DNV·GL

TYPE APPROVAL CERTIFICATE

Certificate No:
TAS000008E
Revision No:
2

This is to certify:

That the Brakes

with type designation(s)
Multi disc brakes

Issued to
Reggiana Riduttori S.r.l.
San Polo d'Enza, RE, Italy

is found to comply with
DNV GL standard DNVGL-ST-0378 – Standard for offshore and platform lifting appliances

Application :

Spring activated disc brakes with hydraulic release

Issued at **Høvik** on **2019-12-12**

This Certificate is valid until **2024-12-11**.
DNV GL local station: **Italy/Malta CMC**

Approval Engineer: **Antonio Sendin Alvarez**

for **DNV GL**
Digitally Signed By: Matteucci, Aldo
Location: DNV GL Høvik, Norway
Signing Date: 13.12.2019

Aldo Matteucci
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

Parking and emergency brakes. The brakes are spring activated with hydraulic release. The braking momentum is added up of frictional forces acting on several discs and connected to the rotating shaft. Different number of springs and discs gives different brake torque for each brake type.

RF5:

Brake type	RF5-21	RF5-29	RF5-43	RF5-65	RF5-85	RF5-110	RF5-130	RF5-150
Brake torque (N*m)	210	290	430	650	850	1100	1300	1500

Number of brake sizes and brake torques are as given for RF5 for the following brake types:

- RFF5
- DG-RF/313
- DG-RF/314
- DG-RF/315
- DG-RF/316
- DG-RFF/396

RF2:

Brake type	RF2/7	RF2/14	RF2/21	RF2/32	RF2/43	RF2/60
Brake torque (N*m)	70	140	210	320	430	600

Number of brake sizes and brake torques are as given for RF2 for the following brake types:

- DG-RF/288
- DG-RF/289
- DG-RF/290

RF170-290:

Brake type	RF170	RF200	RF230	RF290
Brake torque (N*m)	1700	1980	2260	2830

Maximum design pressure for all brakes are 250 bar.
Above torques are based on a friction coefficient of 0.135.

Application/Limitation

1. All load-bearing materials are to be delivered with 3.1 certificates, documenting mechanical properties and chemical composition in accordance with the DNVGL-ST-0378 Sec. 3
2. Support and fixation of the brakes are not covered by this type approval and are to be separately considered/ approved in each case.
3. The friction factor has not been evaluated, the value is provided by the manufacturer.
4. There is no limitation for design temperature (Td) given by the manufacturer, as working temperature is specified to be approximately 100 degrees Celsius.

Type Approval documentation

Documents marked with (*) have been revised 2019-12-09. Rest of documents were revised 2011-09-16:

Code / Drawing no.	***Title***	***Description***	***Rev.***
F401011400	Corpo freno RF2	Input support	I

F022913500	Albero entrata freno	Input shaft	G
F265460200	Coperchio chiusura freno RR105	Support	H
F400331400(*)	Corpo freno RF5	Support	K
C200411	Disco freno acciaio	Iron disc	B
C200863(*)	Disco freno sinterizzato RF5/	Sintered disc	D
F022833000	Albero ent. Freno RF5	Input shaft	I
F180253000	Pistone freno	Brake piston	H
F140166600(*)	Molla per freno RF	Spring	D
F266190300(*)	Supporto di chiusura freno standard	Support	I
F400341400(*)	Supporto di accoppiamento e corpo freno	Support	I
F031983000	Albero	Shaft	N
F400311400	Supporto uscita	Output support	H
F265500200	Coperchio	Cover	F
C200414	Disco in acciaio	Iron disc	C
C200857	Disco sinterizzato	Sintered disc	C
F180383000	Pistone freno RF2	Brake piston	H
F140226600	Molla per freno	Brake spring	A
F022583500	Albero	Shaft	G
F265510200	Supporto di chiusura	Closing support	G
F022553500	Albero	Shaft	O
F400321400	Supporto uscita	Output support	E
F032163500	Albero	Shaft	L
F400371400	Supporto uscita	Output support	G
F266211100	Supporto di chiusura	Closing support	B
F032143500	Albero	Shaft	M
F400361400	Supporto uscita	Output support	I
F266201100	Supporto di chiusura	Closing support	H
F032153500	Albero	Shaft	M
F400621400	Supporto uscita	Output support	B
F032173500	Albero	Shaft	F
F400351400	Supporto uscita	Output support	H
F022803800	Albero	Shaft	P
F261700200	Supporto accoppiamento freno RF170-290	Support	B
F060134200	Corona freno RF170	Ring	C
F021103000	Albero in entrata per freno	Brake shaft	E
C200856	Disco freno sinterizzato	Sintered disc	A
C200406	Disco freno acciaio	Steel disc	A
F070024200	Corpo freno	Brake housing	E
F180024000	Pistone spingidischi	Piston	F
F140116600	Molla per freno RF d.est.13.5	External spring	C
F140126600	Molla per freno RF d.est.7.3	Internal spring	C
F261690200	Supporto entrata freno	Input support	-
REL-155-B	Lifting appliances certification, different brake configuration (NL014-10)		B
REL-152-A	Lifting appliances certification brake RF2/60 154B9186 (NL014-10)		A
-	Drawing list		A
REL-268 (*)		Calculations	0

F180293000(*)		Brake piston RF5	G
	BRAKE RFF5_150	General arrangement	5/11/19
	BRAKE RF5_150	General arrangement	5/11/19

Tests to be carried out

When DNV GL product certificate is required, each item is to be function and pressure tested. Manufacturing survey and tests witnessing to be carried out by a DNV GL surveyor.

Marking of product

Each brake shall be marked according to DNVGL-ST-0378 Sec.14.5.

Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNVGL-CP-0338.

END OF CERTIFICATE