

DESCRIPTION

Lavet type two way stepping motor with integrated reductor.

number of output		2, coaxial
output angle	Minute	2°
	Hour	3°
steps per turn	Minute	180
	Hour	120
Main plate material		Plastic
Gears		Metal, Soptec

Prepared	RC
Checked	BS
Version	2.10
Date	14.08.2018

SPECIFICATIONS

Description	symbole	Unit	Minimum	Nominal	Maximum
pulse width @3 V	T ₀	ms	1.5	2.9	Infinite
Time between pulses	T ₁	ms	16.6	-	Infinite
motor step frequency	M _{fréq}	Hz	0		60
voltage	U ₀	V	2.2	3	3.5
Motor start voltage	U _{start}	V	-	2.2	2.6
Motor consumption @ T ₀ = 2.9ms	I _{mot}	μAs	-	3.8	4.2
Motor peak consumption @3V	I _{peak}	mA	-	2	2.5
Coil Resistor	R _{coil}	Ohm	1480	1600	1720
Motor torque Minute axle 2° @3V	M _{ti}	μNm	20	-	40
Motor torque Hour axle 3° @3V	M _{ti}	μNm	15	-	30
Motor positioning torque 2°	MPT	μNm	-	90	-
Motor positioning torque 3°	MPT	μNm	-	45	-
Total Angular play	∠	°	-	-	2°

Hands specifications

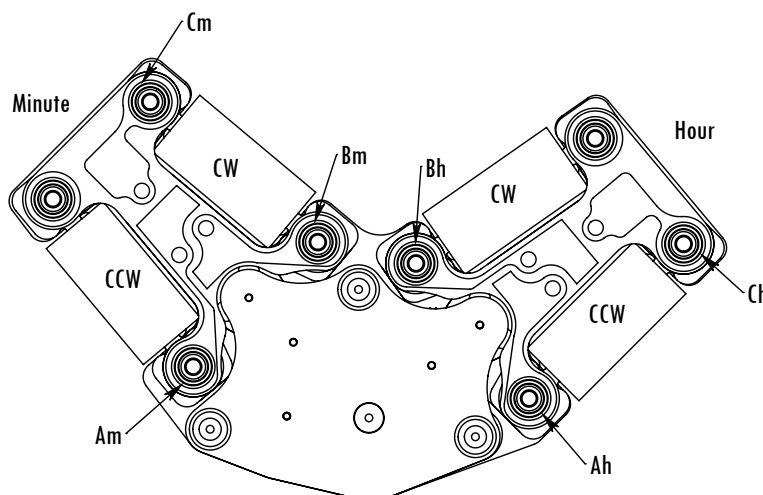
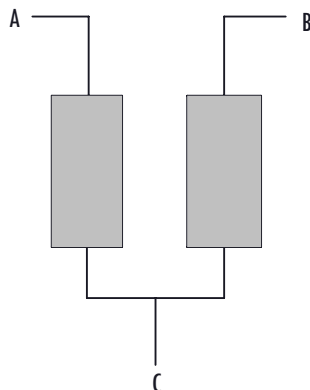
DescriptionMax. values	Minute 2°	Hour 3°
Unbalance (μNm)	0.3	0.2
Inertia (gmm ²)	0.7	0.7
Assembly force (N)	40	40

Unbalance is given for a linear shock resistance up to 300G perpendicular to the hand direction.
For higher values, please contact us.

ELECTRICAL PRINCIPLE

Pin configuration

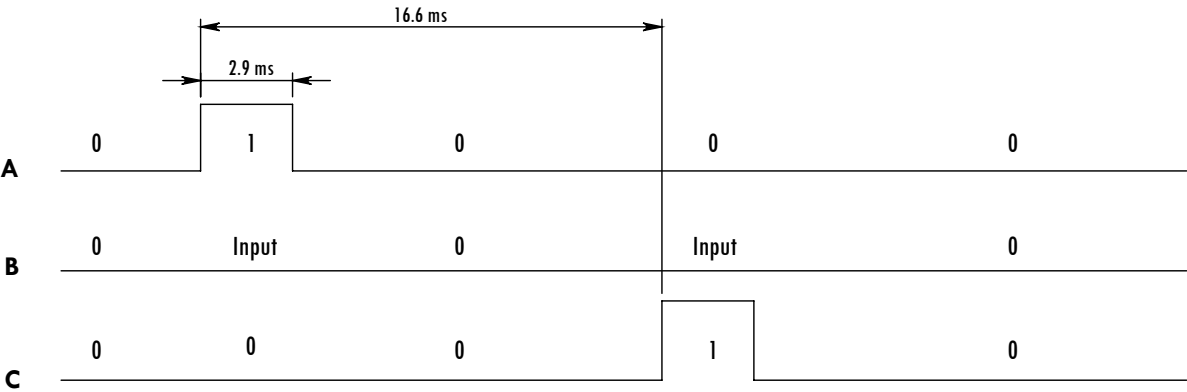
Motor	Pin description	Symbol	Type
Minute (inner axle)	Coil CCW	Am	I/O
	Coil CW	Bm	I/O
	Common	Cm	I/O
Hour (outer axle)	Coil CCW	Ah	I/O
	Coil CW	Bh	I/O
	Common	Ch	I/O



ELECTRICAL PRINCIPLE

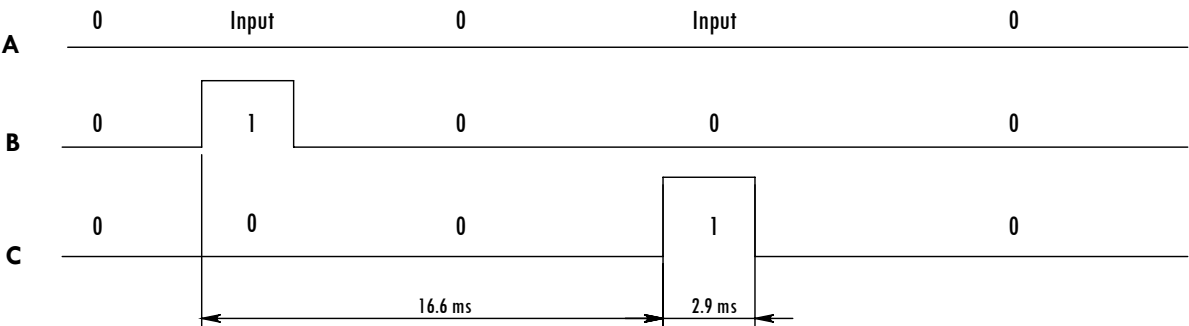
Step Clockwise

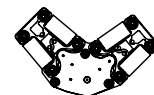
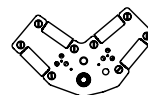
Description	Pin A		Pin B		Pin C	
	Direction	Output	Direction	Output	Direction	Output
Init	Output	'0'	Output	'0'	Output	'0'
Step 1	Output	'1'	Input	'0'	Output	'0'
Between the steps	Output	'0'	Output	'0'	Output	'0'
Step 2	Output	'0'	Input	'0'	Output	'1'
End	Output	'0'	Output	'0'	Output	'0'



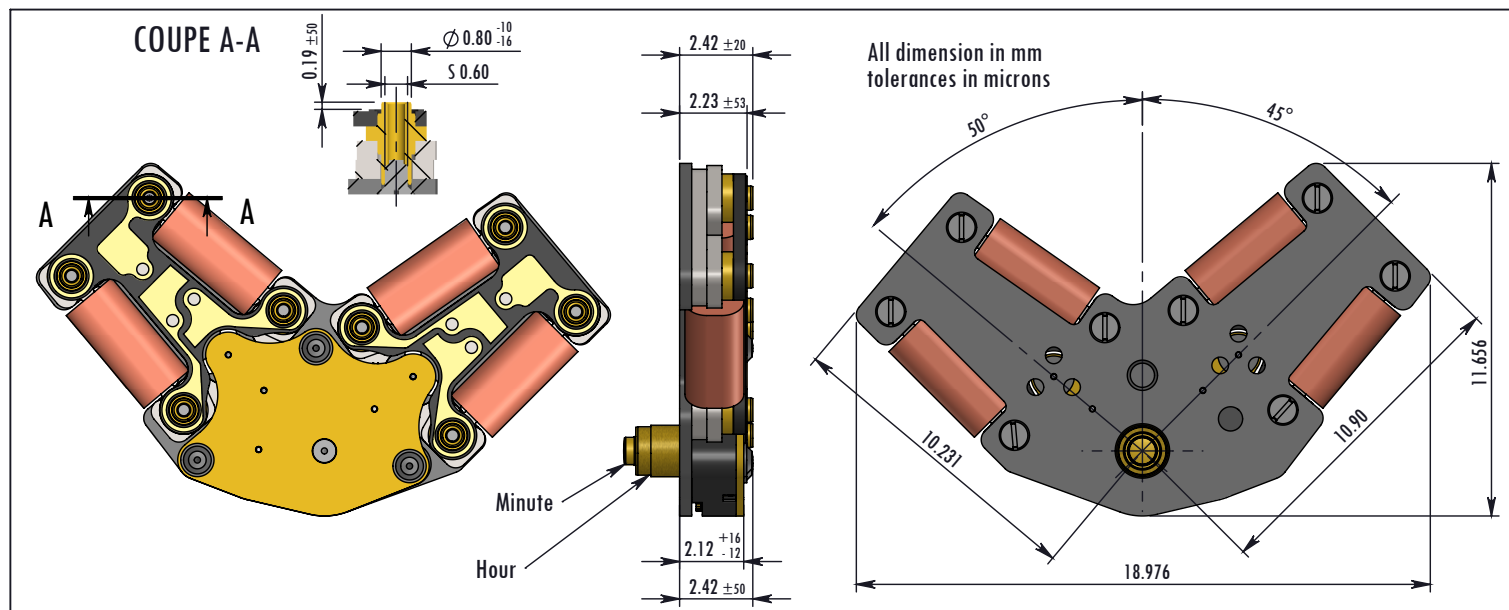
Step Counterclockwise

Description	Pin A		Pin B		Pin C	
	Direction	Output	Direction	Output	Direction	Output
Init	Output	'0'	Output	'0'	Output	'0'
Step 1	Input	'0'	Output	'1'	Output	'0'
Between the steps	Output	'0'	Output	'0'	Output	'0'
Step 2	Input	'0'	Output	'0'	Output	'1'
End	Output	'0'	Output	'0'	Output	'0'

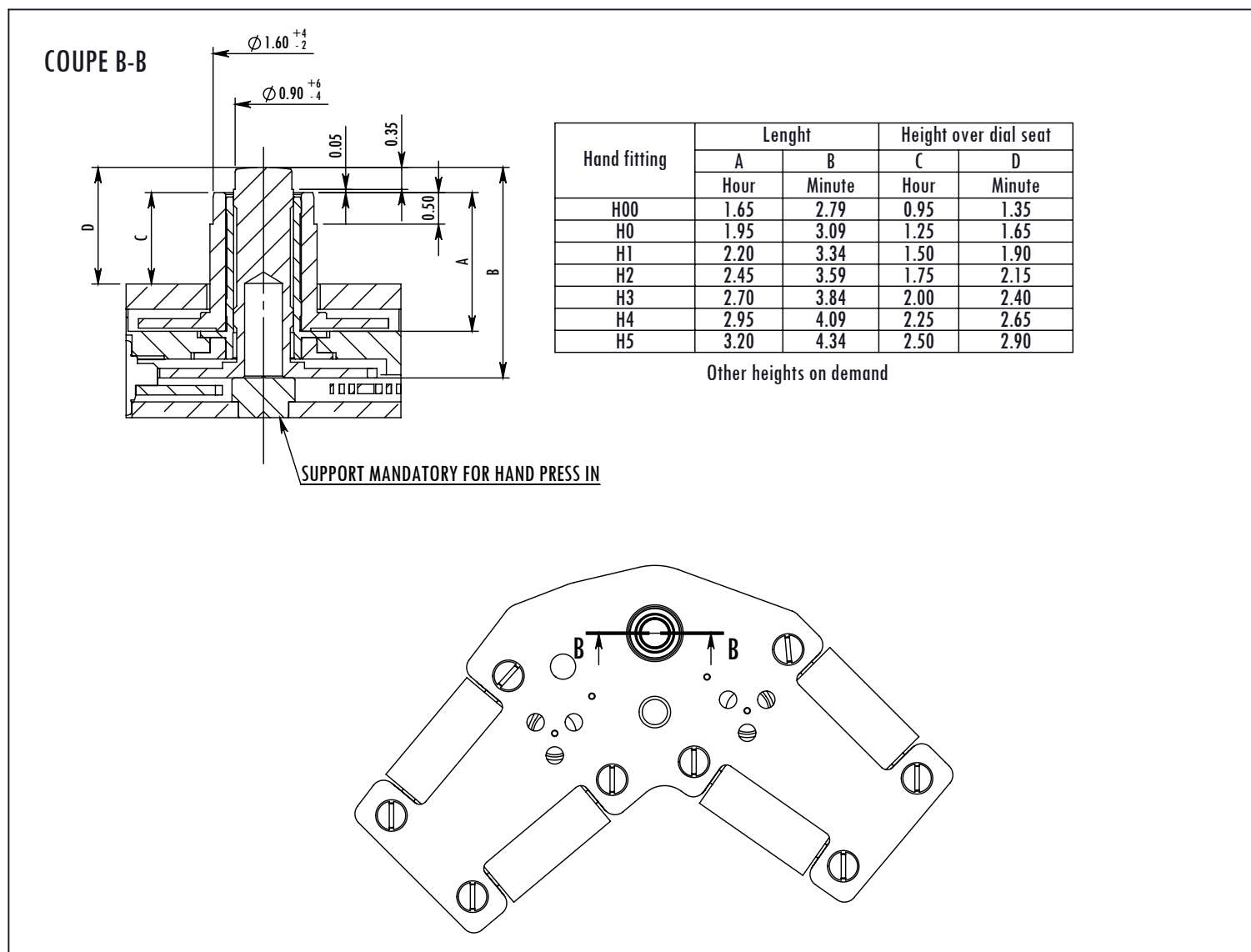


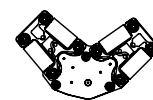
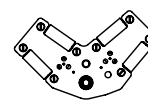


DIMENSIONS



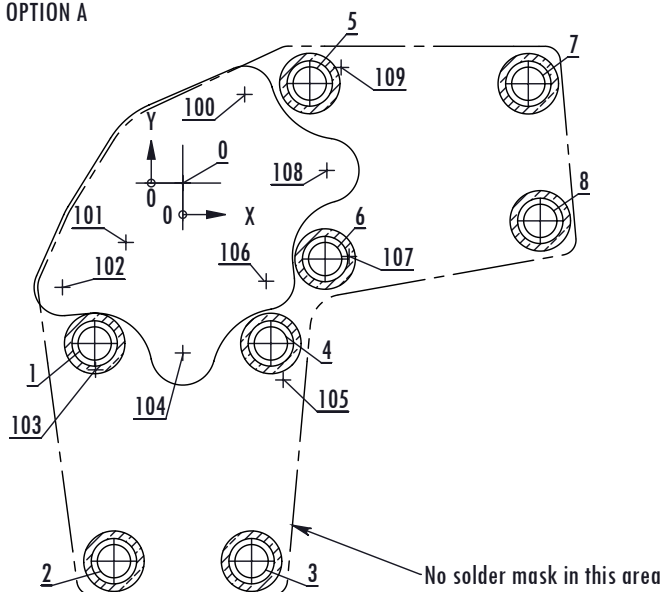
HAND FITTING



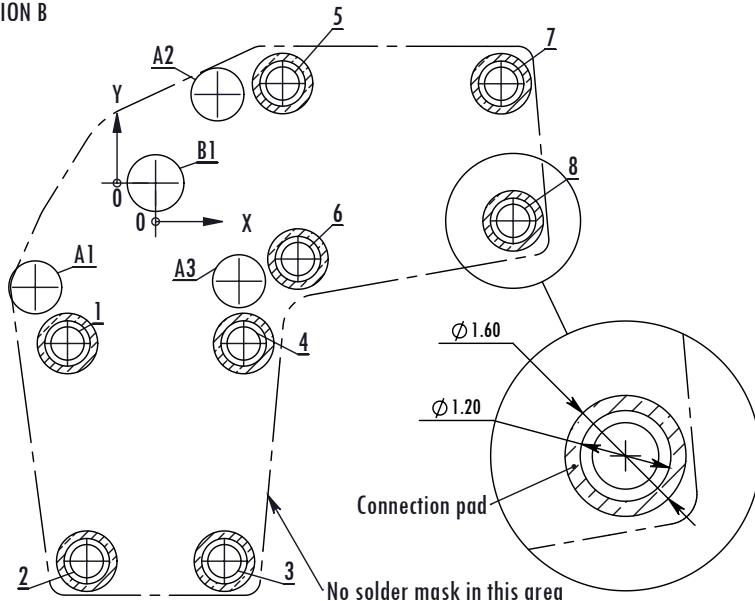


PCB LAYOUT

OPTION A



OPTION B

Connection pad location \oplus 90 XY

REP.	POSITION X	POSITION Y	SIZE	TOL. μm	PIN
1	-2.330	-4.242	$\varnothing 0.88$	± 20	Am
2	-1.820	-10	$\varnothing 0.88$	± 20	not connected
3	1.820	-10	$\varnothing 0.88$	± 20	Cm
4	2.330	-4.242	$\varnothing 0.88$	± 20	Bm
5	3.359	2.633	$\varnothing 0.88$	± 20	Ah
6	3.765	-2.009	$\varnothing 0.88$	± 20	Bh
7	9.139	2.627	$\varnothing 0.88$	± 20	Ch
8	9.456	-1	$\varnothing 0.88$	± 20	not connected

Option A milling coordinates \bigcap 200

REP.	POSITION X	POSITION Y	RADIUS
0	0	0	2.250
100	1.637	2.344	0.750
101	-1.504	-1.571	1.800
102	-3.182	-2.758	0.750
103	-2.307	-4.940	1.500
104	0.000	-4.493	0.850
105	2.656	-5.207	1.900
106	2.207	-2.596	0.750
107	4.400	-1.941	1.500
108	3.811	0.334	0.850
109	4.189	3.058	2.250

Option B drilling coordinates \oplus 90 XY

REP.	POSITION X	POSITION Y	SIZE	TOL. μm
A1	-3.182	-2.758	$\varnothing 1.40$	± 50
A2	1.637	2.344	$\varnothing 1.40$	± 50
A3	2.207	-2.596	$\varnothing 1.40$	± 50
B1	0	0	$\varnothing 1.50$	± 50

Option A is recommended over Option B

If by lack of surface you have to choose Option B, make sure to have no mechanical contact between the train wheel bridge and the PCB. Adding a constraint on this part could stop the wheels.

Connection to main board is ensured trough S0.60 Screws
Soprod reference: 500.001 for PCB from 0.40 to 0.60 mm thick.

