

stepper motor

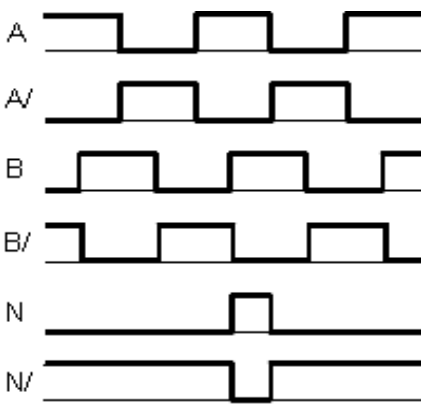


- 2-phase hybrid stepper motor (bipolar)
- high protection class
- with plug or stranded wires
- optional with encoder / brake

part number (not configurable, only for illustration)

MOT	AN	S	060	020	056	M	A	AAAA	
									specifics
									AAAA standard
									AAAC incremental encoder
									AAAD incremental encoder and brake
									options
									A without
									C encoder
									D encoder and brake
									motor connection
									M metric plug
									L stranded wire
									flange dimension
									028 28mm (NEMA11)
									042 42mm (NEMA17)
									056 56mm (NEMA23)
									060 60mm (NEMA23XL)
									086 86mm (NEMA34)
									holding torque
									001 0,1Nm
									005 0,5Nm
									020 2,0Nm
									035 3,5Nm
									059 5,9Nm
									max voltage
									060 60VDC
									motor type
									S stepper motor
									type
									AN version
									product group
									MOT motor

technical data						
flange dimension		28(NEMA11)	42(NEMA17)	56(NEMA23)	60(NEMA23XL)	86(NEMA34)
motor						
max voltage	[VDC]	60	60	60	60	60
nominal voltage	[VDC]	24-48	24-48	24-48	24-48	24-48
nominal current	[A]	1,0	1,8	4,2	4,2	6,4
holding torque	[Nm]	0,12	0,5	2,0	3,5	5,9
detent torque	[Nm]	0,004	0,022	0,068	0,075	0,210
step angle	[°]	1,8 ±5%	1,8 ±5%	1,8 ±5%	1,8 ±5%	1,8 ±5%
resistance / phase	[Ω]	2,30 ±10%	1,75 ±10%	0,50 ±10%	0,65 ±10%	0,33 ±10%
inductance / phase	[mH]	1,80 ±20%	3,30 ±20%	2,20 ±20%	3,20 ±20%	3,00 ±20%
moment of inertia / rotor	[kgcm ²]	0,018	0,082	0,48	0,84	2,70
max. shaft load axial	[N]	7	7	15	15	65
max. shaft load radial	[N]	20	20	52	63	200

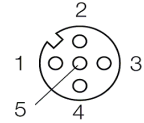
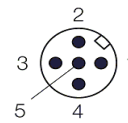
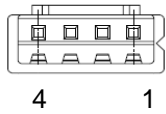
encoder		
operating voltage	[VDC]	5
impulse / turn		500
zero impulse / index		yes
line-driver		RS422 protocol
signal sequence (motor rotation clockwise)	CW	

brake						
operating voltage	[VDC]	-	24 ±10%	24 ±10%	24 ±10%	24 ±10%
wattage	[W]	-	8	10	10	11
holding torque	[Nm]	-	0,4	1,0	1,0	2,0
moment of inertia	[kgcm ²]	-	0,01	0,02	0,02	0,07
operating condition		The brake may closed not till then the motor idleness.				

weight						
stranded wires	[kg]	0,20	0,38	1,04	1,45	-
plug	[kg]	0,22	0,43	1,12	1,56	3,20
encoder	[kg]	0,27	0,45	1,14	1,58	3,30
encoder and brake	[kg]	-	0,58	1,36	1,82	3,60

operating data		
ambient temperature	[°C]	-10 ...+50
max temperature rise	[°C]	80
insulation class		B
humidity (not condensing)	[%]	85
protection class engine case		IP65 (shaft seal IP52), motor with stranded wires IP40
CE		EMV guideline

pin assignment wire motor flange dimension 28,42,56,60(NEMA11,17,23,23XL) **pin assignment M12 motor** flange dimension 28,42,56,60(NEMA11,17,23,23XL)

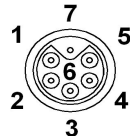
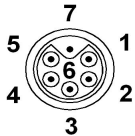


motor bipolar		motor cable	
JST XHP-4		wires*/ cable	
pin	signal	coil	color
1	A	1	white
2	A/		brown
3	B	2	blue
4	B/		black

* wire length 300mm

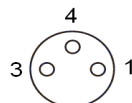
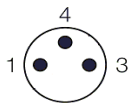
motor bipolar		motor cable	
M12 5-pole		M12 5-pole	
pin	signal	coil	color
1	A/	1	brown
2	A		white
3	B	2	blue
4	B/		black
5	PE		green/yellow
housing	shielding		-

pin assignment M17 motor flange dimension 86(NEMA34)



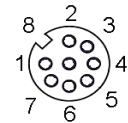
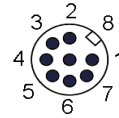
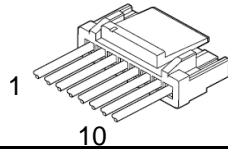
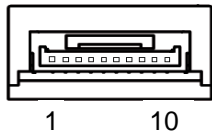
motor bipolar		motor cable	
M17 7-pole		M17 7-pole	
pin	signal	coil	number
1	A/	1	1
2	A		2
3	B	2	3
4	B/		4
5	brake 24V		5
6	brake 0V		6
7	PE		green/yellow
housing	shielding		shielding

pin assignment brake flange dimension 42,56,60(NEMA17,23,23XL)



brake		brake cable	
M8 3-pole		M8 3-pole	
pin	signal	color	
1	brake (24V)	brown	
3	0V	blue	
4	-	black	

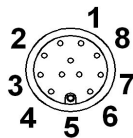
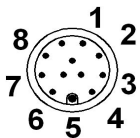
pin assignmen wire encoder flange dimension 28(NEMA11) **pin assignmen M12 encoder** flange dimension 42,56,60(NEMA17,23,23XL)



encoder connector		encoder cable
JST / SM10B-GHS-TB		JST / GHR-10V-S
pin	signal	color
1	shielding	shielding
2	A	white
3	A/	brown
4	B/	green
5	B	yellow
6	N/	grey
7	N	pink
8	GND	blue
9	5VDC	red
10	shielding	shielding

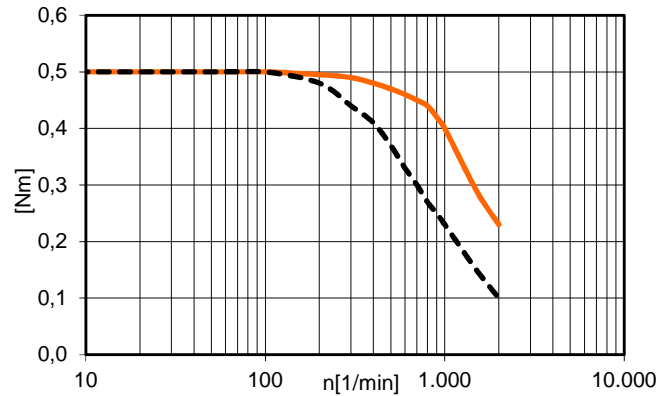
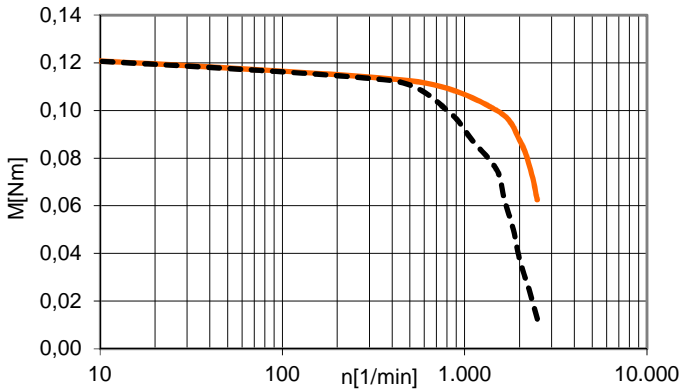
encoder		encoder cable
M12 8-pole		M12 8-pole
pin	signal	color
1	A	white
2	A/	brown
3	B	green
4	B/	yellow
5	0V	grey
6	N/	pink
7	N	blue
8	5V DC	red
housing	shielding	shielding

pin assignmen M17 encoder flange dimension 86(NEMA34)

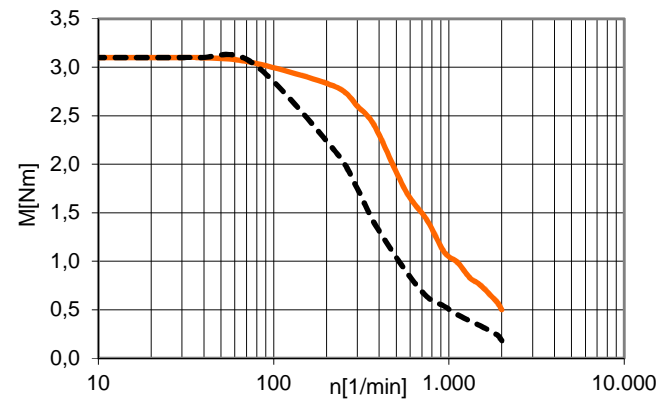
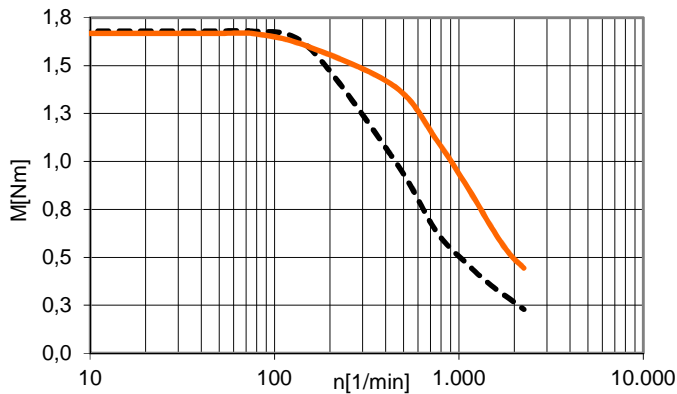


encoder		encoder cable
M17 12-pole		M17 12-pole
pin	signal	color
1	A	brown
2	A/	green
3	B	blue
4	B/	violet
5	0V	white 0,5 [□]
6	N/	grey
7	N	pink
8	5V DC	brown 0,5 [□]
9	-	-
10	-	-
11	-	-
12	-	-
housing	shielding	shielding

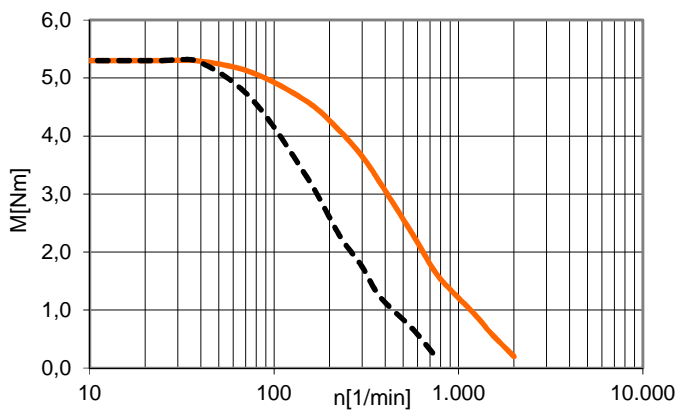
characteristic flange dimension 28 (NEMA11) MOT-AN-S-060-001-028-...	flange dimension 42 (NEMA17) MOT-AN-S-060-005-042-...
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flange dimension 56 (NEMA23) MOT-AN-S-060-020-056-...	flange dimension 60 (NEMA23XL) MOT-AN-S-060-035-060-...
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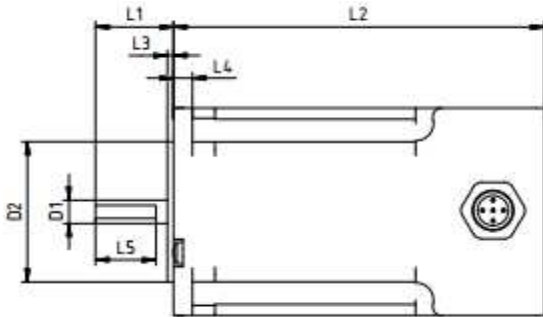


flange dimension 86 (NEMA34) MOT-AN-S-060-059-086-...

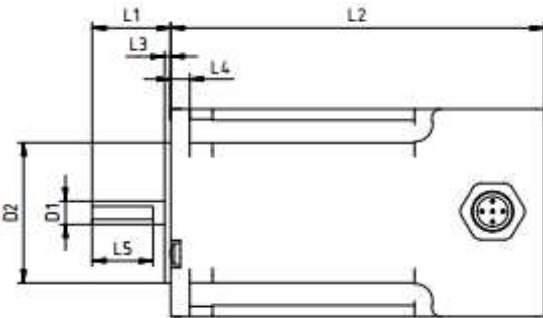


- - - - - 24VDC	— 48 VDC	characteristic based on quarter step mode
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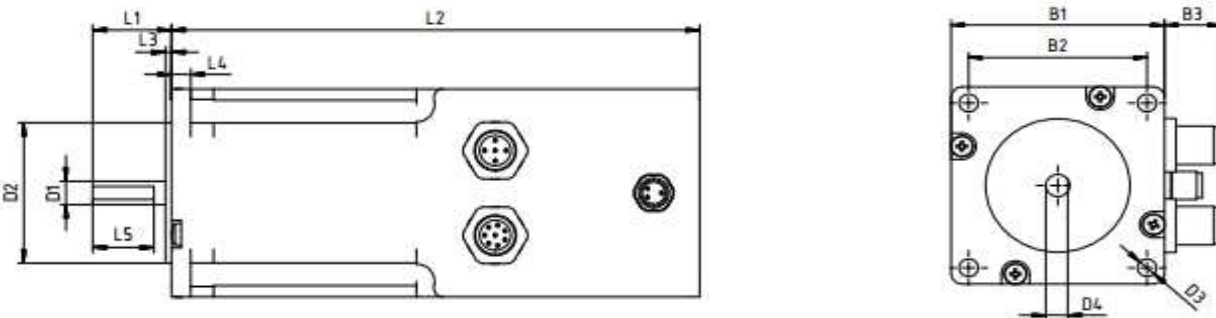
dimension
MOT-AN-S-060-...-L-A-AAAA / MOT-AN-S-060-...-M-A-AAAA



MOT-AN-S-060-...-L-C-AAAC / MOT-AN-S-060-...-M-C-AAAC



MOT-AN-S-060-...-M-D-AAAD



type	B1 [mm]	B2 [mm]	B3 [mm]	D1 Ø [mm]	D2 Ø [mm]	D3 Ø [mm]	D4 [mm]	L1 [mm]	L2 [mm]	L3 [mm]	L4 [mm]	L5 [mm]
MOT-AN-S-060-001-028-L-A-AAAA	28,0	23,00	-	5,00	22,00	M2,5	4,5	20,0	50	2,0	-	15,0
MOT-AN-S-060-001-028-M-A-AAAA	28,0	23,00	13	5,00	22,00	M2,5	4,5	20,0	70	2,0	-	15,0
MOT-AN-S-060-001-028-L-C-AAAC	28,0	23,00	-	5,00	22,00	M2,5	4,5	20,0	60	2,0	-	15,0
MOT-AN-S-060-005-042-L-A-AAAA	42,3	31,00	-	5,00	22,00	M3	4,5	24,0	49	2,0	-	19,0
MOT-AN-S-060-005-042-M-A-AAAA	42,3	31,00	13	5,00	22,00	M3	4,5	24,0	70	2,0	-	19,0
MOT-AN-S-060-005-042-M-C-AAAC	42,3	31,00	13	5,00	22,00	M3	4,5	24,0	70	2,0	-	19,0
MOT-AN-S-060-005-042-M-D-AAAD	42,3	31,00	13	5,00	22,00	M3	4,5	24,0	115	2,0	-	19,0
MOT-AN-S-060-020-056-L-A-AAAA	56,4	47,14	-	6,35	38,10	5,0	5,8	20,6	76	1,6	5	16,0
MOT-AN-S-060-020-056-M-A-AAAA	56,4	47,14	13	6,35	38,10	5,0	5,8	20,6	98	1,6	5	16,0
MOT-AN-S-060-020-056-M-C-AAAC	56,4	47,14	13	6,35	38,10	5,0	5,8	20,6	98	1,6	5	16,0
MOT-AN-S-060-020-056-M-D-AAAD	56,4	47,14	13	6,35	38,10	5,0	5,8	20,6	138	1,6	5	16,0
MOT-AN-S-060-035-060-L-A-AAAA	60,0	47,14	9	8,00	38,10	4,5	7,5	20,6	88	1,6	7	16,0
MOT-AN-S-060-035-060-M-A-AAAA	60,0	47,14	13	8,00	38,10	4,5	7,5	20,6	110	1,6	7	16,0
MOT-AN-S-060-035-060-M-C-AAAC	60,0	47,14	13	8,00	38,10	4,5	7,5	20,6	110	1,6	7	16,0
MOT-AN-S-060-035-060-M-D-AAAD	60,0	47,14	13	8,00	38,10	4,5	7,5	20,6	150	1,6	7	16,0
MOT-AN-S-060-059-086-M-A-AAAA	85,8	69,50	37	14,00	73,02	6,6	13,0	37,0	118	2,0	8	32,0
MOT-AN-S-060-059-086-M-C-AAAC	85,8	69,50	37	14,00	73,02	6,6	13,0	37,0	118	2,0	8	32,0
MOT-AN-S-060-059-086-M-D-AAAD	85,8	69,50	37	14,00	73,02	6,6	13,0	37,0	188	2,0	8	32,0

connecting cable				
part number	outer jacket	type	cable length	plug
flange dimension 28(NEMA11), 42(NEMA17), 56(NEMA23), 60(NEMA23XL)				
motor cable Ø: 5,5 mm / bending radius moved < 10m travel distance: min. 5 x d				
MAT9043737	TPE	CF9-CF.INI	3	straight
MAT9043738	TPE	CF9-CF.INI	5	straight
MAT9043740	TPE	CF9-CF.INI	10	straight
MAT9043742	TPE	CF9-CF.INI	3	angulate
MAT9043743	TPE	CF9-CF.INI	5	angulate
MAT9043745	TPE	CF9-CF.INI	10	angulate

encoder cable Ø: 7 mm / bending radius moved < 10m travel distance: min. 10 x d				
MAT90432594-3	PVC	CF240	3	straight
MAT90432594-5	PVC	CF240	5	straight
MAT90432594-10	PVC	CF240	10	straight
MAT90436430-3	PVC	CF240	3	angulate
MAT90436430-5	PVC	CF240	5	angulate
MAT90436430-10	PVC	CF240	10	angulate

flange dimension 86(NEMA34)				
motor cable Ø: 10,5 mm / bending radius moved < 10m travel distance: min. 6,8 x d				
MAT90439520-3	PUR	CF78.UL	3	straight
MAT90439520-5	PUR	CF78.UL	5	straight
MAT90439520-10	PUR	CF78.UL	10	straight

encoder cable Ø: 8 mm / bending radius moved < 10m travel distance: min.. 10 x d				
MAT90439519-3	PVC	CF211	3	straight
MAT90439519-5	PVC	CF211	5	straight
MAT90439519-10	PVC	CF211	10	straight

flange dimension 42(NEMA17), 56(NEMA23), 60(NEMA23XL)				
brake cable Ø: 4,5 mm / bending radius moved < 10m travel distance: min. 5 x d				
MAT9043716	TPE	CF9-CF.INI	3	straight
MAT9043717	TPE	CF9-CF.INI	5	straight
MAT9043719	TPE	CF9-CF.INI	10	straight
MAT9043724	TPE	CF9-CF.INI	3	angulate
MAT9043725	TPE	CF9-CF.INI	5	angulate
MAT9043727	TPE	CF9-CF.INI	10	angulate

cable wire motor				
part number	outer jacket	type	cable length	plug
flange dimension 28(NEMA11), 42(NEMA17), 56(NEMA23), 60(NEMA23XL)				
motor (extension) cable Ø: 5,5 mm / bending radius moved < 10m travel distance: min. 5 x d				
MAT90490015-3	TPE	CF9.INI	3	straight
MAT90490015-5	TPE	CF9.INI	5	straight

encoder 28(NEMA11) cable Ø: 7,5 mm / bending radius moved < 10m travel distance: min. 6,8 x d				
MAT90450903-3	TPE	CF11	3	straight
MAT90450903-5	TPE	CF11	5	straight

straight



angulate



component part

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motor flange



spacer



coupling



initiator / initiator bracket

