



Datasheet

HC90 R/TR

Coordinate Measuring Machine - R single rail or TR twin rail - with bellows covers

45.16.30

53.16.30

63.16.30

73.16.30

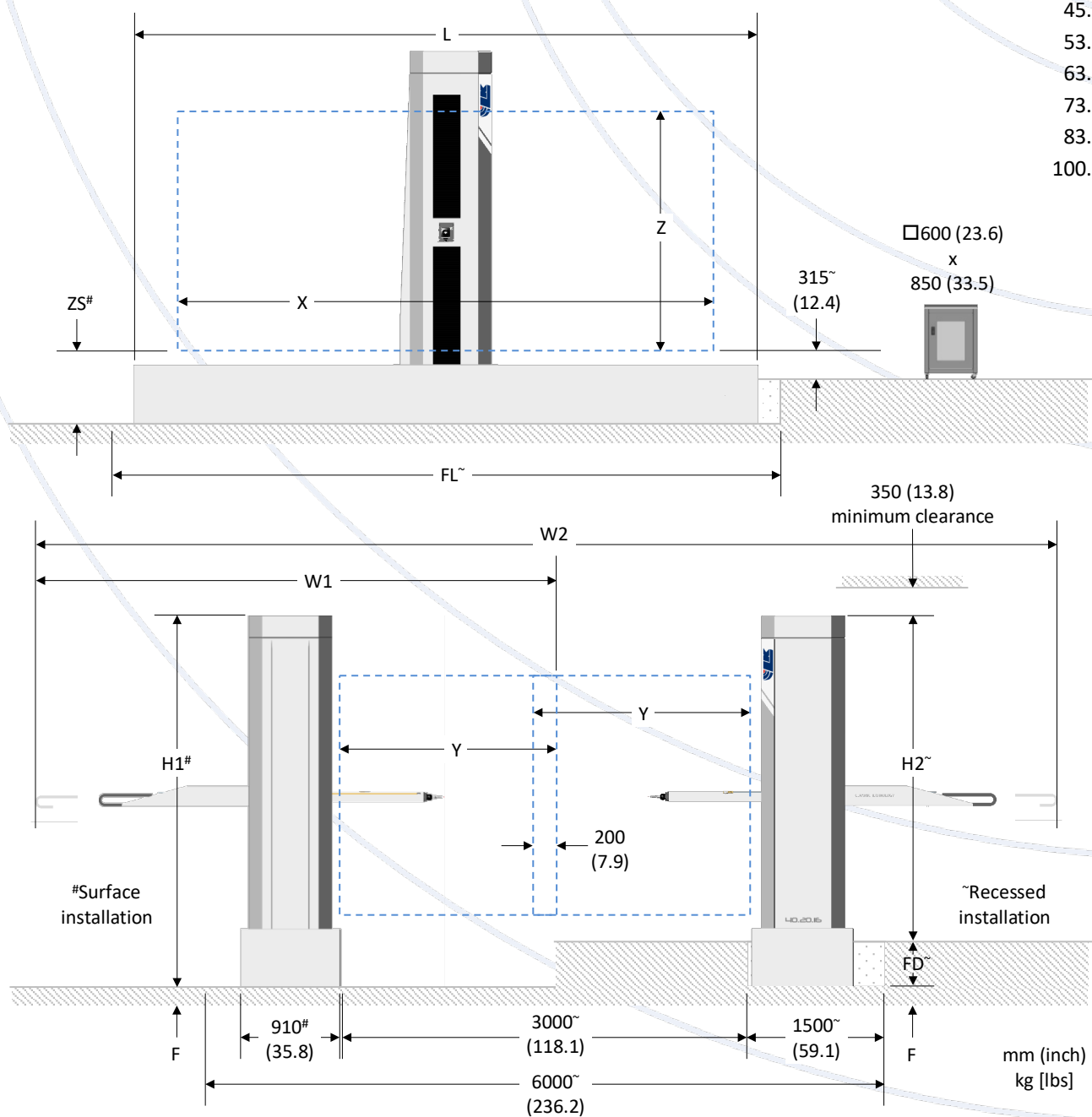
83.16.30

100.16.30



TECHNICAL DATA | Dimensions

HC90 R/TR



	Travels ¹				Overall					Foundation			CMM Weight	
	X	Y	Z	ZS	L	W1	W2	H1	H2	FL~	FD~	F ²	R (single)	TR (twin)
45.16.30	4572 (180)	1625 (64)	3048 (120)	902 (35.5)	6296 (247.9)	4209 (165.7)	8218 (323.5)	4558 (179.4)	3971 (156.3)	6486 (255.4)	587 (23)	125 (4.9)	4340 [9568]	8680 [19136]
53.16.30	5334 (210)	1625 (64)	3048 (120)	977 (38.5)	7058 (277.9)	4209 (165.7)	8218 (323.5)	4633 (182.4)	3971 (156.3)	7248 (285.4)	662 (26)	125 (4.9)	5512 [12152]	11024 [24304]
63.16.30	6350 (250)	1625 (64)	3048 (120)	1052 (41.4)	8074 (317.9)	4209 (165.7)	8218 (323.5)	4708 (185.4)	3971 (156.3)	8264 (325.4)	737 (29)	150 (5.9)	7056 [15556]	14112 [31112]
73.16.30	7366 (290)	1625 (64)	3048 (120)	1152 (45.4)	9180 (361.4)	4209 (165.7)	8218 (323.5)	4808 (189.3)	3971 (156.3)	9370 (368.9)	837 (33)	175 (6.9)	9116 [20097]	18232 [40195]
83.16.30	8382 (330)	1625 (64)	3048 (120)	1252 (49.3)	10542 (415.0)	4209 (165.7)	8218 (323.5)	4908 (193.2)	3971 (156.3)	10732 (422.5)	937 (37)	200 (7.9)	11449 [25241]	22898 [50481]
100.16.30	10033 (395)	1625 (64)	3048 (120)	1352 (53.2)	12194 (480.1)	4209 (165.7)	8254 (325.0)	5008 (197.2)	3971 (156.3)	12573 (495.0)	1037 (41)	250 (9.8)	14888 [32822]	29776 [65645]

¹Maximum travel of PH10MQ PLUS probe head reference centre point (maximum travel of PHS-2 probe head available on request).

²Minimum thickness of homogeneous concrete floor with minimum shear strength of 0.4 N/mm² (58 psi).

TECHNICAL DATA | Specification

HC90 R/TR

TOUCH PROBE ACCURACY¹

ISO 10360 -2:2009			TP20 ² PH10MQ PLUS	T200 ³ PH10MQ PLUS	SP25M ⁴ PH10MQ PLUS	TP20 ² PHS2	T200 ³ PHS2
R/TR simplex mode	Length measurement 18°C to 22°C	E0 MPE E150 MPE	10.0+L/200	10.0+L/200	10.0+L/200	10.0+L/200	
	Length measurement 16°C to 26°C	E0 MPE E150 MPE	10.0+3L/200	10.0+3L/200	10.0+3L/200	10.0+3L/200	
	Repeatability	R0 MPL	6.0	6.0	6.0	6.0	
TR duplex mode	Length measurement 18°C to 22°C	E0 MPE E150 MPE	17.0+L/200	17.0+L/200	17.0+L/200	17.0+L/200	
	Length measurement 16°C to 26°C	E0 MPE E150 MPE	17.0+3L/200	17.0+3L/200	17.0+3L/200	17.0+3L/200	
	Repeatability	R0 MPL	6.0	6.0	6.0	6.0	

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ISO 10360 -3:2001⁵

Rotary table	radial tangent axial	MPE FR MPE FT MPE FA	32.4	32.4	32.4	32.4	
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ISO 10360 -4:2001

Probing accuracy scanning mode	form time	MPE T _{ij} MPT t	-	-	7.5 65 sec.	-	
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ISO 10360 -5:2010

Probing accuracy touch mode	form	PFTU MPE	10.0	6.0	5.5	10.0	
Multi stylus fixed head position	form size location	PFTM MPE PSTM MPE PLTM MPE					
Multi stylus articulating head	form size location	PFTE MPE PSTE MPE PLTE MPE					

LASER SCANNER ACCURACY⁶

ISO 10360 -8:2013		LC15Dx	LC60Dx	L100	XC65Dx	XC65Dx-LS
Probing form	Pform.Sph.1x25 :Tr:ODS,MPE	7	20	15	25	35
Probing dispersion	Pform.Sph.D95% :Tr:ODS,MPL	7.6	36	26	48	60
Probing size All	Psize.Sph.All :Tr:ODS,MPE	15	30	20	45	80
Cone angle		100	125	125	115	125

SPEEDS		PH10MQ PLUS	PHS-2
Acceleration	mm/sec ²	2096	2096
Velocity	mm/sec	617	600

Conformance is proven when all errors of indication lie within or on the accuracy specification limits MPE/MPL.

Conformance is unproven when one or more errors of indication lie outside the accuracy specification limits MPE/MPL.

¹ Touch probe accuracy specifications using manufacturer specified test lengths and test sphere with empirical qualification.

E0 MPE E150 MPE

R0 MPL

MPE FR MPE FT MPE FA

MPE T_{ij} MPT t

PFTU MPE

Maximum volumetric length measurement error in microns where L is the measured length in millimetres.

Maximum repeatability value in microns using E0 values.

Maximum radial, tangential and axial errors respectively in microns.

Maximum single stylus form error in microns using scanning mode with time taken in seconds.

Maximum single stylus form error in microns using touch point mode.

² TP20 standard force module, HA-8 adaptor (PHS2 only), PEL1 extension bar (PHS2 En MPE only), Ø4x10mm stainless steel shaft stylus, Ø4x30mm tungsten carbide shaft stylus (En MPE only), Ø5x20mm star tungsten carbide shaft stylus (P*TM MPE only), touch velocity 0.1m/min, approach 10mm (En MPE only), 7mm (PFTU MPE only).

³ TP200 standard force module, HA-8 adaptor (PHS2 only), PEL1 extension bar (PHS2 En MPE only), Ø4x10mm stainless steel shaft stylus, Ø4x30mm tungsten carbide shaft stylus (En MPE only), Ø5x20mm star tungsten carbide shaft stylus (P*TM MPE only), touch velocity 0.1m/min, approach 10mm (En MPE only), 7mm (PFTU MPE only).

⁴ SP25M SM25-1 module, SH25-1 stylus holder, Ø4x50mm tungsten carbide shaft stylus, Ø3x21mm stainless steel shaft stylus (P*TM MPE only), touch velocity 0.1m/min, scanning velocity 0.5m/min, approach 10mm (En MPE only), 7mm (PFTU MPE only), 50 UPR 2σ filter.

⁵ Rotary table accuracy specifications using manufacturer specified rotary table with Ø1000mm (39.4") table top.

⁶ Laser scanner accuracy specifications for CMM with an accuracy of 2+L/350 or better using manufacturer specified test sphere with empirical qualification.

Pform.Sph.1x25:Tr:ODS,MPE

Pform.Sph.D95%:Tr:ODS,MPL

Psize.Sph.All:Tr:ODS,MPE

Cone angle

Maximum probing form error in microns using 25 representative points in translatory scanning mode.

Maximum probing dispersion value in microns using 95% of the measured points in translatory scanning mode.

Maximum probing size error All in microns using all measured points in translatory scanning mode.

Region of sphere on which the measured points are selected.

TECHNICAL DATA | Probing

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Head type	Indexing head	5-axis wrist
Head positions	720	Infinite
Angular tilt	0° to +105° in 7.5° steps	-184° to +184° in 1µm steps at 100mm radius
Angular rotation	0° to ±180° in 7.5° steps	-184° to +184° in 1µm steps at 100mm radius
Probe change rack	MRS2	MRS2

TOUCH PROBES	TP20	TP200	SP25M	TP20	TP200
Probe type	Touch trigger	Touch trigger	Scanning	Touch trigger	Touch trigger
Min. stylus diameter	0.3 (0.012)	0.3 (0.012)	0.5 (0.02)	0.3 (0.012)	0.3 (0.012)
Max. stylus length	60 (2.4)	100 (3.9)	400 (15.7)	60 (2.4)	100 (3.9)
Max. probe extension	300 (11.8)	300 (11.8)	100 (3.9)	750 (29.5)	750 (29.5)
Min. probing force	0.055 N	0.02 N	0.1 N	0.055 N	0.02 N
Stylus change rack	MCR20	SCR200	FCR25	MCR20	SCR200

LASER SCANNERS	LC15Dx	LC60Dx	L100	XC65Dx/-LS	LC15Dx	LC60Dx	L100	XC65Dx/-LS
Laser line width	15 (0.6)	60 (2.4)	100 (3.9)	3x 65 (2.6)	15 (0.6)	60 (2.4)	100 (3.9)	3x 65 (2.6)
Points/sec	70k	75k	200k	75k	70k	75k	200k	75k
Resolution	22 µm	60 µm	42 µm	65 µm	22 µm	60 µm	42 µm	65 µm
Standoff	68	125	135	107/202	68	125	135	107/202

PERIPHERALS		
Controller	NMC300	NMC300
Controller mounting	Cabinet	Cabinet
Handbox	SOLO	SOLO
Rotary Table	●	●
Automation	●	●

● Optional

– Not available

mm (inch)

TECHNICAL FEATURES

X axis guideway	Granite dovetail guideway with walk-on covers
Y axis guideway	Mono-crystalline alumina ceramic guideway 90 x 80 (3.5 x 3.1) optional bellows covers
Z axis guideway	Mono-crystalline alumina ceramic guideway 350 x 100 (13.8 x 3.9) with bellows covers
X axis friction drive	Chrome-plated hardened steel drive bar with preloaded V roller and DC servomotor
Y axis friction drive	Chrome-plated hardened steel drive bar with preloaded V roller and DC servomotor
Z axis friction drive	Stainless steel drive belt with preloaded rollers and DC servomotor
Linear encoders	0.5µm stainless steel ribbon scale and optical read-head Renishaw system
Air bearings	Single orifice multi-groove air bearings with 5µm air cushion on all axes
Temperature compensation	Automatic temperature compensation for work piece and all axes
Anti-vibration	Passive elastomer anti-vibration as standard.

ENVIRONMENTAL REQUIREMENTS

Ambient temperature	Standard temperature range: 18°C to 22°C Extended temperature range 16°C to 26°C
Temperature gradient	Standard temperature range: 0.5°C/h 2°C/8h 0.5°C/m Extended temperature range: 1.0°C/h 1.0°C/m
Operating temperature	15°C to 30°C
Relative humidity	20% to 80% non-condensing
Floor vibration	Passive anti-vibration: Max. 1.27µm peak-to-peak over 3.5 to 90Hz range

SUPPLY REQUIREMENTS

Power supply	115V/20A or 230V/13A 50 to 60Hz single phase regulated to within -5% to +10%				
Power cable	Region	Overall dia.	Stranding	CSA/Gauge	Conductor Colours
	Rest of world	6.9mm	32/02	1mm ²	blue, brown, green/yellow
	USA (115V)	0.26 inch	41/34	18AWG	black, white, green
Air supply	Min. air supply pressure 6.2 bar (90 psi)				
Air consumption	WR single rail:	3.0 SCFM (85 NI/min)	inc. rotary table:	18.0 SCFM (510 NI/min)	
	WTR twin rail:	6.0 SCFM (170 NI/min)	inc. rotary table:	21.0 SCFM (596 NI/min)	
Air quality	Temperature:	Max. 2°C deviation from ambient temperature			
	Dew point:	2°C			
	Solids:	Max. particle size 1.0µm and max. concentration 1mg/cu.m			
	Oil/hydrocarbons:	Max. concentration 0.1mg/cu.m			

WARRANTY



12 months warranty as standard, extended warranty available on request
Unique 10-year original accuracy guarantee as standard
Terms and conditions apply see LK Metrology website for full details

CONFORMITY



Full CE certification in accordance with the following directives:
Machinery directive 2006/42/EC
Low voltage directive 2014/35/EC
Electromagnetic directive 2014/30/EC