special stepper motor

• IP00 vacuum

• IP65 splash water

• IP68 underwater

special stepper motor MOT- XX-S-…

part number									
MOT	– XX	– S	– 060	– 007	– 056	– M	– A	– AAAA

specifics	
AAAK	IP65 splash water
AAAL	IP65 splash water + encoder
AAAI	IP68 underwater
AAAM	IP68 underwater + encoder
AAAJ	IP00 vacuum

options	
A	without
C	incremental encoder (IP65 and IP68)

motor connection	
M	metric plug
L	stranded wire
K	terminal box

flange dimension	
056	56mm (NEMA23)

holding torque	
007	0,7Nm
013	1,3Nm
017	1,7Nm

max. voltage	
060	60VDC

motor type	
S	stepper motor

type	
XX	version

product group	
MOT	motor

special stepper motor MOT- XX-S-…

technical data

motor		MOT-AD-S-060-017-056-M-A-AAAK IP65 splash water	MOT-AD-S-060-017-056-M-C-AAAL IP65 splash water	MOT-AP-S-060-013-056-K-A-AAAI IP68 underwater	MOT-AP-S-060-013-056-K-C-AAAM IP68 underwater	MOT-AP-S-060-007-056-L-A-AAAJ IP00 vacuum
max. voltage	[VDC]	60	60	60	60	60
nominal voltage	[VDC]	24-48	24-48	24-48	24-48	24-48
nominal current	[A]	3,00	3,00	4,20	4,20	2,50
holding torque	[Nm]	1,7	1,7	1,3	1,3	0,7
detent torque	[Nm]	0,055	0,055	0,025	0,025	0,050
step angle	[°]	1,8±5%	1,8±5%	1,8±5%	1,8±5%	1,8±5%
resistance / phase	[Ω]	0,9	0,9	0,8	0,8	0,8
inductance / phase	[mH]	4,4	4,4	1,5	1,5	2,4
moment of inertia / rotor	[kgcm²]	0,36	0,36	0,38	0,38	0,24
max. shaft load axial	[N]	15	15	80	80	40
max. shaft load radial	[N]	23	23	150	150	80

weight / material

motor	[kg]	1,20	1,25	1,47	1,51	1,00
motor housing material		Al/St lacquered	Al/St lacquered	Al lacquered	Al lacquered	V2A

operating data

ambient temperature	[°C]	-10 …+50	-10 …+50	-10 …+50	-10 …+50	-10 …+50
max temperature rise	[°C]	80	80	80	80	110
humidity (not condensing)	[%]	100	100	100	100	0
protection class engine case		IP65	IP65	IP68 (10m)	IP68 (10m)	IP00
fine vacuum	[mbar]	-	-	-	-	10^{-3}
resistant to radiation	[J/kg]	-	-	-	-	10

encoder

operating voltage	[VDC]	5
impulse / turn		500
zero impulse / index		yes
line-driver		RS422 protocol

signal sequence		MOT-AD-S-060-017-056-M-C-AAAL	MOT-AP-S-060-013-056-K-C-AAAM
motor rotation clockwise	CW	A, A/, B, B/, N, N/	A, A/, B, B/, N, N/

dimension

type	B1 [mm]	B2 [mm] ±0,2	B3 [mm] ±0,1	D1 Ø [mm] -0,013	D2 Ø [mm] ±0,025	D3 Ø [mm]	L1 [mm] ±1	L2 [mm] ±1	L3 [mm]	L4 [mm]
MOT-AD-S-060-017-056-M-A-AAAK	56,4	47,14	13	6,35	38,1	5,0	20,6	106,0	1,6	5
MOT-AD-S-060-017-056-M-C-AAAL	56,4	47,14	24	6,35	38,1	5,0	20,6	106,0	1,6	5
MOT-AP-S-060-013-056-K-A-AAAI	56,4	47,14	21	6,35	38,1	5,4	17,0	134,0	1,6	5
MOT-AP-S-060-013-056-K-C-AAAM	56,4	47,14	21	6,35	38,1	5,4	17,0	154,0	1,6	5
MOT-AP-S-060-007-056-L-A-AAAJ	56,4	47,14	-	6,35	38,1	5,0	20,6	74,0	1,6	5

special stepper motor MOT- XX-S-…

pin assignment motor
MOT-AD-S-060-017-056-M-…   MOT-AP-S-060-013-056-K-A-AAAI
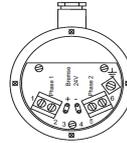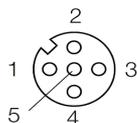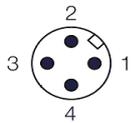
motor bipolar				motor cable	motor	
M12 4-pole			wires	M12 5-pole	cable inlet M16	
pin	signal	phase	color	color	pin	signal
1	A/	1	brown	brown	1	A/
2	A		white	white	2	A
3	B	2	blue	blue	5	B
4	B/		black	black	6	B/
-	-		-	green/yellow	⏚	PE
housing	shielding		-	-		

pin assignment encoder / motor + encoder
MOT-AD-S-060-017-056-M-C-AAAL   MOT-AP-S-060-013-056-K-C-AAAM
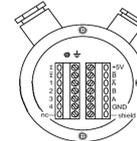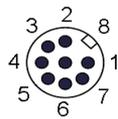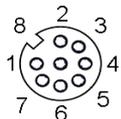
encoder		encoder cable	encoder		motor		
M12 8-pole		M12 8-pole	cable inlet M16		cable inlet M16		
pin	signal	color	pin	signal	pin	signal	phase
1	A	white	+5V	+5V	1	A/	1
2	A/	brown	A	A	2	A	
3	B	green	A/	A/	3	B	2
4	B/	yellow	B	B	4	B/	
5	0V	grey	B/	B/	⏚	PE	
6	N/	pink	GND	0V	nc	no connection	
7	N	blue	I/	N/	-	-	
8	5V DC	red	I	N	-	-	
housing	shielding	shielding	shield	shielding	-	-	

wire assignment
MOT-AP-S-060-007-056-L-A-AAAJ

motor bipolar			wires
pin	signal	phase	color
-	A/	1	brown
-	A		white
-	B	2	blue
-	B/		black

special stepper motor MOT- XX-S-…

cable part number	outer jacket	type	cable length	plug
MOT-AD-S-060-017-056-M-…				
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
MOT-AP-S-060-013-056-K-…				
motor	**- cable Ø: 7,5 mm / bending radius moved < 10m travel distance: min. 5 x d**			
-	TPE	CF9.10.05	no minimum order quantity	-
MOT-AP-S-060-013-056-K-C-AAAM				
encoder	**- cable Ø: 8,5 mm / bending radius moved < 10m travel distance: min. 6,8 x d**			
-	TPE	CF11.02.04.02	no minimum order quantity	-

Note: By underwater applications should be used TPE cable.

**plug straight**

**plug angulate**

# special stepper motor MOT- XX-S-...

characteristic
flange dimension 56 (NEMA23)
MOT-AD-S-060-017-056-M-... (IP65 splash water)
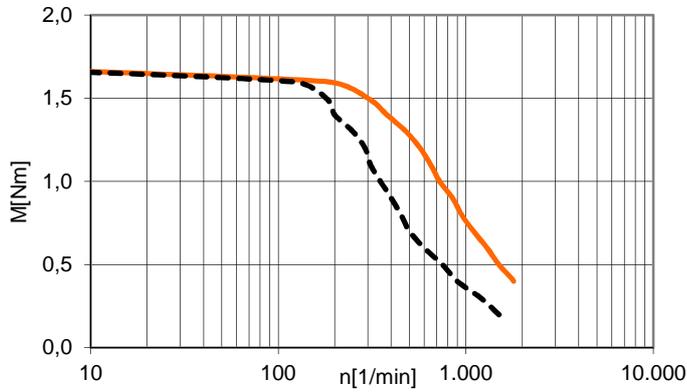
flange dimension 56 (NEMA23)
MOT-AP-S-060-013-056-K-… (IP68 underwater)
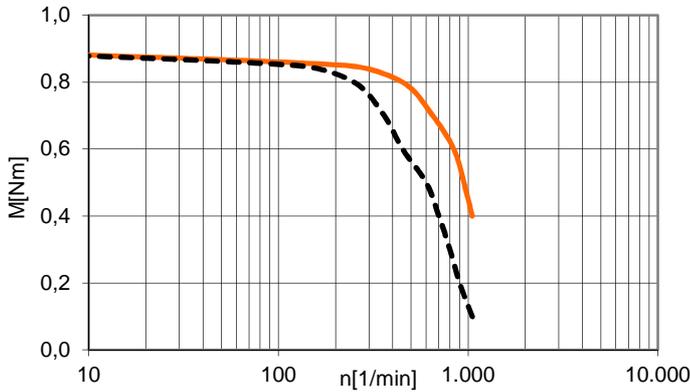
flange dimension 56 (NEMA23)
MOT-AP-S-060-007-056-L-A-AAAJ (IP00 vacuum)
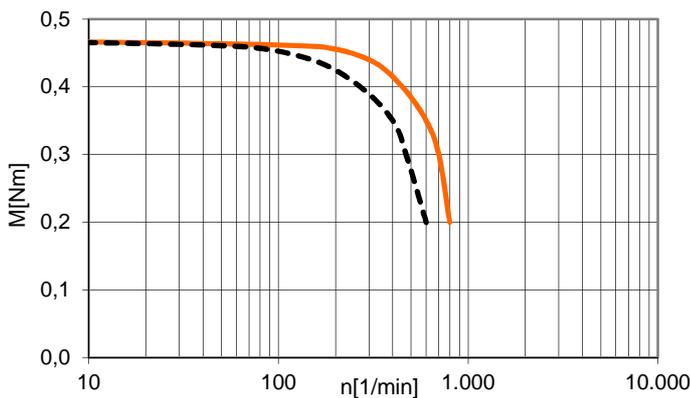
- - - - - - 24VDC ——————— 48 VDC   characteristic based on quarter step mode

special stepper motor MOT- XX-S-…

MOT-AP-S-060-013-056-K-... (IP68 underwater)

+	= resistant
0	= conditionally resistant
-	= not resistant

chemical resistance

substance	residence time	
	1h	24h
formic acid (10%)	+	+
acetic acid (10%)	+	+
lactic acid (10%)	+	+
phosphoric acid (25%)	+	+
sulphur acid (25%)	+	+
hydrochloric acid (10%)	+	+
caustic soda (50%)	+	+
ammoniac (10%)	+	+
salinde solution (10%)	+	+

solvent-, fuel- and detergent resistance

substance	residence time	
	1h	24h
ethanol	+	0
methylated spirit	+	0
isopropanol	+	+
ethyl acetate	0	0
butyl acetate	+	0
acetone	0	0
methylisobutylketone	+	0
white spirit	+	+
xylene	+	0
unleaded petrol	+	+
diesel oil	+	+
gear oil	+	+
hydraulic oil	+	+
brake fuid	+	+
cooling liquid (4%ig)	+	+
Sidolin (konz.)	+	+
Meister Proper (konz.)	+	+
Microzid Liquid (konz.)	+	+
Pril (1%ig)	+	+
chlorine blech Domestos	+	+