DNV·GL

Certificate No:
TAS00001RX

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Winch - General Application

with type designation(s)
Winches BWE085, BWE105, BWE125 & BWE160

Issued to
Dana Motion Systems Italia S.r.l.
Reggio Emilia, RE, Italy

is found to comply with
DNV GL standard DNVGL-ST-0378 – Standard for offshore and platform lifting appliances
DNV GL standard DNVGL-ST-0377 – Standard for shipboard lifting appliances
DNVGL-OS-E101 – Drilling facilities, Edition January 2018

Application :

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

Issued at **Høvik** on **2019-01-08**
This Certificate is valid until **2024-01-07**.
DNV GL local station: **Milan**

for **DNV GL**

Approval Engineer: **Antonio Sendin Alvarez**

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

Winches type BWE085, BWE105, BWE125 and BWE160 for cargo and lifting of personnel, including gears, main and secondary brakes, with the following configurations:

Product	Number of layers	Shipboard i=49.43	Shipboard i=81.00	Offshore i=49.43	Offshore i=81.00	Lifting of personnel	Rope ø
		SWL	SWL	SWL	SWL	SWL	
BWE085	1 layer	58860 N	58860 N	58860 N	58860 N	22570 N	20 mm
	2 layer	54400 N	54400 N	54400 N	54400 N	20850 N	
	3 layer	50560 N	50560 N	50560 N	50560 N	19380 N	
	4 layer	47230 N	47230 N	47230 N	47230 N	18100 N	
	5 layer	44310 N	44310 N	44310 N	44310 N	16990 N	
	1 layer	66710 N	66710 N	66710 N	66710 N	22570 N	22 mm
	2 layer	61210 N	61210 N	61210 N	61210 N	20700 N	
	3 layer	56550 N	56550 N	56550 N	56550 N	19120 N	
	4 layer	52340 N	52340 N	52340 N	52340 N	17770 N	
	1 layer	66710 N	66710 N	66710 N	66710 N	22570 N	24 mm
	2 layer	61210 N	61210 N	61210 N	61210 N	20560 N	
	3 layer	56550 N	56550 N	56550 N	56550 N	18880 N	

Product	Number of layers	Shipboard i=50.79	Shipboard i=83.21	Offshore i=50.79	Offshore i=83.21	Lifting of personnel	Rope ø
		SWL	SWL	SWL	SWL	SWL	
BWE105	1 layer	70640 N	70640 N	70640 N	70640 N	27470 N	20 mm
	2 layer	66040 N	66040 N	66040 N	66040 N	25680 N	
	3 layer	61990 N	61990 N	61990 N	61990 N	24110 N	
	4 layer	58410 N	58410 N	58410 N	58410 N	22720 N	
	5 layer	55240 N	55240 N	55240 N	55240 N	21480 N	
	1 layer	82410 N	82410 N	82410 N	82410 N	27470 N	22 mm
	2 layer	76560 N	76560 N	76560 N	76560 N	25520 N	
	3 layer	71490 N	71490 N	71490 N	71490 N	23830 N	
	4 layer	67050 N	67050 N	67050 N	67050 N	22350 N	
	1 layer	82410 N	82410 N	82410 N	82410 N	27470 N	24 mm
	2 layer	76090 N	76090 N	76090 N	76090 N	25360 N	
	3 layer	70680 N	70680 N	70680 N	70680 N	23560 N	

Product	Number of layers	Shipboard i=50.79	Shipboard i=83.21	Offshore i=50.79	Offshore i=83.21	Lifting of personnel	Rope ø
		SWL	SWL	SWL	SWL	SWL	
BWE125	1 layer	90260 N	90260 N	90260 N	82410 N	34340 N	24 mm
	2 layer	84150 N	84150 N	84150 N	76830 N	32020 N	
	3 layer	78800 N	78800 N	78800 N	71950 N	29980 N	
	4 layer	74100 N	74100 N	74100 N	67650 N	28190 N	
	5 layer	69920 N	69920 N	69920 N	63850 N	26610 N	
	1 layer	103020 N	103020 N	103020 N	82410 N	34340 N	26 mm
	2 layer	95520 N	95520 N	95520 N	76420 N	31840 N	
	3 layer	89040 N	89040 N	89040 N	71230 N	29680 N	
	4 layer	83390 N	83390 N	83390 N	66700 N	27800 N	
	1 layer	103020 N	103020 N	103020 N	82410 N	34340 N	28 mm
	2 layer	95010 N	95010 N	95010 N	76010 N	31670 N	
	3 layer	88170 N	88170 N	88170 N	70530 N	29390 N	

Product	Number of layers	Shipboard i=61.50	Shipboard i=92.57	Offshore i=61.50	Offshore i=92.57	Lifting of personnel	Rope ø
		SWL	SWL	SWL	SWL	SWL	
BWE160	1 layer	107910 N	107910 N	107910 N	98100 N	42190 N	24 mm
	2 layer	100610 N	100610 N	100610 N	91450 N	39330 N	
	3 layer	94220 N	94220 N	94220 N	85660 N	36830 N	
	4 layer	88600 N	88600 N	88600 N	80550 N	34630 N	
	5 layer	83610 N	83610 N	83610 N	76000 N	32680 N	
	1 layer	125570 N	125570 N	125570 N	98100 N	42190 N	26 mm
	2 layer	116440 N	116440 N	116440 N	90960 N	39120 N	
	3 layer	108540 N	108540 N	108540 N	84790 N	36470 N	
	4 layer	101650 N	101650 N	101650 N	79410 N	34150 N	
	1 layer	125570 N	125570 N	125570 N	98100 N	42190 N	28 mm
	2 layer	115820 N	115820 N	115820 N	90480 N	38910 N	
	3 layer	107470 N	107470 N	107470 N	83970 N	36110 N	

Categorization: shipboard, platform, offshore.

The minimum static braking torques are the following:

1. main brake BWE125/BT1172100: 1077.9 Nm (*)
2. secondary brake BWE085/BT9305/MR: 9141.5 Nm
3. secondary brake BWE105/BT12970/MR: 12684.8 Nm
4. secondary brake BWE125/BT18160/MR: 17758.8 Nm
5. secondary brake BWE160/BT22050/MR: 21564.2 Nm

(*): The same main brake type is used for every winch and configuration.

Gears:

Winch	Gear ratio	Maximum dynamic torque	Speed[1] [rpm]	Load spectrum [2]	Lifetime [hrs]	Km [2]
BWE 85	49,43	13942	15	M6 (T6-L2)	7343	0.2
	81,19	13942		M6 (T6-L2)	7790	0.2
BWE 105	50,79	20271		M8 (T9-L2)	97029	0.15
	83,21	20271		M8 (T9-L2)	132504	0.15
BWE 125	50,7	29153		M7 (T7-L2)	19231	0.15
	83,21	29153		M7 (T7-L2)	20096	0.15
BWE 160	61,5	35536		M8 (T9-L2)	58794	0.2
	92,56	35536		M8 (T9-L2)	58692	0.2

1) Output speed is 15 rpm. If other output speed is required, the rating values are to be interpolated. These new values will be provided by Dana Brevini using their calculation program ISO BreCal2000.
2) Load spectrum and classes of utilisation according to F.E.M. (1.001 3rd edition – Revised 1998.10.01)

Minimum dynamic amplification factor (DAF) = 1.3

Design temperature: -20 °C

Application/Limitation

1. The system is not covered by this approval. (**)
2. All materials are to be delivered with 3.1 certificates, documenting mechanical properties and chemical composition in accordance with the type approval documentation.
3. The winches intended for personnel lifting / man-riding will be set up with a mechanically and functionally independent secondary brake:
    1. Winch BWE085 → secondary brake BWE085/BT9305/MR
    2. Winch BWE105 → secondary brake BWE105/BT12970/MR
    3. Winch BWE125 → secondary brake BWE125/BT18160/MR
    4. Winch BWE160 → secondary brake BWE160/BT22050/MR
4. The winches are not intended to lift one person in a riding belt in accordance to OS-E101 clause 5.4.2.6
5. Welding and NDT as specified in the type approval documentation are to be carried out by certified personel.
6. It is the responsibility of the holder of the certificate to ensure that both design and production are in compliance with rules, standards and/or regulations listed on page 1 of this type approval certificate.
7. Combinations by increasing DAF and lowering SWL are allowed as long as the maximum dynamic pulling force remains the same. In any case, minimum DAF to be considered is 1.3 and maximum SWL are the values shown in the tables above-mentioned.
8. Upon final installation of gear unit to foundation/frame the fastening bolts are to be pre-stressed according to procedures acceptable to the attending surveyor. We have assumed that the load carrying bolts are of 8.8 quality or higher.
9. Our gear calculations are based on that optimum hardening depths have been achieved according to recognised standards and manufacturer's experience. Material fatigue values based on 90% reliability of survival have been applied according to the requirements for lifting

appliances in our rules. Load distribution factors as stated by the manufacturer (based on his experience) have been used and we have not considered these.

10. The bearing lifetime for the gear units are not evaluated in this Type Approval. It is assumed that the manufacturer delivers bearings with sufficient capacity for the class of utilisation they are intended for with respect to strength and materials.

Type Approval documentation

Tests carried out

The prototype test is considered not required. In order to obtain a DNV GL Product Certificate, testing is to be carried out in accordance to the applicable standard requirements. DAF and SWL to be specified in the certificate.
For delivery according to DNVGL-ST-0377 or 0378, the gear unit is to be function tested according to Section 13 or 14, respectively before a DNVGL product certificate can be issued.

Marking of product

Each winch shall be marked according to the DNVGL-ST-0378 "Standard for offshore and platform lifting appliances" Ed. May 2016 Clause 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