



► **Slimline stepper motors**

**6403**

- Nominal Torque .... 1.6 mNm
- Weight ..... 7 g

Direct interface between LED and pointer

The 6403 Shaftless stepper motor design optimises pointer illumination efficiency, pointer assembly process and pointer design freedom.

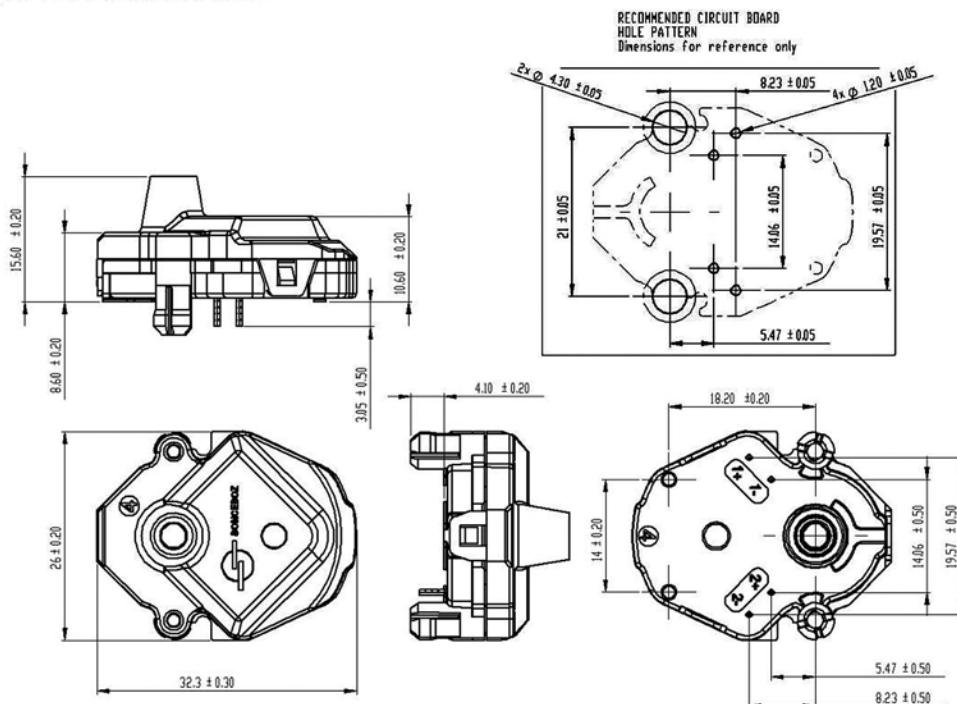
► **Technical data**

Part N°	Position on PCB	Pointer Diameter	Internal stop	Fixing features
6403R200	Front Mount	3.00 mm	yes	Expandable rivets

► **Dimensions**

Drawing not to scale. All dimensions in mm.

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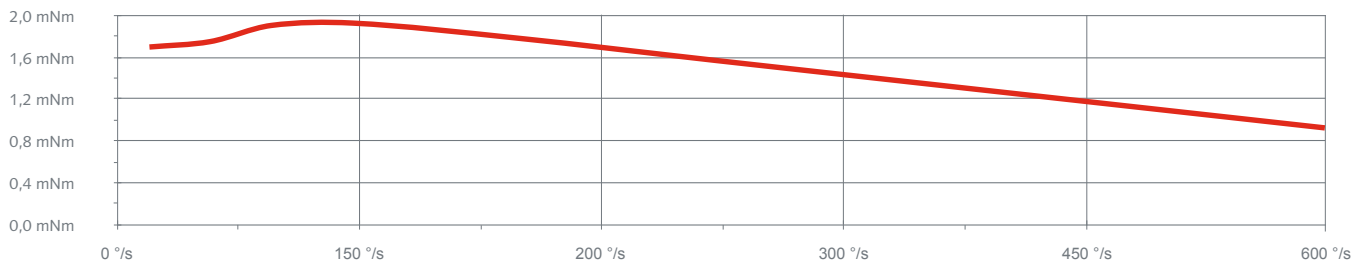


## ▶ Electrical / Mechanical Characteristics

Variables :				
• Ambient temperature $T_a = 22^\circ \text{C}$				
• Voltage at the coils $U = 5 \text{ V} \pm 0.1 \text{ V}$				
Parameter	Min	Typical	Max	Unit
Rotor step angle	–	18	–	degree
Gear ratio	–	1:43.2	–	–
Pole pairs rotor	–	5	–	–
Step size degree in full step mode	–	0.416	–	degree
Step size degree with 6 micro steps	–	0.0694	–	degree
Operating angle	320	325	–	degree
Operating temperature	-40	–	105	$^\circ\text{C}$
Storage temperature	-50	–	105	$^\circ\text{C}$
Soldering temperature (max 5 sec)	–	–	290	$^\circ\text{C}$
Operating voltage	4.5	–	7.5	V
Operating current	–	20	35	mA
Coil resistance	214	227	240	$\Omega$
Coil Inductance	45	55	65	mH
Dynamic torque @ 200 degree / sec	1.25	1.6	–	mNm
Static torque	0.5	0.8	–	mNm
Holding torque (with current, 5 V)	–	3.6	–	mNm
Noise level @ 200 degree / sec @ 5 cm from the reference face, pre-test	–	30	35	dB (A)
Maximum speed	600	–	–	$^\circ/\text{s}$
Equivalent motor inertia at output	–	7.2 E-06	–	$\text{kg m}^2$
Permissible forces on output shaft				
Axial force (with retention of the housing)	–	–	150	N
Radial force at 10 mm from front face of motor	–	–	15	N

## ▶ Dynamic characteristics

Dynamic torque at  $22^\circ \text{C}$ , coil voltage 5 V, for motors driven in 1/6 micro-steps



Special requirements upon customer specifications. Right to change reserved. Patent protected.

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