

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Electrical Control System**

with type designation(s)

DECS-100/DECS-100MLS, DM110/DECS-100MLS, DECS-200, DECS-250, DECS-250N

Issued to

**Basler Electric Company
Highland IL, United States**

is found to comply with

DNV GL 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 GL.**

Type	Temperature	Humidity	Vibration	EMC	Enclosure
DECS-100/DECS-100MLS	B	B	A	A	*
DM110/DECS-100MLS	B	B	A	A	*
DECS-200	B	B	A	A	*
DECS-250	B	B	A	A	*
DECS-250N	B	B	A	A	*

*** Required protection according to DNVGL Rules shall be provided upon installation on board**Issued at **Hamburg** on **2017-09-06**This Certificate is valid until **2022-07-06**.for **DNV GL**DNV GL local station: **Houston Containers**Approval Engineer: **Jens Dietrich**

Joannis Papanuskas
Head of Section

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-200

Digital Excitation Control System DECS-200-XY

X=1: Internal autotracking, X=2: External/Internal autotracking;

Y=L: Power supply 24/48VDC, Y=C: Power supply 120/125VAC/VDC.

Control Power Voltage:

DC Input: 16...60VDC (style XL) or 90...150VDC (style XC)

AC Input: 85...132VAC, 50/60Hz (style XC only).

Operating Power Voltage: 56...277VAC, +/-10%, 50...500Hz, 1 or 3-phase.

Appropriate operating voltage to be provided for respective field requirements.

Bus / Generator Voltage sensing: 85...625 VAC, 50Hz; 94....660VAC, 60Hz

Generator Current sensing: 1A or 5A, 50/60Hz

Field Output: 32/63/125VDC, 15A (continuous),

50/100/200VDC, 30A (10 second forcing)

Binary Inputs and Outputs

Communication Ports: RS232, RS485.

Use in self-contained closed steel enclosures only.

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.

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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].

Software Versions: DECS-100
Firmware 2.XX.XX

Software Versions: DM110
Firmware 1.XX.XX

Software Versions: DECS-200
Firmware 1.XX.XX

Software Versions: DECS-250/250N
Firmware 1.XX.XX

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 GL, 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 GL 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 GL 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.

Tests carried out

Applicable tests acc. To DNV GL Class Guideline CG-0339, edition Nov. 2016.

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)

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- 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