



Certificate No:  
**TAS00003YU**

# TYPE APPROVAL CERTIFICATE

## This is to certify:

**That the electro-mechanical spring brakes**

with type designation(s)  
**model K, model KF, model KR**

Issued to  
**Temporiti S.r.l.**  
**Mesero, MI, Italy**

is found to comply with  
**DNV standard DNV-ST-0377 – Standard for shipboard lifting appliances**  
**DNV standard DNV-ST-0378 – Offshore and platform lifting appliances**

## Application :

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

Issued at **Hamburg** on **2023-09-21**

for **DNV**

This Certificate is valid until **2028-09-20**.

DNV local unit: **Italy/Malta CMC**

Approval Engineer: **Frank Poetsch**

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**Jörg Kallies**  
**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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Form code: TA 251

Revision: 2022-12

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## Product description

Off power, spring applied, electromagnetic brakes series K, KF and KR.

Model K-KF-KR, from size 01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11 and 12.

K-series:

K = standard brake

KF = standard brake with fix torque value, no regulation needed

KR = reverse brake (KF brake, but installed on the motor reverse)

The electro-mechanical spring brake K series is an DC brake considered for electrical motors.

D = double disk brake

## Application/Limitation

1. Work conditions

- for service or parking brake
- for dynamic or static braking
- Duty cycle: S1-S4 40%

Type: K Brake Group

	K01	K02	K03	K04	K05	K06	K07	K07 D	K08	K08 D	K09	K09 D	K10	K10 D	K11	K11 D	K12	K12 D
	K type																	
Torque (Nm)	5	12	16	20	40	60	90	180	200	400	300	600	800	1500	1500	2800	2250	4500
Voltage (vdc)	24-380	24-380	24-380	24-380	24-380	24-380	24-380	24-380	24-380	24-380	24-380	24-380	24-380	24-380	24-380	24-380	24-380	24-380
Power (W)	20	25	30	35	45	60	60	60	70	70	90	90	150	150	220	220	230	230

Type: KF Brake Group

	K01F	K02F	K03F	K04F	K05F	K06F	K07F	K07FD	K08F	K08FD	K09F	K09FD
	F type											
Torque (Nm)	4,5	8	12	16	35	55	90	180	150	300	250	500
Voltage (vdc)	24-380	24-380	24-380	24-380	24-380	24-380	24-380	24-380	24-380	24-380	24-380	24-380
Power (W)	20	25	30	40	45	60	60	60	70	70	90	90

Type: KR Brake Group

	K4R	K5R	K6R	K7R	K8R	K9R	K10R	K11R	K11RD
	R type								
Torque (Nm)	30	50	90	160	300	450	750	1500	3000
Voltage (vdc)	24-380	24-380	24-380	24-380	24-380	24-380	24-380	24-380	24-380
Power (W)	40	45	60	60	70	90	150	220	220

Location Classes according to DNV-CG-0339:

Temperature Class A

Humidity Class B

Vibration Class A

EMC Class A

Enclosure Class IP68

**2. Material/ workmanship requirements:**

- According to DNV-ST-0377, Section 3 and 11
- Electric/ Electric installations according to DNV-RU-SHIP Pt.4 Ch.8

**3. Survey and testing:**

- According to DNV-ST-0377, Section 9, 10 and 13
- Electric/ Electric installations according to DNV-RU-SHIP Pt.4 Ch.8

**4. Product certification:**

To obtain DNV Product Certificate the brake is part of the electrical motor. The product-certification for the electrical motor is required by DNV-RU-SHIP Pt.4 Ch.8 Section 1, table 3.

**Type Approval documentation**

DWG - No	Rev.	Title
Assembly K0X-K0XF	12/06/2023	K0X-K0XF Brake Group – Metal cover
Assembly K0X-K0XF	12/06/2023	K0X-K0XF Brake Group – Plastic cover
TEST PLAN	1	Test Plan
Assembly	04	Elsto TENV Brake Motor
DHRONDK090/250 DHE		Front Cover
DHRONRF080/280 DHE		Brake Shield
DHRONKP090/250		Brake Cover

**Tests carried out**

- Test Report 113-QL23-R01 ver. 0; Type K, KF, KR; report date 08/05/2023; witnessed by DNV
  - o K1F with plastic cover/ testing curve
  - o K09F with metal cover/ testing curve
  - o K5R with iron cast cover/ testing curve

**Marking of product**

Manufacturer's name or trade mark and type designation.

**Periodical assessment**

The scope of the periodical assessment is to verify that the conditions stipulated for the Type approval are complied with and that no alterations are made to the product design or choice of materials.

The main elements of the assessment are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Routine Tests (RT) checked (if not available tests according to RT to be carried out)
- Review of type approval documentation
- Review of possible change in design, materials and performance
- Ensuring traceability between manufacturer's product type marking and 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 the certificate.

END OF CERTIFICATE