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

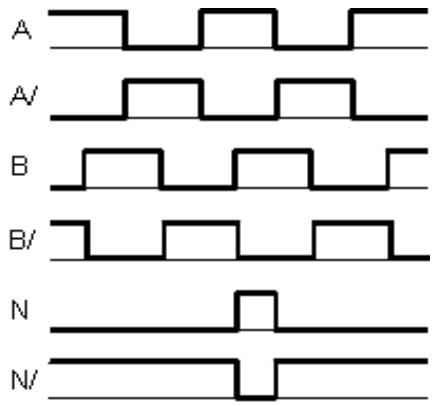
max voltage	
060	60VDC

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	[kgcm²]	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

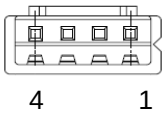
encoder (incremental)		
operating voltage	[VDC]	5
impulse / turn		500
zero impulse / index		yes
line-driver		RS422 protocol
signal sequence (motor rotation clockwise)	CW	

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
A **brake-grinding-process** is necessary for the initial start-up or if the brake was inactive for a long time.		Let the motor run at 200 rpm with the brake open, then apply the brake five times for 0.5 s.				
moment of inertia	[kgcm²]	-	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

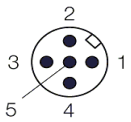
pin assignment wire motor
flange dimension 28,42,56,60(NEMA11,17,23,23XL)

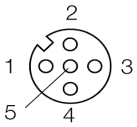


motor bipolar			**motor cable**
JST XHP-4			wires*/ cable
pin	signal	coil	color
1	A	1	white
2	A/		brown
3	B	2	blue
4	B/		black

* wire length 300mm

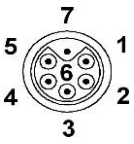
pin assignment M12 motor
flange dimension 28,42,56,60(NEMA11,17,23,23XL)

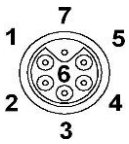




motor bipolar			**motor cable**
M12 5-pole			M12 5-pole
pin	signal	coil	color
1	A/	1	brown
2	A		white
3	B	2	blue
4	B/		black
5	PE		green/yellow
housing	shielding		-

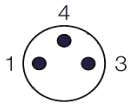
pin assignment M17 motor
flange dimension 86(NEMA34)

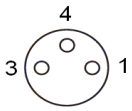




motor bipolar			**motor cable**
M17 7-pole			M17 7-pole
pin	signal	coil	number
1	A/	1	1
2	A		2
3	B	2	3
4	B/		4
5	brake 24V		5
6	brake 0V		6
7	PE		green/yellow
housing	shielding		shielding

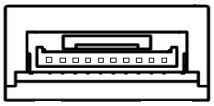
pin assignmen brake
flange dimension 42,56,60(NEMA17,23,23XL)

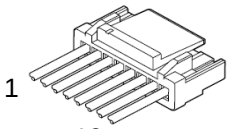




brake		**brake cable**
M8 3-pole		M8 3-pole
pin	signal	color
1	brake (24V)	brown
3	0V	blue
4	-	black

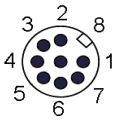
pin assignmen wire encoder
flange dimension 28(NEMA11)

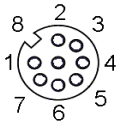




encoder connector		encoder cable
JST / SM10B-GHS-TB		JST / GHR-10V-S
pin	signal	color
1	shielding	shielding
2	A	white
3	A/	brown
4	B/	green
5	B	yellow
6	N/	grey
7	N	pink
8	0V	blue
9	5VDC	red
10	shielding	shielding

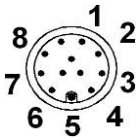
pin assignmen M12 encoder
flange dimension 42,56,60(NEMA17,23,23XL)

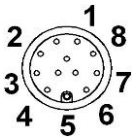




encoder		encoder cable
M12 8-pole		M12 8-pole
pin	signal	color
1	A	white
2	A/	brown
3	B	green
4	B/	yellow
5	0V	grey
6	N/	pink
7	N	blue
8	5V DC	red
housing	shielding	shielding

pin assignmen M17 encoder
flange dimension 86(NEMA34)

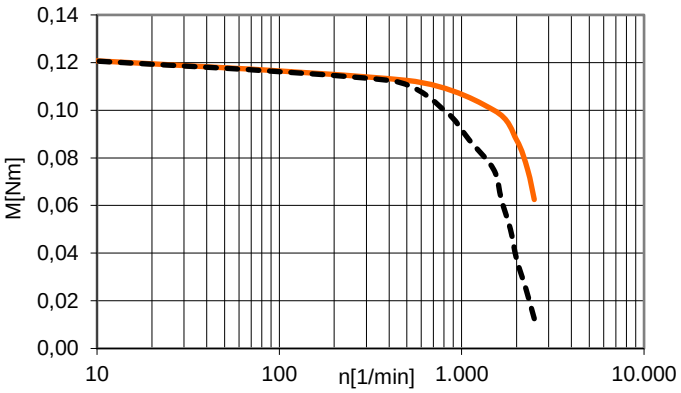




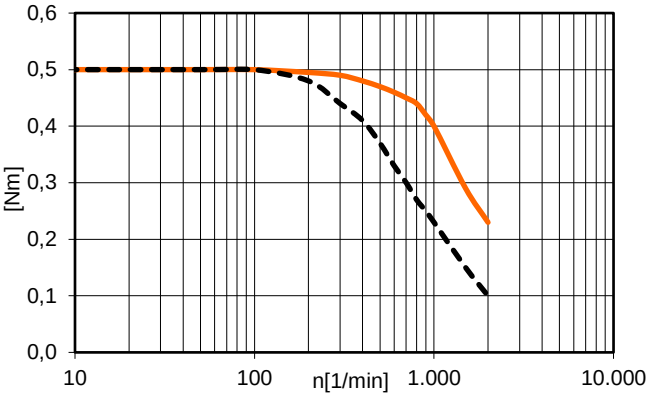
encoder		encoder cable
M17 12-pole		M17 12-pole
pin	signal	color
1	A	brown
2	A/	green
3	B	blue
4	B/	violet
5	0V	white 0,5□
6	N/	grey
7	N	pink
8	5V DC	brown 0,5□
9	-	-
10	-	-
11	-	-
12	-	-
housing	shielding	shielding

characteristic

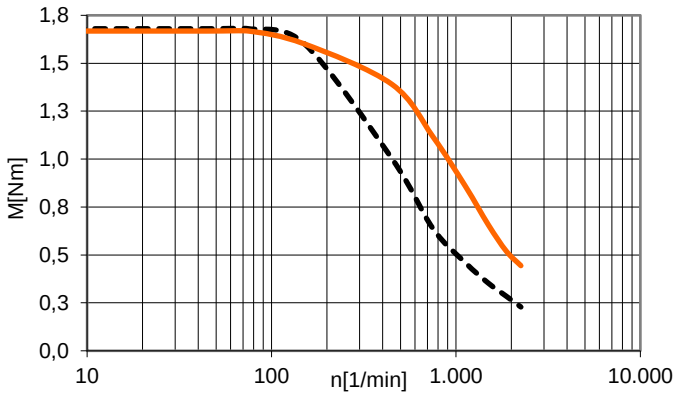
flange dimension 28 (NEMA11)
MOT-AN-S-060-001-028-...



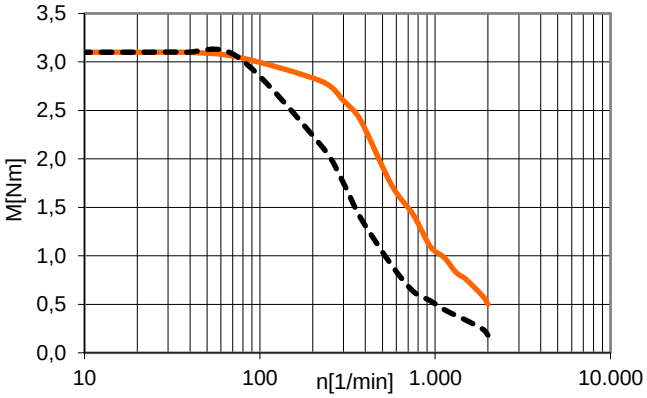
flange dimension 42 (NEMA17)
MOT-AN-S-060-005-042-...



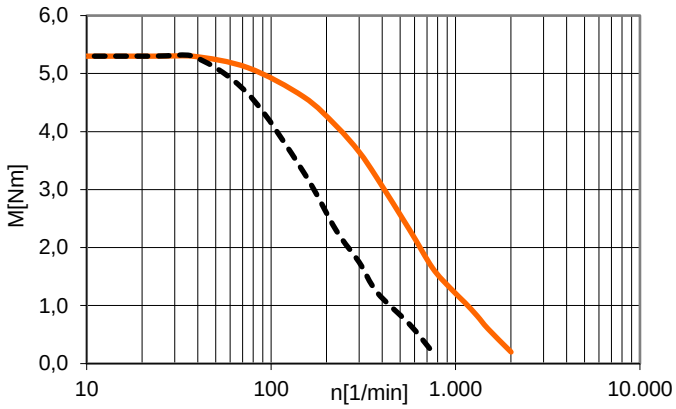
flange dimension 56 (NEMA23)
MOT-AN-S-060-020-056-…



flange dimension 60 (NEMA23XL)
MOT-AN-S-060-035-060-…

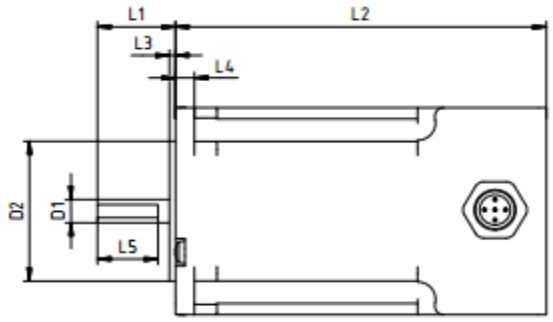


flange dimension 86 (NEMA34)
MOT-AN-S-060-059-086-…

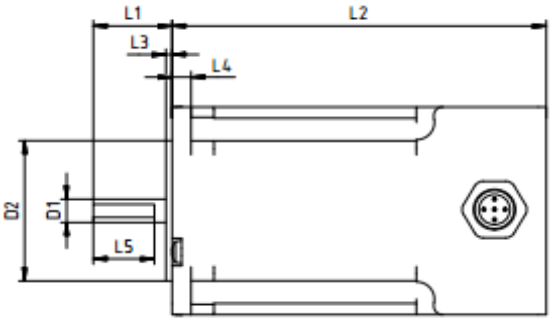


- - - - - 24VDC ——— 48 VDC characteristic based on quarter step mode

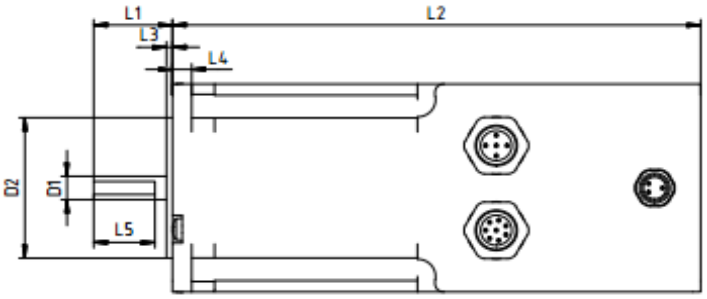
dimension
MOT-AN-S-060-…-L-A-AAAA / MOT-AN-S-060-…-M-A-AAAA

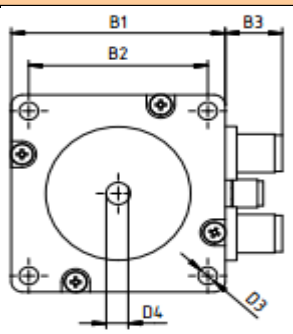


MOT-AN-S-060-...L-C-AAAC / MOT-AN-S-060-... -M-C-AAAC



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



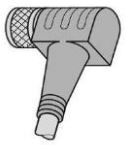


type	B1 [mm]	B2 [mm] ±0,2	B3 [mm]	D1 Ø [mm] -0,013	D2 Ø [mm] ±0,025	D3 Ø [mm]	D4 [mm] ±0,15	L1 [mm] ±1	L2 [mm] ±1	L3 [mm]	L4 [mm]	L5 [mm] ±1
MOT-AN-S-060-001-028-L-A-AAAA	28,0	23,00	-	5,00	22,00	M2,5	4,5	20,0	50	2,0	-	15,0
MOT-AN-S-060-001-028-M-A-AAAA	28,0	23,00	13	5,00	22,00	M2,5	4,5	20,0	70	2,0	-	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
MAT90490015-10	TPE	CF9.INI	10	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
MAT90450903-10	TPE	CF11	10	straight

straight 

angulate 

component part

More Information about our comprehensive component parts can be found at our website
www.igus.eu/drylinE-datasheets

motor flange


spacer


coupling



initiator / initiator bracket