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ISO/IEC 17020 Accredited inspection body - Accreditation certificate BELAC No. 016-INSP

1. **SUBJECT** : **DIRECTION INDICATORS** R6-01

2. **REF.** : Report number : **H2461283069.197** No. of pages : 1 of 13 No. of annexes : -
Fastlane : 98592 Approval No. : (5643 00) Update : 00

3. **GENERALITIES** :

Make of Device : MVP

Commercial Type : -

Manufacturer's Type : BMTHB-61121, BMTHB-61122

Name and address of the manufacturer :
INDEED AUTO PARTS CO., LTD
Building C, No. 318-1, Sinsheng S. Rd.,
Modou Dist. Tainan City 721, Taiwan (R.O.C.)

4. **TESTS** : Date and place : 2024.06.05 to 2024.06.25
X RAY International

Applied document(s) : MVP BMTHB-61121(61122) / 00

Inspector : LIAO Yi-Jin

Persons witnessing the tests : LIAO Yi-Jin

Location of E-mark : On the lamp

5. **CONCLUSIONS** :

The tests were carried out according to the following specifications :

- UNECE Regulation No. 6 incorporating supplement 29 to the 01 series of amendments.

The models presented comply with the requirements to be applied.

Date : 2025.02.04

Signature :

VINÇOTTE nv/sa
LIAO Yi-Jin
Automotive Certification

DESCRIPTION OF THE TESTED DIRECTION INDICATOR

Direction indicator lamp type	:	Rear direction indicator
Direction indicator lamp category	:	2a
Category and kind of light source(s)	:	P21W
Number of light source	:	1
Voltage and wattage	:	12V, 21W

GENERAL SPECIFICATIONS

Characteristics concerned and prescriptions to apply	References	Conformity	Not applicated
The requirements contained in sections 5. "General specifications" and 6. "Individual specifications" and in the Annexes referenced in the said sections of Regulations Nos. 48, 53, 74 or 86, and their series of amendments in force at the time of application for the lamp type approval shall apply to this Regulation.	5.		
The requirements pertinent to each lamp and to the category/ies of vehicle on which the lamp is intended to be installed shall be applied, where its verification at the moment of lamp type approval is feasible.			
Each device supplied shall conform to the specifications set forth in § 6 and § 8 below.	5.1.	X	
The devices must be so designed and constructed that under normal conditions of use and notwithstanding the vibrations to which they may be subjected in such use, their satisfactory operation remains assured and they retain the characteristics prescribed by this Regulation.	5.2.	X	
In the case of light source modules, it shall be checked that :	5.3.		X
The design of the light source module(s) shall be such as	5.3.1.		
(a) that each light source module can only be fitted in no other position than the designated and correct one and can only be removed with the use of tool(s)			
(b) if there are more than one light source module used in the housing for a device, light source modules having different characteristics can not be interchanged within the same lamp housing			
The light source module(s) shall be tamperproof.	5.3.2.		
A light source module shall be so designed that regardless of the use of tool(s), it shall not be mechanically interchangeable with any replaceable approved light source	5.3.3		
In case of failure of the variable intensity control of a direction indicator of category 2b emitting more than the maximum value of category 2a, requirements of steady luminous intensity of category 2a shall be fulfilled automatically.	5.4		X
In the case of replaceable filament lamp(s) :	5.5.	X	
The device shall only be equipped with light source(s) approved according to UN Regulation No. 37 and/or UN Regulation No. 128, provided that no restriction on the use is made in UN Regulation No. 37 and its series of amendments in force at the time of application for type approval or in UN Regulation No. 128 and its series of amendments in force at the time of application for type approval.	5.5.1.		
The design of the device shall be such that light source cannot be fixed in any other position but the correct one.	5.5.2.		
The light source holder shall conform to the characteristics given in IEC Publication 60061. The holder data sheet relevant to the category of light source used, applies.	5.5.3.		

Characteristics concerned and prescriptions to apply	References	Conformity	Not applicated
In the case of non-replaceable filament lamp(s) or light source module(s) equipped with non-replaceable filament lamp(s), the applicant shall annex to the type approval documentation a report (by the light source manufacturer indicated in the type approval documentation), acceptable to the Authority responsible for type approval, that demonstrates compliance of these non-replaceable filament lamp(s) with the requirements as specified in paragraph 4.11. of IEC 60809, Edition 3.	5.6.		X
For direction indicator lamps of categories 1, 1a, 1b, 2a or 2b the flash may be produced by sequential activation of their light sources if the following conditions are met: (a) Each light source, after its activation, shall remain lit until the end of the ON cycle; (b) The sequence of activation of the light sources shall produce a signal which proceeds in a uniform progressive manner from inboard towards the outboard edge of the light emitting surface; (c) It shall be one signal with no interruption and no vertical oscillations (e.g. not more than one change of direction along the vertical axis). The distance between two adjacent/tangential distinct parts of the light emitting surface of the sequential direction indicator shall not exceed 50mm, when measured perpendicularly to the reference axis, instead of the values defined in paragraph 5.7.2. of UN Regulation 48. These interruptions of the signal shall not create any overlap in the vertical axis between the different parts, from inboard towards the outboard of the vehicle, and shall not be used for any other lighting or light signalling functions; (d) The variation shall finish no more than 200ms after the beginning of the ON cycle; (e) The orthogonal projection of the light emitting surfaces of the direction indicator in the direction of the axis of reference shall be circumscribed by a rectangle on a plane normal to the axis of reference and having its longer sides parallel to the H-plane. The ratio of the horizontal to the vertical sides shall not be less than 1.7. Compliance to the conditions mentioned above shall be verified in flashing mode.	(5.6)		X
An interdependent lamp system shall meet the requirements when all its interdependent lamps are operated together. However, if the interdependent lamp system providing the rear direction indicator function is partly mounted on the fixed component and partly mounted on a movable component, the interdependent lamp(s) specified by the Applicant shall meet the geometric visibility, colorimetric and photometric requirement, at all fixed positions of the movable component(s). This does not apply to interdependent direction indicator lamp(s) intended for fitting on vehicle(s) where, to fulfil or complete the geometric visibility angle, additional lamps are activated when the movable component is in any fixed open position, provided that these additional lamps satisfy all the position, photometric and colorimetric requirements applicable to the direction indicator lamps installed on the movable component.	5.7		X

INTENSITY OF LIGHT EMITTED

Characteristics concerned and prescriptions to apply	References	Conformity	Not applicated
The light emitted by each of the two devices supplied must be in the case of direction indicators of Categories 1, 1a, 1b, 2a, 2b in the reference axes, in the case of direction indicators of Categories 5 or 6 in Direction A according to Annex 1 of not less than the minimum intensity and of not more than the maximum intensity specified in the table of § 6.1.	6.1.	X	
For an assembly of two or more direction indicator lamps the total intensity shall not exceed the maximum.	6.1.1.		X
When an assembly of two lamps marked "D" having the same function is deemed to be a single lamp, it shall comply with the requirements for : (a) maximum intensity if all lamps together are lit; (b) minimum intensity if one lamp has failed.	6.1.2.		X
In case of failure of a single lamp, or of an interdependent lamp system of the Categories 1, 1a, 1b, 2a and 2b, containing more than one light source the following provisions shall apply :	6.2.		X
A group of light sources, wired so that the failure of any one of them causes all of them to stop emitting light, shall be considered to be one light source.	6.2.1.		
A signal for activation of the tell-tale prescribed in § 6.5.8. of Regulation No. 48 shall be produced if: (a) any one light source has failed, or (b) in the case of a lamp designed for only two light sources, the intensity in the axis of reference is less than 50 per cent of the minimum intensity, or (c) as a consequence of a failure of one or more light sources, the intensity in one of the following directions as indicated in Annex 4 to this Regulation is less than the minimum intensity required : (i) H=0°, V=0° (ii) H=20° to the outside of the vehicle, V= +5° (iii) H=10° to the inside of the vehicle, V= 0°.	6.2.2.		
Outside the reference axis, within the angular fields specified in the arrangement diagrams in Annex 1 to this Regulation, the intensity of the light emitted by each of the two devices supplied must :	6.3.		
In each direction corresponding to the points in the relevant table of luminous-intensity distribution reproduced in Annex 4 to this Regulation, be not less than the minimum specified in § 6.1. above multiplied by the percentage specified in the said table for the direction in question;	6.3.1.	X	
In divergence from § 6.3. and 6.3.1., for categorie 5 direction indicators, to the rear, a minimum value of 0.6 cd is required throughout the fields specified in Annex 1;	6.3.1.1.		X
In no direction within the area from which the indicator lamp is visible, exceed the maximum specified in § 6.1. above;	6.3.2.	X	

Characteristics concerned and prescriptions to apply	References	Conformity	Not applicated
Moreover,	6.3.3.		
Throughout the fields defined in the diagrams in Annex 1, the intensity of the light emitted must be not less than 0.7 cd for devices of Category 1b, not less than 0.3 cd for devices of Categories 1, 1a, 2a, and category 2b by day; it shall not be less than 0.07 cd for devices of Category 2b by night;	6.3.3.1.	X	
The provisions of § 2.2. of Annex 4 to this Regulation on local variations of intensity must be observed.	6.3.3.2.	X	
In general the intensities shall be measured with the light source(s) continuously alight.	6.4.	X	
However, depending on the construction of the device, for example, the use of light-emitting diodes (LED), or the need to take precautions to avoid overheating, it is allowed to measure the lamps in flashing mode.			
This must be achieved by switching with a frequency of f = 1.5 ± 0.5 Hz with the pulse width greater than 0.3 s, measured at 95 % peak light intensity.			
In the case of replaceable filament lamps, the filament lamps shall be operated at reference luminous flux during on time.			
In the case of LED light sources all measurements shall be made at 6.75 V, 13.5 V or 28.0 V; the luminous flux value produced during on time shall be corrected. The correction factor is the ratio between the objective luminous flux and the value of the luminous flux during on time found at the voltage applied.			
In all other cases the voltage as required in paragraph 7.1.1. shall be switched with a rise time and fall time shorter than 0.01 s; no overshoot is allowed.			
In the case of measurements taken in flashing mode the reported luminous intensity shall be represented by the maximum intensity.			
In the case of devices of category 2b the time that elapses between energising the light source(s) and the light output measured on the reference axis to reach 90 % of the value measured in accordance with § 6.3. above shall be measured for the extreme levels of luminous intensity produced by the direction indicator. The time measured to obtain the lowest luminous intensity shall not exceed the time measured to obtain the highest luminous intensity.	6.5.		X

Characteristics concerned and prescriptions to apply	References	Conformity	Not applicated
The variable intensity control shall not generate signals which cause luminous intensities:	6.6.		X
outside the range specified in § 6.1. above and	6.6.1		
exceeding the category 2a maximum specified in § 6.1. :	6.6.2		
(a) for systems depending only on daytime and night time conditions: under night time conditions. (b) for other systems: under reference conditions as demonstrated by the manufacturer [1]			
Annex 4, referred to in § 6.2.1. above, gives particulars of the measurement methods to be used.	6.7.	X	

[1] Good visibility (meteorological optical range MOR > 2,000 m defined according to WMO, Guide to Meteorological Instruments and Methods of Observation, Sixth Edition, ISBN: 92-63-16008-2, pp 1.9.1/1.9.11, Geneva 1996) and clean lens.

TEST PROCEDURE

Characteristics concerned and prescriptions to apply	References	Conformity	Not applicated
All measurements, photometric and colorimetric, shall be made:	7.1.		
In the case of a lamp with replaceable light source, if not supplied by an electronic light source control gear or a variable intensity control, with an uncoloured or coloured standard light source of the category prescribed for the device, supplied with the voltage:	7.1.1.	X	
(a) In the case of filament lamp(s), it is necessary to produce the reference luminous flux required for that category of filament lamp;		X	
(b) In the case of LED light source(s) of 6.75 V, 13.5 V or 28.0 V; the luminous flux value produced shall be corrected. The correction factor is the ratio between the objective luminous flux and the mean value of the luminous flux found at the voltage applied.			X
In the case of a lamp equipped with non-replaceable light sources (filament lamps and other), at 6.75 V, 13.5 V or 28.0 V respectively.	7.1.2.		X
In the case of a system that uses an electronic light source control gear or a variable intensity control, being part of the lamp [1] applying at the input terminals of the lamp the voltage declared by the manufacturer or, if not indicated, 6.75 V, 13.5 V or 28.0 V respectively.	7.1.3.		X
In the case of a system that uses an electronic light source control gear or a variable intensity control, not being part of the lamp with the voltage declared by the manufacturer applied to the input terminals of the lamp.	7.1.4.		X
However in the case of a direction indicator of category 2b operated by a variable intensity control to obtain variable luminous intensity, photometric measurements shall be performed according to the applicant's description.	7.2.		X
The test laboratory shall require from the manufacturer the light source control gear or a variable intensity control needed to supply the light source and the applicable functions.	7.3.		X
The voltage to be applied to the lamp shall be noted in the communication form in Annex 2 of this Regulation.	7.4.	X	
The limits of the apparent surface in the direction of the reference axis of a direction indicator shall be determined. However, in the case of category 5 and 6 direction indicators, the limits of the light emitting surface shall be determined.	7.5.	X	

[1] For the purpose of this Regulation "being part of the lamp" means to be physically included in the lamp body or to be external, separated or not, but supplied by the lamp manufacturer as part of the lamp system.

COLOUR OF LIGHT EMITTED

Characteristics concerned and prescriptions to apply	References	Conformity	Not applicated
The colour of the light emitted inside the field of the light distribution grid defined in § 2. of Annex 4 shall be amber. Outside this field, no sharp variation of colour shall be observed. To check these colorimetric characteristics, the test procedure described in § 7. of this Regulation shall be applied. These requirements shall also apply within the range of variable luminous intensity produced by direction indicators of category 2b. However, for lamps equipped with non-replaceable light sources (filament lamps and other), the colorimetric characteristics should be verified with the light sources present in the lamp, in accordance with relevant subparagraphs of § 7.1. of this Regulation.	8.	X	

CATEGORIES OF DIRECTION INDICATORS : MINIMUM ANGLES REQUIRED FOR LIGHT DISTRIBUTION IN SPACE OF THESE CATEGORIES OF DIRECTION INDICATORS [1] (ANNEX 1)

Characteristics concerned and prescriptions to apply	References	Conformity	Not applicated
In all cases, the minimum vertical angles of light distribution in space of direction indicators are 15° above and 15° below the horizontal except :		X	
(a) direction indicator lamps intended to be installed with the H plane of the lamp at a mounting height of less than 750 mm above the ground, for which they are 15° above and 5° below the horizontal;			X
(b) optional direction indicator lamps intended to be installed with the H plane of the lamp at a mounting height of more than 2100 mm above the ground, for which they are 5° above and 15° below the horizontal;			X
(c) direction indicator lamps of category 6 : for which they are 30° above and 5° below the horizontal;			X
Minimum horizontal visibility angles :			
Direction indicators for the front of the vehicle :			X
Category 1 : for use at a distance not less than 40 mm from the dipped-beam headlamp and/or the front fog lamp;			
Category 1a : for use at a distance greater than 20 mm but less than 40 mm from the dipped-beam headlamp and/or the front fog lamp;			
Category 1b : for use at a distance less than 20 mm from the dipped-beam headlamp and/or the front fog lamp;			
• 45° inside / 80° outside			
• Under the H-plane for lamps intended to be installed with this plane at a mounting height less than 750 mm above ground : 20° inside/ 80° outside			
Categories 2a and 2b : direction indicators for the rear of the vehicle :			
Category 2a : rear direction indicator lamps with steady luminous intensity		X	
Category 2b : rear direction indicator lamps with variable luminous intensity			X
Category 5 and 6 : supplementary side direction indicators for use on a vehicle also equipped with Categories 1, 1a or 1b and 2a or 2b direction indicators			X

[1] The angles shown in these arrangements are correct for devices to be mounted on the right side of the vehicle. The arrows in these diagrams point towards the front of the vehicle.

[2] H-plane : “Horizontal plane going through the reference centre of the lamp.

PHOTOMETRIC MEASUREMENTS (ANNEX 4)

Characteristics concerned and prescriptions to apply	References	Conformity	Not applicated
Measurement methods	1.		
During photometric measurements, stray reflections shall be avoided by appropriate masking.	1.1.	X	
In case the results of measurements should be challenged, measurements shall be carried out in such a way as to meet the following requirements :	1.2.		
The distance of measurements shall be such that the law of the inverse of the square of the distance is applicable;	1.2.1.	X	
The measuring equipment shall be such that the angular aperture of the receiver viewed from the reference centre of the light is comprised between 10' and 1 degree;	1.2.2.	X	
The intensity requirements for a particular direction of observation shall be deemed to be satisfied if that requirement is met in a direction deviating by not more than one-quarter of a degree from the direction of observation.	1.2.3.	X	
In the case where the device may be installed on the vehicle in more than one or in a field of different positions the photometric measurements shall be repeated for each position or for the extreme positions of the field of the reference axis specified by the manufacturer.	1.3.	X	
Table of standard light distribution in space for direction indicators of the categories 1, 1a, 1b, 2a, 2b : see table in § 2.	2.		
For direction indicators of Category 6 : see table in § 2.			
The direction H = 0° and V = 0° corresponds to the reference axis. (On the vehicle, it is horizontal, parallel to the median longitudinal plane of the vehicle and oriented in the required direction of visibility.) It passes through the centre of reference. The values shown in the tables give, for the various directions of measurement, the minimum intensities as a percentage of the minimum intensities required in the table in § 6.1. :	2.1.	X	
in the direction H = 0° and V = 0° for Categories 1, 1a, 1b, 2a, 2b and in the case of category 5 in the angular area in the direction A as prescribed in Annex 1;	2.1.1.	X	
in the direction H = 5° and V = 0° for Category 6.	2.1.2.		X
However, in the case where a device is intended to be installed with its H plane at a mounting height less than 750 mm above the ground, the photometric intensity is verified only up to an angle of 5° downwards.	2.1.3.		X
Within the field of light distribution of § 2., schematically shown as a grid, the light pattern should be substantially uniform, i.e. in so far as the light intensity in each direction of a part of the field formed by the grid lines shall meet at least the lowest minimum value being shown on the grid lines surrounding the questioned direction as a percentage.	2.2.	X	

Characteristics concerned and prescriptions to apply	References	Conformity	Not applicated
Photometric measurements of lamps	3.		
The photometric performance shall be checked :			
For non-replaceable light sources (filament lamps and other) :	3.1.		X
with the light sources present in the lamp, in accordance with § 7.1.1. of this Regulation			
For replaceable light source(s):	3.2.	X	
when equipped with light source(s) at 6.75 V, 13.5 V or 28.0 V, the luminous intensity values produced shall be corrected. For filament lamps the correction factor is the ratio between the reference luminous flux and the mean value of the luminous flux found at the voltage applied (6.75 V, 13.5 V or 28.0 V). For LED light sources the correction factor is the ratio between the objective luminous flux and the mean value of the luminous flux found at the voltage applied (6.75 V, 13.5 V or 28.0 V). The actual luminous fluxes of light source used shall not deviate more than ± 5 % from the mean value. Alternatively and in case of filament lamps only, a standard filament lamp may be used in turn, in each of the individual positions, operated at its reference flux, the individual measurements in each position being added together.			
For any direction indicator lamp except those equipped with filament lamp(s), the luminous intensities measured after one minute and after 30 minutes of operation in flashing mode (f = 1.5 Hz, duty factor 50 %), shall comply with the minimum and maximum requirements. The luminous intensity distribution after one minute of operation can be calculated by applying at each test point the ratio of luminous intensity measured in HV after one minute and after 30 minutes of operation as above described.	3.3.		X

FACILITIES AND EQUIPMENT

The facilities and equipment used to carry out the inspections are in compliance with the requirements of the applied Regulatory Act(s).

Tested by X RAY International.

TEST RESULTS :

Light sources : 1 × P21W, Rated voltage and wattage : 12V, 21W

During the testing of the rear direction indicator the power supply for this P21W shall be regulated so as to obtain the reference luminous flux 460 lm at 13.5 V.

Test Results of Photometric Measurement

Lamp Function	:	Rear Direction Indicator	Test Voltage	:	13.5 V
Category	:	2a	Reference Flux	:	460 lm
Requirement	:	ECE Reg. 6 Para. 6	Test Distance	:	3.16 m

Point on Measuring Screen	Requirement (cd)		Measurement (cd)	
	Min	Max	Sample LH	Sample RH
10U - 5L	10	500	309.9	175.2
10U - 5R	10	500	260.5	196.9
5U - 20L	5	500	220.9	120.1
5U - 10L	10	500	313.2	231.5
5U - V	35	500	302.8	291.7
5U - 10R	10	500	233.7	258.0
5U - 20R	5	500	114.8	95.2
H - 10L	17.5	500	302.8	230.7
H - 5L	45	500	297.0	265.8
H - V	50	500	290.3	277.5
H - 5R	45	500	236.1	286.0
H - 10R	17.5	500	217.5	299.8
5D - 20L	5	500	181.2	127.1
5D - 10L	10	500	306.8	232.5
5D - V	35	500	271.8	290.2
5D - 10R	10	500	230.1	309.7
5D - 20R	5	500	107.6	107.5
10D - 5L	10	500	172.9	213.5
10D - 5R	10	500	165.3	236.0
Visibility	0.3	-	16.80	15.95
	-	500	335.46	337.54
Test Results	■ Passed		□ Failed	

Test Results of Colour Measurement

Lamp Function : Rear Direction Indicator

Category : 2a

Requirement : ECE Reg. 6 Para. 6

Light Emitted Color : Amber

Color Boundaries
- Limit towards green : $y \leq x - 0.120$
- Limit towards red : $y \geq 0.390$
- Limit towards white : $y \geq 0.790 - 0.670\ x$

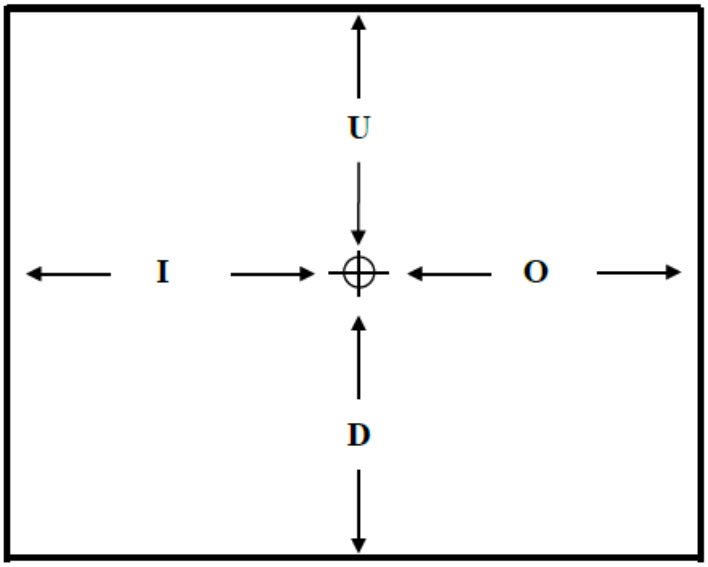
Test Points	Sample LH Measurement		Sample RH Measurement	
	Colour x	Colour y	Colour x	Colour y
5U - V	0.5889	0.4095	0.5905	0.4080
H - 5L	0.5898	0.4087	0.5913	0.4071
H - V	0.5893	0.4091	0.5918	0.4066
H - 5R	0.5895	0.4089	0.5929	0.4055
5D - V	0.5890	0.4093	0.5919	0.4066
Test Results	■ Passed		☐ Failed	

TEST RESULTS :

Apparent surface：Vertical and horizontal outlines of the illuminating surface of the light-signaling device.

Definition of the illuminating surface of the device

◎ Center of reference



FUNCTION	Sample RH Measurement				APPARENT SURFACE cm^2
	BOUNDRY (mm)				
	UP SIDE	DOWN SIDE	INBOARD	OUTBOARD	
REAR DIRECTION INDICATOR	70	84	22	63	130.9

(Null below)