



## UCE1/7; UCE2/8

Dimensions (mm)	∅ 28 x 31
Travel (mm)	10/13
Travel per step (mm)	0,021
Thread pitch (mm)	1,0
Speed (mm/s) at 200 Hz	4,16
Step angle (°)	7,5
Max. Force (N)*	35



\*Depends on winding, frequency and lifetime required.  
Drive against end stops only permissible after clarification of operating conditions and approval by Saia-Burgess.

## Standard Data

Climatic class	wide-spread according to DIN IEC 60721-2-1
Ambient temperature operation	°C -15 ... +60
Ambient temperature storage	°C -20 ... +100
Thermal resistance at f=0 R <sub>therm</sub>	29 K/W
Thermal class	B according to DIN EN 60085
Approval	standard
Mounting	any position
Electrical connection	connector type C, D
Protection	IP 40 according to DIN EN 60529
Weight	67 g
Rotor stalling	motor can be stopped when voltage is applied, without being overheated
Bearings	ball bearing

## Order Reference

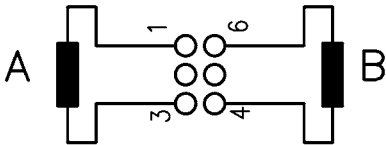
Type	Stepper Motor	UCE	13	N	24 Ω	B	1A
Configuration	13	bipolar, standard magnet	73	bipolar, stronger magnet			
	23	unipolar, standard magnet	83	unipolar, stronger magnet			
Approval	N						
Resistance	see next page, Resistance per winding for bipolar or unipolar						
Connection	C D see next pages „Connection Types“						
Shaft	1A	Travel 10 mm ± 0,7 mm					
	1B	Travel 13 mm ± 0,7 mm					

## Technical Data

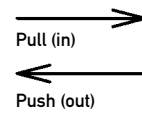
bipolar	type		UCE1	UCE1	UCE5	UCE5
	Operating frequency	Hz	100	200	100	200
	max. Push/Pull force *	30% duty cycle 100% duty cycle	N	49 42	42 28	50 49
unipolar	type		UCE2	UCE2	UCE6	UCE6
	Operating frequency	Hz	100	200	100	200
	max. Push/Pull force *	30% duty cycle 100% duty cycle	N	35 21	28 17	49 29
Rated voltage $U_N$ :		V	6	12	24	
Resistance per winding $R_{20}$		$\Omega$	24	90	380	
Steps per mm			48			
Duty cycle			100 %			
Winding temperature $T_{max}$		$^{\circ}C$	130			
Linear travel max.		mm	10/13			
Axial play at $\pm 20$ N force		mm	< 0,25			

\* measured at 23 °C, lifetime depends on load characteristics and ambient conditions

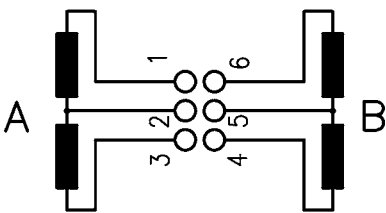
Circuit diagram bipolar



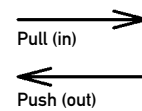
	0	I	II	III	IV
1	+	+	-	-	+
3	-	-	+	+	-
4	-	+	+	-	-
6	+	-	-	+	+



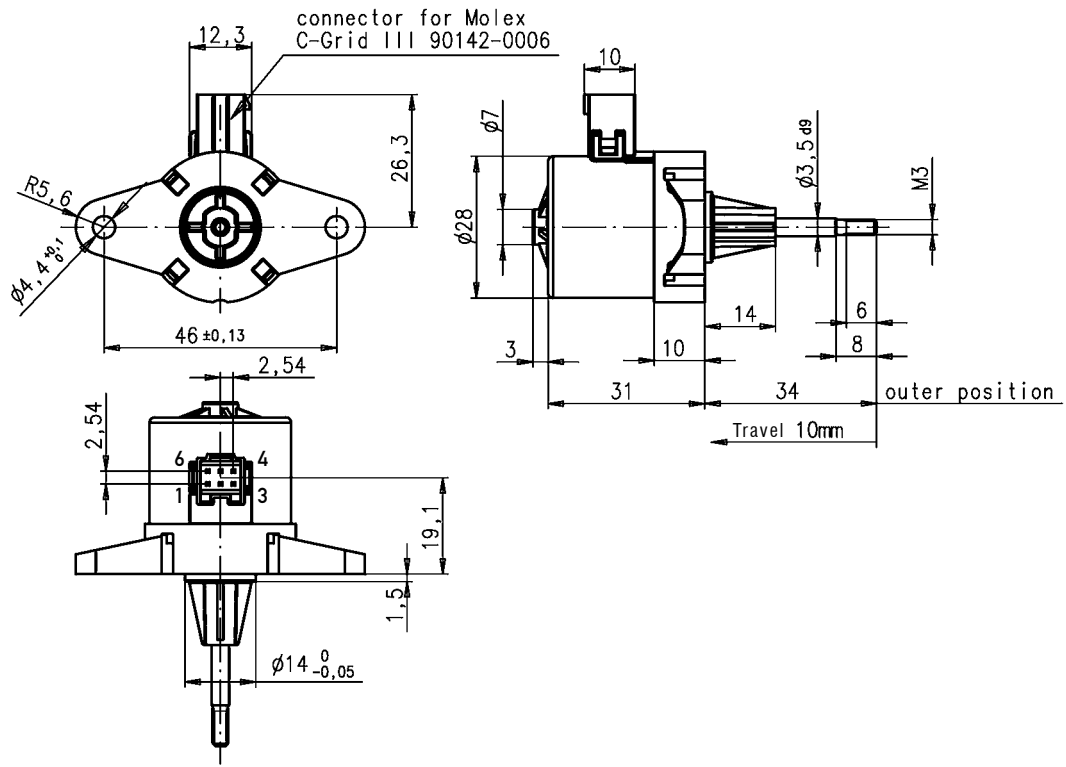
unipolar



	0	I	II	III	IV
1	-	-			-
2	+	+	+	+	+
3			-	-	
4		-	-		
5	+	+	+	+	+
6	-			-	-



Dimensions Version with connector D, 10 mm travel



## UCL1/7; UCL2/8

Dimensions (mm)	∅ 28 x 31
Travel (mm)	10/13
Travel per step (mm)	0.041
Thread pitch (mm)	1.0
Speed (mm/s) at 200 Hz	8,33
Step angle (°)	15
Max. Force (N)*	35



\*Depends on winding, frequency and lifetime required.  
Drive against end stops only permissible after clarification of operating conditions and approval by Saia-Burgess.

## Standard Data

Climatic class	wide-spread according to DIN IEC 60721-2-1
Ambient temperature operation	°C -15 ... +60
Ambient temperature storage	°C -20 ... +100
Thermal resistance at f=0 R <sub>therm</sub>	29 K/W
Thermal class	B according to DIN EN 60085
Approval	standard
Mounting	any position
Electrical connection	connector type C, D
Protection	IP 40 according to DIN EN 60529
Weight	67 g
Rotor stalling	motor can be stopped when voltage is applied, without being overheated
Bearings	ball bearing

## Order Reference

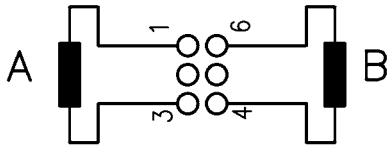
Type	Stepper Motor	UCL	13	N	24 Ω	B	1A
Configuration	13 bipolar, standard magnet	73 bipolar, stronger magnet	23 unipolar, standard magnet	83 unipolar, stronger magnet			
Approval	N						
Resistance	see next page, Resistance per winding for bipolar or unipolar						
Connection	C see next pages „Connection Types“ D						
Shaft	1A Travel 10 mm ± 0,7 mm		1B Travel 13 mm ± 0,7 mm				

## Technical Data

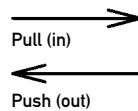
bipolar	type		UCL1	UCL1	UCL5	UCL5
	Operating frequency	Hz	100	200	100	200
	max. Push/Pull force *	30% ED 100% ED	N N	35 30	30 20	50 35
unipolar	type		UCL2	UCL2	UCL6	UCL6
	Operating frequency	Hz	100	200	100	200
	max. Push/Pull force *	30% ED 100% ED	N N	25 15	20 12	35 21
Rated voltage $U_N$ :		V	6	12	24	
Resistance per winding $R_{20}$		$\Omega$	24	90	380	
Steps per mm			24			
Duty cycle			100 %			
Winding temperature $T_{max}$		$^{\circ}C$	130			
Linear travel max.		mm	10/13			
Axial play at $\pm 20$ N force		mm	< 0,25			

\* measured at 23 °C. lifetime depends on load characteristics and ambient conditions

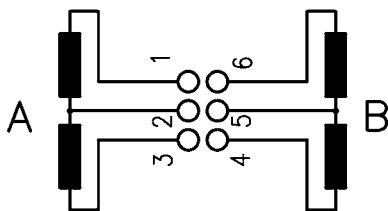
Circuit diagram bipolar



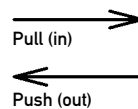
	0	I	II	III	IV
1	+	+	-	-	+
3	-	-	+	+	-
4	-	+	+	-	-
6	+	-	-	+	+



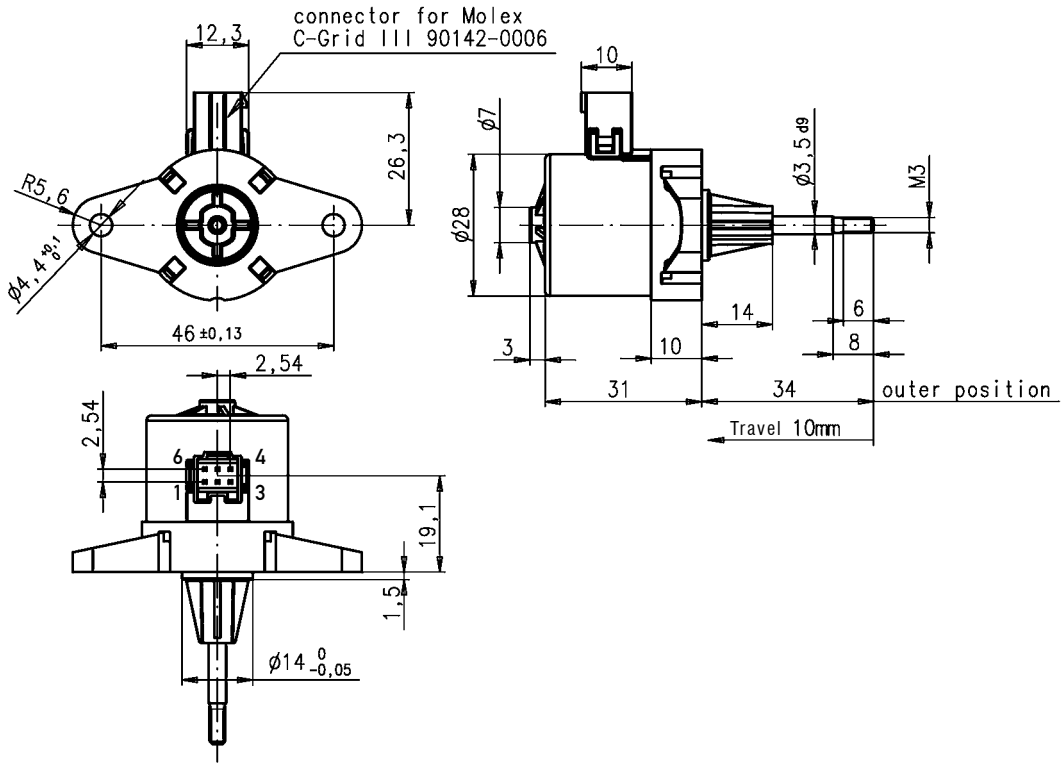
unipolar



	0	I	II	III	IV
1	-	-			-
2	+	+	+	+	+
3			-	-	
4		-	-		
5	+	+	+	+	+
6	-			-	-



Dimensions Version with connector D, 10 mm travel



## UBL1/2

Dimensions (mm)	∅ 36 x 36
Travel (mm)	8: 13: 56 ± 0.7
Travel per step (mm)	0.041
Thread pitch (mm)	0.8
Speed (mm/s) at 200 Hz	8.33
Step angle (°)	15
Max. Force (N)*	35 (for special winding, lower lifetime)
Lifetime	on request



\*Depends on winding, frequency and lifetime required.  
Drive against end stops only permissible after clarification of operating conditions and approval by Saia-Burgess.

## Standard Data

Climatic class	wide-spread according to DIN IEC 60721-2-1
Ambient temperature operation	°C -15...+60
Ambient temperature storage	°C -20...+100
Thermal resistance at f=0 R <sub>therm</sub>	27 K/W
Thermal class	A according to DIN EN 60085
Approval	standard
Mounting	any position
Electrical connection	jack connector
Protection	IP 40 according to DIN EN 60529
Weight	90 g
Rotor stalling	motor can be stopped when voltage is applied, without being overheated
Bearings	ball bearing, for live lubricated
Electric strength	according to DIN EN 60034-1/DIN EN 60335-1

## Order Reference

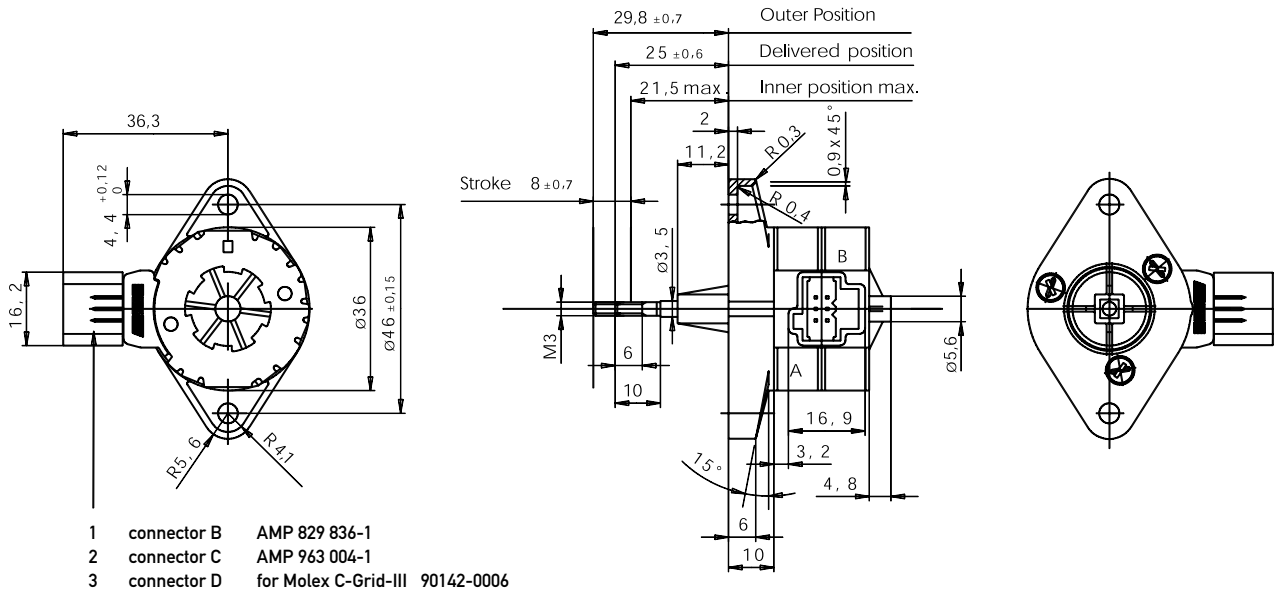
Type	Stepper Motor	UBL	13	N	100	B	3C
Configuration	13 bipolar 23 unipolar						
Approval	N Approval Standard						
Resistance	See next page Resistance per winding for bipolar or unipolar.						
Connection	Jack connector 6 pin (other on request)						
Shaft	3C Travel 8 mm ± 0.7 mm / Tr. 3.7 x 1 (other on request)						



## Technical Data

bipolar (UBL1)	Rated voltage $U_N$	V	6	12	24
	Resistance per winding $R_{20}$	$\Omega$	18,5	100	460
unipolar (UBL2)	Rated voltage $U_N$	V	6	12	24
	Resistance per winding $R_{20}$	$\Omega$	28	120	500
Steps per revolution			24		
Steps per mm			30/24		
Winding temperature $T_{max}$			105° C		
Duty cycle			100%		
Linear travel max.			8; 13; 56 ± 0.7		
Axial play at ± 20 N force			< 0.25 mm		
Axial force at 200 Hz $F_A$			10 N		

## Dimensions



## U0 Linear actuator (LA5021ST)

Dimensions (mm)	∅ 50 x 76
Travel (mm)	45–50
Travel per step (mm)	0.031/0.047/0.063
Thread pitch (mm)	1.5/1.5/1.5
Speed (mm/s) at 200 Hz	6.25/9.37/12.5
Step angle (°)	7.5/11.25/15
Max. Force (N)*	45–50



\*Depends on winding, frequency and lifetime required.  
Drive against end stops only permissible after clarification of operating conditions and approval by Saia-Burgess.

## Standard Data

Climatic class	wide-spread according to DIN IEC 60721-2-1
Ambient temperature operation	°C -15 ... +40
Ambient temperature storage	°C -20 ... +105
Thermal resistance at f=0 R <sub>therm</sub>	K/W 20
Thermal class	A according to DIN EN 60085
Approval	standard
Mounting	any position
Electrical connection	cable
Protection	IP 40 according to DIN EN 60529
Weight	~220 g
Rotor stalling	motor can be stopped when voltage is applied, without being overheated
Bearings	ball bearing
Electric strength	According to DIN EN 60034-1/DIN EN 60335-1

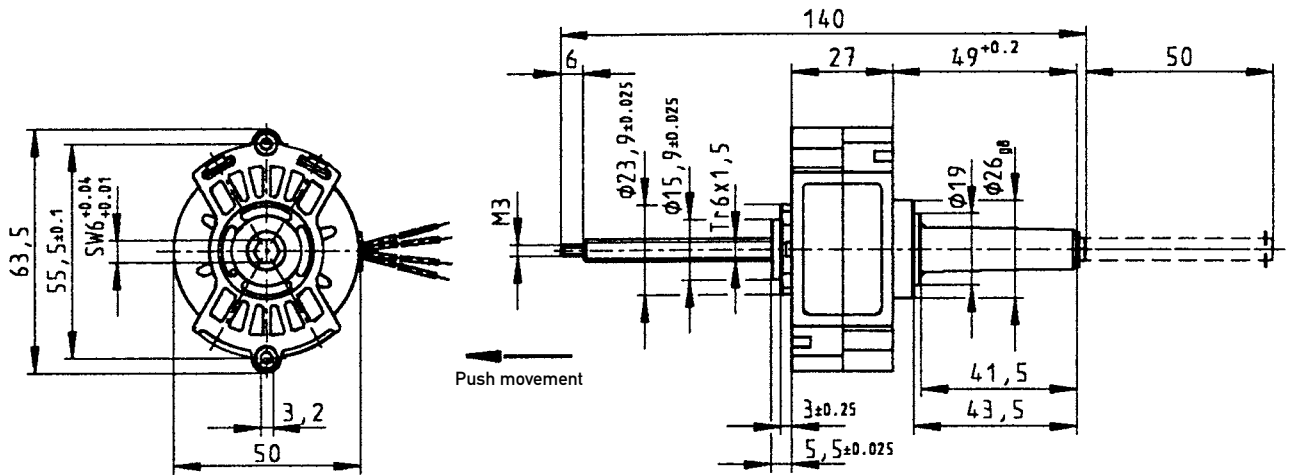
## Order Reference

Type	Stepper Motor	LA5021ST	7 Ω	0.031 mm	50 mm
Resistance	7 Ω				
Travel per step	0.031 mm 0.047 mm 0.063 mm				
Travel	50 mm				

## Technical Data

bipolar	Rated voltage $U_N$ :	V	4 (Chopper drive)		
	Resistance per winding $R_{20}$	$\Omega$	7		
	Step angle	$^\circ$	7.5	11.25	15
	Travel per step	mm	0.031	0.047	0.063
	Steps per mm		32	21	16
	Winding temperature $T_{max}$	$^\circ C$	130		
	Duty cycle		100%		
	Linear travel max.	mm	50		
	Axial play at 20 N force	mm	<0.25		

## Dimensions



Standard - wire length: 100<sup>+20</sup> mm/6<sup>±1</sup> stripped

## U0 Spindle actuator (SP5022ST)

Dimensions (mm)	∅ 50 x 27
Travel (mm)	68–130
Travel per step (mm)	0.031/0.047/0.063
Thread pitch (mm)	1.5/1.5/1.5
Speed (mm/s) at 200 Hz	6.25/9.37/12.5
Step angle (°)	7.5/11.25/15
Max. Force (N)*	50–70



\*Depends on winding, frequency and lifetime required.  
Drive against end stops only permissible after clarification of operating conditions and approval by Saia-Burgess.

### Standard Data

Climatic class	wide-spread according to DIN IEC 60721-2-1
Ambient temperature operation	°C -15 ... +40
Ambient temperature storage	°C -20 ... +105
Thermal resistance at f=0 R <sub>therm</sub>	K/W 20
Thermal class	A according to DIN EN 60085
Approval	standard
Mounting	any position
Electrical connection	cable
Protection	IP 40 according to DIN EN 60529
Weight	~220 g
Rotor stalling	motor can be stopped when voltage is applied, without being overheated
Bearings	ball bearing
Electric strength	According to DIN EN 60034-1/DIN EN 60335-1

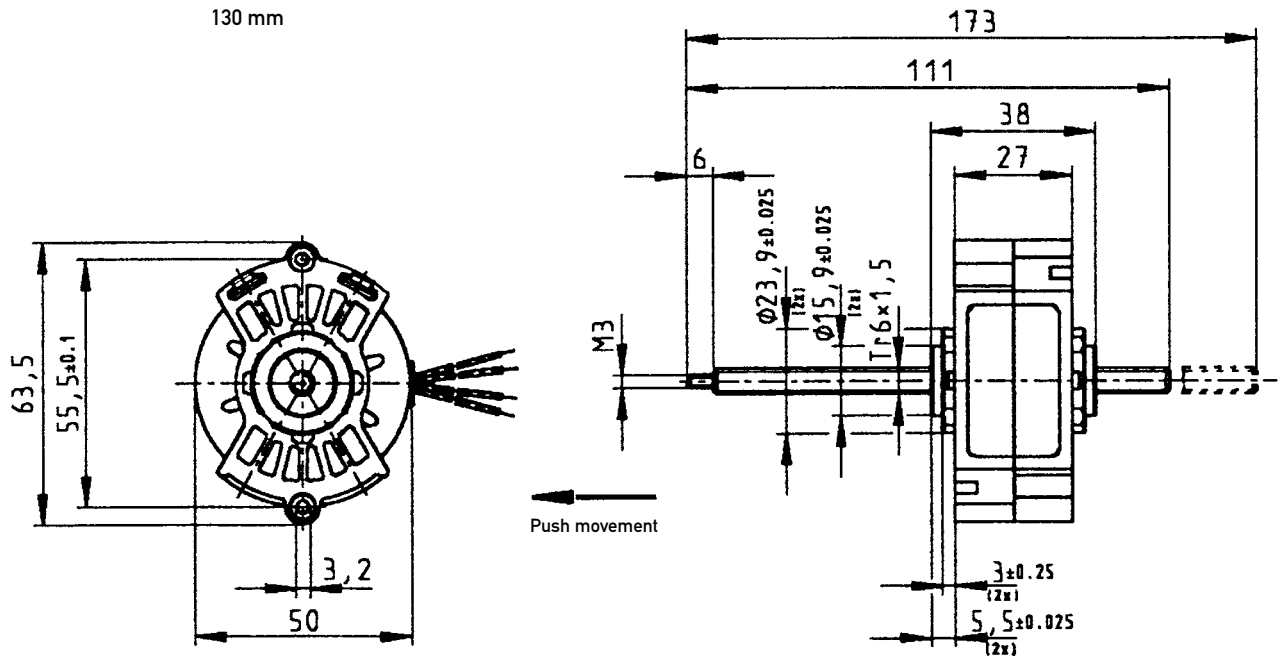
### Order Reference

Type	Stepper Motor	SP5022ST	7 Ω	0.031 mm	68 mm
Resistance	7 Ω				
Travel per step	0.031 mm 0.047 mm 0.063 mm				
Travel	68 mm 130 mm				

## Technical Data

bipolar	Rated voltage $U_N$ :	V	4 (Chopper drive)		
	Resistance per winding $R_{20}$	$\Omega$	7		
	Step angle	$^\circ$	7.5	11.25	15
	Travel per step	mm	0.031	0.047	0.063
	Steps per mm		32	21	16
	Winding temperature $T_{max}$	$^\circ C$	130		
	Travel	mm	-68/+130		
	Positioning accuracy (incl. axial play)	mm	$\pm 0.15$		
	Static axial force	N	max. 50		
	Self-locking by spindle/nut system		yes		
	Drive		not stall-proof		
	Anti-rotation guidance of spindle		external required		

Dimensions Version with Travel 68 mm  
130 mm



Standard - wire length:  $100^{+20}$  mm/ $6^{\pm 1}$  stripped

# UAL Ø20 mm Stepper Motors

## UAL 1/5

Dimensions (mm) Ø 20 x 30

Travel (mm) 15

Travel per Step (mm) 0.021

Thread Pitch (mm) 0.5

Speed 4.16 @ 200 Hz (mm/s)

Step Angle\* 15

Max. Force (N)\* 11



Linear

\* Performance depends on coil winding, frequency and life time requirement. Drive against end stop is not permitted. Please contact us for application support.

## Standard Data

Climatic class	wide-spread according to DIN IEC 60721-2-1: 1992
Ambient temperature operation	°C -15...+60
Ambient temperature storage	°C -20...+100
Thermal resistance at f=0 R <sub>therm</sub>	29 K/W
Thermal class	C according to DIN EN 60085
Approval	standard
Mounting	any position
Electrical connection	lead wire with CT connector
Protection	IP 40 according to DIN EN 60529
Weight	33 g
Rotor stalling	allowed
Bearing system	ball bearing

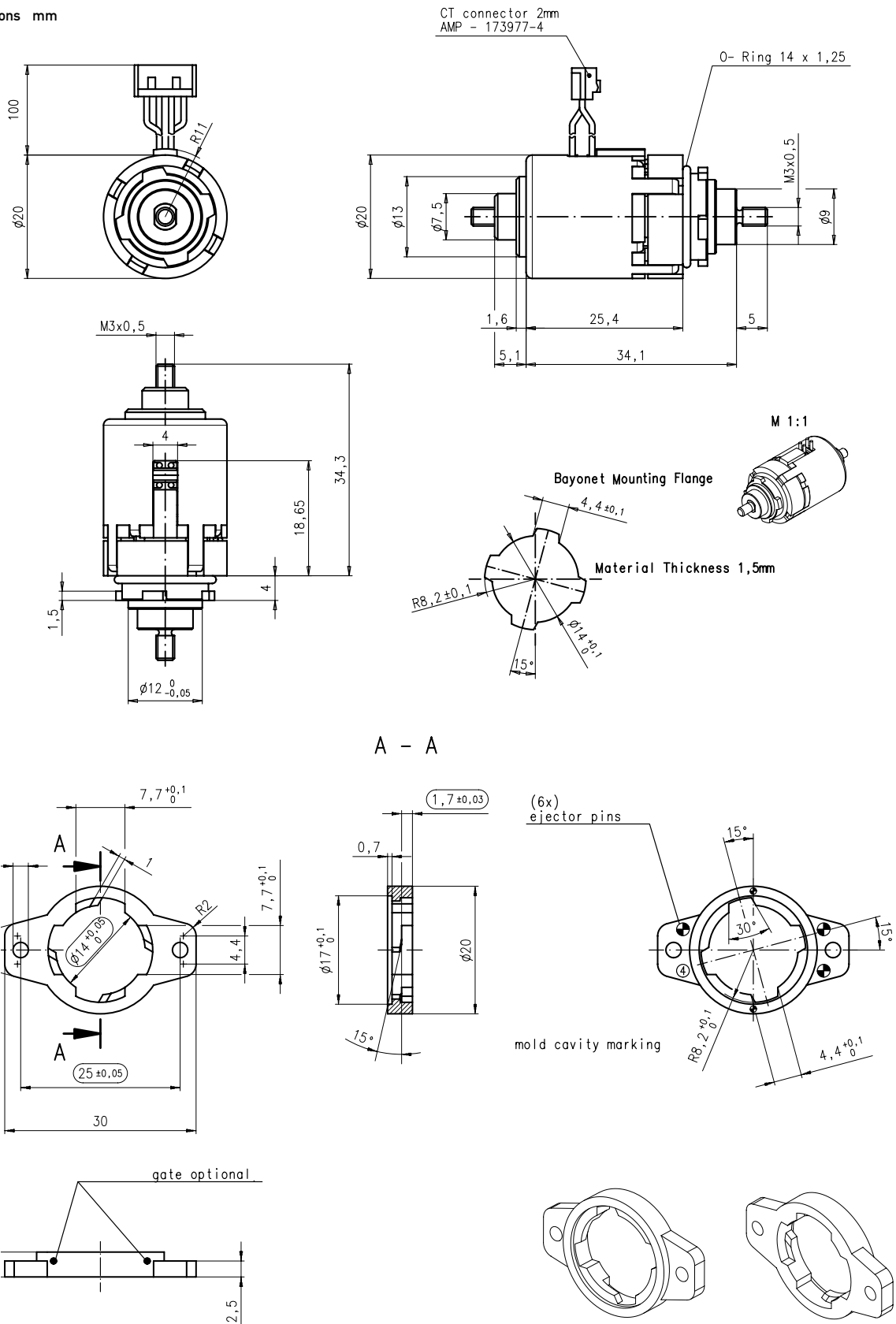
## Technical Data

Bipolar		UAL 1	UAL 1	UAL 5	UAL 5
Max. push/pull force*					
25% Duty Cycle	N	—	—	28	23
100% Duty Cycle	N	11	9	—	—
Rated voltage U <sub>N</sub>	V	6	12	24	
Resistance per winding R <sub>20</sub>	Ω	40	150	610	
Steps per mm		48			
Duty Cycle		100%			
Winding temperature T <sub>Max</sub>	°C	130			
Linear travel max.	mm	15			
Axial play @20N force	mm	0.25			
Unipolar	Unipolar versions available upon request.				

# UAL Stepper Motors

## Technical Data

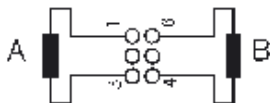
Dimensions mm



# UAL Stepper Motors

## Technical Data

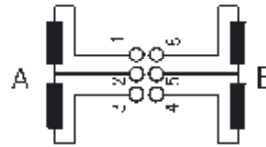
Circuit Diagram **Bipolar**



	0	I	II	III	IV
1	+	+	-	-	+
3	-	-	+	+	-
4	-	+	+	-	-
6	+	-	-	+	+



**Unipolar**



	0	I	II	III	IV
1	-	-	-	-	-
2	+	+	+	-	+
3			-	-	
4		-	-		
5	+	+	+	-	+
6	-			-	-



Dimensions mm

## Order Reference

Type	Stepper Motor	UAL	13	N	150 (Ω)	E	1B
Configuration	13 bipolar, standard magnet 53 bipolar, stronger magnet						
Approval	N Approval Standard						
Resistance	Resistance per winding (see previous page)						
Connection	C 100 mm lead wire with CT connector						
Shaft	1B Travel 15 mm ±0.7 mm (others upon request)						



# Linear Stepper Motors

## Introducing: Advanced Performance Saia® ULE Series Linear Stepper Motors

### Features and Benefits

- Constant positioning force over full travel
- Compact design envelope
- NEMA 23 mounting flange
- Flexible design to accommodate many custom requirements

### Functional Advantages

- Unipolar or bipolar
- Position force to 400 N
- Strokes to 300 mm
- Flexible mounting

### Markets/Applications

- Valve controls
- Positioning and adjustment systems
- Handling systems for the automation industry



### Technical Data\*

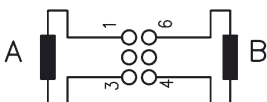
General Performance/ Mechanical Data	Dimensions	mm	Ø55 x 55
	Linear Travel Max	mm	Up to 300 (longer travels available upon request)
	Linear Travel Standard	mm	10
	Travel per Step	mm	0.031
	Thread Pitch	mm	1.5
	Speed	mm/s	6.25 @ 200 Hz
	Step Angle**	°	7.5
	Steps per mm		32
	Bearing System		ball bearing
	Duty Cycle		25% ... 100%
	Max. Force**	N	400
	Axial Play @ 20 N Force		0.3
	Max. Push/Pull Force*		
	25% Duty Cycle	N	400
100% Duty Cycle	N	205	
Electrical	Rated Voltage $U_N$	V	24
	Resistance per Winding $R_{20}$ ULE 1	$\Omega$	100
	Winding Temperature $T_{Max}$	°C	155
	Thermal Resistance at $f=0$ $R_{therm}$	K/W	8.7
Electrical Connection		lead wire (connectors available upon request)	

\*Data based on Bipolar models. Unipolar versions available upon request.

\*\* Performance depends on coil winding, frequency and life time requirement.

### Circuit Diagram

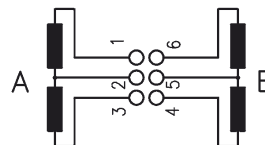
Bipolar



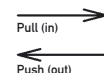
	0	I	II	III	IV
1	+	+	-	-	+
3	-	-	+	+	-
4	-	+	+	-	-
6	+	-	-	+	+



Unipolar

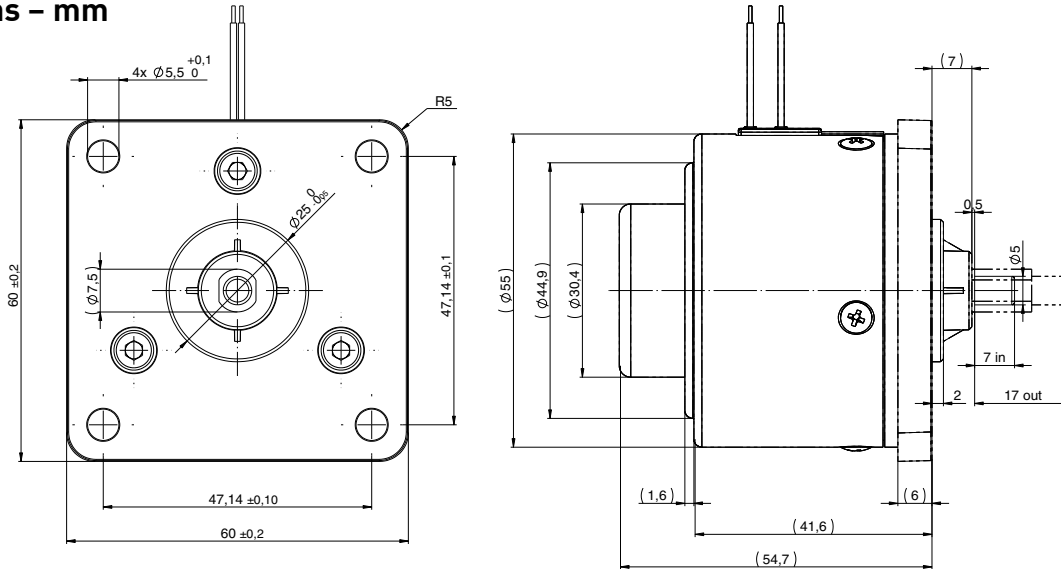


	0	I	II	III	IV
1	-	-			-
2	+	+	+	+	+
3			-	-	
4		-	-		
5	+	+	+	+	+
6	-			-	-



# ULE Series Linear Stepper Motors

## Dimensions – mm



## Order Reference

Type	ULE Stepper Motor	Example:	ULE	13	N	100	N	1A
Configuration	13 Bipolar, standard magnet							
Approval	N Approval Standard							
Resistance	Resistance per winding ( $\Omega$ ) (see previous page)							
Connection	N 150 mm lead wire (connectors available upon request)							
Shaft	1A Travel 10 mm $\pm$ 0.7 mm (others upon request)							

## Other Saia® Linear Stepper Solutions...

In addition to the new 20 mm diameter UAL, the Saia® motor brand linear stepper family includes models from 28 to 55 mm in diameter. Among these are stepper motor drives with integral electronic end stop detection.

Combining the proven 28 mm UCL unipolar linear stepper motor with control electronics mounted directly on the motor, the integral solution UCL offers a three-wire interface for 24 V supply voltage, ground and a control input.

The integral UCL stepper and control electronics package provides enormous advantages compared with conventional two part motor solutions. The automatic end stop detection eliminates noise, reduces mechanical stress, compensates for traverse distance tolerances and increases operating life. The drive produces positioning forces of up to 50 N, positioning speeds between 2 and 20 mm/sec, and positioning distances up to 50 mm.

Optionally the drive can be used as an open-close actuator with a switching contact as a control signal or as a continuously operating adjustment drive. In this configuration, the position set point can be a pulse width modulated (PWM) signal or a control voltage between 0-10 volts.

UCL linear stepper with integral electronic end stop detection.



**saia**

801 Scholz Drive  
Vandalia, OH 45377  
T +1 937 454 2345  
F +1 937 898 8624  
www.saia-motor-usa.com

**JOHNSON  
ELECTRIC**

innovating motion