Direct drive stepper motors

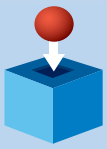
➜ 15° 5 Watts

- **24 steps/revolution (15°)**
- **Absorbed power : 5 W**
- **2 or 4 phase versions available**

Specifications

	2 phases	4 phases
Type	82 910 5	82 910 5
Number of phases	2	4
Part numbers	**82 910 501**	**82 910 502**
General characteristics		
Electronic controller used	Bipolar	Unipolar
Resistance per phase (Ω)	12.9	115
Inductance per phase (mH)	17.3	62
Current per phase (A)	0.44	0.14
Holding torque (mN.m)	20	15
Voltage at motor terminals (V)	5.6	17
Absorbed power (W)	5	5
Step angle (°)	15	15
Positioning accuracy (mm)	5	5
Inertia of rotor (gcm^2)	4.9	4.9
Max. detent torque (mN.m)	3	3
Max. coil temperature (°C)	120	120
Storage temperature (°C)	-40 → +80	-40 → +80
Thermal resistance of coil - ambient air (°C/W)	14	14
Insulation resistance (at 500 Vcc) (MΩ) following NFC 51200 standard	> 10^3	> 10^3
Bearings	Sintered bronze	Sintered bronze
Insulation voltage (50 Hz, 1 minute) (V) following NFC 51200 standard	> 600	> 600
Wires length (mm)	250	250
Weight (g)	90	90
Protection rating	IP40	IP 40

Product adaptations

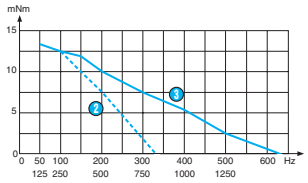


- **Special output shafts**
- **Special supply voltages**
- **Special cable lengths**
- **Special connectors**

To order, see page 13

Curves

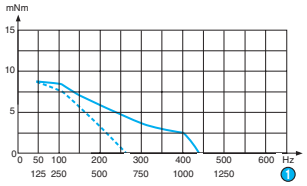
Nominal value dynamic curves
2 phases - 12.9 Ω



1. RPM
2. Stopping-starting
3. Max. operating curves

Measurement conditions :
L 297 298 SGS constant voltage supply board, 5.6 V at motor terminals,
2 phases energised, full steps, inertia of measuring system 4.53 g.cm²

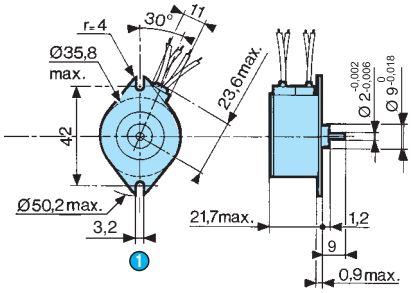
Nominal value dynamic curves
4 phases - 115 Ω



1. RPM
2. Stopping-starting
3. Max. operating curves

Measurement conditions :
L 297 298 SGS constant voltage supply board, 5.6 V at motor terminals,
2 phases energised, full steps, inertia of measuring system 4.53 g.cm²

Dimensions



1. 2 fixing holes Ø 3.2 $^{+0.1}$ 0

Connections

2 phases

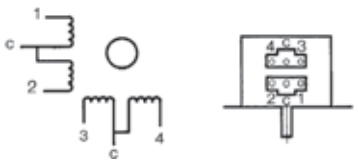
		1	2	3	4
1	1	-	+	-	+
	2	-	+	+	-
	3	+	-	+	-
	4	+	-	-	+
	5	-	+	-	+

1. Step

Energisation sequence for clockwise rotation (viewed from shaft end)

4 phases

		1	2	3	4
1	1	-		-	
	2	-			-
	3		-		-
	4		-	-	
	5	-		-	



1. Step

Energisation sequence for clockwise rotation : 2 phases energised (viewed from shaft end, front forward)
Commons connected to positive.

Direct drive stepper motors

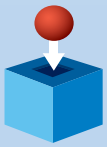
➜ 7.5° 5 Watts

- **48 steps/revolution (7.5°)**
- **Absorbed power : 5 W**
- **2 or 4 phase versions available**

Specifications

	2 phases	2 phases	2 phases
Type	82 910 0	82 910 0	82 910 0
Electronic controller used	Bipolar	Bipolar	Bipolar
Bearings	Sintered bronze	Sintered bronze	Sintered bronze
Part numbers	82 910 001	●	●
General characteristics			
Resistance per phase (Ω)	9	9	9
Inductance per phase (mH)	12	12	12
Current per phase (A)	0.52	0.52	0.52
Holding torque (mN.m)	25	25	25
Voltage at motor terminals (V)	4.7	4.7	4.7
Absorbed power (W)	5	5	5
Step angle (°)	7.5	7.5	7.5
Positioning accuracy (mm)	5	5	5
Inertia of rotor (gcm^2)	4.9	4.9	4.9
Max. detent torque (mN.m)	3	3	3
Max. coil temperature (°C)	120	120	120
Storage temperature (°C)	-40 → +80	-40 → +80	-40 → +80
Thermal resistance of coil - ambient air (°C/W)	14	14	14
Insulation resistance (at 500 Vcc) (MΩ) following NFC 51200 standard	> 10^3	> 10^3	> 10^3
Insulation voltage (50 Hz, 1 minute) (V) following NFC 51200 standard	> 600	> 600	> 600
Wires length (mm)	250	250	250
Weight (g)	90	90	90
Protection rating	IP 40	IP 40	IP 40

Product adaptations



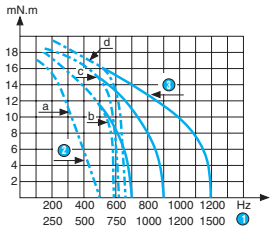
- **Special output shafts**
- **Special supply voltages**
- **Special cable lengths**
- **Special connectors**

To order, see page 13

Curves

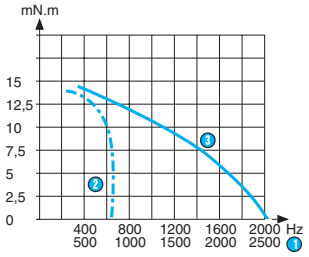
Inertia of measuring chain : 1.5 g.cm²
a = constant voltage controller with Rs (resistance in series) = 0
b = constant voltage controller with Rs (resistance in series) = R motor
c = constant voltage controller with Rs (resistance in series) = 2R motor
d = constant voltage controller with Rs (resistance in series) = 3R motor
The measurements are made with full stepping, 2-phases energised.

2 phases



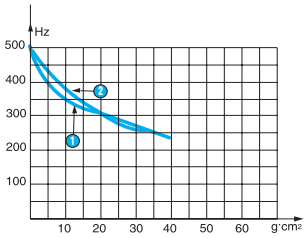
1 RPM
2 Max. stopping-starting curves
3 Max. operating curves

Max. stopping-starting and operating curves at I constant (PBL 3717) for 2 (motor) phases 12.9 Ω



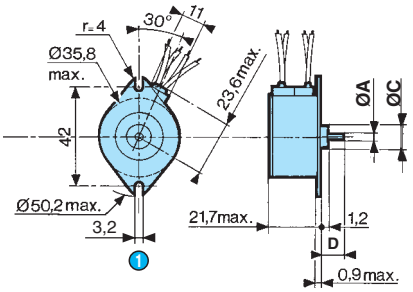
1 RPM
2 Max. stopping-starting curves
3 Max. operating curves

Max. stopping-starting frequency curves as a function of the external inertia load at zero antagonistic torque. Tests at constant U



1 2 phases
2 4 phases

Dimensions



Axe version	Ø A	Ø C	D
Version 1	2 -0,002 -0,006	9 -0,010 -0,060	9
Version 2	2 -0,002 -0,006	10 -0,010 -0,060	9
Version 3	3,17 0 -0,006	9,52 -0,010 -0,060	9

1 2 fixing holes Ø 3.2

Connections

2 phases

		1	2	3	4
1	1	-	+	-	+
	2	-	+	+	-
	3	+	-	+	-
	4	+	-	-	+
	5	-	+	-	+

1 Step
Energisation sequence for clockwise rotation (viewed shaft end)

Direct drive stepper motors

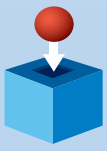
➜ 7.5° 5 Watts

- **48 steps/revolution (7.5°)**
- **Absorbed power : 5 W**
- **2 or 4 phase versions available**

Specifications

	4 phases	4 phases	4 phases
Type	82 910 0	82 910 0	82 910 0
Electronic controller used	Unipolar	Unipolar	Unipolar
Bearings			
Sintered bronze	●	●	●
Plastic	●	●	●
General characteristics			
Electronic controller used	Unipolar	Unipolar	Unipolar
Resistance per phase (Ω)	15.5	15.5	15.5
Inductance per phase (mH)	8	8	8
Current per phase (A)	0.4	0.4	0.4
Holding torque (mN.m)	20	20	20
Voltage at motor terminals (V)	6.2	6.2	6.2
Absorbed power (W)	5	5	5
Step angle (°)	7.5	7.5	7.5
Positioning accuracy (mm)	5	5	5
Inertia of rotor (gcm^2)	4.9	4.9	4.9
Max. detent torque (mN.m)	3	3	3
Max. coil temperature (°C)	120	120	120
Storage temperature (°C)	-40 → +80	-40 → +80	-40 → +80
Thermal resistance of coil - ambient air (°C/W)	14	14	14
Insulation resistance (at 500 Vcc) (MΩ) following NFC 51200 standard	> 10^3	> 10^3	> 10^3
Insulation voltage (50 Hz, 1 minute) (V) following NFC 51200 standard	> 600	> 600	> 600
Wires length (mm)	250	250	250
Weight (g)	90	90	90
Protection rating	IP 40	IP 40	IP 40

Product adaptations



- **Special output shafts**
- **Special supply voltages**
- **Special cable lengths**
- **Special connectors**

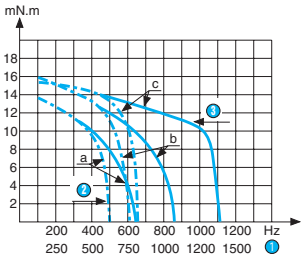
To order, see page 13

Curves

Inertia of measuring chain : 1.5 g.cm²
a = constant voltage controller with Rs (resistance in series) = 0
b = constant voltage controller with Rs (resistance in series) = R motor
c = constant voltage controller with Rs (resistance in series) = 2R motor
d = constant voltage controller with Rs (resistance in series) = 3R motor

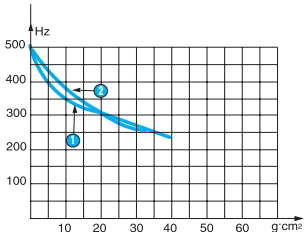
The measurements are made with full stepping, 2-phases energised.

4 phases



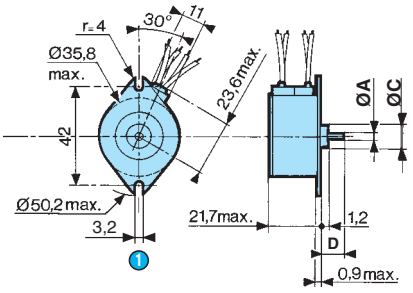
1 RPM
2 Max. stopping-starting curves
3 Max. operating curves

Max. stopping-starting frequency curves as a function of the external inertia load at zero antagonistic torque.Tests at constant U.



1 2 phases
2 4 phases

Dimensions



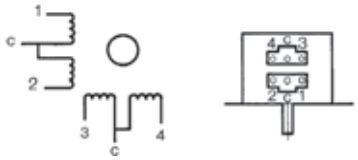
Axe version	Ø A	Ø C	D
Version 1	2 $^{-0,002}_{-0,006}$	9 $^{-0,010}_{-0,060}$	9
Version 2	2 $^{-0,002}_{-0,006}$	10 $^{-0,010}_{-0,060}$	9
Version 3	3,17 $^{0}_{-0,006}$	9,52 $^{-0,010}_{-0,060}$	9

1 2 fixing holes Ø 3.2

Connections

4 phases

		1	2	3	4
1	1	-		-	
	2	-			-
	3		-		-
	4		-	-	
	5	-		-	



1 Step
Energisation sequence for clockwise rotation : 2 phases energised (viewed from shaft end, front forward).
Commons connected to positive.

Direct drive stepper motors

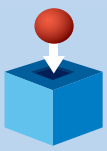
➜ 7.5° 7.5 Watts

- 48 steps/revolution (7.5°)
- Absorbed power : 7.5 W
- 2 or 4 phase versions available

Specifications

			2 phases	4 phases
Type			82 920 0	82 920 0
Number of phases			2	4
Electronic controller used			Bipolar	Unipolar
Resistance per phase (Ω)	**Current per phase (A)**	**Voltage at motor terminals (V)**		
10.7	0.59	0.59	82 920 001	●
46	0.28	12.9	●	82 920 012
General characteristics				
Absorbed power (W)			7.5	7.5
Holding torque (mN.m)			70	57
Step angle (°)			7.5	7.5
Positioning accuracy (mm)			5	5
Inertia of rotor (gcm²)			18.8	18.8
Max. detent torque (mN.m)			6	6
Max. coil temperature (°C)			120	120
Storage temperature (°C)			-40 → +80	-40 → +80
Thermal resistance of coil - ambient air (°C/W)			9.3	9.3
Insulation resistance (at 500 Vcc) (MΩ) following NFC 51200 standard			> 10^3	> 10^3
Insulation voltage (50 Hz, 1 minute) (V) following NFC 51200 standard			> 600	> 600
Wires length (mm)			250	250
Weight (g)			210	210
Protection rating			IP40	IP 40

Product adaptations

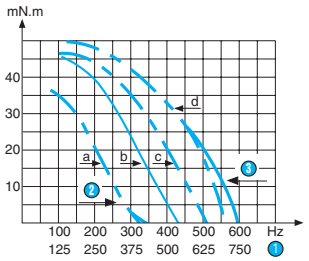


- Special output shafts
- Special supply voltages
- Special cable lengths
- Special connectors

To order, see page 13

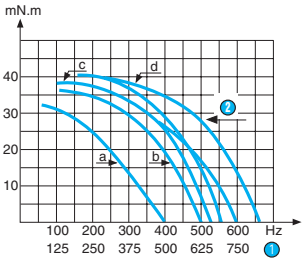
Curves

2 phases



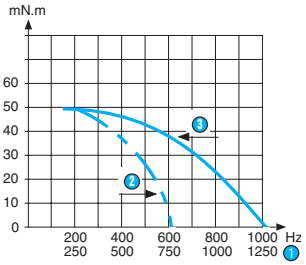
1 RPM
2 Max. stopping-starting curves
3 Max. operating curves

4 phases



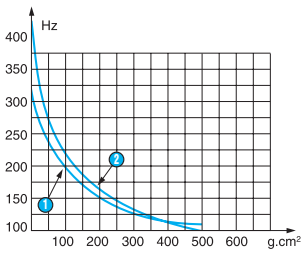
1 RPM
2 Max. operating curves

2 phases - Max. stopping-starting and operating curves at I constant (PBL 3717) for 2 (motor) phases 10.7 Ω. Holding torque 70 mN.m. Current per phase 0.59 A



1 RPM
2 Max. stopping-starting curves
3 Max. operating curves

Max. stopping-starting frequency curves as a function of the external inertia load at zero antagonistic torque. Tests at constant U.

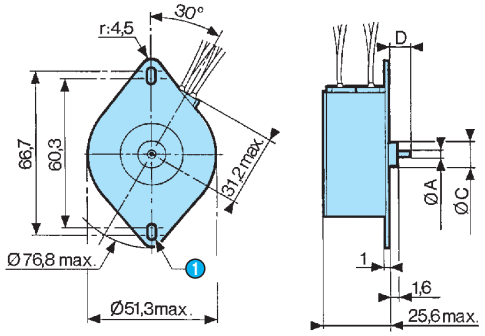


1 2 phases
2 4 phases

Inertia of measuring chain : 2.2 g.cm²
a = constant voltage controller with Rs (resistance in series) = 0
b = constant voltage controller with Rs (resistance in series) = R motor
c = constant voltage controller with Rs (resistance in series) = 2R motor
d = constant voltage controller with Rs (resistance in series) = 3R motor

The measurements are made with full stepping, 2-phases energised.

Dimensions



Version axe	Ø A	Ø C	D
Version 1	**2** $^{0}_{-0,006}$	**9** $^{-0,010}_{-0,060}$	**9**
Version 2	2 $^{0}_{-0,006}$	10 $^{-0,010}_{-0,060}$	9
Version 3	3,17 $^{0}_{-0,006}$	9,52 $^{-0,010}_{-0,060}$	9

1 2 oblong fixing holes : wide 3.5

Connections

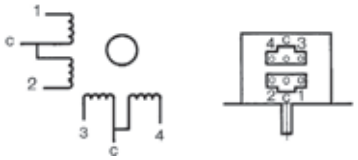
2 phases

		1	2	3	4
1	1	-	+	-	+
	2	-	+	+	-
	3	+	-	+	-
	4	+	-	-	+
	5	-	+	-	+

1 Step
Energisation sequence for clockwise rotation : (viewed shaft end)

4 phases

		1	2	3	4
1	1	-		-	
	2	-			-
	3		-		-
	4		-	-	
	5	-		-	



1 Step
Energisation sequence for clockwise rotation :
2 phases energised (viewed shaft end, front forward)
Commons connected to positive.

Direct drive stepper motors

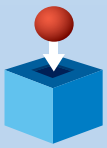
➜ 7.5° 10 Watts

- **48 steps/revolution (7.5°)**
- **Absorbed power : 10 W**
- **2 or 4 phase versions available**

Specifications

			2 phases	4 phases
Type			82 930 0	82 930 0
Number of phases			2	4
Electronic controller used			Bipolar	Unipolar
Resistance per phase (Ω)	**Current per phase (A)**	**Voltage at motor terminals (V)**		
9	0,75	6,6	●	
22,3	0,48	10,4	**82 930 002**	
7,4	0,81	6		●
32	0,39	12,5		**82 930 015**
General characteristics				
Absorbed power (W)			10	10
Holding torque (mN.m)			180	155
Step angle (°)			7.5	7.5
Positioning accuracy (mm)			5	5
Inertia of rotor (gcm^2)			84	84
Max. detent torque (mN.m)			12	12
Max. coil temperature (°C)			120	120
Storage temperature (°C)			-40 → +80	-40 → +80
Thermal resistance of coil - ambient air (°C/W)			7	7
Insulation resistance (at 500 Vcc) (MΩ) following NFC 51200 standard			> 10^3	> 10^3
Insulation voltage (50 Hz, 1 minute) (V) following NFC 51200 standard			> 600	> 600
Wires length (mm)			250	250
Weight (g)			340	340
Protection rating			IP40	IP 40

Product adaptations

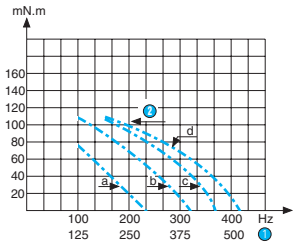


- **Special output shafts**
- **Special supply voltages**
- **Special cable lengths**
- **Special connectors**

To order, see page 13

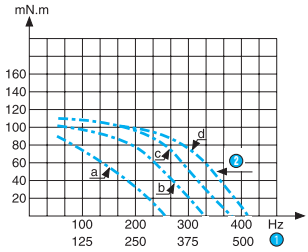
Curves

2 phases



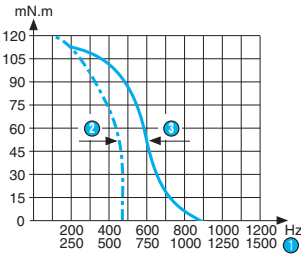
1 RPM
2 Max. stopping-starting curves

4 phases



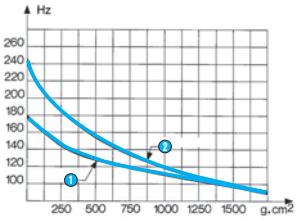
1 RPM
2 Max. stopping-starting curves

2 phases - Max. stopping-starting and operating curves at I constant (PBL 3717) for 2 (motor) phases 9 Ω. Holding torque 150 mN.m. Current per phase 0.53 A



1 RPM
2 Max. stopping-starting curves
3 Max. operating curves

Max. stopping-starting frequency curves as a function of the external inertia load at zero antagonistic torque. Tests at constant U.

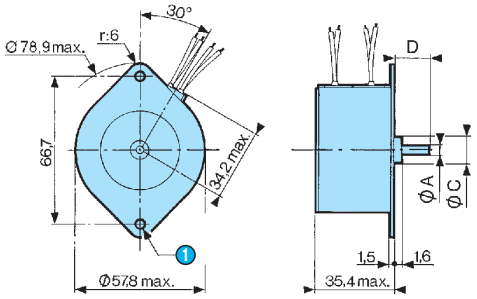


1 2 phases
2 4 phases

Inertia of measuring chain : 3.4 g.cm²
a = constant voltage controller with Rs (resistance in series) = 0
b = constant voltage controller with Rs (resistance in series) = R motor
c = constant voltage controller with Rs (resistance in series) = 2R motor
d = constant voltage controller with Rs (resistance in series) = 3R motor

The measurements are made with full stepping, 2-phases energised.

Dimensions



Axe version	Ø A	Ø C	D
Version 1	$4\ ^{0}_{-0,008}$	$12\ ^{0}_{-0,05}$	16
Version 2	$6,35\ ^{0}_{-0,01}$	$11,13\ ^{0}_{-0,05}$	16
Version 3	$6,35\ ^{0}_{-0,01}$	$12,7\ ^{0}_{-0,05}$	16

1 2 Fixing holes Ø 4.4

Connections

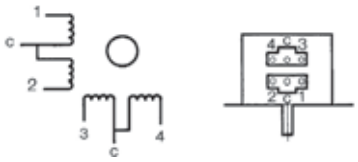
2 phases

		1	2	3	4
1	1	-	+	-	+
	2	-	+	+	-
	3	+	-	+	-
	4	+	-	-	+
	5	-	+	-	+

1 Step
Energisation sequence for clockwise rotation : (viewed shaft end)

4 phases

		1	2	3	4
1	1	-		-	
	2	-			-
	3		-		-
	4		-	-	
	5	-		-	



1 Step
Energisation sequence for clockwise rotation : 2 phases energised (viewed shaft end, front forward)
Commons connected to positive.

Direct drive stepper motors

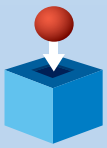
➜ 7.5° 12.5 Watts

- 48 steps/revolution (7.5°)
- Absorbed power : 12.5 W
- 2 or 4 phase versions available

Specifications

			2 phases	4 phases
Type			82 940 0	82 940 0
Number of phases			2	4
Electronic controller used			Bipolar	Unipolar
Resistance per phase (Ω)	**Current per phase (A)**	**Voltage at motor terminals (V)**		
5,2	1,1	5,7	●	
26,7	0,48	12,7	82 940 002	
7,4	0,9	6,7		82 940 015
26,7	0,48	12,7		●
General characteristics				
Absorbed power (W)			12.5	12.5
Holding torque (mN.m)			300	240
Step angle (°)			7.5	7.5
Positioning accuracy (mm)			5	5
Inertia of rotor (gcm^2)			180	180
Max. detent torque (mN.m)			16	16
Max. coil temperature (°C)			120	120
Storage temperature (°C)			-40 → +80	-40 → +80
Thermal resistance of coil - ambient air (°C/W)			5.6	5.6
Insulation resistance (at 500 Vcc) (MΩ) following NFC 51200 standard			> 10^3	> 10^3
Insulation voltage (50 Hz, 1 minute) (V) following NFC 51200 standard			> 600	> 600
Wires length (mm)			250	250
Weight (g)			540	540
Protection rating			IP40	IP 40

Product adaptations

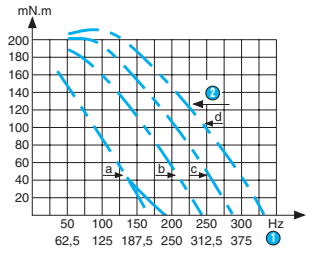


- Special output shafts
- Special supply voltages
- Special cable lengths
- Special connectors

To order, see page 13

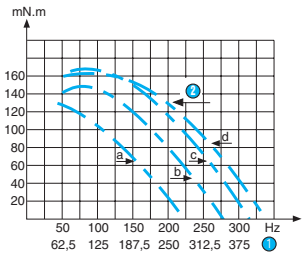
Curves

2 phases



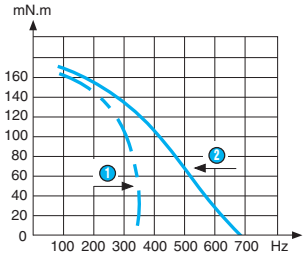
1 RPM
2 Max. stopping-starting curves

4 phases



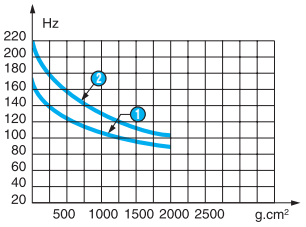
1 RPM
2 Max. stopping-starting curves

2 phases - Max. stopping-starting and operating curves at I constant (PBL 3717) for 2 (motor) phases 5.2 Ω. Holding torque 240 mN.m. Current per phase 0.55 A



1 Max. stopping-starting curves
2 Max. operating curves

Max. stopping-starting frequency curves as a function of the external inertia load at zero antagonistic torque. Tests at constant U.

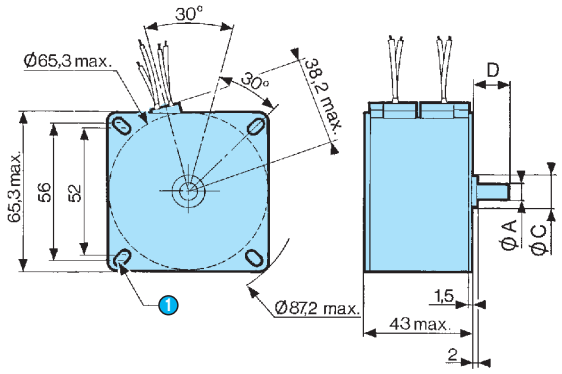


1 2 phases
2 4 phases

Inertia of measuring chain : 20.5 g.cm²
a = constant voltage controller with Rs (resistance in series) = 0
b = constant voltage controller with Rs (resistance in series) = R motor
c = constant voltage controller with Rs (resistance in series) = 2R motor
d = constant voltage controller with Rs (resistance in series) = 3R motor

The measurements are made with full stepping, 2-phases energised.

Dimensions



Axe version	Ø A	Ø C	D
Version 1	**6** $^{0}_{-0,008}$	**12** $^{0}_{-0,05}$	**15**
Version 2	6,35 $^{0}_{-0,01}$	12,7 $^{0}_{-0,05}$	15
Version 3	6,35 $^{0}_{-0,01}$	14 $^{0}_{-0,05}$	15

1 4 oblong fixing holes 4.2 wide

Connections

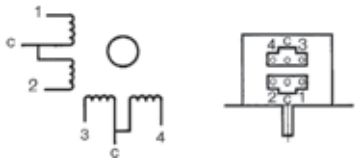
2 phases

		1	2	3	4
1	1	-	+	-	+
	2	-	+	+	-
	3	+	-	+	-
	4	+	-	-	+
	5	-	+	-	+

1 Step
Energisation sequence for clockwise rotation : (viewed shaft end)

4 phases

		1	2	3	4
1	1	-		-	
	2	-			-
	3		-		-
	4		-	-	
	5	-		-	



1 Step
Energisation sequence for clockwise rotation : 2 phases energised (viewed shaft end, front forward)
Commons connected to positive.