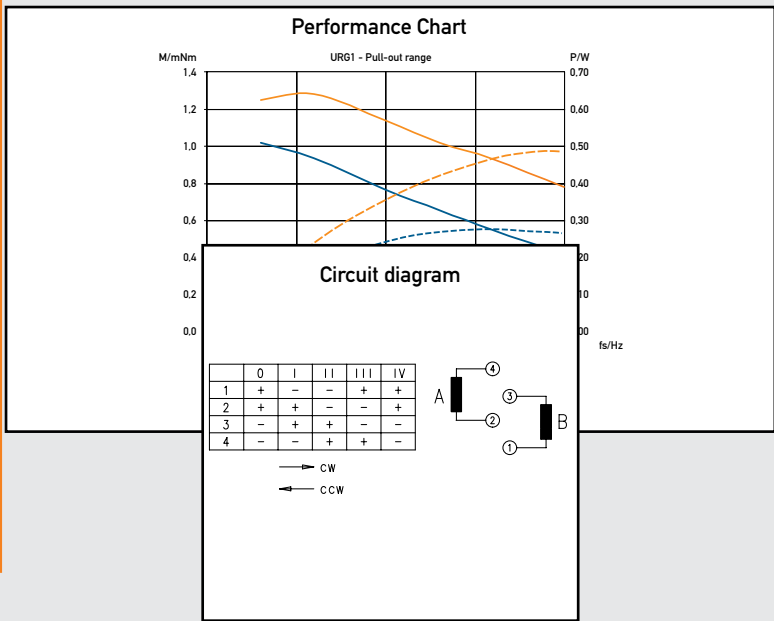


Stepper Motors



URG



Dimensions (mm)	∅ 13 x 11
Step angle (°)	18
Holding torque* (mNm)	2.0
Detent torque (mNm)	0,3
Winding	bipolar
Gear combination	—

* winding for duty cycle 30 %, standard magnet

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 _{therm}	83 K/W
Thermal class	B according to DIN EN 60085
Approval	standard
Mounting	any position
Electrical connection	Pin, optional flex print
Protection	IP 40 according to DIN EN 60529
Weight	7 g
Rotor stalling	motor can be stopped when voltage is applied, without being overheated
Bearings	integrated high temperature plastic bearing

Order Reference

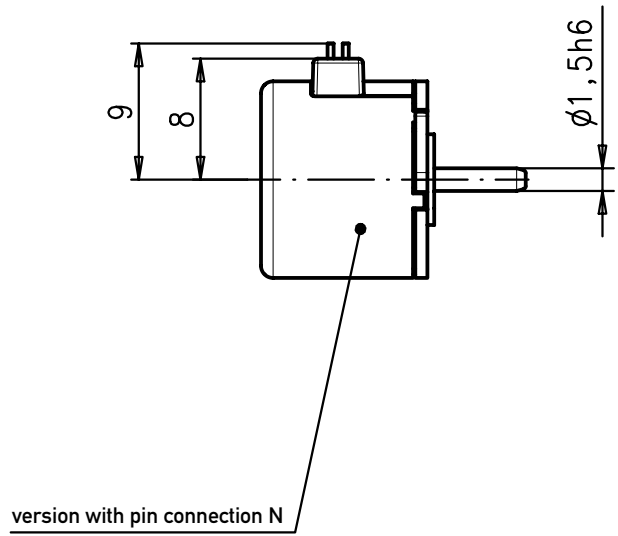
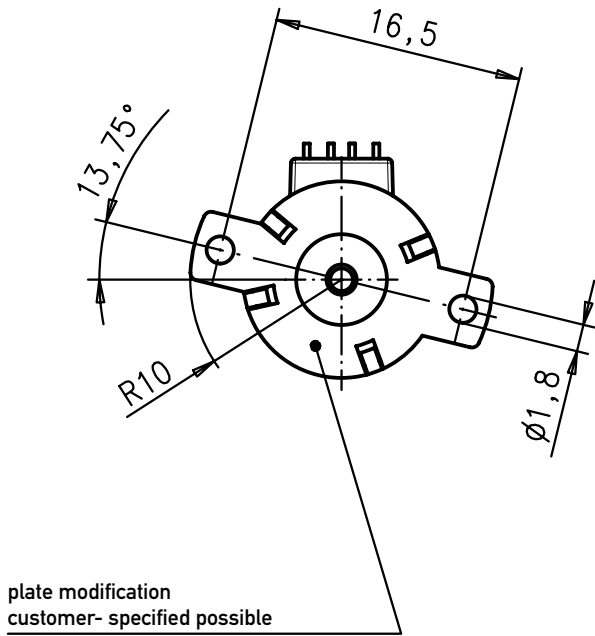
Type	Stepper Motor	URG	1E	N	6 Ω	R	C
Configuration	1E	bipolar, standard magnet					
Approval	N						
Resistance	see next page						
Direction	R	reversible					
Connector	N	Pin					
	C	flex print					

This motor type doesn't fulfil basis insulation requirements of EN 60535-1: 2004
Customer application must realize a suitable protection class.

Technical Data

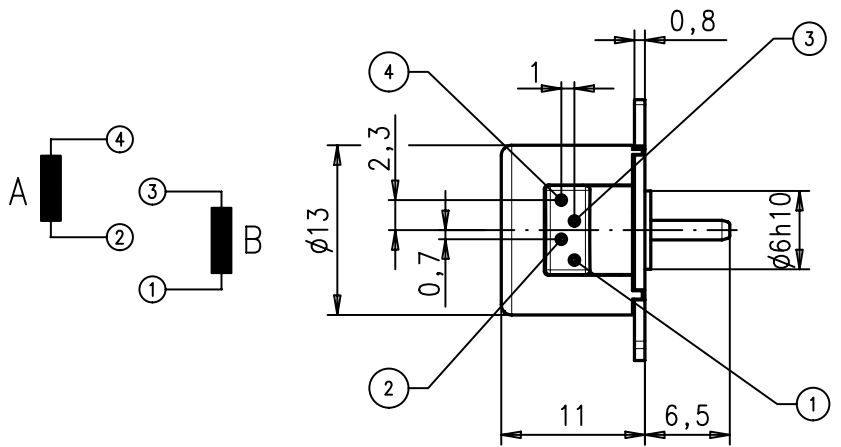
bipolar	Rated voltage U_N	V	3	6	12
	Resistance per winding R_{20}	Ω	6	26	102
	Holding torque M_H	mNm	2.5		
	Detent torque M_S	mNm	0.3		
	Rotor inertia J_R	gcm ²	0.033		
	Steps per revolution		20		
	Duty cycle		30 %		
	Direction of rotation		reversible		

Dimensions



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

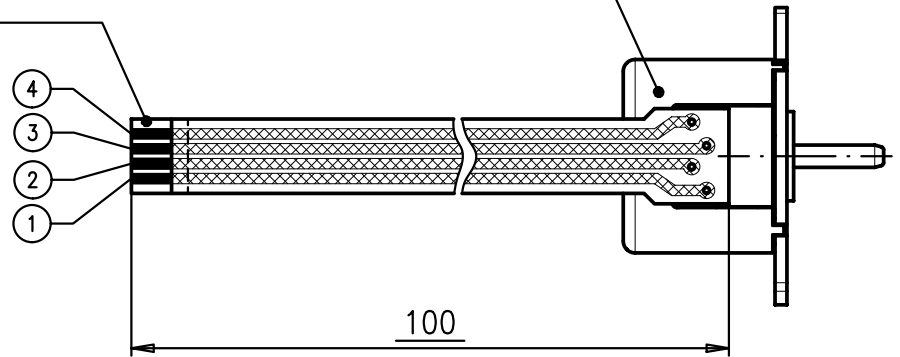
→ clockwise rotation
← counter clockwise rotation



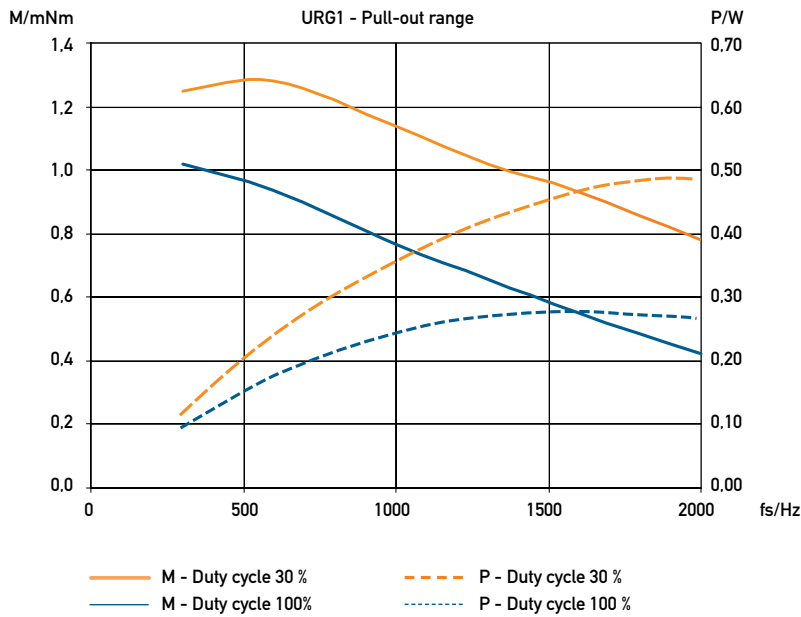
Dimensions

recommended FPC layout for flex print connector 1 mm

version with flex print circuit C



Performance Chart



UAG1/2

UAG1/2

Dimensions (mm)	∅ 20 x 17,2
Step angle (°)	18
Holding torque (cNm)	0,7 / 0,5
Detent torque (cNm)	0,14
Winding	bipolar/unipolar
Gear combination	on request



Rotational

Standard Data

Climatic class	wide-spread according to DIN IEC 60721-2-1
Ambient temperature operation	°C -40...+60
Ambient temperature storage	°C -40...+100
Thermal resistance at f=0 R _{therm}	50 K/W
Thermal class	B according to DIN EN 60085
Approval	standard
Mounting	any position
Electrical connection	insulation displacement connection, pins, lead wires
Protection	IP 40 according to DIN EN 60529
Weight	25 g
Rotor stalling	motor can be stopped when voltage is applied, without being overheated
Bearings	sintered bronze, self-lubricating

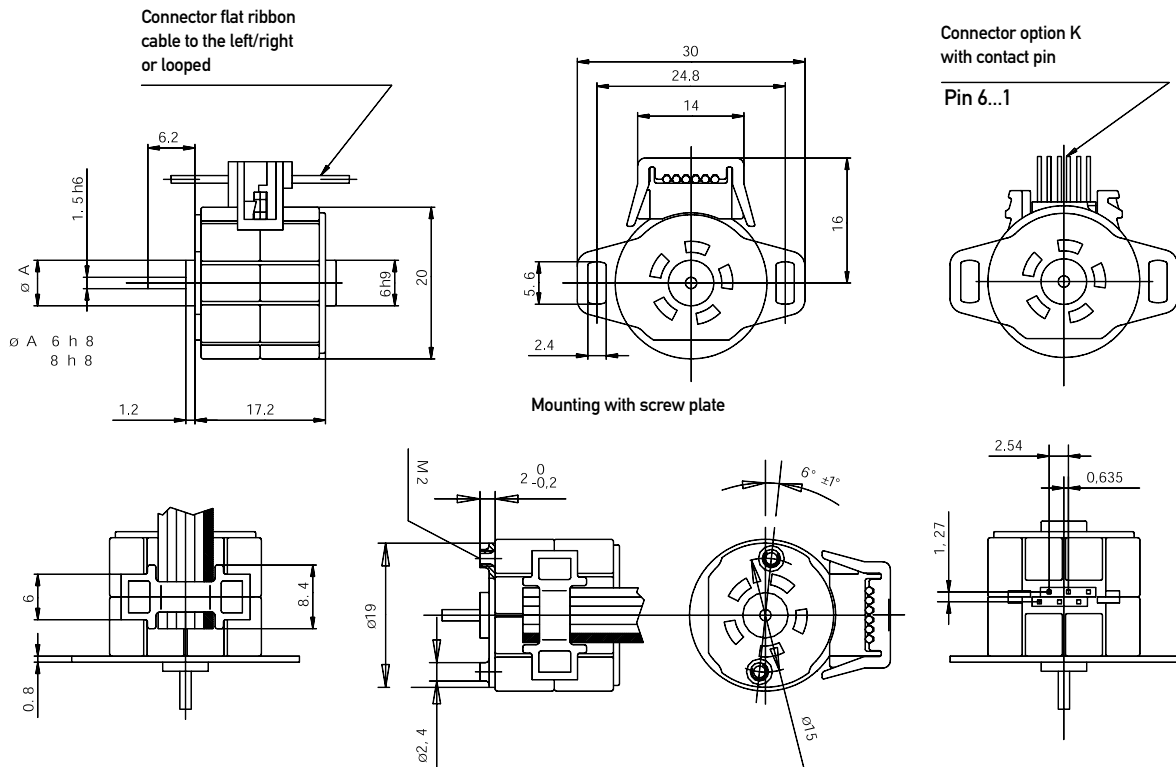
Order Reference

Type	Stepper Motor	UAG	1	0	N	27 (Ω)	R	E
Configuration	1 bipolar 2 unipolar							
Rotor shaft, mounting	0 centring 8 mm, mounting plate with screw M2 3 centring 8 mm, mounting plate with long holes A centring 6 mm, mounting plate with screw M2 E centring 6 mm, mounting plate with long holes							
Approval	N Approval Standard							
Resistance	See next page Resistance per winding for bipolar or unipolar.							
Direction	reversible							
Cable	E Lead wires 150 mm with plug AMP MicroMatch 0-215083-6 (other on request)							

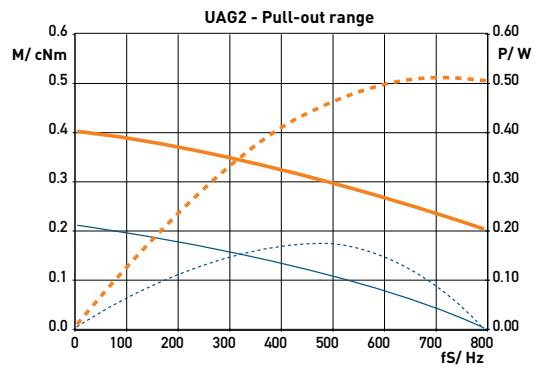
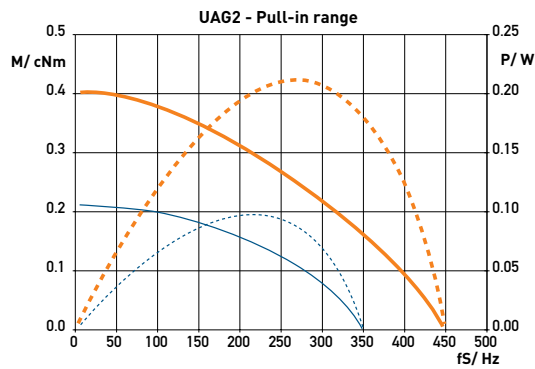
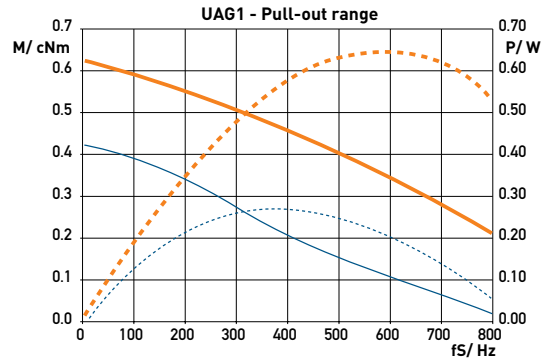
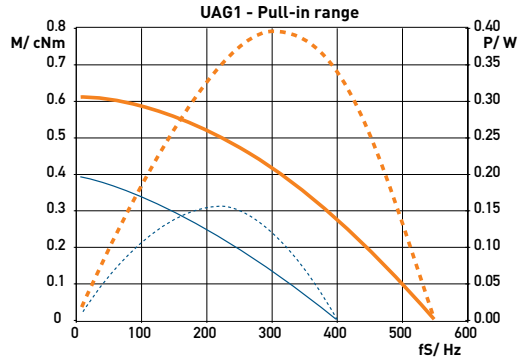
Technical Data

UAG1/2		bipolar (UAG1)	Rated voltage U_N	V	6	12	24
		Resistance per winding		R_{20}	27	150	675
		unipolar (UAG2)	Rated voltage U_N	V	6	12	24
		Resistance per winding R_{20}		Ω		35	170
		Steps per revolution			700		
		Duty cycle			100%		
		Winding temperature T_{max}			130° C		
		Rotor inertia J_R			0.31 gcm ²		
		Holding torque M_H			0.7 cNm (UAG1) 0.5 cNm (UAG2)		
		Detent torque M_D			0.14 cNm		
		Direction of rotation			reversible		

Dimensions



Performance Chart



— M - Duty cycle 30 %
— M - Duty cycle 100%

- - - P - Duty cycle 30 %
- - - P - Duty cycle 100 %

UAG3/4

UAG3/4

Dimensions (mm) $\varnothing 20 \times 17$

Step angle (°) 18

Holding torque (mNm) 5,6 / 4,2

Detent torque (mNm) > 0,6

Winding bipolar/unipolar

Gear combination on request



Standard Data

Climatic class	wide-spread according to DIN IEC 60721-2-1
Ambient temperature operation	°C -20...+60
Ambient temperature storage	°C -40...+100
Thermal resistance at f=0 R _{therm}	47 K/W
Thermal class	B according to DIN EN 60085
Approval	standard
Mounting	any position
Electrical connection	cable
Protection	IP 40 according to DIN EN 60529
Weight	22 g
Rotor stalling	motor can be stopped when voltage is applied, without being overheated
Bearings	sintered bronze, self-lubricating

Order Reference

Type	Stepper Motor	UAG	3	3	N	150 (Ω)	Ω	R	E
Configuration	3 bipolar 4 unipolar								
Rotor shaft, mounting	3 centring 8 mm, mounting plate with long holes 5 centring 8 mm, mounting plate (for clipping) E centring 6 mm, mounting plate with long holes G centring 6 mm, mounting plate (for clipping)								
Approval	N Approval Standard								
Resistance	See next page Resistance per winding for bipolar or unipolar.								
Direction	reversible								
Cable	E cable 150 mm with Tyco connector CT 173977-4 1-6 (other on request)								

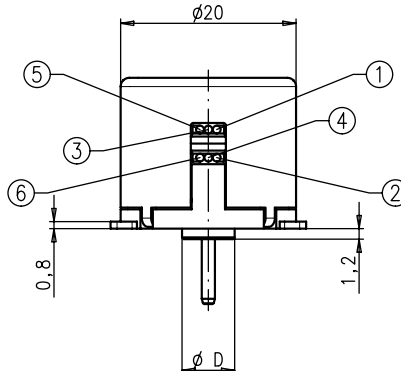
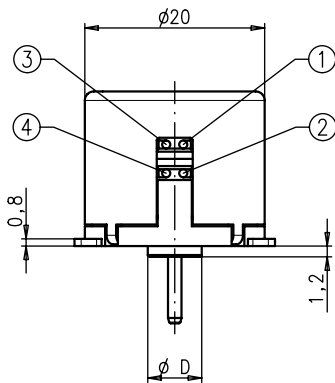
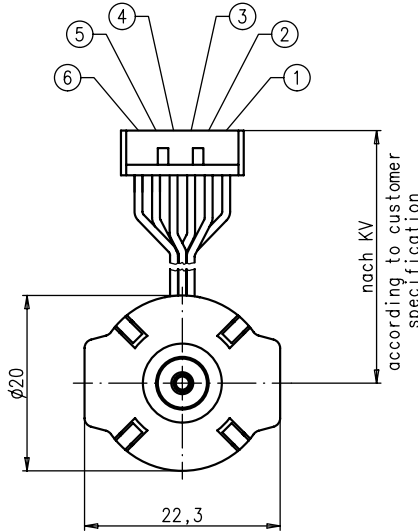
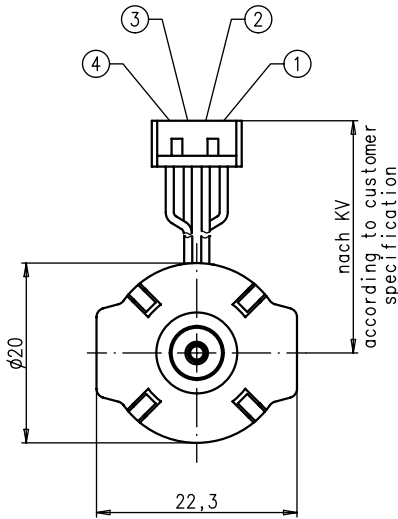
Technical Data

bipolar (UAG3)	Rated voltage U_N	V	12
	Resistance per winding R_{20}	Ω	150
unipolar (UAG4)	Rated voltage U_N	V	12
	Resistance per winding R_{20}	Ω	150
Steps per revolution		20	
Duty cycle		100%	
Winding temperature T_{max}		130° C	
Rotor inertia J_R		0,26 gcm ²	
Holding torque M_H		0,56 cNm (UAG3) 0,42 cNm (UAG4)	
Detent torque M_H		> 0,6 mNm	
Direction of rotation		reversible	

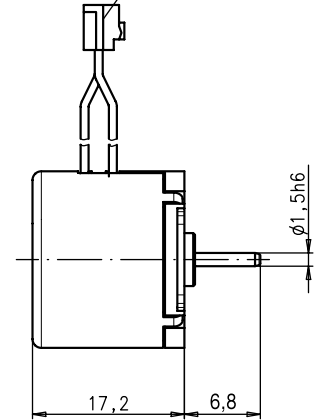
Dimensions

motortype	$\varnothing D$
UAG33	$\varnothing 8 \text{ } 0_{-0,05}$
UAG3E	$\varnothing 6 \text{ } 0_{-0,05}$

motortype	$\varnothing D$
UAG43	$\varnothing 8 \text{ } 0_{-0,05}$
UAG4E	$\varnothing 6 \text{ } 0_{-0,05}$



CT connector 2mm
AMP - 173977-4 (bipolar)
AMP - 173977-6 (unipolar)



bipolar

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

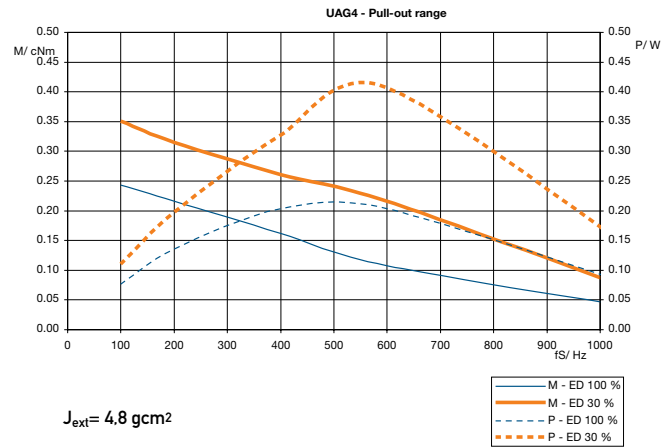
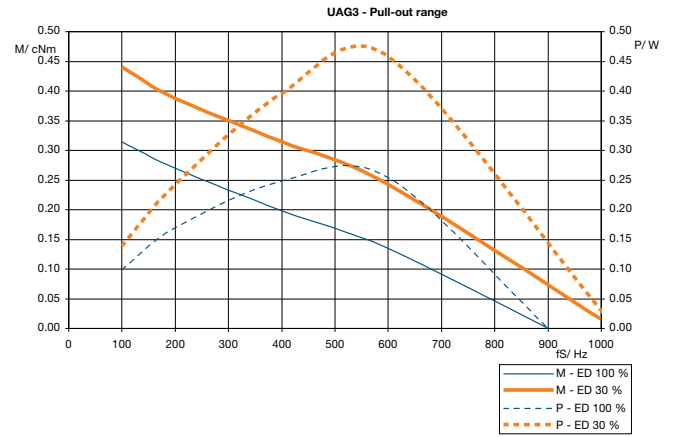
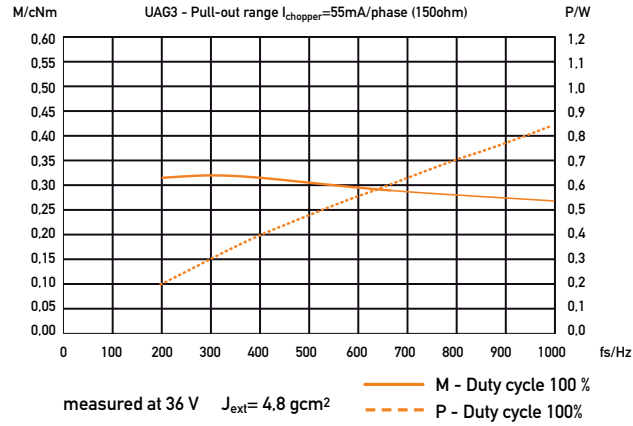
→ clockwise rotation
← counter clockwise rotation

unipolar

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

→ clockwise rotation
← counter clockwise rotation

Performance Chart



UCD1/7; UCD2/8

Dimensions (mm)	∅ 28 x 24
Step angle (°)	7.5
Holding torque* (cNm)	1.6–2.7
Detent torque (cNm)	0.26–0.42
Winding	bipolar/unipolar
Gear combination	on request



* values for lead wire version (connection N) / connector versions up to 15 % higher

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 _{therm}	29 K/W
Thermal class	B according to DIN EN 60085
Approval	standard
Mounting	any position
Electrical connection	connector type D or N
Protection	IP 30 according to DIN EN 60529
Weight	54 g
Rotor stalling	motor can be stopped when voltage is applied, without being overheated
Bearings	Sintered bronze, self-lubricating

Order Reference

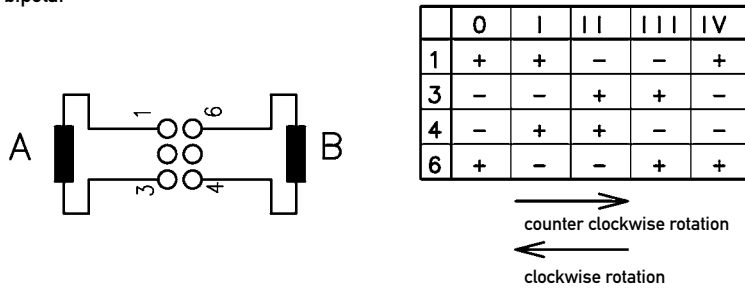
Type	Stepper Motor		UCD	1	0	N	24 Ω	R	B
Configuration	1	bipolar, standard magnet	7	bipolar, stronger magnet					
	2	unipolar, standard magnet	8	unipolar, stronger magnet					
Rotor shaft, mounting	3	centring 8 mm, shaft 2.0 mm, screw plate	E	centring 10 mm, shaft 2.0 mm, screw plate					
	4	centring 8 mm, shaft 1.5 mm, screw plate	K	centring 10 mm, shaft 1.5 mm, screw plate					
	0	centring 8 mm, shaft 2.0 mm, clip	A	centring 10 mm, shaft 2.0 mm, clip					
	1	centring 8 mm, shaft 1.5 mm, clip	C	centring 10 mm, shaft 1.5 mm, clip					
Approval	N	Approval Standard							
Resistance	see next pages; Resistance per winding for bipolar or unipolar								
Direction	R	reversible							
Connection	D	see next pages „Connection Types“							
	N								

Technical Data

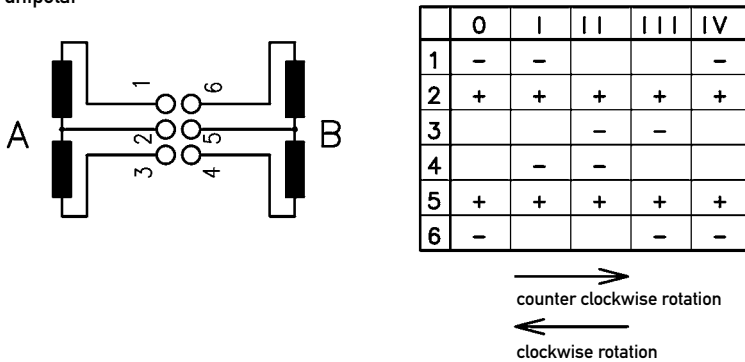
bipolar		UCD1		UCD5	
Holding torque M_H *	cNm	2		2.7	
Detent torque M_S	cNm	0.26		0.42	
Rotor inertia J_R	gcm ²	2.2		2.4	
Rated voltage U_N	V	6	12	24	
Resistance per winding R_{20}	Ω	24	90	380	
Steps per revolution		48			
Duty cycle		100%			
Direction of rotation	V	reversible			
unipolar		UCD2		UCD6	
Holding torque M_H	cNm	1.6		2.3	
Detent torque M_S	cNm	0.26		0.42	
Rotor inertia J_R	gcm ²	2.2		2.4	
Rated voltage U_N	V	3	6	24	
Resistance per winding R_{20}	Ω	24	90	380	
Steps per revolution		48			
Duty cycle		100%			
Direction of rotation	V	reversible			

* values for lead wire version (connection N) / connector versions up to 15 % higher

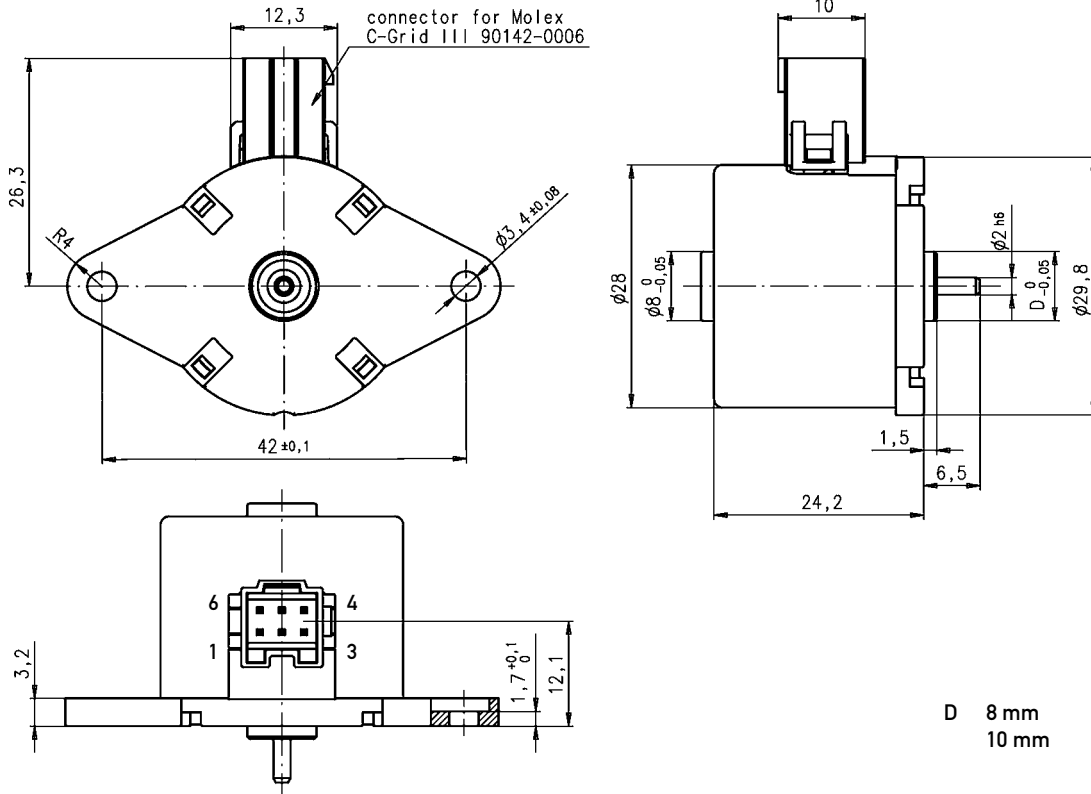
Circuit diagram bipolar



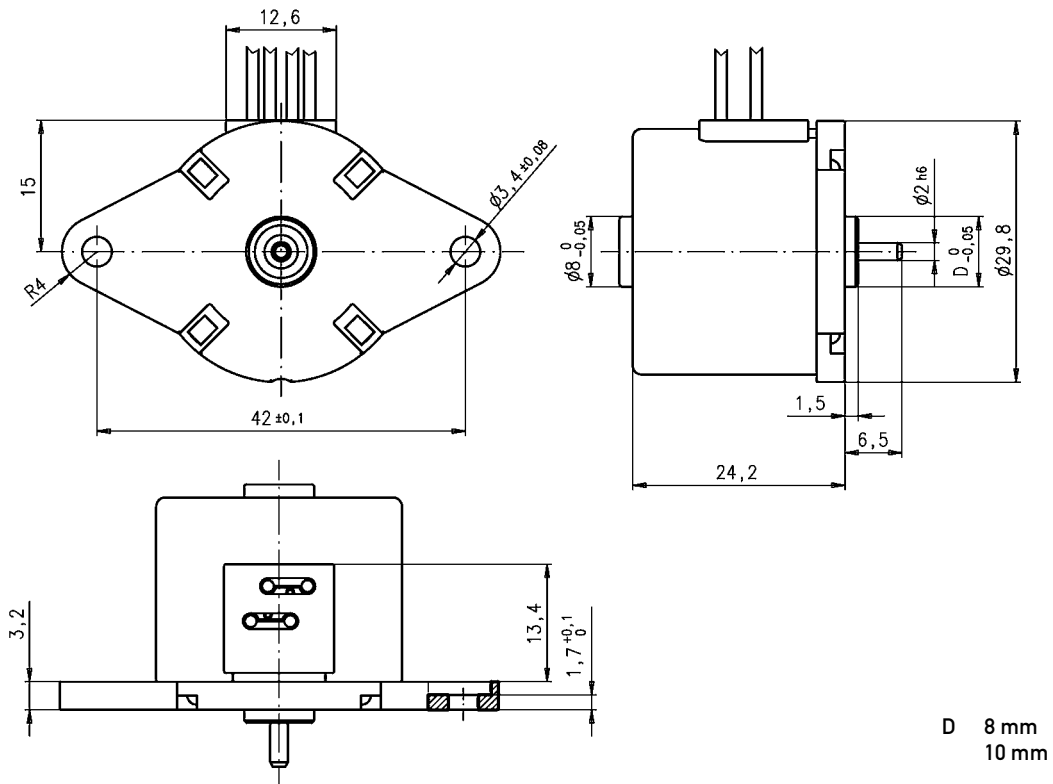
Circuit diagram unipolar



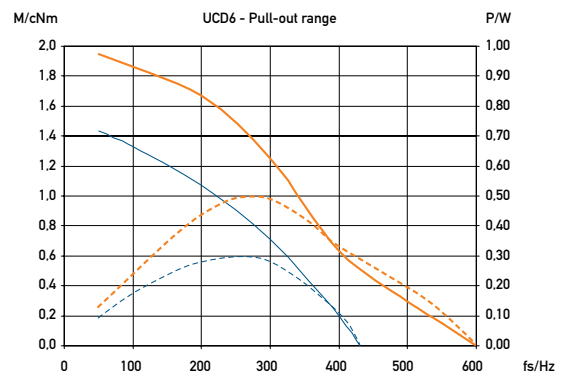
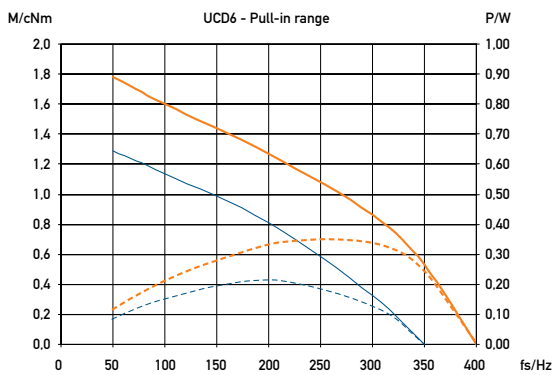
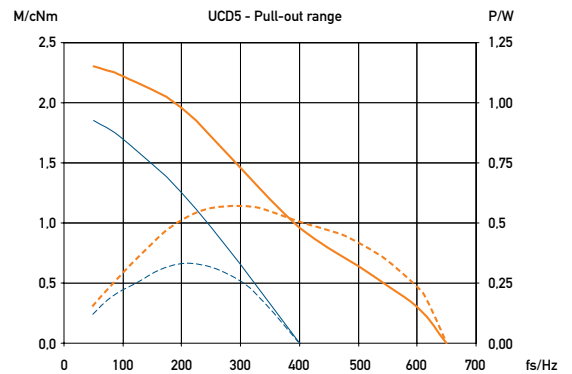
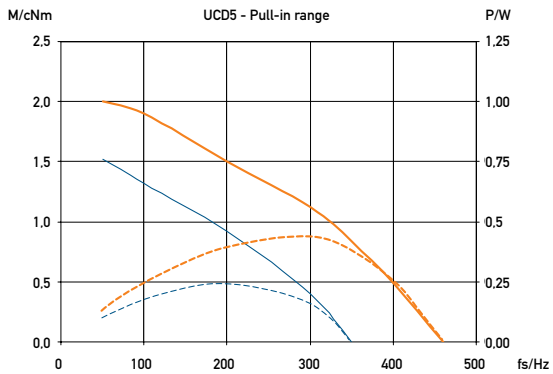
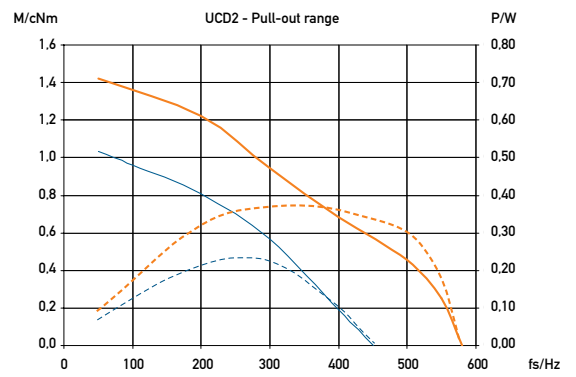
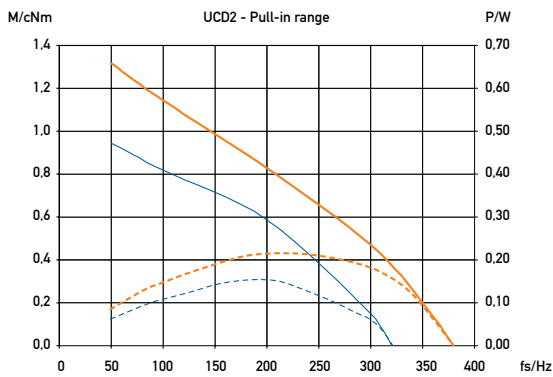
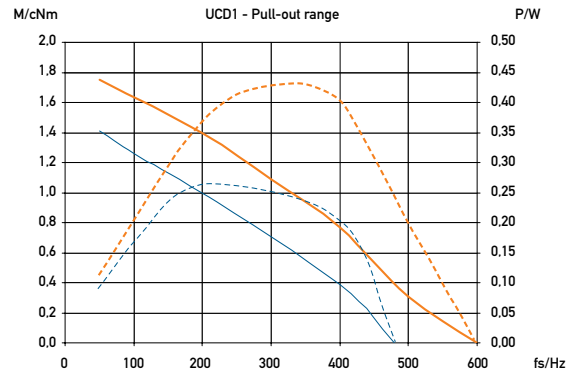
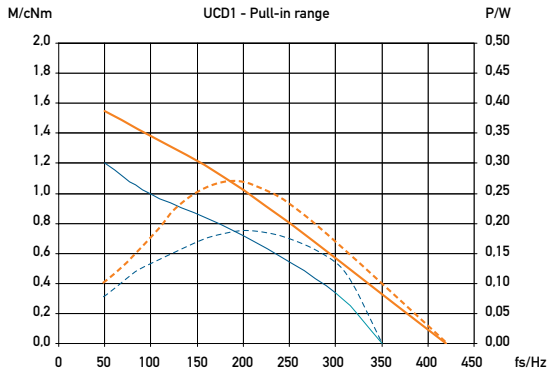
Dimensions Version with Connector D



Version with Connector N



Performance Chart

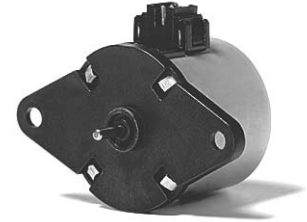


— M - Duty cycle 30 %
 - - - M - Duty cycle 100 %

— P - Duty cycle 30 %
 - - - P - Duty cycle 100 %

UCB1/7; UCB2/8

Dimensions (mm)	∅ 28 x 24
Step angle (°)	15
Holding torque * (cNm)	1.3–2.3
Detent torque (cNm)	0.29
Winding	bipolar/unipolar
Gear combination	on request



* values for lead wire version (connection N) / connector versions up to 15 % higher

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 _{therm}	29 K/W
Thermal class	B according to DIN EN 60085
Approval	standard
Mounting	any position
Electrical connection	connector type D or N
Protection	IP 30 according to DIN EN 60529
Weight	54 g
Rotor stalling	motor can be stopped when voltage is applied, without being overheated
Bearings	Sintered bronze, self- lubricating

Order Reference

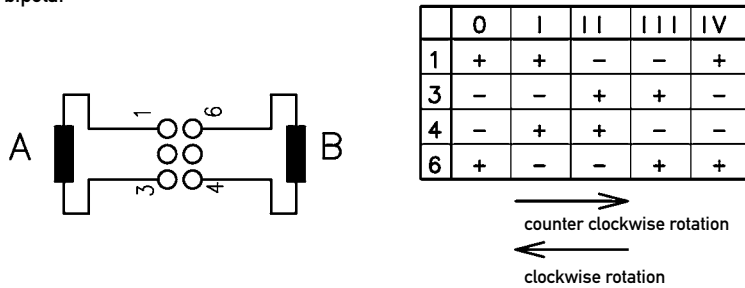
Type	Stepper Motor				UCB	1	0	N	24 Ω	R	B
Configuration	1	bipolar, standard magnet	7	bipolar, stronger magnet							
	2	unipolar, standard magnet	8	unipolar, stronger magnet							
Rotor shaft, mounting	3	centring 8 mm, shaft 2.0 mm, screw plate	E	centring 10 mm, shaft 2.0 mm, screw plate							
	4	centring 8 mm, shaft 1.5 mm, screw plate	K	centring 10 mm, shaft 1.5 mm, screw plate							
	0	centring 8 mm, shaft 2.0 mm, clip	A	centring 10 mm, shaft 2.0 mm, clip							
	1	centring 8 mm, shaft 1.5 mm, clip	C	centring 10 mm, shaft 1.5 mm, clip							
Approval	N	Approval Standard									
Resistance	see next pages; Resistance per winding for bipolar or unipolar										
Direction	R	reversible									
Connection	D	see next pages „Connection Types“									
	N										

Technical Data

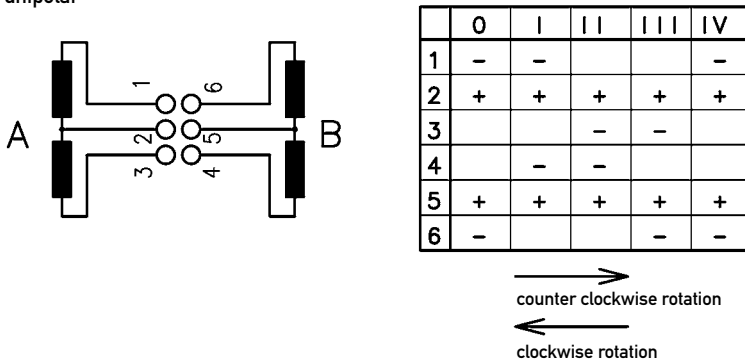
bipolar		UCB1		UCB5	
Holding torque M_H^*	cNm	1.7		2.3	
Detent torque M_S	cNm	0.29		0.46	
Rotor inertia J_R	gcm ²	2.1		2.4	
Rated voltage U_N		V	6	12	24
Resistance per winding R_{20}		Ω	24	90	380
Steps per revolution			24		
Duty cycle			100%		
Direction of rotation		V	reversible		
unipolar		UCB2		UCB6	
Holding torque M_H^*	mNm	1.3		1.8	
Detent torque M_S	mNm	0.29		0.46	
Rotor inertia J_R	gcm ²	2.1		2.4	
Rated voltage U_N		V	6	12	24
Resistance per winding R_{20}		Ω	24	90	380
Steps per revolution			24		
Duty cycle			100%		
Direction of rotation		V	reversible		

* values for lead wire version (connection N) / connector versions up to 15 % higher

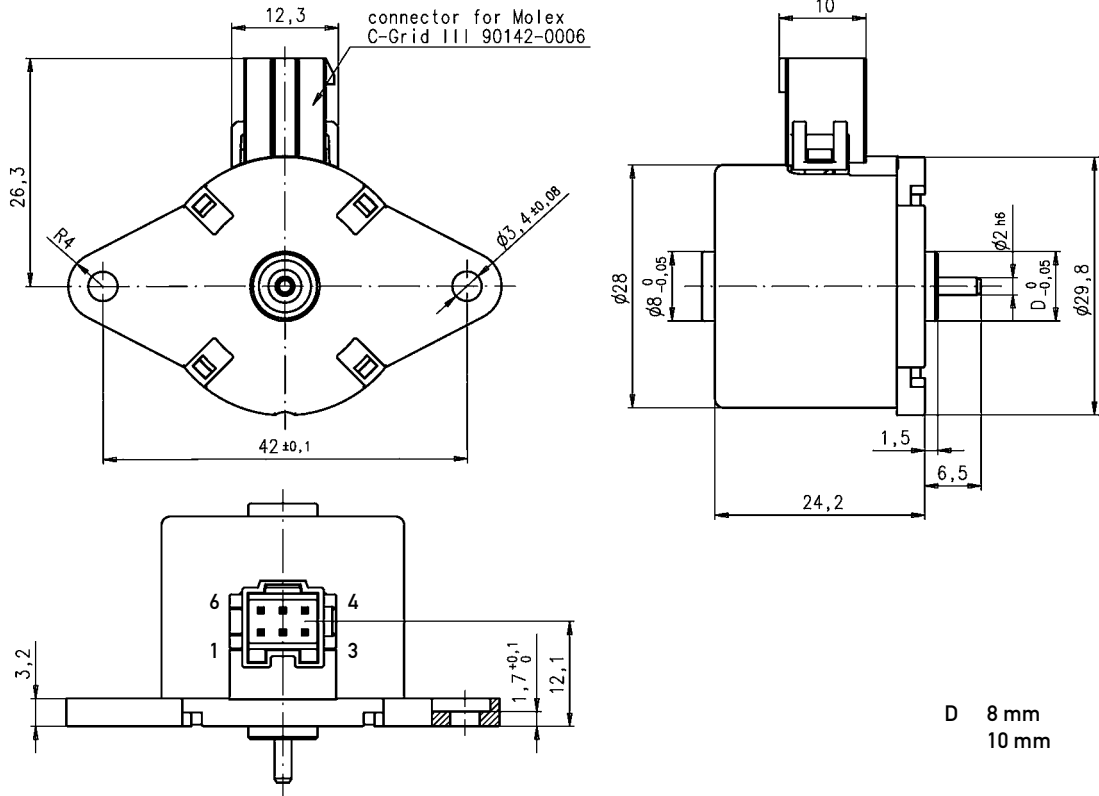
Circuit diagram bipolar



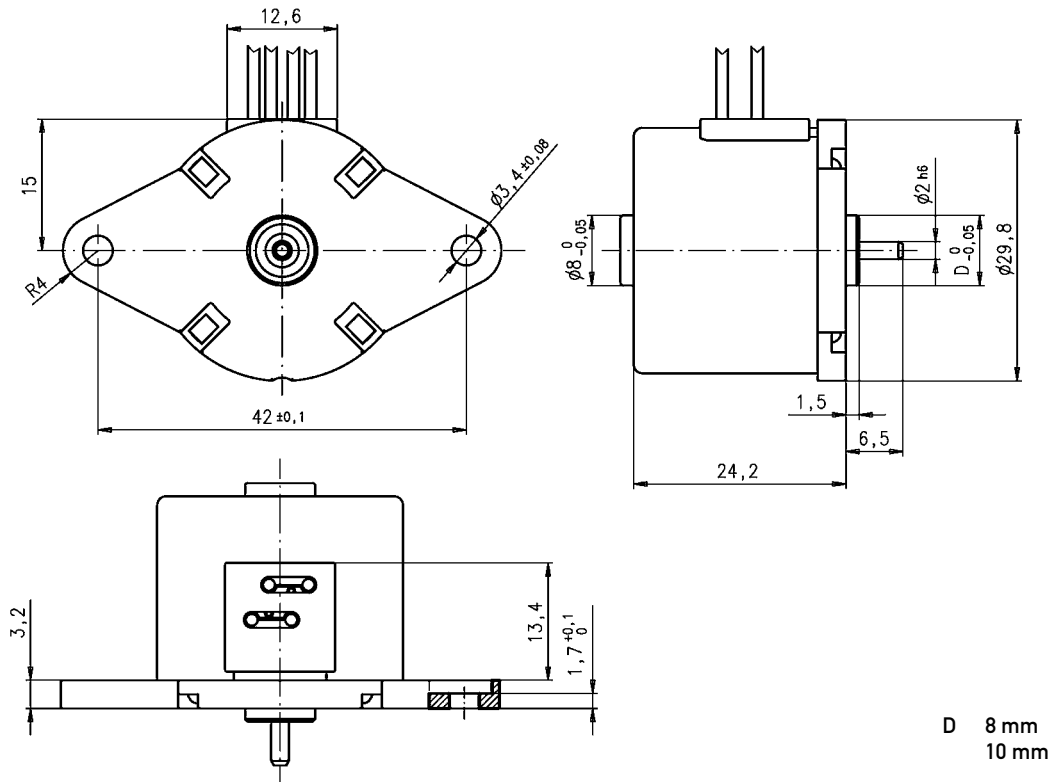
unipolar



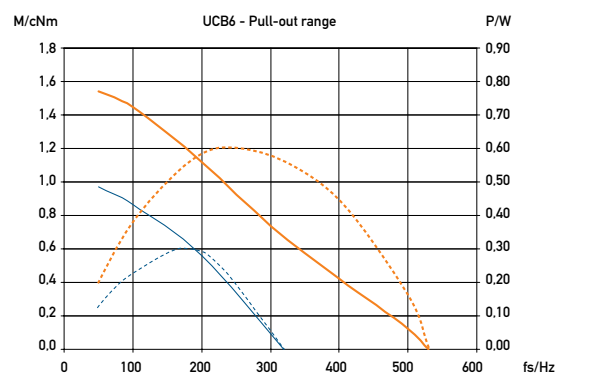
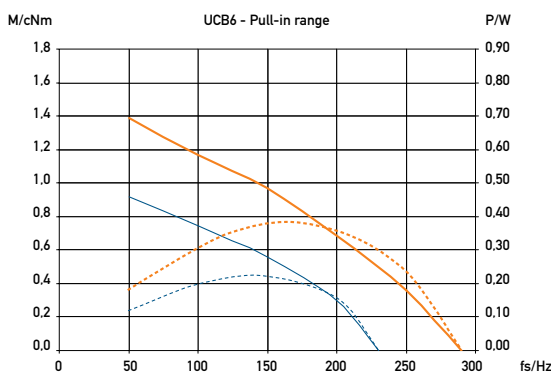
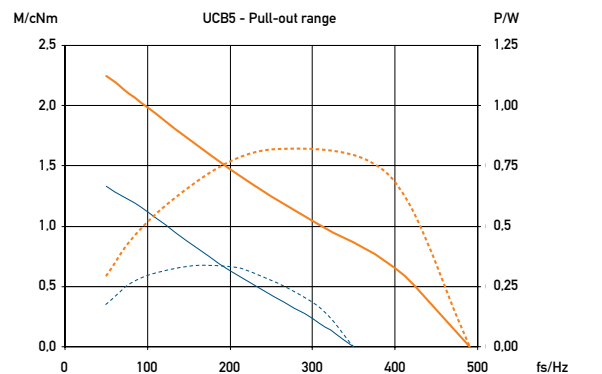
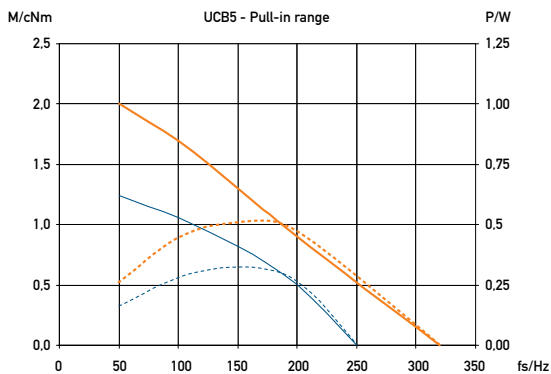
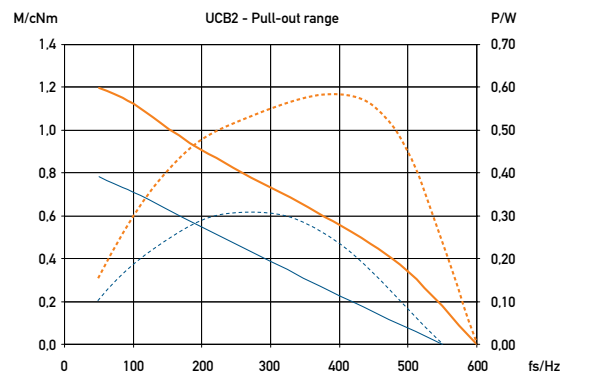
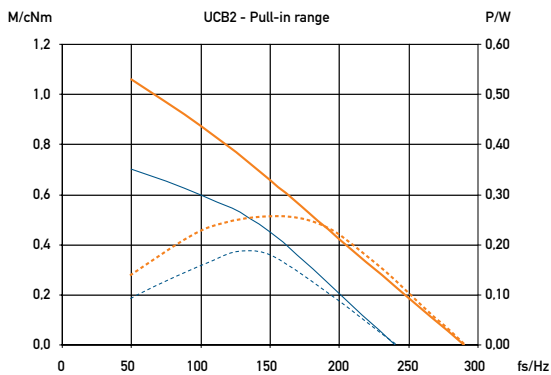
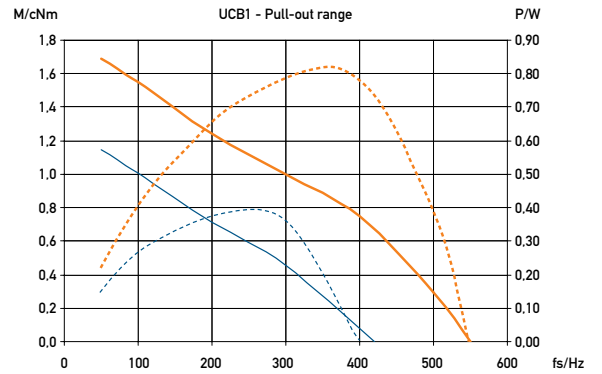
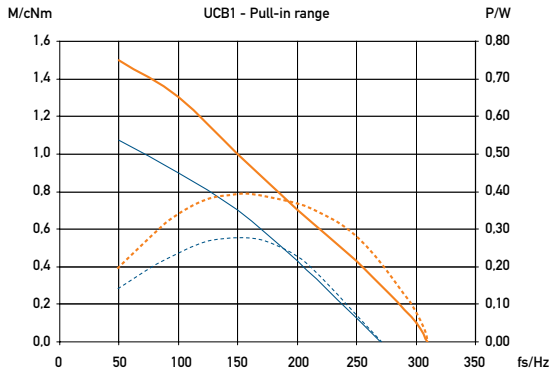
Dimensions Version with Connector D



Version with Connector N



Performance Chart



— M - Duty cycle 30 %
— M - Duty cycle 100%

- - - P - Duty cycle 30 %
- - - P - Duty cycle 100%

UBD1/2/5/6

Dimensions (mm)	∅ 36 x 21
Step angle (°)	7.5
Holding torque (cNm)	1.3–1.9
Detent torque (cNm)	0.22/0.27
Winding	bipolar/unipolar
Gear combination	A, D, M, B, F, V



Standard Data

Climatic class	wide-spread according to DIN IEC 60721-2-1
Ambient temperature operation	°C -15...+55
Ambient temperature storage	°C -20...+100
Thermal resistance at f=0 R _{therm}	27 K/W
Thermal class	A according to DIN EN 60085
Approval	standard (UL/CSA on request)
Mounting	any position
Electrical connection	cable
Protection	IP 40 according to DIN EN 60529
Weight	60 g
Rotor stalling	motor can be stopped when voltage is applied, without being overheated
Bearings	sintered bronze, self-lubricating
Electric strength	according to DIN EN 60034-1/DIN EN 60335-1

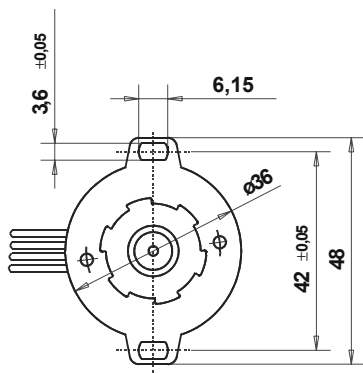
Order Reference

Type	Stepper Motor		UBD	1	0	N	18,5	R	E
Configuration	1 bipolar, standard magnet	5 bipolar, stronger magnet							
	2 unipolar, standard magnet	6 unipolar, stronger magnet							
Rotor shaft, mounting	0 centring 8 mm, shaft 2.0 mm, clip	A centring 10 mm, shaft 2.0 mm, clip							
	1 centring 8 mm, shaft 1.5 mm, clip	C centring 10 mm, shaft 1.5 mm, clip							
	3 centring 8 mm, shaft 2.0 mm, screw plate	E centring 10 mm, shaft 2.0 mm, screw plate							
	4 centring 8 mm, shaft 1.5 mm, screw plate	K centring 10 mm, shaft 1.5 mm, screw plate							
Approval	N Approval Standard								
Resistance	See next page Resistance per winding for bipolar or unipolar.								
Direction	reversible								
Cable	E cable 150 mm (other on request)								

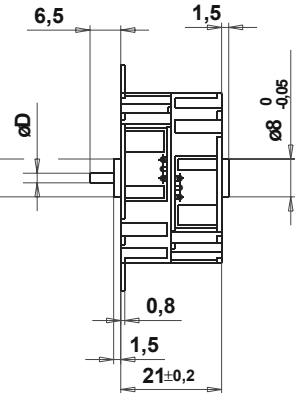
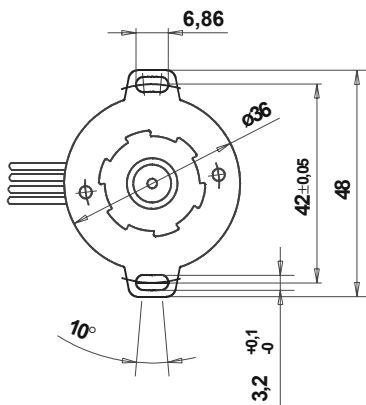
Technical Data

bipolar (UBD1/5)	Rated voltage U_N	V	3	6	12	24	
	Resistance per winding R_{20}	Ω	11,5	18,5	100	460	
	Holding torque M_H	cNm	1,8 (UBD1); 1,9 (UBD5)				
	Detent torque M_S	cNm	0,22 (UBD1); 0,27 (UBD5)				
	Rotor inertia J_R	gcm ²	2,8 (UBD 1), 2,9 (UBD 5)				
unipolar (UBD2/6)	Rated voltage U_N	V	3	6	12	24	
	Resistance per winding R_{20}	Ω	12	28	120	500	
	Holding torque M_H	cNm	1,3 (UBD2); 1,6 (UBD6)				
	Detent torque M_S	cNm	0,22 (UBD2); 0,27 (UBD6)				
	Rotor inertia J_R	gcm ²	2,8 (UBD2); 2,9 (UBD6)				
	Steps per revolution		48				
	Winding temperature T_{max}		105° C				
	Duty cycle		100%				
	Direction of rotation		reversible				

Dimensions Mounting with screw plate



Mounting with screw plate



Mounting with snap on clip

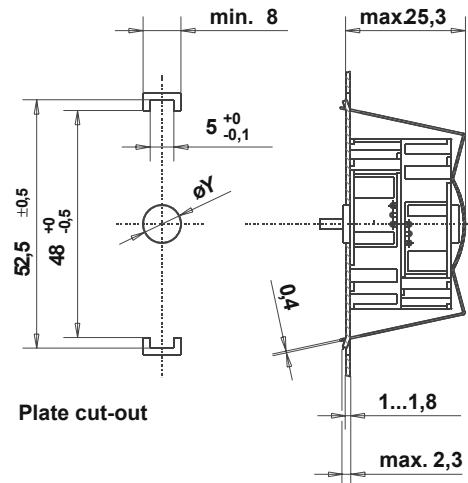


Plate cut-out

$\varnothing D$ Rotor shaft

$\varnothing 2 h6$

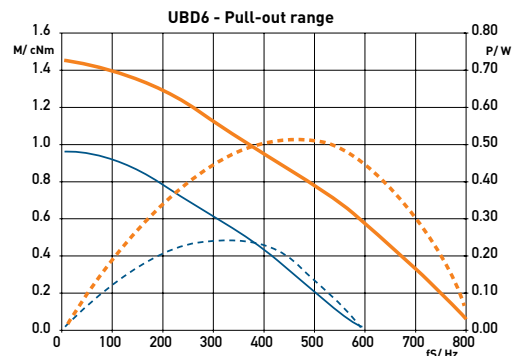
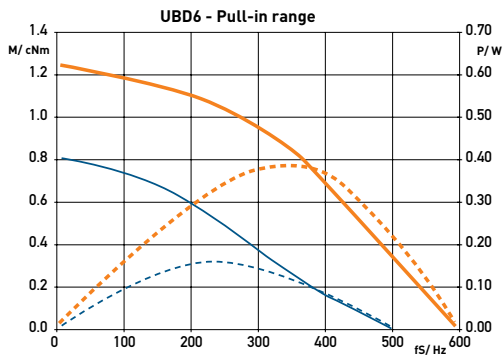
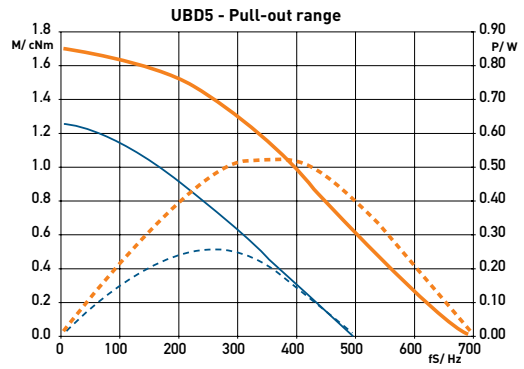
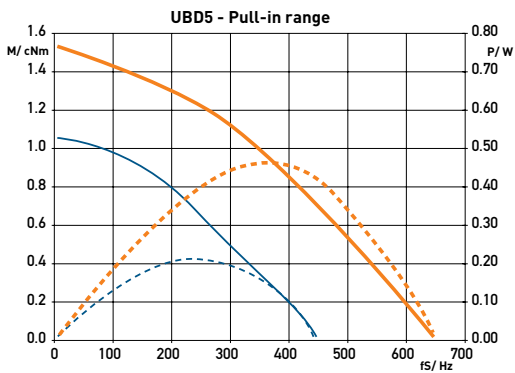
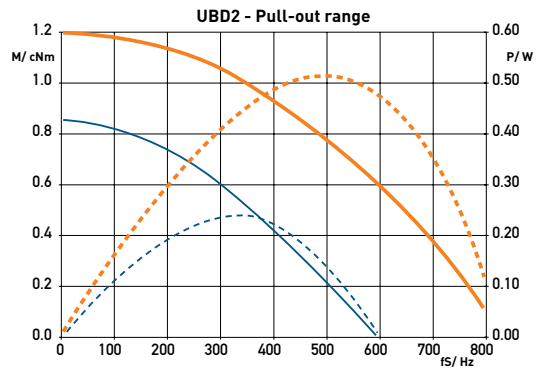
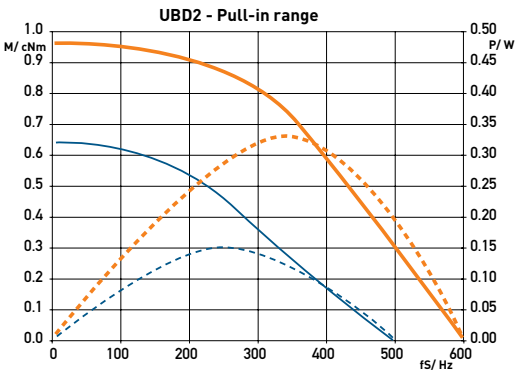
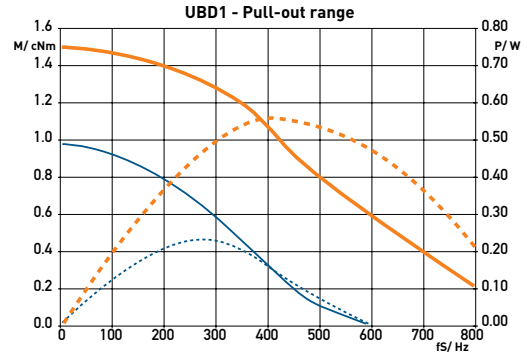
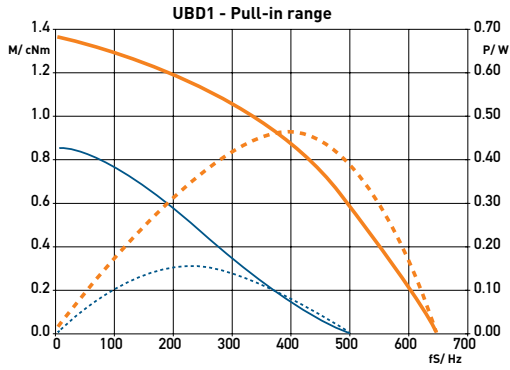
$\varnothing 1.5 js8$

$\varnothing Z$ $\varnothing Y$

8 8F8

10 10F8

Performance Chart



— M - Duty cycle 30 %
— M - Duty cycle 100%

- - - P - Duty cycle 30 %
- - - P - Duty cycle 100%

UBB1/2/5/6

Dimensions (mm)	∅ 36 x 21
Step angle (°)	15
Holding torque (cNm)	1.0–1.9
Detent torque (cNm)	0.25/0.36
Winding	bipolar/unipolar
Gear combination	A, D, M, B, F, V



Standard Data

Climatic class	wide-spread according to DIN IEC 60721-2-1
Ambient temperature operation	°C -15...+55
Ambient temperature storage	°C -20...+100
Thermal resistance at f=0 R _{therm}	27 K/W
Thermal class	A according to DIN EN 60085
Approval	standard (UL/CSA on request)
Mounting	any position
Electrical connection	cable
Protection	IP 40 according to DIN EN 60529
Weight	60 g
Rotor stalling	motor can be stopped when voltage is applied, without being overheated
Bearings	sintered bronze, self-lubricating
Electric strength	according to DIN EN 60034-1/DIN EN 60335-1

Order Reference

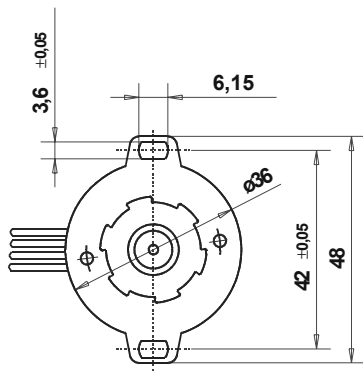
Type	Stepper Motor		UBB	1	0	N	18.5	R	E
Configuration	1 bipolar, standard magnet	5 bipolar, stronger magnet							
	2 unipolar, standard magnet	6 unipolar, stronger magnet							
Rotor shaft, mounting	0 centring 8 mm, shaft 2.0 mm, clip	A centring 10 mm, shaft 2.0 mm, clip							
	1 centring 8 mm, shaft 1.5 mm, clip	C centring 10 mm, shaft 1.5 mm, clip							
	3 centring 8 mm, shaft 2.0 mm, screw plate	E centring 10 mm, shaft 2.0 mm, screw plate							
	4 centring 8 mm, shaft 1.5 mm, screw plate	K centring 10 mm, shaft 1.5 mm, screw plate							
Approval	N Approval Standard								
Resistance	See next page Resistance per winding for bipolar or unipolar.								
Direction	reversible								
Cable	E cable 150 mm (other on request)								

Technical Data

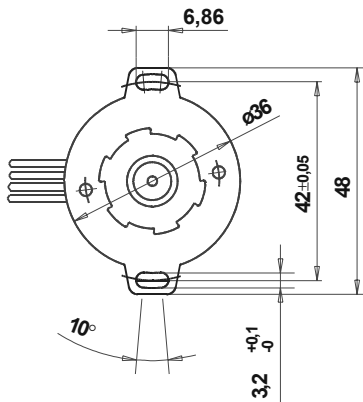
bipolar (UBB1/5)	Rated voltage U_N	V	3	6	12	24
	Resistance per winding R_{20}	Ω	11,5	18,5	100	460
	Holding torque M_H	cNm	1,5 (UBB1); 1,9 (UBB5)			
	Detent torque M_S	cNm	0,25 (UBB1); 0,36 (UBB5)			
	Rotor inertia J_R	gcm ²	2,8 (UBB1); 2,9 (UBB5)			
unipolar (UBB2/6)	Rated voltage U_N	V	3	6	12	24
	Resistance per winding R_{20}	Ω	12	28	120	500
	Holding torque M_H	cNm	1,0 (UBB2); 1,4 (UBB6)			
	Detent torque M_S	cNm	0,25 (UBB2); 0,36 (UBB6)			
	Rotor inertia J_R	gcm ²	2,8 (UBB2); 2,9 (UBB6)			
Steps per revolution			24			
Winding temperature T_{max}			105°C			
Duty cycle			100%			
Direction of rotation			reversible			

Dimensions

Mounting with screw plate



Mounting with screw plate



Mounting with snap on clip

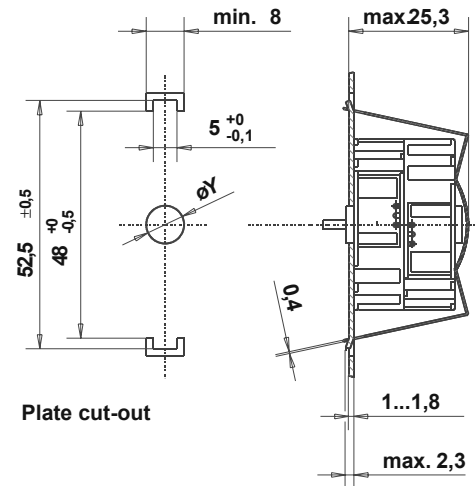
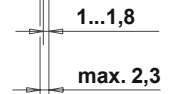


Plate cut-out



øD Rotor shaft

ø 2 h6

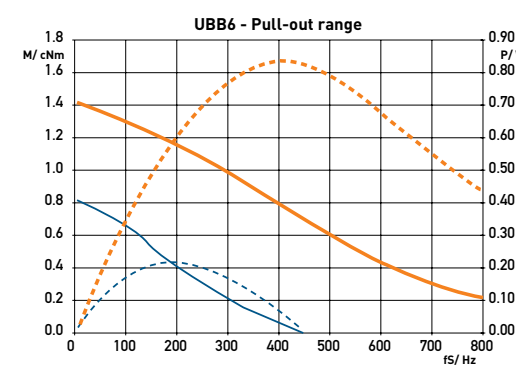
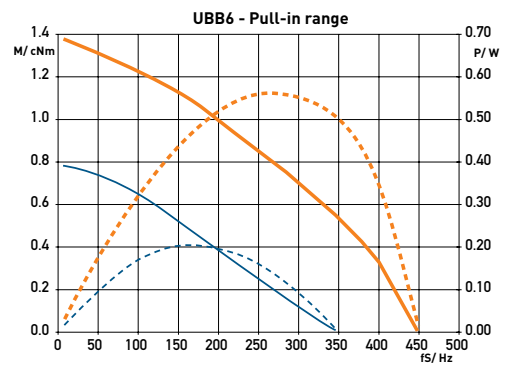
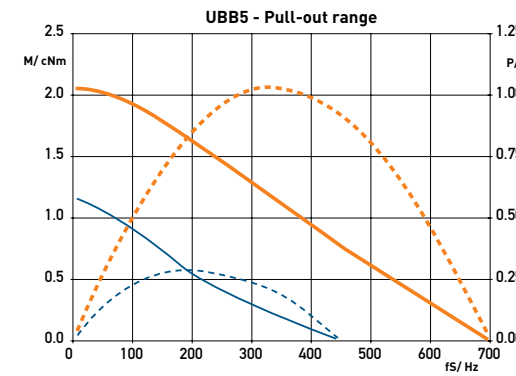
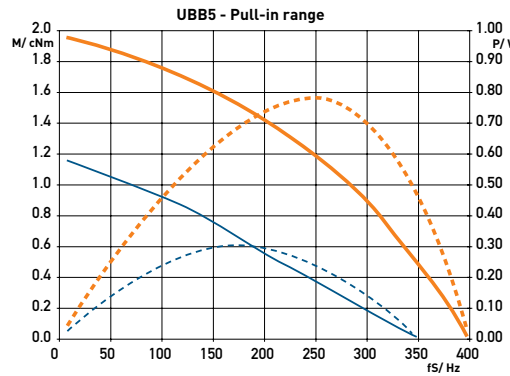
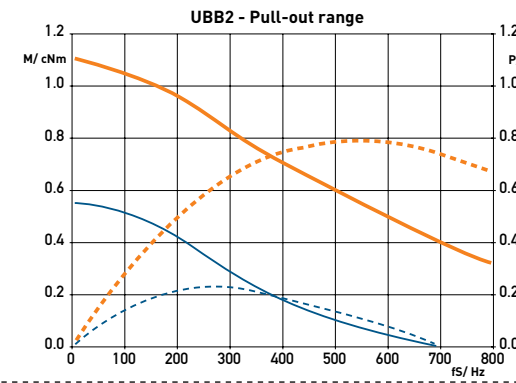
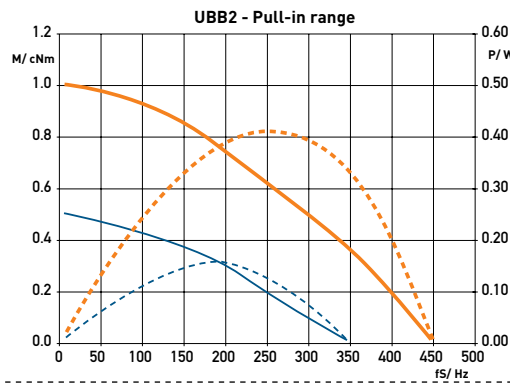
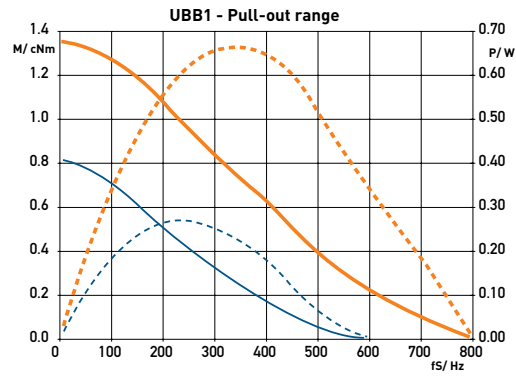
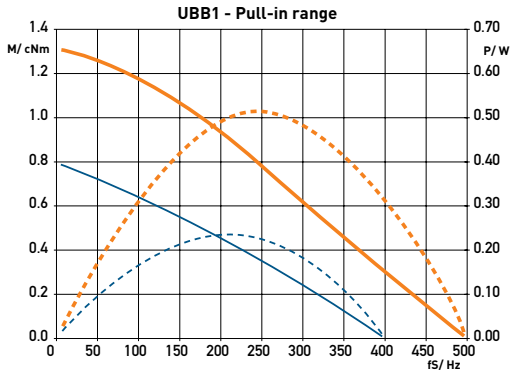
ø 1.5 js8

øZ øY

8 8F8

10 10F8

Performance Chart



— M - Duty cycle 30 %
— M - Duty cycle 100 %

- - - P - Duty cycle 30 %
- - - P - Duty cycle 100 %

UDB1/2

Dimensions (mm)	∅ 48 x 24
Step angle (°)	15
Holding torque (cNm)	2.7/2.2
Detent torque (cNm)	0.35
Winding	bipolar/unipolar
Gear combination	A, D, M, B, F, V, J



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 _{therm}	18 K/W
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	132 g
Rotor stalling	motor can be stopped when voltage is applied, without being overheated
Bearings	sintered bronze, self-lubricating
Electric strength	according to DIN EN 60034-1/DIN EN 60335-1

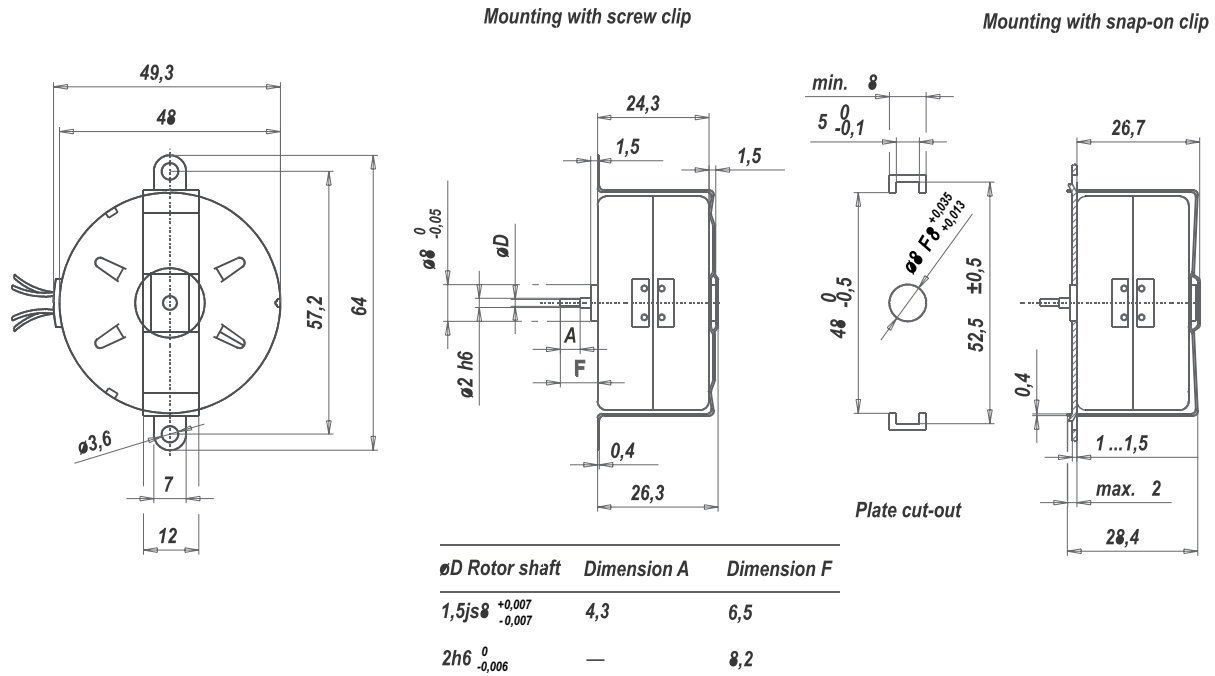
Order Reference

Type	Stepper Motor	UDB	1	0	N	78	R	N
Configuration	1 bipolar 2 unipolar							
Rotor shaft. mounting	0 centring 8 mm, shaft 1,5 mm, clip 1 centring 8 mm, shaft 2,0 mm, clip							
Approval	N Approval Standard							
Resistance	See next page Resistance per winding for bipolar or unipolar.							
Direction	reversible							
Cable	N cable 150 mm (other on request)							

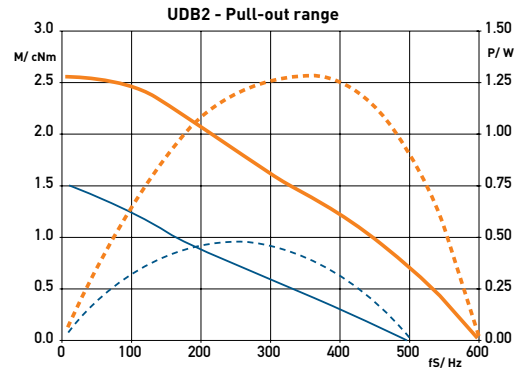
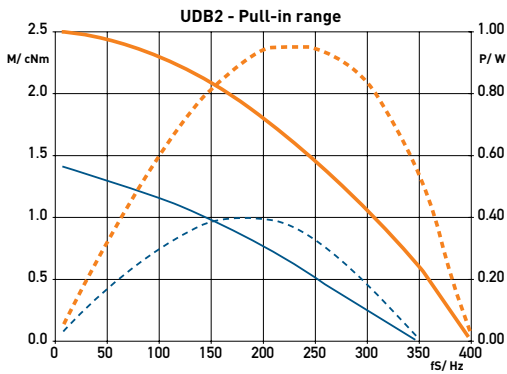
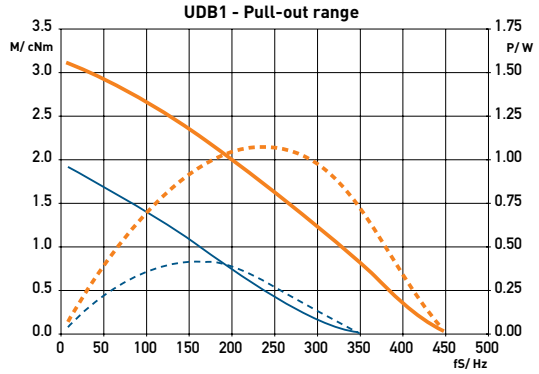
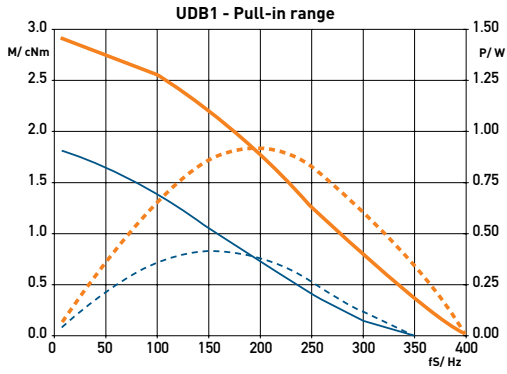
Technical Data

bipolar (UDB1)	Rated voltage U_N	V	6	12	24
	Resistance per winding R_{20}	Ω	15	78	350
	Holding torque M_H	cNm	2.7		
	Detent torque M_S	cNm	0.35		
	Rotor inertia J_R	gcm^2	6.3		
unipolar (UDB2)	Rated voltage U_N	V	6	12	24
	Resistance per winding R_{20}	Ω	19	75	300
	Holding torque M_H	cNm	2.2		
	Detent torque M_S	cNm	0.35		
	Rotor inertia J_R	gcm^2	6.3		
Steps per revolution			24		
Winding temperature T_{\max}			105° C		
Duty cycle			100%		
Direction of rotation			reversible		

Dimensions



Performance Chart



— M - Duty cycle 30 %
 — M - Duty cycle 100 %

- - - P - Duty cycle 30 %
 - - - P - Duty cycle 100 %

U0 (ST5021; ST5022)

Dimensions (mm)	∅ 50 x 21
Step angle (°)	7.5/11.25
Holding torque (cNm)	3.7–4 (ST5021); 4 (ST5022)
Detent torque (cNm)	0.25 (ST5021); 1 (ST5022)
Winding	bipolar
Gear combination	O. P. R



Standard Data

Climatic class	wide-spread according to DIN IEC 60721-2-1
Ambient temperature operation	°C -15 ... +40
Ambient temperature storage	°C -20 ... +100
Thermal class	B (ST5021); A (ST5022) according to DIN EN 60085
Approval	standard
Mounting	any position
Electrical connection	cabl
Protection	IP 30 according to DIN EN 60529
Weight	180 g (ST5021); 195 g (ST5022)
Rotor stalling	motor can be stopped when voltage is applied, without being overheated
Bearings	Sintered bronze, self- lubricating

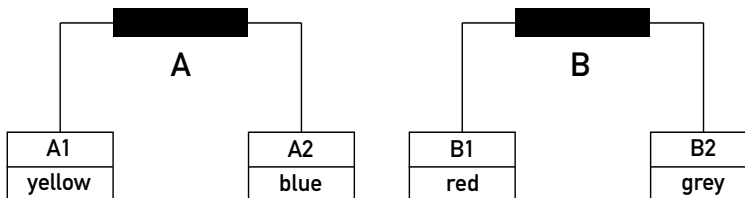
Order Reference

Type	Stepper Motor	ST5021 / ST5022	7.5°	7 Ω
Step angle	7.5° 11.25°			
Resistance	7 Ω			

Technical Data

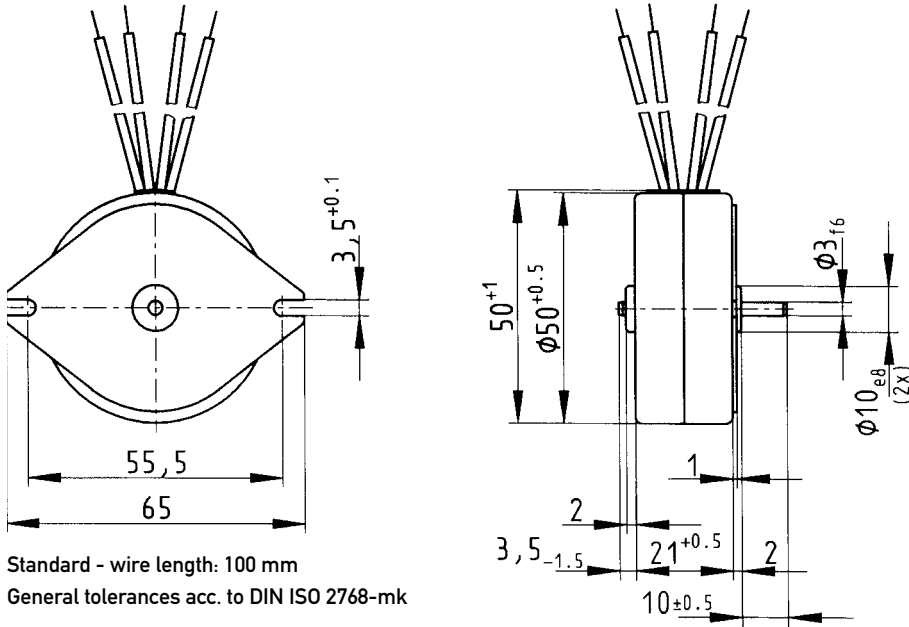
ST5021	Step angle	°	7,5	11,25
	Rated voltage U_N	V	4	4
	Holding torque M_H	cNm	4	3,7
	Detent torque M_S	cNm	0,25	
	Rotor inertia J_R	gcm ²	14,5	
	Winding temperature increase	K	65	
	Current per winding	A	0,53	
	Resistance per winding R_{20}	Ω	7	
	Inductance per winding	mH	12,5	11,5
	Power consumption	W	4	
	Driver mode		Chopper drive	
ST5022	Step angle	°	7,5/11,25	
	Rated voltage U_N	V	4	
	Holding torque M_H	cNm	7,5	
	Detent torque M_S	cNm	1	
	Rotor inertia J_R	gcm ²	25	
	Winding temperature increase	K	65	
	Current per winding	A	0,53	
	Resistance per winding R_{20}	Ω	7	
	Inductance per winding	mH	11	
	Power consumption	W	4	
	Driver mode		Chopper drive	

Circuit diagram Motor connections - bipolar



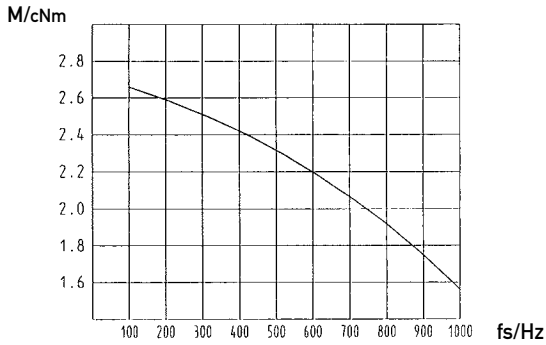
		clockwise rotation				
A	$\frac{A1}{A2}$	↓	↑	↑	↓	↓
B	$\frac{B1}{B2}$	↑	↑	↓	↓	↑

Dimensions

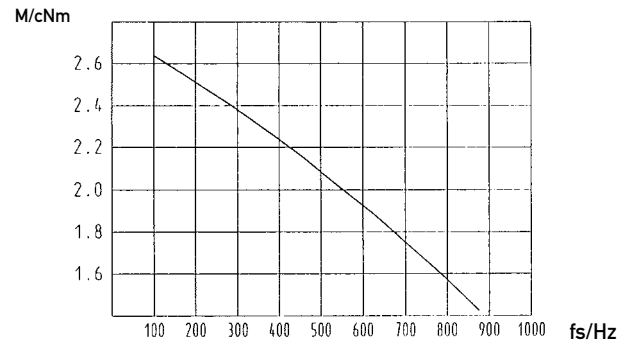


Performance Chart (chopper driver)

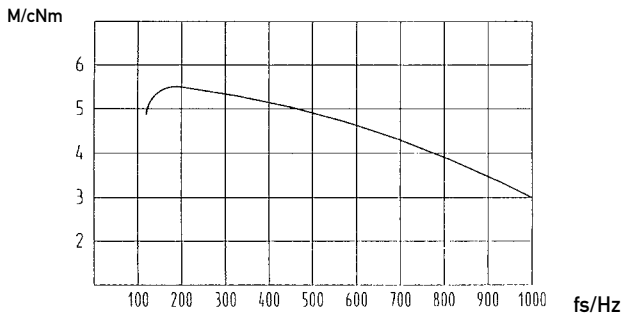
ST5021 UOD1 (ST 5021/7.5/1)



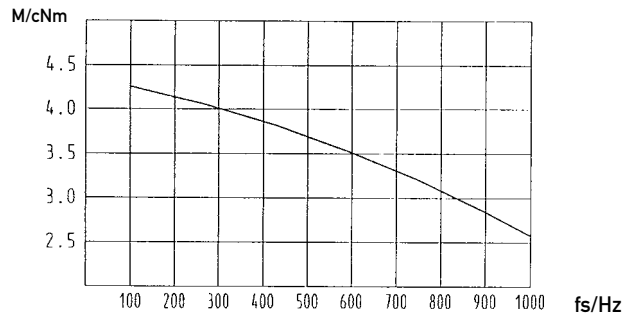
UOJ1 (ST 5021/11.25/1)



ST5022 UOD5 (ST 5022/7.5/1)



UOJ5 (ST 5022/11.25/1)



UFD1/2

Dimensions (mm)	∅ 52 x 28
Step angle (°)	7.5
Holding torque (cNm)	6.4/6.4
Detent torque (cNm)	0.45
Winding	bipolar/unipolar
Gear combination	A, D, M, B, F, V, J, O



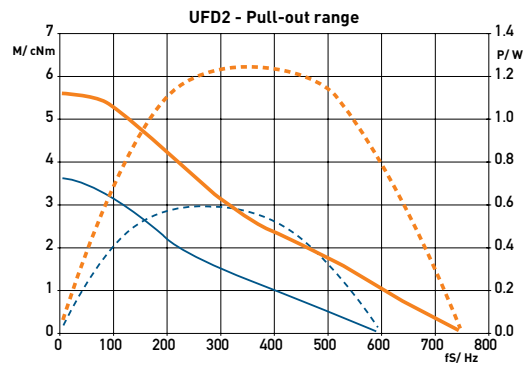
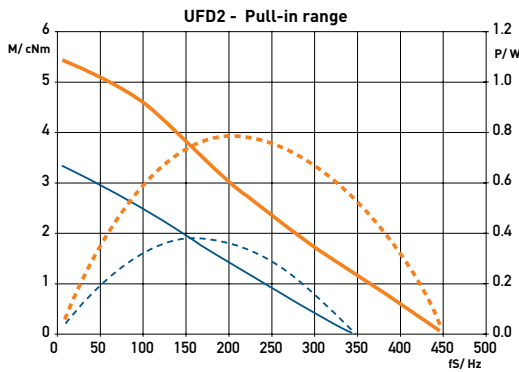
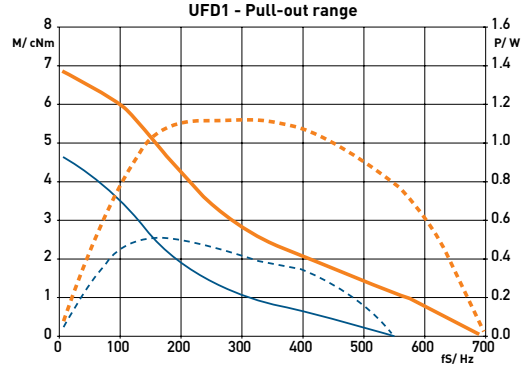
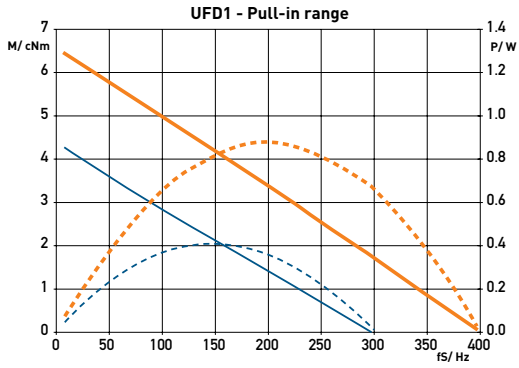
Standard Data

Climatic class	wide-spread according to DIN IEC 60721-2-1
Ambient temperature operation	°C -15...+55
Ambient temperature storage	°C -20...+100
Thermal resistance at f=0 R _{therm}	13 K/W
Thermal class	A according to DIN EN 60085
Approval	standard (UL/CSA on request)
Mounting	any position
Electrical connection	cable
Protection	IP 30 according to DIN EN 60529
Weight	180 g
Rotor stalling	motor can be stopped when voltage is applied, without being overheated
Bearings	sintered bronze, self-lubricating
Electric strength	according to DIN EN 60034-1/DIN EN 60335-1

Order Reference

Type	Stepper Motor	UFD	1	0	N	52	R	N
Configuration	1 bipolar, two coils 2 unipolar, two coils							
Rotor shaft, mounting	0 centring 8 mm, shaft 3.0 mm, clip 1 centring 8 mm, shaft 2.0 mm, clip 2 centring 8 mm, shaft 1.5 mm, clip 3 centring 8 mm, shaft 3.0 mm, screw plate 4 centring 8 mm, shaft 2.0 mm, screw plate 5 centring 8 mm, shaft 1.5 mm, screw plate	E K M	centring 10 mm, shaft 3.0 mm, screw plate centring 10 mm, shaft 2.0 mm, screw plate centring 10 mm, shaft 1.5 mm, screw plate					
Approval	N Approval Standard							
Resistance	See next page Resistance per winding for bipolar or unipolar.							
Direction	reversible							
Cable	E cable 150 mm (other on request)							

Performance Chart



— M - Duty cycle 30 %
— M - Duty cycle 100%

- - - P - Duty cycle 30 %
- - - P - Duty cycle 100 %

UFB1/2; UFB3/4

Dimensions (mm)	∅ 52 x 28 / ∅ 52 x 56
Step angle (°)	15
Holding torque (cNm)	45.3–10.4 (UFB1/2); 7.6–10.4 (UFB3/4)
Detent torque (cNm)	0.45 (UFB1/2); 0.8 (UFB3/4)
Winding	bipolar/unipolar
Gear combination	A, D, M, B, F, V, J, O



Standard Data

Climatic class	wide-spread according to DIN IEC 60721-2-1
Ambient temperature operation	°C -15...+55
Ambient temperature storage	°C -20...+100
Thermal resistance at f=0 R _{therm}	11 K/W (UFB1/2), 7 K/W (UFB3/4)
Thermal class	A according to DIN EN 60085
Approval	standard (UL/CSA on request)
Mounting	any position
Electrical connection	cable
Protection	IP 30 according to DIN EN 60529
Weight	180 g (UFB1/2), 350 g (UFB3/4)
Rotor stalling	motor can be stopped when voltage is applied, without being overheated
Bearings	sintered bronze, self-lubricating
Electric strength	according to DIN EN 60034-1/DIN EN 60335-1

Order Reference

Type	Stepper Motor		UFB	1	0	N	52 Ω	R	N
Configuration	1 bipolar, two coils	3 bipolar, four coils							
	2 unipolar, two coils	4 unipolar, four coils							
Rotor shaft, mounting	0 centring 8 mm, shaft 3.0 mm, clip	E centring 10 mm, shaft 3.0 mm, screw plate *							
	1 centring 8 mm, shaft 2.0 mm, clip	K centring 10 mm, shaft 2.0 mm, screw plate *							
	2 centring 8 mm, shaft 1.5 mm, clip	M centring 10 mm, shaft 1.5 mm, screw plate *							
	3 centring 8 mm, shaft 3.0 mm, screw plate *	A centring 12 mm, shaft 3.0 mm, clip							
	4 centring 8 mm, shaft 2.0 mm, screw plate *								
	5 centring 8 mm, shaft 1.5 mm, screw plate *								
Approval	N Approval Standard								
Resistance	See next page Resistance per winding for bipolar or unipolar.								
Direction	reversible								
Cable	N cable 150 mm (other on request)								

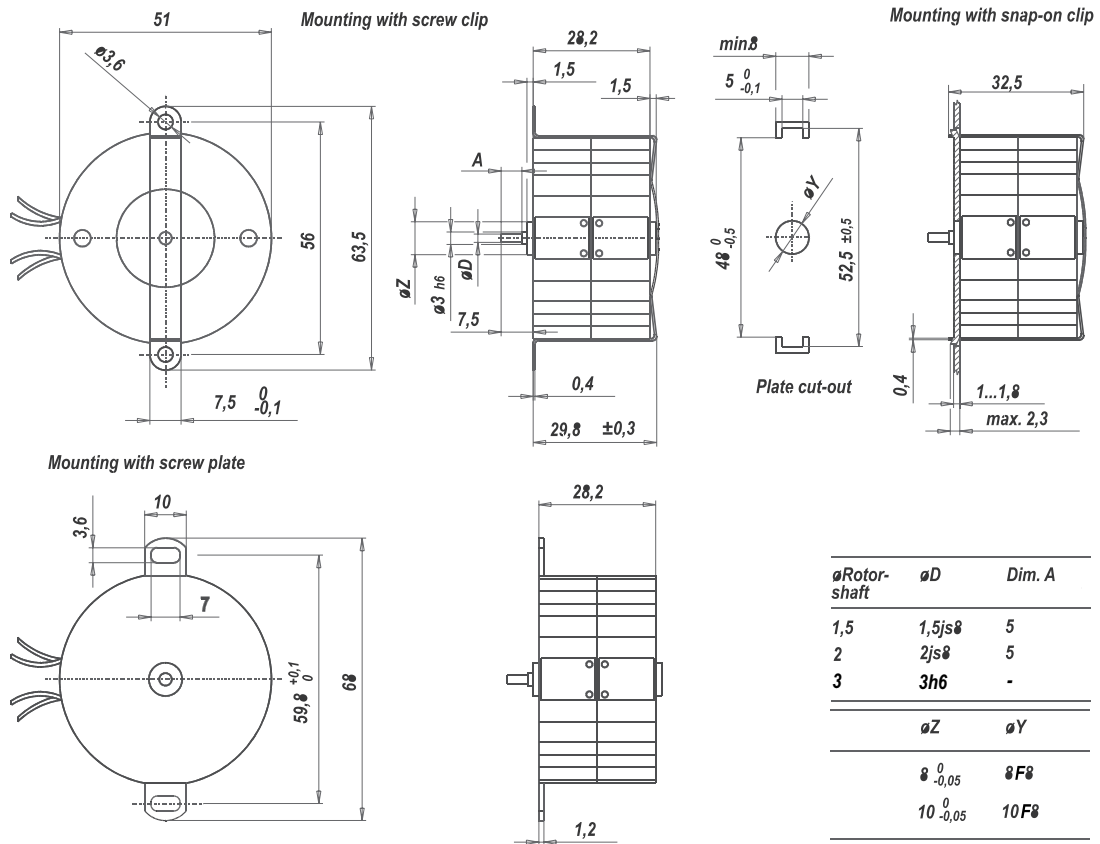
* screw plate not for UFB3 and UFB4

Technical Data

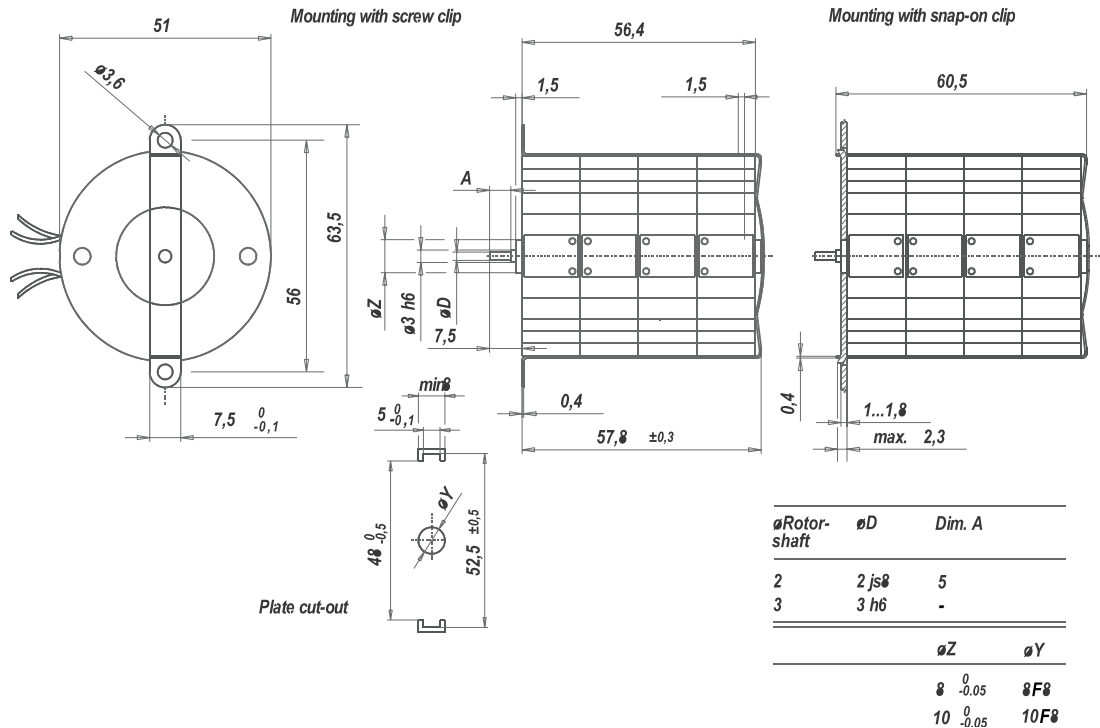
bipolar (UFB1/3)	Rated voltage U_N	V	6	12	24
	Resistance per winding R_{20} (UFB1)	Ω	9,5	52	250
	Resistance per winding R_{20} (UFB3)	Ω	5	25,5	125
	Holding torque M_H	cNm	5,5 (UFB1); 10,4 (UFB3)		
	Detent torque M_S	cNm	0,46 (UFB1); 0,8 (UFB3)		
	Rotor inertia J_R	gcm ²	14,2 (UFB1); 24,2 (UFB3)		
unipolar (UFB2/4)	Rated voltage U_N	V	6	12	24
	Resistance per winding R_{20} (UFB2)	Ω	15	61	251
	Resistance per winding R_{20} (UFB4)	Ω	7,5	30,5	125
	Holding torque M_H	cNm	4,3 (UFB2); 7,6 (UFB4)		
	Detent torque M_S	cNm	0,46 (UFB2); 0,8 (UFB4)		
	Rotor inertia J_R	gcm ²	14,2 (UFB2); 24,2 (UFB4)		
	Steps per revolution		24		
	Duty cycle		100%		
	Winding temperature T_{max}		105° C		
	Direction of rotation		reversible		

Dimensions

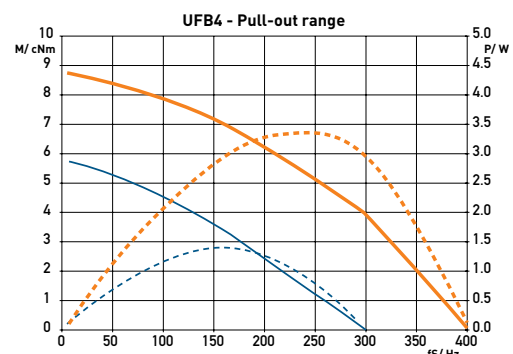
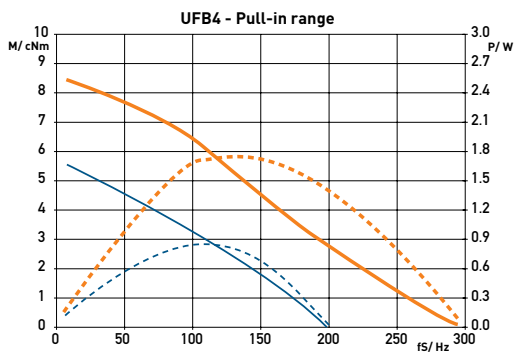
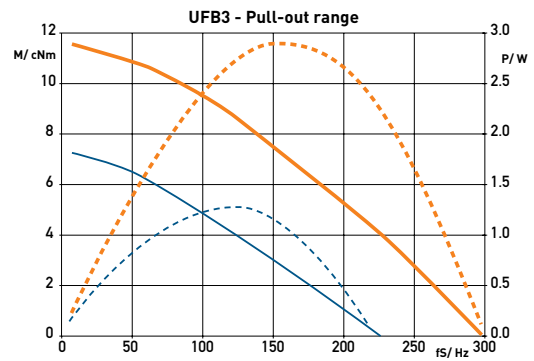
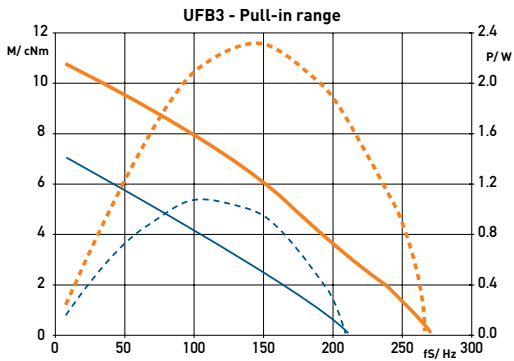
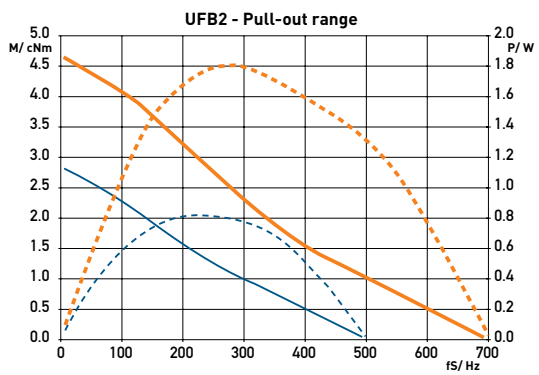
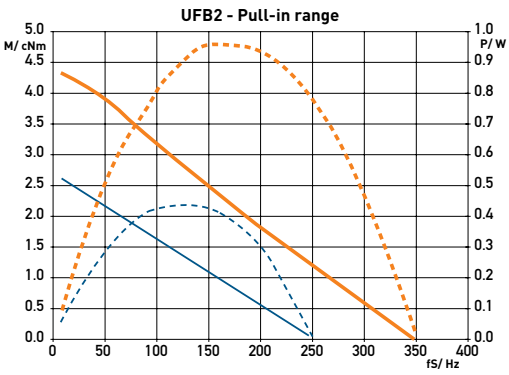
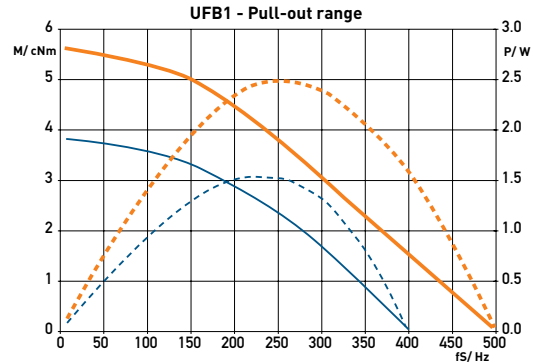
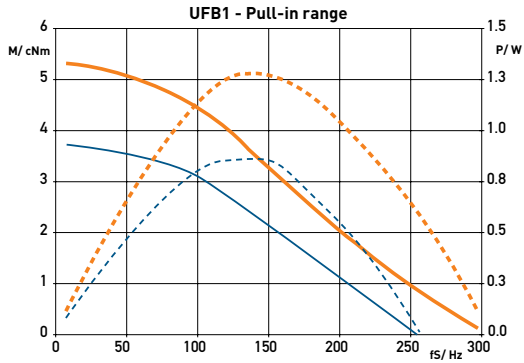
UFB1/2



UFB3/4



Performance Chart



— M - Duty cycle 30 %
— M - Duty cycle 100 %

- - - P - Duty cycle 30 %
- - - P - Duty cycle 100 %

UHD1/2/5/6; UHD3/4/7/8

Dimensions (mm)	∅ 59 x 35 / ∅ 59 x 70
Step angle (°)	7.5
Holding torque (cNm)	13–24 (UHD1/2/5/6); 27.5–45.5 (UHD3/4/7/8)
Detent torque (cNm)	1.3–2.1 (UHD1/2/5/6); 3.4–5.3 (UHD3/4/7/8)
Winding	bipolar/unipolar
Gear combination	J



Standard Data

Climatic class	wide-spread according to DIN IEC 60721-2-1
Ambient temperature operation	-15 ... +55° C
Ambient temperature storage	-20 ... +100° C
Thermal resistance at f=0 (R _{therm})	9 K/W (UHD 1/2/5/6); 6.7 K/W (UHD 3/4/7/8)
Thermal class	A according to DIN EN 60085 (B on request)
Approval	standard (UL/CSA on request)
Mounting	any position
Electrical connection	cable
Protection	IP 30 according to DIN EN 60529
Weight (g)	300 (UHD 1/2/5/6), 580 (UHD 3/4/7/8)
Rotor stalling	motor can be stopped when voltage is applied, without being overheated
Bearings	sintered bronze, self-lubricating
Electric strength	according to DIN EN 60034-1/DIN EN 60335-1

Order Reference

Type	Stepper Motor		UHD 1 0 N 36 R N						
Configuration	1	bipolar, two coils, standard magnet	3	bipolar, four coils, standard magnet					
	2	unipolar, two coils, standard magnet	4	unipolar, four coils, standard magnet					
	5	bipolar, two coils, stronger magnet	7	bipolar, four coils, stronger magnet					
	6	unipolar, two coils, stronger magnet	8	unipolar, four coils, stronger magnet					
	Rotor shaft, mounting	0	centring 12 mm, shaft 6,35 mm, clip **	3	centring 12 mm, shaft 6,35 mm, screw plate*				
		1	centring 12 mm, shaft 4,0 mm, clip **	4	centring 12 mm, shaft 4,0 mm, screw plate*				
2		centring 12 mm, shaft 3,0 mm, clip **	5	centring 12 mm, shaft 3,0 mm, screw plate*					
Approval	N	Standard							
Resistance	see next pages Resistance per winding for bipolar or unipolar.								
Direction	reversible								
Cable	N	cable 150 mm (other on request)							

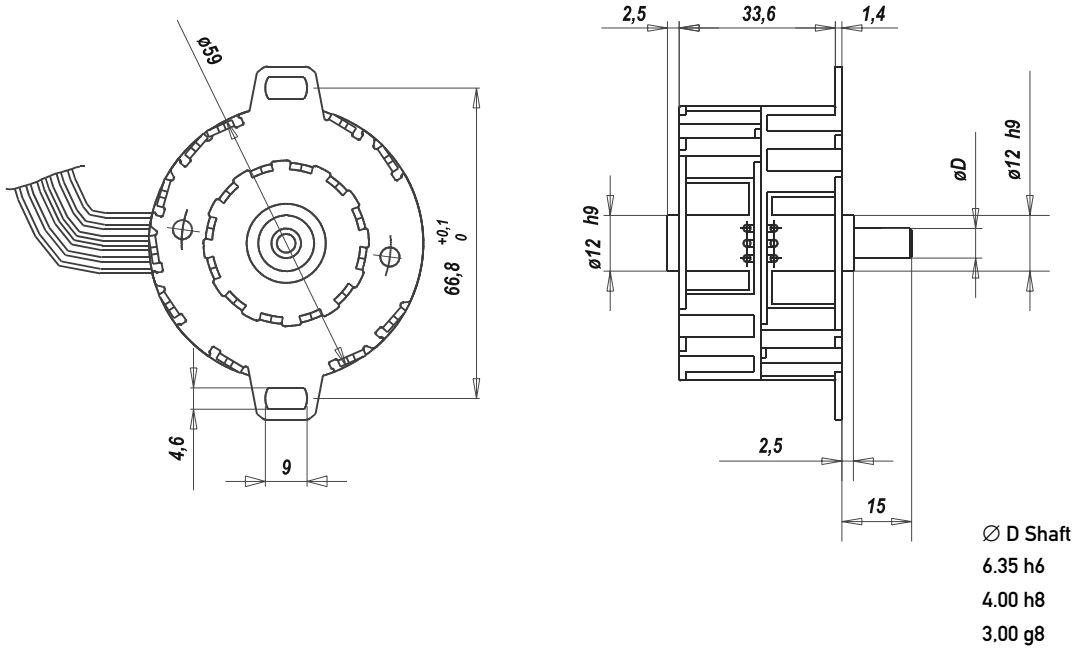
* not for UHD3/4/7/8

** not for UHD1/2/5/6

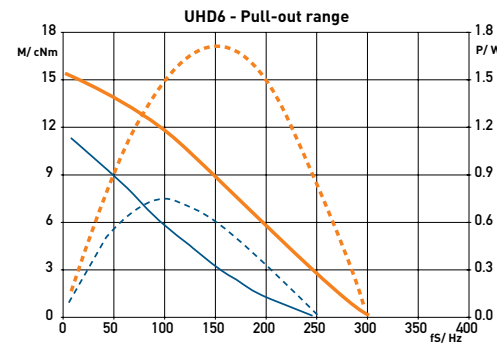
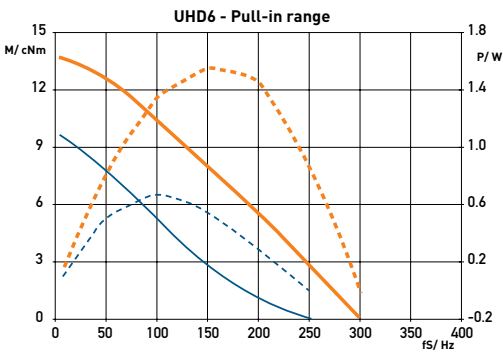
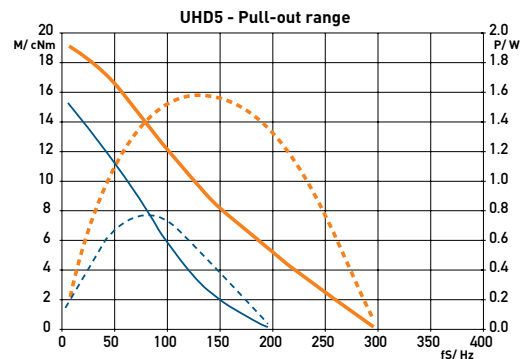
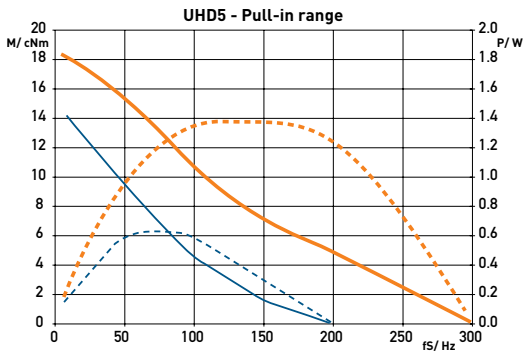
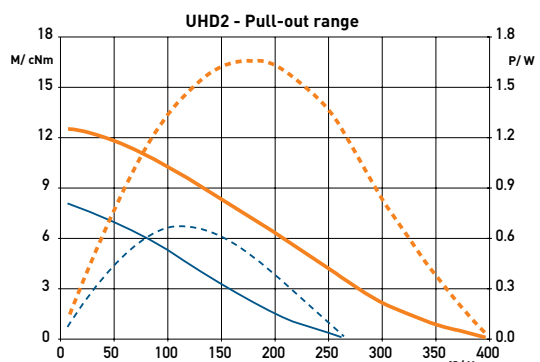
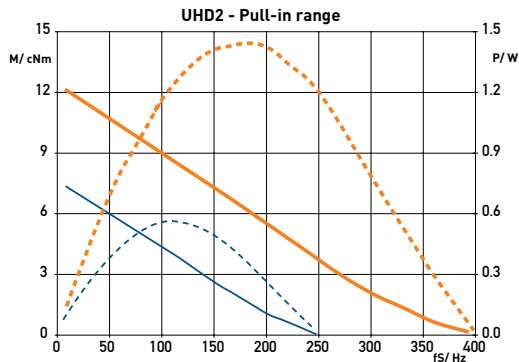
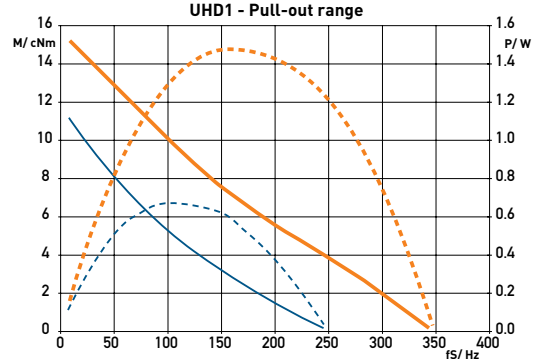
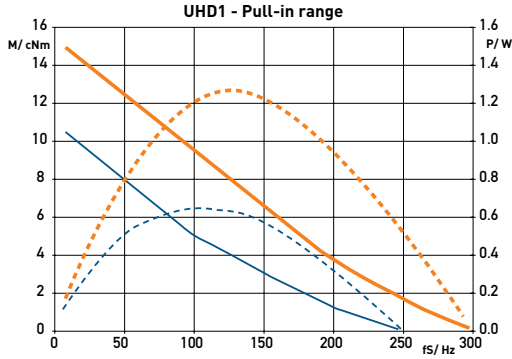
Technical Data UHD1/2/5/6

bipolar (UHD1/5)	Rated voltage U_N	V	6	12	24
	Resistance per winding R_{20}	Ω	6,8	36	168
	Holding torque	cNm	17,1 (UHD1); 24 (UHD5)		
	Detent torque M_s	cNm	1,3 (UHD1/2); 2,1 (UHD5/6)		
	Rotor inertia J_R	gcm ²	49 (UHD1/2); 56 (UHD5/6)		
unipolar (UHD2/6)	Rated voltage U_N	V	6	12	24
	Resistance per winding R_{20}	Ω	10	45	190
	Holding torque	cNm	13 (UHD2); 17,3 (UHD6)		
	Detent torque M_s	cNm	1,3 (UHD1/2); 2,1 (UHD5/6)		
	Rotor inertia J_R	gcm ²	49 (UHD1/2); 56 (UHD5/6)		
	Steps per revolution		48		
	Duty cycle		100%		
	Winding temperature T_{max}		130° C		
	Direction of rotation		reversible		

Dimensions



Performance Chart



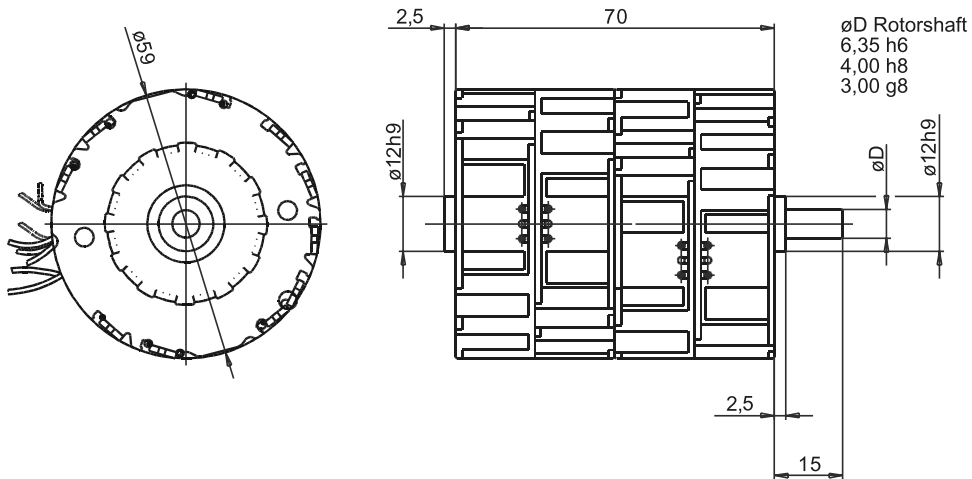
— M - Duty cycle 30 %
— M - Duty cycle 100 %

- - - P - Duty cycle 30 %
- - - P - Duty cycle 100 %

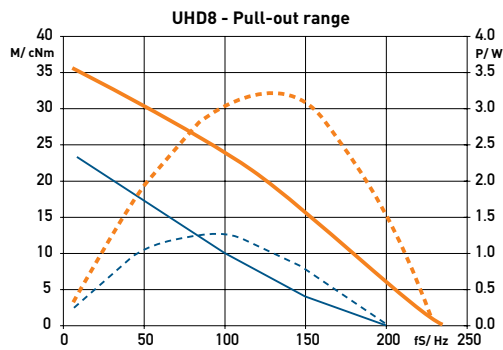
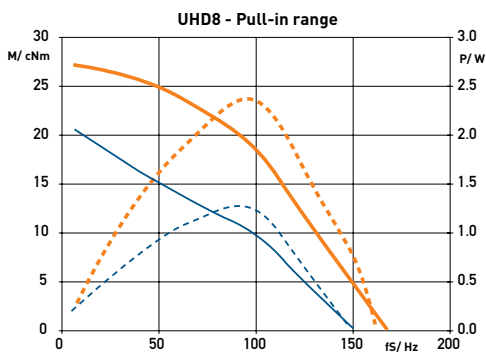
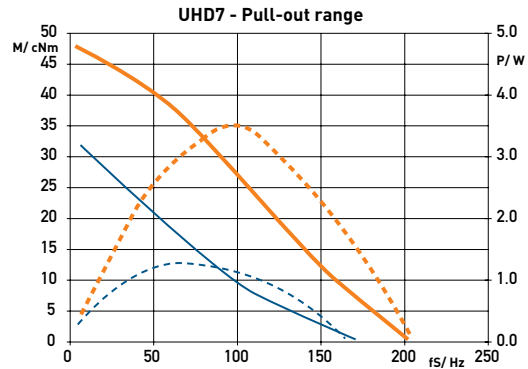
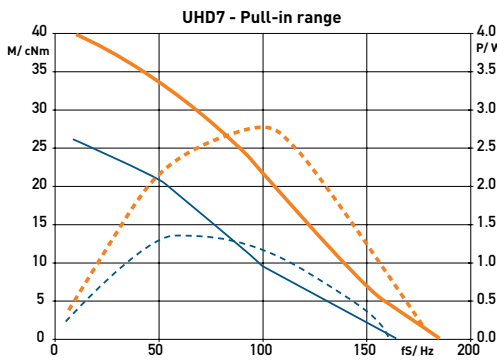
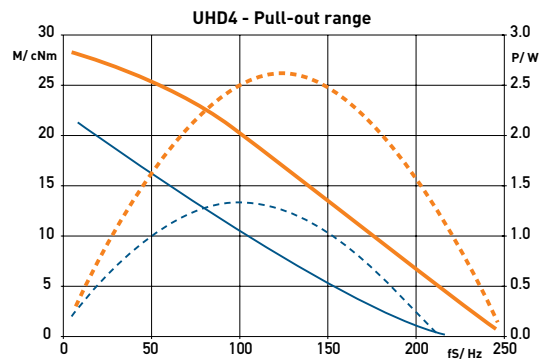
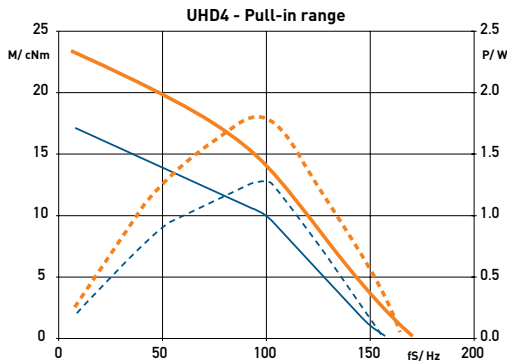
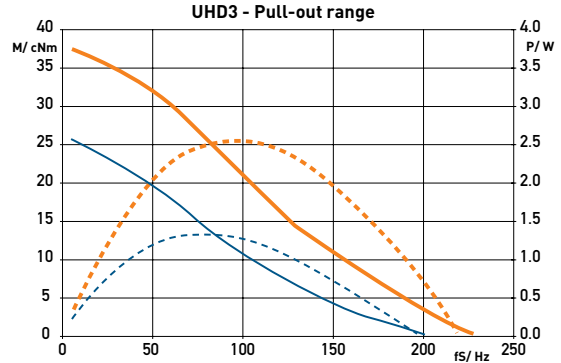
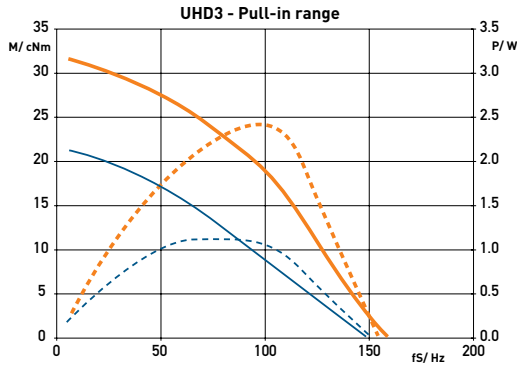
Technical Data UHD3/4/7/8

bipolar (UHD3/7)	Rated voltage U_N	V	12	24	48
	Resistance per winding R_{20}	Ω	20	108	460
	Holding torque	cNm	37,5 (UHD3); 45,5 (UHD7)		
	Detent torque M_s	cNm	3,4 (UHD3/4); 5,3 (UHD7/8)		
	Rotor inertia J_R	gcm ²	135 (UHD3/4); 141 (UHD7/8)		
unipolar (UHD4/8)	Rated voltage U_N	V	6	12	24
	Resistance per winding R_{20}	Ω	6,75	28,5	120
	Holding torque	cNm	27,5 (UHD4); 33,5 (UHD8)		
	Detent torque M_s	cNm	3,4 (UHD3/4); 5,3 (UHD7/8)		
	Rotor inertia J_R	gcm ²	135 (UHD3/4); 141 (UHD7/8)		
Steps per revolution			48		
Duty cycle			100%		
Winding temperature T_{max}			130° C		
Direction of rotation			reversible		

Dimensions



Performance Chart



— M - Duty cycle 30 %
 — M - Duty cycle 100%

- - - P - Duty cycle 30 %
 - - - P - Duty cycle 100 %

UP (ST6443; ST6444)

Dimensions (mm)	∅ 64 x 43
Step angle (°)	7.5/11.25 (ST6443); 11.25 (ST6444)
Holding torque (cNm)	30–35 (ST6443); 45 (ST6444)
Detent torque (cNm)	2–2.5 (ST6443); 7 (ST6444)
Winding	bipolar
Gear combination	O, P, R



Standard Data

Climatic class	wide-spread according to DIN IEC 60721-2-1
Ambient temperature operation	°C -15 ... +40
Ambient temperature storage	°C -20 ... +100
Thermal resistance at f=0 R _{therm}	29 K/W
Thermal class	B (ST6443); A (ST6444) according to DIN EN 60085
Approval	standard
Mounting	any position
Electrical connection	cable
Protection	IP 30 according to DIN EN 60529
Weight	500 g (ST6443); 550 g (ST6444)
Rotor stalling	motor can be stopped when voltage is applied, without being overheated
Bearings	Sintered bronze, self-lubricating

Order Reference

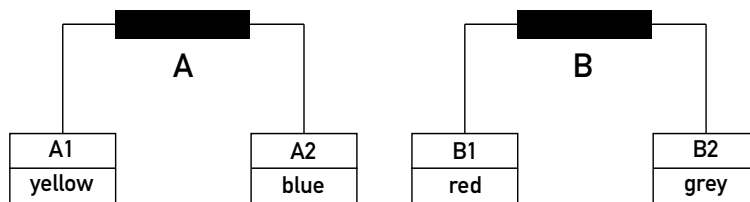
Type	Stepper Motor	ST6443 / ST6444	7.5°	3.7 Ω
Step angle	7.5° (ST6443) 11.25° (ST6443 / ST6444)			
Resistance	3.7 Ω			

Technical Data

bipolar (ST6443)	Rated voltage U_N	V	4,5	4,5	
	Resistance per winding R_{20}	Ω	3,7		
	Step angle	$^\circ$	7,5	11,25	
	Holding torque M_H	cNm	35	30	
	Detent torque M_S	cNm	2,5	2	
	Rotor inertia J_R	gcm ²	85		
	Steps per revolution			48	32
	Winding temperature increase	K	90		
	Current per winding	A	1,25		
	Inductance per winding	mH	10	9,5	
	Power consumption	W	11,5		
Driver mode	Chopper drive				

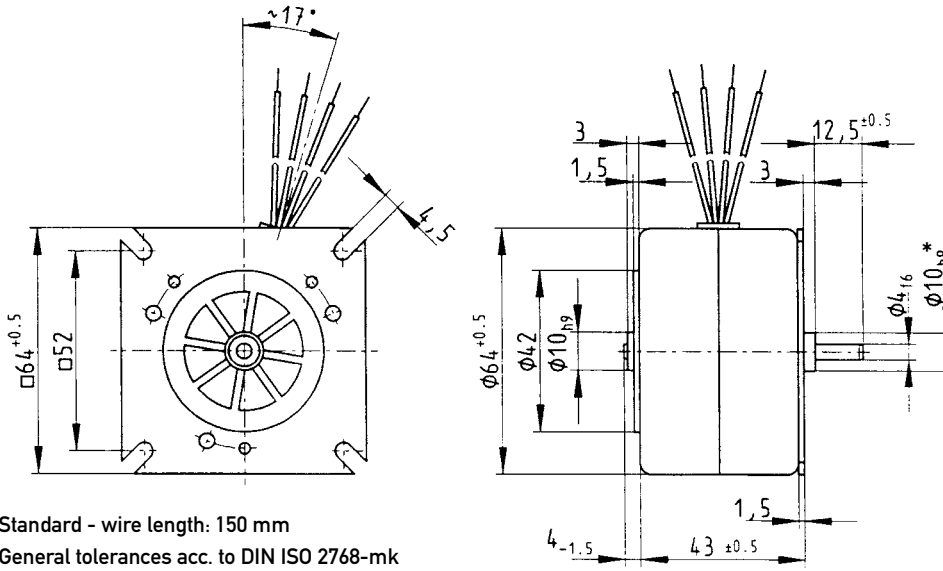
bipolar (ST6444)	Rated voltage U_N	V	4,5		
	Resistance per winding R_{20}	Ω	3,7		
	Step angle	$^\circ$	11,25		
	Holding torque M_H	cNm	45		
	Detent torque M_S	cNm	7		
	Rotor inertia J_R	gcm ²	180		
	Steps per revolution			32	
	Winding temperature increase	K	90		
	Current per winding	A	1,25		
	Inductance per winding	mH	8		
	Power consumption	W	11,5		
Driver mode	Chopper drive				

Circuit diagram Motor connections - bipolar



		clockwise rotation				
A	$\frac{A1}{A2}$	↓	↑	↑	↓	↓
B	$\frac{B1}{B2}$	↑	↑	↓	↓	↑

Dimensions

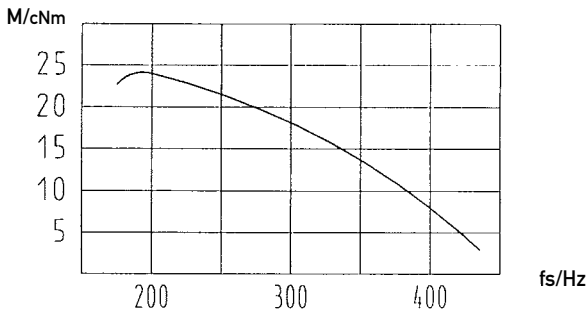


Standard - wire length: 150 mm
General tolerances acc. to DIN ISO 2768-mk

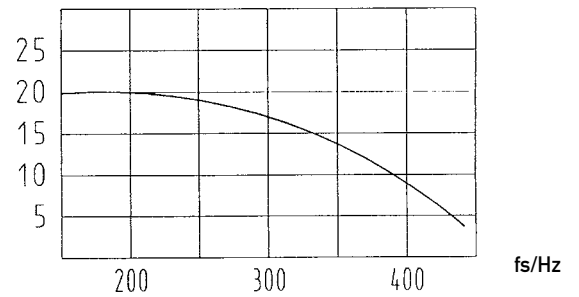
* on request 14h9

Performance Chart (chopper driver)

ST6443 UPD1 (ST6443/7.5/1)



UPJ1 (ST 6443/11.25/1)



ST6444 UPJ5 (ST 6444/11.25)

