

UAT3

Dimensions (mm)	Ø 20 × 17.2
Voltage (V)	12-60
Speed (rpm) 50 Hz	600
60 Hz	720
Pole number	10
Running torque (cNm) 50 Hz	0.32
60 Hz	0.3
Power output (W) 50 Hz	0.20
60 Hz	0.23
Gear combination	on request



Standard Data

Climatic class	„wide-spread“ according to DIN IEC 60721-2-1 : 1992
Ambient temperature operation	°C -20 ... +60
Ambient temperature storage	°C -40 ... +100
Thermal resistance at f=0 R _{therm}	47 K/W
Thermal class	130 (B) according to DIN EN 60085 : 2004
Approval	standard
Mounting	any position
Electrical connection	lead wires AWG28, insulation Ø 0.82 mm
Protection	IP40 according to DIN EN 60529 : 2000
Weight	22 g
Rotor stalling	motor can be stopped when voltage is applied, without being overheated
Bearings	sintered bronze, self-lubricating

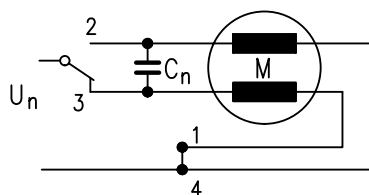
Order Reference

Type	Synchronous Motor	UAT3	3	N	B4	R	E
Rotor shaft, mounting	0 centring 8 mm, mounting plate with screw M2						
	3 centring 8 mm, mounting plate with long holes						
	5 centring 8 mm, mounting plate (for clipping)						
	A centring 6 mm, mounting plate with screw M2						
	E centring 6 mm, mounting plate with long holes						
	G centring 6 mm, mounting plate (for clipping)						
Approval	N Approval Standard						
Voltage/Frequency	See next page						
Direction	reversible						
Cable	E cable 150 mm with Tyco connector CT 173977-4 (other on request)						

Technical Data

Rated frequency	Hz	50	60
Speed n	rpm	600	720
Power consumption	W	1.4	1.4
Power output	W	0.20	0.23
Running torque	cNm	0.32	0.30
Rotor inertia J _R	gcm ²	0.26	
Detent torque M _s	mNm	> 0.6	
Tolerance of voltage		standard power supply system + 10% / - 10%	
Duty cycle		100%	
Winding temperature T _{max}	°C	130	
Direction of rotation		reversible	
Rated voltage U _N	V	24	24
Duty cycle	%	100	100
Resistance R ₂₀	Ω	430	430
Capacitor C _n (50Hz)		3.3	2.7
Winding code	50Hz/60Hz	B4	G4

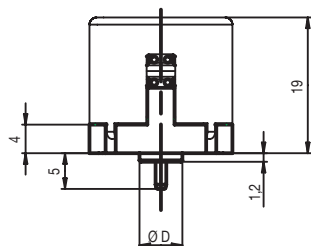
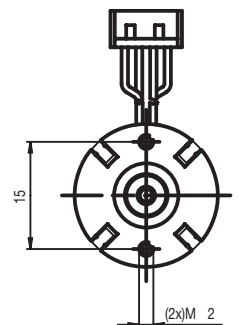
Circuit diagram Parallel circuit



switch to
2 = clockwise rotation
3 = counter clockwise rotation

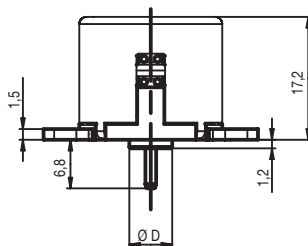
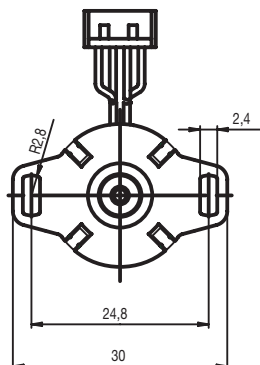
Dimensions

motor type	Ø D	
UAT30	Ø 8	0 -0.05
UAT3A	Ø 6	0 -0.05

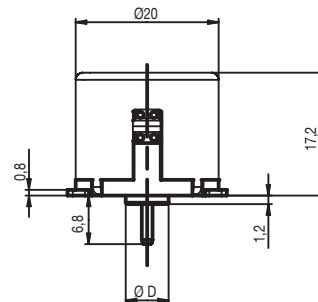
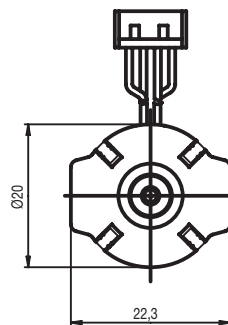


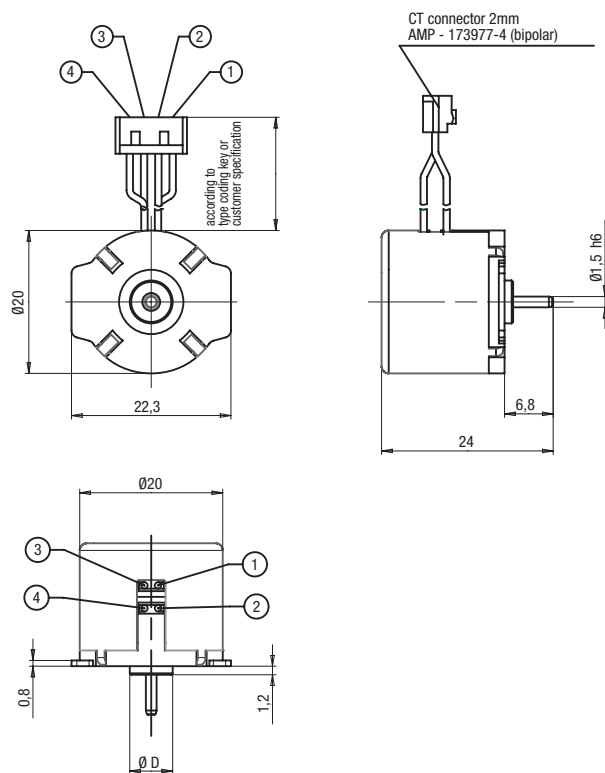
6-FRONT

motor type	Ø D	
UAT33	Ø 8	0 -0.05
UAT3E	Ø 6	0 -0.05



motor type	Ø D	
UAT35	Ø 8	0 -0.05
UAT3G	Ø 6	0 -0.05

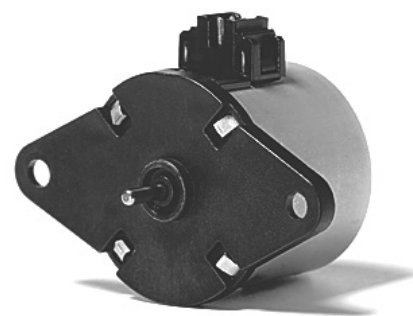




UCM1/7

Dimensions (mm)	Ø 28 x 24
Voltage (V) *	12–230
Speed (rpm) 50 Hz	250
Pole number	24
Running torque (cNm) 50 Hz	1.36–1.98
60 Hz	1.37–1.98
Power output (W) 50 Hz	0.36–0.52
60 Hz	0.43–0.62
Gear combination	D, M, B, F

* regard circuit diagram and connector type



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 _{therm}	29 K/W
Thermal class	130 (B) according to DIN EN 60085 : 2004
Approval	standard
Mounting	any position
Electrical connection	connector type D or N
Protection	IP30 according to DIN EN 60529 : 2000
Weight	54 g
Rotor stalling	motor can be stopped when voltage is applied, without being overheated
Bearings	Sintered bronze, self-lubricating

Order Reference

Type	Synchronous Motor	UCM	1	0	N	B4	R	D
Configuration	1 standard magnet 7 stronger magnet							
Rotor shaft, mounting	3 centring 8 mm, shaft 2.0 mm, screw plate 4 centring 8 mm, shaft 1.5 mm, screw plate 0 centring 8 mm, shaft 2.0 mm, clip 1 centring 8 mm, shaft 1.5 mm, clip	E centring 10 mm, shaft 2.0 mm, screw plate K centring 10 mm, shaft 1.5 mm, screw plate A centring 10 mm, shaft 2.0 mm, clip C centring 10 mm, shaft 1.5 mm, clip						
Approval	N Approval Standard							
Voltage/Frequency	see next pages							
Direction	R reversible							
Connection	D see next pages “Connection Types” and page 145 “Connection Types” for B N							

Technical Data

		UCM1	UCM1	UCM7	UCM7
Rated frequency	Hz	50	60	50	60
Speed n	rpm	250	300	250	300
Detent torque M_s	cNm	0.18	0.18	0.36	0.36
Power consumption	VA	2.2	2.2	2.2	2.2
Rotor inertia J_R	gcm ²	2.2	2.2	2.4	2.4
Tolerance of voltage		standard power supply system +10%/-10%			
Duty cycle		100%			
Winding temperature T_{max}	°C	130			
Direction of rotation		reversible			

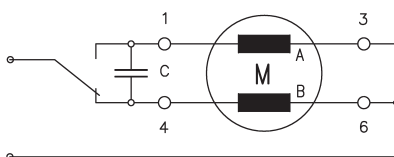
Specific Technical Data Lead Wire Versions

Performance	Running torque	cNm	1.36	1.37	1.71	1.70
	Power output	W	0.36	0.43	0.45	0.53
Capacitors	Rated voltage U_N	V	24	110		
	Duty cycle	%	100	100		
	Resistance R_{20}	Ω	210	5000		
	Capacitor $C_n(50Hz)$	$\mu F/V \pm 10\%$	4.7/40	0.22/200		
	Winding code	50Hz/60Hz	B4/G4	C8/H8		

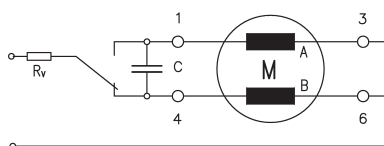
Specific Technical Data Connector Versions

Performance	Running torque	cNm	1.64	1.67	1.98	1.98
	Power output	W	0.43	0.52	0.52	0.62
Capacitors	Rated voltage U_N	V	12	24		
	Duty cycle	%	100	100		
	Resistance R_{20}	Ω	53	210		
	Capacitor C_{50}	$\mu F/V \pm 10\%$	18/20	4.7/40		
	Winding code		B1	B4		

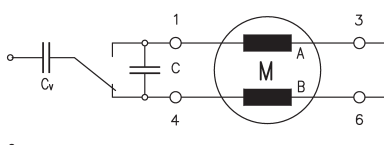
Circuit diagram Parallel circuit 12 V, 24 V, 48 V



Parallel circuit 230 V (only for lead wire versions)
with 110 V motor and resistor R_V



Parallel circuit 230 V (only for lead wire versions)
with 110 V motor and capacitor C_V



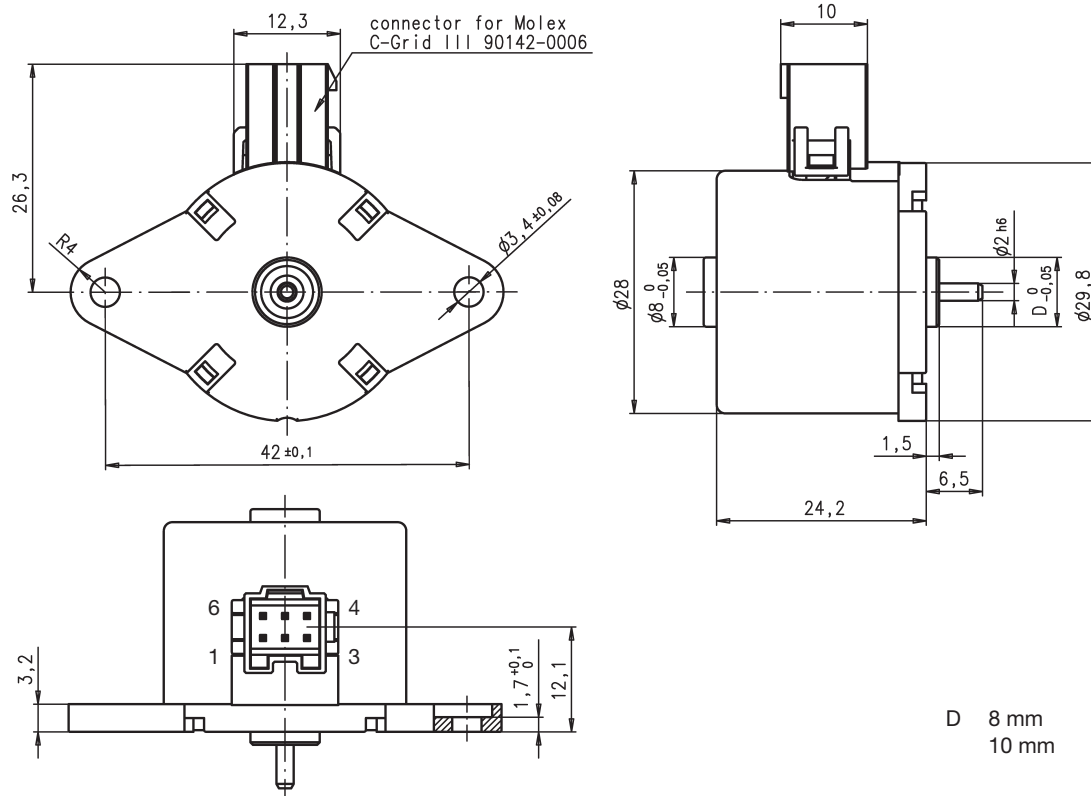
switch to

- 1 clockwise rotation
- 4 counter clockwise rotation
- 6 counter clockwise rotation
(for series circuit)

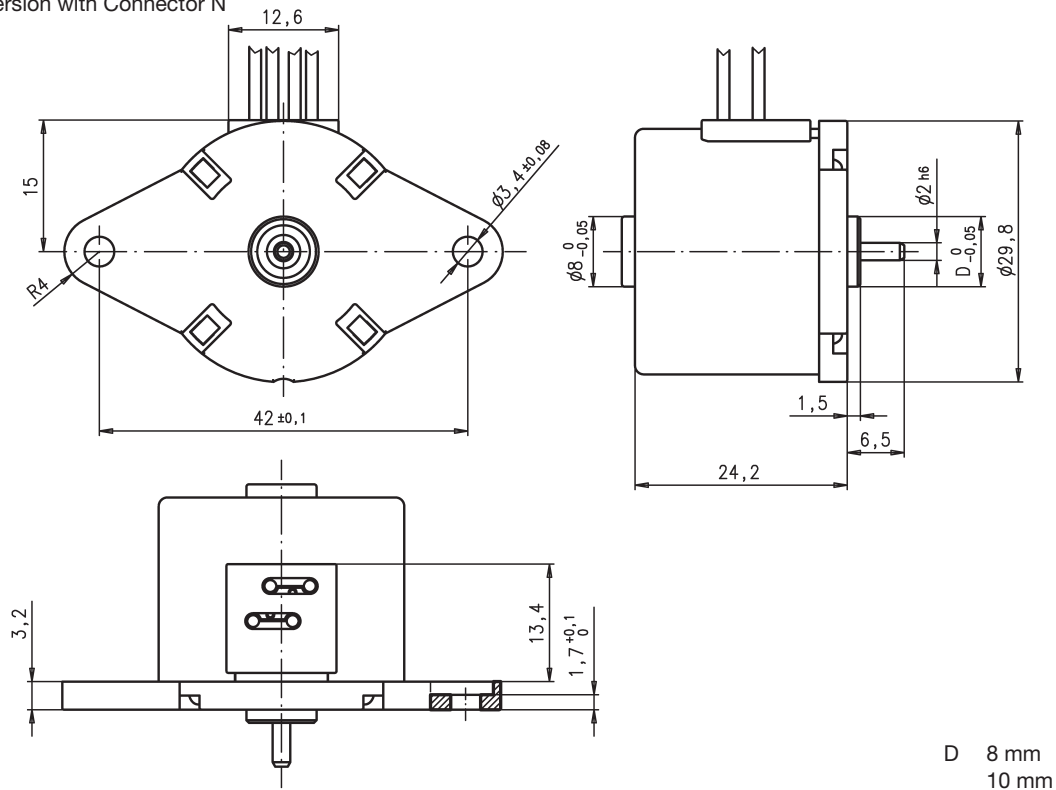
Series resistor $R_V = 5.6 \text{ k}\Omega$, 3 W

Series capacitor $C_V = 0.33 \text{ }\mu\text{F}$, 250 VAC

Dimensions Version with Connector D



Version with Connector N



UCR1/7

Dimensions (mm) Ø 28 x 24

Voltage (V) * 12–230

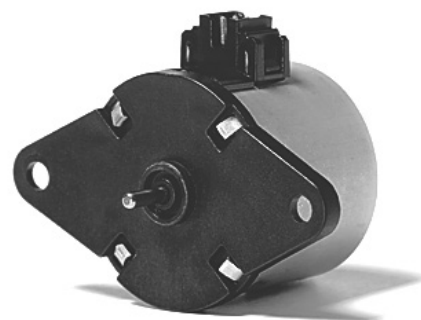
Speed (rpm) 50 Hz 500

Pole number 12

Running torque
(cNm) 50 Hz 0.89–1.41
60 Hz 0.85–1.21

Power output (W)
50 Hz 0.47–0.74
60 Hz 0.53–0.77

Gear combination D, M, B, F



* regard circuit diagram and connector type

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 _{therm}	29 K/W
Thermal class	130 (B) according to DIN EN 60085 : 2004
Approval	standard
Mounting	any position
Electrical connection	connector type D or N
Protection	IP30 according to DIN EN 60529 : 2000
Weight	54 g
Rotor stalling	motor can be stopped when voltage is applied, without being overheated
Bearings	Sintered bronze, self-lubricating

Order Reference

Type	Synchronous Motor	UCR	1	0	N	B4	R	D
Configuration	1 standard magnet 7 stronger magnet							
Rotor shaft, mounting	3 centring 8 mm, shaft 2.0 mm, screw plate 4 centring 8 mm, shaft 1.5 mm, screw plate 0 centring 8 mm, shaft 2.0 mm, clip 1 centring 8 mm, shaft 1.5 mm, clip	E K A C						
Approval	N Approval Standard							
Voltage/Frequency	see next pages							
Direction	R reversible							
Connection	D see next pages "Connection Types" and page 145 "Connection Types" for B N Cable							

Technical Data

		UCR1	UCR1	UCR7	UCR7
Rated frequency	Hz	50	60	50	60
Speed n	rpm	500	600	500	600
Detent torque M_s	cNm	0.2	0.2	0.45	0.45
Power consumption	VA	2.4	2.5	2.3	2.4
Rotor inertia J_R	gcm ²	2.1	2.1	2.4	2.4
Tolerance of voltage		standard power supply system +10%/-10%			
Duty cycle		100%			
Winding temperature T_{max}	°C	130			
Direction of rotation		reversible			

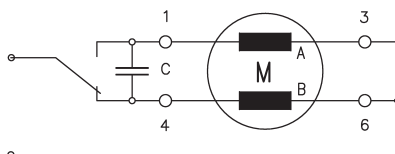
Specific Technical Data Lead Wire Versions

Performance	Running torque	cNm	0.89	0.85	1.41	1.23
	Power output	W	0.47	0.53	0.74	0.77
Capacitors	Rated voltage U_N	V	12	24	110	
	Duty cycle	%	100	100	100	
	Resistance R_{20}	Ω	60	230	5500	
	Capacitor $C_n(50Hz)$	$\mu F/V \pm 10\%$	22/20	5.6/40	0.27/200	
	Winding code	50Hz/60Hz	B1/G1	B4/G4	C8/H8	

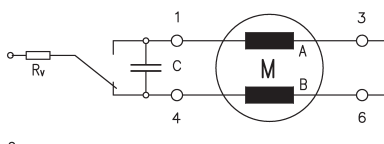
Specific Technical Data Connector Versions

Performance	Running torque	cNm	1.1	1.02	1.41	1.23
	Power output	W	0.58	0.64	0.74	0.77
Capacitors	Rated voltage U_N	V	12	24		
	Duty cycle	%	100	100		
	Resistance R_{20}	Ω	59	230		
	Capacitor $C_n(50Hz)$	$\mu F/V \pm 10\%$	22/20	5.6/40		
	Winding code	50Hz/60Hz	B1	B4		

Circuit diagram Parallel circuit 12 V, 24 V, 48 V, 110 V



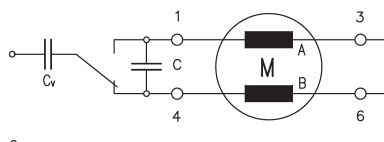
Parallel circuit 230 V (only for lead wire versions)
with 110 V motor and resistor R_v



switch to

- 1 clockwise rotation
- 4 counter clockwise rotation
- 6 counter clockwise rotation
(for series circuit)

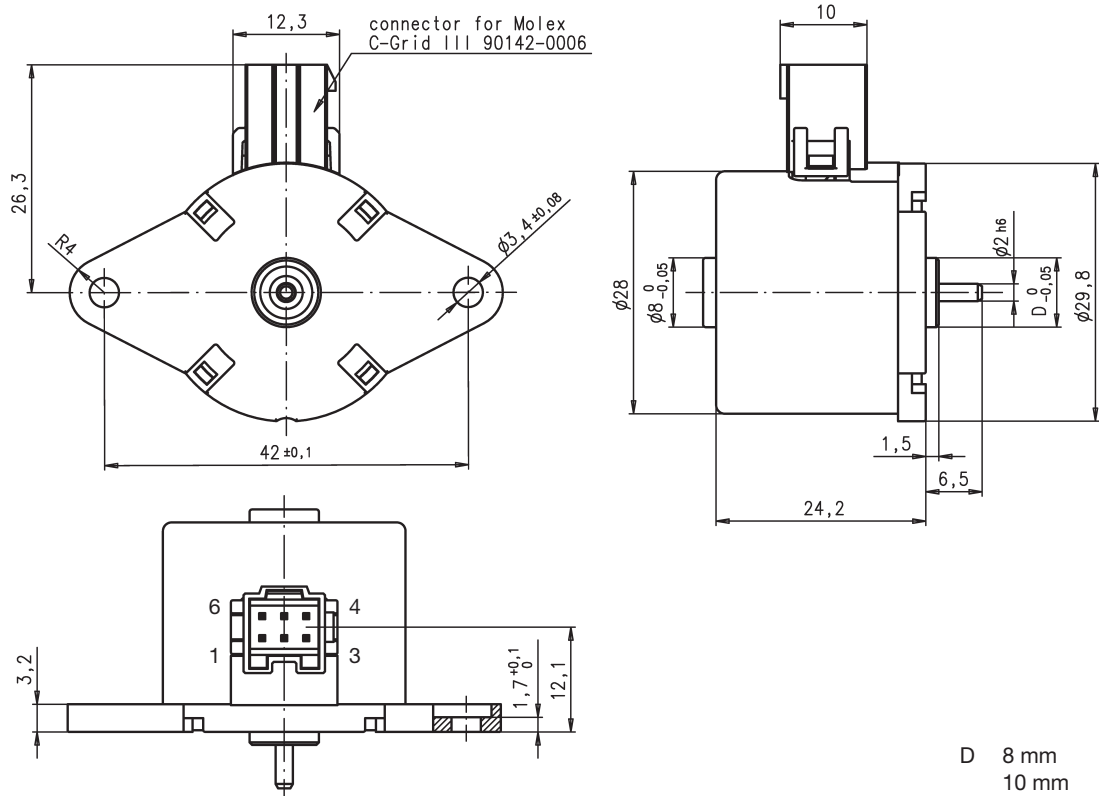
Parallel circuit 230 V (only for lead wire versions)
with 110 V motor and capacitor C_v



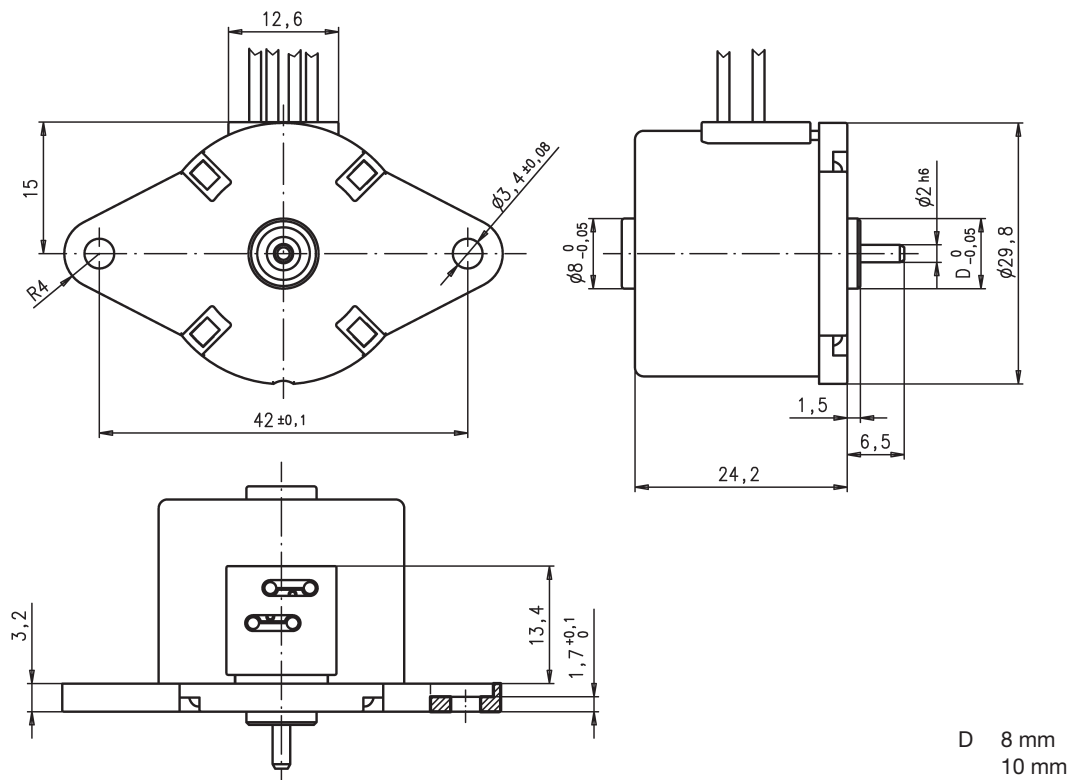
Series resistor $R_v = 5.6 \text{ k}\Omega$, 3 W

Series capacitor $C_v = 0.33 \text{ }\mu\text{F}$, 250 VAC

Dimensions Version with Connector D



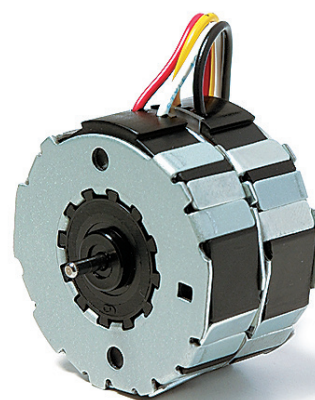
Version with Connector N



UBR1

UBR1

Dimensions (mm)	Ø 36 x 21
Voltage (V)	12–230
Speed (rpm) 50 Hz	250
60 Hz	300
Pole number	24
Running torque (cNm) 50 Hz	0.9
60 Hz	0.9
Power output (W) 50 Hz	0.24
60 Hz	0.28
Gear combination	D, M, B, F, V, J



Standard Data

Climatic class	wide-spread according to DIN IEC 60721-2-1 : 1992
Ambient temperature operation	°C -15...+55
Ambient temperature storage	°C -20...+100
Thermal resistance at f=0 R _{therm}	27 K/W
Thermal class	105 (A) according to DIN EN 60085 : 2004
Approval	standard (UL/CSA on request)
Mounting	any position
Electrical connection	cabl
Protection	IP40 according to DIN EN 60529 : 2000
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	Synchronous Motor	UBR1	0	N	B4	R	E
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						
Voltage/Frequency	See next page						
Direction	reversible						
Cable	E cable 150 mm (other on request)						

Rated frequency	Hz	50	60			
Speed n	rpm	250	300			
Power consumption	W	1.3	1.3			
Power output	W	0.24	0.28			
Running torque	cNm	0.9	0.9			
Rotor inertia J _R	gcm ²	2.8				
Detent torque M _S	cNm	0.22				
Tolerance of voltage		standard power supply system + 10% / - 10%				
Winding temperature T _{max}	°C	105				
Direction of rotation		reversible				
Rated voltage U _N	V	12	24	48	110	230
Duty cycle	%	100	100	100	100	100
Resistance R ₂₀	Ω	104	385	1580	9160	11800
Capacitor C _n (50Hz, 60Hz)	μF/V ±10%	12/20	3.3/34	0.82/70	0.15/170	0.22;0.12/170
Winding code	50Hz/60Hz	B1/G1	B4/G4	C1/H1	D1/J1	D5/J5

Technical drawing of a mechanical part, likely a pump head or valve cover, showing dimensions and tolerances. The drawing includes a top view and a side view. Key dimensions and tolerances are:

- Top view dimensions:
 - Overall width: 42 ± 0.05
 - Overall height: 48
 - Inner diameter: $\varnothing 36$
 - Distance from center to top edge: 6.15
 - Distance from center to bottom edge: 3.6 ± 0.05
- Side view dimensions:
 - Overall height: 48

Technical drawing of a plate cut-out. The drawing shows a side view of a plate with a central cut-out. The dimensions and tolerances are as follows:

- Overall width: $52,5 \pm 0,5$
- Distance from top edge to cut-out center: $48 \begin{smallmatrix} +0 \\ -0,5 \end{smallmatrix}$
- Distance from cut-out center to bottom edge: $48 \begin{smallmatrix} +0 \\ -0,5 \end{smallmatrix}$
- Distance from top edge to cut-out top: $5 \begin{smallmatrix} +0 \\ -0,1 \end{smallmatrix}$
- Distance from cut-out bottom to bottom edge: $5 \begin{smallmatrix} +0 \\ -0,1 \end{smallmatrix}$
- Distance from top edge to cut-out top: $min. 8$
- Distance from cut-out bottom to bottom edge: $max. 25,3$
- Distance from cut-out center to bottom edge: $1...1,8$
- Distance from cut-out center to bottom edge: $max. 2,3$
- Distance from cut-out center to bottom edge: $0,4$
- Distance from cut-out center to bottom edge: $0,4$

$\emptyset Z$	$\emptyset Y$
8	8F8
10	10F8

UBR2

UBR2

Dimensions (mm) Ø 36 x 21

Voltage (V) 12-230

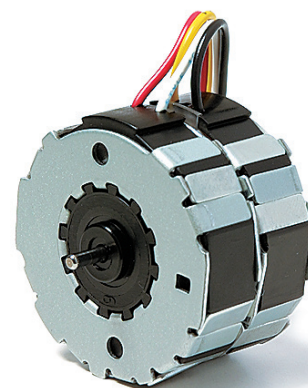
Speed (rpm) 50 Hz 500
60 Hz 600

Pole number 12

Running torque
(cNm) 50 Hz 0.75
60 Hz 0.72

Power output (W)
50 Hz 0.39
60 Hz 0.45

Gear combination D, M, B, F, V, J



Standard Data

Climatic class	wide-spread according to DIN IEC 60721-2-1 : 1992
Ambient temperature operation	°C -15...+55
Ambient temperature storage	°C -20...+100
Thermal resistance at f=0 R _{therm}	27 K/W
Thermal class	105 (A) according to DIN EN 60085 : 2004
Approval	standard (UL/CSA on request)
Mounting	any position
Electrical connection	cabl
Protection	IP40 according to DIN EN 60529 : 2000
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

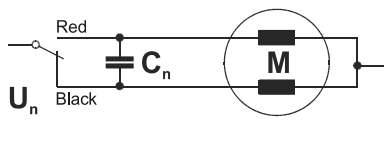
Order Reference

Type	Synchronous Motor					UBR2	0	N	B4	R	E
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									
Voltage/Frequency	See next page										
	reversible										
Direction	E	cable 150 mm (other on request)									
Cable											

Technical Data

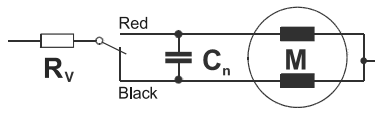
Rated frequency	Hz	50	60			
Speed n	rpm	500	600			
Power consumption	W	1.6	1.6			
Power output	W	0.39	0.45			
Running torque	cNm	0.75	0.72			
Rotor inertia J _R	gcm ²	2.8				
Detent torque M _s	cNm	0.25				
Tolerance of voltage		standard power supply system + 10% / - 10%				
Winding temperature T _{max}	°C	105				
Direction of rotation		reversible				
UBR2 Rated voltage U _N	V	12	24	48	110	230
Duty cycle	%	100	100	100	100	100
Resistance R ₂₀	Ω	87	344	1370	7650	12600
Capacitor C _n (50Hz, 60Hz)	μF/V ±10%	15/20	3.9/40	1/70	0.18/170	0.27;0.22/170
Winding code	50Hz/60Hz	B1/G1	B4/G4	C1/H1	D1/J1	D5/J5
UBR3 Rated voltage U _N	V	12	24	48		
Duty cycle	%	100	100	100		
Resistance R ₂₀	Ω	87	344	1370		
Capacitor C _n (50Hz)	μF/V ±10%	15/20	3.9/40	1/70		
Winding code	50Hz/60Hz	B1/G1	B4/G4	C1/H1		

Circuit diagram Parallel circuit 12V, 24V, 48V, 110V

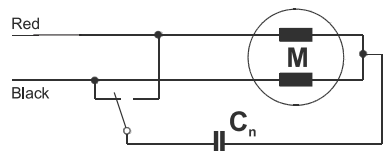


Parallel circuit 230V

R_v=8.2k Ω/1.5W for motors with resistance R₂₀= 7650 Ω, code D1/J1

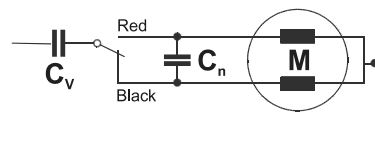


Series circuit 230V (for motors with resistance R₂₀= 12600 Ω)



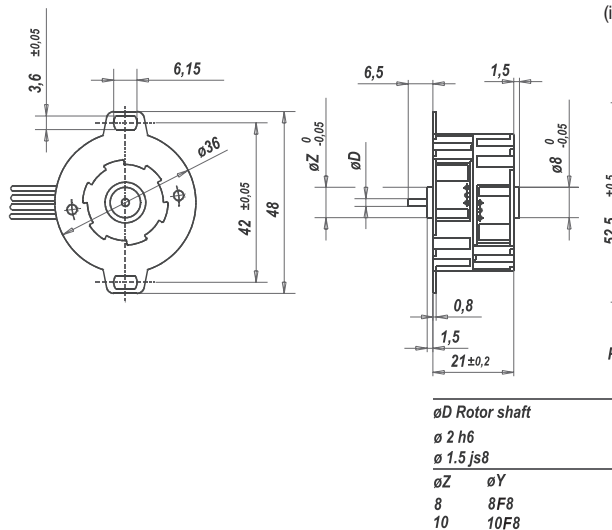
Parallel circuit 230V

C_v=0.22 μF (50Hz)/ 0.18 μF (60Hz)/200 Vac with resistance R₂₀=7650 Ω

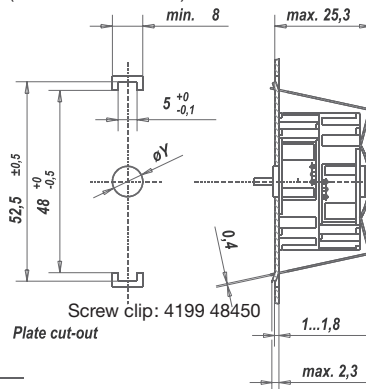


Red = clockwise rotation
Black = counter clockwise rotation

Dimensions Mounting with screw plate



Mounting with snap-on clip
(item no. 4199 48230)



UDS1

Dimensions (mm)	Ø 48 x 18.5
Voltage (V)	6-230
Speed (rpm) 50 Hz	500
60 Hz	600
Pole number	12
Running torque (cNm) 50 Hz	0.9
60 Hz	0.8
Power output (W) 50 Hz	0.5
60 Hz	0.5
Gear combination	D, M, B, F, V, J



Standard Data

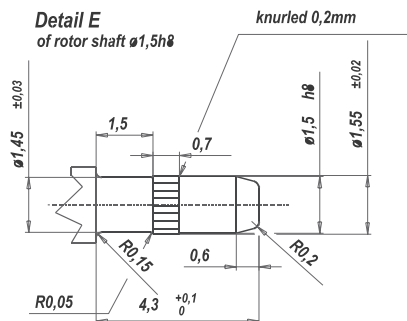
Climatic class	wide-spread according to DIN IEC 60721-2-1 : 1992
Ambient temperature operation	°C -15...+60
Ambient temperature storage	°C -20...+100
Thermal resistance at f=0 R _{therm}	17 K/W
Thermal class	105 (A) according to DIN EN 60085 : 2004 for approval standard 130 (B) according to DIN EN 60085 : 2004 for approval UL/CSA
Approval	standard/UL/CSA
Mounting	any position
Electrical connection	cabl
Protection	IP40 according to DIN EN 60529 : 2000
Weight	102 g
Rotor stalling	motor can be stopped when voltage is applied, without being overheated
Bearings	plastic, self-lubricating
Electric strength	according to DIN EN 60034-1/DIN EN 60335-1

Order Reference

Type	Synchronous Motor	UDS1	0	N	B4	R	N
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 U Approval UL/CSA						
Voltage/Frequency	See next page						
Direction	R clockwise rotation L Counter-clockwise rotation						
Cable	N cable 150 mm (other on request)						

Rated frequency	Hz	50	60										
Speed n	rpm	500	600										
Power consumption*	W	2.4	1.8										
Power output	W	0.5	0.5										
Running torque	cNm	0.9	0.8										
Rotor inertia J _R	gcm ²	11											
Detent torque M _s	cNm	0.27 (in direction of rotation)											
Tolerance of voltage	standard power supply system + 10% / - 10%												
Winding temperature T _{max}	°C	105 for approval Standard (N) 130 for approval UL/CSA											
Direction of rotation	clockwise or counter-clockwise												
Rated voltage U _N	V	6	12	24	36	42	48	60	110	110-120	230	110/230	24/48
Duty cycle	%	100	100	100	100	100	100	100	100	100	100	100	100
Resistance R ₂₀	Ω	5.5	24	78	193	285	330	500	1830	1830	7500	2180/5500	105/260
Winding code		A6/F6	B1/G1	B4/G4	B6/G6	B8/G8	C1/H1	C2/H2	C8/H8	D1/J1	D5/J5	R1/S1	R4/S4
Rated voltage U _N	V	6	12	24	48	100	110	110-120	230	110/230	24/48		
Duty cycle	%	100	100	100	100	100	100	100	100	100	100		
Resistance R ₂₀	Ω	5.5	24	78	330	1350	1830	1830	7500	2180/5500	105/206		
Winding code		A6/F6	B1/G1	B4/G4	C1/H1	C7/H7	C8/H8	D1/J1	D5/J5	R1/S1	R4/S4		
Rated voltage U _N	V	6	12	24	36	42	48	60	110	230	110/230	24/48	
Duty cycle	%	100	100	100	100	100	100	100	100	100	100	100	
Resistance R ₂₀	Ω	5.5	24	78	193	285	330	500	1830	7500	2180/5500	105/260	
Winding code		A6/F6	B1/G1	B4/G4	B6/G6	B8/G8	C1/H1	C2/H2	C8/H8	D5/J5	R1/S1	R4/S4	
Rated voltage U _N	V	12	24	42	48	110-120	230						
Duty cycle	%	100	100	100	100	100	100						
Resistance R ₂₀	Ω	23	98	322	390	2200	8700						
Winding code		B1/G1	B4/G4	B8/G8	C1/H1	D1/J1	D5/J5						

Dimensions

[illegible]

Technical drawing of a door hinge assembly. The drawing shows a side view of a hinge mounted on a door edge. Key dimensions and components are labeled:

- $\phi 6 \pm 0,05$: Dimension of the hinge pin.
- $\phi 2 \pm 0,05$: Dimension of the hinge pin hole.
- ϕD : Dimension of the hinge body.
- $0,4$: Dimension of the hinge body thickness.
- 21 : Dimension of the hinge body width.
- $1 \dots 1,5$: Dimension of the hinge body height.
- $\max. 2$: Maximum dimension of the hinge body height.
- E : Label for the hinge body.
- A_L : Label for the hinge pin hole.
- F_L : Label for the hinge pin hole.

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UDR1

Dimensions (mm) Ø 48 x 24

Voltage (V) 12-230

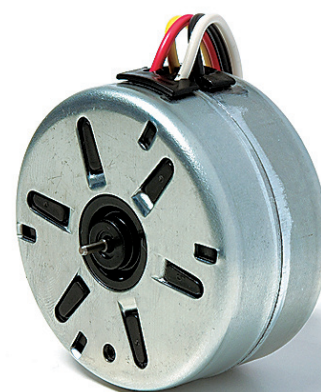
Speed (rpm) 50 Hz 500
60 Hz 600

Pole number 12

Running torque
(cNm) 50 Hz 1.5
60 Hz 1.4

Power output (W)
50 Hz 0.77
60 Hz 0.87

Gear combination D, M, B, F, V, J



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 _{therm}	18 K/W
Thermal class	105 (A) according to DIN EN 60085 : 2004
Approval	standard/UL/CSA
Mounting	any position
Electrical connection	cabl
Protection	IP40 according to DIN EN 60529 : 2000
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

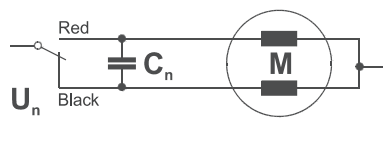
Order Reference

Type	Synchronous Motor	UDR1	00	N	B4	R	N
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 U Approval UL/CSA						
Voltage/Frequency	See next page						
Direction	reversible						
Cable	N cable 150 mm (other on request)						

Technical Data

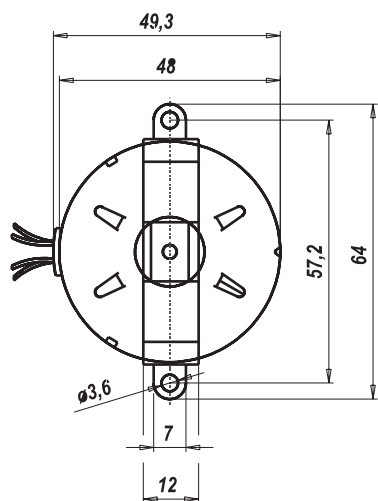
Rated frequency	Hz	50	60			
Speed n	rpm	500	600			
Power consumption	W	2.1	2.2			
Power output	W	0.77	0.87			
Running torque	cNm	1.5	1.4			
Rotor inertia J _R	gcm ²	6.3				
Detent torque M _s	cNm	0.35				
Tolerance of voltage		standard power supply system + 10% / - 10%				
Winding temperature T _{max}	°C	105				
Direction of rotation		reversible				
Rated voltage U _N	V	12	24	48	110-120	230
Duty cycle	%	100	100	100	100	100
Resistance R ₂₀	Ω	50	200	800	5000	19000
Capacitor C _n (50Hz, 60Hz)	μF/V ±10%	27;22/20	6.8;4.7/34	1.5/70	0.27/170	0.068/340
Winding code	50Hz/60Hz	B1/G1	B4/G4	C1/H1	D1/J1	D5/J5

Circuit diagram Parallel circuit

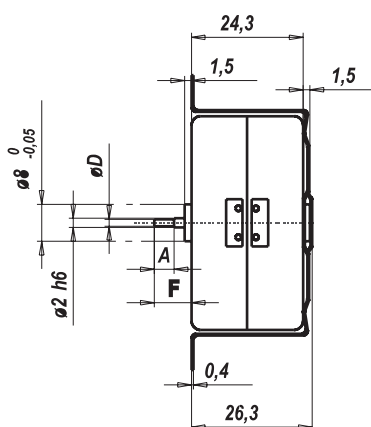


Red = clockwise rotation
Black = counter clockwise rotation

Dimensions



Mounting with screw clip
(item no. 4186 48080)



Mounting with snap-on clip
(item no. 4199 48040)

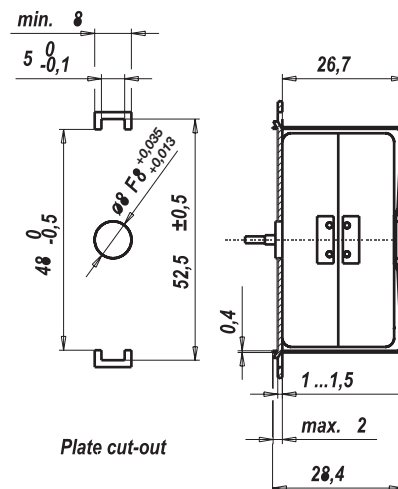


Plate cut-out

øD Rotor shaft

ø 1.5 js8 ^{+0,007}/_{-0,007}

ø 2 h6 ⁰/_{-0,006}

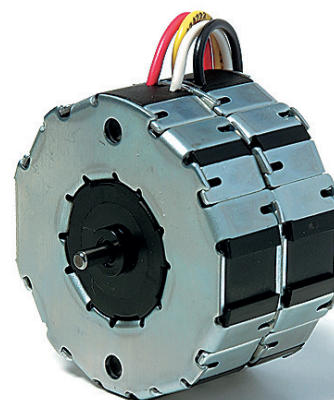
Dimension A Dimension F

4,3 6,5

— 8,2

UFM1

Dimensions (mm)	Ø 52 x 28
Voltage (V)	12-230
Speed (rpm) 50 Hz	250
60 Hz	300
Pole number	24
Running torque (cNm)	
50 Hz	3.2
60 Hz	3.0
Power output (W)	
50 Hz	0.8
60 Hz	0.8
Gear combination	D, M, B, F, V, J ($i \leq 2k$), O, P



Standard Data

Climatic class	wide-spread according to DIN IEC 60721-2-1 : 1992
Ambient temperature operation	°C -15...+55
Ambient temperature storage	°C -20...+100
Thermal resistance at $f=0$ R_{therm}	13 K/W
Thermal class	105 (A) according to DIN EN 60085 : 2004 (130 / B on request)
Approval	standard (UL/CSA on request)
Mounting	any position
Electrical connection	lead wires AWG22, insulation Ø 1.72 ± 0.08 mm
Protection	IP40 according to DIN EN 60529 : 2000
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

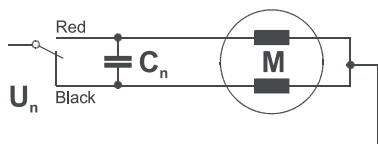
Order Reference

Type	Synchronous Motor	UFM1	0	N	B4	R	N
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	B centring 10 mm, shaft 3.0 mm, clip					
	4 centring 8 mm, shaft 2.0 mm, screw plate	A centring 10 mm, shaft 2.0 mm, clip					
	5 centring 8 mm, shaft 1.5 mm, screw plate	C centring 10 mm, shaft 1.5 mm, clip					
Approval	N Approval Standard						
Voltage/Frequency	See next page						
Direction	reversible						
Cable	N cable 150 mm (other on request)						

Technical Data

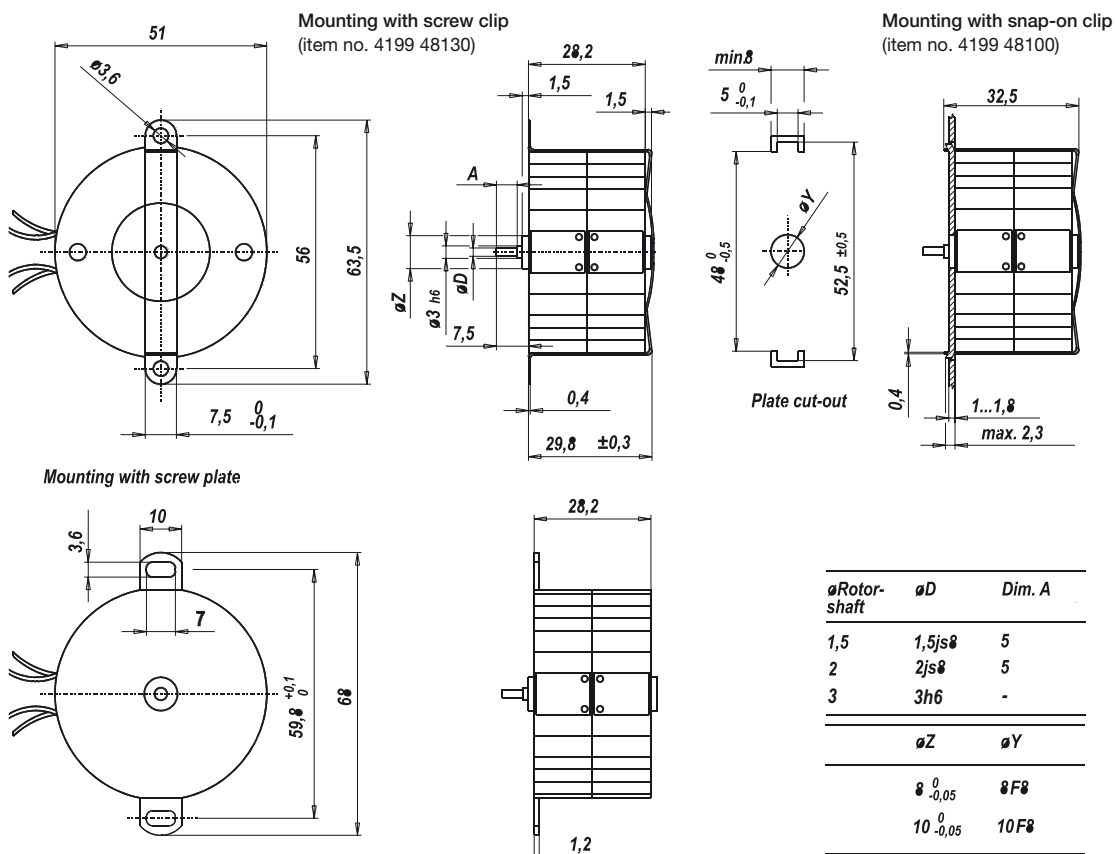
Rated frequency	Hz	50	60			
Speed n	rpm	250	300			
Power consumption	W	4	3.1			
Power output	W	0.8	0.8			
Running torque	cNm	3.2	3.0			
Rotor inertia J _R	gcm ²	14.4				
Detent torque M _s	cNm	0.45				
Tolerance of voltage		standard power supply system + 10% / - 10%				
Winding temperature T _{max}	°C	105				
Direction of rotation		reversible				
Rated voltage U _N	V	12	24	48	110-120	230
Duty cycle	%	100	100	100	100	100
Resistance R ₂₀	Ω	15	59	240	1390	5690
Capacitor C _n (50Hz, 60Hz)	μF/V ±10%	39;33/20	10;8.2/45	2.2;1.8/70	0.39;0.33/230	0.1;0.082/440
Winding code	50Hz/60Hz	B1/G1	B4/G4	C1/H1	D1/J1	D5/J5

Circuit diagram Parallel circuit



Red = clockwise rotation
Black = counter clockwise rotation

Dimensions



UFR1/UFR3/UFR4

Dimensions (mm) Ø 52 x 28 / Ø 52 x 42 / Ø 52 x 56

Voltage (V) 12-230

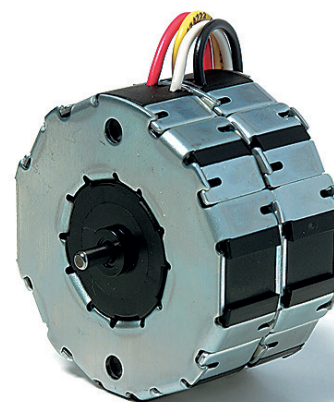
Speed (rpm) 50 Hz 500
60 Hz 600

Pole number 12

Running torque (cNm)
50 Hz 2.6 / 3.4 / 5.3
60 Hz 2.3 / 2.8 / 4.7

Power output (W)
50 Hz 1.4 / 1.8 / 2.8
60 Hz 1.4 / 1.8 / 3.0

Gear combination D, M, B, F, V, J ($i \leq 2k$), O, P



UFR1

Standard Data

Climatic class	wide-spread according to DIN IEC 60721-2-1 : 1992
Ambient temperature operation	°C -15...+55
Ambient temperature storage	°C -20...+100
Thermal resistance at $f=0$ R_{therm}	11 K/W (UFR1), 7 K/W (UFR4)
Thermal class	105 (A) according to DIN EN 60085 : 2004 (130 / B on request)
Approval	standard (UL/CSA on request)
Mounting	any position
Electrical connection	lead wires AWG22, insulation Ø 1.72 ± 0.08 mm
Protection	IP40 according to DIN EN 60529 : 2000
Weight	180 g (UFR1), 370 g (UFR4)
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

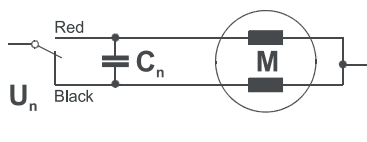
Type	Synchronous Motor	UFR	1	0	N	B4	R	N
Configuration	1 Two coils 3 Three coils 4 Four coils							
Rotor shaft, mounting	0 centring 8 mm, shaft 3.0 mm, clip 1 centring 8 mm, shaft 2.0 mm, clip 2 centring 8 mm, shaft 1.5 mm, clip 3 centring 8 mm, shaft 3.0 mm, screw plate* 4 centring 8 mm, shaft 2.0 mm, screw plate* 5 centring 8 mm, shaft 1.5 mm, screw plate*	B centring 10 mm, shaft 3.0 mm, clip A centring 10 mm, shaft 2.0 mm, clip C centring 10 mm, shaft 1.5 mm, clip D centring 12 mm, shaft 3.0 mm, clip E centring 10 mm, shaft 3.0 mm, screw plate* K centring 10 mm, shaft 2.0 mm, screw plate* M centring 10 mm, shaft 1.5 mm, screw plate*						
Approval	N Approval Standard							
Voltage/Frequency	See next page							
Direction	reversible							
Cable	N cable 150 mm (other on request)							

* screw plate not for UFR3 and UFR4

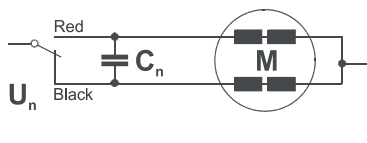
Technical Data

UFR1	Rated frequency	Hz	50	60			
	Speed n	rpm	500	600			
	Power output P _{mech}	W	1.4	1.4			
	Running torque M _n	cNm	2.6	2.3			
	Power consumption P _{el}	W	3.3	3.6			
	Detent torque M _s	cNm	0.46				
	Rotor inertia J _R	gcm ²	14.2				
	Rated voltage U _N	V	12	24	48	110	230
	Duty cycle	%	100	100	100	100	100
	Resistance R ₂₀	Ω	27	105	400	2400	9100
	Capacitor C _n (50Hz, 60Hz)	μF/V ±10%	39;33/24	10;8.2/45	2.7;2.2/90	0.47;0.39/230	0.12;0.10/440
UFR3	Rated frequency	Hz	50	60			
	Speed n	rpm	500	600			
	Power output P _{mech}	W	1.8	1.8			
	Running torque M _n	cNm	3.4	2.8			
	Power consumption P _{el}	W	6.1	5.1			
	Detent torque M _s	cNm	0.54				
	Rotor inertia J _R	gcm ²	17				
	Rated voltage U _N	V	12	24	48	110	230
	Duty cycle	%	100	100	100	100	100
	Resistance R ₂₀	Ω	19	70	280	1520	5850
	Capacitor C _n (50Hz, 60Hz)	μF/V ±10%	150;100/12	39;27/24	10;6.8/48	1.8;1.2/110	0.47;0.33/230
UFR4	Rated frequency	Hz	50	60			
	Speed n	rpm	500	600			
	Power output P _{mech}	W	2.8	3			
	Running torque M _n	cNm	5.3	4.7			
	Power consumption P _{el}	W	6.4	6.9			
	Detent torque M _s	cNm	0.8				
	Rotor inertia J _R	gcm ²	24.2				
	Rated voltage U _N	V	24	48	110	230	
	Duty cycle	%	100	100	100	100	
	Resistance R ₂₀	Ω	56	210	1200	4800	
	Capacitor C _n (50Hz, 60Hz)	μF/V ±10%	18;15/45	4.7;3.9/90	0.82;0.68/200	0.22;0.18/400	
Tolerance of voltage			standard power supply system + 10% ... - 10%				
Winding temperature T _{max} °C			105				
Direction of rotation			reversible				

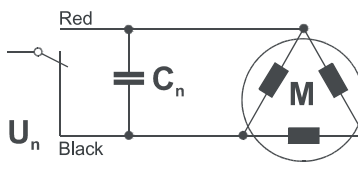
Circuit diagram UFR1 Parallel circuit



UFR4 Parallel circuit



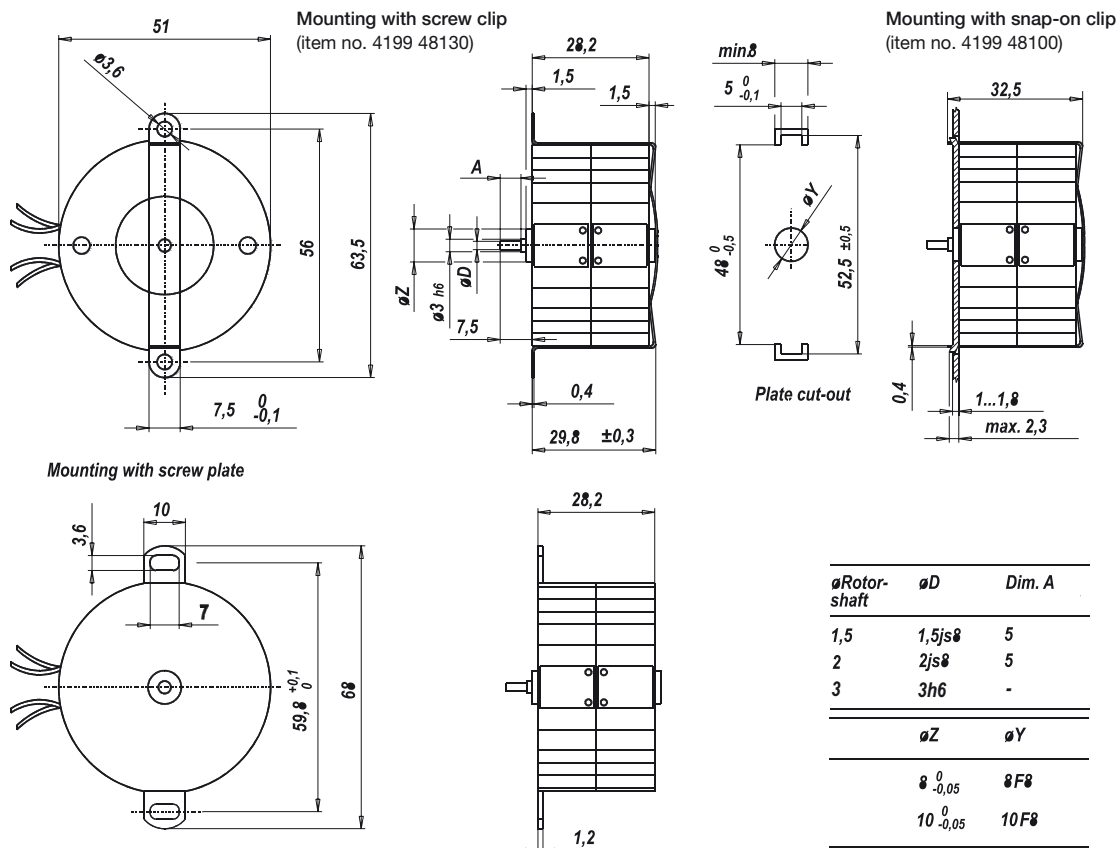
UFR3 Parallel circuit



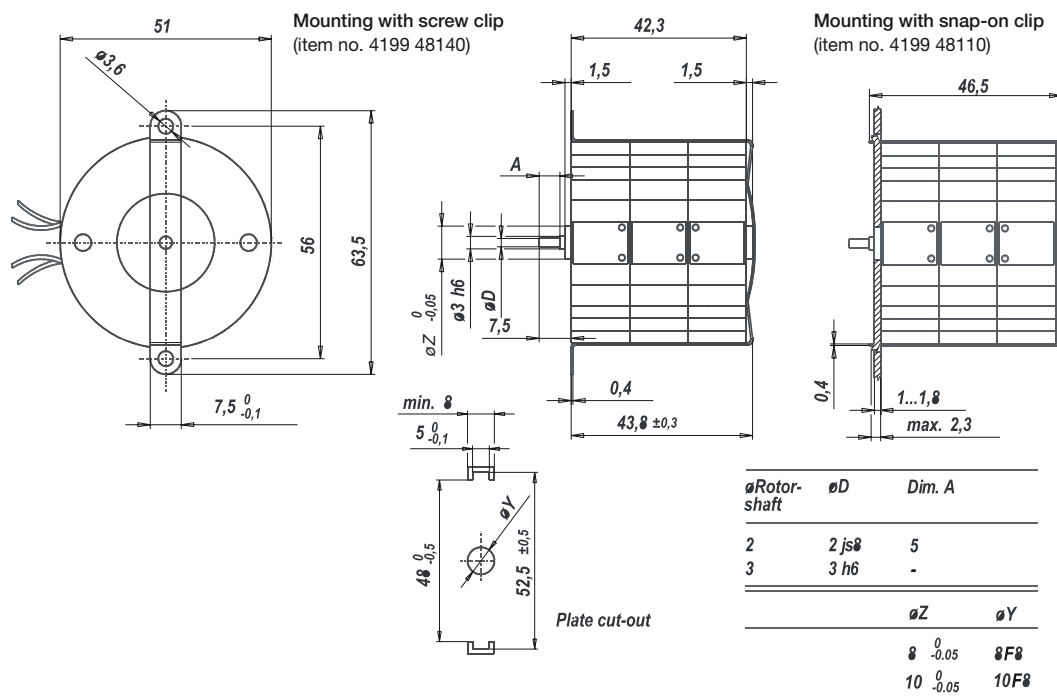
Red = clockwise rotation
Black = counter clockwise rotation

Dimensions

UFR1

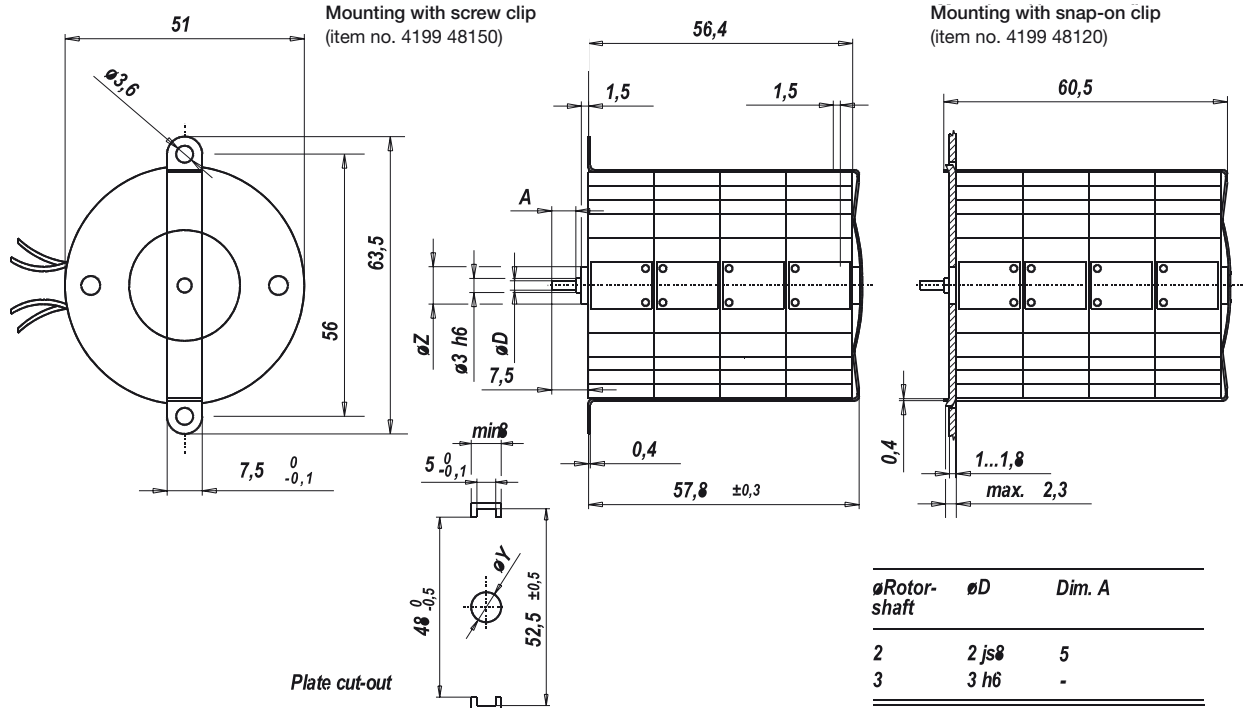


UFR3



Dimensions

UFR4

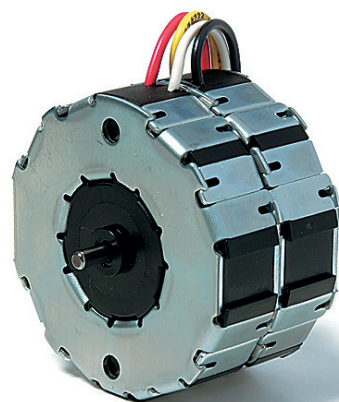


ØRotor-shaft	ØD	Dim. A
2	2 js8	5
3	3 h6	-

ØZ	ØY
8 $\begin{smallmatrix} 0 \\ -0.05 \end{smallmatrix}$	8 F8
10 $\begin{smallmatrix} 0 \\ -0.05 \end{smallmatrix}$	10 F8

UFU1

Dimensions (mm)	Ø 52 x 28
Voltage (V)	24–230
Speed (rpm) 50 Hz	375
60 Hz	450
Pole number	16
Running torque (cNm)	
50 Hz	3.3
60 Hz	3.0
Power output (W)	
50 Hz	1.3
60 Hz	1.4
Gear combination	D, M, B, F, V, J ($i \leq 2k$), O, P



Standard Data

Climatic class	wide-spread according to DIN IEC 60721-2-1 : 1992
Ambient temperature operation	°C -15...+55
Ambient temperature storage	°C -20...+100
Thermal resistance at $f=0$ R_{therm}	13 K/W
Thermal class	105 (A) according to DIN EN 60085 : 2004 (130 / B on request)
Approval	standard
Mounting	any position
Electrical connection	cable
Protection	IP40 according to DIN EN 60529 : 2000
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

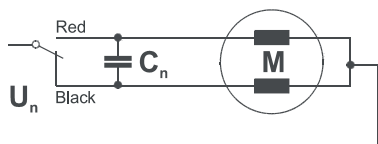
Order Reference

Type	Synchronous Motor	UFU1	00	N	B4	R	N
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	B centring 10 mm, shaft 3.0 mm, clip					
	4 centring 8 mm, shaft 2.0 mm, screw plate	A centring 10 mm, shaft 2.0 mm, clip					
	5 centring 8 mm, shaft 1.5 mm, screw plate	C centring 10 mm, shaft 1.5 mm, clip					
		D centring 12 mm, shaft 3.0 mm, clip					
Approval	N Approval Standard						
Voltage/Frequency	See next page						
Direction	reversible						
Cable	N cable 150 mm (other on request)						

Technical Data

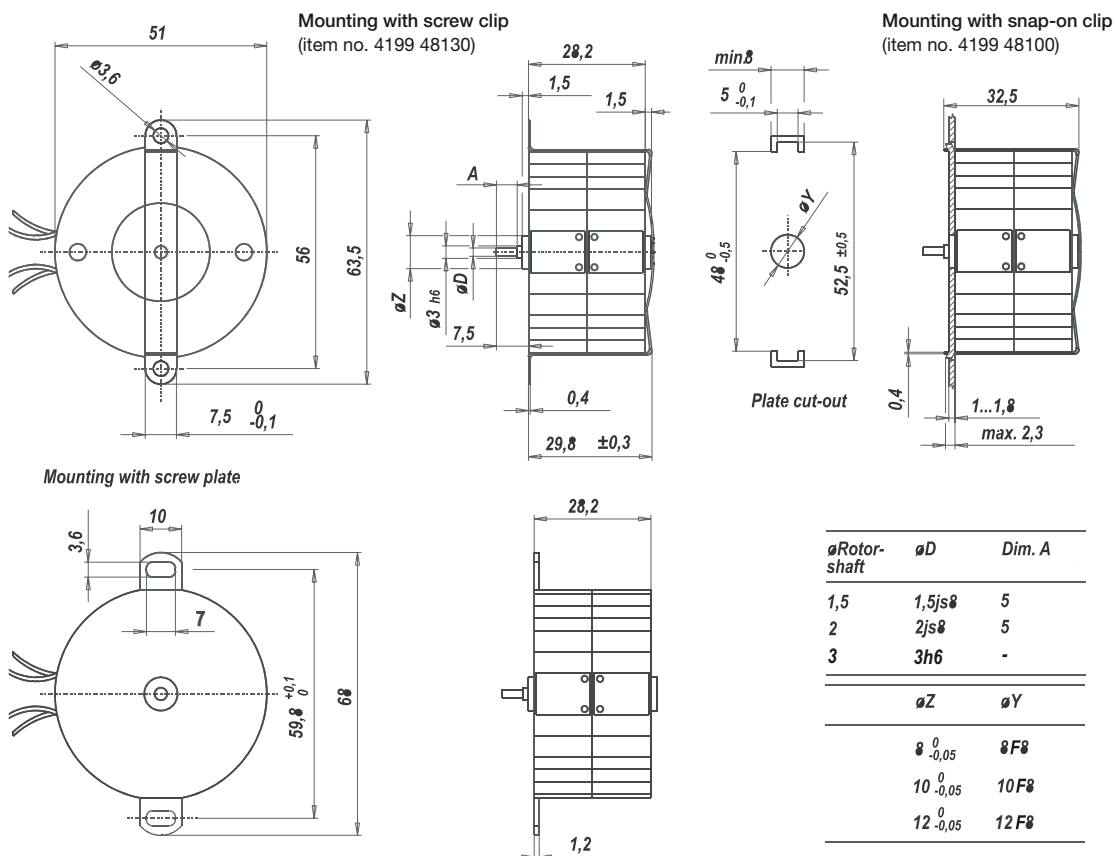
Rated frequency	Hz	50	60	
Speed n	rpm	375	450	
Power consumption	W	3.2	3.5	
Power output	W	1.3	1.4	
Running torque	cNm	3.3	3.0	
Rotor inertia J_R	gcm ²	14.4		
Detent torque M_s	cNm	0.45		
Tolerance of voltage		standard power supply system + 10% / - 10%		
Winding temperature T_{max}	°C	105		
Direction of rotation		reversible		
Rated voltage U_N	V	24	110	230
Duty cycle	%	100	100	100
Resistance R_{20}	Ω	95	2200	8400
Capacitor C_n (50Hz, 60Hz)	$\mu F/V \pm 10\%$	10;8.2/48	0.47;0.39/220	0.1;0.082/460
Winding code	50Hz/60Hz	B4/G4	C8/H8	D5/J5

Circuit diagram Parallel circuit



Red = clockwise rotation
Black = counter clockwise rotation

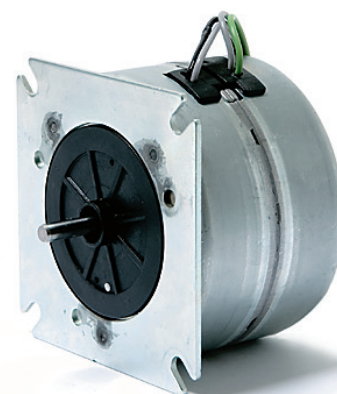
Dimensions



Lead wires: AWG 22 (0.34 mm²), insulation diameter $\varnothing 1.72 \pm 0.08$ mm, 6 mm stripped

UP (SM6443; SM6444)

Dimensions (mm)	Ø 64 x 43
Voltage (V)	12–230
Speed (rpm) 50 Hz	375
60 Hz	450
Pole number	16
Running torque (cNm) 50 Hz	13–18.5 (UPU1); 28–35 (UPU5)
60 Hz	11–17 (UPU1); 21–30 (UPU5)
Power output (W) 50 Hz	5.1–7.3 (UPU1); 11–13.8 (UPU5)
60 Hz	5.2–8.0 (UPU1); 9.9–14.2 (UPU5)
Gear combination	O, P, R



Standard Data

Climatic class	wide-spread according to DIN IEC 60721-2-1 : 1992
Ambient temperature operation	°C -15 ... +40
Ambient temperature storage	°C -20 ... +100
Thermal class	130 (B) according to DIN EN 60085 : 2004
Approval	standard
Mounting	any position
Electrical connection	lead wires AWG22, insulation Ø 1.6 ± 0.1 mm
Protection	IP30 according to DIN EN 60529 : 2000
Weight	500 g (UPU1); 550 g (UPU5)
Rotor stalling	motor can be stopped when voltage is applied, without being overheated
Bearings	Sintered bronze, self-lubricating

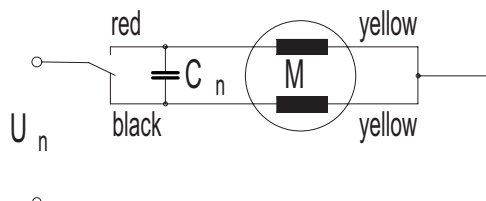
Order Reference

Type	Synchronous Motor	UPU	1	1	N	B4	R	E
Configuration	1 standard magnet							
	5 stronger magnet							
Rotor shaft, mounting	1 centring 10 mm, shaft length 8,1 mm, screw plate							
	2 centring 10 mm, shaft length 15,5 mm, screw plate							
	A centring 14 mm, shaft length 8,1 mm, screw plate							
	C centring 14 mm, shaft length 15,5 mm, screw plate							
Approval	N standard							
Voltage/Frequency	see next page							
Direction	R reversible							
Cable	E 150 mm (other upon request)							

Technical Data

UPU1		Standard			S2 version (Z20)	
Rated frequency	Hz	50	60		50	60
Speed	rpm	375	450		375	450
Running torque Mn	cNm	13	11		18,5	17
Power output	W	5,1	5,2		7,3	8
Power consumption	VA	11,7	12,65		18	21
Nominal current at 230 V	mA	51	55		78,2	91,3
Max. permissible ext. inertia	gcm ²	100	50		130	60
Detent torque MS	cNm	2	2		2	2
Winding temperature increase	K	95	100		90 (S2 20 min)	
Weight	g	500	500		500	500
Standard windings						
Rated voltage U _N	V	24	115	230		
Duty cycle	%	100	100	100		
Resistance R ₂₀	Ω	26	560	2450		
Winding code		B4/G4	D0/J0	D5/J5		
UPU5		Special version (Z21)			Standard	
Rated frequency	Hz	50	60		50	60
Speed	rpm	375	450		375	450
Running torque Mn	cNm	28	21		35	30
Power output	W	11	9,9		13,8	14,2
Power consumption	VA	26	28		31	33,5
Nominal current at 230 V	mA	113	122		135	145
Max. permissible ext. inertia	gcm ²	500	350		600	400
Detent torque MS	cNm	7	7		7	7
Winding temperature increase	K	85 (S2 6,5 min)	85 (S2 6,5 min)		95 (S2 5 min)	95 (S2 5 min)
Weight	g	550	550		550	550
Standard windings						
Rated voltage U _N	V	24	48	115	230	
Duty cycle	%					
Resistance R ₂₀	Ω	9,5	37	230	810	
Capacitor C ₅₀	μF/V ±10%	82/63	20/160	3,3/250	0,82/500	
Winding code		B4/G4	C1/H1	D0/J0	D5/J5	

Circuit diagram Clockwise rotation



Dimensions mounting dimensions UP with screw plate

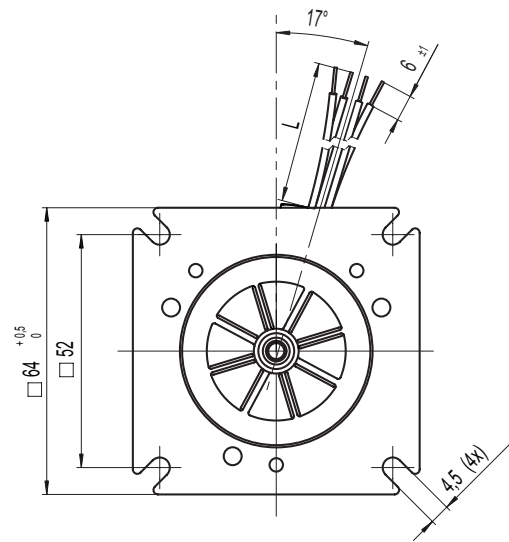
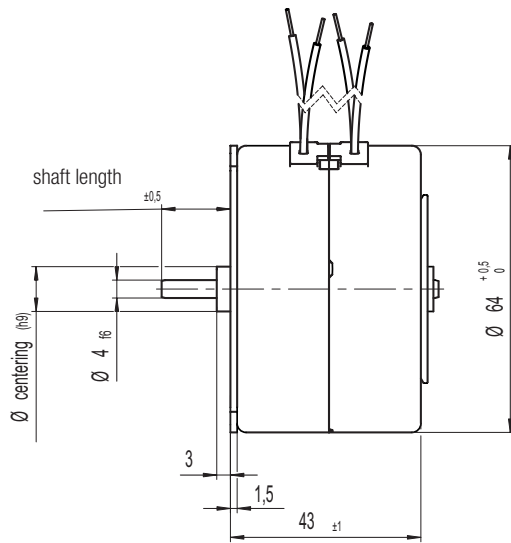
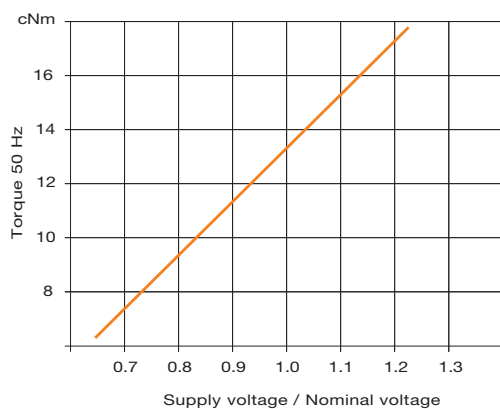


Chart: Torque versus Voltage

UPU1



UPU1 S2 version (Z20)

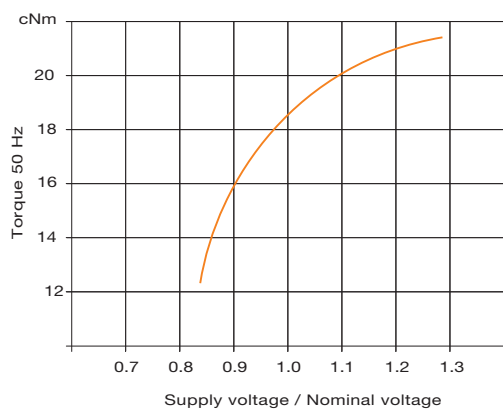
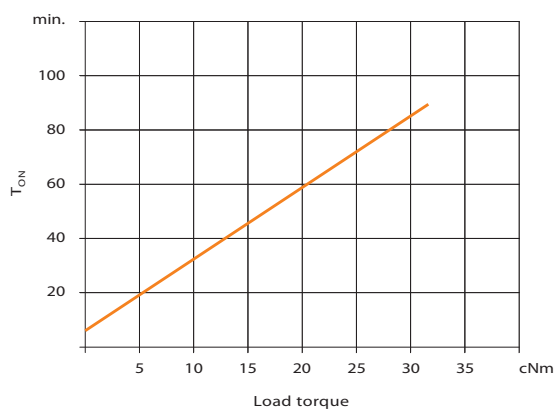


Chart: Possible S2 ON time versus load torque

UPU5 special version (Z21)



UPU5 standard

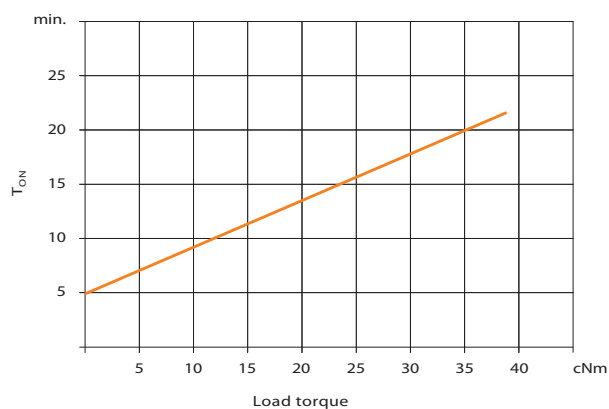
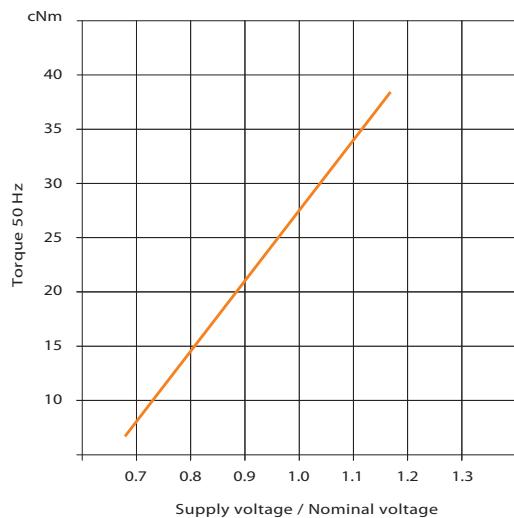


Chart: Torque versus Voltage

UPU5 special version (Z21)



UPU5 standard

