TÜVRheinland®

TEST REPORT

60387492 001

For

Transceiver
NX-12xx series
NX-13xx Series
TK-3710 X

JVC KENWOOD Corporation

This documentation consists of 16 pages (excluding this cover page)

Prüfbericht-Nr.: *Test Report No.*:	**60387492 001**	**Auftrags-Nr.:** *Order No.*:	**150225392**	*Seite 1 von 16 Page 1 of 16*
Kunden-Referenz-Nr.: *Client Reference No.*:		**Auftragsdatum:** *Order date*:	2020.05.14	
Auftraggeber: *Client*:	**JVC KENWOOD Corporation** 1-16-2Hakusan, Midori-Ku, Yokohama-shi, 226-8525, Japan			
Prüfgegenstand: *Test item*:	Transceiver			
Bezeichnung / Typ-Nr.: *Identification / Type No.*:	NX-12xx Series, NX-13xx Series, TK-3710 X			
Auftrags-Inhalt: *Order content*:	IP67 testing			
Prüfgrundlage: *Test specification*:	EN 60529:1991+A1+A2 IEC 60529:1989+A1+A2			
Wareneingangsdatum: *Date of receipt*:	2020.05.08			
Prüfmuster-Nr.: *Test sample No.*:	C1B00024 (IP6X) C1A00004 (IPX7)			
Prüfzeitraum: *Testing period*:	2020.05-19 - 2020.06.16			
Ort der Prüfung: *Place of testing*:	Same as testing Laboratory			
Prüflaboratorium: *Testing laboratory*:	TÜV Rheinland Japan Ltd., Osaka Laboratory (refer to remark No. 4)			
Prüfergebnis*: *Test result**:	Pass			

überprüft von: *reviewed by*:		**genehmigt von:** *authorized by*:	
Datum: 2020.06.29 *Date:*	K. Watanabe	**Datum:** 2020.06.29 *Date:*	T. Kawahigashi
Stellung / Position:	Sachveständige(r)/Expert	**Stellung /** Position:	Sachveständige(r)/Expert

Sonstiges / *Other*:

Zustand des Prüfgegenstandes bei Anlieferung: *Condition of the test item at delivery*:	Prüfmuster vollständig und unbeschädigt *Test item complete and undamaged*

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
** Legend:*	*1 = very good*	*2 = good*	*3 = satisfactory*	*4 = sufficient*	*5 = poor*
	P(ass) = passed a.m. test specification(s)		*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

	Remarks
1	*The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system.* *Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.*
2	*As contractually agreed, this document has been signed digitally only. TUV Rheinland has not verified and unable to verify which legal or other pertaining requirements are applicable for this document. Such verification is within the responsibility of the user of this document. Upon request by its client, TUV Rheinland can confirm the validity of the digital signature by a separate document. Such request shall be addressed to our Sales department. An environmental fee for such additional service will be charged.*
3	*Test clauses with remark of * are subcontracted to qualified subcontractors and descripted under the respective test clause in the report.* *Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.*
4	*Testing laboratory:* *TÜV Rheinland Japan Ltd., Osaka Laboratory* *Kansai Technology Assessment Center (KTAC),* *Adress:* *1-3-14, Fukae Minami, Higashinari-ku, Osaka-shi, 537-0002, Japan*

Product descripition		
1	*Product details*	EUT is a lithium ion Transceiver. Refer to Attachment A for construction drawing.
2	*Dimensions / Weight*	Dimensions (mm): Width: 54, Height: 123, Length: 39.7 (All models, not included anntena and dials) Weight: N/A
3	*Operating elements*	N/A
4	*Equipment / Accessories*	The equipment was tested without any optional accessory installed. Hence, this report does not cover parameters that are influenced by the installation of optional accessory that might affect safety in the meaning of this standard.
5	*Used materials*	Assembled final product
6	*Other*	Test sample(s), as well sample information, description, product details and intended usage was provided by customer.
7	*Test sample obtaining:*	☒ Sending by customer ☐ Sampling by TÜV Rheinland Group ☐ others:
8	*General remarks:*	The test results presented in this report relate only to the item(s) tested. ”(see remark #)" refers to a remark appended to the report. "(see Annex #)" refers to an annex appended to the report. Throughout this report a period is used as the decimal separator.
9	*Abbreviations used throughout this test report:*	PE:protective earth pri:primary CB:circuit breaker sec:secondary (SW)PS: (switching) power supply gnd:ground HV:high voltage I/O:input/output PCB:printed circuit (wiring) board EUT: Equipment Under Test
10	*Description of the test item:*	Test was conducted on Transceiver model: NX-1200DVK2. Used 1 sample for IP6X and 1 sample for IPX7. Refer to Attachment A for model differences, construction drawings, sealing materials and sealing constructions.
11	*Description of equipment Setup (e.g. wiring, description of openings, installation, artificial surface...):*	For IP6X dust test the EUT was placed in a horizontal position and the connector nipple was fixed to the enclosure. For IPX7 water test the EUT was placed into the tank in a horizontal position.

Photos:

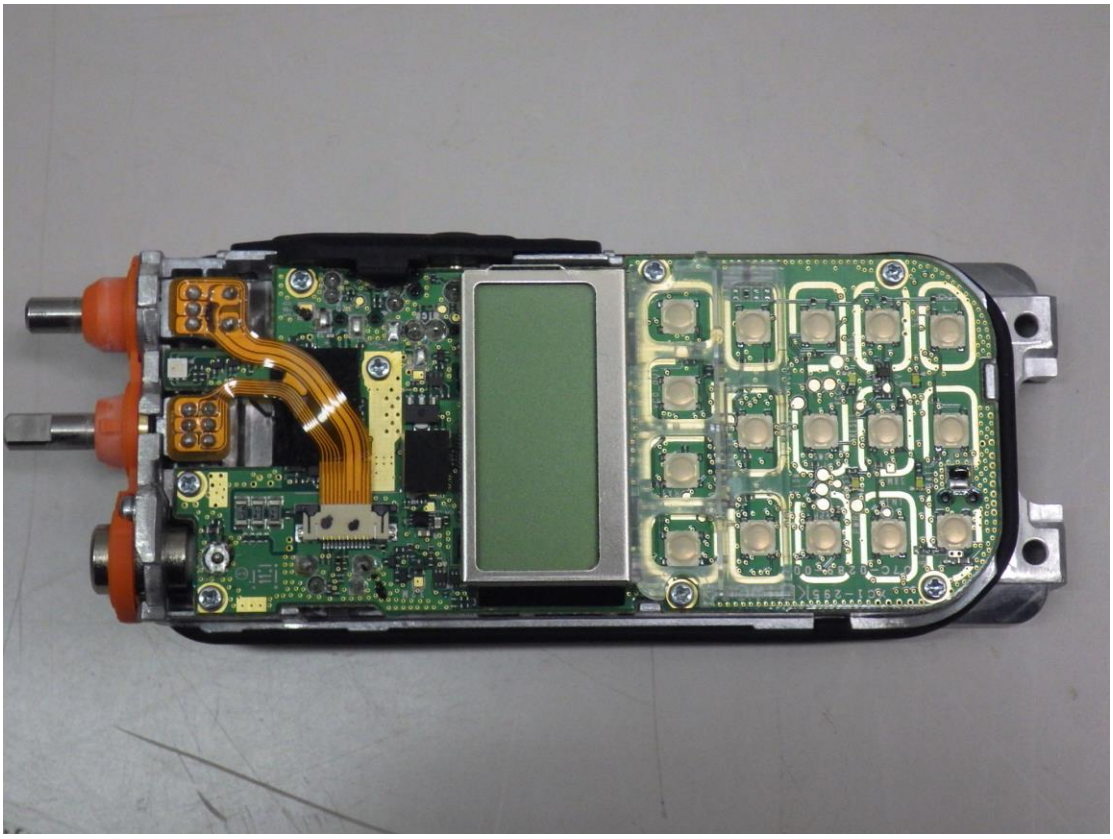
Model, NX-1200D M3 for IP6X

Model, NX-1200D X2 for IPX7

Photos:

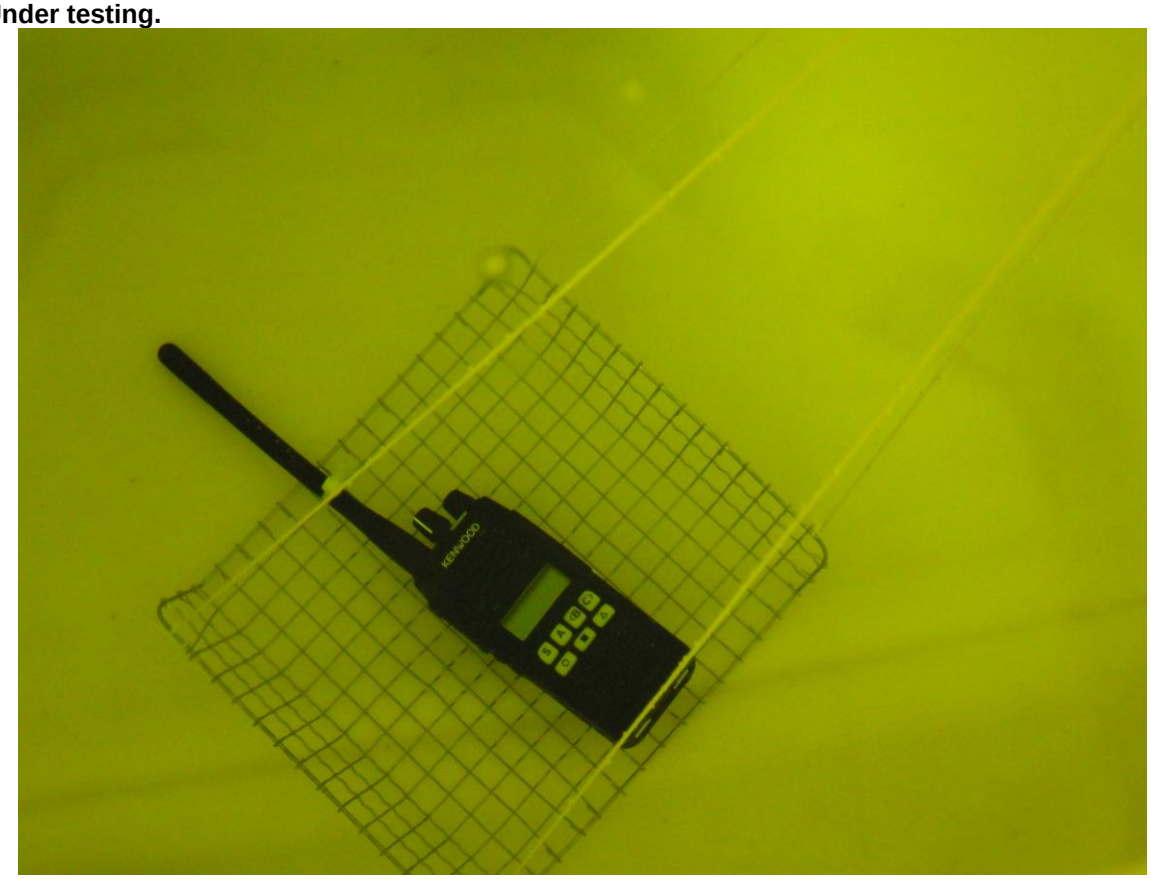
Condition of the EUT for IP6X
After testing.

Interior of the enclosure.

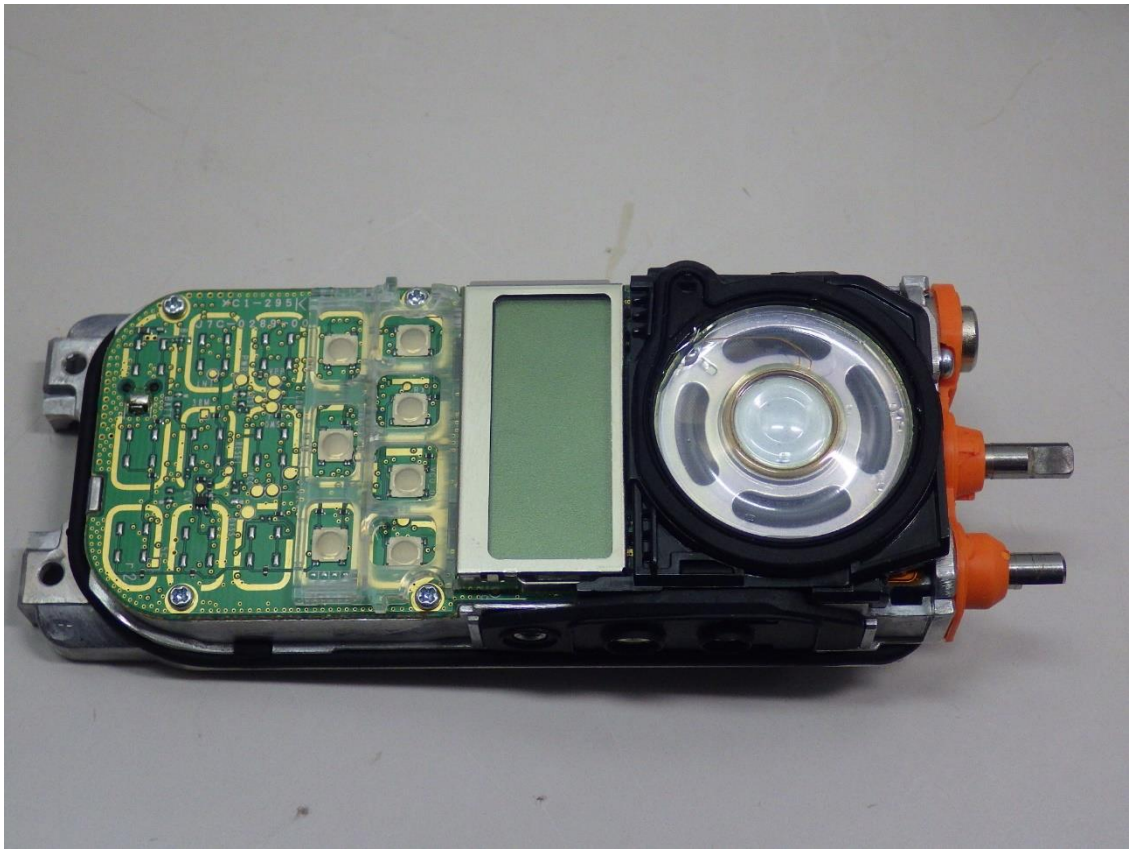


Photos:

Condition of the EUT for IPX7
Under testing.



Interior of the enclosure.



IEC/EN 60529			
Clause	Requirement – Test	Result	Verdict
10	**MARKING**		——
	The requirements for marking shall be specified in the relevant product standard.		N/A
	Where appropriate, such a standard should also specify the method of marking which is to be used when:		N/A
	one part of an enclosure has a different degree of protection to that of another part of the same enclosure		N/A
	the mounting position has an influence on the degree of protection		N/A
	the maximum immersion depth and time are indicated		N/A
11	**GENERAL REQUIREMENTS FOR TESTS**		——
11.1	**Atmospheric conditions for water or dust tests**		——
	Unless otherwise specified in the relevant product standard, the tests should be carried out under the standard atmospheric conditions described in IEC 68-1.		P
	The recommended atmospheric conditions during the tests are as follows		——
	Temperature range : 15 to 35 °C Relative humidity : 25 to 75 % Air pressure : 86 to 106 kPa (860 to 1060 mbar)	22.7 °C 64 % 100.5 kPa	P
11.2	**Test samples**		——
	The tests specified in this standard are type tests.		P
	Unless otherwise specified in a relevant product standard, the test samples for each test shall be in a clean and new condition, with all parts in place and mounted in the manner stated by the manufacturer.	horizontal position	P
	If it is impracticable to test the complete equipment, representative parts or smaller equipment having the same full-scale design details shall be tested		N/A
	The relevant product standard shall specify details such as:		——
	The number of samples to be tested;	1 for dust test 2 for water test	P
	The conditions for mounting, assembling and positioning of the samples, for example by the use of an artificial surface (ceiling, floor or wall);		N/A
	The pre-conditioning, if any, which is to be used;	No pre-conditioning	N/A
	Whether to be tested energized or not;	Not energized	N/A
	Whether to be tested with its parts in motion or not.	Not in motion	N/A
	In the absence of such specification, the manufacturer's instructions shall apply.		N/A
11.3	**Application of test requirements and interpretation of test results**		——
	The application of the general requirements for tests and the acceptance conditions for equipment containing drain-holes or ventilation openings is the responsibility of the relevant Technical Committee.	No drain holes and ventilation openings	P
	In the absence of such specification the requirement of this standard shall apply.		P
	The interpretation of test results is the responsibility of the relevant Technical Committee. In the absence of a specification the acceptance of a specification the acceptance conditions of this standard shall at least apply		P

IEC/EN 60529				
Clause	Requirement – Test		Result	Verdict
11.4	**Combination of test conditions for the first characteristic numeral**			——
	Designation with a first characteristic numeral implies that all test conditions are met for this numeral:			P
	Tab. V-5 **Test conditions for degrees of protection indicated by the first characteristic numeral**			——
	First characteristic numeral	**Test for protection against**		——
		access to hazardous parts	**solid foreign objects**	——
	0	No test required	No test required	N/A
	1	The sphere of 50 mm Ø shall not fully penetrate and adequate clearance shall be kept		P
	2	The jointed test finger may penetrate up to its 80 mm length, but adequate clearance shall be kept	The sphere of 12.5 mm Ø shall not fully penetrate	P
	3	The test rod of 2,5 mm Ø shall not penetrate and adequate clearance shall be kept		P
	4	The test wire of 1,0 mm Ø shall not penetrate and adequate clearance shall be kept		P
	5	The test wire of 1,0 mm Ø shall not penetrate and adequate clearance shall be kept	Dust-protected as specified in Tab. II	P
	6	The test wire of 1,0 mm Ø shall not penetrate and adequate clearance shall be kept	Dust-tight as specified in Tab. II	P
11.5	**Empty enclosures**			——
	If the enclosure is tested without equipment inside, detailed requirements shall be indicated by the enclosure manufacturer in his instructions for the arrangement and spacing of hazardous parts or parts which might be affected by the penetration of foreign objects or water.		Enclosure was not empty.	N/A
	The manufacturer of the final assembly shall ensure that after the electrical equipment is enclosed the enclosure meets the declared degree of protection of the final product.			N/A
12	**TESTS FOR PROTECTION AGAINST ACCESS TO HAZARDOUS PARTS INDICATED BY THE FIRST CHARACTERISTIC NUMERAL**			——
12.1	**Access probes**			——
	Access probes to test the protection of persons against access to hazardous parts are given in Tab. VI.			——
12.2	**Test conditions**			——
	The access probe is pushed against or (in case of the test for first characteristic numeral 2) inserted through any openings of the enclosure with the force specified in Tab. VI.			P
	For tests on low-voltage equipment, a low-voltage supply (of not less than 40 V and not more than 50 V) in series with a suitable lamp should be connected between the probe and the hazardous parts inside the enclosure. Hazardous live parts covered only with varnish or paint, or protected by oxidation or by a similar process, are covered by a metal foil electrically connected to those parts which are normally live in operation.			N/A
	The signal-circuit method should also be applied to the hazardous moving parts of high-voltage equipment.			N/A
	Internal moving parts may be operated slowly, where this is possible.			N/A

IEC/EN 60529			
Clause	Requirement – Test	Result	Verdict
12.3	**Acceptance conditions**		——
	The protection is satisfactory if adequate clearance is kept between the access probe and hazardous parts.		P
	For the test of first characteristic numeral 1, the access probe 50 mm diameter shall not completely pass through the opening.		P
	For the test of first characteristic numeral 2, the jointed test finger may penetrate to its 80 mm length, but the stop face (Ø 50 x 20 mm) shall not pass through the opening. Starting from the straight position, both joints of the test finger shall be successively bent through an angle of up to 90°with respect to the axis of the adjoining section of the finger and shall be placed in every possible position.		P
	See Annex A for further clarification. **Adequate clearance means:**		——
12.3.1	**For low-voltage equipment (rated voltages not exceeding 1000 V a.c. and 1500 V d.c.)**		——
	The access probe shall not touch hazardous live parts.		N/A
	If adequate clearance is verified by a signal circuit between the probe and hazardous parts, the lamp shall not light.		N/A
12.3.2	**For high-voltage equipment (rated voltages exceeding 1000 V a.c. and 1500 V d.c.)**		——
	When the access probe is placed in the most unfavourable position(s), the equipment shall be capable of withstanding the dielectric tests as specified in the relevant product standard applicable to the equipment.		N/A
	Verification may be made either by dielectric test or by inspection of the specified clearance dimension in air which would ensure that the tests would be satisfactory under the most unfavourable electric field configuration (see IEC 71-2).		N/A
	In the case where an enclosure includes sections at different voltage levels the appropriate acceptance conditions for adequate clearance shall be applied for each section.		N/A
12.3.3	**For equipment with hazardous mechanical parts**		——
	The access probe shall not touch hazardous mechanical parts. The enclosure considered for the evaluation is only the part enclosing the electrical part.	No hazardous mechanical parts.	N/A
	If adequate clearance is verified by a signal circuit between the probe and hazardous parts, the lamp shall not light.		N/A

IEC/EN 60529					
Clause	Requirement – Test		Result		Verdict
13	**TESTS FOR PROTECTION AGAINST SOLID FOREIGN OBJECTS INDICATED BY THE FIRST CHARACTERISTIC NUMERAL**				——
13.1	**Test**				——
	Test means and the main test conditions are given in Tab. VII.				——
	Tab. VII-7 **Test means for the tests for protection against solid foreign objects**				——
	First characteristic Numeral	**Test means**	**Test force**	**Test conditions**	——
	0	No test required	—	—	N/A
	1	Rigid sphere without handle or guard 50 mm diameter	50 N ±10%	13.2	P
	2	Rigid sphere without handle or guard 12,5 mm diameter	30 N ± 10%	13.2	P
	3	Rigid steel rod2,5 mm diameter with edges free from burrs	3 N ± 10%	13.2	P
	4	Rigid steel wire 1 mm diameter with edges free from burrs	1 N ± 10%	13.2	P
	5	Dust chamber Fig. 2, with or without under pressure	—	13.4 and 13.5	P
	6	Dust chamber Fig. 2, with under pressure	—	13.4 and 13.6	P
13.2	**Test conditions for first characteristic numerals 1, 2, 3, 4**				——
	The object probe is pushed against any openings of the enclosure with the force specified in Tab. VII.				P
13.3	**Acceptance conditions for first characteristic numerals 1, 2, 3, 4**				——
	The protection is satisfactory if the full diameter of the probe specified in Table 7 does not pass through any opening.		(EN 60529/A1)		P
13.4	**Dust test for first characteristic numerals 5 and 6**				——
	The test is made using a dust chamber incorporating the basic principles shown in Fig.2 whereby the powder circulation pump may be replaced by other means suitable to maintain the talcum powder in suspension in a closed test chamber. The talcum powder used shall be able to pass through a square-meshed sieve the nominal wire diameter of which is 50 mm and the nominal width of a gap between wires 75 mm. The amount of talcum powder to be used is 2 kg per cubic metre of the test chamber volume. It shall not have been used for more than 20 tests.		(EN 60529/A1)		P
	Enclosures are of necessity in one of two categories:				——
	Category 1: Enclosures where the normal working cycle of the equipment causes reductions in air pressure within the enclosure below that of the surrounding air, e.g., due to thermal cycling effects.				P
	Category 2: Enclosures where no pressure difference relative to the surrounding air is present				N/A
	Category 1 enclosures:				——
	The enclosure under test is supported inside the test chamber and the pressure inside the enclosure is maintained below the surrounding atmospheric pressure by a vacuum pump.				P
	The suction connection shall be made to a hole specially provided for this test.		By using nipple connector.		P
	If not otherwise specified in the relevant product standard, this hole shall be in the vicinity of the vulnerable parts.				P

IEC/EN 60529			
Clause	Requirement – Test	Result	Verdict
	If it is impracticable to make a special hole, the suction connection shall be made to the cable inlet hole.		N/A
	If there are other holes (e.g., more cable inlet holes or drain-holes) these shall be treated as intended for normal use on site.		N/A
	The object of the test is to draw into the enclosure, by means of depression, a volume of air 80 times the volume of the sample enclosure tested without exceeding the extraction rate of 60 volumes per hour.	Total volume of air drawn (80 times internal volume) 3120 cm^3	P
	In no event shall the depression exceed 2 kPa (20 mbar) on the manometer shown in Fig. 2.	1.8 kPa	P
	If an extraction rate of 40 to 60 volumes per hour is obtained the duration of the test is 2 h.		N/A
	If, with a maximum depression of 2 kPa (20mbar), the extraction rate is less than 40 volumes per hour, the test is continued until 80 volumes have been drawn through,	Extraction rate : 600 cm^3/h, Extracted volumes : 15.28/h	P
	or a period of 8 h has elapsed.	8 h	P
	Category 2 enclosures:		——
	The enclosure under test is supported in its normal operating position inside the test chamber, but is not connected to a vacuum pump.		N/A
	Any drain-hole normally open shall be left open for the duration of the test.		N/A
	The test shall be continued for a period of 8h		N/A
	Category 1 and category 2 enclosures:		——
	If it is impracticable to test the complete enclosure in the test chamber, one of the following procedures shall be applied:	Complete enclosure tested.	N/A
	Testing of individually enclosed sections of the enclosure;		N/A
	Testing of representative parts of the enclosure, comprising components such as doors, ventilation openings, joints, shaft seals, etc., in position during test;		N/A
	Testing of a smaller enclosure having the same full-scale design details.		N/A
	In the last two cases, the volume of air to be drawn through the enclosure under test shall be the same as for the whole enclosure in full scale		N/A
13.5	**Special conditions for first characteristic numeral 5**		——
13.5.1	**Test conditions for first characteristic numeral 5**		——
	The enclosure shall be deemed category 1 unless the relevant product standard for the equipment specifies that the enclosure is category 2.		P
13.5.2	**Acceptance conditions for first characteristic numeral 5**		——
	The protection is satisfactory if, on inspection, talcum powder has not accumulated in a quantity or location such that, as with any other kind of dust, it could interfere with the correct operation of the equipment or impair safety.		P
	Except for special cases to be clearly specified in the relevant product standard, no dust shall deposit where it could lead to tracking along the creepage distances.		P

IEC/EN 60529						
Clause	Requirement – Test			Result		Verdict
13.6	**Special conditions for first characteristic numeral 6**					——
13.6.1	**Test conditions for first characteristic numeral 6**					——
	The enclosure shall be deemed category 1, whether reductions in pressure below the atmospheric pressure are present or not.					P
13.6.2	**Acceptance conditions for first characteristic numeral 6**					——
	The protection is satisfactory if no deposit of dust is observable inside the enclosure at the end of the test.			No deposit of dust was observed after the test.		P
14	**TESTS FOR PROTECTION AGAINST WATER INDICATED BY THE SECOND CHARACTERISTIC NUMERAL**					——
14.1	**Test means**					——
	The test means and the main test conditions are given in Tab. VIII.					——
	Tab. VIII-8 **Test means and main test conditions for the tests for protection against water**					——
	Second charact. Numeral	**Test means**	**Water flow rate**	**Duration of test**	**Test conditions**	——
	0	No test required	—	—	—	N/A
	1	Drip box Fig.3 Enclosure on turntable	1 mm/min	10 min	14.2.1	N/A
	2	Drip box Fig.3 Enclosure in 4 fixed positions of 15°tilt	3 mm/min	2,5 min for each position of tilt	14.2.2	N/A
	3	Oscillating tube Fig. 4 Spray ± 60° from vertical, distance max. 200 mm Spray nozzle Fig. 5 Spray ± 60° from vertical	0,07 l /min ± 5% per hole, multiplied by number of holes	10 min	14.2.3 a)	N/A
			10 L/min ± 5%	1 min/m² at least 5 min	14.2.3 b)	
	4	As for numeral 3 Spray ± 180° from vertical	As for numeral 3		14.2.4	N/A
	5	Water jet hose nozzle Fig. 6 Nozzle 6,3 mm diameter, distance 2,5 m to 3 m	12,5 l /min ± 5%	1 min/m² at least 3 min	14.2.5	N/A
	6	Water jet hose nozzle Fig. 6 Nozzle 12,5 mm diameter, distance 2,5 m to 3 m	100 l /min ± 5%	1 min/m² at least 3 min	14.2.6	N/A
	7	Immersion tank Water-level on enclosure: 0,15 m above top 1 m above bottom	—	30 min	14.2.7	P
	8	Immersion tank Water-level: by agreement	—	by agreement	14.2.8	N/A
	9	Fan jet nozzle Figure7 Test of small enclosure on turntable Figure 12 Turntable speed (5 ± 1) r/min Spray at 0°, 30° , 60° , 90° Or Test of large enclosures as per intended use Spray from all practical directions Distance (175 ± 25) mm	(15 ± 1) l/min	30 s per position 1 min/m2 at least 3 min	14.2.9 a) 14.2.9 b)	N/A
14.2	**Test conditions**					——
	Test means and main test conditions are given in Tab. VIII.					——
	Details concerning compliance of degrees of protection – in particular for second characteristic numerals 5/6/9 (water jets) and numerals 7/8 (immersion) – are given in Clause 6.					N/A
	The tests are conducted with fresh water.					P

IEC/EN 60529			
Clause	Requirement – Test	Result	Verdict
	During the tests for IPX1 to IPX6 the water temperature should not differ by more than 5 K from the temperature of the specimen under test.	0.6K	P
	If the water temperature is more than 5 K below the temperature of the specimen a pressure balance shall be provided for the enclosure.		N/A
	For IPX7 and IPX9 details of the water temperature are given in 14.2.7 and 14.2.9 respectively.		——
	During the test, the moisture contained inside the enclosure may partly condense. The dew which may thus deposit shall not be mistaken for ingress of water.		P
	For the purpose of the tests, the surface area of the enclosure is calculated with a tolerance of 10%.		P
	Adequate safety precautions should be taken when testing the equipment in the energized condition		N/A
14.2.1	**Test for second characteristic numeral 1 with the drip box**		——
	The test is made with a device which produces a uniform flow of water drops over the whole area of the enclosure.		N/A
	The turntable on which the enclosure is placed has a rotation speed of 1 r/min and the eccentricity (distance between turntable axis and specimen axis) is approximately 100 mm.		N/A
	The enclosure under test is placed in its normal operating position under the drip box, the base of which is larger than that of the enclosure.		N/A
	Except for enclosures designed for wall or ceiling mounting, the support for the enclosure under test should be smaller than the base of the enclosure.		N/A
	An enclosure normally fixed to a wall or ceiling is fixed in its normal position of use to a wooden board having dimensions which are equal to those of that surface of the enclosure which is in contact with the wall or ceiling when the enclosure is mounted as in normal use.		N/A
	The duration of test is 10 min.		N/A
14.2.2	**Test for second characteristic numeral 2 with the drip box**		——
	The dripping device is the same as specified in 14.2.1 adjusted to provide the water flow rate specified in Tab. VIII.		N/A
	The table on which the enclosure is placed does not turn as in the case of the test for the second characteristic numeral 1.		N/A
	The enclosure is tested for 2.5 min in each of four fixed positions of tilt. These positions are 15° on either side of the vertical in two mutually perpendicular planes (see Fig. 3b).		N/A
	The total duration of the test is 10 min.		N/A
14.2.3	**Test for second characteristic numeral 3 with oscillating tube or spray nozzle**		——
	The test is made using one of the two test devices described in Fig. 4 and in Fig. 5 in accordance with the relevant product standard.		N/A
	a) Conditions when using the test device as in Fig. 4 (oscillating tube)		N/A
	b) Conditions when using the test device as in Fig. 5 (spray nozzle)		N/A
14.2.4	**Test for second characteristic numeral 4 with oscillating tube or spray nozzle**		——
	The test is made using one of the two test devices described in Fig. 4 and in Fig. 5 in accordance with the relevant product standard.		N/A

IEC/EN 60529						
Clause	Requirement – Test			Result		Verdict
	a) Conditions when using the test device as in Fig. 4 (oscillating tube):					N/A
	b) Conditions when using the test device as in Fig. 5 (spray nozzle):					N/A
	Tab. IX-9 Total water rate qv under IPX3 and IPX4 test conditions Mean flow rate per hole qv1 = 0,07 l/min					———
	Tube radius R mm	**Number of open holes** N[1)]	**Total water flow** qv l/min	**Number of open holes** N[1)]	**Total water flow** qv l/min	———
	200	8	0,56	12	0.84	N/A
	400	16	1,1	25	1,8	N/A
	600	25	1,8	37	2,6	N/A
	800	33	2,3	50	3,5	N/A
	1000	41	2,9	62	4,3	N/A
	1200	50	3,5	75	5,3	N/A
	1400	58	4,1	87	6,1	N/A
	1600	67	4,7	100	7,0	N/A
	1) Depending on the actual arrangement of the hole centres at the specified distance, the number of open holes N may be increased by 1.					N/A
14.2.5	**Test for second characteristic numeral 5 with the 6,3 mm nozzle**					———
	The test is made by spraying the enclosure from all practicable directions with a stream of water from a standard test nozzle as shown in Fig. 6.					N/A
	The conditions to be observed are as follows:					———
	Internal diameter of the nozzle: 6,3 mm;					N/A
	Delivery rate: 12,5 l/min ± 5%;					N/A
	Water pressure: to be adjusted to achieve the specified delivery rate;					N/A
	Core of the substantial stream: circle of approximately 40 mm diameter at 2,5 m distance from nozzle;					N/A
	Test duration per square metre of enclosure surface area likely to be sprayed: 1 min;					N/A
	Minimum test duration: 3 min;					N/A
	Distance from nozzle to enclosure surface: between 2,5 and 3 m					N/A
14.2.6	**Test for second characteristic numeral 6 with the 12,5 mm nozzle**					———
	The test is made by spraying the enclosure from all practicable directions with a stream of water from a standard test nozzle as shown in Fig. 6.					N/A
	The conditions to be observed are as follows:					———
	Internal diameter of the nozzle: 12,5 mm;					N/A
	Delivery rate: 100 l/min ± 5%;					N/A
	Water pressure: to be adjusted to achieve the specified delivery rate;					N/A
	Core of the substantial stream circle of approximately 120 mm diameter at 2,5 m distance from nozzle;					N/A
	Test duration per square metre of enclosure surface area likely to be sprayed: 1 min;					N/A
	Minimum test duration: 3 min;					N/A

IEC/EN 60529			
Clause	Requirement – Test	Result	Verdict
	Distance from nozzle to enclosure surface: between 2,5 and 3 m.		N/A
14.2.7	**Test for second characteristic numeral 7: temporary immersion between 0,15 and 1 m**		——
	The test is made by completely immersing the enclosure in water in its service position as specified by the manufacturer so that the following conditions are satisfied:		——
	a) The lowest point of enclosures with a height less than 850 mm is located 1000 mm below the surface of the water;	The lowest point is located 1000 mm below the surface of the water.	P
	b) The highest point of enclosures with a height equal to or greater than 850 mm is located 150mm below the surface of the water;		N/A
	c) The duration of the test is 30 min	30min.	P
	d) The water temperature does not differ from that of the equipment by more than 5 K. However, a modified requirement may be specified in the relevant product standard if the tests are to be made when the equipment is energized and/or its parts in motion	0.6K	P
14.2.8	**Test for second characteristic numeral 8: continuous immersion subject to agreement**		——
	Unless there is a relevant product standard, the test conditions are subject to agreement between manufacturer and user.		N/A
	but they shall be more severe than those prescribed in 14.2.7 And they shall take account of the condition that the enclosure will be continuously immersed in actual use.		N/A
14.2.9	**Test for second characteristic numeral 9 by high pressure and temperature water jetting**		
	The test is made by spraying the enclosure with a stream of water from a standard test nozzle as shown in Figures 7, 8 and 9.		N/A
	The set-up for measuring the impact force of the water jet is given in Figure 10.		N/A
	The distribution force shall be verified at upper and lower limits of distance tolerance range (see Figure 11).		N/A
	During the test a) or b) of the enclosure, the water temperature shall be (80± 5)℃.		N/A
	a) For small enclosures (largest dimension less than 250 mm), the enclosure shall be mounted on the test device shown in Figure 12.		N/A
	turntable speed: 5 r/min ± 1 r/min		N/A
	spray positions: 0°, 30°, 60°, 90°		N/A
	The test duration is 30 s per position.		N/A
	b) For large enclosures (largest dimension greater than or equal to 250 mm), the enclosure shall be mounted as per intended use. The entire exposed surface area of the enclosure shall be subjected to the spray at some point during the test procedure.		N/A
	spray positions: the enclosure shall be sprayed from all practical directions covering the entire surface area and the spray shall be, as far as possible, perpendicular to the sprayed surface.		N/A
	distance between nozzle and sample under test shall be 175 ± 25 mm.		N/A

IEC/EN 60529			
Clause	Requirement – Test	Result	Verdict
	The test duration is 1 min/m2 of the calculated surface area of the enclosure (excluding any mounting surface), with a minimum duration of 3 min.		N/A
14.3	**Acceptance conditions**		——
	After testing in accordance with the appropriate requirements of 14.2.1 to 14.2.9, the enclosure shall be inspected for ingress of water.		P
	It is the responsibility of the relevant Technical Committee to specify the amount of water which may be allowed to enter the enclosure and the details of a dielectric strength test, if any.		P
	In general, if any water has entered, it shall not:		——
	Be sufficient to interfere with the correct operation of the equipment or impair safety;	After testing, no ingress of water was observed inside the enclosure. No water has entered that is sufficient to interfere with the correct operation or impair safety.	P
	Deposit on insulation parts where it could lead to tracking along the creep age distances;	No water has deposited on insulation parts where it could lead to tracking along creepage distances.	P
	Reach live parts or windings not designed to operate when wet.	No water reached live parts or windings.	P
	Accumulate near the cable end or enter the cable if any.	No cables.	N/A
	If the enclosure is provided with drain-holes, it should be proved by inspection that any water which enters does not accumulate and that it drains away without doing any harm to the equipment.	No drain holes.	N/A
	For enclosures without drain-holes, the relevant product standard shall specify the acceptance conditions if water can accumulate to reach live parts.		N/A

- End of Report -

Attachment A (1/18)

"NX-1200D" Series

Model Name		Model No. (参考)	Main Market/市場 (参考)	取得IP レポート		Buttons			Freq. Range (MHz)
Base Model	Type 仕向			IP-54 IP-55	IP-67	16Key	7Key	Non Key	
NX-1200DV	K2	YC1-118K-00	USA	●	-	-	●	-	136 - 174
NX-1200D	K2	YC1-118K-01	Latin America, Canada	●	-	-	●	-	
NX-1200DV	K	YC1-118K-02	USA	●	-	-	-	●	
NX-1200D	K	YC1-118K-03	Latin America, Canada	●	-	-	-	●	
NX-1200D	E2	YC1-118E-01	EU, UK-export, E.Asia	●	-	-	●	-	
NX-1200D	E3	YC1-118E-02	EU, UK-export, E.Asia	●	-	-	-	●	
NX-1200D	C	YC1-118C-01	China, Hong Kong	●	-	●	-	-	
NX-1200D	C3	YC1-118C-02	China, Hong Kong, India	●	-	-	-	●	
NX-1200D	M3	YC1-118M-01	Asia, India	●	●	●	-	-	
NX-1200D	M	YC1-118M-02	Asia, India	●	●	-	-	●	
NX-1200D	X2	YC1-118X-01	Oceania, India	●	●	-	●	-	

"NX-1200N" Series

Model Name		Model No. (参考)	Main Market/市場 (参考)	取得IP レポート		Buttons			Freq. Range (MHz)
Base Model	Type 仕向			IP-54 IP-55	IP-67	16Key	7Key	Non Key	
NX-1200NV	K2	YC1-123K-00	USA	●	-	-	●	-	136 - 174
NX-1200N	K2	YC1-123K-01	Latin America, Canada	●	-	-	●	-	
NX-1200NV	K	YC1-123K-02	USA	●	-	-	-	●	
NX-1200N	K	YC1-123K-03	Latin America, Canada	●	-	-	-	●	
NX-P1200NV	K	YC1-123K-04	USA	●	-	-	-	●	
NX-1200N	E2	YC1-123E-01	EU, UK-export,E.Asia	●	-	-	●	-	
NX-1200N	E3	YC1-123E-02	EU, UK-export,E.Asia	●	-	-	-	●	
NX-1200N	C	YC1-123C-01	China, Hong Kong	●	-	●	-	-	
NX-1200N	C3	YC1-123C-02	China, Hong Kong	●	-	-	-	●	
NX-1200N	M3	YC1-123M-01	Asia	●	●	●	-	-	
NX-1200N	M	YC1-123M-02	Asia	●	●	-	-	●	
NX-1200N	X2	YC1-123X-01	Oceania	●	●	-	●	-	

"NX-1200A" Series

Model Name		Model No. (参考)	Main Market/市場 (参考)	取得IP レポート		Buttons			Freq. Range (MHz)
Base Model	Type 仕向			IP-54 IP-55	IP-67	16Key	7Key	Non Key	
NX-1200AV	K2	YC1-126K-00	USA	●	-	-	●	-	136-174
NX-1200A	K2	YC1-126K-01	Latin America, Canada	●	-	-	●	-	
NX-1200AV	K	YC1-126K-02	USA	●	-	-	-	●	
NX-1200A	K	YC1-126K-03	Latin America, Canada	●	-	-	-	●	
NX-1202AV	K	YC1-126K-04	USA	●	-	-	-	●	
NX-P1200AV	K	YC1-126K-05	USA	●	-	-	-	●	
NX-P1202AV	K	YC1-126K-06	USA	●	-	-	-	●	
NX-1200A	C3	YC1-126C-01	Hong Kong, India	●	-	-	-	●	
NX-1200A	M3	YC1-126M-01	Asia, Oceania, India	●	●	●	-	-	
NX-1200A	M	YC1-126M-02	Asia, India	●	●	-	-	●	

NX-12xx Series 種別	IP-54/55取得 Model数	IP-54/55/67取得 Model数	小計
NX-1200D Series	8	3	11
NX-1200N Series	9	3	12
NX-1200A Series	8	2	10
NX-12xx Series 合計	25	8	33

"NX-1300D" Series

Model Name		Model No. (参考)	Main Market/市場 (参考)	取得IP レポート		Buttons			Freq. Range (MHz)
Base Model	Type 仕向			IP-54 IP-55	IP-67	16Key	7Key	Non Key	
NX-1300DU	K5	YC1-119K-00	USA	●	-	-	●	-	350 - 520
NX-1300D	K5	YC1-119K-01	Latin America, Canada	●	-	-	●	-	
NX-1300DU	K4	YC1-119K-02	USA	●	-	-	-	●	
NX-1300D	K4	YC1-119K-03	Latin America, Canada	●	-	-	-	●	
NX-1300DU	K2	YC1-119K-04	USA	●	-	-	●	-	
NX-1300D	K2	YC1-119K-05	Latin America	●	-	-	●	-	
NX-1300DU	K	YC1-119K-06	USA	●	-	-	-	●	
NX-1300D	K	YC1-119K-07	Latin America	●	-	-	-	●	
NX-1300D	K7	YC1-119K-08	Brazil	●	-	-	-	●	
NX-1300D	E2	YC1-119E-01	EU, UK-export, E.Asia	●	-	-	●	-	
NX-1300D	E3	YC1-119E-02	EU, UK-export, E.Asia	●	-	-	-	●	
NX-1300D	C	YC1-119C-01	China, Hong Kong	●	-	●	-	-	
NX-1300D	C3	YC1-119C-02	China, Hong Kong	●	-	-	-	●	
NX-1300D	M3	YC1-119M-01	Asia, Oceania	●	●	●	-	-	
NX-1300D	M	YC1-119M-02	Asia	●	●	-	-	●	
NX-1300D	X2	YC1-119X-01	Oceania	●	●	-	●	-	

"NX-1300N" Series

Model Name		Model No. (参考)	Main Market/市場 (参考)	取得IP レポート		Buttons			Freq. Range (MHz)
Base Model	Type 仕向			IP-54 IP-55	IP-67	16Key	7Key	Non Key	
NX-1300NU	K5	YC1-124K-00	USA	●	-	-	●	-	350-520
NX-1300N	K5	YC1-124K-01	Latin America, Canada	●	-	-	●	-	
NX-1300NU	K4	YC1-124K-02	USA	●	-	-	-	●	
NX-1300N	K4	YC1-124K-03	Latin America, Canada	●	-	-	-	●	
NX-1300NU	K2	YC1-124K-04	USA	●	-	-	●	-	
NX-1300N	K2	YC1-124K-05	Latin America	●	-	-	●	-	
NX-1300NU	K	YC1-124K-06	USA	●	-	-	-	●	
NX-1300N	K	YC1-124K-07	Latin America ~~Oceania~~	●	-	-	-	●	
NX-1300N	K7	YC1-124K-08	Brazil	●	-	-	-	●	
NX-P1300NU	K	YC1-124K-09	USA	●	-	-	-	●	
NX-1300N	E2	YC1-124E-01	EU, UK-export, E.Asia	●	-	-	●	-	
NX-1300N	E3	YC1-124E-02	EU, UK-export, E.Asia	●	-	-	-	●	
NX-1300N	C	YC1-124C-01	China, Hong Kong	●	-	●	-	-	
NX-1300N	C3	YC1-124C-02	China, Hong Kong	●	-	-	-	●	
NX-1300N	M3	YC1-124M-01	Asia, Ocenia	●	●	●	-	-	
NX-1300N	M	YC1-124M-02	Asia	●	●	-	-	●	
NX-1300N	X2	YC1-124X-01	Oceania	●	●	-	●	-	

"NX-1300A" Series

Model Name		Model No. (参考)	Main Market/市場 (参考)	取得IP レポート		Buttons			Freq. Range (MHz)
Base Model	Type 仕向			IP-54 IP-55	IP-67	16Key	7Key	Non Key	
NX-1300AU	K5	YC1-127K-01	USA	●	-	-	●	-	400-520
NX-1300A	K5	YC1-127K-02	Latin America, Canada	●	-	-	●	-	
NX-1300AU	K4	YC1-127K-03	USA	●	-	-	-	●	
NX-1300A	K4	YC1-127K-04	Latin America, Canada	●	-	-	-	●	
NX-1300AU	K2	YC1-127K-05	USA	●	-	-	●	-	
NX-1300A	K2	YC1-127K-06	Latin America	●	-	-	●	-	
NX-1300AU	K	YC1-127K-07	USA	●	-	-	-	●	
NX-1300A	K	YC1-127K-08	Latin America	●	-	-	-	●	
NX-1302AU	K	YC1-127K-09	USA	●	-	-	-	●	
NX-P1300AU	K	YC1-127K-0A	USA	●	-	-	-	●	
NX-P1302AU	K	YC1-127K-0B	USA	●	-	-	-	●	
NX-1300A	C3	YC1-127C-01	Hong Kong	●	-	-	-	●	
NX-1300A	M3	YC1-127M-01	Asia	●	●	●	-	-	
NX-1300A	M	YC1-127M-02	Asia	●	●	-	-	●	

NX-13xx Series 種別	IP-54/55取得 Model数	IP-54/55/67取得 Model数	小計
NX-1300D Series	13	3	16
NX-1300N Series	14	3	17
NX-1300A Series	12	2	14
NX-13xx Series 合計	39	8	47

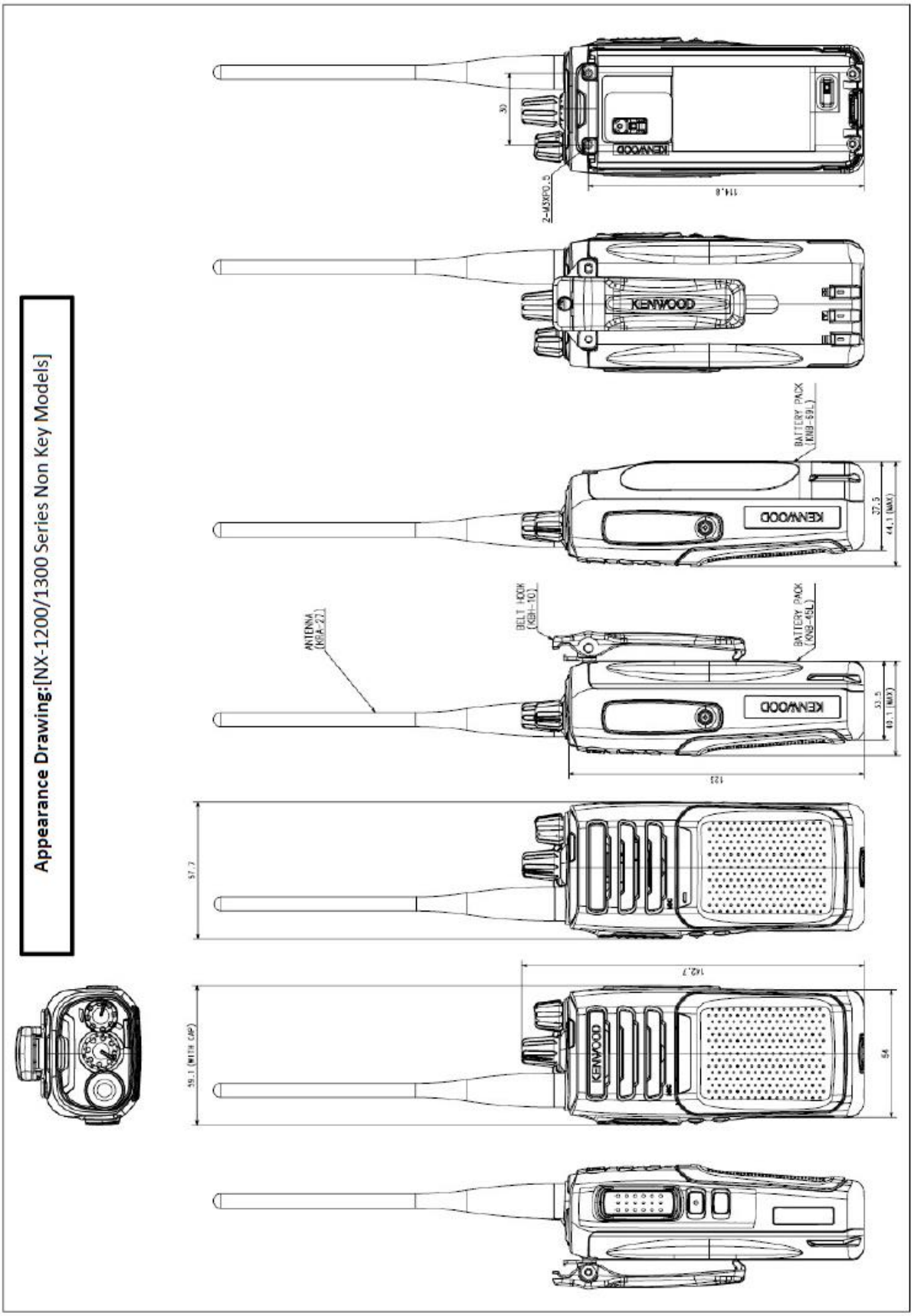
Attachment A (3/18)

"TK-37xx" Series

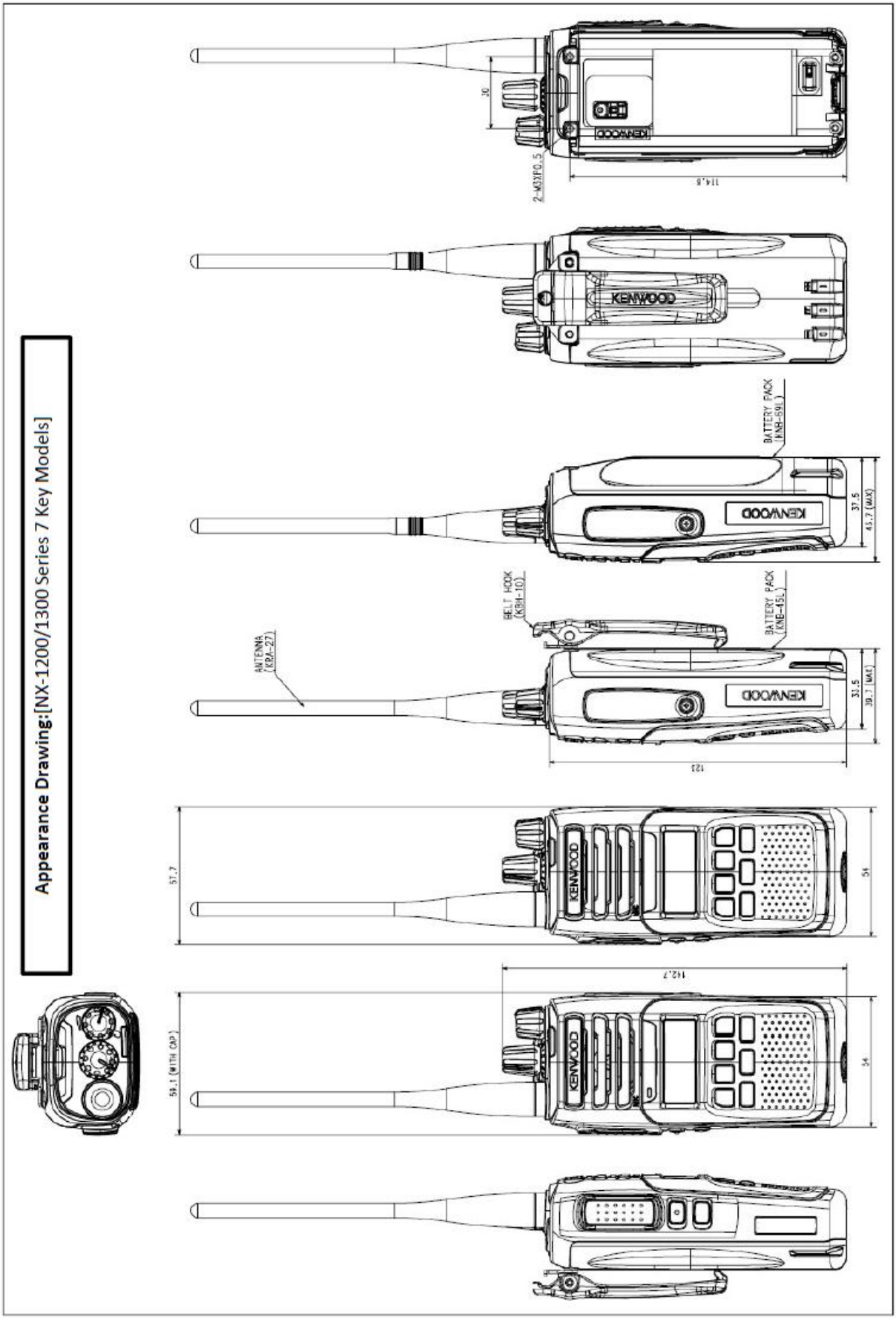
Model Name		Model No. (参考)	Main Market/市場 (参考)	取得IP レポート		Buttons			Freq. Range (MHz)
Base Model	Type 仕向			IP-54 IP-55	IP-67	16Key	7Key	Non Key	
TK-3701D	E	YC1-125E-00	EU (Continental)	●	-	-	-	●	446
TK-3701D	T	YC1-125T-01	UK	●	-	-	-	●	
TK-3710	X	YC1-127X-00	Oceania	●	●	-	●	-	450-520

TK-37xx Series 種別	IP-54/55取得 Model数	IP-54/55/67取得 Model数	小計
TK-3701D	2	0	2
TK-3710	0	1	1
TK-37xx Series 合計	2	1	3

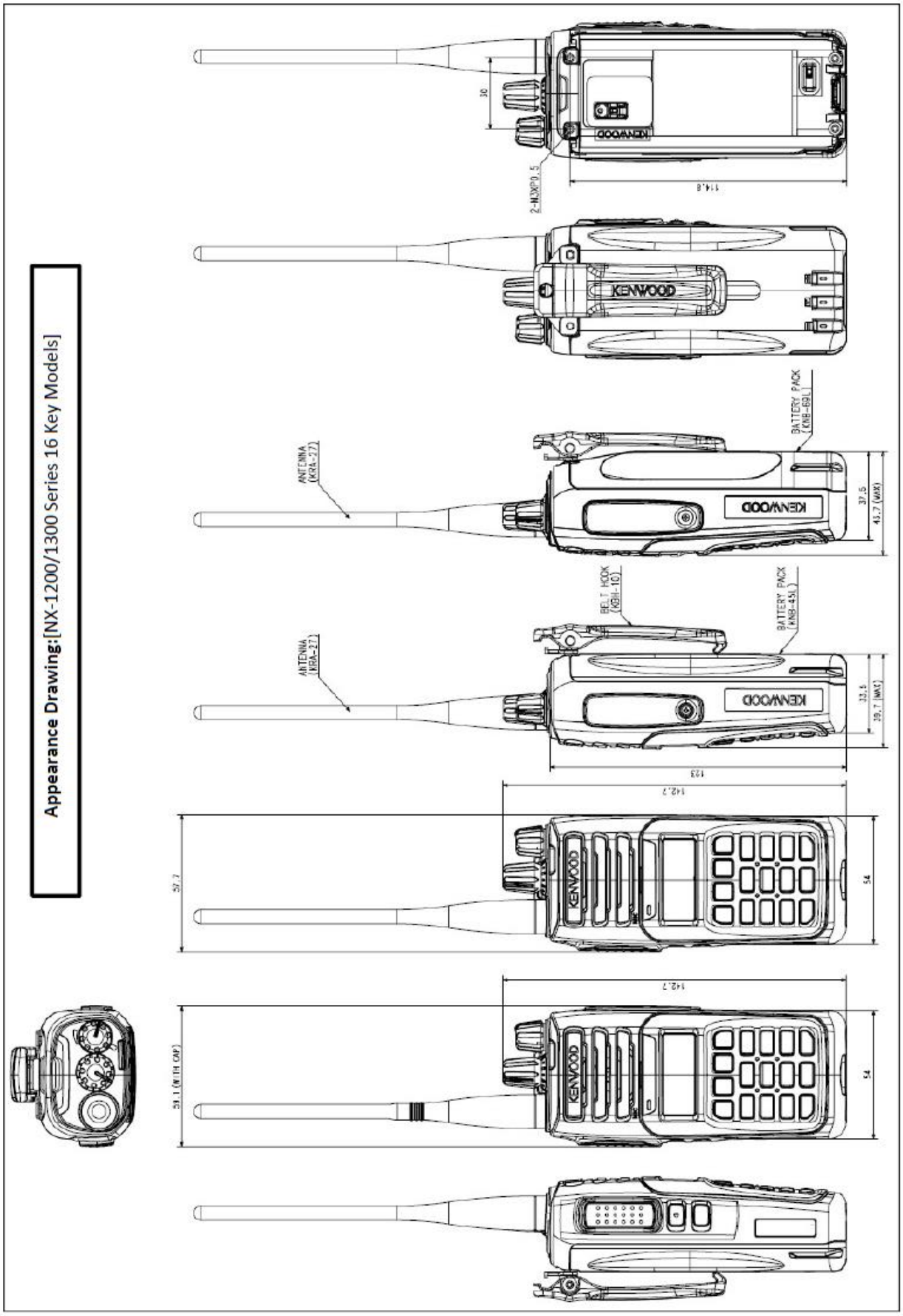
Attachment A (4/18)



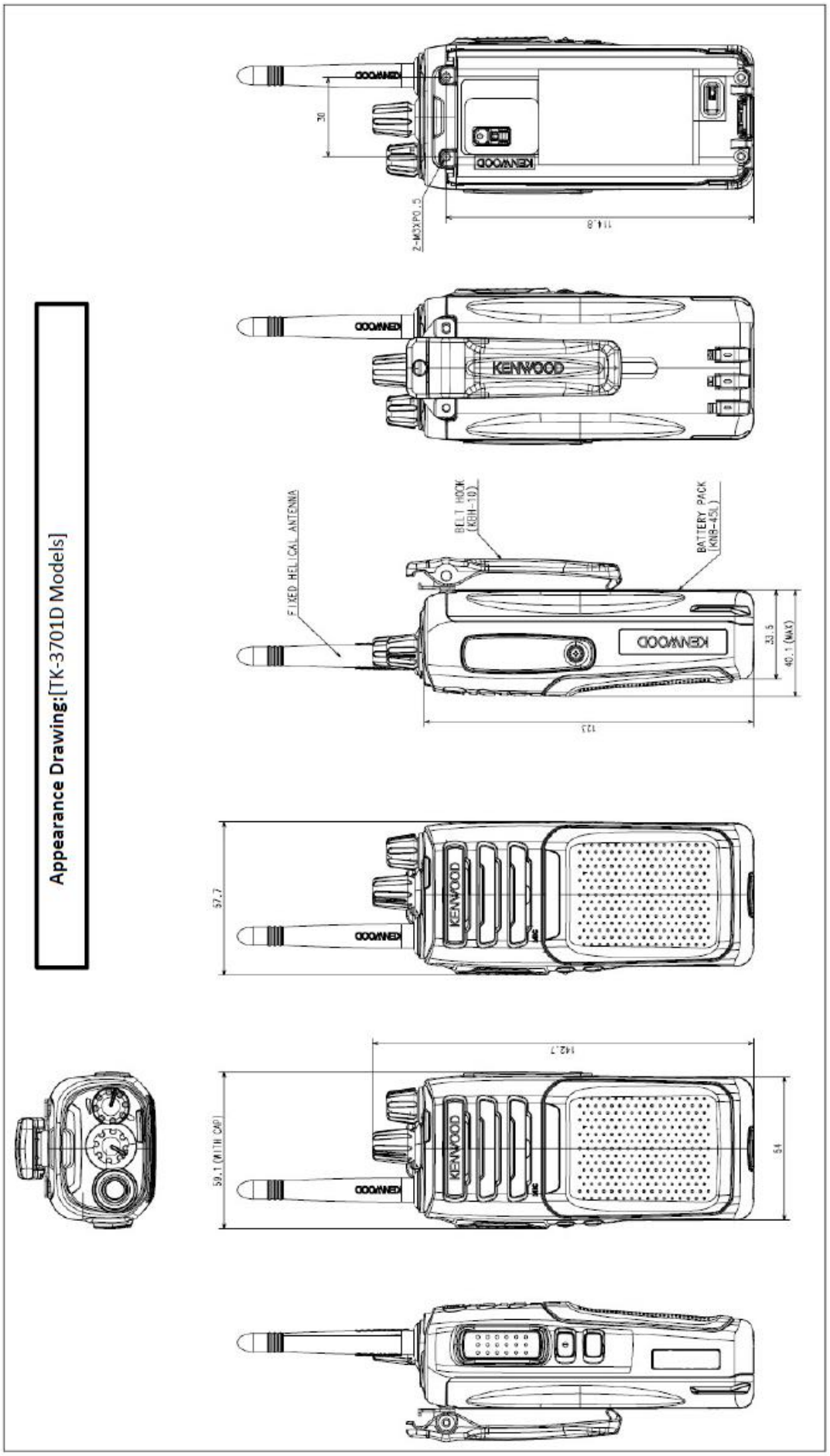
Attachment A (5/18)



Attachment A (6/18)



Attachment A (7/18)



Sealing Parts List

No.	DRAWING No.	Key type	IP Grade	Part Name	Part Number	Supplier	Material	NX-12xx Qty	NX-13xx Qty	TK-3701D Qty
1	5	Common	Common	ILL.GUIDE	B1B-0174-00	BRANDPLUS PRECISION PLASTIC SDN.BHD.	Si Rubber	1	1	1
2	25	Common	Common	PACKING	G53-2218-03	ICHIA RUBBER INDUSTRY(M)	Si Rubber	1	1	1
3	26	Common	Common	RUBBER SEAL	G5D-0191-00	N.K RUBBER (M) SDN BHD	Si Rubber	1	1	1
4	28	Common	Common	RUBBER SEAL	G5D-0193-10	ICHIA RUBBER INDUSTRY(M)	Si Rubber	1	1	1
5	29	Common	Common	RUBBER SEAL	G5D-0194-00	ICHIA RUBBER INDUSTRY(M)	Si Rubber	1	1	1
6	37	Common	Common	ADHESIVE SHEE	J9K-0054-00	BRANDPLUS PRECISION PLASTIC SDN.BHD.	Double Faced Tape	1	1	1
7	41	Common	Common	BUTTON KNOB	K2K-0411-00	BRANDPLUS PRECISION PLASTIC SDN.BHD.	Si Rubber	1	1	1
8	42	7 Key type	Common	KEY TOP	K2K-0412-10	N.K RUBBER (M) SDN BHD	Si Rubber	1	1	-
	42	16 Key type	Common	KEY TOP	K2K-0413-00	N.K RUBBER (M) SDN BHD	Si Rubber	1	1	-
9	45	Common	IP-54/55	SPEAKER	T0H-0011-00	VANSONIC (SINGAPORE)PTE.LTD.	SPEAKER	1	1	1
	45	Common	IP-67	SPEAKER	T0H-0026-00	VANSONIC (SINGAPORE)PTE.LTD.	SPEAKER	1	1	1
10	46	Common	IP-54/55	MIC ELEMENT	T9B-0062-10	VANSONIC (SINGAPORE)PTE.LTD.	MIC ELEMENT	1	1	1
	46	Common	IP67	MIC ELEMENT	T0H-0068-00	VANSONIC (SINGAPORE)PTE.LTD.	MIC ELEMENT	1	1	1
11	49	Common	IP-67のみ	FIBROUS SHEET	G1A-0136-00	VANSONIC (SINGAPORE)PTE.LTD.	PTFE Porous Film	1	1	1
12	51	Common	IP-67のみ	CUSHION	G1B-0431-00	FLEXI COMPONENTS SDN BHD	PORON MS-40	1	1	1
TK-3701Dのみ存在するSealing Parts										
13	48	TK-3701D	IP-54/55	ANTENNA COVER	F07-1882-23	VANSONIC (SINGAPORE)PTE.LTD.	ARNITEL EM400	-	-	1
14	49	TK-3701D	IP-54/55	PACKING	G53-1611-04	SANTEH TECHNOLOGY PTE.LTD.	Si Rubber	-	-	1

Attachment A (14/18)

Model Name Series (Radio/Transceiver)		NX-12xx Series			NX-13xx Series			TK-37xx Series	NX-12xx Series			NX-13xx Series			TK-37xx Series
Quantity Keys		No Key	7 Key	16 Keys	No Key	7 Key	16 Keys	No Key	No Key	7 Key	16 Keys	No Key	7 Key	16 Keys	7 Key
Appearance Dimension (mm)		54.0 x 33.5 x 123													
Band Width (Frequency/MHz)		VHF			UHF			UHF	VHF			UHF			UHF
I/O Connector		2Pins Jack													
Antenna	KRA-22 /26 /41	Common			No Use				Common			No Use			
	KRA-23 /27 /42	No Use			Common			No Use	No Use			Common			
Battery	KNB-45L	IP-54 /55							IP-54 /55						
	KNB-29N	IP-54 /55							IP-54 /55						
	KNB-53N	IP-54 /55							IP-54 /55						
	KNB-69L	IP-54 /55							IP-54 /55						
	KNB-84L	IP-54 /55							IP-54 /55 /67						
Speaker Mic	Cap for 2Pins Jack	IP-54 /55							IP-54 /55 /67						
	KMC-45 / 45D / 48GPS	IP-54 /55							IP-54 /55						

機種名について / About Model Names

例:NX-12xx Series　*詳細は"NX-12xx Series" 一覧 タブを参照下さい /Please see the "NX-12xx Series" list for details

NX- 1 2 0 0 DV K2

仕向先/Type
市場によって仕様が異なります。K：米州 USA / E：欧州 Europe / C：中国 China etc

Base Model
周波数帯と通信方式によります。Depends on frequency band and communication method
おおまかに1200はVHF、1300はUHF帯域となります。末尾のアルファベットが通信方式、機能を意味します。

機種名 /Model Nameは「Base Model」と「Type」を足した文字を指します。
"Model Name" means which added "Base Model" and "type".
上記の例だと【NX-1200DV K2】が機種名となります。
*NX-13xx Series, TK-37xx Series についても同様です。

キーについて / About Keys

同一機種名に3種のキー数違いが存在します。
Non Keyタイプ、7 Keyタイプ、16Keyタイプの3パターンです。
下図の通り、キー数による防水構造に差異は無く、外観のみの違いとなります。
There are 3 kinds of key versions in the same model name.
They are Basic type, Standard type and Full key type.
According to the following figure, there isn't the structural difference of the waterproof depending on key version.
Only the appearance is different.

Non Key TYPE　7Key TYPE　16 KEY TYPE

LCD及びKEY TOPの有無などの差がありますが、防水構造は共通で
There are the differences of the presence or absence of LCD and KEY TO

Non Key TYPE　LCD +Key Top TYPE

アンテナについて / About Anttena

使用される周波数帯やアンテナ長により6種のアンテナが存在します。
取付構造は全てSMAコネクタとなっており、共通構造です。
6 kinds of antennas have difference in usable frequency band and length.
However, all those installation structure are SMA connector and are a common structure.

SMA CONNECTOR
全アンテナ共通

[TK-3701D E] , [TK-3701D T] 外観

*例外として、TK-37xx Seriesの [TK-3701D E] , [TK-3701D T] のみ、取り外し不可の専用アンテナとなっております。これらアンテナ取り外し不可構造の機種はIP-54/55の取得となります。
As an exception, only the TK-37xx Series [TK-3701D E] and [TK-3701D T] are non-removable dedicated antennas.
Models of this construction can only pass IP-54/55

バッテリーについて / About battery

電池容量によって数種類の電池が存在します。無線機 - バッテリー間の取付構造は全て共通構造です。
KNB-84Lのみ、バッテリー内部構造がIP-67対応となっております。それ以外のバッテリー内部構造はIP-54/55仕様です。
There are several kinds of batteryies depending on battery capacity.
All the installation structure is common.
Only KNB-84L has a battery internal structure that is IP-67 compliant.
Other battery internal structure is IP-54 / 55 specification.

電池接続部/防水構造

無線機本体側 / Transceiver side

電池側 / Battery side

スピーカーマイクについて About Sperkar Microphone

2Pin Jack部はスピーカーマイクKMC-45/45D/48GPSを接続し、付属のホルダーでプラグ部を保持することによりIP-54/55となります。
KMC-45/45D/48GPSの2Pinプラグは共通構造です。
また、付属のCAPを取り付けることでIP-54/55/67を達成することができます。

Regarding 2Pin Jack side are, connected with KMC-45/45D/48GPS satisfy IP-54/55
when mounted a holder for supporting the plug. 2Pin plug of KMC-45/45D/48GPS are common structure.
Also, satisfy IP-54/55/67 when mounting an exclusive cap.

KMC-45/45D/48GPS
2Pin Plug

Holder

IP-54/55

Cap

IP-54/55/67

Attachment A (17/18)

NX-12xx Series / NX-13xx Series

アンテナ着脱可能タイプ
Removable antenna type

Non Key Type

7Key Type

16Key Type

TK-3710 X (エックス)
Only 7Key Type

同一構造
Completely identical structure

TK-3701DT / TK-3701DE
Only Non Key Type

アンテナ着脱可能タイプ
Removable antenna type

アンテナ着脱不可タイプ
Can't removable antenna type

Attachment A (18/18)

Antenna (同一取付構造)

KRA-22 KRA-23 KRA-26 KRA-27 KRA-41 KRA-42

Battery (同一取付構

KNB-45L KNB-29N/53N KNB-69L KNB-84L

Speaker Mic (同一取付構造)

KMC-45/45D KMC-48GPS