Q- Motion Miniature Linear Stage

PIEZOMOTORS FOR SMALL DIMENSIONS, HIGH RESOLUTION AND A FAVORABLE PRICE

Q-522

- Only 22 mm wide and 10 mm high
- Direct Position Measurement with Incremental Encoder with up to 1 nm resolution (optional)
- Up to 2 nm minimum incremental motion
- XY mounting without adapter
- Q-622 Rotation Stage mountable without adapter
- Suitable for high vacuum to 10^{-6} hPa, ultrahigh vacuum variants for 10^{-9} hPa are also available

Precision- class micropositioning stage

Q- Motion stages have very small dimensions and a high position resolution in the nanometer range. The piezomotor drive principle and the electrical operation are cost- efficient and can be customized

PIShift piezo inertia drives

Self- locking when at rest, therefore no heat generation and no servo jitter. Velocity to 10 mm/ s. 1 N holding force, 1 N feed force

Direct- measuring principle

Versions with noncontact optical linear encoder available. Resolution 4 nm or 1 nm, depending on the version. Versions with encoder feature a reference point switch

Vacuum and nonmagnetic environment

All Q- Motion stages are suitable for operation in high vacuum to 10^{-6} hPa. Furthermore, ultrahigh vacuum variants for
10^{-9} hPa are also available. Nonmagnetic variants are also available on request

Fields of application

Industry and research. For metrology, microscopy, micromanipulation, biotechnology and automation

Specifications

Preliminary Data	Q-522.030	Q-522.040 / Q-522.04U	Q-522.130	Q-522.140 / Q-522.14U	Q-522.230	Q-522.240 / Q-522.24U	Q-522.x00 / Q-522.x0U	Unit
Motion and positioning	6.5 mm travel range, resolution 4 nm	6.5 mm travel range, resolution 1 nm, UHV version Q-522.04U	13 mm travel range, resolution 4 nm	13 mm travel range, resolution 1 nm, UHV version Q-522.14U	26 mm travel range, resolution 4 nm	26 mm travel range, resolution 1 nm, UHV version Q-522.24U	6.5 mm to 26 mm travel range, open- loop, UHV versions Q-522.x0U	
Active axis	X	X	X	X	X	X	X	
Travel	6.5	6.5	13	13	26	26	6.5 to 26	mm
Integrated sensor	Linear encoder	Linear encoder	Linear encoder	Linear encoder	Linear encoder	Linear encoder	-	
Sensor resolution	4	1	4	1	4	1	-	nm
Min. incremental motion	8	2	8	2	8	2	-	nm
Unidirectional repeatability over entire travel range	25	25	25	25	30	30	-	nm
Bidirectional repeatability over entire travel range	40	40	40	40	50	50	-	nm

Unidirectional repeatability over 100 µm travel range	12	12	12	12	12	12	-	
Bidirectional repeatability over 100 µm travel range	24	24	24	24	24	24	-	nm
Pitch / yaw over entire travel range	100	100	100	100	100	100	100	µrad
Pitch / yaw over 100 µm travel range	1	1	1	1	1	1	1	µrad
Maximum velocity*	10	10	10	10	10	10	10	mm/s
Mechanical properties								
Load capacity	10	10	10	10	10	10	10	N
Push / pull force	1	1	1	1	1	1	1	N
Length	22	22	32	32	42	42	22 to 42	mm
Width	32	32	32	32	32	32	22	mm
Height	10	10	10	10	10	10	10	mm
Drive properties								
Motor type	Piezoelectric inertia drive	Piezoelectric inertia drive	Piezoelectric inertia drive	Piezoelectric inertia drive	Piezoelectric inertia drive	Piezoelectric inertia drive	Piezoelectric inertia drive	
Miscellaneous								
Operating temperature range	0 to 40	0 to 40	0 to 40	0 to 40	0 to 40	0 to 40	0 to 40	°C
Material	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	
Mass, including cabling	107	107	118	118	128	128	68 to 88	g
Cable length	1	1	1	1	1	1	1	m
Connector	Sub- D	Sub- D	Sub- D	Sub- D	Sub- D	Sub- D	Sub- D	
Recommended controller	E-871, E-873	E-871, E-873	E-871, E-873	E-871, E-873	E-871, E-873	E-871, E-873	E-870	

* Typical velocity at a control frequency of 20 kHz
The Q-522 stage series replaces the LPS-22 series.

Order Information

Q-522.000
Q- Motion Miniature Linear Stage, 6.5 mm Travel Range, without Position Sensor, for Open- Loop Operation, 1 N Push/ Pull Force, Dimensions 22 × 22 × 10 mm (W × L × H), Piezoelectric Inertia Drive

Q-522.00U
Q- Motion Miniature Linear Stage, 6.5 mm Travel Range, without Position Sensor, for Open- Loop Operation, 1 N Push/ Pull Force, Dimensions 22 × 22 × 10 mm (W × L × H), Piezoelectric Inertia Drive, Vacuum- Compatible to 10^{-9} hPa

Q-522.030
Q- Motion Miniature Linear Stage, 6.5 mm Travel Range, Linear Encoder, 4 nm Resolution, 1 N Push/ Pull Force, Dimensions 32 × 22 × 10 mm (W × L × H), Piezoelectric Inertia Drive

Q-522.040
Q- Motion Miniature Linear Stage, 6.5 mm Travel Range, Linear Encoder, 1 nm Resolution, 1 N Push/ Pull Force, Dimensions 32 × 22 × 10 mm (W × L × H), Piezoelectric Inertia Drive

Q-522.04U
Q- Motion Miniature Linear Stage, 6.5 mm Travel Range, Linear Encoder, 1 nm Resolution, 1 N Push/ Pull Force, Dimensions 32 × 22 × 10 mm (W × L × H), Piezoelectric Inertia Drive, Vacuum- Compatible to 10^{-9} hPa

Q-522.100
Q- Motion Miniature Linear Stage, 13 mm Travel Range, without Position Sensor, for Open- Loop Operation, 1 N Push/ Pull Force, Dimensions 22 × 32 × 10 mm (W × L × H), Piezoelectric Inertia Drive

Q-522.10U
Q- Motion Miniature Linear Stage, 13 mm Travel Range, without Position Sensor, for Open- Loop Operation, 1 N Push/ Pull Force, Dimensions 22 × 32 × 10 mm (W × L × H), Piezoelectric Inertia Drive, Vacuum- Compatible to 10^{-9} hPa

Q-522.130
Q- Motion Miniature Linear Stage, 13 mm Travel Range, Linear Encoder, 4 nm Resolution, 1 N Push/ Pull Force, Dimensions 32 × 32 × 10 mm (W × L × H), Piezoelectric Inertia Drive

Q-522.140
Q- Motion Miniature Linear Stage, 13 mm Travel Range, Linear Encoder, 1 nm Resolution, 1 N Push/ Pull Force, Dimensions 32 × 32 × 10 mm (W × L × H), Piezoelectric Inertia Drive

Q-522.14U
Q- Motion Miniature Linear Stage, 13 mm Travel Range, Linear Encoder, 1 nm Resolution, 1 N Push/ Pull Force, Dimensions 32 × 32 × 10 mm (W × L × H), Piezoelectric Inertia Drive, Vacuum- Compatible to 10^{-9} hPa

Q-522.200
Q- Motion Miniature Linear Stage, 26 mm Travel Range, without Position Sensor, for Open- Loop Operation, 1 N Push/ Pull Force, Dimensions 22 × 42 × 10 mm (W × L × H), Piezoelectric Inertia Drive

Q-522.20U

Q- Motion Miniature Linear Stage, 26 mm Travel Range, without Position Sensor, for Open- Loop Operation, 1 N Push/ Pull Force, Dimensions 22 × 42 × 10 mm (W × L × H), Piezoelectric Inertia Drive, Vacuum- Compatible to 10^{-9} hPa

Q-522.230
Q- Motion Miniature Linear Stage, 26 mm Travel Range, Linear Encoder, 4 nm Resolution, 1 N Push/ Pull Force, Dimensions 32 × 42 × 10 mm (W × L × H), Piezoelectric Inertia Drive

Q-522.240
Q- Motion Miniature Linear Stage, 26 mm Travel Range, Linear Encoder, 1 nm Resolution, 1 N Push/ Pull Force, Dimensions 32 × 42 × 10 mm (W × L × H), Piezoelectric Inertia Drive

Q-522.24U
Q- Motion Miniature Linear Stage, 26 mm Travel Range, Linear Encoder, 1 nm Resolution, 1 N Push/ Pull Force, Dimensions 32 × 42 × 10 mm (W × L × H), Piezoelectric Inertia Drive, Vacuum- Compatible to 10^{-9} hPa

Ask about custom designs!

Controllers / Drivers / Amplifiers

E-870 PIShift Drive Electronics
E-871 Networkable Servo Controller for Stick- Slip Piezo Motors

Accessories

Q-122 Adapter Bracket

Related Products

Q-521 Q- Motion® Miniature Linear Positioning Stage
Q-545 Q- Motion® Precision Linear Stage
Q-614 Q- Motion Miniature Rotation Stage
Q-622 Q- Motion Miniature Rotation Stage
Q-632 Q- Motion Rotation Stage
M-663 Compact Linear Positioning Stage

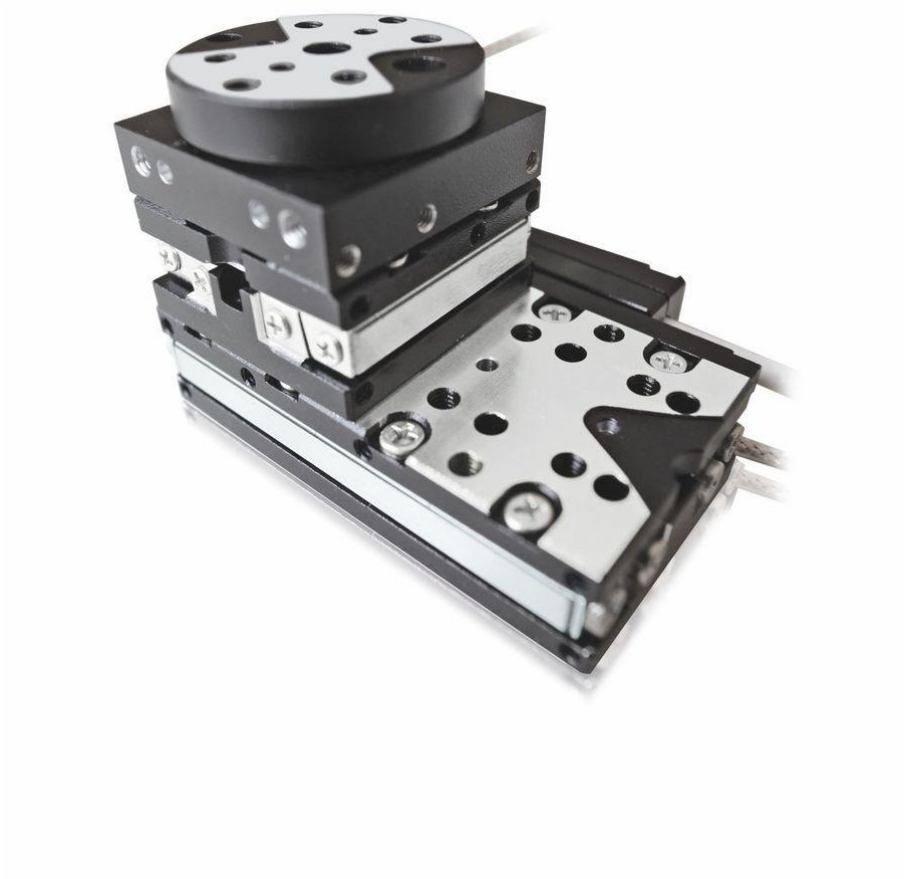
Technology

Piezoelectric Inertia Drives | Inertia Drives are space- saving and low- cost piezo- based inertia drives with relatively high holding forces and a travel range that is only limited by the length of the moving rod. Learn more ...

Drawings / Images

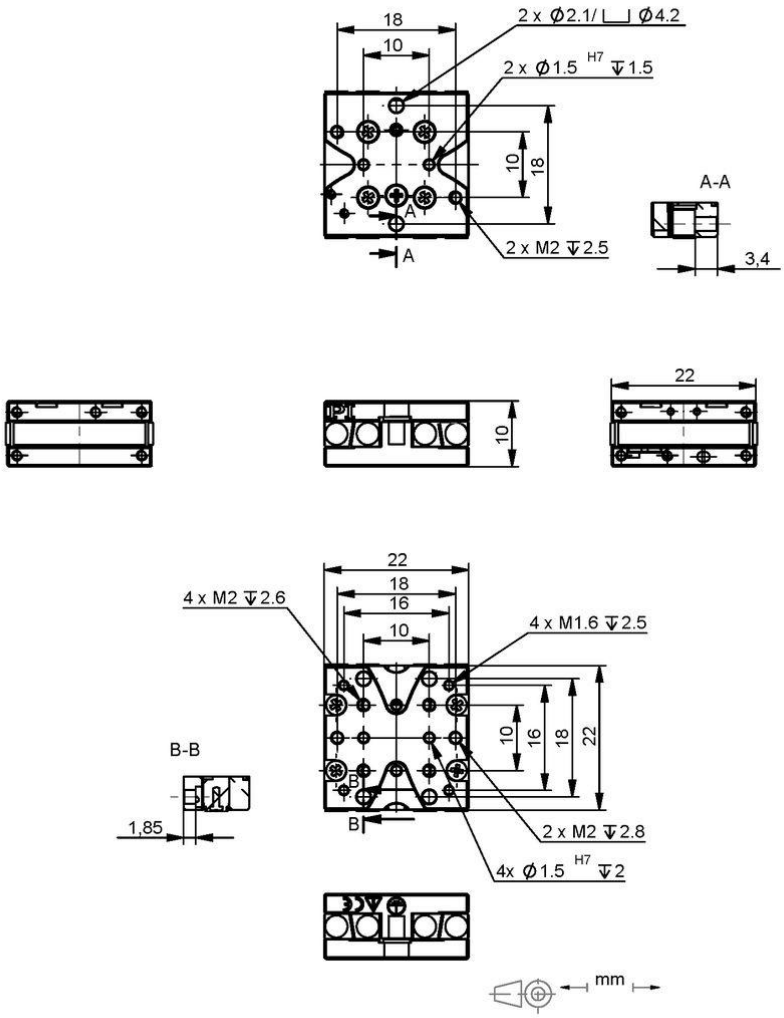
Q-522.14U vacuum-compatible to 10^{-9} hPa

XYθ_Z- Stack
consisting of
two Q-522.000 and
one Q-622.900

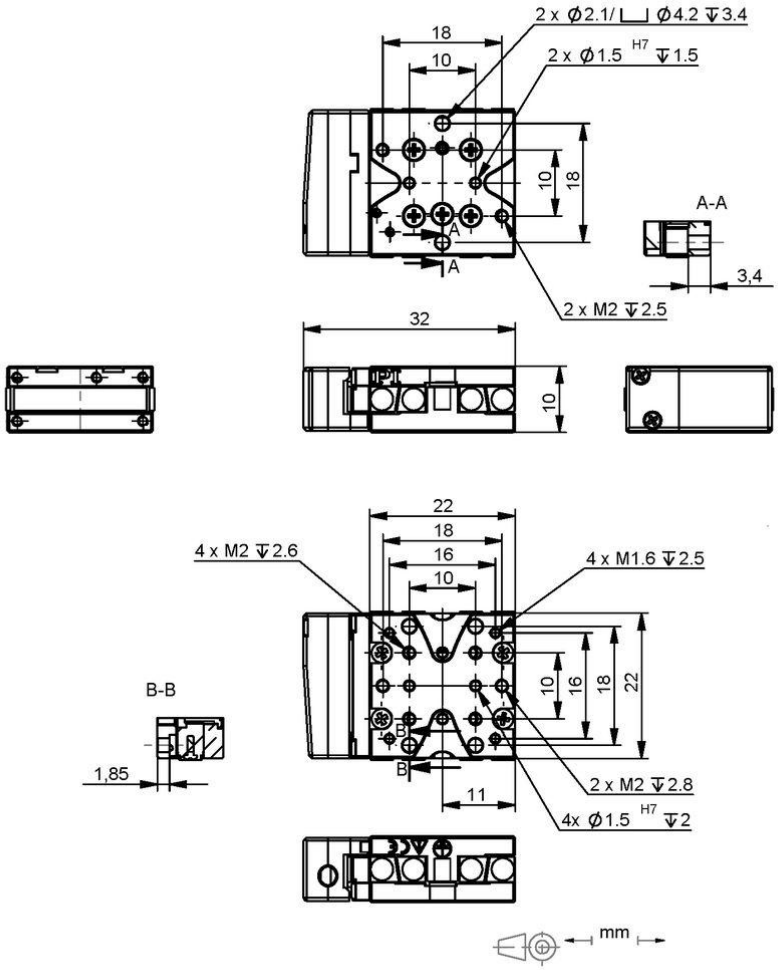


XYθ_Z- stack consisting of Q-522.240, Q-522.00 and Q-622.900

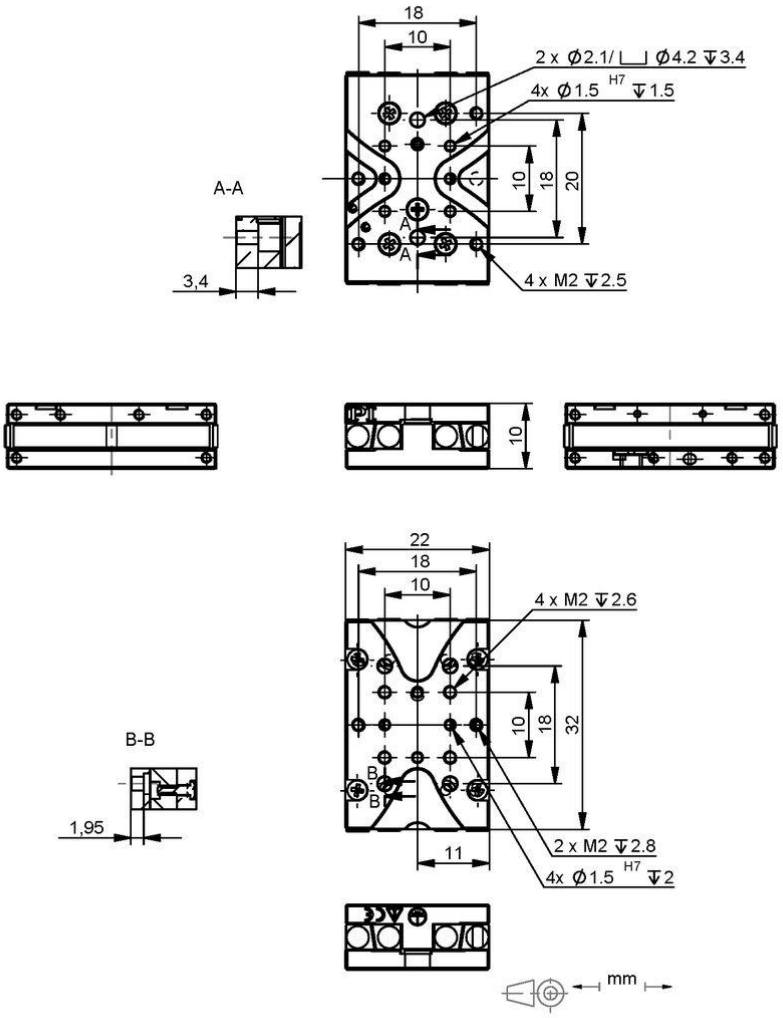
Q-522.000,
dimensions in mm



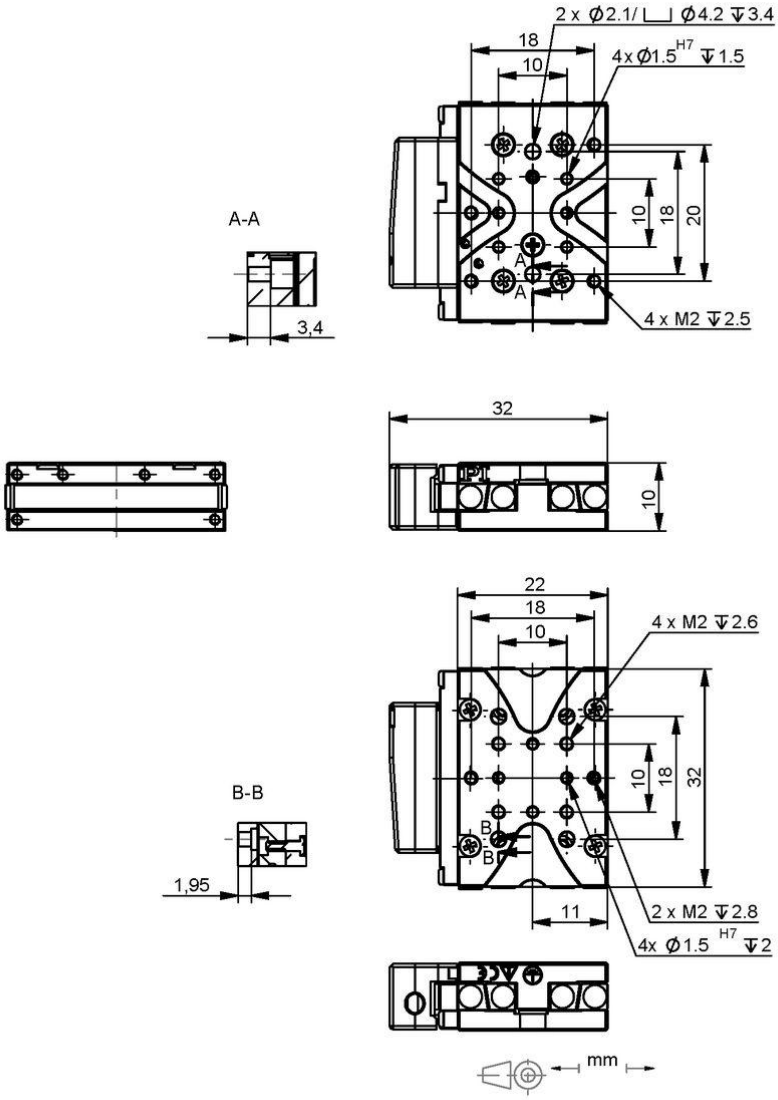
Q-522.x4x, Q-522.x3x,
dimensions in mm



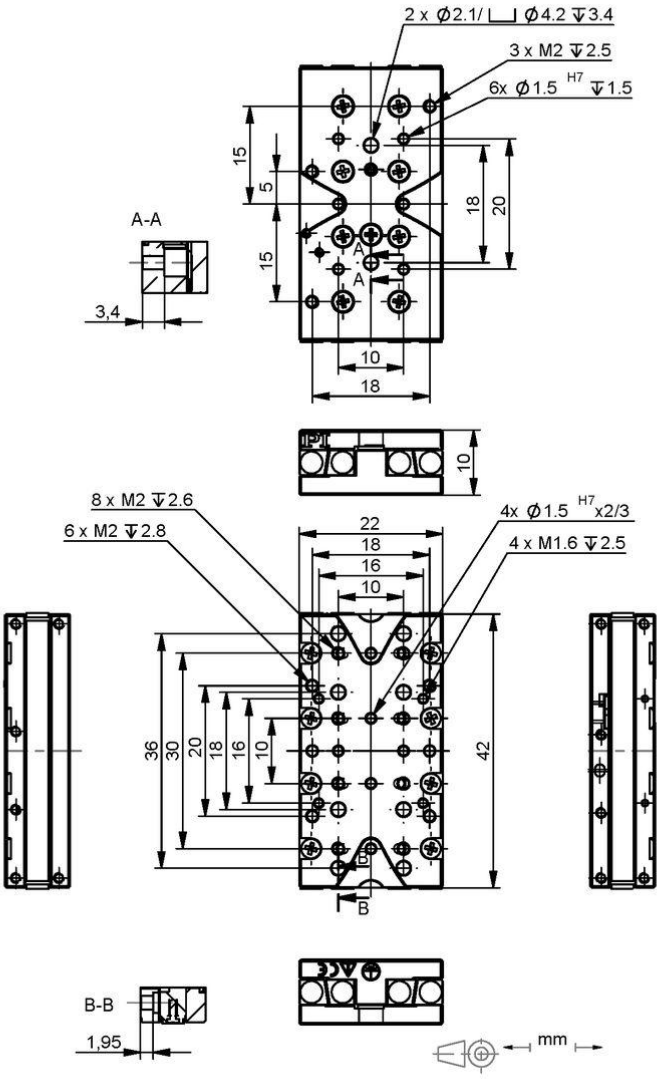
Q-522.100,
dimensions in mm



Q-522.140,
dimensions in mm



Q-522.200, dimension in mm



Q-522.240,
dimensions in mm