TYPE APPROVAL CERTIFICATE

Certificate no.:
TAA000019S
Revision No:
3

This is to certify:

that the Electrical Control System

with type designation(s)
DECS-100/DECS-100MLS, DM110/DECS-100MLS, DECS-250, DECS-250N

issued to
Basler Electric Company
Highland, IL, USA

is found to comply with
DNV rules for classification – Ships, offshore units, and high speed and light craft

Application:

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Location classes:

Type	Temperature	Humidity	Vibration	EMC	Enclosure
DECS-100/DECS-100MLS	B	B	A	A	*
DM110/DECS-100MLS	B	B	A	A	*
DECS-250	B	B	A	A	*
DECS-250N	B	B	A	A	*

*** Required protection according to DNV Rules shall be provided upon installation on board**

Issued at **Hamburg** on **2025-06-02**

This Certificate is valid until **2027-07-06**.
DNV local unit: **Certification & Inspection Services**

Approval Engineer: **Jens Dietrich**

for **DNV**
Digitally signed by: Dariusz Lesniewski
Location: DNV SE, Germany

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

Product description

Digital Excitation Control Systems:

DECS-100
Digital Excitation Control Systems DECS-100(LR)(MLS)-XYZ, DM110
X=A: No var/PF control, X=B: var/PF control;
Y=0: No Voltage matching, Y=1: Voltage matching;
Z=1: Current transformer 1A, Z=5: Current transformer 5A (DECS-100 only).
Operating Power: 88...250VAC, single or three phase
50...400Hz, Burden: 650VA
Gen. Voltage Sensing: 1-Phase/3-Phase:
50Hz: 100VAC, 200VAC or 400VAC,
60Hz: 120VAC, 240VAC, 480VAC, 600VAC,
Gen. Current Sensing: 1-phase 50/60Hz, 1A or 5A (DM110: 1A).
Exciter Field Output: 63VDC, 7A continuous, Gen. Voltage Accuracy: +/-0.5%,
Accessory Input (aux. adjust): +/-3VDC, (DECS-100), 4...20mA DC (DM110),
Common Alarm Output, Communication Ports: RS232.
Firmware revisions:
DECS-100(MLS): 2.14.xx, DM110: 1.05.xx., DECS-100LR: 1.00.01.

Use in self-contained metal enclosure (conduit box) only.

DECS-100LR is identical to the DECS-100 only with Load Rejection capability.

DECS-100MLS is an OEM variant of the DECS-100 made for Leroy Somer.

DM110 is an OEM variant of DECS-100 made for AvK Stamford.

DECS-250
Digital Excitation Control System DECS-250[N]-A-B-C-D-E-F-G
Power Supply: A=L: 24/48VDC, A=C: 120VAC/125VDC,
PSS: B=N: None, B=P with Power System Stabilizer,
DECS-250: C: Autotracking: C=1: Internal, C=2: Internal/External Autotracking,
[DECS-250N: C: Input Power Frequency:
C=1:Low 50/60Hz; C=2: High 61 to 420Hz, C=3: 480VAC@50/60Hz].
Terminals: D=S: Spring type, D=C: Compression type,
Synchronizer: E=N: None, E=A: Auto Synchronizer,
Remark: Genrator protection functions to be used as back-up only.
1st Comm. Protocol: F=1: 100Base-T Ethernet., F=2: 100 Base F Ethernet,
2nd Comm. Protocol: G=N: None, G=P: Profibus.
Operating Power Input for Excitation Voltage [In brackets: DECS-250N]:
32 [63]V DC: Input: 56…70 [100..139]V AC,
63 [125]VDC: Input: 100..139V AC or 125V DC [190..277V AC],
125 [250]VDC: Input: 190 to 277V AC or 250V DC [380..528VAC, 50/60Hz] C=3.
Excitation current: Cont. 15A DC (10s@30ADC) [Cont. 20A DC].

Place of manufacture
Basler Electric Company, Highland, Illinois, USA
Basler Electric Company, Taylor, Texas, USA

Approval conditions
The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV, documentation for the actual application is to be submitted for approval by the manufacturer of the application system in each case. Reference is made to DNV Rules for Ships Pt.4 Ch.8 Electrical Installations.

Clause for application software control
All changes in software are to be recorded as long as the system is in use on board. The records of all changes are to be forwarded to DNV for evaluation and approval.
Major changes in the software are to be approved before being installed in the computer.
A Certification of Application Functions may be required for the particular vessel.

Application/Limitation
Compliance with the requirements for generator voltage regulation and generator short circuit capabilities given in Pt.4 Ch.8 Sec.5, 2 must be ensured. It must be possible to verify that compliance by review of power system documentation. Testing onboard should be limited to confirming compliance already verified by design review.

Type Approval documentation

DECS-100/DECS100-LR/DECS-100MLS/DM110 :

Drawing No.	Rev.	DNV No.	Title
9287500400	C		Final Assembly Drawing
9287500991	L		Instruction Manual, DECS-100
9287500992	J		Instruction Manual, DM110
9287500993	-	35	Instruction Manual, DECS-100LR
9287501405	-		PC Board Assembly
9287501911	-		Schematic
9287500780	-		IACS E10 Immunity Report of DECS-100
9287500781	-		IACS E10 Emmission Report of DECS-100
9287500094	-		EM0266-1 (Environmental test)
94023	4/26/2012		IACS E10, Test 18; L-L (Surge Immunity)
	-		IACS E10 Test Plan, DECS-100 & DM110

DECS-200:

Drawing No.	Rev.	DNV No.	Title
9360100400	H		Final Assy.
9360100920	A		Outline Drawing
9360100990	K		Instruction Manual
9360101912	A		Schematic - Digital Board
9360102912	-		Schematic - Analog Board
9360103910	C		Schematic - Power Supply 120/125
9360103911	A		Schematic - Power Supply 24/48
9360104910	C		Schematic - Isolation Board
9360105910	A		Schematic - Chopper Board
9360100783			IACS E10 Immunity Report of DECS-200
9360100781			IACS E10 Emmission Report of DECS-200 (Low Voltage)
9360100784			IACS E10 Emmission Report of DECS-200 (120V)
9360100062			NM0373-1, Issue 2 (Environmental test)
94014#1	4/13/2012		IACS E10, Test 17; L-N (Fast Transient)
94014#2	4/13/2012		IACS E10, Test 18; L-E (Fast Transient)
94014#3	4/13/2012		IACS E10, Test 18; 200-L (Surge Immunity)
	-		IACS E10 Test Plan, DECS-200

DECS-250/DECS-250N included 2012:

Drawing No.	Rev.	DNV No.	Title
9439701912	E	4	PowerPC Board Schematic
9440300401	A	5	DECS-250 Assy Drawing
9440300990	E	6	DECS-250 Instruction Manual
9440303910	C	9	Power Supply Board Schematic, DECS-250
	B	20	IACS E10 Test Plan DECS-250 & DECS-250N
93724#3	3/30/2012	13	IACS E10, 3 External power supply failure
93724#4	3/30/2012	14	IACS E10, 4 Power supply variations
93724#5	3/30/2012	15	IACS E10, 5 Dry heat test
93724#6	3/30/2012	16	IACS E10, 6 Damp heat test
93724#(7)	3/26/2012	17	IACS E10, 7 Vibration test
93734#9&10	3/30/2012	18	IACS E10, 9 Insulation resistance & 10 High voltage
93724#11	3/30/2012	19	IACS E10, 11 Cold test
9440300786		22	IACS E10 Immunity Report of DECS-250
9440300783		23	IACS E10 Immunity Report of DECS-250N
9440300781		24	IACS E10 Emmission Report of DECS-250
9440300784		25	IACS E10 Emmission Report of DECS-250DECS-250N
9440300920	A	26	DECS-250 Outline Drawing
9440500400	B	27	DECS-250N Assembly Drawing
9440500990	A	28	DECS-250N Instruction Manual
9440304403	B	32	Bridge BD PC assembly DECS-250

	3/6/13	34	Vibration Test – DECS-250

Updated/new documents in connection with HW modification of DECS-100, -250 and -250N included in 2014:

Drawing No.	Rev.	DNV No.	Title
9440301910	D	7	DECS-250 digital board schematic
9440302910	C	8	DECS-250 analog board schematic
9440304910	A	10	DEC-250 bridge board schematic
9440503910	C	11	DEC-250N pwr supply / isolation bd. 125V
9440504910	B	12	DECS-250N bridge board schematic
9287501911	B	36	DECS-100 / DM110 circuit diagram
		43	2.4_EN 61000-4-5 Surge Immunity_DECS-250 DVT
		44	2.4_EN 61000-4-5 Surge Immunity_DECS-250N DVT
		45	2.42.4_EN 61000-4-6 Conducted Immunity_DECS-250N DVT
		50	22.4_IEC 61000-4-4 EFT_DECS-250 DVT
		51	2.4_IEC 61000-4-5 Surge Immunity_DECS-250 DVT
		52	2.4_Impulse Voltage-Unit 82_DECS-250 DVT
		53	2.4_Impulse Voltage-Unit 82_DECS-250N DVT
		54	2.5_BV Dry Heat_DECS_250N DVT
		55	2.5_BV Dry Heat_DECS_250 DVT
		56	2.5_BV External Power Supply Failure DECS-250/DECS-250N
		57	2.5_BV Hipot-Insulation Resistance DECS-250/DECS-250N
		58	2.5_BV Power Supply Variations DECS-250/DECS-250N
		59	2.5_BV Vibration_DECS-250 DVT
		60	2.5_BV Vibration_DECS-250N DVT
		61	EN55011 conducted emissions DECS250N New Bridge Bd
9440301403	C	69	DECS-250 digital board assy
9440302403	D	71	DECS-250 analog board assy
9440304404	A	77	DECS-250N bridge board assy

Update 2017:

Drawing No.	Rev.	DNV No.	Title
DECS-100/DECS100-LR/DECS-100MLS/DM110 :			
9287500991	P		Instruction Manual, DECS-100
9287500992	K		Instruction Manual, DM110
9287501911	B	112	DECS-100/DM110
9287500402		111	Master Final Assy, DECS-100
9287500404	A	110	Final Assy, DECS-100
DECS-200:			
9360100990	M	124	Instruction Manual, DECS-200
DECS-250/DECS-250N:			
9440304403	C	119	DECS-250 Bridge BD PC Assembly
9440304910	B	117	DECS-250 Bridge BD Schematic
9440303910	D	116	DECS-250 PWR Supply / Isolation BD.
9440503910	D	126	DECS-250N PWR Supply / Isolation BD.
9440504910	C	125	DECS-250N Bridge BD Schematic
9440302910	E	115	DECS-250 Analog BD
9440301910	E	114	DECS-250 Digital BD
9440300401	C	113	DECS-250 Assembly Drawing
9440300990	M		DECS-250 Instruction Manual
9440500990	G		DECS-250N, Instruction Manual
9440500400	D120		DECS-250N Assembly Drawing

Additional EMC Test Reports: DLS 25821 and 25822, project 11166, dated 2020-12-03.
Additional EMC Test Report DLS 29050, issued 2025-04-10.

TA assessment report issued by DNV Houston 2025-05-01.

Tests carried out

Applicable tests according to DNV Class Guideline CG-0339, edition August 2021.

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the type approval certificate

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of this certificate.

END OF CERTIFICATE