

M μ .

ULTRA-PRECISE MACHINING CENTRES.

Machines of the M μ series are designed for ultimate precision and long-term accuracy. Close to μ accuracy and – as always at BW – not just on the day of commissioning, but over many years of use. The M μ series is no standard machine trimmed for accuracy. The M μ is based much more on a fundamentally new concept. Because the final μ is the result of many specific individual measures, such as careful design, best materials, strict production methods and very experienced employees. M μ : Accuracy by design, not compensation.

The result is the most precise machine series we've ever built.

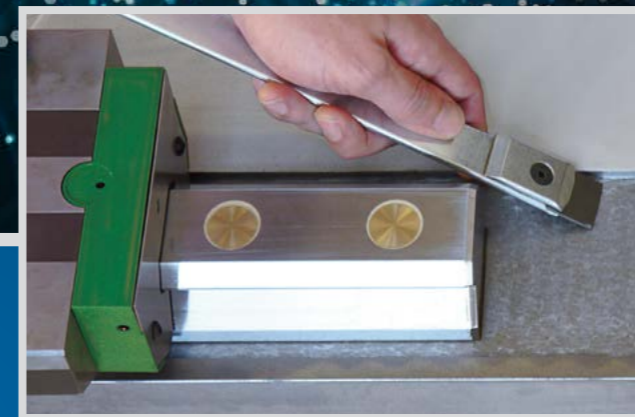


M μ – THE ULTRA-PRECISE SERIES.



WHEN ACCURATE IS NOT ACCURATE ENOUGH.

The M μ provides tightest geometric tolerances (positioning, flatness, radial eccentricity, concentricity, angularity, repositioning) for the most demanding applications. The basis for long-term accuracy is maximum stability from the ground up. High guide bars, FEM-optimised structures cast from mineral casting material, a thermally inert system and active tempering are examples of the many measures taken. BW's very high degree of vertical integration in all core components is decisive for the successful implementation of such accurate machines.



Hand-crafted perfection is reflected in the guide supports, which are refilled by hand. The last μ is obtained in this way.







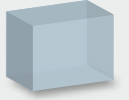


Ideal technical conditions: high-precision machining in-house in production halls air-conditioned to $\pm 1^\circ\text{C}$ and an integrated, thermally symmetrical measuring machine in the same climatic environment for component measurement.








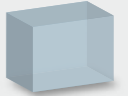
MCμ – THE ULTRA-PRECISE SERIES.

TECHNICAL DATA.

MCμ (Metric System)	Unit	750	800		900	1000	1200	1250
								
Working range X Y Z	mm	1,100 900 1,250	1,250 1,000 1,250		1,600 1,400 1,600	2,200 1,400 1,800	2,500 1,800 1,800	2,800 1,800 2,100
Workpiece swing diameter Ø x h	mm	1,400x1,300	1,500x1,300		1,600x1,750	2,300x1,900	2,500x2,100	2,800x2,500
Pallet size	mm	630x630	800x800		800x1,000	1,000x1,250	1,000x1,250	1,000x1,250
Pallet load	kg	1,500	2,500		3,000	5,000	6,000	7,000
Feed force X Y Z	kN	15 15 15	15 15 15		20 20 20	20 20 20	25 25 25	25 25 25
Rapid traverse X Y Z (standard axis travel)	m/min	30 30 30	30 30 30		30 30 30	30 30 30	30 30 30	30 30 30
Table speed	rpm	15	15		10	6	6	6
Tilting torque	Nm	20,000	20,000		35,000	55,000	55,000	55,000
Tangential torque	Nm	12,000	12,000		20,000	35,000	35,000	35,000
Spindle power 100% duty rating	kW	32	32		32	32	32	32
Torque 100% duty rating	Nm	610	610		610	610	610	610
Speed range	rpm	20 – 6,000	20 – 6,000		20 – 6,000	20 – 6,000	20 – 6,000	20 – 6,000
Bearing diameter main spindle	mm	120	120		120	120	120	120
Spindle radial runout	mm	< 0.002	< 0.002		< 0.002	< 0.002	< 0.002	< 0.002
Spindle axial runout	mm	< 0.002	< 0.002		< 0.002	< 0.002	< 0.002	< 0.002
Number of tool pockets		128 – 608	128 – 608		128 – 608	128 – 608	128 – 608	128 – 608
Machine control, Siemens Sinumerik		SIN 840D sl	SIN 840D sl		SIN 840D sl	SIN 840D sl	SIN 840D sl	SIN 840D sl
Floor space required, l x w x h approx.	mm	8,600x6,100x4,700	8,600x6,100x4,700		9,800x6,500x5,100	10,200x7,200x5,300	10,600x7,800x5,400	11,600x8,600x5,400
Weight approx.	kg	30,000	32,000		40,000	50,000	55,000	58,000
ACCURACY according to VDI/DGQ 3441								
P X Y Z	mm	0.004	0.004		0.004	0,005	0.005	0.005
Pa X Y Z	mm	0.003	0.003		0.003	0.004	0.004	0.004
Us X Y Z	mm	0.002	0.002		0.002	0.003 X 0.002 Y, Z	0.003	0.003
P, B	arcsec	3	3		3	3	3	3
Pa, B	arcsec	2	2		2	2	2	2
Us, B	arcsec	2	2		2	2	2	2
ANGULARITY of the linear axis X Y Z	mm	< 0.005 1,000	< 0.005 1,000		< 0.005 1,000	< 0.006 1,000 X < 0.005 1,000 Y, Z	< 0.006 1,000	< 0.006 1,000
STRAIGHTNESS of the linear axis X Y Z	mm	< 0.004	< 0.004		< 0.005	< 0.007 X < 0.005 Y, Z	< 0.008	< 0.008
EXCHANGING REPEATABILITY of pallets	mm	< 0.008	< 0.008		< 0.008	< 0.010	< 0.010	< 0.010

MCμ – THE ULTRA-PRECISE SERIES.

TECHNICAL DATA.

MCμ (Imperial System)	Unit	750	800		900	1000	1200	1250
								
Working range X Y Z	in	43.31 35.53 49.21	49.21 39.37 49.21		63.00 55.12 63.00	86.61 55.12 70.87	98.43 70.87 70.87	110.24 70.87 82.68
Workpiece swing diameter Ø x h	in	55.12x55.18	59.06x51.18		63.00x68.90	90.55x74.80	98.43x82.68	110.24x98.43
Pallet size	in	24.80x24.80	31.50x31.50		31.50x39.37	39.37x49.21	39.37x49.21	39.37x49.21
Pallet load	lbs	3,307	4,409		6,614	11,023	13,228	15,432
Feed force X Y Z	lb	3,372 3,372 3,372	3,372 3,372 3,372		4,496 4,496 4,496	4,496 4,496 4,496	5,620 5,620 5,620	5,620 5,620 5,620
Rapid traverse X Y Z (standard axis travel)	in/min	1,181 1,181 1,181	1,181 1,181 1,181		1,181 1,181 1,181	1,181 1,181 1,181	1,181 1,181 1,181	1,181 1,181 1,181
Table speed	rpm	15	15		10	6	6	6
Tilting torque	lb/in	177,015	177,015		309,776	486,791	486,791	486,791
Tangential torque	lb/in	106,205	106,205		177,015	309,776	309,776	309,776
Spindle power 100% duty rating	HP	43	43		43	43	43	43
Torque 100% duty rating	lb/in	5,400	5,400		5,400	5,400	5,400	5,400
Speed range	rpm	20 – 6,000	20 – 6,000		20 – 6,000	20 – 6,000	20 – 6,000	20 – 6,000
Bearing diameter main spindle	in	4.7244	4.7244		4.7244	4.7244	4.7244	4.7244
Spindle radial runout	in	< 0.0000787	< 0.0000787		< 0.0000787	< 0.0000787	< 0.0000787	< 0.0000787
Spindle axial runout	in	< 0.0000787	< 0.0000787		< 0.0000787	< 0.0000787	< 0.0000787	< 0.0000787
Number of tool pockets		128 – 608	128 – 608		128 – 608	128 – 608	128 – 608	128 – 608
Machine control, Siemens Sinumerik		SIN 840D sl	SIN 840D sl		SIN 840D sl	SIN 840D sl	SIN 840D sl	SIN 840D sl
Floor space required, l x w x h approx.	in	339x240x185	339x240x185		386x256x201	402x284x209	417x307x213	457x339x213
Weight approx.	lbs	66,140	70,550		88,180	110,230	121,250	127,870
ACCURACY according to VDI/DGQ 3441								
P X Y Z	in	0.000157	0.000157		0.000157	0.000197	0.000197	0.000197
Pa X Y Z	in	0.000118	0.000118		0.000118	0.000157	0.000157	0.000157
Us X Y Z	in	0.000079	0.000079		0.000079	0.000118 X 0.000079 Y, Z	0.000118	0.000118
P, B	arcsec	3	3		3	3	3	3
Pa, B	arcsec	2	2		2	2	2	2
Us, B	arcsec	2	2		2	2	2	2
ANGULARITY of the linear axis X Y Z	in	< 0.000197 39.37	< 0.000197 39.37		< 0.000197 39.37	< 0.000236 39.37 X < 0.000197 39.37 Y, Z	< 0.000236 39.37	< 0.000236 39.37
STRAIGHTNESS of the linear axis X Y Z	in	< 0.000157	< 0.000157		< 0.000197	< 0.000276 X < 0.000197 Y, Z	< 0.000315	< 0.000315
EXCHANGING REPEATABILITY of pallets	in	< 0.000315	< 0.000315		< 0.000315	< 0.000394	< 0.000394	< 0.000394