brics

Certificado de Conformidade

Certificado nº: **8044/2022-LIP-1** **Emissão:** **15/09/2022**

Escopo: **Luminárias para Iluminação Pública Viárias** **Valido até:** **14/09/2026**

Laboratório: LABLUX - Laboratório de Luminotécnica da UFF

Relatório de ensaio nº:

REL LUM PUB 16-390-22 LP-NENAIII3.097W4K0DME7P - ORION;
REL LUM PUB 17-390-22 LP-NENAII3.078W4K0DME7P - ORION;
REL LUM PUB 18-390-22 LP-NENAI3.058W4K0DME7P - ORION;
REL LUM PUB 19-390-22 LP-NENAI3.047W4K0DME7P - ORION;
REL LUM PUB 20-390-22 LP-NENAI3.038W4K0DME7P - ORION;
REL LUM PUB 21-390-22 LP-NENAV3.0259W5K0DME7P - ORION;
REL LUM PUB 22-390-22 LP-NENAI3.087W5K0DME7P - ORION;
REL LUM PUB 23-390-22 LP-NENAI3.069W5K0DME7P - ORION;
REL LUM PUB 24-390-22 LP-NENAI3.026W5K0DME7P - ORION;
REL LUM PUB 25-390-22 LP-NENAV3.0259W4K0DME7P - ORION;
REL LUM PUB 26-390-22 LP-NENAI3.087W4K0DME7P - ORION;
REL LUM PUB 27-390-22 LP-NENAI3.069W4K0DME7P - ORION;
REL LUM PUB 28-390-22 LP-NENAI3.026W4K0DME7P - ORION.

Data de emissão: 06/09/2022

Listagem de produtos certificados: 28

Modelo de Certificação

Certificação com Avaliação do Sistema da Qualidade do Fabricante e Ensaios no Produto (Modelo 5)

Concessão

Licença para Uso do Selo de Identificação da Conformidade

Revisão | Data: 00 - 15/09/2022 - Emissão do Certificado

Carina Amanda Senatore
Executiva Sênior

Rua Dr. Ramos de Azevedo, 159 - 18º andar
Sala 1807 - Guarulhos - SP
CNPJ 16.884.899/0001-92
Tel +55 (11) 2087 7051
www.brics-corp.com.br

Certificado de Conformidade

Certificado nº: 8044/2022-LIP-1 **Emissão:** 15/09/2022

Escopo: Luminárias para Iluminação Pública Viárias **Valido até:** 14/09/2026

Família: LUMINÁRIAS TECNOLOGIA LED / OSRAM - DURIS S8 GW P9LT31.PM / IP66 / 102.000 h

Marca	Identificação do(s) modelo(s)/Tipo(s)		Código de Barras
	Modelo(Descrição Comercial do Produto)	Descrição Técnica do Produto	
ORION DO BRASIL	LP-NENAI3.026W4K0DME7P	26 W; 4420 lm; 170 lm/W; 0,98; 4.000 K	130026400073
ORION DO BRASIL	LP-NENAI3.038W4K0DME7P	38 W; 6460 lm; 170 lm/W; 0,98; 4.000 K	130038400073
ORION DO BRASIL	LP-NENAI3.047W4K0DME7P	47 W; 7990 lm; 170 lm/W; 0,98; 4.000 K	130047400073
ORION DO BRASIL	LP-NENAI3.058W4K0DME7P	58 W; 9860 lm; 170 lm/W; 0,98; 4.000 K	130058400073
ORION DO BRASIL	LP-NENAI3.069W4K0DME7P	69 W; 11730 lm; 170 lm/W; 0,98; 4.000 K	230069400073
ORION DO BRASIL	LP-NENAII3.078W4K0DME7P	78 W; 13260 lm; 170 lm/W; 0,98; 4.000 K	230078400073
ORION DO BRASIL	LP-NENAI3.087W4K0DME7P	87 W; 14790 lm; 170 lm/W; 0,98; 4.000 K	230087400073
ORION DO BRASIL	LP-NENAIII3.097W4K0DME7P	97 W; 16490 lm; 170 lm/W; 0,98; 4.000 K	330097400073
ORION DO BRASIL	LP-NENAIII3.0116W4K0DME7P	116 W; 19720 lm; 170 lm/W; 0,98; 4.000 K	330116400073
ORION DO BRASIL	LP-NENAIV3.0148W4K0DME7P	148 W; 25160 lm; 170 lm/W; 0,98; 4.000 K	430148400073

Certificado de Conformidade

Certificado nº: 8044/2022-LIP-1 Emissão: 15/09/2022

Escopo: Luminárias para Iluminação Pública Viárias Valido até: 14/09/2026

Família: LUMINÁRIAS TECNOLOGIA LED / OSRAM - DURIS S8 GW P9LT31.PM / IP66 / 102.000 h

Marca	Identificação do(s) modelo(s)/Tipo(s)		Código de Barras
	Modelo(Descrição Comercial do Produto)	Descrição Técnica do Produto	
ORION DO BRASIL	LP-NENAIV3.0178W4K0DME7P	178 W; 30260 lm; 170 lm/W; 0,98; 4.000 K	430178400073
ORION DO BRASIL	LP-NENAIV3.0197W4K0DME7P	197 W; 33490 lm; 170 lm/W; 0,98; 4.000 K	430197400073
ORION DO BRASIL	LP-NENAV3.0239W4K0DME7P	239 W; 40630 lm; 170 lm/W; 0,98; 4.000 K	530239400073
ORION DO BRASIL	LP-NENAV3.0259W4K0DME7P	259 W; 44030 lm; 170 lm/W; 0,98; 4.000 K	530259400073
ORION DO BRASIL	LP-NENAI3.026W5K0DME7P	26 W; 4420 lm; 170 lm/W; 0,98; 5.000 K	130026500073
ORION DO BRASIL	LP-NENAI3.038W5K0DME7P	38 W; 6460 lm; 170 lm/W; 0,98; 5.000 K	130038500073
ORION DO BRASIL	LP-NENAI3.047W5K0DME7P	47 W; 7990 lm; 170 lm/W; 0,98; 5.000 K	130047500073
ORION DO BRASIL	LP-NENAI3.058W5K0DME7P	58 W; 9860 lm; 170 lm/W; 0,98; 5.000 K	130058500073
ORION DO BRASIL	LP-NENAI3.069W5K0DME7P	69 W; 11730 lm; 170 lm/W; 0,98; 5.000 K	230069500073
ORION DO BRASIL	LP-NENAII3.078W5K0DME7P	78 W; 13260 lm; 170 lm/W; 0,98; 5.000 K	230078500073

Certificado de Produto
OCP 0098

Certificado de Conformidade

Certificado nº:	**8044/2022-[illegible] 1**	**Emissão:**	**15/09/2022**
Escopo:	**Luminária[illegible] [illegible]minaçã[illegible] [illegible]ublica Viárias**	**Valido até:**	**14/09/2026**

Família: **LUMINÁRIAS [illegible]ECNOLOGIA LED / OSRAM - DURIS S8 GW P9LT31.PM / IP66 / 102.000 h**

Marca	[illegible] modelo(s)/Tipo(s)		Código de Barras
	Modelo(De[illegible] [illegible]ercial do Produto)	Descrição Técnica do Produto	
ORION DO BRASIL	LP-NEN[illegible]087W5K0[illegible]1E7P	87 W; 14790 lm; 170 lm/W; 0,98; 5.000 K	230087500073
ORION DO BRASIL	LP-NENA[illegible]7W5K[illegible]1E7P	97 W; 16490 lm; 170 lm/W; 0,98; 5.000 K	330097500073
ORION DO BRASIL	LP-NEN[illegible]W5K[illegible]1E7P	116 W; 19720 lm; 170 lm/W; 0,98; 5.000 K	330116500073
ORION DO BRASIL	LP-NENA[illegible]148W5K[illegible]1E7P	148 W; 25160 lm; 170 lm/W; 0,98; 5.000 K	430148500073
ORION DO BRASIL	LP-NENA[illegible]1E7P	178 W; 30260 lm; 170 lm/W; 0,98; 5.000 K	430178500073
ORION DO BRASIL	LP-NEN[illegible]W5[illegible]ME7P	197 W; 33490 lm; 170 lm/W; 0,98; 5.000 K	430197500073
ORION DO BRASIL	LP-NEN[illegible]W5K[illegible]1E7P	239 W; 40630 lm; 170 lm/W; 0,98; 5.000 K	530239500073
ORION DO BRASIL	LP-NENA[illegible]1E7P	259 W; 44030 lm; 170 lm/W; 0,98; 5.000 K	530259500073

001045

PET - Planilha de Especificações Tecnicas

1 - DENOMINAÇÃO COMERCIAL

Marca:	*ORION DO BRASIL*
Fornecedor:	*ORION SOLUCOES EM ILUMINACAO EIRELI*
Fabricante:	*ORION SOLUCOES EM ILUMINACAO EIRELI*

2 - IDENTIFICAÇÃO DA FAMÍLIA

Familia (*):	*LUMINÁRIAS TECNOLOGIA LED / OSRAM - DURIS S8 GW P9LT31.PM / IP66 / 102.000 h*
Marca/Modelo do LED	*OSRAM - DURIS S8 GW P9LT31.PM*
Tipo da Luminária	*Luminária com Tecnologia LED*
Vida Declarada (h):	*102.000 h*

(*) Composicao do Codigo da Familia:
LUMINÁRIA TECNOLOGIA LED: Tecnologia da luminária / Marca e Modelo do LED / IP da luminária / Vida nominal;
LUMINÁRIA COM LÂMPADA DESCARGA: Tecnologia da luminária / Tipo de lâmpada / Tipo de refrator e difusor / IP da Luminária / Vida nominal;

Código de Barras:	Modelo	Tensão de Ensaio (V)	Frequência (Hz)	Potência (W)	Fator de Potência	Fluxo Luminoso (lm)	RENDIMENTO ÓTICO (***) (%)	EE(**) (lm/W)	IRC	TCC (K)	Nº Relatório de ensaio/laboratório
130026400073	LP-NENAI3.026W4K0DME7P	90-305	50/60	26	0,98	4420	Não Aplicável	170	Ra≥70	4000	REL LUM PUB 28-390-22 LP-NENAI3.026W4K0DME7P - ORION / LABLUX Laboratório de Luminotecnica da UFF
130038400073	LP-NENAI3.038W4K0DME7P	[illegible]-305	50/60	[illegible]	0,98	6460	[illegible] Aplicável	170	Ra≥70	[illegible]	REL LUM PUB [illegible]-390-22 LP-NENA[illegible] - ORION / LABLUX Laboratório de Luminotecnica da UFF
130047400073	LP-NENAI3.047W4K0DME7P	[illegible]-305	[illegible]	[illegible]	0,98	[illegible]	[illegible] Aplicável	170	[illegible]	[illegible]	REL LUM PUB [illegible]-390-22 LP-NEN[illegible] Laboratório de Luminotecnica da UFF
130058400073	LP-NENAI3.058W4K0DME7P	[illegible]-305	[illegible]	[illegible]	0,98	9860	[illegible] Aplicável	170	[illegible]	[illegible]	REL LUM PUB 18-390-22 LP-NENAI3[illegible] Laboratório de Luminotecnica da UFF

brics

PET - Planilha de Especificações Tecnicas

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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	170	Ra≥70	4000	REL LUM PUB 27-390-22 LP-NENAI3.069W4K0DME7P - ORION / LABLUX - [illegible] Luminotécnica da UFF
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] Luminotécnica da UFF
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] DME7P - ORION / LABLUX - [illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] - ORION / LABLUX [illegible] Luminotécnica da UFF
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] E7P - ORION / LABLUX - [illegible] Luminotécnica da UFF
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] - Laboratório de Luminotecnica da UFF
[illegible]	LP NENAIV3.0197W4K0DME7P	90-305	50/60	197	0,98	33490	Não Aplicável	170	Ra≥70	4000	REL LUM PUB 12-390-22 LP-NENAIV3.0197W4K0DME7P - ORION / LABLUX - Laboratório de Luminotécnica da UFF
530239400073	LP-NENAV3.0239W4K0DME7P	90-305	50/60	239	0,98	40630	Não Aplicável	170	Ra≥70	4000	REL LUM PUB 11-390-22 LP-NENAV3.0239W4K0DME7P - ORION / LABLUX - Laboratório de Luminotécnica da UFF

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00[illegible]047

PET - Planilha de Especificações Tecnicas

530259400073	LP-NENAV3.0259W4K0DME7P	90-305	50/60	259	0,98	44030	Não Aplicável	170	Ra≥70	4000	REL LUM PUB 25-390-22 LP-NENAV3.0259W4K0DME7P - ORION / LABLUX - Laboratório de Luminotécnica da UFF
130026500073	LP-NENAI3.026W5K0DME7P	90-305	50/60	26	0,98	4420	Não Aplicável	170	Ra≥70	5000	REL LUM PUB 24-390-22 LP-NENAI3.026W5K0DME7P - ORION / LABLUX - Laboratorio de Luminotécnica da UFF
130038500073	LP-NENAI3.038W5K0DME7P	90-305	50/60	38	0,98	6460	Não Aplicável	170	Ra≥70	5000	REL LUM PUB 10-390-22 LP-NENAI3.038W5K0DME7P - ORION / LABLUX - Laboratório de Luminotécnica da UFF
130047500073	[illegible]NENAI3.047[illegible]	[illegible]305	50/60	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	REL LUM PUB [illegible] Laboratorio de Lum[illegible] da UFF
130058500073	[illegible]NENAI3.058[illegible]	[illegible]305	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	REL LUM PUB [illegible] Laboratorio de [illegible] da UFF
230069500073	[illegible]NENAI3.069W5K0DM[illegible]7P	[illegible]305	[illegible]	[illegible]	[illegible]	1173[illegible]	[illegible]	170	[illegible]	[illegible]	REL LUM PUB 23 [illegible]-22 [illegible] Laboratório de [illegible] da UFF
230078500073	[illegible]NENAI3.078[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	170	[illegible]	[illegible]	REL LUM P[illegible] Laboratorio [illegible]
23008750007[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	REL LUM P[illegible] [illegible]
33009750007[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] Laboratorio de [illegible] da UFF

PET - Planilha de Especificações Tecnicas

[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]	170	Ra≥70	5000	REL LUM PUB 05-390-22 LP-NENAIII3.0116W5K0DME7P - ORION / LABLUX - Laboratório de Luminotécnica da UFF
											[illegible] - ORION / LABLUX [illegible] UFF
								[illegible]	[illegible]	[illegible]	[illegible] 22 LP [illegible] K0DME7P - ORION / LABLUX - Laboratório de Luminotécnica da UFF
										[illegible]	[illegible] 22 LP [illegible] K0DME7P - ORION / LABLUX - Laboratório de Luminotécnica da UFF
										[illegible]	[illegible] 22 LP [illegible] K0DME7P - ORION / LABLUX - Laboratório de Luminotécnica da UFF
[illegible]			[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	Ra≥70	50[illegible]	[illegible] 22 LP NENAV[illegible]255W5K0DME7P - ORION / LABLUX - Laboratório de Luminotécnica da UFF

[illegible] Eficiência Energética

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Selo de Identificaç

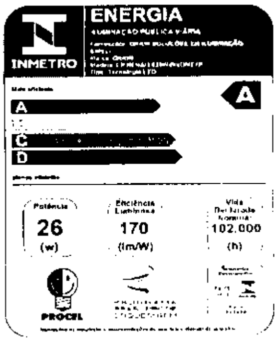
Etiqueta Nacional de Eficiência En ica - ENCE

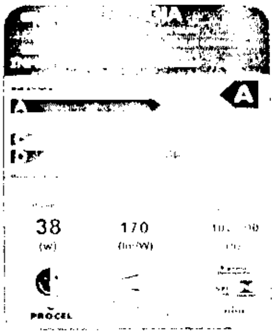
Anexo do Certificado - Mo lo do Se o de Ident a Conformidade

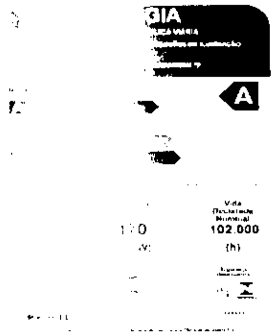
A BRICS concede a empresa contratante o direito não exclusivo de utilizar-se da Marca d ão da Conformidade pela BRICS em caráter condicional, limitado, oneroso, temporário e revogável, de acordo com a valid ção. As orientações quanto ao seu uso e aplicação, deverá obedecer aos requisitos da Portaria específica do produto, be ntações estabelecidas pelo procedimento P-01 Cartilha para Uso da Marca, disponível no site da ICS: http://br

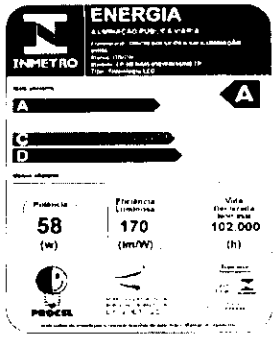
Para os produtos passíveis de Registro de Objeto junto ao Inmetro, é de responsabilid nte da certificação, após a concessão da certificação pela BRICS, a solicitação e manutenção desse registro junt m como a inclusão do número concedido nos selos e aplicação dos Selos de Identificação da Conformidade nos prod s.

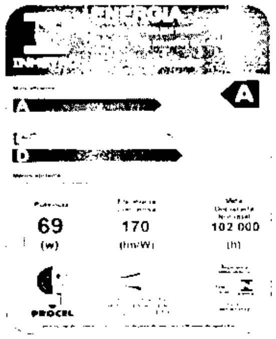
O solicitante da certificação pode ter acesso aos modelos da arte da marca de confor lutos certificados pela BRICS, as quais poderão ser visualizadas e baixadas em arquivo eletrônico em alta resolução no e/ou .CDR (imagem vetorial), disponibilizadas na internet através do **link de acesso:** ftp://ftp.bric ec.com.br/brics tos/ através do **login: selos** e **senha: BRICS@Ab18** informados pelo cliente.

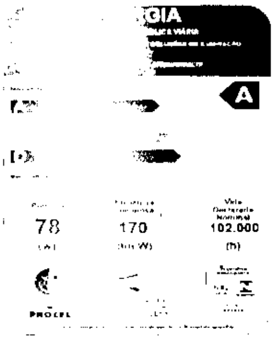




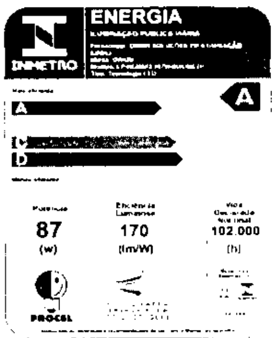


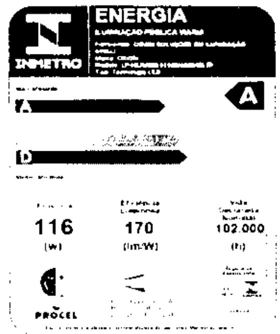


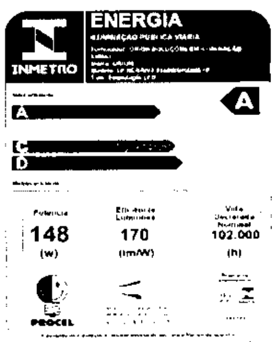


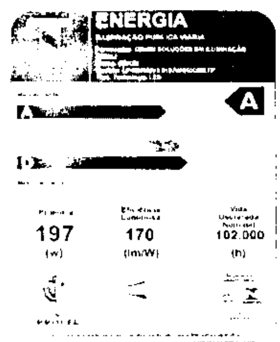


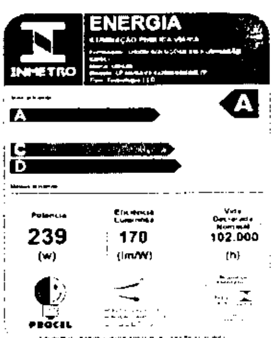
Selo de Ident… …rmidade - Etiqueta Nac… … Energética - ENCE











DATA DE EMISSÃO: 25 / 07 / 2023
Emission date

VÁLIDO ATÉ: 14 / 09 / 2026
Valid until

001051

CERTIFICADO DE CONFORMIDADE

Certificate of Compliance

Nº ILUM 1096-01-23

FORNECEDOR (SOLICITANTE):
Supplier (Applicant)

ORION SOLUCOES EM ILUMINACAO EIRELI
Rua Rio São Francisco, 1120 – Weissopolis, Pinhais – PR 83.322-020 Brasil
CNPJ: 08.389.230/0001-04

FABRICANTE:
Manufacturer

ORION SOLUCOES EM ILUMINACAO EIRELI
Rua Rio São Francisco, 1120 – Weissopolis, Pinhais – PR 83.322-020 Brasil
CNPJ: 08.389.230/0001-04

Responsável Legal:
Legal Responsible by Supplier

ORION SOLUCOES EM ILUMINACAO EIRELI
Rua Rio São Francisco, 1120 – Weissopolis, Pinhais – PR 83.322-020 Brasil
CNPJ: 08.389.230/0001-04

PRODUTO Product: Luminárias para Iluminação Pública Viárias

MARCA Brand: ORION DO BRASIL

MODELO Model: Vide Descrição

FAMÍLIA Family: 01 – LUMINÁRIAS TECNOLOGIA LED / OSRAM - DURIS S8 GW P9LT31.PM / IP66 / 102.000 h

MODELO DE CERTIFICAÇÃO
Certification model

Certificação com Avaliação do Sistema da Qualidade do Fabricante e Ensaios no Produto (Modelo 5)

Gustavo Domenes Ferlin
Gerente Geral

ICC
Instituto de Certificações e Conformidades

DATA DE EMISSÃO: 25 / 07 / 2023
Emission date

VÁLIDO ATÉ: 14 / 09 / 2026
Valid until

001052

CERTIFICADO DE CONFORMIDADE
Certificate of Compliance

Nº ILUM 1096-01-23

DESCRIÇÃO:
Description

Modelo (s) Model (s)	**Descrição** Description	**Código de barras** EAN Code
LP NENAI3.026W4K0DME7P	26 W; 4420 lm; 170 lm/W; 0,98; 4.000 K	130026400073
LP-NENAI3.038W4K0DME7P	38 W; 6460 lm; 170 lm/W; 0,98; 4.000 K	130038400073
LP-NENAI3.047W4K0DME7P	47 W; 7990 lm; 170 lm/W; 0,98; 4.000 K	130047400073
LP-NENAI3.058W4K0DME7P	58 W; 9860 lm; 170 lm/W; 0,98; 4.000 K	130058400073
LP-NENAI3.069W4K0DME7P	69 W; 11730 lm; 170 lm/W; 0,98; 4.000 K	230069400073
LP-NENAII3.078W4K0DME7P	78 W; 13260 lm; 170 lm/W; 0,98; 4.000 K	230078400073
LP-NENAI3.087W4K0DME7P	87 W; 14790 lm; 170 lm/W; 0,98; 4.000 K	230087400073
LP NENAIII3.097W4K0DME7P	97 W; 16490 lm; 170 lm/W; 0,98; 4.000 K	330097400073
LP-NENAIII3.0116W4K0DME7P	116 W; 19720 lm; 170 lm/W; 0,98; 4.000 K	330116400073
LP-NENAIV3.0148W4K0DME7P	148 W; 25160 lm; 170 lm/W; 0,98; 4.000 K	430148400073
LP-NENAIV3.0178W4K0DME7P	178 W; 30260 lm; 170 lm/W; 0,98; 4.000 K	430178400073

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VÁLIDO ATÉ: Valid until	14 / 09 / 2026

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N° ILUM 1096-01-23

DESCRIÇÃO:
Description

Modelo (s) Model (s)	**Descrição** Description	**Código de barras** EAN Code
LP-NENAIV3.0197W4K0DME7P	178 W; 30260 lm; 170 lm/W; 0,98; 4.000 K	430178400073
LP-NENAV3.0239W4K0DME7P	197 W; 33490 lm; 170 lm/W; 0,98; 4.000 K	430197400073
LP-NENAV3.0259W4K0DME7P	239 W; 40630 lm; 170 lm/W; 0,98; 4.000 K	530239400073
LP-NENAI3.026W5K0DME7P	259 W; 44030 lm; 170 lm/W; 0,98; 4.000 K	530259400073
LP-NENAI3.038W5K0DME7P	26 W; 4420 lm; 170 lm/W; 0,98; 5.000 K	130026500073
LP-NENAI3.047W5K0DME7P	38 W; 6460 lm; 170 lm/W; 0,98; 5.000 K	130038500073
LP-NENAI3.058W5K0DME7P	47 W; 7990 lm; 170 lm/W; 0,98; 5.000 K	130047500073
LP-NENAI3.069W5K0DME7P	58 W; 9860 lm; 170 lm/W; 0,98; 5.000 K	130058500073
LP-NENAII3.078W5K0DME7P	69 W; 11730 lm; 170 lm/W; 0,98; 5.000 K	230069500073
LP-NENAI3.087W5K0DME7P	87 W; 14790 lm; 170 lm/W; 0,98; 5.000 K	230087500073
LP-NENAIII3.097W5K0DME7P	97 W; 16490 lm; 170 lm/W; 0,98; 5.000 K	330097500073

DATA DE EMISSÃO: 25 / 07 / 2023
Emission date

VÁLIDO ATÉ: 14 / 09 / 2026
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001054

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N° ILUM 1096-01-23

DESCRIÇÃO:
Description

Modelo (s) Model (s)	**Descrição** Description	**Código de barras** EAN Code
LP-NENAIII3.0116W5K0DME7P	116 W; 19720 lm; 170 lm/W; 0,98; 5.000 K	330116500073
LP-NENAIV3.0148W5K0DME7P	148 W; 25160 lm; 170 lm/W; 0,98; 5.000 K	430148500073
LP NENAIV3.0178W5K0DME7P	178 W; 30260 lm; 170 lm/W; 0,98; 5.000 K	430178500073
LP-NENAIV3.0197W5K0DME7P	197 W; 33490 lm; 170 lm/W; 0,98; 5.000 K	430197500073
LP-NENAV3.0239W5K0DME7P	239 W; 40630 lm; 170 lm/W; 0,98; 5.000 K	530239500073
LP-NENAV3.0259W5K0DME7P	259 W; 44030 lm; 170 lm/W; 0,98; 5.000 K	530259500073

NORMAS E PORTARIAS:
Standards and Ordinances

Norma Ordinance	**Ano de Publicação** Publication' Year
Portaria Inmetro n° 62	2022
Portaria Inmetro n° 200	2021

DATA DA AUDITORIA INICIAL: 27/06/2022
Date of the Initial Audit

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DATA DE EMISSÃO: 25 / 07 / 2023
Emission date

VÁLIDO ATÉ: 14 / 09 / 2026
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N° ILUM 1096-01-23

ENSAIOS:
Testing

Laboratório de ensaios Testing Laboratory	**Relatório de ensaios N°** Report N°	**Data de emissão** Date of issue
LABLUX - Laboratório de Luminotécnica da UFF	REL LUM PUB 01-390-22 LP-NENAV3.0239W5K0DME7P - ORION	06/09/2022
	REL LUM PUB 02-390-22 LP-NENAIV3.0197W5K0DME7P - ORION	
	REL LUM PUB 03-390-22 LP-NENAIV3.0178W5K0DME7P - ORION	
	REL LUM PUB 04-390-22 LP-NENAIV3.0148W5K0DME7P - ORION	
	REL LUM PUB 05-390-22 LP-NENAIII3.0116W5K0DME7P - ORION;	
	REL LUM PUB 06-390-22 LP-NENAIII3.097W5K0DME7P - ORION	
	REL LUM PUB 07-390-22 LP-NENAII3.078W5K0DME7P - ORION	
	REL LUM PUB 08-390-22 LP-NENAI3.058W5K0DME7P - ORION;	
	REL LUM PUB 09-390-22 LP-NENAI3.047W5K0DME7P - ORION	
	REL LUM PUB 10-390-22 LP-NENAI3.038W5K0DME7P - ORION	
	REL LUM PUB 11-390-22 LP-NENAV3.0239W4K0DME7P - ORION	
	REL LUM PUB 12-390-22 LP-NENAIV3.0197W4K0DME7P - ORION	
	REL LUM PUB 13-390-22 LP-NENAIV3.0178W4K0DME7P - ORION	
	REL LUM PUB 14-390-22 LP-NENAIV3.0148W4K0DME7P – ORION	
	REL LUM PUB 15-390-22 LP-NENAIII3.0116W4K0DME7P - ORION	
	REL LUM PUB 16-390-22 LP-NENAIII3.097W4K0DME7P - ORION	
	REL LUM PUB 17-390-22 LP-NENAII3.078W4K0DME7P - ORION	
	REL LUM PUB 18-390-22 LP-NENAI3.058W4K0DME7P - ORION	

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VÁLIDO ATÉ: Valid until	14 / 09 / 2026

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N° ILUM 1096-01-23

ENSAIOS:
Testing

Laboratório de ensaios Testing Laboratory	**Relatório de ensaios N°** Report N°	**Data de emissão** Date of issue
LABLUX - Laboratório de Luminotécnica da UFF	REL LUM PUB 19-390-22 LP-NENAI3.047W4K0DME7P - ORION	06/09/2022
	REL LUM PUB 20-390-22 LP-NENAI3.038W4K0DME7P - ORION	
	REL LUM PUB 21-390-22 LP-NENAV3.0259W5K0DME7P - ORION	
	REL LUM PUB 22-390-22 LP-NENAI3.087W5K0DME7P - ORION	
	REL LUM PUB 23-390-22 LP-NENAI3.069W5K0DME7P - ORION	
	REL LUM PUB 24-390-22 LP-NENAI3.026W5K0DME7P - ORION	
	REL LUM PUB 25-390-22 LP-NENAV3.0259W4K0DME7P - ORION	
	REL LUM PUB 26-390-22 LP-NENAI3.087W4K0DME7P - ORION	
	REL LUM PUB 27-390-22 LP-NENAI3.069W4K0DME7P - ORION	
	REL LUM PUB 28-390-22 LP-NENAI3.026W4K0DME7P - ORION	

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N° ILUM 1096-01-23

PLANILHA DE ESPECIFICAÇÕES TÉCNICAS - PET
TECHNICAL SPECIFICATIONS LIST

INMETRO

ANEXO F
MODELO DE PLANILHA DE ESPECIFICAÇÕES TÉCNICAS

01 – DENOMINAÇÃO COMERCIAL	
MARCA	ORION
FORNECEDOR	ORION DO BRASIL SOLUÇÕES EM ILUMINAÇÃO EIRELI
FABRICANTE	ORION DO BRASIL SOLUÇOES EM ILUMINAÇÃO EIRELI

02 - IDENTIFICAÇÃO DA FAMÍLIA	
FAMÍLIA (*)	LUMINÁRIAS TECNOLOGIA LED / OSRAM/GW P9LT31.PM DURIS S8 / IP66 / 102.000h /
MARCA/MODELO DO LED	OSRAM/GW P9LT31.PM DURIS S8
TIPO DA LUMINÁRIA	LUMINÁRIAS TECNOLOGIA LED
VIDA DECLARADA (h)	102.000h

(*) Composição do Código da Família:
LUMINÁRIA TECNOLOGIA LED: Tipo de Luminária / Marca e Modelo do LED / IP da Luminária / Vida declarada nominal
LUMINÁRIA COM LÂMPADA DESCARGA: Tipo de Luminária / Tipo de refrator e difusor / Vida declarada nominal

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DATA DE EMISSÃO: 25 / 07 / 2023
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Certificate of Compliance

Nº ILUM 1096-01-23

PLANILHA DE ESPECIFICAÇÕES TÉCNICAS - PET
TECHNICAL SPECIFICATIONS LIST

CÓDIGO DE BARRAS	MODELO	TENSÃO DE ENSAIO (V)	FREQ. (Hz)	POTÊNCIA (W)	FATOR DE POTÊNCIA	FLUXO LUMINOSO (lm)	RENDIMENTO ÓTICO (***) (%)	EE (**) (lm/W)	IRC	TCC (K)	Nº RELATÓRIO ENSAIO/ LABORATÓRIO
130026400073	LP-NENAI3.026W4K0DME7P	90-305	50/60	26	0,98	4420	Não Aplicável	170	Ra≥70	4.000	REL LUM PUB 28-390-22 LP-NENAI3.026W4K0DME7P - ORION
130038400073	LP-NENAI3.038W4K0DME7P	90-305	50/60	38	0,98	6460	Não Aplicável	170	Ra≥70	4.000	REL LUM PUB 20-390-22 LP-NENAI3.038W4K0DME7P ORION
130047400073	LP-NENAI3.047W4K0DME7P	90-305	50/60	47	0,98	7990	Não Aplicável	170	Ra≥70	4.000	REL LUM PUB 19-390-22 LP-NENAI3.047W4K0DME7P ORION
130058400073	LP-NENAI3.058W4K0DME7P	90-305	50/60	58	0,98	9860	Não Aplicável	170	Ra≥70	4.000	REL LUM PUB 18-390-22 LP-NENAI3.058W4K0DME7P ORION
230069400073	LP-NENAI3.069W4K0DME7P	90-305	50/60	69	0,98	11730	Não Aplicável	170	Ra≥70	4.000	REL LUM PUB 27-390-22 LP-NENAI3.069W4K0DME7P ORION
230078400073	LP-NENAII3.078W4K0DME7P	90-305	50/60	78	0,98	13260	Não Aplicável	170	Ra≥70	4.000	REL LUM PUB 17-390-22 LP-NENAII3.078W4K0DME7P ORION
230087400073	LP-NENAI3.087W4K0DME7P	90-305	50/60	87	0,98	14790	Não Aplicável	170	Ra≥70	4.000	REL LUM PUB 26-390-22 LP-NENAI3.087W4K0DME7P ORION
330097400073	LP-NENAIII3.097W4K0DME7P	90-305	50/60	97	0,98	16490	Não Aplicável	170	Ra≥70	4.000	REL LUM PUB 16-390-22 LP-NENAIII3.097W4K0DME7P ORION
330116400073	LP-NENAIII3.0116W4K0DME7P	90-305	50/60	116	0,98	19720	Não Aplicável	170	Ra≥70	4.000	REL LUM PUB 15-390-22 LP-NENAIII3.0116W4K0DME7P ORION
430148400073	LP-NENAIV3.0148W4K0DME7P	90-305	50/60	148	0,98	25160	Não Aplicável	170	Ra≥70	4.000	REL LUM PUB 14-390-22 LP-NENAIV3.0148W4K0DME7P ORION
430178400073	LP-NENAIV3.0178W4K0DME7P	90-305	50/60	178	0,98	30260	Não Aplicável	170	Ra≥70	4.000	REL LUM PUB 13-390-22 LP-NENAIV3.0178W4K0DME7P ORION

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Emission date

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PLANILHA DE ESPECIFICAÇÕES TÉCNICAS - PET
TECHNICAL SPECIFICATIONS LIST

430197400073	LP-NENAIV3.0197W4K0DME7P	90-305	50/60	197	0,98	33490	Não Aplicável	170	Ra≥70	4.000	REL LUM PUB 12-390-22 LP-NENAIV3.0197W4K0DME7P - ORION
530239400073	LP-NENAV3.0239W4K0DME7P	90-305	50/60	239	0,98	40630	Não Aplicável	170	Ra≥70	4.000	REL LUM PUB 11-390-22 LP-NENAV3.0239W4K0DME7P - ORION
530259400073	LP-NENAV3.0259W4K0DME7P	90-305	50/60	259	0,98	44030	Não Aplicável	170	Ra≥70	4.000	REL LUM PUB 25-390-22 LP-NENAV3.0259W4K0DME7P - ORION
130026500073	LP-NENAI3.026W5K0DME7P	90-305	50/60	26	0,98	4420	Não Aplicável	170	Ra≥70	5.000	REL LUM PUB 24-390-22 LP-NENAI3.026W5K0DME7P ORION
130038500073	LP-NENAI3.038W5K0DME7P	90-305	50/60	38	0,98	6460	Não Aplicável	170	Ra≥70	5.000	REL LUM PUB 10-390-22 LP-NENAI3.038W5K0DME7P - ORION
130047500073	LP-NENAI3.047W5K0DME7P	90-305	50/60	47	0,98	7990	Não Aplicável	170	Ra≥70	5.000	REL LUM PUB 09-390-22 LP-NENAI3.047W5K0DME7P - ORION
130058500073	LP-NENAI3.058W5K0DME7P	90-305	50/60	58	0,98	9860	Não Aplicável	170	Ra≥70	5.000	REL LUM PUB 08-390-22 LP-NENAI3.058W5K0DME7P - ORION
230069500073	LP-NENAI3.069W5K0DME7P	90-305	50/60	69	0,98	11730	Não Aplicável	170	Ra≥70	5.000	REL LUM PUB 23-390-22 LP-NENAI3.069W5K0DME7P - ORION
230078500073	LP-NENAII3.078W5K0DME7P	90-305	50/60	78	0,98	13260	Não Aplicável	170	Ra≥70	5.000	REL LUM PUB 07-390-22 LP-NENAII3.078W5K0DME7P - ORION
230087500073	LP-NENAI3.087W5K0DME7P	90-305	50/60	87	0,98	14790	Não Aplicável	170	Ra≥70	5.000	REL LUM PUB 22-390-22 LP-NENAI3.087W5K0DME7P ORION
330097500073	LP-NENAIII3.097W5K0DME7P	90-305	50/60	97	0,98	16490	Não Aplicável	170	Ra≥70	5.000	REL LUM PUB 06-390-22 LP-NENAIII3.097W5K0DME7P - ORION
330116500073	LP-NENAIII3.0116W5K0DME7P	90-305	50/60	116	0,98	19720	Não Aplicável	170	Ra≥70	5.000	REL LUM PUB 05-390-22 LP-NENAIII3.0116W5K0DME7P ORION
430148500073	LP-NENAIV3.0148W5K0DME7P	90-305	50/60	148	0,98	25160	Não Aplicável	170	Ra≥70	5.000	REL LUM PUB 04-390-22 LP-NENAIV3.0148W5K0DME7P - ORION
430178500073	LP-NENAIV3.0178W5K0DME7P	90-305	50/60	178	0,98	30260	Não Aplicável	170	Ra≥70	5.000	REL LUM PUB 03-390-22 LP-NENAIV3.0178W5K0DME7P - ORION

DATA DE EMISSÃO: 25 / 07 / 2023
Emission date

VÁLIDO ATÉ: 14 / 09 / 2026
Valid until

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PLANILHA DE ESPECIFICAÇÕES TÉCNICAS - PET
TECHNICAL SPECIFICATIONS LIST

430197500073	LP-NENAIV3.0197W5K0DME7P	90-305	50/60	197	0,98	33490	Não Aplicável	170	Ra≥70	5.000	REL LUM PUB 02-390-22 LP-NENAIV3.0197W5K0DME7P - ORION
530239500073	LP-NENAV3.0239W5K0DME7P	90-305	50/60	239	0,98	40630	Não Aplicável	170	Ra≥70	5.000	REL LUM PUB 01-390-22 LP-NENAV3.0239W5K0DME7P - ORION
530259500073	LP-NENAV3.0259W5K0DME7P	90-305	50/60	259	0,98	44030	Não Aplicável	170	Ra≥70	5.000	REL LUM PUB 21-390-22 LP-NENAV3.0259W5K0DME7P - ORION

(**) EE – Eficiência Energética. (***) Aplicável somente para Luminárias com lâmpadas de descarga

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Emission date

VÁLIDO ATÉ: 14 / 09 / 2026
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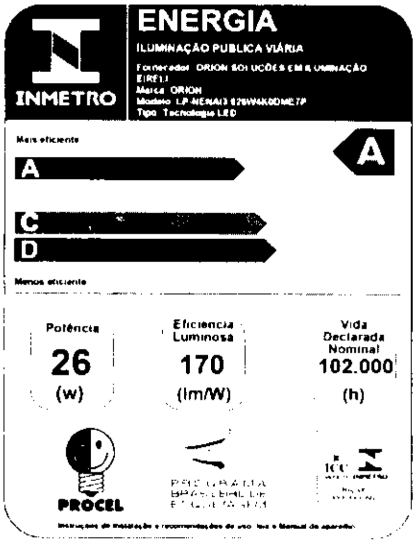

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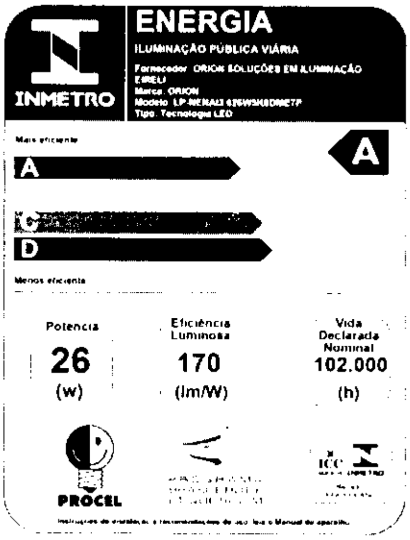

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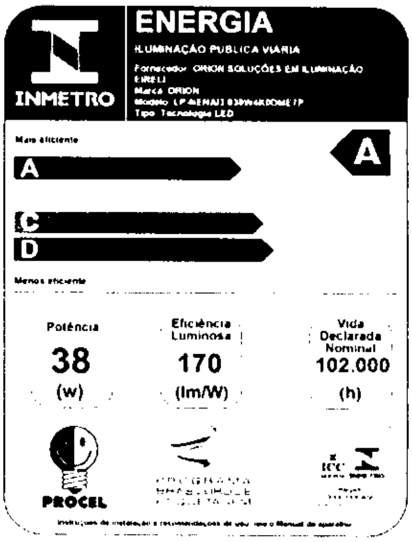

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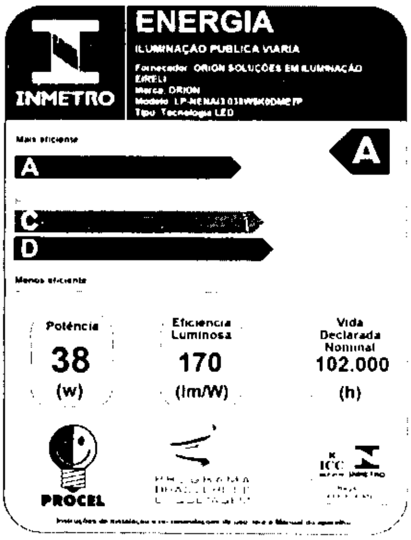

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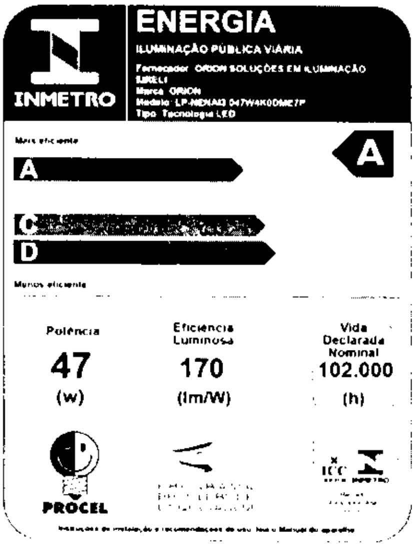

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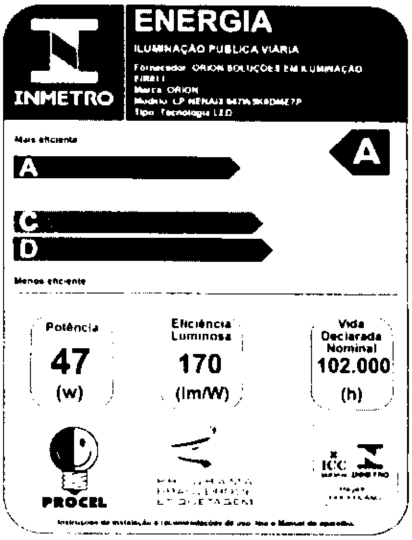

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VÁLIDO ATÉ: 14 / 09 / 2026
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N° ILUM 1096-01-23

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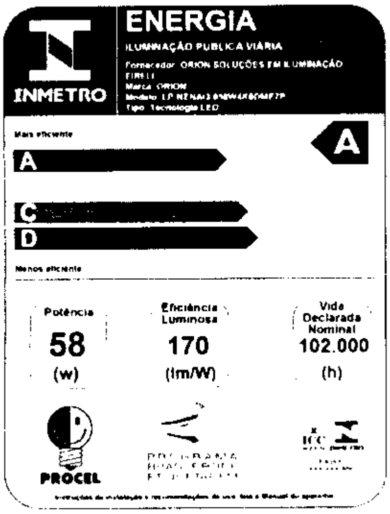

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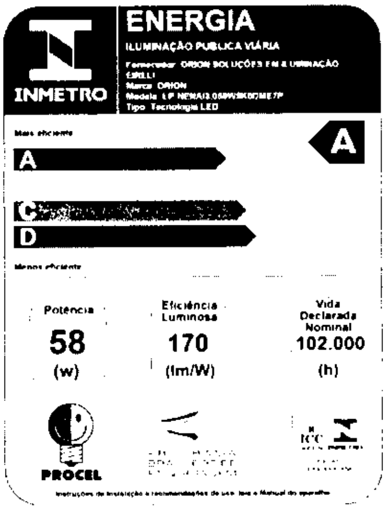

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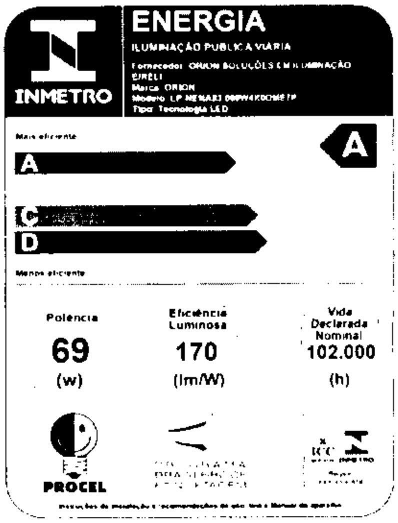

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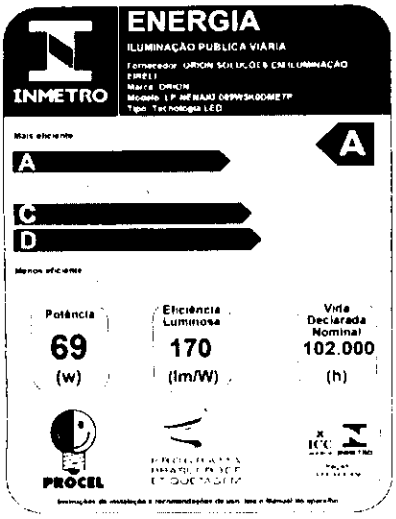

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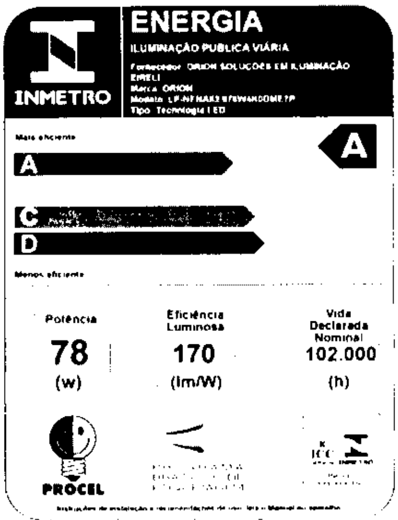

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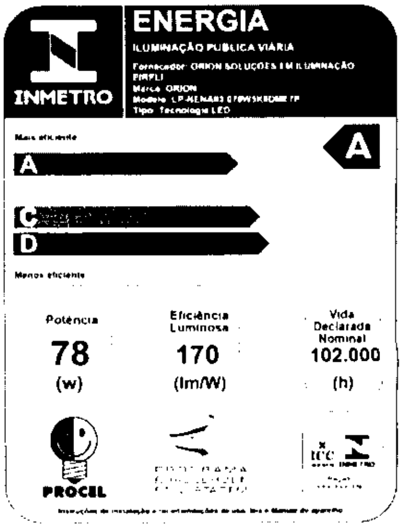

LP-NENAII3.078W5K0

DATA DE EMISSÃO: 25 / 07 / 2023
Emission date

VÁLIDO ATÉ: 14 / 09 / 2026
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ETIQUETA NACIONAL DE CONSERVAÇÃO DE ENERGIA – ENCE
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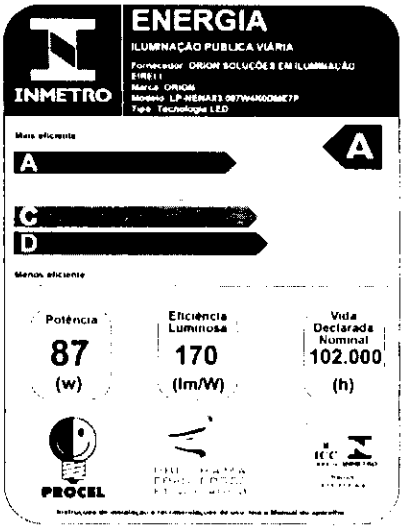

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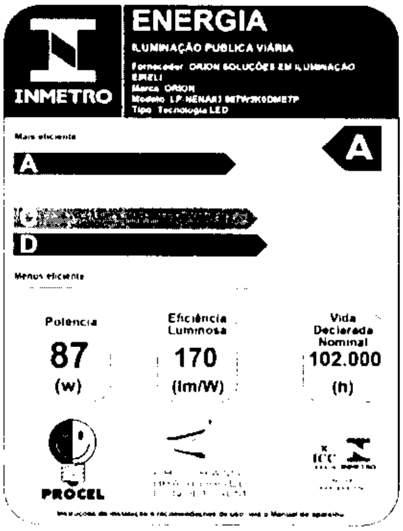

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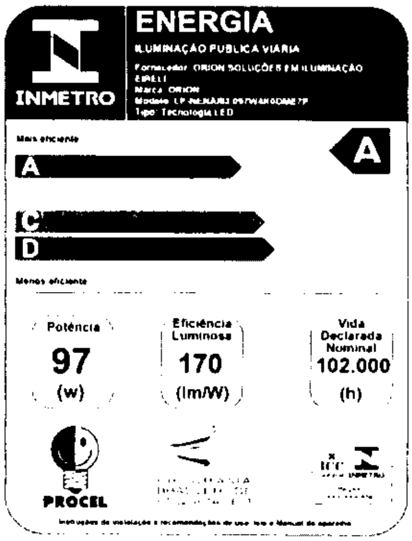

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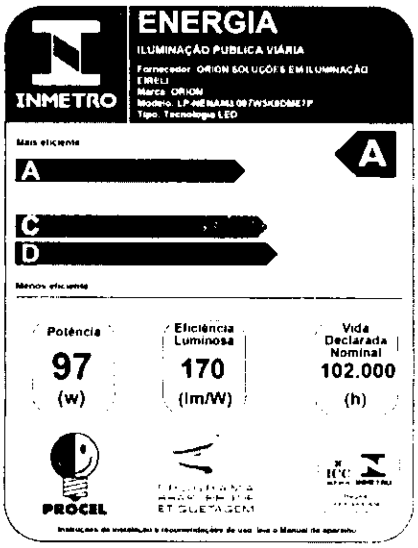

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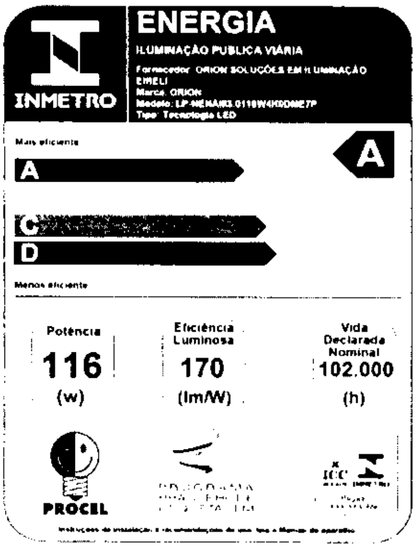

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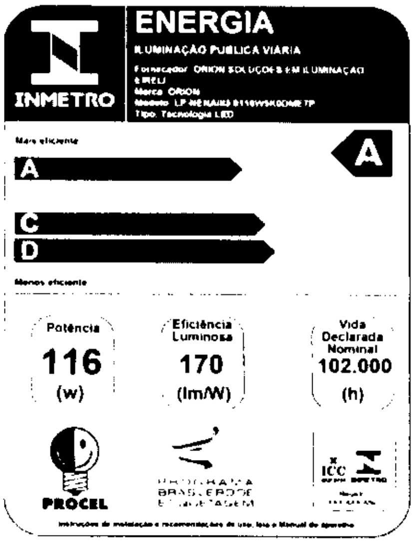

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Emission date

VÁLIDO ATÉ: 14 / 09 / 2026
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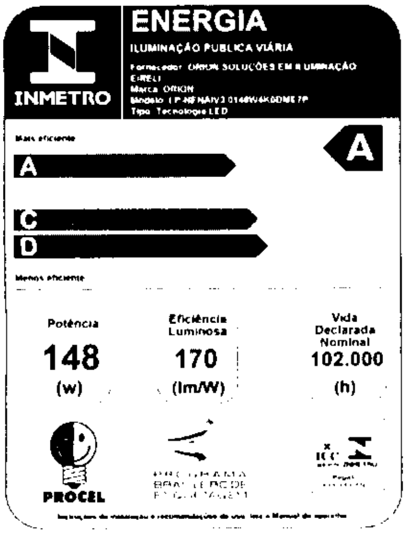

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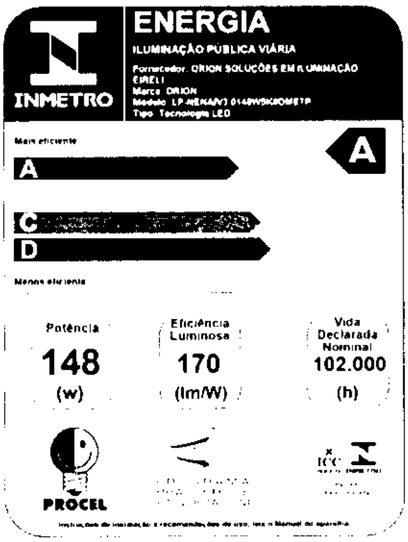

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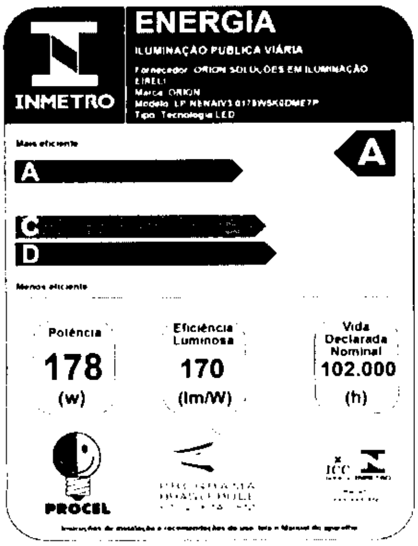

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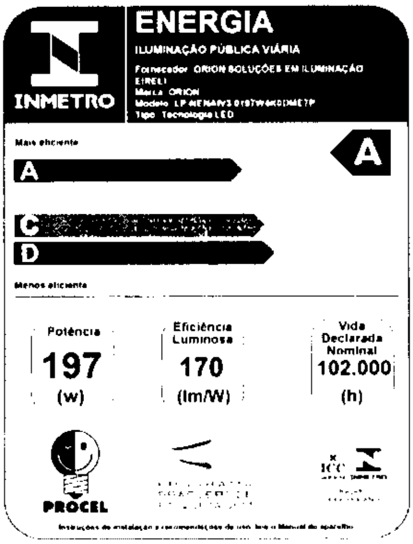

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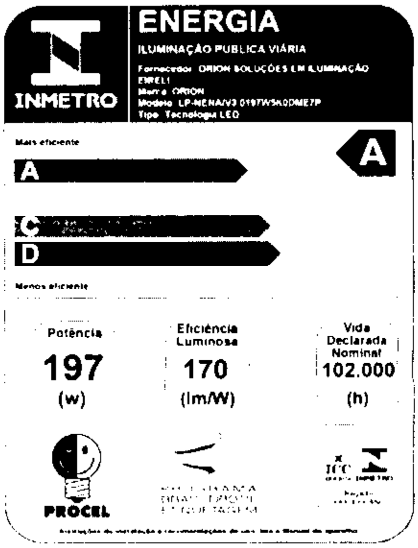

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Emission date

VÁLIDO ATÉ: 14 / 09 / 2026
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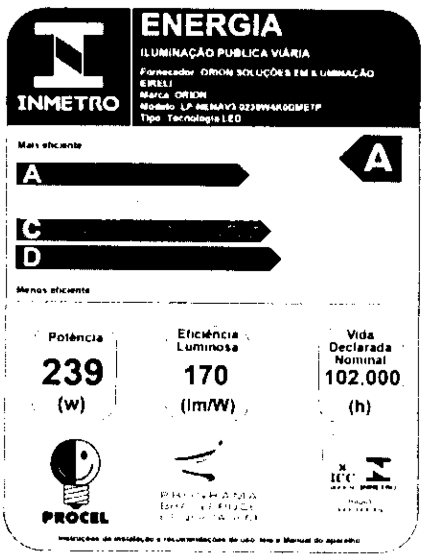

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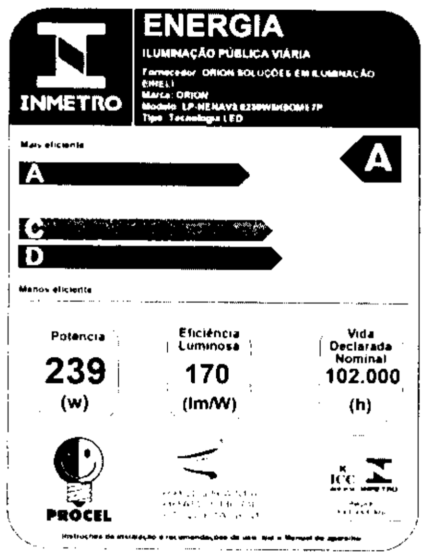

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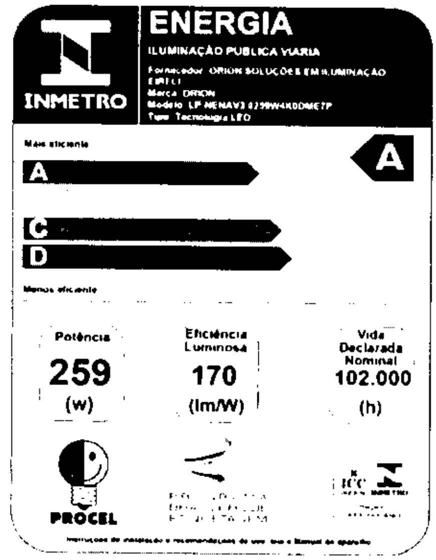

LP-NENAV3.0259W4K0DME7P

LP-NENAV3.0259W5K0DME7P

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Emission date

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CERTIFICADO DE CONFORMIDADE

Certificate of Compliance

Nº ILUM 1096-01-23

REVISÃO
Review

Data de Revisão Review Date	**Justificativa de Revisão** Review reason
25/07/2023	Emissão Inicial. Processo de transferência do certificado nº: 8044/2022-LIP-1 emitido inicialmente pelo OCP BRICS.

NOTAS
Note

I. O uso da marca de Certificação do ICC é limitado às condições estabelecidas no contrato. A validade deste Certificado está atrelada à realização das avaliações de manutenção e tratamento de possíveis não conformidades de acordo com as orientações do ICC previstas no RAC específico. Para verificação da condição atualizada de regularidade deste Certificado de Conformidade deve ser consultado o banco de dados de produtos e serviços certificados do Inmetro. Este certificado é de uso exclusivo do Cliente do ICC e é fornecido de acordo com o contrato de certificação entre ICC e seu cliente. A responsabilidade do ICC está limitada aos termos e condições do contrato. O ICC não assume qualquer responsabilidade, salvo por parte do cliente, de acordo com o contrato, por perda, despesa ou dano causado pela utilização deste Certificado e/ou da marca. Apenas o cliente está autorizado a permitir a cópia ou distribuição deste Certificado. Para mais informações, contate: e-mail: contato@icc-ocd.com.br ou Telefone: +55 (19) 2660-2204 – Rua Conceição, 233 - Andar 14 - Sala 1414 – Centro – Campinas – SP.

II. "A Cgcre é signatária do Acordo de Reconhecimento Multilateral do IAF para Certificação de Produtos"

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DATA DE EMISSÃO: 25 / 07 / 2023
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CERTIFICADO DE CONFORMIDADE
Certificate of Compliance

Nº ILUM 1096-01-23

FORNECEDOR (SOLICITANTE): Supplier (Applicant)	**ORION SOLUCOES EM ILUMINACAO EIRELI** Rua Rio São Francisco, 1120 – Weissopolis, Pinhais – PR 83.322-020 Brasil CNPJ: 08.389.230/0001-04
FABRICANTE: Manufacturer	**ORION SOLUCOES EM ILUMINACAO EIRELI** Rua Rio São Francisco, 1120 – Weissopolis, Pinhais – PR 83.322-020 Brasil CNPJ: 08.389.230/0001-04
Responsável Legal: Legal Responsible by Supplier	**ORION SOLUCOES EM ILUMINACAO EIRELI** Rua Rio São Francisco, 1120 – Weissopolis, Pinhais – PR 83.322-020 Brasil CNPJ: 08.389.230/0001-04

PRODUTO Product	Luminárias para Iluminação Pública Viárias	**MARCA** Brand	ORION DO BRASIL
MODELO Model	Vide Descrição	**FAMÍLIA** Family	01 – LUMINÁRIAS TECNOLOGIA LED / OSRAM - DURIS S8 GW P9LT31.PM / IP66 / 102.000 h

MODELO DE CERTIFICAÇÃO
Certification model

Certificação com Avaliação do Sistema da Qualidade do Fabricante e Ensaios no Produto (Modelo 5)

Gustavo Domenes Ferlin
Gerente Geral

DATA DE EMISSÃO: 25 / 07 / 2023
Emission date

VÁLIDO ATÉ: 14 / 09 / 2026
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CERTIFICADO DE CONFORMIDADE
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Nº ILUM 1096-01-23

DESCRIÇÃO:
Description

Modelo (s) Model (s)	**Descrição** Description	**Código de barras** EAN Code
LP NENAI3.026W4K0DME7P	26 W; 4420 lm; 170 lm/W; 0,98; 4.000 K	130026400073
LP-NENAI3.038W4K0DME7P	38 W; 6460 lm; 170 lm/W; 0,98; 4.000 K	130038400073
LP-NENAI3.047W4K0DME7P	47 W; 7990 lm; 170 lm/W; 0,98; 4.000 K	130047400073
LP-NENAI3.058W4K0DME7P	58 W; 9860 lm; 170 lm/W; 0,98; 4.000 K	130058400073
LP-NENAI3.069W4K0DME7P	69 W; 11730 lm; 170 lm/W; 0,98; 4.000 K	230069400073
LP-NENAII3.078W4K0DME7P	78 W; 13260 lm; 170 lm/W; 0,98; 4.000 K	230078400073
LP-NENAI3.087W4K0DME7P	87 W; 14790 lm; 170 lm/W; 0,98; 4.000 K	230087400073
LP NENAIII3.097W4K0DME7P	97 W; 16490 lm; 170 lm/W; 0,98; 4.000 K	330097400073
LP-NENAIII3.0116W4K0DME7P	116 W; 19720 lm; 170 lm/W; 0,98; 4.000 K	330116400073
LP-NENAIV3.0148W4K0DME7P	148 W; 25160 lm; 170 lm/W; 0,98; 4.000 K	430148400073
LP-NENAIV3.0178W4K0DME7P	178 W; 30260 lm; 170 lm/W; 0,98; 4.000 K	430178400073

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Emission date

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Certificate of Compliance

Nº ILUM 1096-01-23

DESCRIÇÃO:
Description

Modelo (s) Model (s)	**Descrição** Description	**Código de barras** EAN Code
LP-NENAIV3.0197W4K0DME7P	178 W; 30260 lm; 170 lm/W; 0,98; 4.000 K	430178400073
LP-NENAV3.0239W4K0DME7P	197 W; 33490 lm; 170 lm/W; 0,98; 4.000 K	430197400073
LP-NENAV3.0259W4K0DME7P	239 W; 40630 lm; 170 lm/W; 0,98; 4.000 K	530239400073
LP-NENAI3.026W5K0DME7P	259 W; 44030 lm; 170 lm/W; 0,98; 4.000 K	530259400073
LP-NENAI3.038W5K0DME7P	26 W; 4420 lm; 170 lm/W; 0,98; 5.000 K	130026500073
LP-NENAI3.047W5K0DME7P	38 W; 6460 lm; 170 lm/W; 0,98; 5.000 K	130038500073
LP-NENAI3.058W5K0DME7P	47 W; 7990 lm; 170 lm/W; 0,98; 5.000 K	130047500073
LP-NENAI3.069W5K0DME7P	58 W; 9860 lm; 170 lm/W; 0,98; 5.000 K	130058500073
LP-NENAII3.078W5K0DME7P	69 W; 11730 lm; 170 lm/W; 0,98; 5.000 K	230069500073
LP-NENAI3.087W5K0DME7P	87 W; 14790 lm; 170 lm/W; 0,98; 5.000 K	230087500073
LP-NENAIII3.097W5K0DME7P	97 W; 16490 lm; 170 lm/W; 0,98; 5.000 K	330097500073

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CERTIFICADO DE CONFORMIDADE

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Nº ILUM 1096-01-23

DESCRIÇÃO:
Description

Modelo (s) Model (s)	**Descrição** Description	**Código de barras** EAN Code
LP-NENAIII3.0116W5K0DME7P	116 W; 19720 lm; 170 lm/W; 0,98; 5.000 K	330116500073
LP-NENAIV3.0148W5K0DME7P	148 W; 25160 lm; 170 lm/W; 0,98; 5.000 K	430148500073
LP-NENAIV3.0178W5K0DME7P	178 W; 30260 lm; 170 lm/W; 0,98; 5.000 K	430178500073
LP-NENAIV3.0197W5K0DME7P	197 W; 33490 lm; 170 lm/W; 0,98; 5.000 K	430197500073
LP-NENAV3.0239W5K0DME7P	239 W; 40630 lm; 170 lm/W; 0,98; 5.000 K	530239500073
LP-NENAV3.0259W5K0DME7P	259 W; 44030 lm; 170 lm/W; 0,98; 5.000 K	530259500073

NORMAS E PORTARIAS:
Standards and Ordinances

Norma Ordinance	**Ano de Publicação** Publication' Year
Portaria Inmetro nº 62	2022
Portaria Inmetro nº 200	2021

DATA DA AUDITORIA INICIAL: 27/06/2022
Date of the Initial Audit

DATA DE EMISSÃO: 25 / 07 / 2023
Emission date

VÁLIDO ATÉ: 14 / 09 / 2026
Valid until

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CERTIFICADO DE CONFORMIDADE

Certificate of Compliance

Nº ILUM 1096-01-23

ENSAIOS:
Testing

Laboratório de ensaios Testing Laboratory	**Relatório de ensaios N°** Report N°	**Data de emissão** Date of issue
	REL LUM PUB 01-390-22 LP-NENAV3.0239W5K0DME7P - ORION	
	REL LUM PUB 02-390-22 LP-NENAIV3.0197W5K0DME7P - ORION	
	REL LUM PUB 03-390-22 LP-NENAIV3.0178W5K0DME7P - ORION	
	REL LUM PUB 04-390-22 LP-NENAIV3.0148W5K0DME7P - ORION	
	REL LUM PUB 05-390-22 LP-NENAIII3.0116W5K0DME7P - ORION;	
	REL LUM PUB 06-390-22 LP-NENAIII3.097W5K0DME7P - ORION	
	REL LUM PUB 07-390-22 LP-NENAII3.078W5K0DME7P - ORION	
	REL LUM PUB 08-390-22 LP-NENAI3.058W5K0DME7P - ORION;	
LABLUX - Laboratório de Luminotécnica da UFF (CGCRE - CRL 0557)	REL LUM PUB 09-390-22 LP-NENAI3.047W5K0DME7P - ORION	06/09/2022
	REL LUM PUB 10-390-22 LP-NENAI3.038W5K0DME7P - ORION	
	REL LUM PUB 11-390-22 LP-NENAV3.0239W4K0DME7P - ORION	
	REL LUM PUB 12-390-22 LP-NENAIV3.0197W4K0DME7P - ORION	
	REL LUM PUB 13-390-22 LP-NENAIV3.0178W4K0DME7P - ORION	
	REL LUM PUB 14-390-22 LP-NENAIV3.0148W4K0DME7P – ORION	
	REL LUM PUB 15-390-22 LP-NENAIII3.0116W4K0DME7P - ORION	
	REL LUM PUB 16-390-22 LP-NENAIII3.097W4K0DME7P - ORION	
	REL LUM PUB 17-390-22 LP-NENAII3.078W4K0DME7P - ORION	
	REL LUM PUB 18-390-22 LP-NENAI3.058W4K0DME7P - ORION	

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Certificação de produtos
OCP0174

CERTIFICADO DE CONFORMIDADE

Certificate of Compliance

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Nº ILUM 1096-01-23

ENSAIOS:
Testing

Laboratório de ensaios Testing Laboratory	**Relatório de ensaios N°** Report N°	**Data de emissão** Date of issue
LABLUX - Laboratório de Luminotécnica da UFF (CGCRE - CRL 0557)	REL LUM PUB 19-390-22 LP-NENAI3.047W4K0DME7P - ORION	06/09/2022
	REL LUM PUB 20-390-22 LP-NENAI3.038W4K0DME7P - ORION	
	REL LUM PUB 21-390-22 LP-NENAV3.0259W5K0DME7P - ORION	
	REL LUM PUB 22-390-22 LP-NENAI3.087W5K0DME7P - ORION	
	REL LUM PUB 23-390-22 LP-NENAI3.069W5K0DME7P - ORION	
	REL LUM PUB 24-390-22 LP-NENAI3.026W5K0DME7P - ORION	
	REL LUM PUB 25-390-22 LP-NENAV3.0259W4K0DME7P - ORION	
	REL LUM PUB 26-390-22 LP-NENAI3.087W4K0DME7P - ORION	
	REL LUM PUB 27-390-22 LP-NENAI3.069W4K0DME7P - ORION	
	REL LUM PUB 28-390-22 LP-NENAI3.026W4K0DME7P - ORION	
BR Cert Laboratórios Ltda. (CGCRE - CRL 0287)	OS 10266-2023 01 A (LP-NENA II3.069W4KODME7P - DRIVER L4012-CIP4U1050/075P)	27/11/2023
	OS 10266-2023 01 B (LP-NENA II3.069W4KODME7P - DRIVER L4012-CIP4U1050/075P)	27/11/2023
	OS 10266-2023 02 (LP-NENA II3.069W4KODME7P - DRIVER L4012-CIP4U1050/075P)	24/11/2023
	OS 10266-2023 03 (LP-NENAI3.038W4K0DME7P - DRIVER L4158CDI3UO800/040MC6)	24/11/2023
	OS 10266-2023 04 A (LP-NENAI3.038W4K0DME7P - DRIVER L4158CDI3UO800/040MC6)	21/11/2023
	OS 10266-2023 04 B (LP-NENAI3.038W4K0DME7P - DRIVER L4158CDI3UO800/040MC6)	21/11/2023
	OS 10266-2023 07 (LP - NENA I3. 047W4KODME7P - DRIVER L4270CDI3UO950/060MC6)	24/11/2023
	OS 10266-2023 08 A (LP-NENAI3.047W4K0DME7P – DRIVER L4270CDI3UO950/060MC6)	21/11/2023
	OS 10266-2023 08 B (LP-NENAI3.047W4K0DME7P – DRIVER L4270CDI3UO950/060MC6)	21/11/2023
	OS 10266-2023 09 A (LP-NENAI3.058W4K0DME7P – DRIVER L4271CDI3UO1150/060MC6)	21/11/2023
	OS 10266-2023 09 B (LP-NENAI3.058W4K0DME7P – DRIVER L4271CDI3UO1150/060MC6)	21/11/2023
	OS 10266/2023 10 (LP-NENAI3.058W4K0DME7P – DRIVER L4271CDI3UO1150/060MC6)	24/11/2023

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PLANILHA DE ESPECIFICAÇÕES TÉCNICAS - PET
TECHNICAL SPECIFICATIONS LIST

INMETRO

ANEXO F
MODELO DE PLANILHA DE ESPECIFICAÇÕES TÉCNICAS

01 – DENOMINAÇÃO COMERCIAL	
MARCA	ORION
FORNECEDOR	ORION DO BRASIL SOLUÇÕES EM ILUMINAÇÃO EIRELI
FABRICANTE	ORION DO BRASIL SOLUÇOES EM ILUMINAÇÃO EIRELI

02 - IDENTIFICAÇÃO DA FAMÍLIA	
FAMÍLIA (*)	LUMINÁRIAS TECNOLOGIA LED / OSRAM/GW P9LT31.PM DURIS S8 / IP66 / 102.000h /
MARCA/MODELO DO LED	OSRAM/GW P9LT31.PM DURIS S8
TIPO DA LUMINÁRIA	LUMINÁRIAS TECNOLOGIA LED
VIDA DECLARADA (h)	102.000h

(*) Composição do Código da Família:
LUMINÁRIA TECNOLOGIA LED: Tipo de Luminária / Marca e Modelo do LED / IP da Luminária / Vida declarada nominal
LUMINÁRIA COM LÂMPADA DESCARGA: Tipo de Luminária / Tipo de refrator e difusor / Vida declarada nominal

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OCP 0174

DATA DE EMISSÃO: 25 / 07 / 2023
Emission date

VÁLIDO ATÉ: 14 / 09 / 2026
Valid until

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Certificate of Compliance

Nº ILUM 1096-01-23

PLANILHA DE ESPECIFICAÇÕES TÉCNICAS - PET
TECHNICAL SPECIFICATIONS LIST

CÓDIGO DE BARRAS	MODELO	TENSÃO DE ENSAIO (V)	FREQ. (Hz)	POTÊNCIA (W)	FATOR DE POTÊNCIA	FLUXO LUMINOSO (lm)	RENDIMENTO ÓTICO (***) (%)	EE (**) (lm/W)	IRC	TCC (K)	Nº RELATÓRIO ENSAIO/ LABORATÓRIO
130026400073	LP-NENAI3.026W4K0DME7P	90-305	50/60	26	0,98	4420	Não Aplicável	170	Ra≥70	4.000	REL LUM PUB 28-390-22 LP NENAI3.026W4K0DME7P ORION
130038400073	LP-NENAI3.038W4K0DME7P	90-305	50/60	38	0,98	6460	Não Aplicável	170	Ra>70	4.000	REL LUM PUB 20 390-22 LP NENAI3.038W4K0DME7P ORION
130047400073	LP-NENAI3.047W4K0DME7P	90-305	50/60	47	0,98	7990	Não Aplicável	170	Ra≥70	4.000	REL LUM PUB 19 390 22 LP NENAI3.047W4K0DME7P ORION
130058400073	LP-NENAI3.058W4K0DME7P	90-305	50/60	58	0,98	9860	Não Aplicável	170	Ra≥70	4.000	REL LUM PUB 18-390-22 LP NENAI3 058W4K0DME7P - ORION
230069400073	LP-NENAI3.069W4K0DME7P	90-305	50/60	69	0,98	11730	Não Aplicável	170	Ra≥70	4.000	REL LUM PUB 27 390 22 LP NENAI3 069W4K0DME7P - ORION
230078400073	LP-NENAII3.078W4K0DME7P	90-305	50/60	78	0,98	13260	Não Aplicável	170	Ra≥70	4.000	REL LUM PUB 17-390 LP NENAII3 078W4K0DME7P - ORION
230087400073	LP-NENAI3.087W4K0DME7P	90-305	50/60	87	0,98	14790	Não Aplicável	170	Ra≥70	4.000	REL LUM PUB 26 390 22 LP NENAI3.087W4K0DME7P - ORION
330097400073	LP-NENAIII3.097W4K0DME7P	90-305	50/60	97	0,98	16490	Não Aplicável	170	Ra≥70	4.000	REL LUM PUB 16 390 22 LP NENAIII3 097W4K0DME7P - ORION
330116400073	LP-NENAIII3.0116W4K0DME7P	90-305	50/60	116	0,98	19720	Não Aplicável	170	Ra≥70	4.000	REL LUM PUB 15-390 22 LP-NENAIII3 0116W4K0DME7P ORION
430148400073	LP-NENAIV3.0148W4K0DME7P	90-305	50/60	148	0,98	25160	Não Aplicável	170	Ra≥70	4.000	REL LUM PUB 14 390-22 LP-NENAIV3 0148W4K0DME7P ORION
430178400073	LP-NENAIV3.0178W4K0DME7P	90-305	50/60	178	0,98	30260	Não Aplicável	170	Ra>70	4.000	REL LUM PUB 13 390-22 LP NENAIV3.0178W4K0DME7P ORION

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DATA DE EMISSÃO: 25 / 07 / 2023
Emission date

VÁLIDO ATÉ: 14 / 09 / 2026
Valid until

Certificação de produtos
OCP 0174

CERTIFICADO DE CONFORMIDADE
Certificate of Compliance

001075

Nº ILUM 1096-01-23

PLANILHA DE ESPECIFICAÇÕES TÉCNICAS - PET
TECHNICAL SPECIFICATIONS LIST

430197400073	LP-NENAIV3.0197W4K0DME7P	90-305	50/60	197	0,98	33490	Não Aplicável	170	Ra≥70	4.000	REL LUM PUB 12-390-22 LP-NENAIV3.0197W4K0DME7P - ORION
530239400073	LP-NENAV3.0239W4K0DME7P	90-305	50/60	239	0,98	40630	Não Aplicável	170	Ra≥70	4.000	REL LUM PUB 11-390-22 LP-NENAV3.0239W4K0DME7P - ORION
530259400073	LP-NENAV3.0259W4K0DME7P	90-305	50/60	259	0,98	44030	Não Aplicável	170	Ra≥70	4.000	REL LUM PUB 25-390-22 LP-NENAV3.0259W4K0DME7P - ORION
130026500073	LP-NENAI3.026W5K0DME7P	90-305	50/60	26	0,98	4420	Não Aplicável	170	Ra≥70	5.000	REL LUM PUB 24-390-22 LP-NENAI3.026W5K0DME7P - ORION
130038500073	LP-NENAI3.038W5K0DME7P	90-305	50/60	38	0,98	6460	Não Aplicável	170	Ra≥70	5.000	REL LUM PUB 10-390-22 LP-NENAI3.038W5K0DME7P - ORION
130047500073	LP-NENAI3.047W5K0DME7P	90-305	50/60	47	0,98	7990	Não Aplicável	170	Ra≥70	5.000	REL LUM PUB 09-390-22 LP-NENAI3.047W5K0DME7P - ORION
130058500073	LP-NENAI3.058W5K0DME7P	90-305	50/60	58	0,98	9860	Não Aplicável	170	Ra≥70	5.000	REL LUM PUB 08-390-22 LP-NENAI3.058W5K0DME7P - ORION
230069500073	LP-NENAI3.069W5K0DME7P	90-305	50/60	69	0,98	11730	Não Aplicável	170	Ra≥70	5.000	REL LUM PUB 23-390-22 LP-NENAI3.069W5K0DME7P - ORION
230078500073	LP-NENAII3.078W5K0DME7P	90-305	50/60	78	0,98	13260	Não Aplicável	170	Ra≥70	5.000	REL LUM PUB 07-390-22 LP-NENAII3.078W5K0DME7P - ORION
230087500073	LP-NENAI3.087W5K0DME7P	90-305	50/60	87	0,98	14790	Não Aplicável	170	Ra≥70	5.000	REL LUM PUB 22-390-22 LP-NENAI3.087W5K0DME7P - ORION
330097500073	LP-NENAIII3.097W5K0DME7P	90-305	50/60	97	0,98	16490	Não Aplicável	170	Ra≥70	5.000	REL LUM PUB 06-390-22 LP-NENAIII3.097W5K0DME7P - ORION
330116500073	LP-NENAIII3.0116W5K0DME7P	90-305	50/60	116	0,98	19720	Não Aplicável	170	Ra≥70	5.000	REL LUM PUB 05-390-22 LP-NENAIII3.0116W5K0DME7P - ORION
430148500073	LP-NENAIV3.0148W5K0DME7P	90-305	50/60	148	0,98	25160	Não Aplicável	170	Ra≥70	5.000	REL LUM PUB 04-390-22 LP-NENAIV3.0148W5K0DME7P - ORION
430178500073	LP-NENAIV3.0178W5K0DME7P	90-305	50/60	178	0,98	30260	Não Aplicável	170	Ra≥70	5.000	REL LUM PUB 03-390-22 LP-NENAIV3.0178W5K0DME7P – ORION

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Instituto de Certificações e Conformidades

DATA DE EMISSÃO: 25 / 07 / 2023
Emission date

VÁLIDO ATÉ: 14 / 09 / 2026
Valid until

001076

CERTIFICADO DE CONFORMIDADE

Certificate of Compliance

Nº ILUM 1096-01-23

PLANILHA DE ESPECIFICAÇÕES TÉCNICAS - PET
TECHNICAL SPECIFICATIONS LIST

430197500073	LP-NENAIV3.0197W5K0DME7P	90-305	50/60	197	0,98	33490	Não Aplicável	170	Ra≥70	5.000	REL LUM PUB 02-390-22 LP-NENAIV3.0197W5K0DME7P ORION
530239500073	LP-NENAV3.0239W5K0DME7P	90-305	50/60	239	0,98	40630	Não Aplicável	170	Ra≥70	5.000	REL LUM PUB 01-390-22 LP-NENAV3.0239W5K0DME7P ORION
530259500073	LP-NENAV3.0259W5K0DME7P	90-305	50/60	259	0,98	44030	Não Aplicável	170	Ra≥70	5.000	REL LUM PUB 21-390-22 LP-NENAV3.0259W5K0DME7P ORION

(**) EE – Eficiência Energética. (***) Aplicável somente para Luminárias com lâmpadas de descarga

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VÁLIDO ATÉ: Valid until	14 / 09 / 2026

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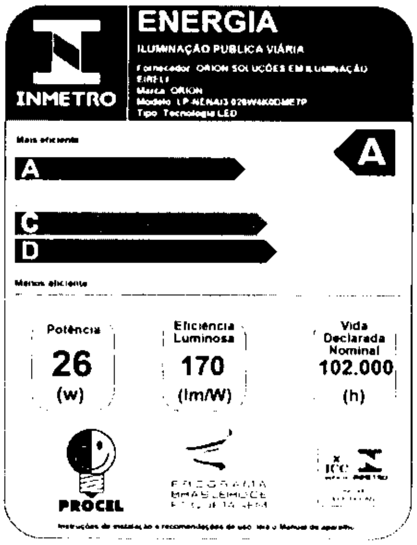
Nº ILUM 1096-01-23

ETIQUETA NACIONAL DE CONSERVAÇÃO DE ENERGIA – ENCE
NATIONAL ENERGY CONSERVATION LABEL



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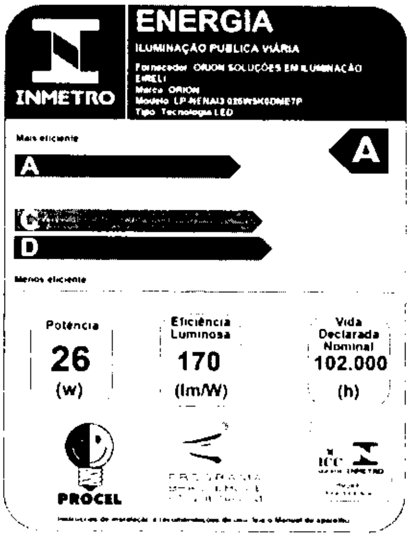

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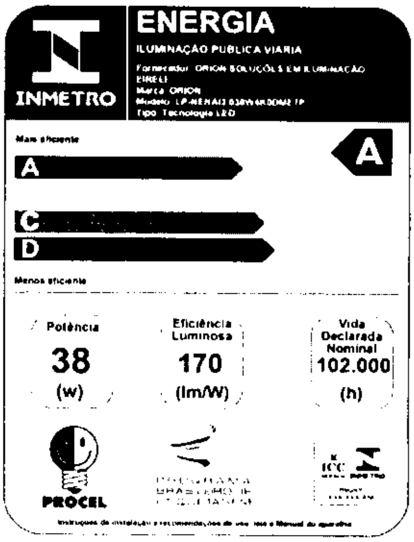

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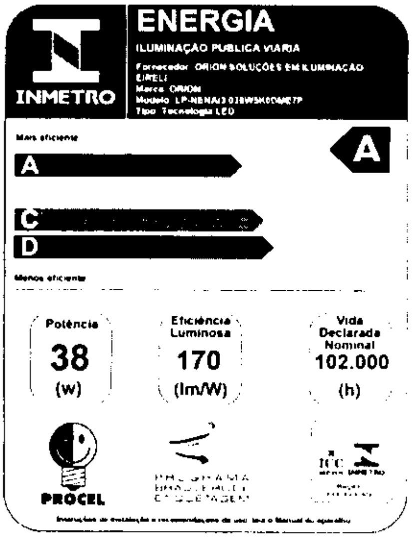

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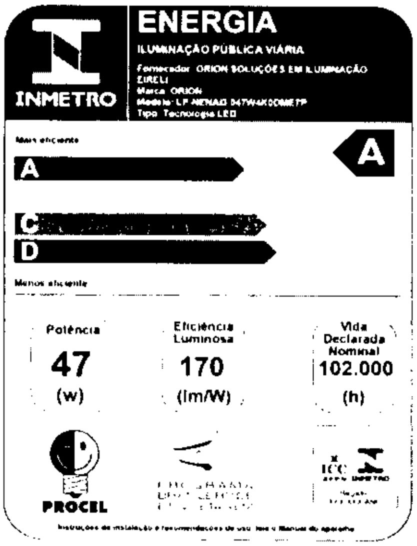

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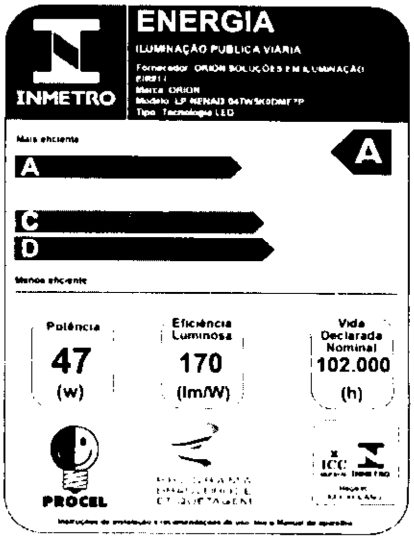

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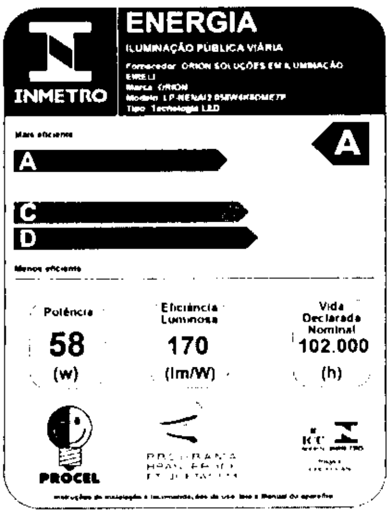
Nº ILUM 1096-01-23

ETIQUETA NACIONAL DE CONSERVAÇÃO DE ENERGIA – ENCE
NATIONAL ENERGY CONSERVATION LABEL



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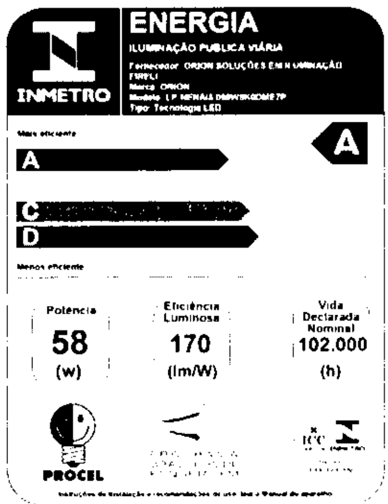

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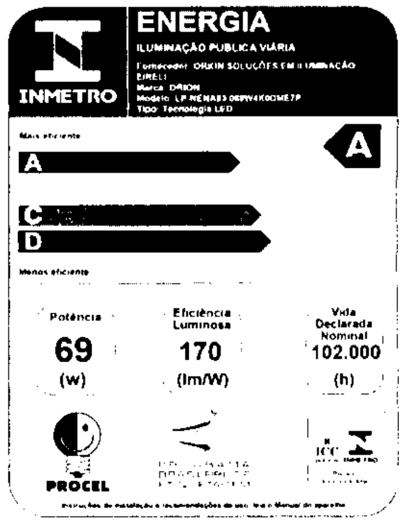

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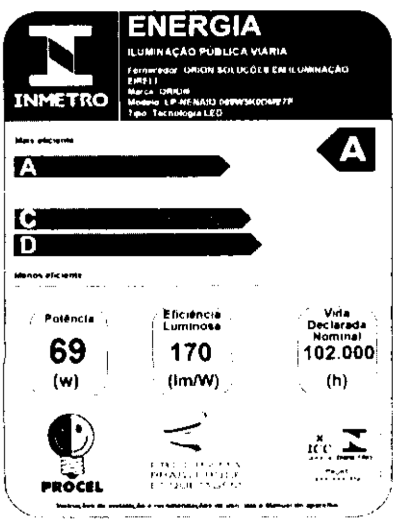

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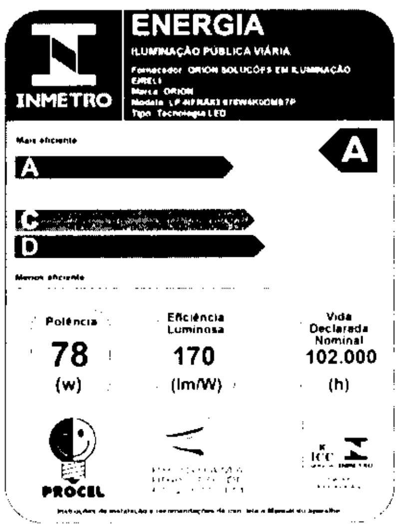

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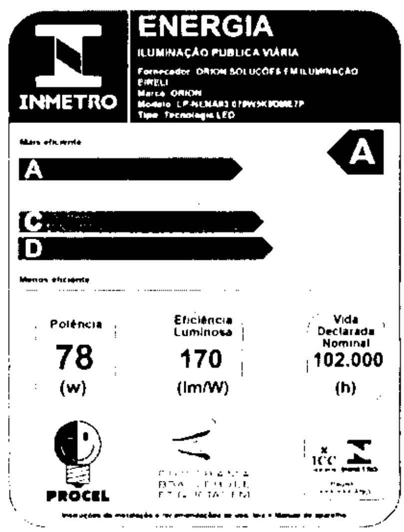

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Nº ILUM 1096-01-23

ETIQUETA NACIONAL DE CONSERVAÇÃO DE ENERGIA – ENCE
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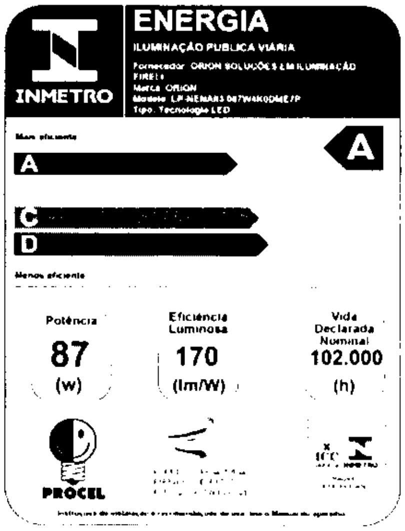

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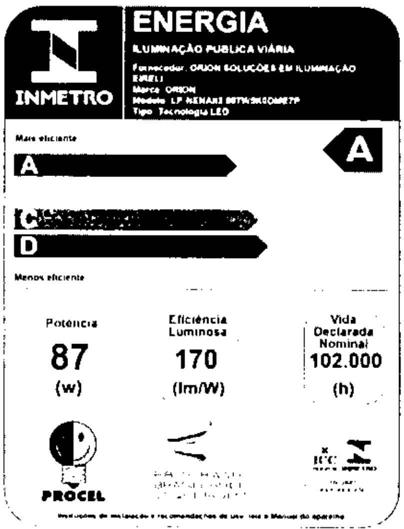

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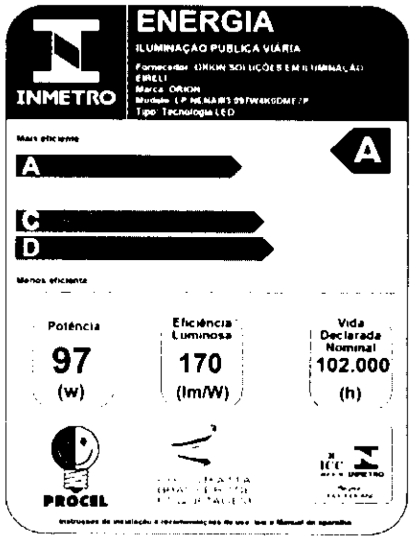

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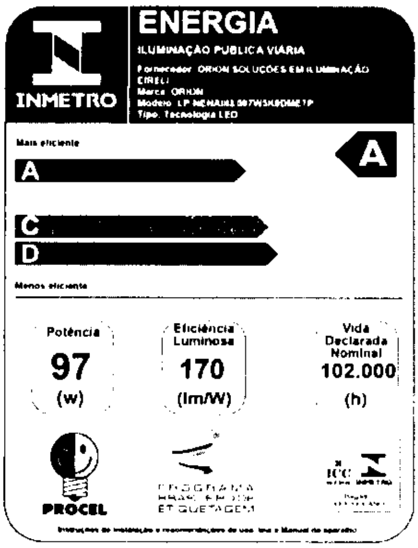

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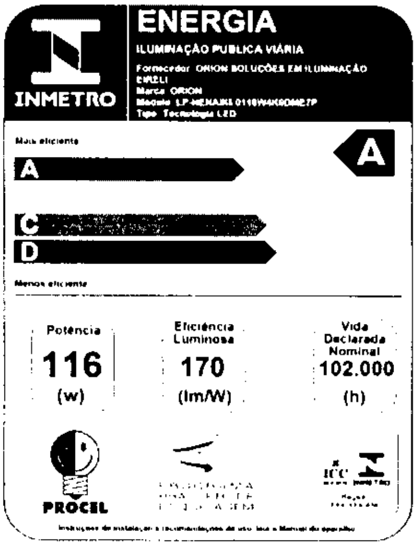

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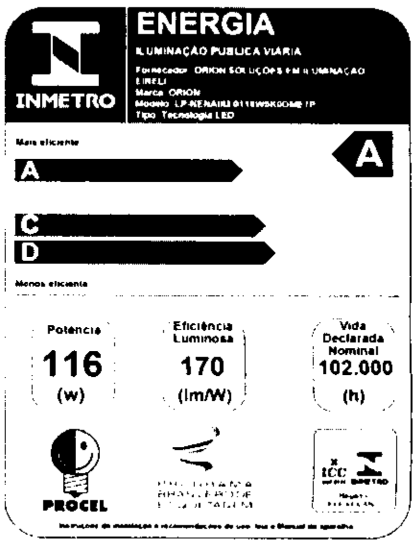

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DATA DE EMISSÃO: 25 / 07 / 2023
Emission date

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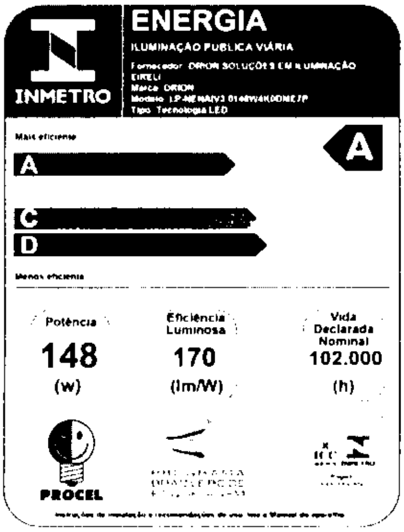
Nº ILUM 1096-01-23

ETIQUETA NACIONAL DE CONSERVAÇÃO DE ENERGIA – ENCE
NATIONAL ENERGY CONSERVATION LABEL



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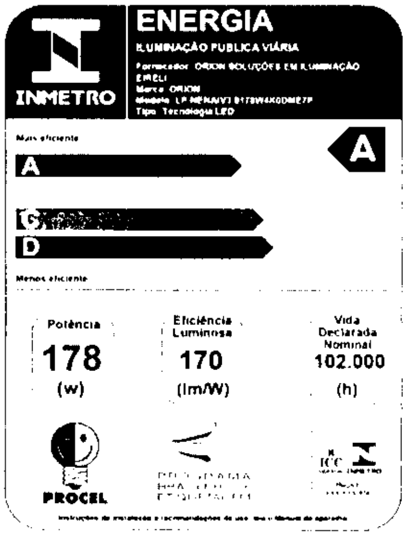

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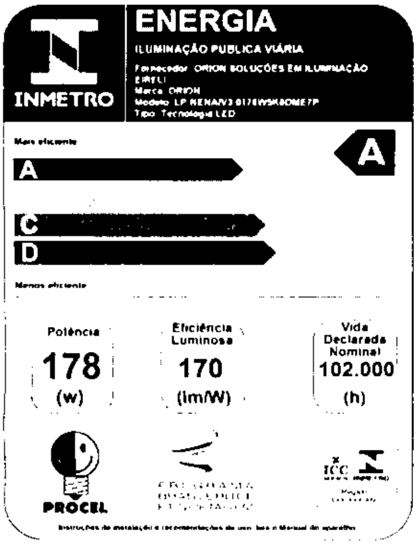

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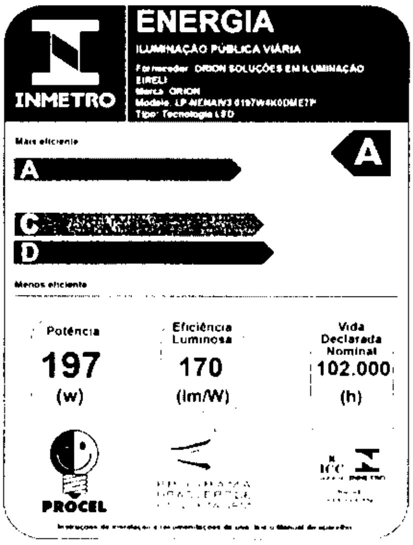

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LP-NENAIV3.0197W5K0DME7P

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DATA DE EMISSÃO: 25 / 07 / 2023
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VÁLIDO ATÉ: 14 / 09 / 2026
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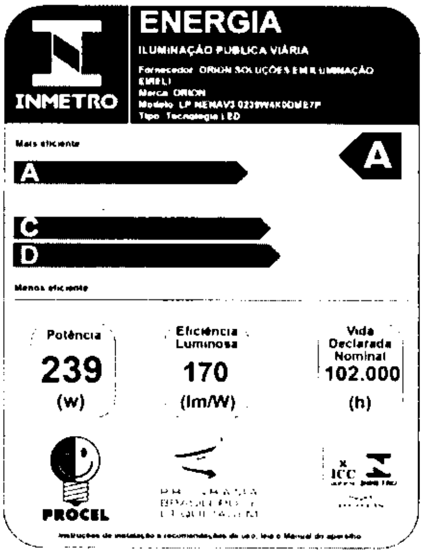
CERTIFICADO DE CONFORMIDADE
Certificate of Compliance

Nº ILUM 1096-01-23

ETIQUETA NACIONAL DE CONSERVAÇÃO DE ENERGIA – ENCE
NATIONAL ENERGY CONSERVATION LABEL



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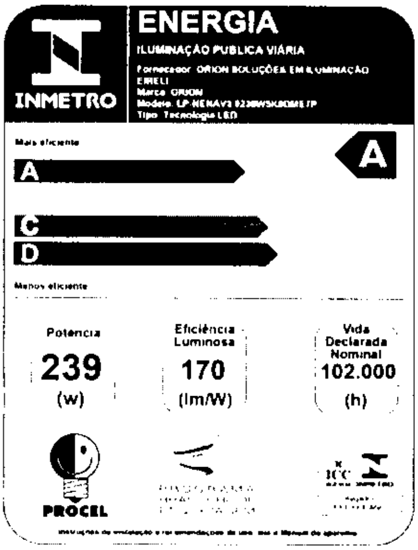

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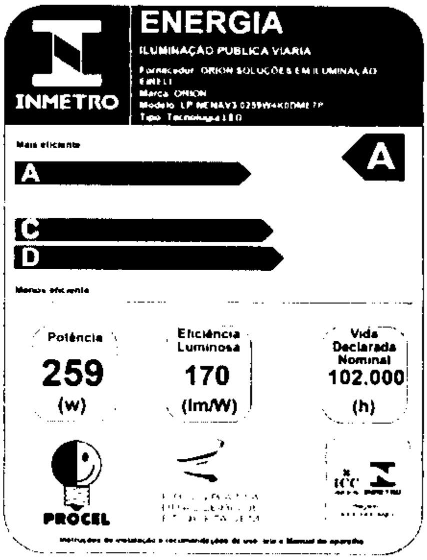

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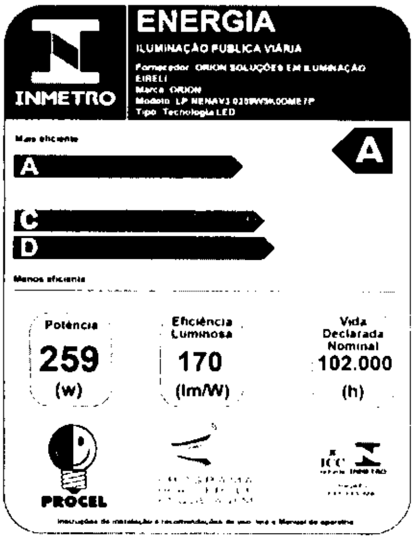

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ICC
Instituto de Certificações e Conformidades

DATA DE EMISSÃO: 25 / 07 / 2023
Emission date

VÁLIDO ATÉ: 14 / 09 / 2026
Valid until

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001082

CERTIFICADO DE CONFORMIDADE

Certificate of Compliance

Nº ILUM 1096-01-23

REVISÃO
Review

Data de Revisão Review Date	**Justificativa de Revisão** Review reason
25/07/2023	Emissão Inicial. Processo de transferência do certificado nº: 8044/2022-LIP-1 emitido inicialmente pelo OCP BRICS.
01/12/2023	Inclusão de drivers alternativos conforme correlação listada abaixo:

Modelo da Luminária	Modelo de Driver Alternativo
LP-NENAI3.038W5K0DME7P	DRIVER L4158CDI3UO800/040MC6
LP-NENAI3.047W5K0DME7P	DRIVER L4270CDI3UO950/060MC6
LP-NENAI3.058W5K0DME7P	DRIVER L4271CDI3UO1150/060MC6
LP-NENAII3.069W5K0DME7P	DRIVER L4012-CIP4U1050/075P
LP-NENAI3.038W4K0DME7P	DRIVER L4158CDI3UO800/040MC6
LP-NENAI3.047W4K0DME7P	DRIVER L4270CDI3UO950/060MC6
LP-NENAI3.058W4K0DME7P	DRIVER L4271CDI3UO1150/060MC6
LP-NENAII3.069W4K0DME7P	DRIVER L4012-CIP4U1050/075P

NOTAS
Note

I. O uso da marca de Certificação do ICC é limitado às condições estabelecidas no contrato. A validade deste Certificado está atrelada à realização das avaliações de manutenção e tratamento de possíveis não conformidades de acordo com as orientações do ICC previstas no RAC específico. Para verificação da condição atualizada de regularidade deste Certificado de Conformidade deve ser consultado o banco de dados de produtos e serviços certificados do Inmetro. Este certificado é de uso exclusivo do Cliente do ICC e é fornecido de acordo com o contrato de certificação entre ICC e seu cliente. A responsabilidade do ICC está limitada aos termos e condições do contrato. O ICC não assume qualquer responsabilidade, salvo por parte do cliente, de acordo com o contrato, por perda, despesa ou dano causado pela utilização deste Certificado e/ou da marca. Apenas o cliente está autorizado a permitir a cópia ou distribuição deste Certificado. Para mais informações, contate: e-mail: contato@icc-ocd.com.br ou Telefone: +55 (19) 2660-2204 – Rua Conceição, 233 - Andar 14 - Sala 1414 – Centro – Campinas – SP.

I. "A Cgcre é signatária do Acordo de Reconhecimento Multilateral do IAF para Certificação de Produtos"

Registro de Objeto Consultar registros concedidos

Detalhes do Registro 010092/2022

Status
Ativo

Concessão
27/09/2022

ORION SOLUCOES EM ILUMINACAO EIRELI
Rua Rio São Francisco, 1120 BARRACÃO Cep:83322-020 | Jardim Weissópolis - Pinhais - PR
Tel: (Telefone) 4136011250 - bruno@oriondobrasil.com.br (mailto:bruno@oriondobrasil.com.br) - CNPJ: (CNPJ)08.389.230/0001-04

Programa de Avaliação da Conformidade
Luminárias para Iluminação Pública Viária

Portaria Inmetro
nº (número) 62 de 17/02/2022

Nome de Família
LUMINÁRIAS TECNOLOGIA LED / OSRAM - DURIS S8 GW P9LT31.PM / IP66 / 102.000 h

Certificado
8044/2022-LIP-1

Pesquisar histórico de alterações

Data	Alteração	Marca	Modelo	Descrição

Data	Alteração	Marca	Modelo	Descrição
27/09/2022	Incluido	ORION DO BRASIL	LP-NENAI3.026W4K0DME7P	26 W - 4420 lm - 170 lm/W - 0,98 - 4000 K
27/09/2022	Incluido	ORION DO BRASIL	LP-NENAI3.038W4K0DME7P	38 W - 6460 lm - 170 lm/W - 0,98 - 4000 K
27/09/2022	Incluido	ORION DO BRASIL	LP-NENAI3.047W4K0DME7P	47 W - 7990 lm - 170 lm/W - 0,98 - 4000 K
27/09/2022	Incluido	ORION DO BRASIL	LP-NENAI3.058W4K0DME7P	58 W - 9860 lm - 170 lm/W - 0,98 - 4000 K
27/09/2022	Incluido	ORION DO BRASIL	LP-NENAII3.087W4K0DME7P	87 W - 14790 lm - 170 lm/W - 0,98 - 4000 K
27/09/2022	Incluido	ORION DO BRASIL	LP-NENAII3.078W4K0DME7P	78 W - 13260 lm - 170 lm/W - 0,98 - 4000 K
27/09/2022	Incluido	ORION DO BRASIL	LP-NENAIII3.097W4K0DME7P	97 W - 16490 lm - 170 lm/W - 0,98 - 4000 K
27/09/2022	Incluido	ORION DO BRASIL	LP-NENAIII3.0116W4K0DME7P	116 W - 19720 lm - 170 lm/W - 0,98 - 4000 K
27/09/2022	Incluido	ORION DO BRASIL	LP-NENAIV3.0148W4K0DME7P	148 W - 25160 lm - 170 lm/W - 0,98 - 4000 K
27/09/2022	Incluido	ORION DO BRASIL	LP-NENAIV3.0178W4K0DME7P	178 W - 30260 lm - 170 lm/W - 0,98 - 4000 K
27/09/2022	Incluido	ORION DO BRASIL	LP-NENAIV3.0197W4K0DME7P	197 W - 33490 lm - 170 lm/W - 0,98 - 4000 K
27/09/2022	Incluido	ORION DO BRASIL	LP-NENAV3.0239W4K0DME7P	239 W - 40630 lm - 170 lm/W - 0,98 - 4000 K
27/09/2022	Incluido	ORION DO BRASIL	LP-NENAIII3.0259W4K0DME7P	259 W - 44030 lm - 170 lm/W - 0,98 - 4000 K
27/09/2022	Incluido	ORION DO BRASIL	LP-NENAI3.026W5K0DME7P	26 W - 4420 lm - 170 lm/W - 0,98 - 5000 K
27/09/2022	Incluido	ORION DO BRASIL	LP-NENAI3.038W5K0DME7P	38 W - 6460 lm - 170 lm/W - 0,98 - 5000 K
27/09/2022	Incluido	ORION DO BRASIL	LP-NENAI3.047W5K0DME7P	47 W - 7990 lm - 170 lm/W - 0,98 - 5000 K
27/09/2022	Incluido	ORION DO BRASIL	LP-NENAI3.058W5K0DME7P	58 W - 9860 lm - 170 lm/W - 0,98 - 5000 K

Data	Alteração	Marca	Modelo	Descrição
27/09/2022	Incluido	ORION DO BRASIL	LP-NENAI3.069W5K0DME7P	69 W - 11730 lm - 170 lm/W - 0,98 - 5000 K
27/09/2022	Incluido	ORION DO BRASIL	LP-NENAI3.087W5K0DME7P	87 W - 14790 lm - 170 lm/W - 0,98 - 5000 K
27/09/2022	Incluido	ORION DO BRASIL	LP-NENAII3.078W5K0DME7P	78 W - 13260 lm - 170 lm/W - 0,98 - 5000 K
27/09/2022	Incluido	ORION DO BRASIL	LP-NENAIII3.097W5K0DME7P	97 W - 16490 lm - 170 lm/W - 0,98 - 5000 K
27/09/2022	Incluido	ORION DO BRASIL	LP-NENAIII3.0116W5K0DME7P	116 W - 19720 lm - 170 lm/W - 0,98 - 5000 K
27/09/2022	Incluido	ORION DO BRASIL	LP-NENAIV3.0148W5K0DME7P	148 W - 25160 lm - 170 lm/W - 0,98 - 5000 K
27/09/2022	Incluido	ORION DO BRASIL	LP-NENAIV3.0178W5K0DME7P	178 W - 30260 lm - 170 lm/W - 0,98 - 5000 K
27/09/2022	Incluido	ORION DO BRASIL	LP-NENAIV3.0197W5K0DME7P	197 W - 33490 lm - 170 lm/W - 0,98 - 5000 K
27/09/2022	Incluido	ORION DO BRASIL	LP-NENAV3.0239W5K0DME7P	239 W - 40630 lm - 170 lm/W - 0,98 - 5000 K
27/09/2022	Incluido	ORION DO BRASIL	LP-NENAIII3.0259W5K0DME7P	259 W - 44030 lm - 170 lm/W - 0,98 - 5000 K
27/09/2022	Incluido	ORION DO BRASIL	LP-NENAI3.069W4K0DME7P	69 W - 11730 lm - 170 lm/W - 0,98 - 4000 K

<< Voltar

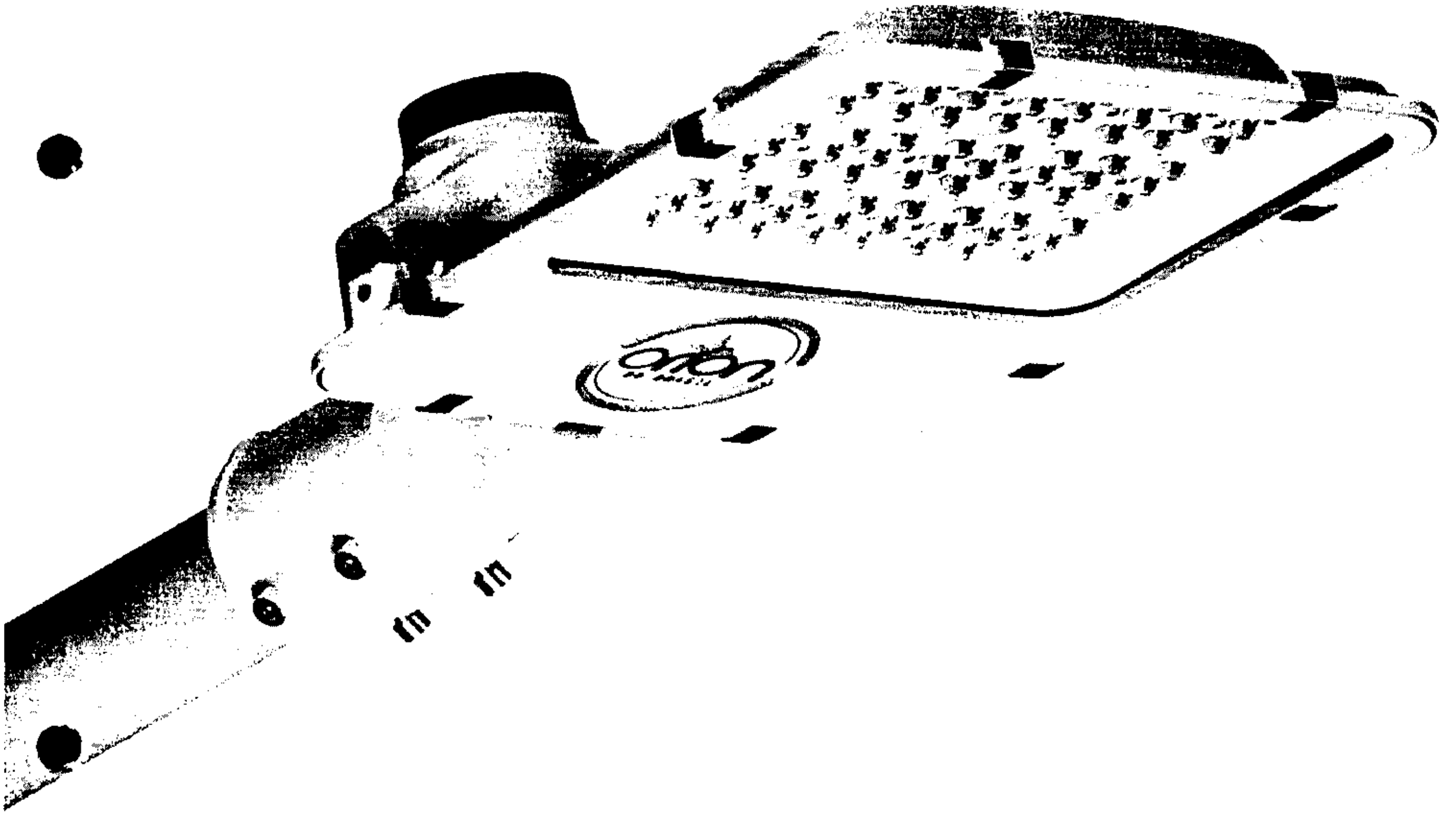
NENA SERIES

orion DO BRASIL

Lighting as a Service

001086

MADE IN BRAZIL • FABRICADO NO BRASIL



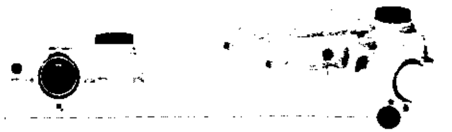
OSRAM Opto Semiconductors | SOSEN LED DRIVER | intral ILUMINAÇÃO INTELIGENTE | POWERED BY INVENTRONICS | CLAMPER | WAGO

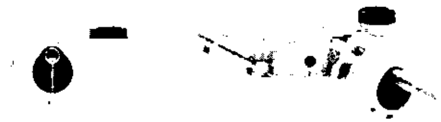
RoHS Compliant | LM-79 LM-80 | IP66 IK08 | ANSI

170 lm/w

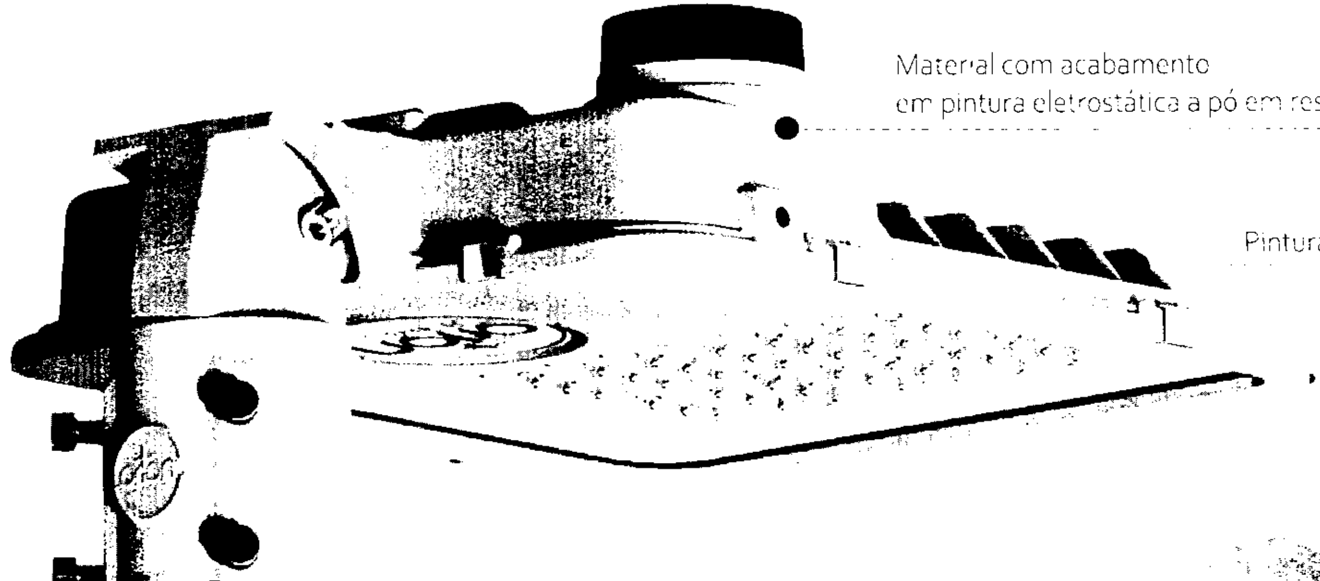
NENA Series®
Design Exclusivo

Diâmetro Padrão ø 25,40mm² à 68mm²
*) Parafusos em aço inoxidável (Opcional)



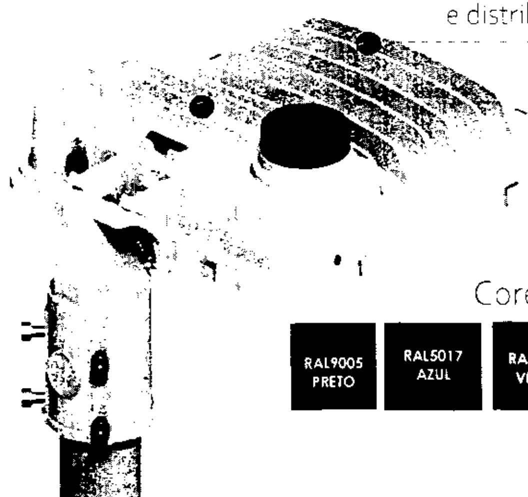


Material com acabamento
em pintura eletrostática a pó em resina poliéster



Pintura PADRÃO CINZA RAL 7035

Aletas de dissipação formadas no
próprio corpo da luminária
para melhor dissipação térmica
e distribuição uniforme da luminária



O que é pintura eletrostática a pó?
A pintura eletrostática é uma das formas de pintura mais resistente e efetiva existente. Essa pintura utiliza um processo diferenciado por meio de cargas elétricas para a fixação da tinta.

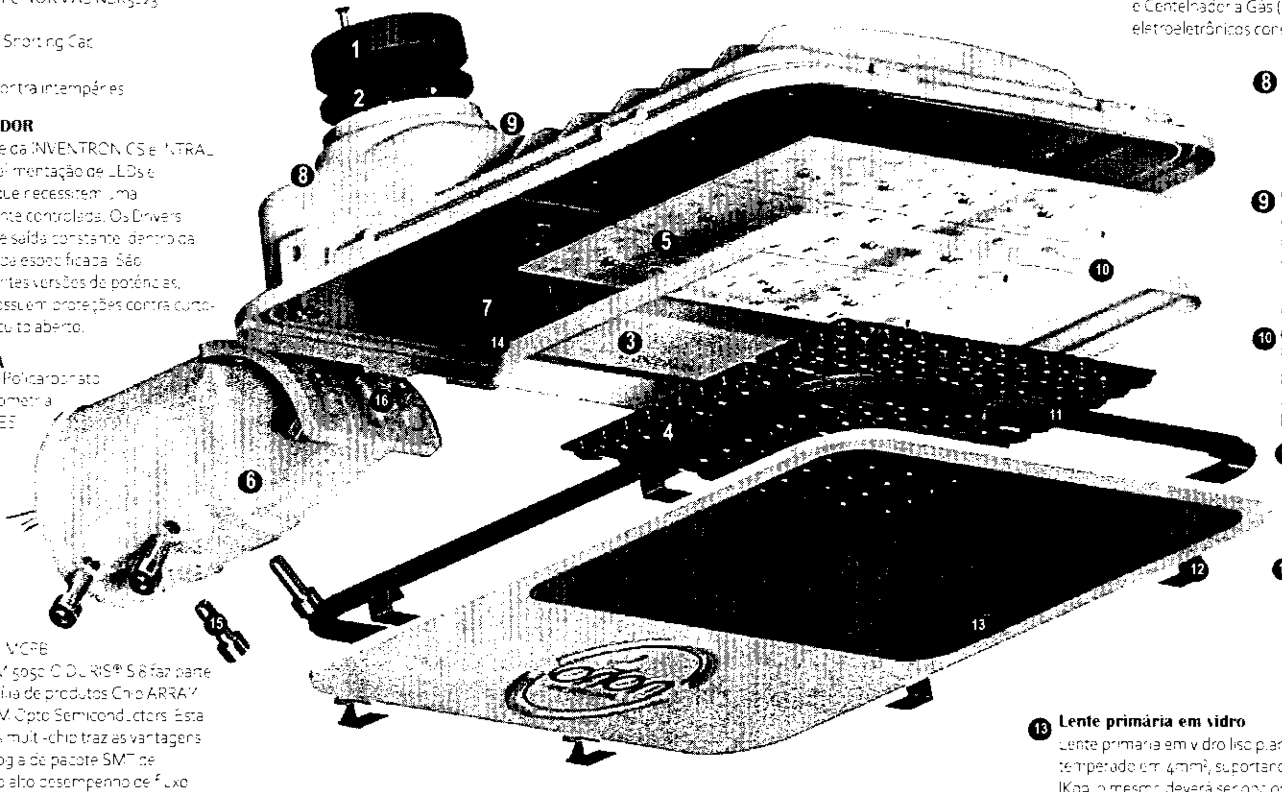
Quais são as vantagens em usar a pintura eletrostática a pó?
A pintura eletrostática a pó oferece muitas vantagens em relação à pintura tradicional. Podemos citar a economia do material, por ser um processo em que a tinta é extraída ao objeto através de uma carga elétrica oposta, ocorre pouco desperdício de matéria-prima. Além disso podemos citar o resultado da pintura na qual oferece um acabamento altamente durável. Tintas eletrostáticas a pó também oferecem maiores taxas de cobertura quando comparadas aos métodos tradicionais de pintura em spray.

Cores opcionais sob consulta

RAL9005 PRETO	RAL5017 AZUL	RAL6002 VERDE	RAL7024 CINZA	RAL7030 CINZA	RAL3020 VERMELHO

NENA SERIES
LUMINÁRIA PÚBLICA VIÁRIA DE LED

Catálogo Especificações Técnicas



1 TOMADA NEMA, SEM BASE OU SC
Base NEMA 3, 5 ou 7 PINOS.
Atendimento conforme NORMAS NBR5123
ANSI C136.41-2013
Versões sem base ou Shorting Cap

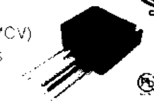
2 VEDAÇÃO
Gasket de Vedação contra intempéries

3 DRIVER CONTROLADOR
POWERED BY INVENTRONICS
intral
DIMERIZÁVEL (0-10V)
Os drivers de corrente da INVENTRONICS e INTRAL são indicados para a alimentação de LEDs e Luminárias de LEDs que necessitem uma alimentação de corrente controlada. Os Drivers mantêm a corrente de saída constante dentro da faixa de tensão de saída especificada. São disponíveis em diferentes versões de potências, e PROGRAMMER. Possuem proteções contra curto-circuito na saída e circuito aberto.

4 LENTE SECUNDÁRIA
Lente secundária em Policarbonato
Responsável pela fotometria
Gerada em arquivo IES

5 CHIP LED
OSRAM Opto Semiconductors
Chip de LED SMD em MCPB
HIGH POWER OSRAM 5050 OLDURIS® S 8 faz parte da revolucionária família de produtos Chip ARRAY SMD (CAS) da OSRAM Opto Semiconductors. Esta família de dispositivos multi-chip traz as vantagens conhecidas da tecnologia de pacote SMT de potência média para o alto desempenho de fluxo luminoso dos dispositivos. Permite designs completamente novos na área de grandes vãos, holofotes, iluminação pública e outras aplicações de iluminação.

6 INVÓLUCRO (100% CORPO DA LUMINÁRIA)
Corpo de alumínio injetado 100% em alta pressão liga de alumínio A360, acima de 80% de pureza de alumínio.

7 DPS (Dispositivo de Proteção contra-surtos)

Dispositivo de Proteção contra Surtos (DPS), Classe I (IEC 61643-11), com tecnologia de Varistor de Óxido Metálico (MOV) e Centelhador a Gás (GDT) para proteção de equipamentos eletroeletrônicos conectados à linha de energia

8 Nivel Bolha (Adicional)

Nivel bolha acoplada em parte superior da luminária para melhor ajuste de ângulo em sua instalação e melhor performance fotométrica

9 Válvula de respiro (Adicional)

A válvula de respiro da luminária garante o equilíbrio do ar dentro e fora da luminária, que melhora a vida útil da luminária e mantém a temperatura ambiente

10 Corpo Refletor em polimero
Refletor projetado para melhor dinâmica e performance fotométrica da luminária, propicia uma melhor distribuição luminosa e não desperdiça luminosidade, aumentando a eficácia da luminária

11 Junta de vedação 250° C
Junta de vedação injetado em material de silicone polipropileno, preparada para suportar temperatura de até +250° C, melhorando impacto e proteção da luminária contra resíduos sólidos e líquidos

12 Fechos em inox para abertura da luminária
Não é necessário nenhuma ferramenta para a abertura da luminária, ela é executada pela sua parte frontal, apenas através de pressão manual, o profissional deve estar com equipamento de proteção individual como luvas apenas, não haverá perda de vedação

13 Lente primária em vidro
Lente primaria em vidro liso plano temperado em 4mm², suportando IK08, para IK09 o mesmo deverá ser opcional.

14 Conectores internos de alta resistência
WAGO

16 Fácil ajuste de ângulo (Fixação)

Ajuste de ângulo com graduação gravada diretamente no componente de fixação, facilitando significativamente a instalação

15 Parafusos para fixação em Inox
Todas as arruelas, porcas e parafusos são em aço inox davel. Todas as partes mecânicas (fixações, articulações, devido à preocupação da *Orion do Brasil* possuem resistência à corrosão/de seu produto, além de possuir selagem química resistente à atmosfera marinha).

orion DO BRASIL
Lighting as a Service

❖ CHIP LED 5050 Versão LUMINÁRIA PÚBLICA

Ef. Luminosa (lm/w)	Família	Modelo	Potência (w)	Marca CHIP LED	Fluxo Luminoso efetivo (+/- 5%)	Tensão (v)	Freq. (hz)	Driver I.P. (Controlador) T.H.D. %	Controle de Distribuição Luminosa (CDL)	TCC (k)	DPS	Vida útil da Luminária L@80*
170 LM/W	NENA	LP-NENAI3.026W3K0DME7P LP-NENAI3.026W4K0DME7P LP-NENAI3.026W5K0DME7P	26	OSRAM DURIS S8	4.420	90-305	50/60	IP66/67 ≤ 8%	TIPO II MÉDIA TOTALMENTE LIMITADA	3.000* 4.000 5.000	10kV 12kA	102.000h
170 LM/W	NENA	LP-NENAI3.038W3K0DME7P LP-NENAI3.038W4K0DME7P LP-NENAI3.038W5K0DME7P	38	OSRAM DURIS S8	6.460	90-305	50/60	IP66/67 ≤ 8%	TIPO II MÉDIA TOTALMENTE LIMITADA	3.000* 4.000 5.000	10kV 12kA	102.000h
170 LM/W	NENA	LP-NENAI3.047W3K0DME7P LP-NENAI3.047W4K0DME7P LP-NENAI3.047W5K0DME7P	47	OSRAM DURIS S8	7.990	90-305	50/60	IP66/67 ≤ 8%	TIPO II MÉDIA TOTALMENTE LIMITADA	3.000* 4.000 5.000	10kV 12kA	102.000h
170 LM/W	NENA	LP-NENAI3.058W3K0DME7P LP-NENAI3.058W4K0DME7P LP-NENAI3.058W5K0DME7P	58	OSRAM DURIS S8	9.860	90-305	50/60	IP66/67 ≤ 8%	TIPO II MÉDIA TOTALMENTE LIMITADA	3.000* 4.000 5.000	10kV 12kA	102.000h
170 LM/W	NENA	LP-NENAI3.069W3K0DME7P LP-NENAI3.069W4K0DME7P LP-NENAI3.069W5K0DME7P	69	OSRAM DURIS S8	11.730	90-305	50/60	IP67 ≤ 8%	TIPO II MÉDIA TOTALMENTE LIMITADA	3.000* 4.000 5.000	10kV 12kA	102.000h
170 LM/W	NENA	LP-NENAII3.078W3K0DME7P LP-NENAII3.078W4K0DME7P LP-NENAII3.078W5K0DME7P	78	OSRAM DURIS S8	13.260	90-305	50/60	IP67 ≤ 8%	TIPO II MÉDIA TOTALMENTE LIMITADA	3.000* 4.000 5.000	10kV 12kA	102.0[illegible]
170 LM/W	NENA	LP-NENAI3.087W3K0DME7P LP-NENAII3.087W4K0DME7P LP-NENAI3.087W5K0DME7P	87	OSRAM DURIS S8	14.790	90-305	50/60	IP67 ≤ 8%	TIPO II MÉDIA TOTALMENTE LIMITADA	3.000* 4.000 5.000	10kV 12kA	102.000h
170 LM/W	NENA	LP-NENAIII3.097W3K0DME7P LP-NENAIII3.097W4K0DME7P LP-NENAIII3.097W5K0DME7P	97	OSRAM DURIS S8	16.490	90-305	50/60	IP67 ≤ 8%	TIPO II MÉDIA TOTALMENTE LIMITADA	3.000* 4.000 5.000	10kV 12kA	102.000h
170 LM/W	NENA	LP-NENAIII3.0116W3K0DME7P LP-NENAIII3.0116W4K0DME7P LP-NENAIII3.0116W5K0DME7P	116	OSRAM DURIS S8	19.720	90-305	50/60	IP67 ≤ 8%	TIPO II MÉDIA TOTALMENTE LIMITADA	3.000* 4.000 5.000	10kV 12kA	102.000h
170 LM/W	NENA	LP-NENAIV3.0148W3K0DME7P LP-NENAIV3.0148W4K0DME7P LP-NENAIV3.0148W5K0DME7P	148	OSRAM DURIS S8	25.160	90-305	50/60	IP67 ≤ 8%	TIPO II MÉDIA TOTALMENTE LIMITADA	3.000* 4.000 5.000	10kV 12kA	102.000h
170 LM/W	NENA	LP-NENAIV3.0178W3K0DME7P LP-NENAIV3.0178W4K0DME7P LP-NENAIV3.0178W5K0DME7P	178	OSRAM DURIS S8	30.260	90-305	50/60	IP67 ≤ 8%	TIPO II MÉDIA TOTALMENTE LIMITADA	3.000* 4.000 5.000	10kV 12kA	102.000h
170 LM/W	NENA	LP-NENAIV3.0197W3K0DME7P LP-NENAIV3.0197W4K0DME7P LP-NENAIV3.0197W5K0DME7P	197	OSRAM DURIS S8	33.490	90-305	50/60	IP67 ≤ 8%	TIPO II MÉDIA TOTALMENTE LIMITADA	3.000* 4.000 5.000	10kV 12kA	102.000h
170 LM/W	NENA	LP-NENAV3.0239W3K0DME7P LP-NENAV3.0239W4K0DME7P LP-NENAV3.0239W5K0DME7P	239	OSRAM DURIS S8	40.630	90-305	50/60	IP67 ≤ 8%	TIPO II MÉDIA TOTALMENTE LIMITADA	3.000* 4.000 5.000	10kV 12kA	102.000h
170 LM/W	NENA	LP-NENAV3.0259W3K0DME7P LP-NENAV3.0259W4K0DME7P LP-NENAV3.0259W5K0DME7P	259	OSRAM DURIS S8	44.030	90-305	50/60	IP67 ≤ 8%	TIPO II MÉDIA TOTALMENTE LIMITADA	3.000* 4.000 5.000	10kV 12kA	102.000h

- Fluxo luminoso de 3.000K, é 5% abaixo das outras TCC, OPCIONAL.
- Vida útil da Luminária, pode ser visualizado de acordo com o cálculo IES TM-21-11 LM-80-15 Test Report, refletindo Case temperature (solder point) Ts=°c, cenários L@70, L@80 e L@90

PART NUMBER

L P – N E N A I 3 . 0 3 8 W 4 K 0 D M E 7 P

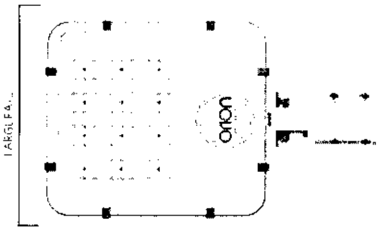
- Versões SB*, SC*, 3P*, 5P*, 7P* e AF*
- LUMINÁRIA PÚBLICA
- Dimerizável 0-10v
- FAMÍLIA
- Temperatura de Cor (K)
- Potência (w)
- Geração

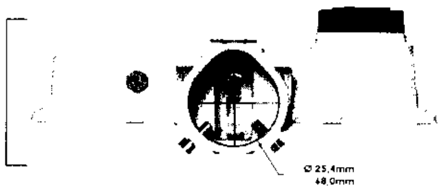
1. Versão........I
2. Versão........II
3. Versão........III
4. Versão........IV
5. Versão........V

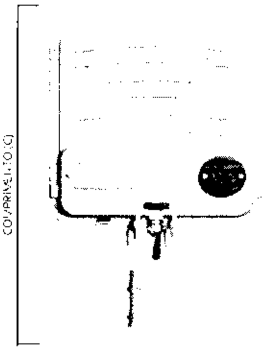
*SB (SEM BASE), SC (SHORTING CAP), 3P (TRÊS PINOS), 5P (5 PINOS), 7P (7 PINOS), AF (AJUSTE FIXO)

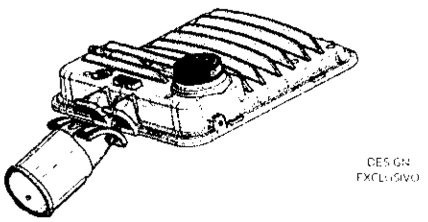
- Os produtos da marca ORION DO BRASIL [illegible]

❖ Design Externo







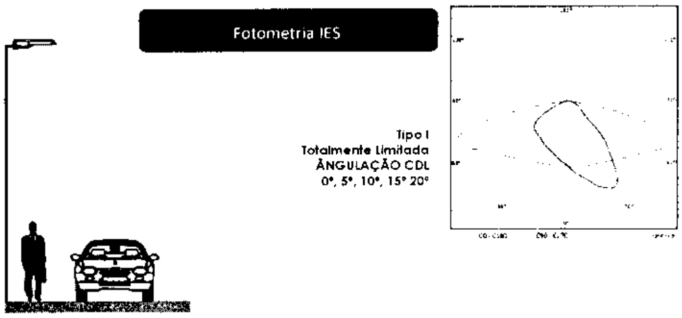


Versão	Família	Modelo	Dimensão (mm) C x L x A	Peso Líq. (kg)	Temperatura ambiente °C	Classe Proteção (IP) (IK)	IRC	Fator de potência (220v)	Efi. Driver (%)	Material Corpo (Invólucro)	Diâmetro de dispositivo de fixação (mm)
LP	NENA	LP-NENAI3.026W3K0DME7P LP-NENAI3.026W4K0DME7P LP-NENAI3.026W5K0DME7P	287*310*90 440*300*90	1,88 3,62	-45°C + 60°C	CL I IP66 IK08	≥70	≥0,98	≥90%	ALUMÍNIO INJETADO A360	25mm 68mm*
LP	NENA	LP-NENAI3.038W3K0DME7P LP-NENAI3.038W4K0DME7P LP-NENAI3.038W5K0DME7P	287*310*90 440*300*90	1,88 3,62	-45°C + 60°C	CL I IP66 IK08	≥70	≥0,98	≥90%	ALUMÍNIO INJETADO A360	25mm 68mm*
LP	NENA	LP-NENAI3.047W3K0DME7P LP-NENAI3.047W4K0DME7P LP-NENAI3.047W5K0DME7P	287*310*90 440*300*90	1,88 3,62	-45°C + 60°C	CL I IP66 IK08	≥70	≥0,98	≥90%	ALUMÍNIO INJETADO A360	25mm 68mm*
LP	NENA	LP-NENAI3.058W3K0DME7P LP-NENAI3.058W4K0DME7P LP-NENAI3.058W5K0DME7P	287*310*90 440*300*90	1,88 3,62	-45°C + 60°C	CL I IP66 IK08	≥70	≥0,98	≥90%	ALUMÍNIO INJETADO A360	25mm 68mm*
LP	NENA	LP-NENAI3.069W3K0DME7P LP-NENAI3.069W4K0DME7P LP-NENAI3.069W5K0DME7P	440*300*90	3,62	-45°C + 60°C	CL I IP66 IK08	≥70	≥0,98	≥90%	ALUMÍNIO INJETADO A360	25mm 68mm
[illegible]	NENA	LP-NENAII3.078W3K0DME7P LP-NENAII3.078W4K0DME7P LP-NENAII3.078W5K0DME7P	440*300*90	3,62	-45°C + 60°C	CL I IP66 IK08	≥70	≥0,98	≥90%	ALUMÍNIO INJETADO A360	25mm 68mm
LP	NENA	LP-NENAI3.087W3K0DME7P LP-NENAII3.087W4K0DME7P LP-NENAI3.087W5K0DME7P	440*300*90	3,62	-45°C + 60°C	CL I IP66 IK08	≥70	≥0,98	≥90%	ALUMÍNIO INJETADO A360	25mm 68mm
LP	NENA	LP-NENAIII3.097W3K0DME7P LP-NENAIII3.097W4K0DME7P LP-NENAIII3.097W5K0DME7P	440*300*90	3,62	-45°C + 60°C	CL I IP66 IK08	≥70	≥0,98	≥90%	ALUMÍNIO INJETADO A360	25mm 68mm
LP	NENA	LP-NENAIII3.0116W3K0DME7P LP-NENAIII3.0116W4K0DME7P LP-NENAIII3.0116W5K0DME7P	440*300*90	3,62	-45°C + 60°C	CL I IP66 IK08	≥70	≥0,98	≥90%	ALUMÍNIO INJETADO A360	25mm 68mm
LP	NENA	LP-NENAIV3.0148W3K0DME7P LP-NENAIV3.0148W4K0DME7P LP-NENAIV3.0148W5K0DME7P	490*300*90	3,82	-45°C + 60°C	CL I IP66 IK08	≥70	≥0,98	≥90%	ALUMÍNIO INJETADO A360	25mm 68mm
LP	NENA	LP-NENAIV3.0178W3K0DME7P LP-NENAIV3.0178W4K0DME7P LP-NENAIV3.0178W5K0DME7P	490*300*90	3,82	-45°C + 60°C	CL I IP66 IK08	≥70	≥0,98	≥90%	ALUMÍNIO INJETADO A360	25mm 68mm
LP	NENA	LP-NENAIV3.0197W3K0DME7P LP-NENAIV3.0197W4K0DME7P LP-NENAIV3.0197W5K0DME7P	490*300*90	3,82	-45°C + 60°C	CL I IP66 IK08	≥70	≥0,98	≥90%	ALUMÍNIO INJETADO A360	25mm 68mm
LP	NENA	LP-NENAV3.0239W3K0DME7P LP-NENAV3.0239W4K0DME7P LP-NENAV3.0239W5K0DME7P	600*300*100	5,78	-45°C + 60°C	CL I IP66 IK08	≥70	≥0,98	≥90%	ALUMÍNIO INJETADO A360	25mm 68mm
LP	NENA	LP-NENAV3.0259W3K0DME7P LP-NENAV3.0259W4K0DME7P LP-NENAV3.0259W5K0DME7P	600*300*100	5,78	-45°C + 60°C	CL I IP66 IK08	≥70	≥0,98	≥90%	ALUMÍNIO INJETADO A360	25mm 68mm

- Nota: Os dados de peso acima são todos valores típicos.
- Potências até 47W, podem ser utilizado o modelo de ajuste de fixação fixo como opcional, até 64mm², conforme demonstrativo em página 08.

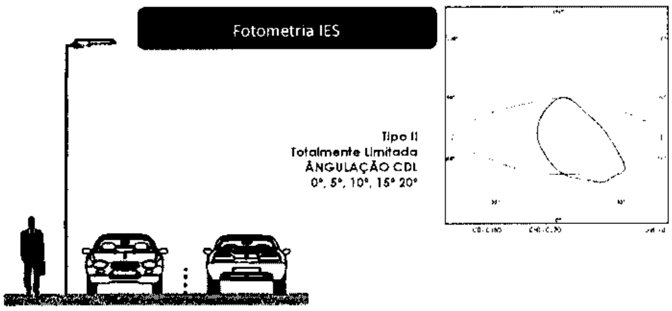
Opções de Controle de Distribuição Luminosa (CDL)

A iluminação de vias públicas, devem se adequar a uma ampla gama de aplicações, como rodovias, vias expressas, estradas, avenidas, caminhos de pedestres ou iluminação de estacionamentos.
Considerando isso, a ORION DO BRASIL fornece diferentes lentes de distribuição luminosa para a iluminação pública da Série NENA, para obter o melhor efeito de iluminação em diferentes aplicações.
ORION segue o padrão norte americano IESNA ao fornecer a largura de lente opcional, Tipo I, Tipo II e Tipo III.
O Tipo I é adequado para caminhos pedestres com 1 faixa, o Tipo II é para 2 faixas e o Tipo III é para estradas ainda mais largas.
A ORION seleciona a lente mais adequada para seus clientes de acordo com os parâmetros detalhados projeto a projeto.



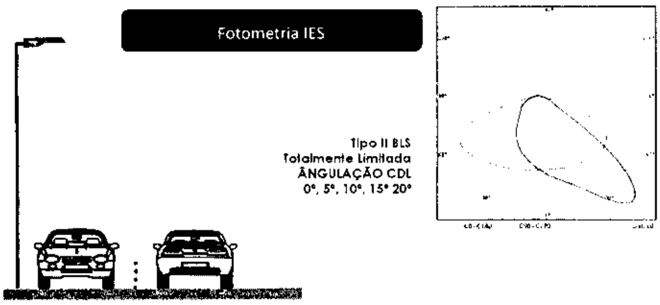
TIPO I

A lente Tipo I para iluminação viária da série ORION NENA tem um ângulo de feixe de 50*160 graus.
No padrão IESNA, a distribuição Tipo I é ótima para iluminar passarelas, caminhos e calçadas. É geralmente aplicável onde a altura de montagem é aproximadamente igual à largura da via.



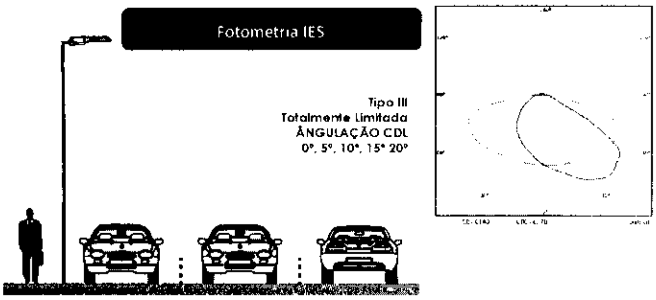
TIPO II

A lente Tipo II para iluminação viária da série ORION NENA tem um ângulo de feixe de 65*155 graus.
No padrão IESNA, a distribuição Tipo II é usada para passarelas largas, em rampas e estradas de entrada, bem como outras luzes longas e estreitas. É geralmente aplicável onde a largura da via não excede 1,75 vezes a altura de montagem projetada.



TIPO II BLS

O Tipo II BLS é uma nova distribuição de luz desenvolvida com base no Tipo II. BLS significa escudo de luz de fundo. A luz na parte de trás do poste é reduzida e a luz na frente do poste seja aumentado de acordo. É geralmente aplicável onde não precisa ou precisa de menos luz na parte de trás do poste, como área residencial, estrada, ponte e etc.

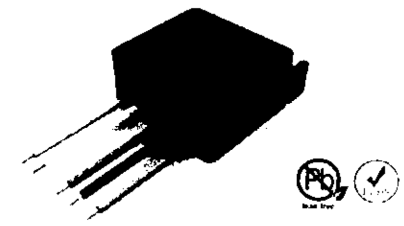


TIPO III

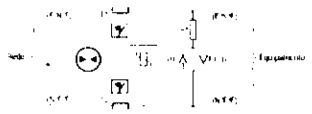
A lente Tipo III para iluminação viária da série ORION NENA tem um ângulo de feixe de 80*160 graus.
Na Norma IESNA, a distribuição Tipo III destina-se à iluminação rodoviária, áreas gerais de estacionamento e outras áreas onde é necessária uma maior área de iluminação.
Esta distribuição destina-se a luminárias montadas ao lado ou perto do meio largura das estradas ou áreas, onde a largura da estrada ou área não exceda 2,75 vezes a altura de montagem.

Dispositivo de Proteção contra surtos

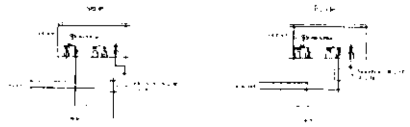
Características técnicas	Unid.	CLAMPER Light
Código CLAMPER		812231
Atende à diretiva RoHS		Sim
Norma aplicada		[illegible]
Classe de proteção		II
Tecnologia de proteção		Varistor de Óxido Metálico (MOV) e Centelhador a Gás (GDT)
Modos de proteção		[illegible]
Nível de proteção	[illegible]	[illegible]
Tempo de resposta	[illegible]	[illegible]
Proteção térmica dos varistores		Sim
Nº de condutores protegidos		[illegible]
Fusível Backup (recomendado)	A	[illegible]
Tensão nominal de operação (Un)	V	[illegible]
Corrente de carga nominal (IL)	A	10 A - Aplicável somente quando o produto for ligado em série
Potência máxima (WL)	W	[illegible]
Tensão máxima de operação contínua (Uc)	Vca / Vcc	[illegible]
Sobretensão temporária (UT)	V	[illegible]
Corrente de descarga nominal 8/20µs (In)	kA	5
Corrente de descarga máxima 8/20µs (Imax)	kA	12
Corrente de descarga total 8/20µs	kA	[illegible]
Indicação de proteção ativa		[illegible]
Esquema de instalação		[illegible]
Conexão elétrica (entrada/saída)	mm²	[illegible]
Comprimento dos condutores (entrada e saída)	mm	[illegible]
Sistema de aterramento		[illegible]
Temperatura de operação	°C	[illegible]
Invólucro		[illegible]
Grau de proteção		[illegible]
Peso aproximado	g	[illegible]
Dimensões máximas	mm	[illegible]



Circuito elétrico



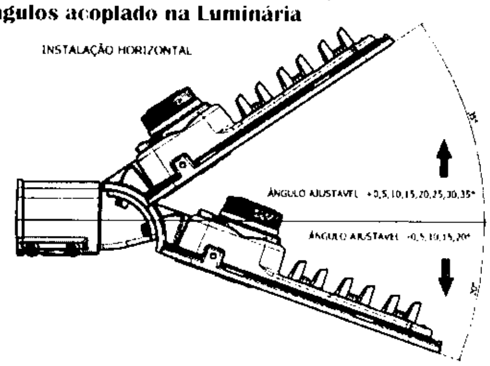
Esquema de Ligação



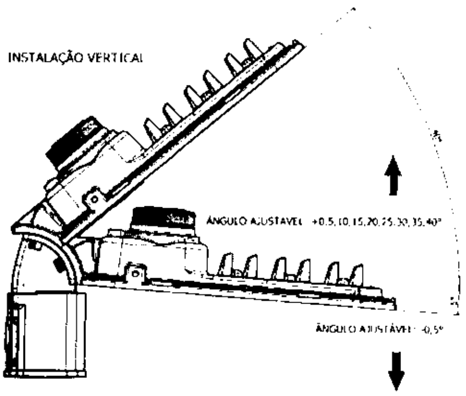
PADRÃO

Ajuste de fixação através de variação de diferentes ângulos acoplado na Luminária

INSTALAÇÃO HORIZONTAL



INSTALAÇÃO VERTICAL

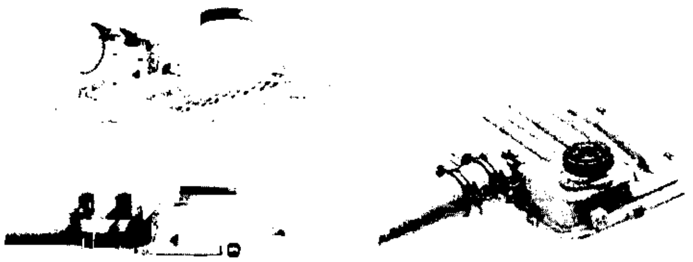


OPCIONAL

Ajuste de fixação acoplado na Luminária (AJUSTE FIXO)

INSTALAÇÃO VERTICAL

Diâmetro Padrão ø 25,40mm² à 64mm²



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Fone +55 41 3601.1250 | vendas@oriondobrasil.com.br

Website

www.oriondbrasil.com.br

CERTIFICADO DE CONFORMIDADE
CERTIFICATE OF CONFORMITY

Certificado No. / *Certificate No.* **UL-BR 20.1124**

Certificado de Conformidade válido somente acompanhado das páginas de: **1 a 4**
Certificate of Conformity valid only with the following pages:

Emissão / *Date of issue* 18 de agosto de 2020 / *August 18, 2020*
Revisão / *Revision Date* 04 de abril de 2022 / *April 04, 2022*
Validade / *Expire date* 17 de agosto de 2024 / *August 17, 2024*

Solicitante / *Applicant* **CLAMPER INDÚSTRIA E COMÉRCIO S.A**
Rodovia LMG 800, Km 1, nº 128, Distrito Industrial Genesco Aparecido de Oliveira
33240-100 – Lagoa Santa - MG - Brasil
CNPJ: 66.429.895/0003-54
Party Site: 612434
Data da Auditoria / *Audit date*: 2021-08-25

FILE#/VOL.#/SEC.# **BR4224/Vol.1/Sec.1**

Produto Certificado / *Certified Product* **Dispositivo de Proteção Contra Surtos Elétricos (DPS)**
Surge Protective Device (SPD)

Marca Comercial / *Trademark* CLAMPER

Modelo / *Model* **DPS Clamper Light**

Lote ou Número de Série / *Lot or Serial Number* **Não aplicável** / *Not applicable*

Normas Aplicáveis / *Applicable Standards* **IEC 61643-11:2011**

Programa de certificação / *Certification Program* **Procedimento** / *Procedure* **no. 00-GC-P0987**

Concessão Para / *Concession for* **Ostentar a marca de conformidade da UL-BR sobre o(s) produto(s) relacionado(s) neste certificado.**
Bearing the Conformity Identification Seal of UL-BR on the product covered by this certificate.

Pedro Mottola
Program Owner

UL do Brasil Certificações, confirma que o produto está em conformidade com a(s) Norma(s) ou programas acima descritas.
UL do Brasil Certificações, confirms that the product is in compliance with the standards or certification Program above mentioned.

UL BR

Organismo de Certificação / *Certification Body* **UL do Brasil Certificações**
Avenida Engenheiro Luis Carlos Berrini, 105 – 24° andar
04571-010 – Brooklin – São Paulo – SP – Brasil

001035

CERTIFICADO DE CONFORMIDADE
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Validade / *Expire date* 17 de agosto de 2024 / *August 17, 2024*

Fabricante / *Manufacturer* **CLAMPER INDÚSTRIA E COMÉRCIO S.A**
Rodovia LMG 800, Km 9, Galpão 01, Entreposto Aeroporto Industrial
33240-100 – Lagoa Santa - MG - Brasil
CNPJ: 66.429.895/0001-92
Party Site: 612434
Data da Auditoria / *Audit date:* 2021-08-25

Representante Legal / *Legal Representative* **Não aplicável** / *Not applicable.*

MODELO DE CERTIFICAÇÃO / *CERTIFICATION MODEL:*

☒ Modelo com Avaliação do Sistema de Gestão da Qualidade do Processo de Produção do Produto e Ensaios no Produto
Quality Management System Evaluation of the Product Production Process and Product Test Model

☐ Modelo Ensaio de Lote
Lot Test Model

CÓDIGO DE BARRAS GTIN / *GTIN BAR CODE:*

Não aplicável / *Not applicable.*

DESCRIÇÃO DO PRODUTO / *PRODUCT DESCRIPTION:*

O Dispositivo de Proteção Contra Surtos Elétricos, modelo DPS Clamper Light, Classe II, fabricado em material termoplástico o qual possui característica de não propagação e auto extinção do fogo, é destinado para aplicações residencial e/ou comercial e projetado para proteção de equipamentos eletroeletrônicos conectados à linha de energia.
The Surge Protective Device, type DPS Clamper Light, Class II, made of thermoplastic material with non-propagating and self-extinguishing characteristics and it is intended to commercial and residential applications and it is designed to protect electro-electronics devices that are connected to energy supply.

CARACTERÍSTICAS ELÉTRICAS / *ELECTRICAL CHARACTERISTICS:*

Modelo	**Clamper Light**	**Clamper Light Bracket**	**Clamper Light Lead Free**	***CLAMPER Light Sx 275v 12kA HCCyz**
Código	012282	013016	012281	*Vide legenda para codificação
Tensão nominal de operação (V)	127 / 220 (L/N); 220 (L/L)			
Nível de proteção U_P (kV)	1,5			
Tensão máxima de operação contínua U_C (Vac / Vdc)	275 / 350			
Corrente de descarga nominal @8/20 µs – I_N (kA)	5			
Corrente de descarga máxima @ 8/20 µs – $I_{MÁX.}$ (kA)	12			
Classificação de ensaio de Impulso	Classe II / *Class II*			
Sistemas de Aterramento	TN e TT			
Dimensões máximas (mm)	49 x 25 x 56			40 x 45 x 22,5

***Legenda para codificação – "CLAMPER Light Sx 275V 12kA HCCyz":**
x: Tipo de cabo (S=Simples / M=Multivias-PP)
y: Grau de proteção IP(2=IP20 / 6=IP66)
z: Suporte de fixação (S=com suporte)

Organismo de Certificação / *Certification Body* **UL do Brasil Certificações**
Avenida Engenheiro Luis Carlos Berrini, 105 – 24° andar
04571-010 – Brooklin – São Paulo – SP – Brasil

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LISTA DE DOCUMENTOS / *DOCUMENTS LIST:*

☒Description ILL# ☐TestRef ILL#	Título / *Title:*	Desenho Nº *Drawing No.:*	Revisão ou Data: *Issue or Date*
01	Especificação Técnica - Clamper Light	-	05
02	Assembly – Clamper Light	DT-PJ-Clamper Light	04
03	Embalagem (Caixa de papelão com parede dupla)	EMB-010.01.004449	00
04	Embalagem (Caixa de papelão com parede dupla)	EMB-010.02.002728	02
05	Etiqueta de embalagem	-	00
06	Datasheet	-	01
07	Datasheet	-	2017-01-04
08	Datasheet	-	2011-05-09
09	Manual de instalação Clamper Light	MI-013423	03
10	Etiqueta de identificação UL-BR	-	2020-07-22
11	PCI	-	-
12	Datasheet	-	-
13	Datasheet	-	2018-01
14	Datasheet	-	2018-05-08
15	Datasheet	-	-

CERTIFICADO DE CONFORMIDADE, RELATÓRIOS DE ENSAIO / *CERTIFICATE OF CONFORMANCE, TEST REPORTS:*

☒TestRec DS# ☐TestRef DS#	Título/Descrição: *Title/Description:*	Documento Nº *Document No.:*	Revisão ou Data: *Issue or Date*
01	Relatório de ensaios, emitido por LPD Testing Center of Shanghai Lightning Protection Center	L20190367	2020-08-10
02	Relatório de ensaios, emitido por LPD Testing Center of Shanghai Lightning Protection Center	L20210600	2021-11-17
03	Relatório de ensaios, emitido por LPD Testing Center of Shanghai Lightning Protection Center	L20210711	2021-12-31

OBSERVAÇÕES / *OBSERVATIONS:*

1. Este certificado aplica-se aos produtos idênticos ao protótipo avaliado e certificado, manufaturados na(s) unidade(s) fabril(is) mencionada(s) neste certificado, sendo este válido apenas para produtos fabricados/produzidos após a sua emissão.

2. Qualquer alteração no produto, incluindo a marcação, invalidará o presente certificado, salvo se o solicitante informar por escrito à UL do Brasil Certificações sobre esta modificação, a qual procederá à avaliação e decidirá quanto à continuidade da validade do certificado.

3. Somente as unidades comercializadas durante a vigência deste certificado estarão cobertas por esta certificação.

Organismo de Certificação / *Certification Body* **UL do Brasil Certificações**
Avenida Engenheiro Luis Carlos Berrini, 105 – 24° andar
04571-010 – Brooklin – São Paulo – SP – Brasil

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Validade / *Expire date* 17 de agosto de 2024 / *August 17, 2024*

4. As atividades de instalação, inspeção, manutenção, reparo, revisão e recuperação dos equipamentos são de responsabilidade dos usuários e devem ser executadas de acordo com os requisitos das normas técnicas vigentes e com as recomendações do fabricante.

5. A validade deste Certificado de Conformidade está atrelada à realização das avaliações de manutenção e tratamento de possíveis não conformidades de acordo com as orientações da UL do Brasil Certificações previstas no procedimento específico. Para verificação da condição atualizada de regularidade deste Certificado de Conformidade deve ser consultado o banco de dados de produtos e serviços certificados da UL.

1. *This certificate applies to the products that are identical to the prototype investigated, certified and manufactured at the production site(s) mentioned in this certificate, being valid only for products produced/manufactured after its issuance.*

2. *Any changes made on the product, including marking, will invalidate this certificate unless UL do Brasil Certificações is notified, in written, about the desired change, who will conduct an analyzes and will decide over the continuity of the certificate validity.*

3. *Only the products placed into the market during the validity of this certificate will be covered by this certification.*

4. *The installation, inspection, maintenance, repair, review and rebuild equipment activities are responsibility of the end user and must be performed in accordance with the requirements of the standards and manufacturer's recommendation.*

5. *The validity of this Certificate of Conformity is subjected to the conduction of the maintenance evaluations and treatment of possible nonconformities according to UL do Brasil Certificações guidelines in accordance with the specific RAC. In order to verify the updated condition of validity of this Certificate of Conformity, the Inmetro database of certified products and services must be consulted.*

HISTÓRICO DE REVISÕES / *REVISION HISTORY:*

Data de revisão *Revision Date*	**Descrição da revisão** *Description of revision*	**Número do projeto** *Project number*	**Número da Revisão** *Revision Number*
2022-04-04	Adição dos insumos elencados nos itens 12 à 15 (lista de documentos) e dos relatórios de ensaios L20210600 e L20210711. Inclusion of the raw materials listed on items 12 to 15 (documents list) and test reports L20210600 and L20210711.	1281201.12012192	3
2021-10-11	Correção do CEP do solicitante e alteração da unidade fabril, conforme os detalhes abaixo: De: Rod LMG 800 Km 1, 128, Industrial Genesco Ap Oliveira - 33240-100 - Lagoa Santa, MG - Brasil Para: Rodovia LMG 800 – Km 9, Galpão 01, Entreposto Aeroporto Industrial - 33240-100 - Lagoa Santa/MG – Brasil. *P.O.Box correction on the applicant's address and manufacturing location changed as given below:* *From: Rod LMG 800 Km 1, 128, Industrial Genesco Ap Oliveira - 33240-100 - Lagoa Santa, MG - Brasil* *To: Rodovia LMG 800 – Km 9, Galpão 01, Entreposto Aeroporto Industrial - 33240-100 - Lagoa Santa/MG – Brasil.*	4789983976	2
2021-04-13	Inclusão do modelo, cobrindo possibilidades relacionadas ao redimensionamento da PCI, novo invólucro e uso do cabo PP. *Model inclusion overing possibilities related to the resizing of the PCI, new enclosure and use of the PP cable.*	4789857038	1
2020-08-18	Emissão inicial. *Initial Issuance.*	OPP-052019-102364985.1.2	0
A última revisão substitui e cancela as anteriores *The last revision cancel and substitutes the previous ones*			

Organismo de Certificação / *Certification Body* **UL do Brasil Certificações**
Avenida Engenheiro Luis Carlos Berrini, 105 – 24° andar
04571-010 – Brooklin – São Paulo – SP – Brasil

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中国认可
国际互认
检测
TESTING
CNAS L2601

TEST REPORT

No.L20190367

Name of product:

Surge protective devices

Type:

CLAMPER LIGHT

Provided by:

CLAMPER Indústria e Comércio SA

Date of issue:

2020.08.10

LPD Testing Center of Shanghai Lightning Protection Center

Declaration

1. The report is invalid without "The Special Stamp for Inspection Report" and "The Official Stamp".
2. The report is invalid without the signatures of the compiler, the verifier and the approver.
3. Partially copying this report is not permitted without the written authorization (except copy all).
4. The copy of the report is invalid without "The Special Stamp for Inspection Report" and "The Official Stamp".
5. The report is invalid if it is modified.
6. Any objection to the report, please demur within 15 days after receiving the report (according to the postmark date or receiving signature date).
7. The result of the entrustment test is only responsible for the submitted samples.
8. The retention samples will be preserved in laboratory for two years.

Contact Us

Address: No.2030 Laifang Road, Songjiang District, Shanghai City, P.R.China, 201615

Post code: 201615

Tel: +86-021-67697076

Fax: +86-021-67697062

No.L20190367

TEST REPORT

Name of product:Surge protective devices Model:CLAMPER LIGHT Trade Mark:/ Quantity of samples:56 Date of performance test:2019.08.28~2020.08.10 Term of validity:2020.08.10~2022.08.09	Applicant's name:CLAMPER Indústria e Comércio SA Applicant's address:Rod. LMG 800, km01, nº 128. City: Lagoa Santa, State: Minas Gerais, Country: Brazil Manufacturer:CLAMPER Indústria e Comércio SA Address of manufacturer:Rod. LMG 800, km01, nº 128. City: Lagoa Santa, State: Minas Gerais, Country: Brazil Factory:CLAMPER Indústria e Comércio SA Address of factory:Rod. LMG 800, km01, nº 128. City: Lagoa Santa, State: Minas Gerais, Country: Brazil
Test standard: IEC 61643-11:2011 Low-voltage surge protective devices- Part 11: Surge protective devices connected to low-voltage power systems- Requirements and test methods	
Test case verdicts: See " Test items catalogue"	
Compiled by: 沈云新 Sign: 沈云新 Date: 2020.08.10 Verified by: 林 毅 Sign: 林毅 Date: 2020.08.10 Approved by: 陈华晖 Sign: 陈华晖 Date: 2020.08.10	LPD Testing Center of Shanghai Lightning Protection Center Date:2020.08.10
Remarks: /	

Test items catalogue

No.	Test items	Subclause	Conclusion
01	Identification and marking	7.1.1 / 7.1.2 / 8.2	P
02	Mounting	7.3.1	P
03	Terminals and connections	7.3.2 / 7.3.3 / 8.4.2	P
04	Testing for protection against direct contact	7.2.1 / 8.3.1	P
05	Environment, IP code	7.4.1 / 8.5.1	P
06	Residual current	7.2.2 / 8.3.2	P
07	Operating duty test	7.2.4 / 8.3.4	P
08	Thermal stability	7.2.5.2 / 8.3.5.2	P
09	Air clearances and creepage distances	7.3.4 / 8.4.3	P
10	Ball pressure test	7.4.2 / 8.5.3	P
11	Resistance to abnormal heat and fire	7.4.3 / 8.5.4	P
12	Tracking resistance	7.4.4 / 8.5.5	P
13	Voltage protection level	7.2.3 / 8.3.3	P
14	Insulation resistance	7.2.6 / 8.3.6	P
15	Dielectric withstand	7.2.7 / 8.3.7	P
16	Temperature withstand	7.2.5 / 8.3.5.1	P
17	Heat resistance	7.4.2 / 8.5.2	P
18	TOVs caused by faults or disturbances in the LV system	7.2.8.1 / 8.3.8.1	P

Subclause and sample number catalogue

Subclause	Sample No.
7.1.1 / 7.1.2 / 8.2	55#
7.3.1	1#~3#
7.3.2 / 7.3.3 / 8.4.2	1#~3#
7.2.1 / 8.3.1	1#~3#
7.4.1 / 8.5.1	1#~3#
7.2.2 / 8.3.2	1#~3#
7.2.4 / 8.3.4	4#~6#
7.2.5.2 / 8.3.5.2	1#~3#
7.3.4 / 8.4.3	56#
7.4.2 / 8.5.3	1#~3#
7.4.3 / 8.5.4	1#~3#
7.4.4 / 8.5.5	1#~3#
7.2.3 / 8.3.3	7#~9#
7.2.6 / 8.3.6	10#~12#
7.2.7 / 8.3.7	10#~12#
7.2.5 / 8.3.5.1	10#~12#
7.4.2 / 8.5.2	13#~15#
7.2.8.1 / 8.3.8.1	13#~18#

Clause	Requirement - Test	Result - Remark	Verdict
7.1.1/7.1.2	**Identification and Marking**	Model:CLAMPER LIGHT	
	Markings on the body or permanently attached to		
	a1)Manufacturer/Trade mark/Model number	CLAMPER CLAMPER LIGHT	P
	a2)Maximum continuous operating voltage U_C (one value for each mode of protection)	275 V/350 V	P
	a3)Type of current: a.c. or "~"and/or frequency	AC/DC	P
	a4)Test classification and discharge parameters shall be printed next to each other for each mode of protection declared by the manufacturer		
	For test class I: either "test class I" and "I_{imp}" and the value in kA, and/or "$\boxed{T1}$" (T1 in a square) and "I_{imp}" and the value in kA	____ kA	N/A
	For test class II: either "test class II" and "I_n" and the value in kA, and/or "$\boxed{T2}$" (T2 in a square) and "I_n" and the value in kA	$\boxed{T2}$ 5kA	P
	For test class III: either "test class III" and "U_{OC}" and the value in kV, and/or "$\boxed{T3}$" (T3 in a square) and "U_{OC}" and the value in kV	____ kV	N/A
	a5)Voltage protection level U_P (one value for each mode of protection)	1.5kV	P
	a6)Degree of protection if > IP20	IP ____	N/A
	a7)Identification of terminals or leads	——	N/A
	a8)Rated load current I_L	——	N/A
	Information provided with the products		
	b1)Location	Indoor	P
	b2)Number of ports	One	P
	b3)Method of mounting	Fixed	P
	b4)Short circuit current rating I_{SCCR}	1kA	P
	b5)Ratings and characteristics for external disconnector	10A	P
	b6)Indication of disconnector operation	LED	P

Clause	Requirement - Test	Result - Remark	Verdict
	b7)Orientation for normal installation	——	N/A
	b8) Installation instructions - type of LV systems (TN-, TT-, IT-system) - intended connection - nominal a.c. system voltages and maximum allowed voltage regulation for which the SPD is designed, mechanical dimensions, lead lengths, etc.	TN-system	P
	b9) Temperature and humidity range	-5°C to 40°C 5 % to 95 %	P
	b10) Follow current interrupting rating I_{fi}	——	N/A
	b11) Residual current I_{PE}	<600μA	P
	b12) Transition surge current rating for short-circuiting type SPD I_{trans}	——	N/A
	b13) The minimum distance from any earthed conductive surface at which the SPD can be installed	——	N/A
	b14) I_{max} (optional)	12kA	P
	Information which shall be available in a datasheet		
	c1)Temporary overvoltage rating U_T and/or the type(s) of power system(s) the SPD is designed for according to Annex B and corresponding connection details	441.66V(5s) 336.6V(120min)	P
	c2) Total discharge current ITOTAL for multipole SPDs (if declared by the manufacturer) and the corresponding test class	——	N/A
	c3) Voltage drop for two port SPDs	——	N/A
	c4) Load-side surge withstand capability for two-port SPDs	——	N/A
	c5) Information about replaceable parts (indicators, fuses, etc.)	——	N/A
	c6) Voltage rate of rise du/dt	——	N/A
	c7) Current factor k, if different from Table 20	——	N/A
	c8) Modes of protection (for SPDs with more than one mode of protection)	——	N/A
8.2	**Indelibility of markings**	Model:CLAMPER LIGHT	
	This test shall be applied on markings of all types except those made by impressing, molding and engraving.		P

Clause	Requirement - Test	Result - Remark	Verdict
	The test is made by rubbing the marking by hand for 15s with a piece of cotton soaked with water and again for 15s with a piece of cotton soaked with aliphatic solvent hexane with a content of aromatics of maximum 0,1% volume, a kauributanol value of 29, initial boiling-point approximately 65 °C and a specific gravity of 0,68 g/cm³.		P
	After this test, the marking shall be easily legible.		P
7.3.1	**Mounting**	Model:CLAMPER LIGHT	
	SPDs shall be provided with appropriate means for mounting that will ensure mechanical stability.		P
	Mechanical coding/interlock shall be provided to prevent incorrect combinations of plug-in SPD modules and sockets.		P
	Compliance is checked by visual inspection.		P
	Terminals and connections		
7.3.2	**Screws, current carrying parts and connections**	Model:CLAMPER LIGHT	
8.4.1	Reliability of screws, current-carrying parts and connections		
	Screws operated when connecting the SPD:		
	The screws are tightened and loosened:		
	- ten times for screws in engagement with a thread of insulating material		N/A
	- five times in all other cases		N/A
	Screws or nuts in engagement with a thread of insulating material are completely removed and reinserted each time unless the construction of the screw prevents this.		N/A
	The test is made by means of a suitable test screwdriver or spanner applying a torque as shown in Table 10 or according to the manufacturer's specification, whichever is greater.		N/A
	The screws shall not be tightened in jerks.		N/A
	The conductor is moved each time the screw is loosened.		N/A
	During the test, the screwed connections shall not work loose and there shall be no damage, such as breakage of screws or damage to the head slots, threads, washers or stirrups, that will impair the further use of the SPD.		N/A
	Enclosures and covers shall not be damaged. This shall be verified by visual inspection.		P

Clause	Requirement - Test	Result - Remark	Verdict
7.3.3	**External connections**		
8.4.2	Terminals for external conductors		
	The SPD is mounted according to the manufacturer's recommendation on a dull, black-painted board of about 20mm thickness, and protected against undue external heating or cooling. SPD terminals wired with conductors according to: - table 11, for two-port devices and one port devices with separate input/output terminals or, - the manufacturer's instruction, for other one-port devices	____ A ____ to ____mm² ____ to ____mm²	N/A N/A N/A
	SPDs tested according to class I and one-port SPDs with a nominal discharge current ≥ 5 kA tested according to class II shall be capable of clamping conductors up to a cross-section of at least 4 mm^2		P
	Terminals shall be fastened to the SPD in such a way that they will not work loose if the clamping screws or the lock nuts are tightened or loosened. A tool shall be required to loosen the clamping screws or the lock nuts.		N/A
	Terminals for external conductors shall be such that the conductors may be connected so as to ensure that the necessary contact pressure is maintained permanently. The terminals shall be readily accessible under the intended conditions of use.		N/A
	The means for clamping the conductors in the terminals shall not serve to fix any other component, although they may hold the terminals in place or prevent them from turning.		N/A
	Terminals shall have adequate mechanical strength.		N/A
	Terminals shall be so designed that they clamp the conductor without undue damage to the conductor.		N/A
	Terminals shall be so designed that they clamp the conductor reliably and between metal surfaces.		N/A
	Terminals shall be so designed or positioned that neither a rigid solid conductor nor a wire of a stranded conductor can slip out while the clamping screws or nuts are tightened.		N/A

Clause	Requirement - Test	Result - Remark	Verdict
7.3.3.1	**Terminals with screws**		
	Screws and nuts for clamping the conductors shall have a metric ISO thread or a thread comparable in pitch and mechanical strength.		N/A
	Terminals shall be so fixed or located that, when the clamping screws or nuts are tightened or loosened, the terminals shall not work loose from their fixings to the SPDs.		N/A
	These requirements do not imply that the terminals shall be so designed that their rotation or displacement is prevented, but any movement shall be sufficiently limited so as to prevent non-compliance with the requirements of this standard.		N/A
	The use of sealing compound or resin id considered to be sufficient for preventing a terminal from working loose, provided that: • The sealing compound or resin is not subject to stress during normal use, and • The effectiveness of the sealing compound or resin is not impaired by temperatures attained by the terminal under the least favourable conditions specified in this standard.		N/A N/A
	Clamping screws or nuts of terminals intended for the connection of protective conductors shall be adequately secured against accidental loosening.		N/A
	Screws shall not be made of metal that is soft or liable to creep, such as zinc or aluminium.		N/A
8.4.2.1.1	General		
	These tests are made by means of a suitable screwdriver or spanner applying a torque as shown in table 10.	___mm∅ ____ Nm	N/A
	The terminals are fitted with cooper conductors of the smallest or largest cross-sectional areas specified in 8.4.2, solid or stranded, whichever is least favourable	___ to 2___mm²	N/A
	The conductor is inserted into the terminal for the minimum distance prescribed or, where no distance is prescribed, until it just projects from the far side, and in the position most likely to assist the wire to escape		N/A
	The clamping screws are then tightened with a torque to two-thirds of that shown in the appropriate column of table 10.	___Nm	N/A
	Each conductor is then subjected to a pull of the value, in newtons, shown in table 12. The pull is applied without jerks, for 1 min, in the direction of the axes of the conductor space.	___ N	N/A

Clause	Requirement - Test	Result - Remark	Verdict
	During this test, the conductor shall not move noticeably in the terminal		N/A
8.4.2.1.2 a)	The terminals are fitted with cooper conductors (solid or stranded), of the smallest or largest-sectional areas as specified in 8.4.2, (whichever is the least favourable) and the terminal screws are tightened with a torque equal to two-thirds of the values shown in the appropriate column of table 10. The terminal screws are then loosened and the part of the conductor which may have been affected by the terminal is inspected.	min. ___ mm^2 max. ___ mm^2	N/A
	The conductors shall show neither undue damage nor severed wires		N/A
	Conductors are considered to be unduly damaged if they show deep or sharp indentations.		N/A
	During the test, terminals shall not work loose and there shall be no damage such as breakage of screws or damage to the head slots, threads, washers or stirrups, that will impair the further use of the terminal.		N/A
8.4.2.1.2 b)	The terminals are fitted with a rigid stranded cooper conductor according to table 13.	___ to ___mm^2	N/A
	Before insertion in the terminal, the wires of the conductors are suitably reshaped		N/A
	The conductor is inserted into the terminal until the conductor reaches the bottom of the terminal or just projects from the far side of the terminal and in the position most likely to assist a wire to escape. The clamping screw or nut is then tightened with a torque equal to two-thirds of that shown in the appropriate column of table 10	___ mm∅ ___ Nm	N/A
	After the test, no wire of the conductor shall have slipped out of the SPD terminal.		N/A
7.3.3.2	**Screwless terminals**		
	Terminals shall be so designed and constructed that: • each conductor is clamped individually. During the connection or disconnection the conductors can be connected or disconnected either at the same time or separately, • it is possible to clamp securely any number of conductors up to the maximum provided		P N/A
8.4.2.2	The terminals are fitted with new cooper conductors (solid or stranded), of the smallest or largest cross-sectional areas as specified in 8.4.2		P
	Each conductor is then subjected to a pull of the value shown in table 14. The pull is applied without jerks for 1 min in the direction of the axis of the conductor.	___ to ___mm^2 35 N	N/A

Clause	Requirement - Test	Result - Remark	Verdict
8.4.2.3	**Insulation piercing connections**		
8.4.2.3.1	Pull test on terminals designed for single core conductors		
	The terminals are fitted with new cooper conductors (solid or stranded), of the smallest or largest cross-sectional areas as specified in 8.4.2, (whichever is the least favourable). Screws, if any, are tightened according to Table 10.	____ mm∅ ____ Nm	N/A
	The conductors are connected and disconnected five times, new conductors being used each time. After each connection the conductors are subjected to a pull, without jerks, for 1 min in the axis of the tapping conductor according to the value given in Table 14.	____ to ____mm² ____ N	N/A
	During the test, there shall be no movement of the conductor in the terminal or any sign of damage.		N/A
8.4.2.3.2	**Pull test on terminals designed for multi-core cables or cords**		
	The pull-out test on the SPD terminals designed for multi-core cables or cords is carried out as for single core conductors, except that the pull force is applied to the entire multi-core cable or cord instead of to the individual core.	min. ____ mm² max. ____ mm	N/A
	The pull force is calculated according to the following formula: $F = F(x)\sqrt{n}$ F is the total force to apply n is the number of cores $F(x)$ is the force for one core according to the cross-section of one conductor (see table 9)	$F(x)$ = ____ N n = ____ F = ____ N	N/A
	During the test, the cable or cord shall not slip out of the terminals.		N/A
8.4.2.4	**Flat quick connect terminations**		
	Under consideration		
8.4.2.5	**Pigtail connections (flying leads)**		
8.4.2.5.1	Pull test on flying lead conductors		—
	A flying lead and anchorage shall withstand without damage or detachment a direct pull of 89N for one minute, applied to the lead from any angle which the construction or the device will allow.		—
	During the test, there shall be no movement of the conductor or any sign of damage.		—

Clause	Requirement - Test	Result - Remark	Verdict
7.2.1	**Protection against direct contact**	Model:CLAMPER LIGHT	
	These requirements are valid for accessible SPDs where the maximum continuous operating voltage U_c is above 50 V r.m.s.		P
	For protection against direct contact (inaccessibility of live parts), SPDs shall be so designed that, when they are wired and mounted as for normal use, live parts are not accessible, even after removal of parts which can be removed without the use of a tool.		P
8.3.1.1	**Insulated parts**		
	The sample is mounted as for normal use and the test is conducted using conductors of the smallest cross-sectional area and then again using conductors of the largest cross-sectional area specified in 8.4.2.		P
	The standard test finger (in accordance with IEC 60529) is applied in every possible position.		P
	For plug-in SPDs (which can be changed without a tool), the test finger is applied in every possible position, when the plug is partially inserted or completely inserted in a socket outlet.		P
	An electrical continuity indicator operating from a voltage of not less than 40V and not more than 50V, one side of which is connected to the test finger to check for the possibility of contact with any live part or the sample.		P
8.3.1.2	**Metal parts**		
	Metal parts which are accessible when the SPD is wired and mounted as for normal use are connected to earth through a low resistance connection, except of small screws and the like, isolated from live parts, for fixing bases and covers or cover plates of socket-outlets.		N/A
	A current (derived from an a.c. source having a no-load voltage not exceeding 12 V) equal to 1,5 times the rated load current or 25 A, whichever is the greater, is passed between the earthing terminal and each of the accessible metal parts in turn.	____ A	N/A
	The voltage drop between the earthing terminal and the accessible metal part is measured and the resistance is calculated from the current and this voltage drop. The resistance shall not exceed 0,05 Ω.	_____mV _____ Ω	N/A
7.4.1	**Environment, IP code**	Model:CLAMPER LIGHT	
	SPDs shall be provided with an enclosure for protection against ingress of solid objects and water in accordance with the IP code declared by the manufacturer.		P

Clause	Requirement - Test	Result - Remark	Verdict
8.5.1	Test carried out acc. to IEC 60529 to check IP code	IP <u>20</u>	P
7.2.2	**Residual current I_{PE}**	Model:CLAMPER LIGHT	
	For all SPDs with a terminal for the protective conductor, the residual current I_{PE} shall be measured when all SPD terminals are connected to a power supply at the reference test voltage (U_{REF}) according to the manufacturer's instructions.		P
8.3.2	The SPD shall be connected as for normal use according to the manufacturer's instructions. The voltage shall be adjusted to the reference test voltage of U_{REF}. The residual current flowing through the PE terminal is measured.	U_{REF} <u>255</u> I_{PE} <u>0.8uA</u>	P
7.2.4/8.3.4	**Operating duty**	Model:CLAMPER LIGHT	
	The SPD shall be capable of withstanding specified discharge currents during application of the maximum continuous operating voltage U_C without unacceptable changes in its characteristics. The test setup shall comply with the circuit diagram given in Figure 7.		P
	Determination of the measured limiting voltage:		
	according to 8.3.3.1, but only at a crest value corresponding to I_{imp} for test class I	____ kA / ____ V	N/A
	according to 8.3.3.1, but only at I_n for test class II	<u>5.04</u> kA / <u>939.9</u> V	P
	according to 8.3.3.3, but only at U_{OC} for test class III	____ kA / ____ V	N/A
	SPDs tested acc. to class I and II containing switching components: Front-of-wave sparkover voltage acc. to 8.3.3.2 All measured peak values (5 pos./5 neg.) below U_P	<u>1.44</u> kV	P
	Sample connected to power frequency source at U_C	<u>275</u> V	P
8.3.4.2.1	SPDs with follow current < 500A: Voltage at SPD terminals does not fall below the peak value of U_C by more than 10% during flow of follow current		P
8.3.4.2.2	SPDs with follow current > 500A: Power frequency voltage U_C with a prospective short circuit current equal to the follow current interrupt rating I_{fi} declared by the manufacturer in accordance with Table 8, or 500A, whichever is greater. For SPDs connected between neutral and protective earth only, the prospective short-circuit current shall be at least 100A.	____ kA cos φ = ____	N/A N/A

Clause	Requirement - Test	Result - Remark	Verdict
8.3.4.3	**Class I and II operating duty tests**		
	Three groups of five impulses of 8/20 current impulses with positive polarity shall be applied. The test samples are connected to a power source according to 8.3.4.2. Each impulse shall be increased in steps of 30° with a tolerance of ± 5° for each synchronisation angle. time interval between the impulses 50s – 60s time interval between the groups 30 min – 35 min	5 kA sync. 0°, 30°, 60°, 90°, 120°, 150°, 180°, 210°, 240°, 270°, 300°, 330°, 0°, 30°, 60° el.	P
	The SPD shall be energized at U_C. The prospective short-circuit current of the power source shall comply with 8.3.4.2 during the application of groups of impulses. After the application of each group of impulses and after the interruption of the last follow current (if any) the SPD shall remain energized without interruption for at least 1 min to check for reignition. After the last group of impulses and the 1 min period the SPD either remains applied or is reapplied within less than 30s to U_C for another 15 min to check for stability. For that purpose, the short-circuit capability of the power source (at U_C) may be reduced to 5A.	U_C = 275 V	P
	When testing SPDs to class I, 8/20 current impulses with a crest corresponding to I_{imp} shall be applied.		N/A
	When testing SPDs to class II, 8/20 current impulses with I_n shall be applied.	see Annex 1	P
	Current records show no sign of puncture or flashover of the sample		P
8.3.4.5	**Class III operating duty tests**		
	The SPD is tested with three groups of impulses corresponding to U_{OC} with: - five positive impulses initiated at crest value of positive half cycle (±5°) - five negative impulses initiated at crest value of positive half cycle (±5°) - five positive impulses initiated at crest value of positive half cycle (±5°)		N/A
8.3.4.4	**Additional duty test for test class I**		
	This test is carried out with current impulses in steps up to I_{imp} passing through the SPD. SPD energized at U_C by a voltage source having a nominal current capability of 5A during the application of impulses.	U_C = ____ V	N/A

Clause	Requirement - Test	Result - Remark	Verdict
	Current impulses of positive polarity shall be initiated in the corresponding positive crest value of the power frequency voltage source to the energized test sample as follows: a) One current impulse at 0,1 I_{imp} b) One current impulse at 0,25 I_{imp} c) One current impulse at 0,5 I_{imp} d) One current impulse at 0,75 I_{imp} e) One current impulse at 1,0 I_{imp}	____ kA ____ kA ____ kA ____ kA ____ kA	N/A
	After each impulse cool down to ambient temperature		N/A
8.3.4.6	**Pass criteria**		
A	After the application of each impulse and after interruption of each follow current (if any) the SPD shall remain energized without interruption for at least 1 min to check for re-ignition. After that period the SPD either remains applied or is reapplied within less than 30s to U_C for another 15 min to check for stability. For that purpose the short-circuit capability of the power source shall also be 5A.		P P
B	Voltage and current records and visual inspection show no sign of puncture or flashover.		P
C	No mechanical damage		P
D	Determination of the measured limiting voltage:	$U_P \leq$ 1.3 kV	
	according to 8.3.3.1, but only at a crest value corresponding to I_{imp} for test class I	____ kA / ____ V	N/A
	according to 8.3.3.1, but only at I_n for test class II	5.180 kA / 1.088 kV	P
	according to 8.3.3.3, but only at U_{OC} for test class III	____ kA / ____ V	N/A
	SPDs tested acc. to class I and II containing switching components: Front-of-wave sparkover voltage acc. to 8.3.3.2 All measured peak values (5 pos./5 neg.) below U_P	1.50 kV	P
E	No excessive leakage currents shall occur after the test		
	If there is more than one possible connection arrangement for normal use, this check shall be performed for all arrangements		——

Clause	Requirement - Test	Result - Remark	Verdict
	The SPD shall be connected as for normal use according to the manufacturer's instructions to a power supply at the reference test voltage (U_{REF}). The current that flows through each terminal is measured. Its resistive component (measured at the crest of the sine wave) • shall not exceed a value of 1 mA or • the current shall not have changed by more than 20% compared to the initial value determined at the beginning of the test sequence	U_{REF}= 255 V 0mA	P P N/A
	Any resettable or rearmable disconnector shall be switched off and dielectric withstand shall be checked by application of two times U_C or 1000V a.c. whichever is greater. During the test, no flashover, breakdown of insulation or any other manifestation of disruptive discharge shall occur.	U_C= ___ V test voltage ___ V	N/A
	For SPD modes connected N-PE only, the current through the PE-terminal shall be measured, whereas the terminals are connected to a power supply at U_C. Its resistive component (measured at the crest of the sine wave) • shall not exceed a value of 1 mA or • the current shall not have changed by more than 20% compared to the initial value determined at the beginning of the test sequence	U_C= ___ V I_{PE} = ___ mA	N/A
F	External disconnectors shall not operate during the test and shall be in working order after the test.		P
G	Internal disconnectors shall not operate during the test and shall be in working order after the test.		P
M	There shall be no explosion or other hazard to either personnel or the facility.		P
7.2.5.2	**Thermal protection**	Model:CLAMPER LIGHT	
	SPDs shall be protected against overheating due to degradation or overstress		P
	This test is not performed on SPDs containing only switching components and/or ABD devices.		N/A
7.2.5.4	**Status indicator**		
	The manufacturer shall provide information about the function of the indicator and the actions to be taken after change of status indication.		P

Clause	Requirement - Test	Result - Remark	Verdict
	A status indicator may be composed of two parts (one of which is not replaced on replacement of the SPD), linked by a coupling mechanism which can be mechanical, optical, audio, electromagnetic, etc. The part of the status indicator which is not replaced shall be capable of operating at least 50 times.		P
	Where there is an appropriate standard for the type of indication used, this shall be met by the non-replaced part of the status indicator, with the exception that the indicator need only be tested for 50 operations.		N/A
8.3.5.2	**Thermal stability**		
	If different non-linear components connected in parallel, this test has to be performed for every current path of the SPD by disconnecting/interrupting all the remaining current path. If components of the same type and parameters are connected in parallel, they shall be tested as one current path.		N/A P
	Any voltage switching component within the current path under test, which is connected in series with a voltage limiting component shall be short-circuited by a cooper dummy with a diameter such that it does not melt during the test.		N/A
	Test for SPDs containing only voltage limiting components - procedure a)		
	Sample connected to power frequency source with a voltage high enough to drive a constant current, which is increased by the following steps – 2mA or 5% of the previously adjusted test current, whichever is greater – with a tolerance of ± 10%: 2 mA r.m.s. or corresponding crest value 4 mA r.m.s. or corresponding crest value 6 mA r.m.s. or corresponding crest value 8 mA r.m.s. or corresponding crest value 10 mA r.m.s. or corresponding crest value 12 mA r.m.s. or corresponding crest value	Duration 16.5min 20 min 18 min 24 min 16.5 min 18.5 min	P
	Each step is maintained until thermal equilibrium is reached – temperature variation < 2K within 10 min		P
	Surface temperature of the hottest spot and current through the SPD are monitored continuously		P
	Test interrupted if all non-linear components under test are disconnected. The voltage is not increased further in order to avoid any malfunction of the disconnectors.		P

Clause	Requirement - Test	Result - Remark	Verdict
	For the other two samples the starting point shall be changed from 2 mA to a current corresponding to 5 steps below the current value at which the first sample disconnected		P
	If the voltage across the SPD falls below U_{REF} during the test, the current regulation is discontinued and the voltage is adjusted back to U_{REF} and maintained for a duration of 15 min. Continuous current monitoring is no longer required. Source short-circuit current capability does not limit the current before any disconnector operates. The maximum available current value does not exceed the short circuit withstand capability declared by the manufacturer.	U_{REF} = ___ V _____ V ___ kA cos phi = ____	N/A
	Test for SPDs having a voltage switching component in series with other components – procedure b)		
	SPD energized with a power frequency source at U_{REF} having a short-circuit current capability which will not limit the current before any disconnector operates. The maximum available current value does not exceed the short-circuit withstand capability declared by the manufacturer.	___ V ___ kA cos phi = ____	N/A
	If no significant current flows – test procedure a) shall be followed		N/A
	Pass criteria		
C	No mechanical damage		P
H	Disconnection shall be provided by one or more internal or external disconnector(s). Their correct indication shall be checked.		P
I	SPDs having an IP degree ≥ IP 2X – no live parts accessible with standardised test finger applied with a force of 5N, except the ones which are accessible when the SPD is fitted as in normal use.		P
J	If disconnection occurs during the test, there shall be clear evidence of effective disconnection of the corresponding protective component(s). If internal disconnection occurs, the test sample is connected at U_C and rated frequency for 1 min. The current flow shall not exceed a value of 1 mA.	275 V 0 mA	P
	Currents through components connected in parallel to the relevant protective component(s), are disregarded for this measurement.		N/A

Clause	Requirement - Test	Result - Remark	Verdict
	Current through the PE-terminal shall not exceed 1mA If there is more than one possible connection arrangement for normal use, this check shall be performed for all arrangements.	0 mA	P N/A
M	There shall be no explosion or other hazard to either personnel or the facility		P
O	After completion of this test the samples shall be allowed to return to room temperature and be connected to a power source at U_C for 2 hours. The residual current shall be monitored and not exceed the value measured at the beginning of the test by more than 10%.		P P
	In addition for indoor SPDs the surface temperature rise shall not exceed 120K during and after the test. 5 min. after disconnection of all non-linear components under test the surface temperature rise shall not exceed 80K.	46.387 K 33.282 K	P P
7.3.4/8.4.3	**Verification of air clearances and creepage distances**	Model:CLAMPER LIGHT	
	SPDs for domestic and similar applications shall be designed for pollution degree 2.		P
	SPDs for more stringent environmental applications may require special precautions, e.g. an appropriate SPD housing or an additional enclosure, which will ensure pollution degree 2 for the SPD		N/A
	For SPDs for outdoor and out of reach applications pollution degree 4 applies. This may be reduced to pollution degree 3 for internal distances, if they are covered by an adequate housing ensuring pollution degree 3 conditions.		N/A
	The electrode spacing of spark gaps shall not be considered for the determination of air clearances and creepage distances.		N/A
	The air clearances and creepage distances shall not be smaller than the values indicated in Table 15 and Table 16.		P

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Clause	Requirement - Test	Result - Remark	Verdict
	Air clearances in millimetres	U_{max} 1440 V required / measured	
	1) Between live parts of different polarity	1.5 /10.85	P
	2) Between live parts and		
	– screws and other means to fasten a covering, having to be detached for mounting the SPD	___/___	N/A
	– fastening surfaces (note 2)	__ /___	N/A
	– screws or other means for fastening the SPD (note 2)	___ /__	N/A
	– bodies (notes 1 and 2)	1.5 / 38.88	P
	3) Between the metal parts of the disconnector mechanism and		
	– bodies (note 1)	1.5 / 4.74	P
	– screws or other means for fastening the SPD	1.5 / 9.5	P
	NOTE 1 – Definition see 8.3.6 a)		
	NOTE 2 – If clearances between live parts of the device and the metallic screen or the surface on which the SPD is mounted are dependent on the design of the SPD only and cannot be reduced when the SPD is mounted in the least favourable position (even in a metallic enclosure), the values of lines 1 are sufficient.		
	Creepage distances in millimetres		
	– r.m.s. voltage	275	
	– Material group	IIIa	
	– Pollution	2	
	– distances required	2.75 / 38.88	P
	Printed wiring material		
	– r.m.s. voltage	___	
	– Material group	___	
	– Pollution	___	
	– distances required	___ / ___	N/A
7.4.2/8.5.3	**Ball pressure test**	Model:CLAMPER LIGHT	
	Outer parts of SPDs, consist of insulating material, are submitted to a ball pressure test by means of a tester as shown on Figure 20 and 21.		P
	Parts of insulating material necessary to retain current carrying parts and parts of the earthing circuit in position are tested in a heating cabinet at 125°C ± 2 K.		P

Clause	Requirement - Test	Result - Remark	Verdict
	Parts of insulating material not necessary to retain current carrying parts and parts of the earthing circuit in position, even though they are in contact with them, are tested at 70°C ± 2 K.		N/A
	The sample to be tested is fastened accordingly, its surface being positioned horizontally; a steel ball having a diameter of 5 mm is pressed against the surface with a force of 20 N.		P
	After 1 h, the steel ball is taken away from the sample; by dipping it into cold water, the temperature of the sample is reduced to ambient temperature within 10 s.		P
	Pass criteria		
	The diameter of the ball indentation is measured and shall not exceed 2 mm.	1.06 mm	—
7.4.3/8.5.4	**Resistance to abnormal heat and fire**	Model:CLAMPER LIGHT	
	Insulating parts of the housing shall be either non-flammable or self-extinguishing. The glow wire test is performed in accordance with Clauses 4 to 10 of IEC 60695-2-11 under the following conditions: • for external parts of SPDs made of insulating material necessary to reatain in position current-carrying parts and parts of the protective circuit, by the test made at a temperature of 850 °C ± 15 K. • for all other external parts made of insulating material, by the test made at a temperature of 650 °C ± 10 K.		P N/A
	The test is not made on parts of ceramic material and parts with lower size than defined in 3.1 of IEC 60695-2-11.		N/A
	If the insulating parts are made of the same material, the test is carried out only on one of these parts, according to the appropriate glow-wire test temperature.		P
	The test is made on one sample		P
	In case of doubt, the test is repeated on two additional samples.		N/A
	The test is made by applying the glow-wire once.		P
	The sample shall be positioned during the test in the least favourable position of its intended use (with the surface tested in a vertical position).		P

Clause	Requirement - Test	Result - Remark	Verdict
	The tip of the glow-wire shall be applied to the specified surface of the test sample taking into account the conditions of intended use under which a heated or glowing element may come into contact with the sample.		P
	Pass criteria		
	The sample is regarded as having passed the glow-wire test if • there is no visible flame and no sustained glowing or if, • flames and glowing parts on the sample extinguish themselves within 30 s after the removal of the glow-wire.		N/A P
	There shall be no ignition of the tissue paper or scorching of the pinewood board.		P
7.4.4/8.5.5	**Tracking resistance**	Model:CLAMPER LIGHT	
	The test is performed according to IEC 60112, solution A with a test voltage depending on the measured creepage distances and the required material group according to 8.3.4.		P
Remarks: /			

Clause	Requirement - Test	Result - Remark	Verdict
7.2.3/8.3.3	**Voltage protection level**	Model:CLAMPER LIGHT	
	The measured limiting voltage of the SPDs shall not exceed the voltage protection level that is specified by the manufacturer.		P
	All one-port SPDs shall be tested unenergized.		P
	All two-port SPDs shall be tested energized for the tests according 8.3.3.1 and 8.3.3.3 by means of a voltage source having a nominal current of at least 5 A at U_C. Positive impulses are applied at the (90 ± 5)° point and negative impulses at (270 ± 5)° point on the sinusoidal voltage waveform.		N/A
	For a one-port SPD having terminals, the test is performed without external disconnectors and the voltage is measured at the terminals. For a one-port SPD having connecting leads the voltage is measured with external lead lengths of 150mm. For a two-port SPD, and a one-port SPD having separate load terminals, the voltage for determining the measured limiting voltage is measured at the output/load port or load terminals of the SPD and the voltage for determining U_{max} is measured at the input/line port or terminals of the SPD.		P
8.3.3.1	**Residual voltage with 8/20 current impulses**		
	Class I, 8/20 current impulses with a sequence of crest values of 0,1; 0,2; 0,5; 1,0 times the crest value of I_{imp} shall be applied. 0,1 times I_{imp} 0,2 times I_{imp} 0,5 times I_{imp} 1,0 times I_{imp}	___ kA / ___ V ___ kA / ___ V ___ kA / ___ V ___ kA / ___ V	N/A
	Class II, 8/20 current impulses with a sequence of crest values of 0,1; 0,2; 0,5; 1,0 times I_n shall be applied. 0,1 times I_n 0,2 times I_n 0,5 times I_n 1,0 times I_n	492.0 A / 770.428 V 0.990 kA / 834.668 V 2.540 kA / 973.854 V 5.143 kA / 1.072 kV	P P P P
	If the SPD contains only voltage-limiting components, this test needs only to be performed at a crest values of I_{imp} for test class I or I_n for test class II.		P
	When I_{max} is declared by the manufacturer an additional 8/20 current impulse with a crest value of I_{max} shall be applied and the residual voltage shall be measured and recorded.	12.428 kA / 1.408 kV	P

Clause	Requirement - Test	Result - Remark	Verdict
	One sequence of positive polarity and one sequence of negative polarity are applied to the SPD		P
	The interval between individual impulses shall be long enough for the sample to cool down to ambient temperature.		P
	Current and voltage oscillogram	see Annex 2	P
	Crest values – discharge current versus residual voltage diagram to I_n or I_{imp}	see Annex 3	P
	The residual voltage used for determining the measured limiting voltage is the highest voltage value corresponding to the range of currents for: • class I: up to I_{imp} • class II: up to I_n	___ V 1.080 kV	P
	The value for determining U_{max} is the highest residual voltage measured at I_n, I_{max} or I_{imp}, as applicable depending on the SPD test class.	1.440 kV	P
8.3.3.2	**Front-of-wave sparkover voltage**		
	The 1,2/50 voltage impulse is used. The generator is set to an open circuit output voltage of 6 kV.		P
	10 impulses are applied to the SPD, five of positive and five of negative polarity.		P
	The interval between individual impulses shall be long enough for the sample to cool down to ambient temperature.		P
	If sparkover is not observed during each of the 10 impulses on the front of wave, then the above procedure are repeated with the generator output voltage increased up to a maximum 10 kV.		N/A
	Voltage oscillograms	see Annex 4	P
	The value for determining the measured limiting voltage and U_{max} is the maximum sparkover voltage recorded during this test.	1.40 kV	P
8.3.3.3	**Limiting voltage with the combination wave**		
	To perform this test a combination wave generator is used. The interval between the individual impulses shall be long enough for the sample to cool down to ambient temperature.		N/A

Clause	Requirement - Test	Result - Remark	Verdict
	The voltage of the combination wave generator is set to provide an open-circuit voltage of 0,1; 0,2; 0,5; 1,0 times the U_{OC}. If the SPD only contains voltage-limiting components this test needs to be carried out at U_{OC} only. 0,1 times U_{OC} ____ kV 0,2 times U_{OC} ____ kV 0,5 times U_{OC} ____ kV 1,0 times U_{OC} ____ kV	____ kA / ____ V ____ kA / ____ V ____ kA / ____ V ____ kA / ____ V	N/A
	With these generator settings four surges will be applied to the SPD at each amplitude: two with positive and two with negative polarity.		N/A
	Current-voltage oscillograms; voltage at the output port of the SPD		N/A
	The value for determining the measured limiting voltage and U_{max} is the maximum voltage recorded during the test.	____ V	N/A
8.3.3.4	**Pass criteria for all measured limiting voltage tests**		
B	Voltage and current records and visual inspection show no sign of puncture or flashover.		P
C	No mechanical damage		P
I	SPDs having an IP degree ≥ IP 2X – no live parts accessible with standardised test finger applied with a force of 5N, except the ones which are accessible when the SPD is fitted as in normal use.		P
M	There shall be no explosion or other hazard to either personnel or the facility		P
Remarks: /			

Clause	Requirement - Test	Result - Remark	Verdict
7.2.6/8.3.6	**Insulation resistance**	Model:CLAMPER LIGHT	
	The insulation resistance of the SPD shall be sufficient with respect to leakage currents and protection against direct contact. This test is not applicable to SPDs having a metallic enclosure connected to protective earth.		P N/A
	Additional entry holes for cables, if there are any, are left open. If there are any knockouts, one of them is opened. Coverings and other parts which are detachable without tools, are removed and undergo the same moisture treatment.		P
	The moisture treatment is carried out in a humidity cabinet at a relative humidity of 93% ± 3% RH. The air temperature is kept at all points, where the test sample can be positioned, within ± 2 K at a suitable temperature T between 20°C and 30°C. Before putting the test samples into the humidity cabinet, they shall have a temperature between T and (T+4) in °C.		P
	The samples shall be kept in the humidity cabinet for 2 days (48 h).		P
	After a delay of between 30 min and 60 min following the humidity treatment, the insulation resistance is measured 60 s after having applied a d.c. voltage of 500 V.		P
	This measurement is carried out in the humidity cabinet or in the room into which the specimens were brought to reach the determined temperature, after having refitted the parts which might have been detached. a) between all interconnected live parts and the SPDs body accessible to accidental contact. The express "body" in the sense of this test means • all touchable metal parts and a metal foil on surfaces of insulating material, which are touchable after installation as for normal use, • the surface on which the SPD is mounted, if necessary covered with metal foil, • screws and other facilities for fastening the SPD on its support Fore these measurements, the metal foil is put on in such a way, that perhaps existing casting mass is effectively tested. Protective components connected to PE may be disconnected for this test b) between the live parts of the SPD main circuit and live parts of separate isolated circuits, if there are any.		P N/A

Clause	Requirement - Test	Result - Remark	Verdict
	Pass criteria		
	The insulation resistance shall not be lower than • 5 MΩ for the measurements according to a), • 2 MΩ for the measurements according to b).	≥100 MΩ ___ MΩ	P N/A
7.2.7/8.3.7	**Dielectric withstand**	Model:CLAMPER LIGHT	
	The dielectric withstand of the SPD shall be sufficient with respect to insulation breakdown and protection against direct contact.		
	SPDs classified for outdoor use are tested between the terminals with the internal parts removed. During this test, the SPD is subjected to sprinkling according to 9.1 of IEC 60060-1.		N/A
	SPDs classified for indoor are tested as indicated in a) and b) of 8.3.6.		P
	SPDs are tested with an a.c. voltage according to Table 9. Starting with not more than half the required a.c. voltage, this voltage is increased to the full value within 30 s which is maintained for 1 min. a) between all interconnected live parts and the SPDs body accessible to accidental contact. The express "body" in the sense of this test means • all touchable metal parts and a metal foil on surfaces of insulating material, which are touchable after installation as for normal use, • the surface on which the SPD is mounted, if necessary covered with metal foil, • screws and other facilities for fastening the SPD on its support Fore these measurements, the metal foil is put on in such a way, that perhaps existing casting mass is effectively tested. Protective components connected to PE may be disconnected for this test. b) between the live parts of the SPD main circuit and live parts of separate isolated circuits, if there are any.		P N/A
	Pass criteria		
	Arcing or puncturing shall not occur, however, partial discharges are accepted if the voltage change the discharge is less than 5%.		P

Clause	Requirement - Test	Result - Remark	Verdict
	The power transformer used for testing shall be designed in such a way that after having been adjusted to the test voltage at its open terminals it will generate a short-circuit current of at least 200 mA after short-circuiting the terminals. An overcurrent relay, if any, shall only react if the test circuit current exceeds 100 mA. The device for measuring the test voltage shall have a precision of ± 3 %.		P
7.2.5/8.3.5.1	**Temperature withstand**	Model:CLAMPER LIGHT	
	The SPD is kept in a heated cabinet at an ambient temperature of 80 °C ± 5 K for 24 h.		P
	Pass criteria		
C	No mechanical damage		P
G	Internal disconnectors shall not operate during the test and shall be in working order after the test.		P
Remarks:/			

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Clause	Requirement - Test	Result - Remark	Verdict
7.4.2/8.5.2	**Heat resistance**	Model:CLAMPER LIGHT	
	The SPD is kept in a heated cabinet at a temperature of 100 °C ± 2 K for the duration of 1 h.		P
	Pass criteria		
C	No mechanical damage		P
I	SPDs having an IP degree ≥ IP 2X – no live parts accessible with standardised test finger applied with a force of 5 N, except the ones which are accessible when the SPD is fitted as in normal use.		P
	Any sealing compound (including potting) used in the internal assembly shall not move to such an extent as to create a problem for the functionality of the SPD.		N/A
	The SPD is deemed to have passed the test even if a disconnector has opened.		N/A
7.2.8.1/8.3.8.1	**TOVs caused by faults or disturbances in the low voltage system**	Model:CLAMPER LIGHT	
	For SPDs with a U_C greater than or equal to U_T there is no need to perform this test	——	N/A
	SPDs shall be tested using either the • TOV voltages U_T given in the relevant tables of Annex B, or, • TOV voltages stated by the manufacturer according to 7.1.1 c1), whichever values are higher.	U_T = 441.66 V U_T = ____ V	P N/A
	Table B.1 shall be applied to all SPDs Depending on the information given by the manufacturer on 7.1.1 c1), the additional tables according to Clause B.1 of Annex B shall also be applied. For North American systems – Table B.2 For Japanese systems – Table B.3	under consideration	N/A
	New samples shall be used and fitted as in normal use, according to the manufacturer's instructions		N/A
	The test sample shall be connected to a power frequency voltage of U_T $^{+0}/_{-5}$ % for a duration t_T $^{+5}/_{-0}$ %.		N/A

Clause	Requirement - Test	Result - Remark	Verdict
	Except for loss of neutral tests, this power source for U_T, shall be capable of delivering a current high enough to ensure that the voltage at the SPD terminals does not fall below U_T by more than 5 % during the test. For loss of neutral tests this voltage source shall be capable of delivering a prospective short-circuit current of 10A.		N/A
	Immediately following the application of U_T, a voltage equal to U_{REF} $^{+0}/_{-5}$ % with the same current capability, shall be applied to the test sample for a period of 15 min $^{+5}/_{-0}$ %.	U_T = 441.66 V U_{REF} = 255 V	P
	For loss of neutral tests, this power source for U_{REF} shall be capable of delivering a prospective short-circuit current equal to the declared short-circuit current rating of the SPD.		N/A
	The time interval between the test periods shall be as short as possible and shell in any case not exceed 100 ms.	≤100 ms	P
a)	**Pass criteria TOV failure mode**		
C	No mechanical damage		N/A
H	Disconnection shall be provided by one or more internal or external disconnector(s). Their correct indication shall be checked.		N/A
I	SPDs having an IP degree ≥ IP 2X – no live parts accessible with standardised test finger applied with a force of 5N, except the ones which are accessible when the SPD is fitted as in normal use.		N/A
J	If disconnection occurs during the test, there shall be clear evidence of effective disconnection of the corresponding protective component(s). If internal disconnection occurs, the test sample is connected at U_C and rated frequency for 1 min. The current flow shall not exceed a value of 1 mA.	___ V ___ mA	N/A
	Currents through components connected in parallel to the relevant protective component(s), are disregarded for this measurement.		N/A
	Current through the PE-terminal shall not exceed 1mA If there is more than one possible connection arrangement for normal use, this check shall be performed for all arrangements.	___ mA	N/A N/A
K	The short-circuit current from the power source, if any, shall be interrupted within 5 s by one or more internal and/or external disconnector(s).		N/A
L	The tissue paper shall not catch fire.		N/A

Clause	Requirement - Test	Result - Remark	Verdict
M	There shall be no explosion or other hazard to either personnel or the facility		N/A
b)	**Pass criteria TOV withstand mode**		
A	Thermal stability shall be achieved		P
B	Voltage and current records and visual inspection show no sign of puncture or flashover.		P
C	No mechanical damage		P
D	Determination of the measured limiting voltage:	$U_P \le$ 1.5 kV	
	according to 8.3.3.1, but only at a crest value corresponding to I_{imp} for test class I	____ kA / ____ V	N/A
	according to 8.3.3.1, but only at I_n for test class II	-5.224 kA / -1.072 V	P
	according to 8.3.3.3, but only at U_{OC} for test class III	____ kA / ____ V	N/A
	SPDs tested acc. to class I and II containing switching components: Front-of-wave sparkover voltage acc. to 8.3.3.2 All measured peak values (5 pos./5 neg.) below U_P	1.40 kV	P
E	No excessive leakage currents shall occur after the test		
	If there is more than one possible connection arrangement for normal use, this check shall be performed for all arrangements		N/A
	The SPD shall be connected as for normal use according to the manufacturer's instructions to a power supply at the reference test voltage (U_{REF}). The current that flows through each terminal is measured. Its resistive component (measured at the crest of the sine wave)	U_{REF}= 255 V	P
	• shall not exceed a value of 1 mA or	0 mA	P
	• the current shall not have changed by more than 20% compared to the initial value determined at the beginning of the test sequence		N/A
	Any resettable or rearmable disconnector shall be switched off and dielectric withstand shall be checked by application of two times U_C or 1000V a.c. whichever is greater.	U_C= _____ V	N/A
	During the test, no flashover, breakdown of insulation or any other manifestation of disruptive discharge shall occur.	test voltage ____ V	P

Clause	Requirement - Test	Result - Remark	Verdict
	For SPD modes connected N-PE only, the current through the PE-terminal shall be measured, whereas the terminals are connected to a power supply at U_C. Its resistive component (measured at the crest of the sine wave) • shall not exceed a value of 1 mA or • the current shall not have changed by more than 20% compared to the initial value determined at the beginning of the test sequence	U_C= ___ V I_{PE} = ____ mA	N/A
F	External disconnectors shall not operate during the test and shall be in working order after the test.		P
G	Internal disconnectors shall not operate during the test and shall be in working order after the test.		P
I	SPDs having an IP degree ≥ IP 2X – no live parts accessible with standardised test finger applied with a force of 5 N, except the ones which are accessible when the SPD is fitted as in normal use.		P
L	The tissue paper shall not catch fire.		P
M	There shall be no explosion or other hazard to either personnel or the facility		P
7.2.8.1/8.3.8.1	**TOVs caused by faults or disturbances in the low voltage system**	Model:CLAMPER LIGHT	
	For SPDs with a U_C greater than or equal to U_T there is no need to perform this test	____	N/A
	SPDs shall be tested using either the • TOV voltages U_T given in the relevant tables of Annex B, or, • TOV voltages stated by the manufacturer according to 7.1.1 c1), whichever values are higher.	U_T = 336.6 V U_T = ____ V	P N/A
	Table B.1 shall be applied to all SPDs Depending on the information given by the manufacturer on 7.1.1 c1), the additional tables according to Clause B.1 of Annex B shall also be applied. For North American systems – Table B.2 For Japanese systems – Table B.3	under consideration	N/A
	New samples shall be used and fitted as in normal use, according to the manufacturer's instructions		N/A

Clause	Requirement - Test	Result - Remark	Verdict
	The test sample shall be connected to a power frequency voltage of U_T $^{+0}/_{-5}$ % for a duration t_T $^{+5}/_{-0}$ %.		N/A
	Except for loss of neutral tests, this power source for U_T, shall be capable of delivering a current high enough to ensure that the voltage at the SPD terminals does not fall below U_T by more than 5 % during the test. For loss of neutral tests this voltage source shall be capable of delivering a prospective short-circuit current of 10A.		P
	Immediately following the application of U_T, a voltage equal to U_{REF} $^{+0}/_{-5}$ % with the same current capability, shall be applied to the test sample for a period of 15 min $^{+5}/_{-0}$ %.	U_T = 336.6 V U_{REF} = 255 V	P
	For loss of neutral tests, this power source for U_{REF} shall be capable of delivering a prospective short-circuit current equal to the declared short-circuit current rating of the SPD.		P
	The time interval between the test periods shall be as short as possible and shell in any case not exceed 100 ms.	≤100 ms	P
a)	**Pass criteria TOV failure mode**		
C	No mechanical damage		N/A
H	Disconnection shall be provided by one or more internal or external disconnector(s). Their correct indication shall be checked.		N/A
I	SPDs having an IP degree ≥ IP 2X – no live parts accessible with standardised test finger applied with a force of 5N, except the ones which are accessible when the SPD is fitted as in normal use.		N/A
J	If disconnection occurs during the test, there shall be clear evidence of effective disconnection of the corresponding protective component(s). If internal disconnection occurs, the test sample is connected at U_C and rated frequency for 1 min. The current flow shall not exceed a value of 1 mA.	___ V ___ mA	N/A
	Currents through components connected in parallel to the relevant protective component(s), are disregarded for this measurement.		N/A
	Current through the PE-terminal shall not exceed 1mA If there is more than one possible connection arrangement for normal use, this check shall be performed for all arrangements.	___ mA	N/A N/A
K	The short-circuit current from the power source, if any, shall be interrupted within 5 s by one or more internal and/or external disconnector(s).		N/A

Clause	Requirement - Test	Result - Remark	Verdict
L	The tissue paper shall not catch fire.		N/A
M	There shall be no explosion or other hazard to either personnel or the facility		N/A
b)	**Pass criteria TOV withstand mode**		
A	Thermal stability shall be achieved		P
B	Voltage and current records and visual inspection show no sign of puncture or flashover.		P
C	No mechanical damage		P
D	Determination of the measured limiting voltage:	$U_P \leq$ 1.5 kV	
	according to 8.3.3.1, but only at a crest value corresponding to I_{imp} for test class I	___ kA / ___ V	N/A
	according to 8.3.3.1, but only at I_n for test class II	5.135 kA / 1.088 kV	P
	according to 8.3.3.3, but only at U_{OC} for test class III	___ kA / ___ V	N/A
	SPDs tested acc. to class I and II containing switching components: Front-of-wave sparkover voltage acc. to 8.3.3.2 All measured peak values (5 pos./5 neg.) below U_P	1.40 kV	P
E	No excessive leakage currents shall occur after the test		
	If there is more than one possible connection arrangement for normal use, this check shall be performed for all arrangements		N/A
	The SPD shall be connected as for normal use according to the manufacturer's instructions to a power supply at the reference test voltage (U_{REF}). The current that flows through each terminal is measured. Its resistive component (measured at the crest of the sine wave)	U_{REF}= 255 V	P
	• shall not exceed a value of 1 mA	0 mA	P
	or • the current shall not have changed by more than 20% compared to the initial value determined at the beginning of the test sequence		N/A
	Any resettable or rearmable disconnector shall be switched off and dielectric withstand shall be checked by application of two times U_C or 1000V a.c. whichever is greater.	U_C= ____ V	N/A
	During the test, no flashover, breakdown of insulation or any other manifestation of disruptive discharge shall occur.	test voltage ____ V	P

Clause	Requirement - Test	Result - Remark	Verdict
	For SPD modes connected N-PE only, the current through the PE-terminal shall be measured, whereas the terminals are connected to a power supply at U_C. Its resistive component (measured at the crest of the sine wave) • shall not exceed a value of 1 mA or • the current shall not have changed by more than 20% compared to the initial value determined at the beginning of the test sequence	U_C= ___ V I_{PE} = ____ mA	N/A
F	External disconnectors shall not operate during the test and shall be in working order after the test.		P
G	Internal disconnectors shall not operate during the test and shall be in working order after the test.		P
I	SPDs having an IP degree ≥ IP 2X – no live parts accessible with standardised test finger applied with a force of 5 N, except the ones which are accessible when the SPD is fitted as in normal use.		P
L	The tissue paper shall not catch fire.		P
M	There shall be no explosion or other hazard to either personnel or the facility		P
Remarks:/			

Test Instrument List

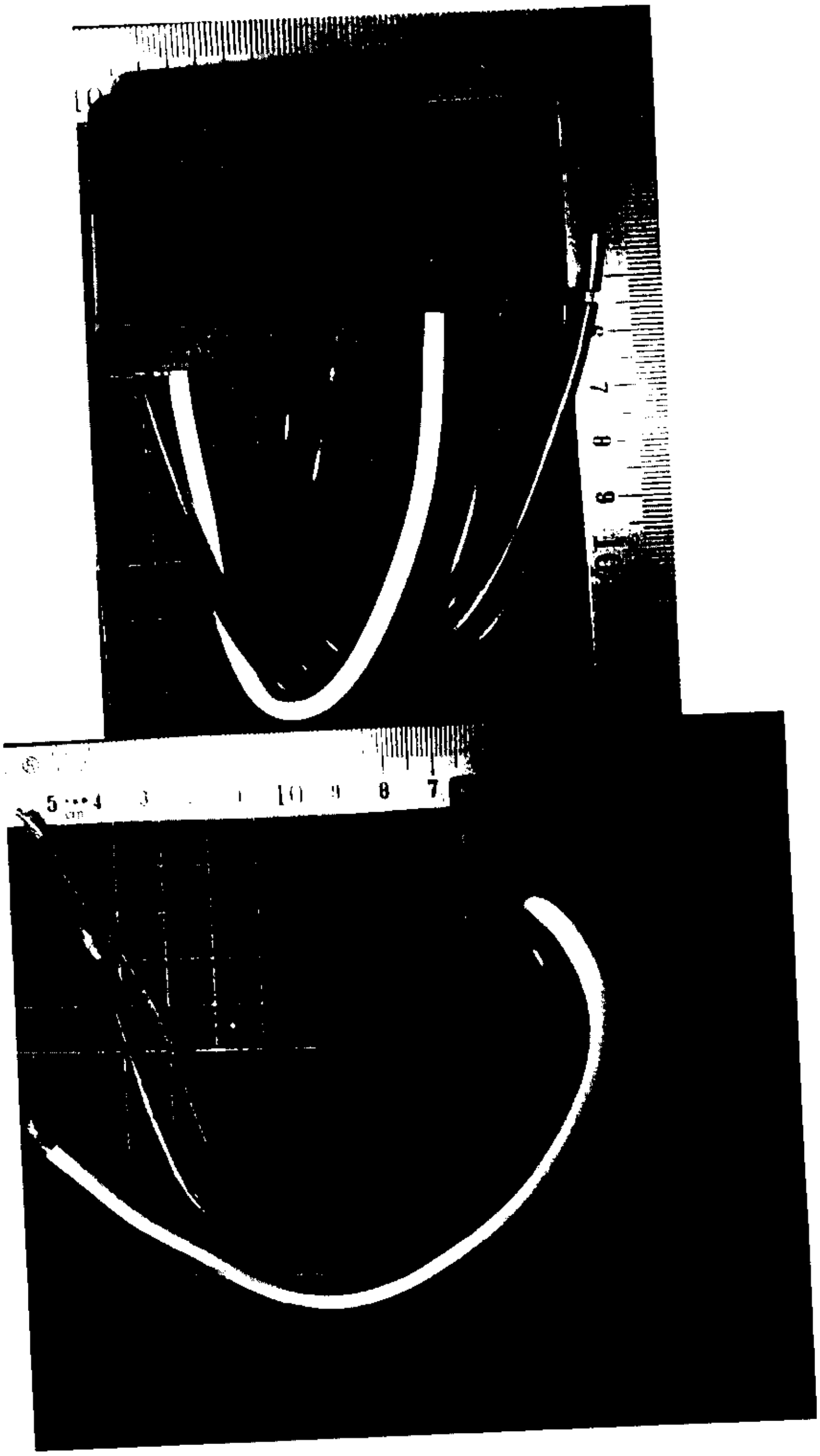
Name of instrument	Manufacturer	Model/Specification	No. of instrument	Date for calibrated	Due date
GT120-B Impulse Current Test Systems	上海冠图防雷科技有限公司	GT120-B	Ag002	2019-10-13	2020-10-12
GTIC-160D impulse current generator	上海冠图防雷科技有限公司	GTIC-160D	Ag004	2019-10-13	2020-10-12
Variable frequency power supply	上海欧阳电子科技有限公司	OFC-31060	Cz006	/	/
Resistor Load Box	上海冠图防雷科技有限公司	/	Cz004	/	/
Standard test finger	协和机电(无锡)有限公司	20N	Bc002	2020-1-23	2021-1-22
Multi-function signal generator	株式会社 NF 回路设计	WF1943B	Bz017	2020-5-20	2021-5-19
Non-Digital Dynamometer	温州山度仪器有限公司	SN-20	Ac028	2020-7-17	2021-7-16
Non digital display working dynamometer	温州山度仪器有限公司	SN-50	Ac051	2020-6-3	2021-6-2
Ball probe	广州市智力通机电有限公司	Φ12.50mm	Bz018	2020-7-30	2021-7-29
High voltage power amplifier	株式会社 NF 回路设计	4305	Bz016	/	/
High-temperature test chamber	爱斯佩克环境仪器(上海)有限公司	SEG-041H	Bz010	2020-7-22	2021-7-21
Constant temperature and humidity box	上海爱斯佩克环境设备有限公司	EH-010L	Bz029	2020-7-22	2021-7-21
Infrared radiation thermometer	福禄克公司	63	Ac049	2020-4-5	2021-4-6
Hexane solvent	/	Hexane solvent	SFL-XH-002	/	/
Weight force value	协和机电(无锡)有限公司	5N、10N	Bc007	2020-7-29	2021-7-28
Tracking Test Apparatus	上海海悦电子科技有限公司	HY-TTA-1	BZ033	2020-1-20	2021-1-19

Test Instrument List

Name of instrument	Manufacturer	Model/Specification	No. of instrument	Date for calibrated	Due date
Voltage insulation tester	日置电机株式会社	3159	Ac023	2019-10-29	2020-10-28
Ball pressure test device	广州市智力通机电有限公司	ZLT-QY1	Bz025	2020-1-23	2021-1-22
Thermal stability test apparatus	上海交通大学高电压试验设备研究开发中心	SJTU-100	Bz015	2019-10-29	2020-10-28
Data trap	安捷伦科技有限公司	34970A	Ac016	2020-1-20	2021-1-19
Data logger	EXTECH	SD700	Ac069	2020-4-20	2021-4-19
Data logger	EXTECH	SD700	Ac071	2020-4-20	2021-4-19
Digital Caliper	上海量具刃具厂	0~150mm/0.02mm	Ac033	2020-7-18	2021-7-17
Digital Power Meter	日置电机株式会社	3332	Ac017	2019-10-29	2020-10-28
Digital oscilloscope	Tektronix	MSO54 5-BW-350	Ac078	2019-10-22	2020-10-21
Digital oscilloscope	Tektronix, Inc.	TDS5104	Ac012	2019-12-11	2020-12-10
Hygromaster	上海气象仪器厂有限公司	ZJI-2B	Ac035	2019-10-17	2020-10-16
Impact test device	协和机电(无锡)有限公司	ZJJ-A	Bz003	2019-10-19	2020-10-18
Glow-wire tester	上海海悦电子科技有限公司	HY GLT-1	Bz032	2020-1-20	2021-1-19

No.L20190367

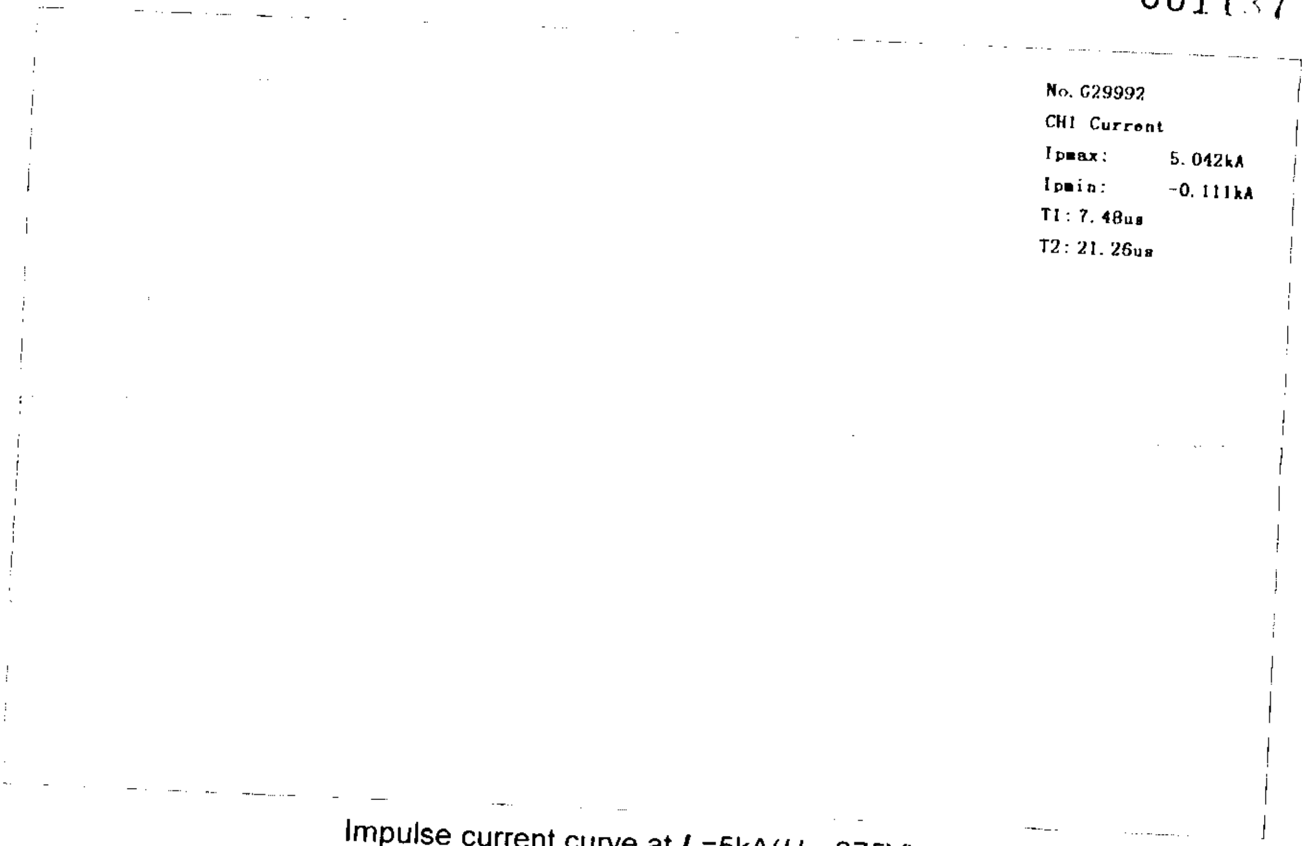
Photograph:



Clamper Light

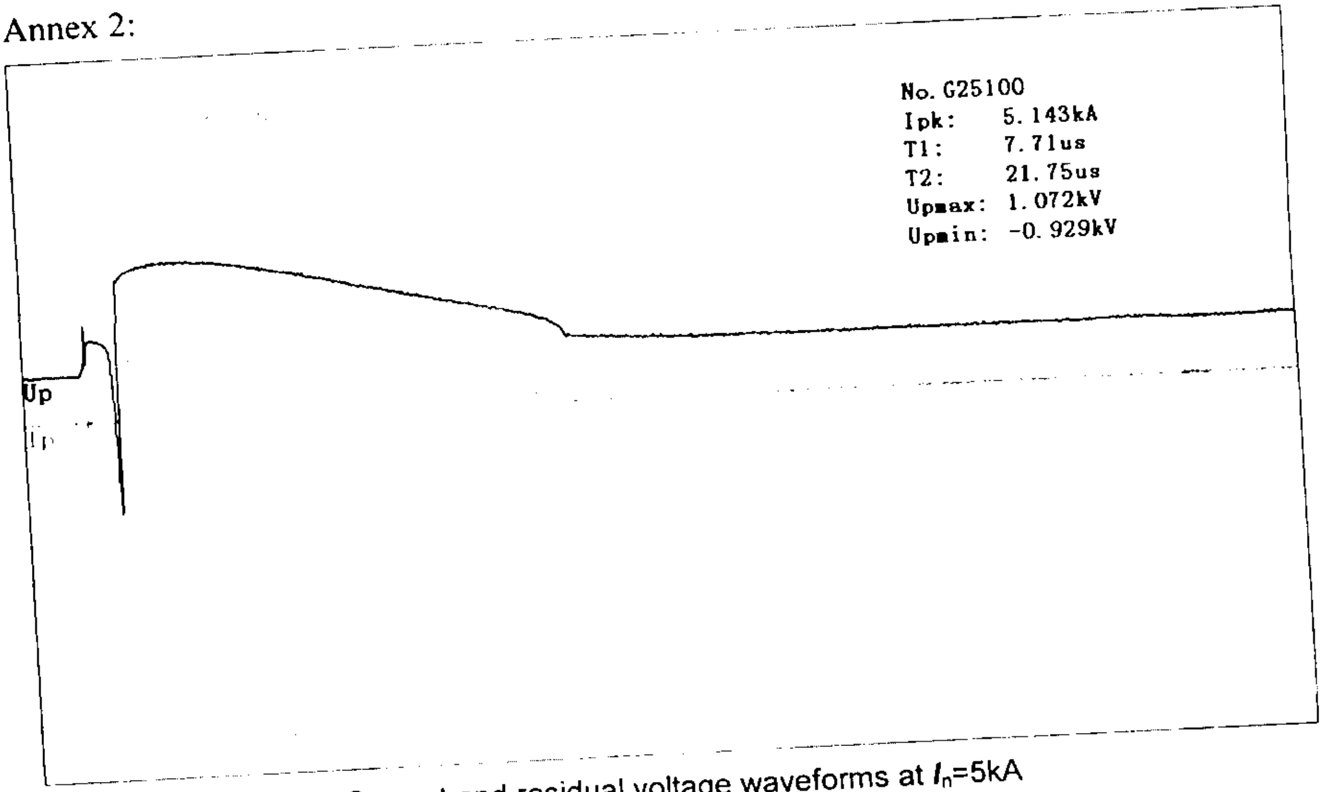
I_n=5kA, I_{max}=12kA, U_p=1.5kV, U_c=275V (L-PE/N-PE)

Annex 1:



Impulse current curve at I_n=5kA(U_C=275V)

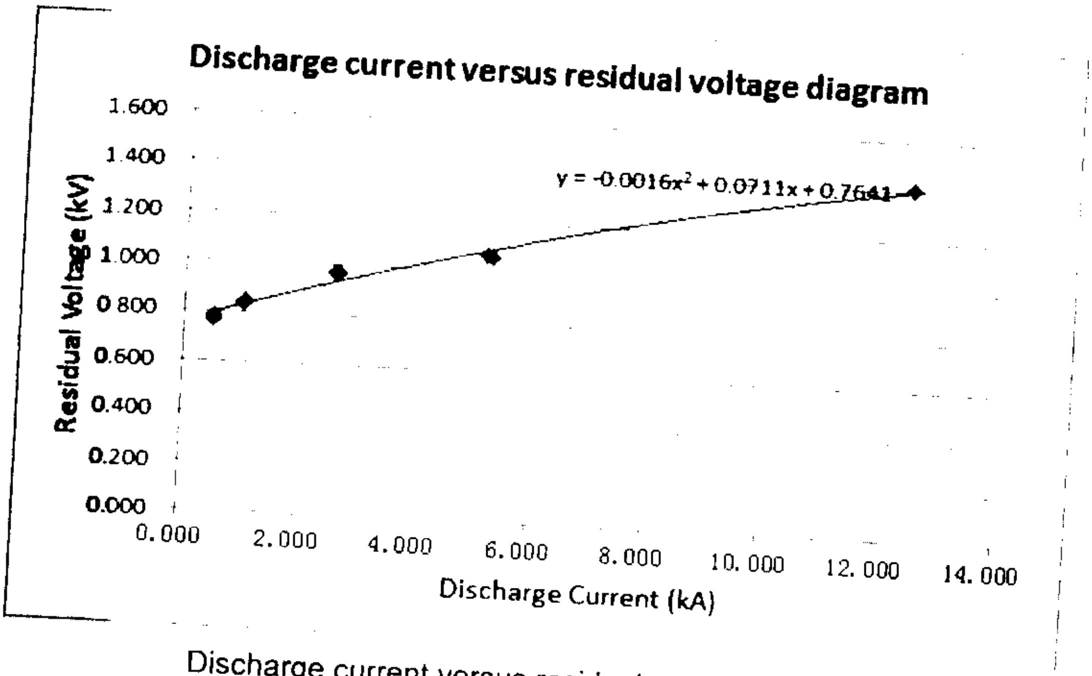
Annex 2:



Current and residual voltage waveforms at I_n=5kA

No.L20190367

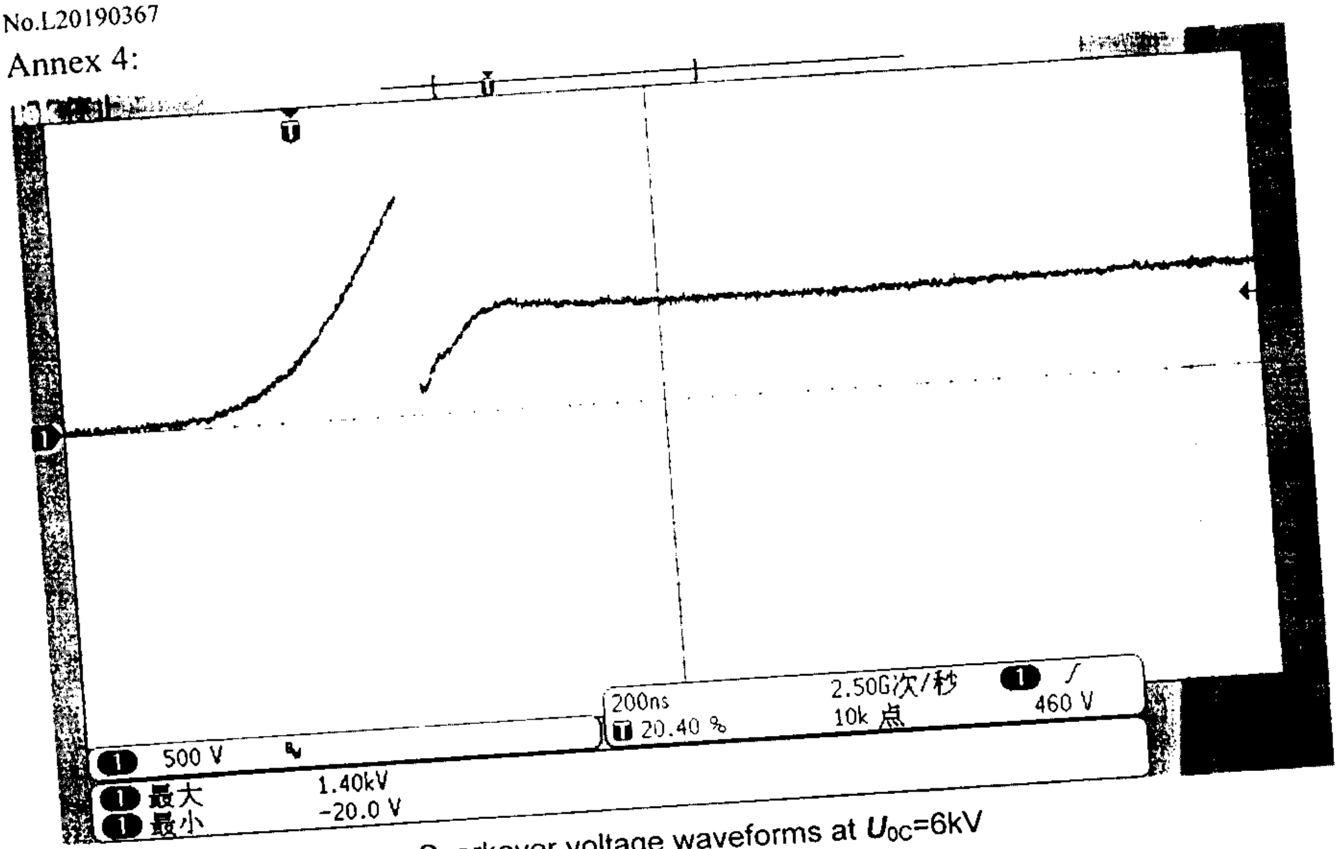
Annex 3:



Discharge current versus residual voltage diagram

No.L20190367

Annex 4:



Sparkover voltage waveforms at U_{0C}=6kV

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CNAS
中国认可
国际互认
检测
TESTING
CNAS L2601

TEST REPORT

No.L20210600

Name of product:

Surge protective devices

Type:

CLAMPER Light Sx 275V 12kA HCCyz

Provided by:

CLAMPER Indústria e Comércio SA

Date of issue:

2021.11.17

LPD Testing Center of Shanghai Lightning Protection Center

001142

Declaration

1. The report is invalid without "The Special Stamp for Inspection Report" and "The Official Stamp".
2. The report is invalid without the signatures of the compiler, the verifier and the approver.
3. Partially copying this report is not permitted without the written authorization (except copy all).
4. The copy of the report is invalid without "The Special Stamp for Inspection Report" and "The Official Stamp".
5. The report is invalid if it is modified.
6. Any objection to the report, please demur within 15 days after receiving the report (according to the postmark date or receiving signature date).
7. The result of the entrustment test is only responsible for the submitted samples.
8. The retention samples will be preserved in laboratory for two years.

Contact Us

Address: No.2030 Laifang Road, Songjiang District, Shanghai City, P.R.China, 201615

Post code: 201615

Tel: +86-021-67697076

Fax: +86-021-67697062

001143

TEST REPORT

Name of product:Surge protective devices Model:CLAMPER Light Sx 275V 12kA HCCyz Trade Mark:/ Quantity of samples:9 Date of performance test:2021.10.26~2021.11.11 Term of validity:2021.11.17~2023.11.16	Applicant's name:CLAMPER Indústria e Comércio SA Applicant's address:Rod. LMG 800, km01, nº 128. City: Lagoa Santa, State: Minas Gerais, Country: Brazil Manufacturer:CLAMPER Indústria e Comércio SA Address of manufacturer:Rod. LMG 800, km01, nº 128. City: Lagoa Santa, State: Minas Gerais, Country: Brazil Factory:CLAMPER Indústria e Comércio SA Address of factory:Rod. LMG 800, km09, Galpão 01, Aeroporto Industrial. City: Lagoa Santa, State: Minas Gerais, Country: Brazil

Test standard: IEC 61643-11:2011

Low-voltage surge protective devices-
Part 11: Surge protective devices connected to low-voltage power systems-
Requirements and test methods

Test case verdicts:

See " Test items catalogue"

Compiled by：沈云新 Sign：沈云新 Date：2021.11.17 Verified by：王逢士 Sign：王逢士 Date：2021.11.17 Approved by：林 毅 Sign：林毅 Date：2021.11.17	LPD Testing Center of Shanghai Lightning Protection Center Date:2021.11.17

Remarks: /

Test items catalogue

No.	Test items	Subclause	Conclusion
01	Operating duty test	7.2.4 / 8.3.4	P
02	Ball pressure test	7.4.2 / 8.5.3	P
03	Resistance to abnormal heat and fire	7.4.3 / 8.5.4	P
04	Tracking resistance	7.4.4 / 8.5.5	P
05	Voltage protection level	7.2.3 / 8.3.3	P

Subclause and sample number catalogue

Subclause	Sample No.
7.2.4 / 8.3.4	4#~6#
7.4.2 / 8.5.3	1#~3#
7.4.3 / 8.5.4	1#~3#
7.4.4 / 8.5.5	1#~3#
7.2.3 / 8.3.3	7#~9#

Clause	Requirement - Test	Result - Remark	Verdict
7.2.4/8.3.4	**Operating duty**	Model:CLAMPER Light Sx 275V 12kA HCCyz	
	The SPD shall be capable of withstanding specified discharge currents during application of the maximum continuous operating voltage U_C without unacceptable changes in its characteristics. The test setup shall comply with the circuit diagram given in Figure 7.		P
	Determination of the measured limiting voltage:		
	according to 8.3.3.1, but only at a crest value corresponding to I_{imp} for test class I	____ kA / ____ V	N/A
	according to 8.3.3.1, but only at I_n for test class II	-5.240 kA / -1.100 kV	P
	according to 8.3.3.3, but only at U_{OC} for test class III	____ kA / ____ V	N/A
	SPDs tested acc. to class I and II containing switching components: Front-of-wave sparkover voltage acc. to 8.3.3.2 All measured peak values (5 pos./5 neg.) below U_P	1.060 kV	P
	Sample connected to power frequency source at U_C	275 V	P
8.3.4.2.1	SPDs with follow current < 500A: Voltage at SPD terminals does not fall below the peak value of U_C by more than 10% during flow of follow current		P
8.3.4.2.2	SPDs with follow current > 500A: Power frequency voltage U_C with a prospective short circuit current equal to the follow current interrupt rating I_{fi} declared by the manufacturer in accordance with Table 8, or 500A, whichever is greater. For SPDs connected between neutral and protective earth only, the prospective short-circuit current shall be at least 100A.	____ kA cos φ = ____	N/A N/A
8.3.4.3	**Class I and II operating duty tests**		
	Three groups of five impulses of 8/20 current impulses with positive polarity shall be applied. The test samples are connected to a power source according to 8.3.4.2. Each impulse shall be increased in steps of 30° with a tolerance of ± 5° for each synchronisation angle. time interval between the impulses 50s – 60s time interval between the groups 30 min – 35 min	5 kA sync. 0°, 30°, 60°, 90°, 120°, 150°, 180°, 210°, 240°, 270°, 300°, 330°, 0°, 30°, 60° el.	P

Clause	Requirement - Test	Result - Remark	Verdict
	The SPD shall be energized at U_C. The prospective short-circuit current of the power source shall comply with 8.3.4.2 during the application of groups of impulses. After the application of each group of impulses and after the interruption of the last follow current (if any) the SPD shall remain energized without interruption for at least 1 min to check for reignition. After the last group of impulses and the 1 min period the SPD either remains applied or is reapplied within less than 30s to U_C for another 15 min to check for stability. For that purpose, the short-circuit capability of the power source (at U_C) may be reduced to 5A.	U_C = 275 V	P
	When testing SPDs to class I, 8/20 current impulses with a crest corresponding to I_{imp} shall be applied.		N/A
	When testing SPDs to class II, 8/20 current impulses with I_n shall be applied.	see Annex 1	P
	Current records show no sign of puncture or flashover of the sample		P
8.3.4.5	**Class III operating duty tests**		
	The SPD is tested with three groups of impulses corresponding to U_{OC} with: - five positive impulses initiated at crest value of positive half cycle (±5°) - five negative impulses initiated at crest value of positive half cycle (±5°) - five positive impulses initiated at crest value of positive half cycle (±5°)		N/A
8.3.4.4	**Additional duty test for test class I**		
	This test is carried out with current impulses in steps up to I_{imp} passing through the SPD. SPD energized at U_C by a voltage source having a nominal current capability of 5A during the application of impulses.	U_C = ____ V	N/A
	Current impulses of positive polarity shall be initiated in the corresponding positive crest value of the power frequency voltage source to the energized test sample as follows: a) One current impulse at 0,1 I_{imp} b) One current impulse at 0,25 I_{imp} c) One current impulse at 0,5 I_{imp} d) One current impulse at 0,75 I_{imp} e) One current impulse at 1,0 I_{imp}	____ kA ____ kA ____ kA ____ kA ____ kA	N/A
	After each impulse cool down to ambient temperature		N/A

Clause	Requirement - Test	Result - Remark	Verdict
8.3.4.6	**Pass criteria**		
A	After the application of each impulse and after interruption of each follow current (if any) the SPD shall remain energized without interruption for at least 1 min to check for re-ignition. After that period the SPD either remains applied or is reapplied within less than 30s to U_C for another 15 min to check for stability. For that purpose the short-circuit capability of the power source shall also be 5A.		P P
B	Voltage and current records and visual inspection show no sign of puncture or flashover.		P
C	No mechanical damage		P
D	Determination of the measured limiting voltage:	U_P ≤ 1.5 kV	
	according to 8.3.3.1, but only at a crest value corresponding to I_{imp} for test class I	____ kA / ____ V	N/A
	according to 8.3.3.1, but only at I_n for test class II	-5.160 kA / -1.105 V	P
	according to 8.3.3.3, but only at U_{OC} for test class III	____ kA / ____ V	N/A
	SPDs tested acc. to class I and II containing switching components: Front-of-wave sparkover voltage acc. to 8.3.3.2 All measured peak values (5 pos./5 neg.) below U_P	1.240 kV	P
E	No excessive leakage currents shall occur after the test		
	If there is more than one possible connection arrangement for normal use, this check shall be performed for all arrangements		____
	The SPD shall be connected as for normal use according to the manufacturer's instructions to a power supply at the reference test voltage (U_{REF}). The current that flows through each terminal is measured. Its resistive component (measured at the crest of the sine wave) • shall not exceed a value of 1 mA or • the current shall not have changed by more than 20% compared to the initial value determined at the beginning of the test sequence	U_{REF}= 255 V 0mA	P P N/A
	Any resettable or rearmable disconnector shall be switched off and dielectric withstand shall be checked by application of two times U_C or 1000V a.c. whichever is greater. During the test, no flashover, breakdown of insulation or any other manifestation of disruptive discharge shall occur.	U_C= ____ V test voltage ____ V	N/A

Clause	Requirement - Test	Result - Remark	Verdict
	For SPD modes connected N-PE only, the current through the PE-terminal shall be measured, whereas the terminals are connected to a power supply at U_C. Its resistive component (measured at the crest of the sine wave) • shall not exceed a value of 1 mA or • the current shall not have changed by more than 20% compared to the initial value determined at the beginning of the test sequence	U_C= ____ V I_{PE} = ____ mA	N/A
F	External disconnectors shall not operate during the test and shall be in working order after the test.		N/A
G	Internal disconnectors shall not operate during the test and shall be in working order after the test.		P
M	There shall be no explosion or other hazard to either personnel or the facility.		P
7.4.2/8.5.3	**Ball pressure test**	Model:CLAMPER Light Sx 275V 12kA HCCyz	
	Outer parts of SPDs, consist of insulating material, are submitted to a ball pressure test by means of a tester as shown on Figure 20 and 21.		P
	Parts of insulating material necessary to retain current carrying parts and parts of the earthing circuit in position are tested in a heating cabinet at 125°C ± 2 K.		P
	Parts of insulating material not necessary to retain current carrying parts and parts of the earthing circuit in position, even though they are in contact with them, are tested at 70°C ± 2 K.		N/A
	The sample to be tested is fastened accordingly, its surface being positioned horizontally; a steel ball having a diameter of 5 mm is pressed against the surface with a force of 20 N.		P
	After 1 h, the steel ball is taken away from the sample; by dipping it into cold water, the temperature of the sample is reduced to ambient temperature within 10 s.		P
	Pass criteria		
	The diameter of the ball indentation is measured and shall not exceed 2 mm.	1.03 mm	____

Clause	Requirement - Test	Result - Remark	Verdict
7.4.3/8.5.4	**Resistance to abnormal heat and fire**	Model:CLAMPER Light Sx 275V 12kA HCCyz	
	Insulating parts of the housing shall be either non-flammable or self-extinguishing. The glow wire test is performed in accordance with Clauses 4 to 10 of IEC 60695-2-11 under the following conditions: • for external parts of SPDs made of insulating material necessary to reatain in position current-carrying parts and parts of the protective circuit, by the test made at a temperature of 850 °C ± 15 K. • for all other external parts made of insulating material, by the test made at a temperature of 650 °C ± 10 K.		P N/A
	The test is not made on parts of ceramic material and parts with lower size than defined in 3.1 of IEC 60695-2-11.		N/A
	If the insulating parts are made of the same material, the test is carried out only on one of these parts, according to the appropriate glow-wire test temperature.		P
	The test is made on one sample		P
	In case of doubt, the test is repeated on two additional samples.		N/A
	The test is made by applying the glow-wire once.		P
	The sample shall be positioned during the test in the least favourable position of its intended use (with the surface tested in a vertical position).		P
	The tip of the glow-wire shall be applied to the specified surface of the test sample taking into account the conditions of intended use under which a heated or glowing element may come into contact with the sample.		P
	Pass criteria		
	The sample is regarded as having passed the glow-wire test if • there is no visible flame and no sustained glowing or if, • flames and glowing parts on the sample extinguish themselves within 30 s after the removal of the glow-wire.		N/A P
	There shall be no ignition of the tissue paper or scorching of the pinewood board.		P

Clause	Requirement - Test	Result - Remark	Verdict
7.4.4/8.5.5	**Tracking resistance**	Model:CLAMPER Light Sx 275V 12kA HCCyz	
	The test is performed according to IEC 60112, solution A with a test voltage depending on the measured creepage distances and the required material group according to 8.3.4.	CTI 150(125)	P

Remarks: /

Clause	Requirement - Test	Result - Remark	Verdict
7.2.3/8.3.3	**Voltage protection level**	Model:CLAMPER Light Sx 275V 12kA HCCyz	
	The measured limiting voltage of the SPDs shall not exceed the voltage protection level that is specified by the manufacturer.		P
	All one-port SPDs shall be tested unenergized.		P
	All two-port SPDs shall be tested energized for the tests according 8.3.3.1 and 8.3.3.3 by means of a voltage source having a nominal current of at least 5 A at U_C. Positive impulses are applied at the (90 ± 5)° point and negative impulses at (270 ± 5)° point on the sinusoidal voltage waveform.		N/A
	For a one-port SPD having terminals, the test is performed without external disconnectors and the voltage is measured at the terminals. For a one-port SPD having connecting leads the voltage is measured with external lead lengths of 150mm. For a two-port SPD, and a one-port SPD having separate load terminals, the voltage for determining the measured limiting voltage is measured at the output/load port or load terminals of the SPD and the voltage for determining U_{max} is measured at the input/line port or terminals of the SPD.		P
8.3.3.1	**Residual voltage with 8/20 current impulses**		
	Class I, 8/20 current impulses with a sequence of crest values of 0,1; 0,2; 0,5; 1,0 times the crest value of I_{imp} shall be applied. 0,1 times I_{imp} 0,2 times I_{imp} 0,5 times I_{imp} 1,0 times I_{imp}	 ___ kA / ___ V ___ kA / ___ V ___ kA / ___ V ___ kA / ___ V	N/A
	Class II, 8/20 current impulses with a sequence of crest values of 0,1; 0,2; 0,5; 1,0 times I_n shall be applied. 0,1 times I_n 0,2 times I_n 0,5 times I_n 1,0 times I_n	 516.0 A / 778.937 V 1.030 kA / 846.810 V 2.500 kA / 948.620 V 5.160 kA / 1.084 kV	P
	If the SPD contains only voltage-limiting components, this test needs only to be performed at a crest values of I_{imp} for test class I or I_n for test class II.		P
	When I_{max} is declared by the manufacturer an additional 8/20 current impulse with a crest value of I_{max} shall be applied and the residual voltage shall be measured and recorded.	-12.10 kA / -1.393 kV	P

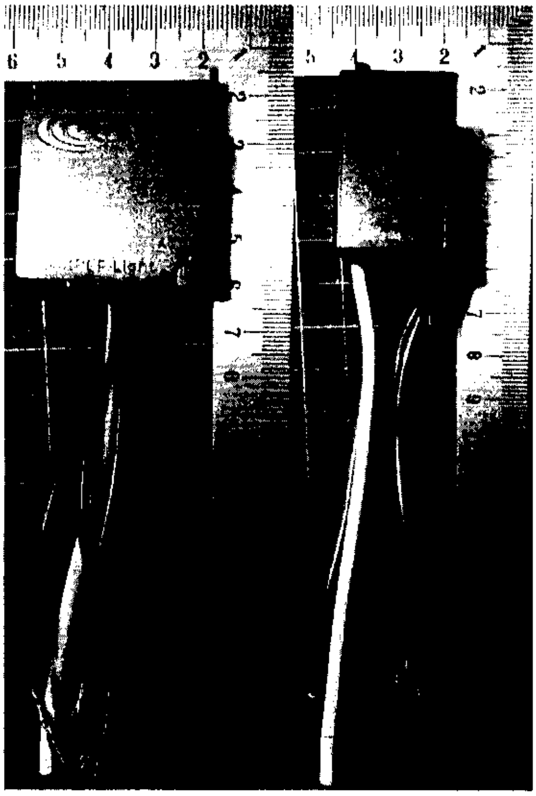
Clause	Requirement - Test	Result - Remark	Verdict
	One sequence of positive polarity and one sequence of negative polarity are applied to the SPD		P
	The interval between individual impulses shall be long enough for the sample to cool down to ambient temperature.		P
	Current and voltage oscillogram	see Annex 2	P
	Crest values – discharge current versus residual voltage diagram to I_n or I_{imp}	see Annex 3	P
	The residual voltage used for determining the measured limiting voltage is the highest voltage value corresponding to the range of currents for: • class I: up to I_{imp} • class II: up to I_n	___ V 1.082 kV	P
	The value for determining U_{max} is the highest residual voltage measured at I_n, I_{max} or I_{imp}, as applicable depending on the SPD test class.	1.393 kV	P
8.3.3.2	**Front-of-wave sparkover voltage**		
	The 1,2/50 voltage impulse is used. The generator is set to an open circuit output voltage of 6 kV.		P
	10 impulses are applied to the SPD, five of positive and five of negative polarity.		P
	The interval between individual impulses shall be long enough for the sample to cool down to ambient temperature.		P
	If sparkover is not observed during each of the 10 impulses on the front of wave, then the above procedure are repeated with the generator output voltage increased up to a maximum 10 kV.		N/A
	Voltage oscillograms	see Annex 4	P
	The value for determining the measured limiting voltage and U_{max} is the maximum sparkover voltage recorded during this test.	1.240 kV	P
8.3.3.3	**Limiting voltage with the combination wave**		
	To perform this test a combination wave generator is used. The interval between the individual impulses shall be long enough for the sample to cool down to ambient temperature.		N/A

Clause	Requirement - Test	Result - Remark	Verdict
	The voltage of the combination wave generator is set to provide an open-circuit voltage of 0,1; 0,2; 0,5; 1,0 times the U_{OC}. If the SPD only contains voltage-limiting components this test needs to be carried out at U_{OC} only. 0,1 times U_{OC} ____ kV 0,2 times U_{OC} ____ kV 0,5 times U_{OC} ____ kV 1,0 times U_{OC} ____ kV	 ____ kA / ____ V ____ kA / ____ V ____ kA / ____ V ____ kA / ____ V	N/A
	With these generator settings four surges will be applied to the SPD at each amplitude: two with positive and two with negative polarity.		N/A
	Current-voltage oscillograms; voltage at the output port of the SPD		N/A
	The value for determining the measured limiting voltage and U_{max} is the maximum voltage recorded during the test.	____ V	N/A
8.3.3.4	**Pass criteria for all measured limiting voltage tests**		
B	Voltage and current records and visual inspection show no sign of puncture or flashover.		P
C	No mechanical damage		P
I	SPDs having an IP degree ≥ IP 2X – no live parts accessible with standardised test finger applied with a force of 5N, except the ones which are accessible when the SPD is fitted as in normal use.		P
M	There shall be no explosion or other hazard to either personnel or the facility		P
Remarks: /			

Test Instrument List

Name of instrument	Manufacturer	Model/Specification	No. of instrument	Date for calibrated	Due date
Electronic balance	梅特勒-托利多（常州）称重设备系统有限公司	SPN202F	Ac026	2021-7-2	2022-7-1
Multi-function signal generator	株式会社 NF 回路设计	WF1943B	Bz017	2021-5-10	2022-5-9
High voltage power amplifier	株式会社 NF 回路设计	4305	Bz016	/	/
High-temperature test chamber	爱斯佩克环境仪器（上海）有限公司	SEG-041H	Bz010	2021-7-5	2022-7-4
Tracking Test Apparatus	无锡市惠尔顿工贸有限公司	LDH-E	Bz035	2021-6-2	2022-6-1
Ball pressure test device	广州市智力通机电有限公司	ZLT-QY1	Bz025	2020-12-18	2021-12-17
Data logger	EXTECH	SD700	Ac069	2021-4-16	2022-4-15
Data logger	EXTECH	SD700	Ac085	2021-1-8	2022-1-7
Data logger	EXTECH	SD700	Ac087	2021-1-8	2022-1-7
Digital caliper	上海量具刃具厂有限公司	0～200mm/0.01mm	Ac074	2021-8-12	2022-8-11
Digital Power Meter	日置电机株式会社	3332	Ac017	2021-9-15	2022-9-14
Digital oscilloscope	Tektronix	MSO54	Ac088	2021-2-24	2022-2-23
Glow-wire tester	上海海悦电子科技有限公司	HY-GLT-1	Bz032	2020-12-18	2021-12-17
Combination Wave Generator	HAEFELY TEST AG	PSURGE 8000	Bg018	2021-9-15	2022-9-14
Combination Wave Generator	苏州峰极电磁电子科技有限公司	FSG30	Bg040	2021-5-14	2022-5-13

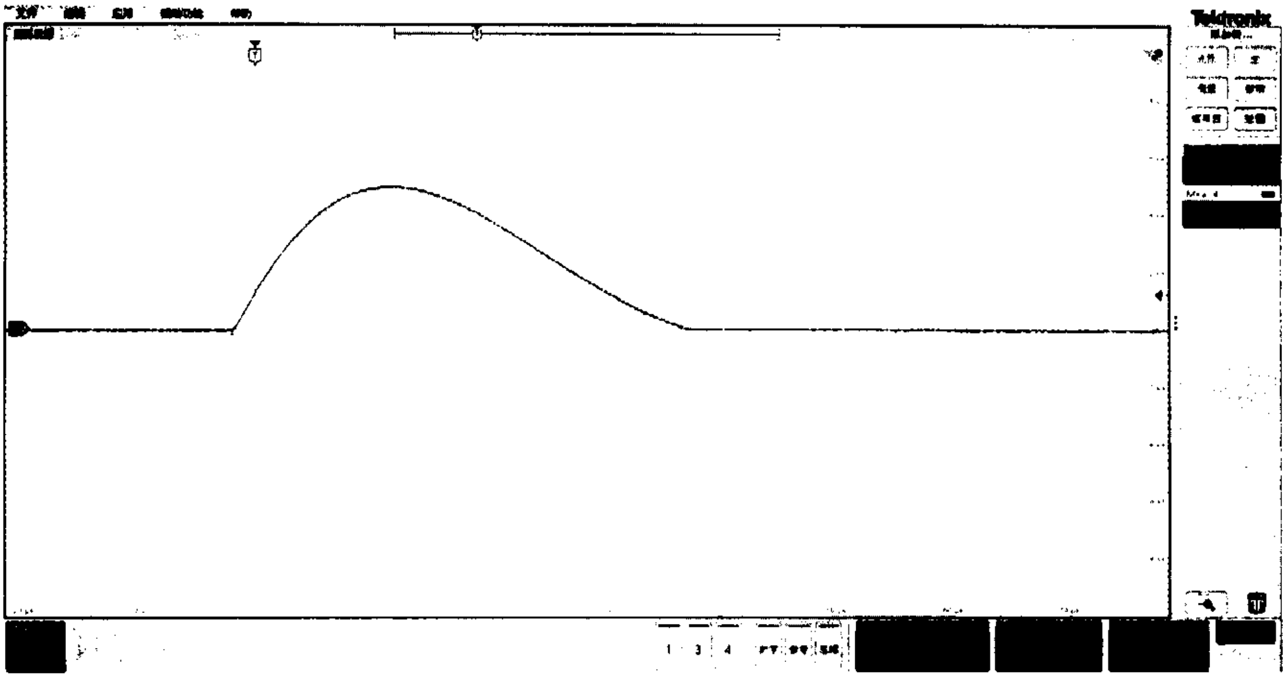
Photograph:



CLAMPER Light Sx 275V 12kA HCCyz

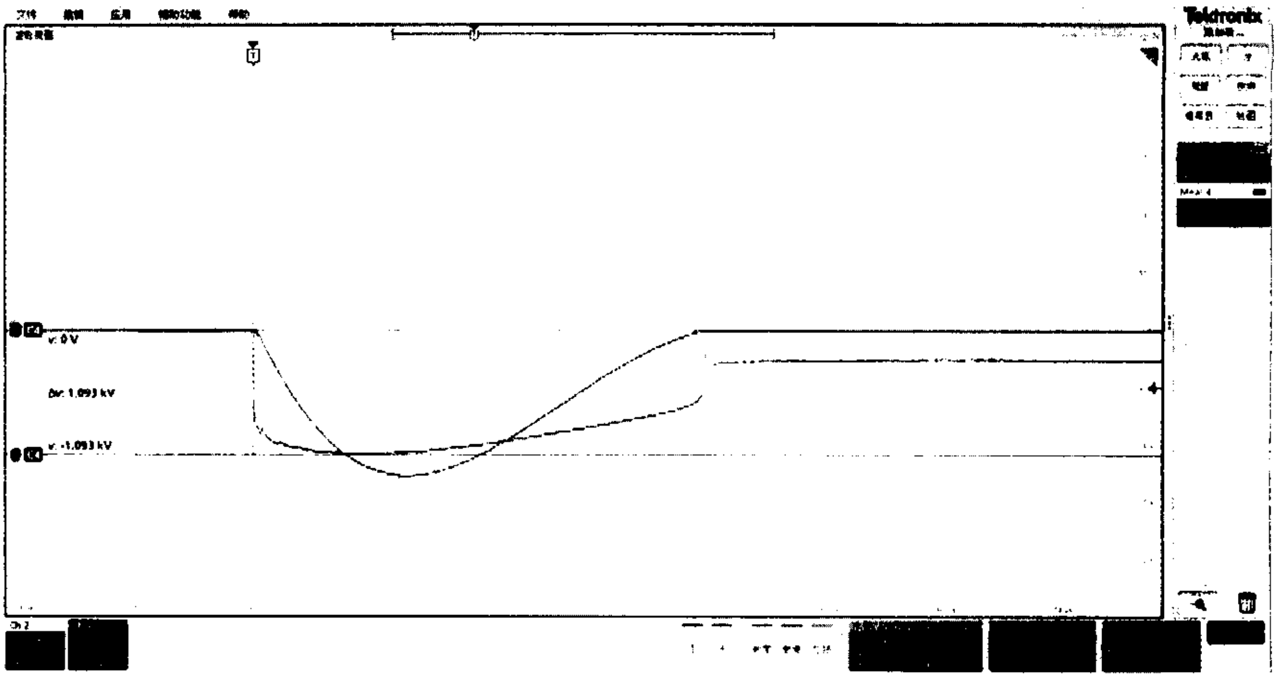
I_n=5kA, I_{max}=12kA, U_p=1.5kV, U_c=275V, U_{REF}=255V (L-PE)

Annex 1:



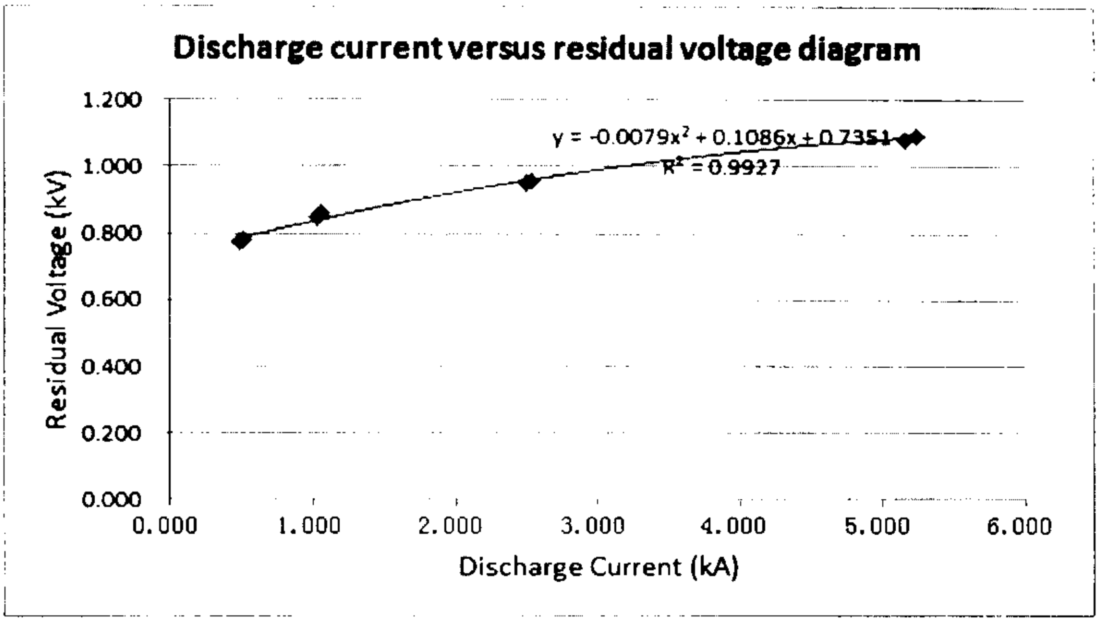
Impulse current curve at I_n=5kA(U_C=275V)

Annex 2:



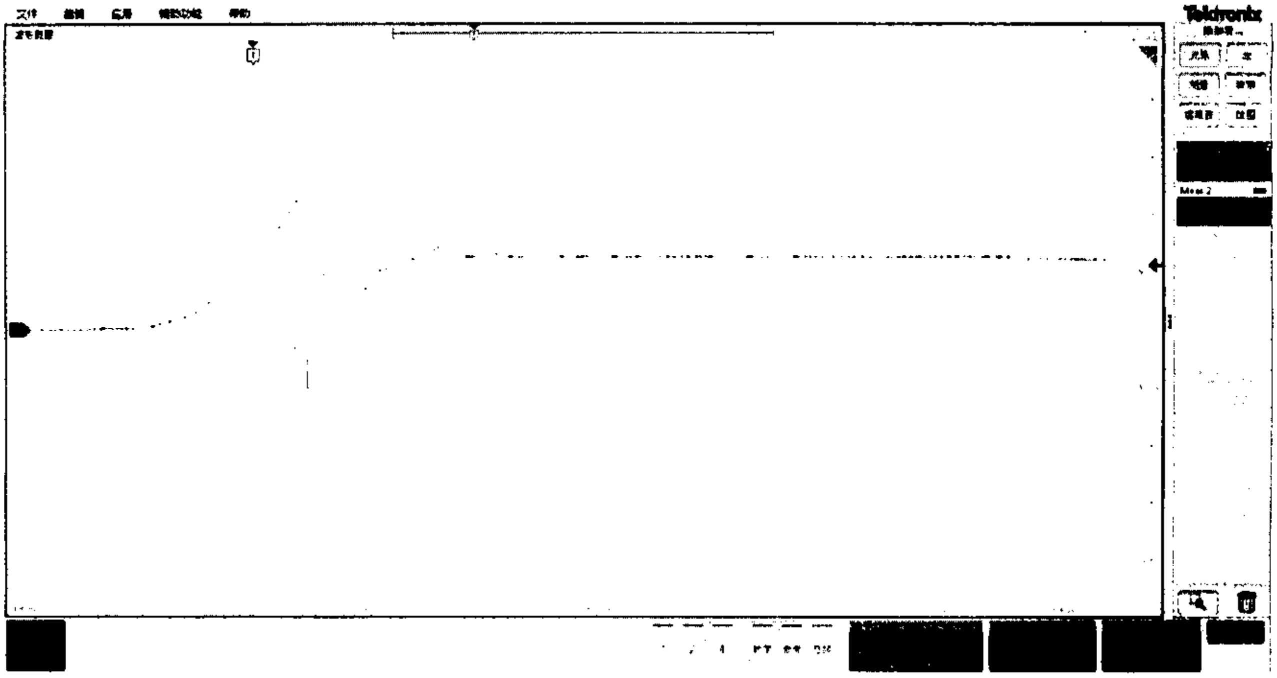
Current and residual voltage waveforms at I_n=-5kA

Annex 3:



Crest values – discharge current versus residual voltage diagram

Annex 4:



Wavefront discharge voltage waveform at U_{OC}=6kV

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RELATÓRIO DE ENSAIO Nº 78602

A. Laboratório Responsável: SVALTENDA-04 - SERVIÇO TÉCNICO DE ALTAS TENSÕES E DESCARGAS ATMOSFÉRICAS

B. Ordem de Serviço nº: 2015622

C. Descrição do Corpo de Prova: Um dispositivo de proteção contra surtos elétricos de fabricação Clamper Indústria e Comércio S.A., com os seguintes dados fornecidos pelo representante do interessado: 722.E.010.220-S-12KA; Uc:275 V; Imáx.: 12 kA (8/20); In: 5 kA (8/20); Up: < 1,0 kV; categoria C; Identificado como CP01.

D. Cliente: Clamper Indústria e Comércio S/A
Endereço: Rodovia LMG 800, Km 01, Nº 128
Cep: 33400-000
Cidade/Estado: LAGOA SANTA - MG

E. Interessado: Clamper Indústria e Comércio S/A
Endereço: Rodovia LMG 800, Km 01, Nº 128
Cep: 33400-000
Cidade/Estado: LAGOA SANTA - MG

F. Objetivo: Ensaio com ondas de surto padronizadas.

G. Norma e/ou Procedimento: Conforme recomendações do representante do interessado.

H. Observações:

- As incertezas de medição dos resultados de ensaios estão dentre as seguintes grandezas e valores.
  - Tensão alternada 60 Hz, valor de crista de impulso atmosférico e de impulsos de corrente: ± 3%;
  - Parâmetros de tempo de impulso atmosférico de tensão e de impulsos de corrente: ± 10%;
  - Descargas parciais: ± 1 pC para valores até 10 pC, ± 10% para demais intensidades;
  - Tensão de radiointerferência: ± 30%;
  - Fator de dissipação dielétrica (tangente delta): ± 10%;
  - Capacitância: ± 0,5%;
  - Distâncias de escoamento e de isolação: ± 0,5 mm.

A incerteza de medição declarada é estimada considerando-se a incerteza padrão combinada multiplicada pelo fator de abrangência k=2, que para uma distribuição normal corresponde a uma probabilidade de abrangência de 95%. A incerteza padrão da medição foi determinada de acordo com a publicação EA4-16.

- O Corpo de Prova foi recebido em: 28/08/2015
- Ensaio realizado no período de: 02/09/2015
- Relatório de Ensaio em arquivo eletrônico:
  - é cópia integral e fiel do original impresso e assinado que estará à disposição no IEE/USP.
- Forma de apresentação: Arquivo Eletrônico (formato ADOBE® * pdf) autenticado pelo sistema de autenticação de documentos da Universidade de São Paulo.
- Forma de envio: O endereço eletrônico (***link***) e o código de acesso ao documento serão enviados por e-mail.
- O IEE USP não emite vias impressas dos certificados de calibração e dos relatórios de ensaio em respeito à política de sustentabilidade da Universidade de São Paulo.
- O IEE USP mantém uma cópia impressa assinada fisicamente em seu sistema de arquivamento em papel.

ENSAIO COM ONDAS DE SURTO PADRONIZADAS

1. Local de ensaio:

O ensaio foi realizado no Laboratório de Alta Tensão deste Instituto.

2. Equipamentos de medição utilizados:

2.1. Sistema digital de medição de impulsos, 12 bits, 120 MS/s, cód. IEE/USP: MT 1644

2.2. Divisor de tensão resistivo, cód. IEE/USP: MT1742.

2.3. Divisor de tensão resistivo, cód. IEE/USP: MT450.

2.4. Transformador de corrente, marca PEARSON, mod. 101, 0,01 V/A, Nº de série: 101054.

2.5. Cronômetro digital, cód. IEE/USP: MT1274.

2.6. Estação meteorológica, cód. IEE/USP: MT1991.

3. Características dos impulsos de tensão obtidas com a saída do gerador em circuito-aberto:

3.1. Forma dos impulsos:

Tempo de frente: .... 1,0 μs
Tempo até o meio valor: .... 51 μs

3.2. Valores de crista de tensão:

Polaridades positiva e negativa .... 10,0 kV

4. Características dos impulsos de corrente obtidas com a saída do gerador em curto-circuito:

4.1. Forma de onda dos impulsos de corrente:

Tempo de frente .... 8,0 μs
Tempo até o meio valor .... 17 μs

4.2. Valores de crista de corrente:

Polaridades positiva e negativa .... 10,0 kA

5. Posições de ensaio:

5.1. Alimentação em F (fio preto) do lado REDE, mantendo-se ⏚ (fio verde) aterrado.

5.2. Alimentação em F/N (fio branco) do lado REDE, mantendo-se ⏚ (fio verde) aterrado.

5.3. Alimentação em F (fio preto) do lado rede, mantendo-se F/N (fio branco) do lado rede aterrado.

6. Procedimento de ensaio:

Foram aplicados, em cada posição de ensaio descrita no item 5, os seguintes impulsos em seqüência:

- Quatro impulsos de tensão de polaridade positiva com intervalo de um minuto entre aplicações;
- Quatro impulsos de tensão de polaridade negativa com intervalo de um minuto entre aplicações;
- Quatro impulsos de corrente de polaridade positiva com intervalo de um minuto entre aplicações;
- Quatro impulsos de corrente de polaridade negativa com intervalo de um minuto entre aplicações.

7. Resultados obtidos:

7.1. Posição de ensaio descrita no item 5.1:

7.1.1. Impulsos de tensão:

Tensão(kV)	
Polaridade (+)	Polaridade (-)
780	764
811	766
783	782
784	785

7.1.2. Impulsos de corrente:

Impulso de Corrente (kA)	Tensão Residual (kV)	Polaridade
10,1	1,34	+
10,2	1,37	+
10,0	1,36	+
10,1	1,39	+
10,1	1,39	-
10,2	1,38	-
10,1	1,38	-
10,1	1,39	-

7.2. Posição de ensaio descrita no item 5.2:

7.2.1. Impulsos de tensão:

Tensão(kV)	
Polaridade (+)	Polaridade (-)
829	810
812	819
804	779
807	812

7.2.2. Impulsos de corrente:

Impulso de Corrente (kA)	Tensão Residual (kV)	Polaridade
10,0	1,36	+
10,0	1,39	+
10,0	1,39	+
10,0	1,39	+
10,0	1,39	-
10,0	1,39	-
10,0	1,39	-
10,0	1,40	-

7.3. Posição de ensaio descrita no item 5.3:

7.3.1. Impulsos de tensão:

Tensão(kV)	
Polaridade (+)	Polaridade (-)
766	758
761	782
788	757
796	757

7.3.2. Impulsos de corrente:

Impulso de Corrente (kA)	Tensão Residual (kV)	Polaridade
10,0	1,35	+
10,0	1,38	+
10,0	1,38	+
10,0	1,38	+
10,0	1,39	-
10,0	1,39	-
10,0	1,40	-
10,0	1,39	-

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7.4. Após inspeção visual e análise dos oscilogramas obtidos durante o ensaio não foram constatadas anormalidades.

8. Observações:

8.1. Em anexo, fotos do corpo de prova após a realização do ensaio e cópias do último oscilograma de tensão e do último oscilograma de corrente / tensão residual obtidos para cada posição de ensaio descrita no item 5.

8.2. Os impulsos de tensão e de corrente caracterizados nos itens 3 e 4 estão de acordo com a tabela 4 da Recommended Practice IEEE std C62.41.2 dentro das tolerâncias permitidas pela Norma IEEE Std 4/1995.

8.3. Condições ambientes:

-Pressão barométrica .... 93,8 kPa.

-Temperatura ambiente .... 18,1 °C.

-Umidade relativa .... 67 %.

8.4. Esteve presente ao ensaio o Sr.:

Douglas Thiago Moreira Lara (CLAMPER)

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São Paulo, 16 de setembro 2015.

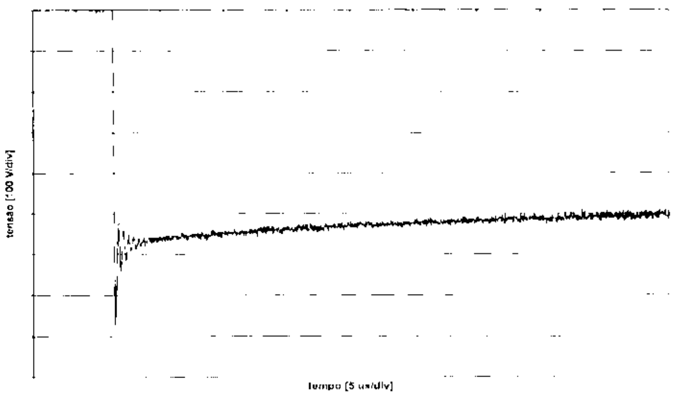
Dr. Celso Pereira Braz
Divisão Científica de Tecnologia de Sistemas Elétricos
Chefe de Divisão Científica - Substituto
IEE/USP

Cleber Rogério Fiori
Cleber Rogério Fiori
Serviço Técnico de Alta Tensão
Responsável pelo Ensaio
IEE/USP

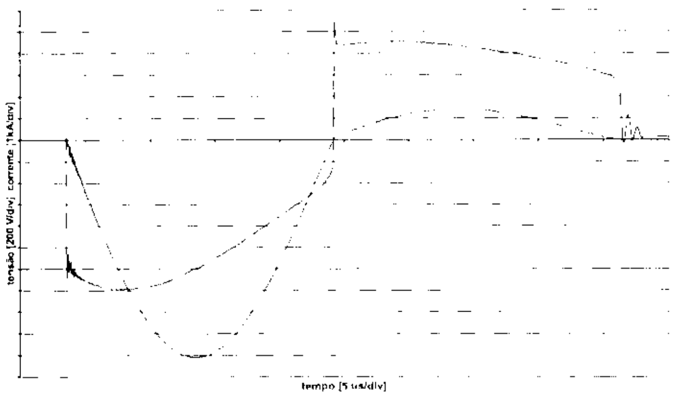
ANEXO

1 - Oscilogramas

Posição de ensaio descrita no item 5.1:



Oscilograma 1 - resultante da aplicação de impulso de tensão (última aplicação)



Oscilograma 2 - corrente/tensão residual (última aplicação)

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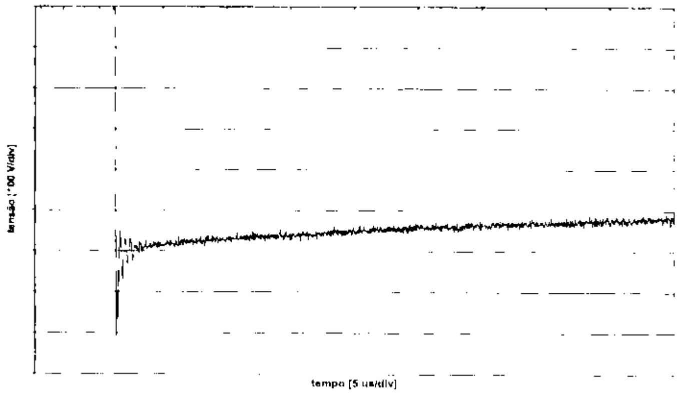
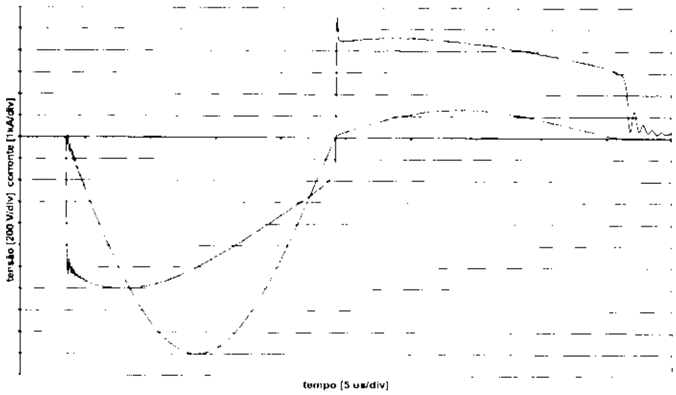
Posição de ensaio descrita no item 5.2:



Oscilograma 3 - resultante da aplicação de impulso de tensão (última aplicação)



Oscilograma 4 - corrente/tensão residual (última aplicação)

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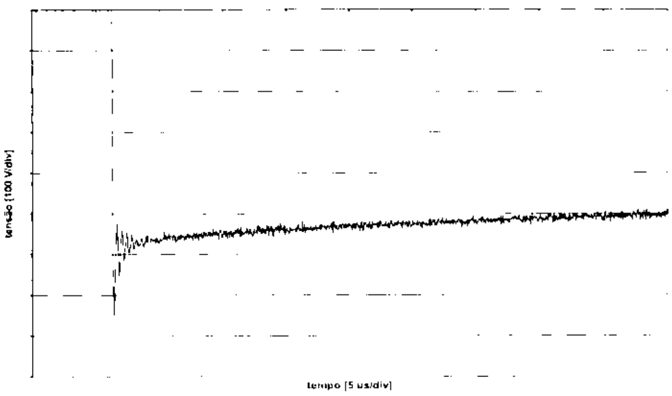
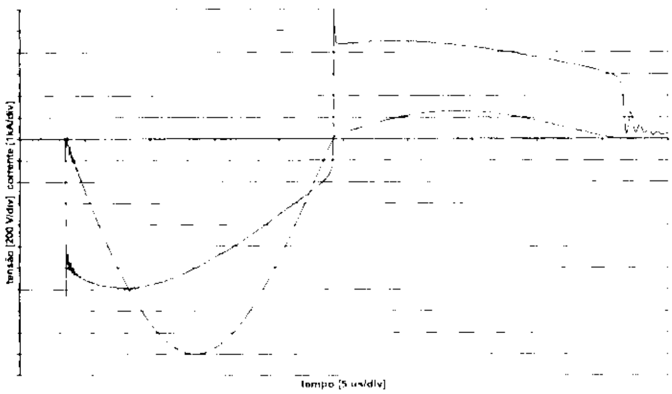
Posição de ensaio descrita no item 5.3:



Oscilograma 5 - resultante da aplicação de impulso de tensão (última aplicação)



Oscilograma 6 - corrente/tensão residual (última aplicação)