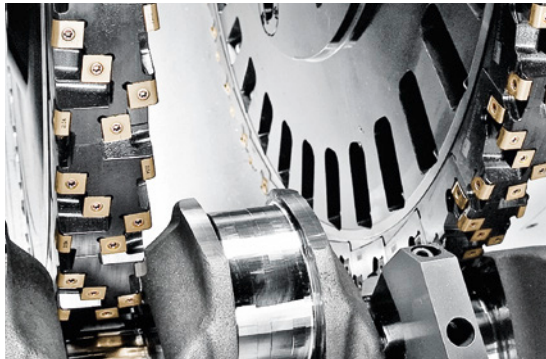
_ tool generates the cutting speed
_ workpiece generates the feed rate
_ use of external cutters
_ tool profile is designed according to the profile to be milled
_ for the machining of crankpins, 2 interpolating NC axes are used which are positioned eccentrically to the workpiece centre and/or the concentric main bearings of crankshafts
_ rotary feed is generated by the workpiece rotary axis, whilst the milling unit(s) is/are following as required using one/two linear axis/axes
_ the plunge cut to the journal diameter is either carried out using the linear axis of the milling unit whilst the rotary axis is stationary or using a spiral motion with interpolation of the two axes. During the plunge cut, the cheek faces can be completely or partially machined
_ in order to withstand cutting forces, workpieces are clamped and supported by two hydraulic clamping chucks with electrically synchronized rotation and by an additional steady rest which can be positioned using NC programming
_ steady rest travels on a separate guideway below the milling slides to ensure unrestricted positioning within the travel path
_ machining using one or two milling units is possible
_ machining of bearing diameters and undercuts in a single operation is feasible
_ simultaneous machining of mains and pin profiles is possible
_ use of gang cutters is possible
_ high precision of machined surfaces makes rough grinding obsolete

The following features can be machined (also in combination):
_ mains
_ pin bearings
_ main and pin bearings in one set-up
_ cheek faces and cheek outer diameters
_ undercuts
_ cheek profiles

Technical data

Production system	RFK 10	RFK 15	RFK 30
Max. workpiece dimensions			
Length	500 mm	600 mm	1,250 mm
Swing diameter	160 mm	200 mm	290 mm
Tool diameter	700 mm	700 mm	800 mm
Max. power	30 kW	60 kW	80 kW





RFK

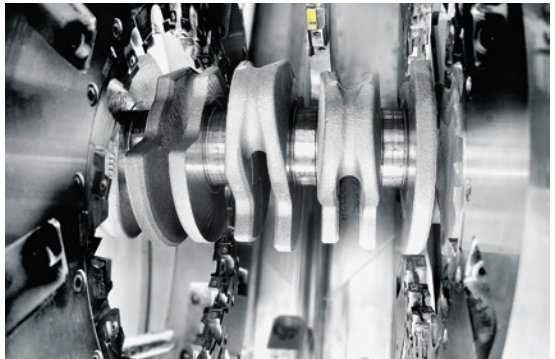
Internal milling of crankshafts

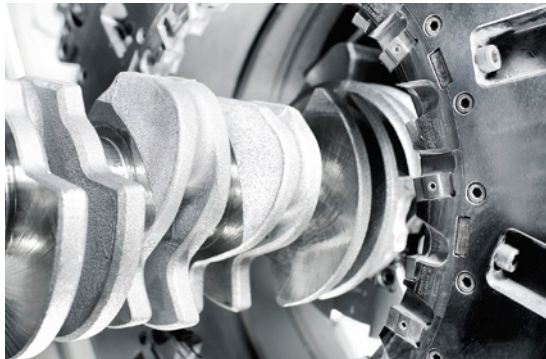
_ tool generates the cutting speed
_ workpiece generates the feed rate
_ use of internal cutters
_ the workpiece is surrounded by the tool, i.e. the inner tool diameter exceeds the maximum workpiece swing diameter and the clamping chuck diameter
_ tool profile is designed according to the profile to be milled
_ for the machining of crankpins, 2 interpolating NC axes are used which are positioned eccentrically to the workpiece centre and/or the concentric main bearings of crankshafts
_ rotary feed is generated by the workpiece rotary axis, whilst the milling unit(s) is/are following as required using one/two linear axis/axes
_ the plunge cut to the journal diameter is either carried out using the linear axis of the milling unit whilst the rotary axis is stationary or using a spiral motion with interpolation of the two axes. During the plunge cut, the cheek faces can be completely or partially machined
_ in order to withstand cutting forces, workpieces are clamped and supported by two hydraulic clamping chucks with electrically synchronized rotation and by an additional steady rest which can be positioned using NC programming
_ steady rest travels on the guideway below the milling slides and is positioned between the two milling units on twin-spindle machines
_ machining using one or two milling units is possible
_ machining of bearing diameters and undercuts in a single operation is feasible
_ simultaneous machining of mains and pin profiles is possible
_ use of gang cutters is possible
_ high precision of machined surfaces makes rough grinding obsolete

The following features can be machined (also in combination):
_ mains
_ pin bearings
_ main and pin bearings in one set-up
_ cheek faces and cheek outer diameters
_ undercuts
_ cheek profiles

Technical data

Production system	RFK 100	RFK 150	RFK 300
Max. workpiece dimensions			
Length	500 mm	600 mm	1,250 mm
Swing diameter	160 mm	200 mm	290 mm
Tool diameter	230 mm	275 mm	310 mm
Max. power	30 kW	60 kW	80 kW





DRZ

Turn-chasing of crankshafts

_ tool generates the cutting speed
_ workpiece generates the feed rate
_ plunge turning using standard inserts in combination with a chasing operation, specifically developed for this purpose and patented by HELLER, enables cost-effective and highly precise machining of any diameters and surfaces positioned concentric to the rotary axis
_ extended tool operation times due to the use of duplicate cutting edges
_ fast indexing of inserts results in extremely short chip-to-chip-times
_ automatic tip probing of inserts in two directions
_ all concentric diameters (mains, undercuts, grooves, flange and stub end) can be machined in a single set-up
_ robust machine design also allows heavy-duty cheek face cutting or cutting of the cheek outer diameter
_ workpieces are clamped using two hydraulic, electronically synchronised clamping chucks; retractable clamping jaws are available as an option
_ in order to withstand cutting forces, workpieces can be supported with an additional, steady rest positioned using NC programming
_ steady rest travels on a separate guideway to ensure unrestricted positioning within the travel path
_ machining using either one or two turn-chasing units is possible
_ high precision of machined surfaces makes rough grinding obsolete

The following features can be machined (also in combination):

_ mains
_ undercuts and grooves
_ thrust bearings
_ flange diameters
_ stub-end diameters
_ concentric profiles
_ pin bearings by means of eccentric clamping (special version)
_ cheek faces and cheek outer diameters
_ chamfering (also eccentric and circumferential)

Technical data

Production system	DRZ 10	DRZ 15	DRZ 30
Max. workpiece dimensions			
Length	500 mm	600 mm	1,250 mm
Swing diameter	160 mm	200 mm	280 mm
Tool diameter	700 mm	700 mm	700 mm
Max. power	30 kW	48 kW	48 kW

MCC 15

Milling, drilling, thread cutting of crankshafts

Product range: MCC 15-C (Centering), MCC 15-D (Drilling), MCC 15-E (End machining)

_ a proven and tested HELLER machining centre for heavy-duty cutting provides the basic machine with the corresponding serial components

_ machining unit can be traversed via the NC axes in transverse (X axis) and vertical (Y axis) direction

_ traversing in longitudinal direction (Z axis) is accomplished using two synchronously driven ball screw drives, providing the NC rotary table motion

_ workpiece rotation into the required machining positions is accomplished as follows: for type 'C' and 'E' by means of the NC rotary table (B axis) and for type 'D' by means of the NC rotary axis (A axis) and the NC rotary table (B axis)

_ correction of all workpiece features to be generated is possible via user-friendly input screens at the HMI

_ large operator doors and vision panels provide excellent visibility of the work area

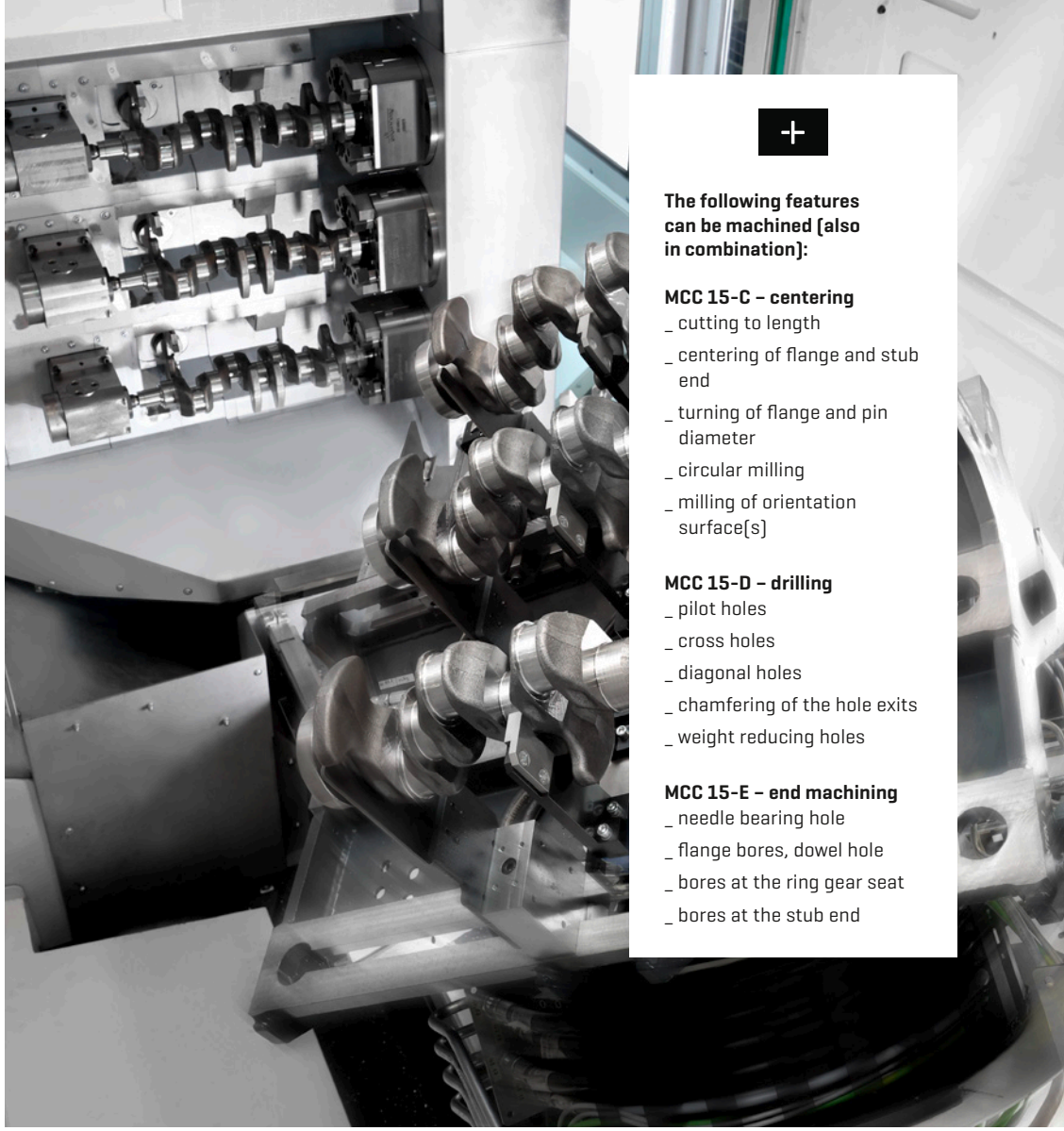
_ swivel operation of the fixture makes manual loading of the machine easy

_ outstanding accessibility for all maintenance and repair tasks

_ loading and unloading of up to three workpieces parallel to machining

_ use of multiheads is possible

_ machine can be designed for MQL (minimal quantity lubrication) or coolant lubrication



The following features can be machined (also in combination):

MCC 15-C – centering

_ cutting to length

_ centering of flange and stub end

_ turning of flange and pin diameter

_ circular milling

_ milling of orientation surface(s)

MCC 15-D – drilling

_ pilot holes

_ cross holes

_ diagonal holes

_ chamfering of the hole exits

_ weight reducing holes

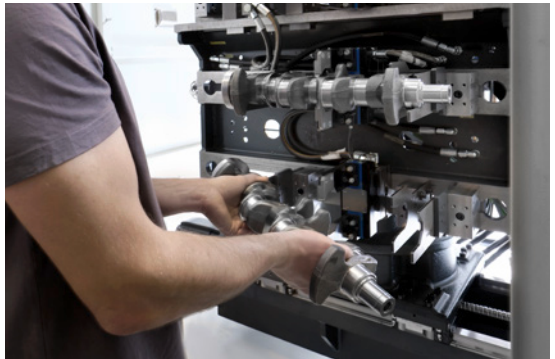
MCC 15-E – end machining

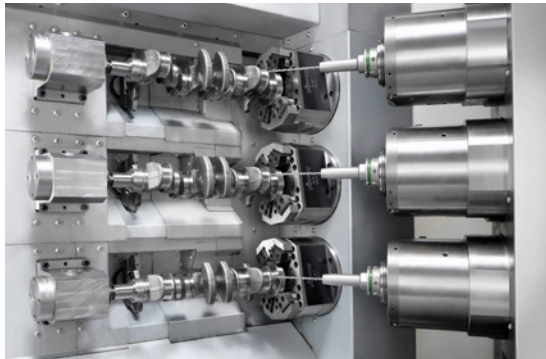
_ needle bearing hole

_ flange bores, dowel hole

_ bores at the ring gear seat

_ bores at the stub end





Technical data

Production system	MCC 15-C	MCC 15-D	MCC 15-E
Number of spindles	2/3	2/3	2/3
Max. workpiece dimensions			
Length	700 mm	625 mm	700 mm
Swing diameter	200 mm	200 mm	200 mm
Max. power/ spindle	31 / 22 kW	31 / 22 kW	31 / 22 kW

RFN

External milling of camshafts

_ tool generates the cutting speed
_ workpiece generates the feed rate
_ use of external cutters
_ cutter diameter can also be used for most hollow cam profiles.
_ tool profile is designed according to the profile to be milled
_ 2 interpolating NC axes are used for the machining of cam profiles
_ rotary feed is generated by the workpiece rotary axis, whilst the milling unit(s) is/are following as required using one/two linear axis/axes
_ the plunge cut to the cam profile is either carried out using the linear axis of the milling unit whilst the rotary axis is stationary or using a spiral motion with interpolation of the two axes
_ in order to withstand cutting forces, workpieces are clamped and supported by two hydraulic clamping chucks with electrically synchronized rotation and by one or two additional steady rests which can be positioned using NC programming
_ steady rests travel on a separate guideway below the milling slides to ensure unrestricted positioning within the travel path
_ machining using one or two milling units is possible
_ machining of cam profiles and chamfers in one operation is feasible
_ use of gang cutters is possible
_ radial alignment by means of bore or groove is possible
_ high precision of machined contours makes rough grinding obsolete

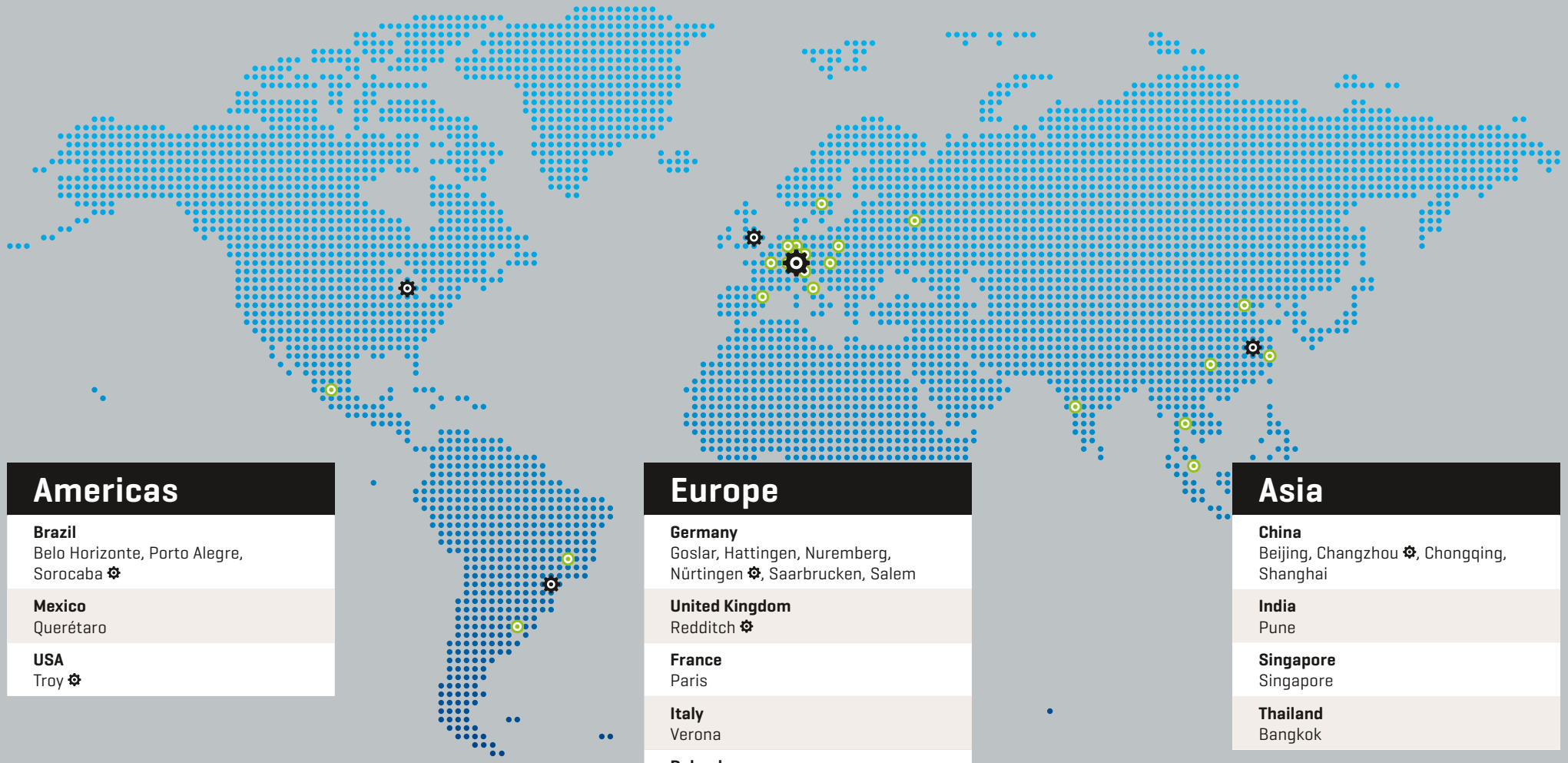
+

The following features can be machined (also in combination):

_ cam profiles made of cast and forged camshafts
_ cam profiles made of bar stock
_ cam profiles with circumferential chamfers/ profiles
_ cam interspaces (special application)

Technical data

Production system	RFN 10
Max. workpiece dimensions	
Length	1,250 mm
Swing diameter	100 mm
Tool diameter	450 mm
Max. power	37 kW



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Troy ⚙

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Redditch ⚙

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Paris

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Poland
Posen

Russia
Moscow

Slovakia
Vráble

Spain
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India
Pune

Singapore
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Thailand
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