




EU-TYPE EXAMINATION CERTIFICATE



Equipment or Protective System intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU

- [3] EU-Type Examination Certificate Number: **DEMKO 10 ATEX 0915070X Rev. 10**
- [4] Product: **Brushless Servomotor, Models G493, G495 and G496**
- [5] Manufacturer: **Moog Controls (India) Private Limited**
- [6] Address: **KIADB Industrial Area, No. 99P, 100P and 41P, Electronic City Phase II, Hosur Road, Bangalore 560 100, Karnataka, India**
- [7] This product and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.
- [8] UL International Demko A/S, notified body number 0539 in accordance with Article 17 of the Council Directive 2014/34/EU of 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.
- The examination and test results are recorded in confidential report no. **US/UL/ExTR16.0125/06**
- [9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
- EN IEC 60079-0:2018 EN 60079-1:2014 EN 60079-31:2014**
- [10] If the sign "X" is placed after the certificate number, it indicates that the product is subject to special conditions for safe use specified in the schedule to this certificate.
- [11] This EU-Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by the certificate.
- [12] The marking of the product shall include the following:

 **II 2 G Ex db IIC Tx Gb**
 **II 2 G Ex db IIB Tx Gb**
 **II 2 D Ex tb IIIC Tx Db IP65/67**

Where Tx is the appropriate Temperature code or value,
corresponding to the marked ambient and model type.

Certification Manager
Jan-Erik Storgaard

This is to certify that the sample(s) of the Product described herein ("Certified Product") has been investigated and found in compliance with the Standard(s) indicated on this Certificate, in accordance with the ATEX Product Certification Program Requirements. This certificate and test results obtained apply only to the product sample(s) submitted by the Manufacturer. UL did not select the sample(s) or determine whether the sample(s) provided were representative of other manufactured product. UL has not established Follow-Up Service or other surveillance of the product. The Manufacturer is solely and fully responsible for conformity of all product to all applicable Standards, specifications, requirements or Directives. The test results may not be used, in whole or in part, in any other document without UL's prior written approval.

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Schedule

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[15] Description of Product
 Product is a Brushless Servomotor for use in Gas, or Gas and Dust atmospheres of model numbers G493, G495, and G496. The three models are similar in design but vary in size, volume and electrical parameters. The motor has two versions for IP rating, IP 65 and IP 67. The motor has a built-in temperature-limiting device of NTC, PTC or KTY type. A primary thermistor which is a PTC type only and is to be connected to a temperature monitoring device, which would trip power supply to drive on field. An optional secondary thermistor which can be of the PTC/NTC or KTY type can also be connected. The enclosure is made of aluminum alloy. The dimensions and flame paths remain constant for a particular motor model and only the torque and power ratings vary. The motor is available in various stack lengths.

Nomenclature for types G493, G495 and G496:

G	3	L	M	2	010	00	00	01	01	000
I	II	III	IV	V	VI	VII	VIII	IX	X	XI

I – Motor Series

G (Global) – Series designation

II – Motor Size

3 (493) – 70 mm square flange
 5 (495) – 140 mm square flange
 6 (496) – 190 mm square flange

III – Design

L – Moog Ex Design UL

IV – Winding Voltage

M – Low voltage
 V – High voltage

V – Stack Length

0 – Non-standard stack length, between L05 and L40 for G493, between L10 and L50 for G495 and between L15 and L90 for G496
 2 – L05 (G493) or L10 (G495) or L15 (G496)
 4 – L15 (G493) or L20 (G495) or L30 (G496)
 6 – L25 (G493) or L30 (G495) or L45 (G496)
 8 – L40 (G493) or L50 (G495) or L60 (G496)
 9 – L90 (G496)

VI – Nominal Speed, RPM

Any number between X – XXX, followed by motor RPM code, where the RPM code designation given as = RPM/100

VII – Electrical Option

	Brake Options		Cable gland position		Internal clearance for connection	
	1	2	Top	Back	No additional clearance	Additional clearance
00	-	-	X	-	X	-
01	X	-	X	-	X	-
02	-	X	X	-	X	-
03	-	-	-	X	X	-
04	X	-	-	X	X	-
05	-	X	-	X	X	-
06	-	-	X	-	-	X
07	X	-	X	-	-	X
08	-	X	X	-	-	X
09	-	-	-	X	-	X
10	X	-	-	X	-	X
11	-	X	-	X	-	X
99	Special version – not affecting the electrical performance or protection methods of the device as described in the documents					

Note: Additional clearance for internal clearance for connection is applicable only for G493 models.



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Brake option

Brake Option				
Motor Size		G493	G495	G496
Low -T	1	2 Nm	14.5 Nm	22 Nm
High -T	2	4.5 Nm	22 Nm	72 Nm
Code				

VIII – Mechanical Option

Code	Keyway	Shaft exit seal
00	None provided	X
01	X	X
99	Special version – not affecting the electrical performance or protection methods of the device as described in the documents	

IX – Feedback Option

Any two digit number - Not related to the protection method

X – Surface Temperature Class

Ignition Temperature Class / Ambient (°C)*																		
	-20 to +40	-20 to +50	-20 to +60	-20 to +70	-20 to +80	-20 to +90	-20 to +100	-20 to +110	-20 to +120	-40 to +40	-40 to +50	-40 to +60	-40 to +70	-40 to +80	-40 to +90	-40 to +100	-40 to +110	-40 to +120
00	-	-	-	-	-	-	-	-	-	-	-	-	-	T4	-	-	-	-
01	-	T4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02	-	-	T4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
03	T4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04	-	-	-	T4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05	-	-	-	-	T4	-	-	-	-	-	-	-	-	-	-	-	-	-
06	-	-	-	-	-	-	-	-	-	T4	-	-	-	-	-	-	-	-
07	-	-	-	-	-	-	-	-	-	-	T4	-	-	-	-	-	-	-
08	-	-	-	-	-	-	-	-	-	-	-	T4	-	-	-	-	-	-
09	-	-	-	-	-	-	-	-	-	-	-	-	T4	-	-	-	-	-
10	T5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	-	-	-	-	-	-	-	-	-	T5	-	-	-	-	-	-	-	-
12	T6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-	-	-	T6	-	-	-	-	-	-	-	-
14	T3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	-	T3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	-	-	T3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	-	-	-	T3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	-	-	-	-	T3	-	-	-	-	-	-	-	-	-	-	-	-	-
19	-	-	-	-	-	T3	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	T3	-	-	-	-	-	-	-	-	-	-	-
21	-	-	-	-	-	-	-	-	-	T3	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-	-	-	T3	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-	-	-	-	-	T3	-	-	-	-	-	-
24	-	-	-	-	-	-	-	-	-	-	-	-	T3	-	-	-	-	-
25	-	-	-	-	-	-	-	-	-	-	-	-	-	T3	-	-	-	-
26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	T3	-	-	-
27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	T3	-	-
28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	T3	-
29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	T3
30	-	-	-	-	-	-	-	T3	-	-	-	-	-	-	-	-	-	-
31	-	-	-	-	-	-	-	-	T3	-	-	-	-	-	-	-	-	-
99	Special version – not affecting the electrical performance or protection methods of the device as described in the documents																	

* - T3 ignition temp class for motor size 3 & 5 up to 80°C only.

+ - T3 ignition temp class for motor size 5 between 80°C to 120°C only gas code.

XI – Special Version

Any three digit number - Not related to the protection method



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Temperature range

The relation between ambient temperature and the assigned temperature class See Electrical data. The temperature class and ambient are related based on the power supply rating to the motor at a specific ambient range.

Electrical data

Power ratings with corresponding range of parameters for motors are as below:

For G493:

Stack Length	Power, W	Speed, rpm	Rated Torque, Nm	Peak Torque, Nm	Ambient Rating, °C	Temperature Class
L05	0	0	0.52	1.6	-40 to +40 -20 to +40	T4/T135°C
	359	7800	0.44	1.6		
L40	0	0	3.26	13.2		
	1117	3800	2.82	13.2		
L05	0	0	0.5	1.6	-40 to +50 -20 to +50	T4/T135°C
	341	7800	0.42	1.6		
L40	0	0	3.13	13.2		
	1059	3800	2.66	13.2		
L05	0	0	0.46	1.6	-40 to +60 -20 to +60	T4/T135°C
	304	7800	0.37	1.6		
L40	0	0	2.88	13.2		
	942	3800	2.37	13.2		
L05	0	0	0.41	1.6	-40 to +70 -20 to +70	T4/T135°C
	253	7800	0.31	1.6		
L40	0	0	2.56	13.2		
	786	3800	1.97	13.2		
L05	0	0	0.34	1.6	-40 to +80 -20 to +80	T4/T135°C
	177	7800	0.22	1.6		
L40	0	0	2.14	13.2		
	552	3800	1.38	13.2		
L05	0	0	0.43	1.6	-40 to +40 -20 to +40	T5/T100°C
	273	7800	0.33	1.6		
L40	0	0	2.74	13.2		
	847	3800	2.12	13.2		
L05	0	0	0.32	1.6	-40 to +40 -20 to +40	T6/T85°C
	118	7800	0.14	1.6		
L40	0	0	1.99	13.2		
	364	3800	0.91	13.2		

For G495:

Stack Length	Power, W	Speed, rpm	Rated Torque, Nm	Peak Torque, Nm	Ambient Rating, °C	Temperature Class
L10	0	0	4.32	13.08	-40 to +90 -20 to +90	T3
	1240	4000	2.96	13.08		
L50	0	0	19.22	67.53		
	2692	1800	14.28	67.53		
L10	0	0	3.96	13.05	-40 to +100 -20 to +100	T3
	1005	4000	2.4	13.05		
L50	0	0	17.71	67.53		
	2237	1800	11.87	67.53		
L10	0	0	3.57	13.03	-40 to +110 -20 to +110	T3
	777	3500	3.24	13.03		
L50	0	0	15.94	67.53		
	1726	1600	10.3	67.53		
L10	0	0	3.12	13	-40 to +120 -20 to +120	T3
	577	2700	2.04	13		
L50	0	0	13.94	67.53		
	1220	1400	8.32	67.53		
L10	0	0	5.79	12.2	-40 to +40 -20 to +40	T4/T135°C
	2173	4800	4.32	12.2		
L50	0	0	25.39	61.2		
	4388	2000	20.95	61.2		
L10	0	0	5.47	12.2	-40 to +50 -20 to +50	T4/T135°C
	1969	4800	3.92	12.2		
L50	0	0	24	61.2		
	4046	2000	19.32	61.2		
L10	0	0	5.15	12.2	-40 to +60 -20 to +60	T4/T135°C
	1746	4800	3.47	12.2		



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Stack Length	Power, W	Speed, rpm	Rated Torque, Nm	Peak Torque, Nm	Ambient Rating, °C	Temperature Class			
L50	0	0	22.6	61.2	-40 to +70 -20 to +70	T4/T135°C			
	3682	2000	17.58	61.2					
L10	0	0	4.81	12.2					
	1489	4800	2.96	12.2					
L50	0	0	21.14	61.2					
	3283	2000	15.67	61.2					
L10	0	0	4.3	12.2		-40 to +80 -20 to +80	T4/T135°C		
	1035	4800	2.06	12.2					
L50	0	0	18.87	61.2					
	2604	2000	12.43	61.2					
L10	0	0	5.09	12.2				-40 to +40 -20 to +40	T5/T100°C
	1581	4800	3.15	12.2					
L50	0	0	22.35	61.2					
	3474	2000	16.6	61.2					
L10	0	0	4.03	12.2	-40 to +40 -20 to +40	T6/T85°C			
	645	4800	1.47	12.2					
L50	0	0	17.68	61.2					
	1640	2000	7.83	61.2					

For G496:

Stack Length	Power, W	Speed, rpm	Rated Torque, Nm	Peak Torque, Nm	Ambient Rating, °C	Temperature Class			
L15	0	0	13	40	-40 to +40 -20 to +40	T3/T200°C			
	3464	4000	8	40					
L90	0	0	70	240					
	8378	2000	40	240					
L15	0	0	13	40			-40 to +50 -20 to +50	T3/T200°C	
	3179	4000	8	40					
L90	0	0	66	240					
	8378	2000	40	240					
L15	0	0	12	40		-40 to +60 -20 to +60			T3/T200°C
	2886	4000	7	40					
L90	0	0	64	240					
	8378	2000	40	240					
L15	0	0	11	40	-40 to +70 -20 to +70		T3/T200°C		
	2346	3200	7	40					
L90	0	0	58	240					
	6053	1700	34	240					
L15	0	0	10	40		-40 to +80 -20 to +80		T3/T200°C	
	1926	2800	7	40					
L90	0	0	53	240					
	5027	1500	32	240					
L15	0	0	9	40	-40 to +90 -20 to +90		T3/T200°C		
	1330	2300	6	40					
L90	0	0	46	240					
	4241	1500	27	240					
L15	0	0	8	40		-40 to +100 -20 to +100		T3/T200°C	
	928	2000	4	40					
L90	0	0	40	240					
	3142	1250	24	240					
L15	0	0	13	40	-40 to +40 -20 to +40		T4/T135°C		
	3464	4000	8	40					
L90	0	0	70	240					
	8378	2000	40	240					
L15	0	0	13	40		-40 to +50 -20 to +50		T4/T135°C	
	3179	4000	8	40					
L90	0	0	66	240					
	8378	2000	40	240					
L15	0	0	12	40	-40 to +60 -20 to +60		T4/T135°C		
	2622	4000	6	40					
L90	0	0	62	240					
	7459	1800	39	240					
L15	0	0	11	40		-40 to +70 -20 to +70		T4/T135°C	
	2346	3200	7	40					



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Stack Length	Power, W	Speed, rpm	Rated Torque, Nm	Peak Torque, Nm	Ambient Rating, °C	Temperature Class
L90	0	0	58	240		
	6053	1700	34	240		
L15	0	0	10	40	-40 to +80 -20 to +80	T4/T135°C
	1926	2800	7	40		
L90	0	0	53	240		
	5027	1500	32	240		
L15	0	0	10	40	-40 to +40 -20 to +40	T5/T100°C
	1875	2700	7	40		
L90	0	0	55	240		
	4765	1300	35	240		
L15	0	0	9	40	-40 to +40 -20 to +40	T6/T85°C
	1256	2100	6	40		
L90	0	0	47	240		
	3110	1100	27	240		

The above ratings are continuous 100% duty cycle. The change in torque ratings with respect to duty cycle is as given below:

Duty Cycle	Torque rating increases by
25%	85%
40%	50%
60%	25%

The duty cycle for peak torque condition is 10% i.e. 6 seconds ON and 54 seconds OFF, in a cycle time of 1 minute.

For ratings between the above stack lengths, refer to page 4 of schedule drawings CA91180, CA91181 and CB35199.

All the above ratings are at DC bus voltage of 325 volts, maximum DC bus voltage rating is 750 volts, ratings remain the same for all voltages and hence the losses also remain the same.

Routine tests

Routine tests hydrostatic pressure test according to EN 60079-1 cl. 16 are to be carried out in accordance with work instruction WI005306, for type G493 motors rated below -20°C as the enclosures have been tested at 1.5 times the reference pressure. All other type G493 motors rated -20°C and above, have successfully been tested at four times the reference pressure and routine tests are not required.

Routine tests according to EN 60079-1 cl. 16 are not required, for all the type G495, G496 and G493 with increased additional clearance motors as the enclosures have been successfully tested at four times the reference pressure.

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Descriptive Documents

The scheduled drawings are listed in the report no. provided under item no. [8] on page 1 of this EU-Type Examination Certificate.

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Specific conditions of use:

- For ambient temperatures below -10 °C and above +60 °C use field wiring suitable for both minimum and maximum ambient temperature.
- Contact Moog for information on the dimensions of the flameproof joints.
- Yield strength of the front and rear cover assembling fasteners shall not be less than 640 MPa.
- The drive used with the Servomotor shall be of specification as detailed by manufacturer and suitable for the motor electrical specifications and operating characteristics.
- Refer to duty ratings for maximum torque permitted per duration time of use.
- Each motor shall use a suitable thermal protector based on its rated ambient and surface temperature class (T-code).
- Every motor covered under this certificate shall be connected to a temperature monitoring device in field. The temperature monitoring device connected to the PTC temperature sensor in the motor shall be ATEX certified to latest edition of the EN 50495 standard.
- The painted surface of motor may store electrostatic charge and become a source of ignition in applications, operating Instruction CB07398 provides guidance for the user to minimize the risk from electrostatic discharge.



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[18]

Essential Health and Safety Requirements

The Essential Health and Safety Requirements (EHSRs) covered by the standards listed at item 9.

Additional information

The Brushless Servomotor models G493, G495, and G496 have also passed the tests for Ingress Protection to IP 65 and IP 67 in accordance with EN60529:1991+A1:2000+A2:2013.

The trademark **MOOG** will be used as the company identifier on the marking label.

The manufacturer shall inform the notified body concerning all modifications to the technical documentation as described in Annex III to Directive 2014/34/EU of the European Parliament and the Council of 26 February 2014.

