4. DESCARGADOR DE 198KV

Kawara Trade S.A.

AUTORIZACIÓN DEL FABRICANTE

Kawara Trade S.A.

Descar

西安西电避雷器有限责任公司
XIAN XD ARRESTER CO..LTD.

Autorización del Fabricante

Fecha: 22 **de Agosto de 2022**.

LPI N°.: **[ID de Licitación 414153] Licitación Pública Internacional ANDE N° 1712/2022**

A: Administración Nacional de Electricidad

POR CUANTO:

Nosotros ***XIAN XD Arrester Co., Ltd.***, como fabricantes oficiales de ***Descargador de sobretensión de 60kV, Y10W-60/140, y Descargador de Sobretensión de 198kV, Y10W-198/460***, con fábricas ubicadas en ***No. 485 Daqing Road, Xi'an, Shaanxi, P.R. China*** mediante el presente instrumento autorizamos al **KAWARA TRADE S.A., ubicado en Plaza Cagancha Nro.1145 Piso 6. Montevideo Uruguay** a presentar una oferta con el solo propósito de suministrar los siguientes Bienes de fabricación nuestra ***Descargador de sobretensión de 60kV, Y10W-60/140, y Descargador de Sobretensión de 198kV, Y10W-198/460***, y a posteriormente firmar el Contrato.

Cuando existan servicios conexos asociados al suministro como parte del contrato, certificamos que **KAWARA TRADE S.A.** cuenta con la capacidad para llevarlos a cabo.

Asimismo, confirmamos haber el leído las Condiciones Contractuales y expresamos nuestra conformidad con lo allí establecido en materia de avales, garantías, plazos y cualquier otro aspecto.

Por este medio extendemos nuestro aval y plena garantía, respecto a los bienes ofrecidos por la firma antes mencionada.

Firma:

Nombre: LvHuaifa
Cargo: Manager

Debidamente autorizado para firmar esta Autorización en nombre de: XIAN XD Arrester Co., Ltd.

Fechado en el día _____22_____ de _____Agosto_____de 202_2_ [fecha de la firma]

Kawara Trade S.A.

MANUAL

Kawara Trade S.A.

EXPERIENCIAS

Kawara Trade S.A.

EXPERIENCIA EN CANTIDADES

Kawara Trade S.A.

Direccion:Campo Via esq. Los Arbolitos, Isla Bogado
Ciudad:Luque - Paraguay
TEL:+595 21 642850 FAX:+595 21 644130
RUC:80030503-5

ORDEN DE IMPORTACIÓN - 022753

Razon Social:NARI ENERGY CO.,LTD. Codigo:14287 Tienda:00
Direccion:9TH FLOOR, BUILDING 91, N 1122 NORTH QINEHOU ROAD País:CHINA, REPUBLICA POPULAR
Municipio:SHANGHAI RUC:91310000132772715Q
TEL:( ) 008613357738605 FAX:( )

Item	Nro.SC	Descrip.	UM	Cantidad	Valor Unitario	Valor Total
0001		DESCARGADOR DE SOBRETENSIÓN DE 198 KV, TIPO ZNO, CON BASE AISLANTE Y CONTADOR, COMPLETO CON TODOS SUS ACCESORIOS. E.T: 02.04.82.13 P/ SE ALTO PARANA	u	6,000	[redacted]	[redacted]
0002		REPUESTOS - DESCARGADOR COMPLETO	u	1,000	[redacted]	[redacted]
0003		REPUESTOS - CONTADOR DE DESCARGAS, COMPLETO	u	1,000	[redacted]	[redacted]
0004		REPUESTOS - CONECTOR PARA TERMINAL DE AT	u	1,000	[redacted]	[redacted]
0005		REPUESTOS - JUEGO DE CONECTORES DE PUESTA A TIERRA	u	1,000	[redacted]	[redacted]
0006		REPUESTOS - SUB-BASE AISLANTE	u	1,000	[redacted]	[redacted]
0007		DESCARGADOR DE SOBRETENSIÓN DE 198 KV, TIPO ZNO, CON BASE AISLANTE Y CONTADOR, COMPLETO CON TODOS SUS ACCESORIOS E.T: 02.04.82.13 P/ SE PRESIDENTE FRANCO	u	3,000	[redacted]	[redacted]
0008		REPUESTOS - DESCARGADOR COMPLETO	u	1,000	[redacted]	[redacted]
0009		REPUESTOS - CONTADOR DE DESCARGAS, COMPLETO	u	1,000	[redacted]	[redacted]
0010		REPUESTOS - CONECTOR PARA TERMINAL DE AT	u	1,000	[redacted]	[redacted]
0011		REPUESTOS - JUEGO DE CONECTORES DE PUESTA A TIERRA	u	1,000	[redacted]	[redacted]
0012		REPUESTOS - SUB-BASE AISLANTE	u	1,000	[redacted]	[redacted]

--Valor Mercaderia	----------Flete	----------Gasto	----------Seguro	------Total Gastos	Total Descuentos	
[redacted]	0,00	0,00	0,00	0,00	0,00	Total del Pedido: U$S [redacted]
						Total Impuestos : U$S
						Total General : U$S [redacted]

SON: [redacted]

Condicion de pago: 30% ANTICIPO HASTA 10 DIAS A LA ENTREGA DE LA GARANTIA DE ANTICIPO, 70% CONTRA APROBACION DE BORRADORES DE LOS DOCUMENTOS DE EMBARQUE ANTES DE LA SALIDA
Medio de pago: Transferencia Bancaria
Fecha de Emision: 14/01/2022

C O N D I C I O N E S P A R T I C U L A R E S

Local de Entrega : CIP ANNP PUERTO VILLETA - INCOTERMS 2020
Plazo de Entrega : 180 A 200 DIAS POSTERIOR A LA APROBACION DE LOS PLANOS Y EL PAGO DE ANTICIPO
Transporte: MARITIMO
Garantías: NO PRESENTARÁ LA GARANTÍA DE CUMPLIMIENTO Y LA GARANTÍA DE CALIDAD DE SUMINISTRO.GARANTIA TECNICA ESCRITA VALIDA DURANTE 24 MESES DESDE LA PUESTA EN SERVICIO O 28 MESES DESDE LA SALIDA EN ORIGEN.
LA GARANTÍA de ANTICIPO deberá ser emitida por una aseguradora o por un Banco a satisfacción de CIE S.A. y deberá cubrir una suma igual al cien por ciento (100%) del valor del anticipo a ser entregado. Esta garantia de Anticipo deberá estar vigente hasta el momento del embarque de los suministros.

Penalidad por Mora: 0.1% POR DIA, HASATA 10% DEL MONTO TOTAL DE LA OI 022753
Documentos Exigidos:
* FACTURA COMERCIAL: 01 (UN) ORIGINAL VISADO POR EL CONSULADO PARAGUAYO, MAS 02 (DOS) COPIAS A NOMBRE DE CIE S.A., AV. ARTIGAS 3443, ASUNCION, PARAGUAY

* BILL OF LADING (BL), CONSIGNADO A LA ADMINISTRACION NACIONAL DE ELECTRICIDAD (ANDE), AVENIDA ESPAÑA 1268 Y PADRE CARDOZO, ASUNCIÓN, PARAGUAY), JUEGO COMPLETO, 01 (UN) ORIGINAL VISADO POR EL CONSULADO PARAGUAYO

LISTA DE EMPAQUE: UN (1) ORIGINAL, MAS DOS (2) COPIAS EMITIDAS A NOMBRE DE LA ADMINISTRACION NACIONAL DE ELECTRICIDAD (ANDE), AVENIDA ESPAÑA 1268 Y PADRE CARDOZO, ASUNCIÓN, PARAGUAY

CERTIFICADO DE ORIGEN: UN (1) ORIGINAL, MAS DOS (2) COPIAS EMITIDAS A NOMBRE DE LA ADMINISTRACION NACIONAL DE ELECTRICIDAD (ANDE), AVENIDA ESPAÑA 1268 Y PADRE CARDOZO, ASUNCIÓN, PARAGUAY

. EL EMBALAJE, IDENTIFICACION, DOCUMENTOS FUERA Y DENTRO DE LOS BULTOS SERA: OI 019216 LPI ANDE-BEI NBR 1482/2019-CONTRATO NBR 8136/2020-OCI NBR 8162 - LOTE 1 " PROYECTO DE CONSTRUCCION E INTERCONEXION DE LA SUBESTACION ALTO PARANA 220/66/23 KV"

Condiciones de Inspección: A RECPECION EN SITIO DE OBRAS SE ALTO PARANA 220 KV.
Condiciones de Embalaje: SEGUN E.T.02.04.82.13 ITEM 8
Referencias: OFERTA COMERCIAL DE FECHA 18 DE NOVIEMBRE 2021
Observaciones: SOLICITADO POR: YENY PEDROZO
APLICACION: LPI 1482-19 PROYECTO DE CONSTRUCCION E INTERCONEXIÓN DE LA SUBESTACIÓN ALTO PARANÁ 220/66/23 KV
EL PROVEEDOR ESTARÁ A CARGO DE TRANSPORTAR LOS EQUIPOS AL PUERTO ESTABLECIDO, PERO NO SE ENCARGA DEL TRABAJO DE DESCARGAR LOS EQUIPOS DEL BUQUE.

Firmado digitalmente por Abel Mora
DN: cn=Abel Mora, c=PY, o=CIE S.A., ou=SUB - ULS, email=abel.mora@cie.com.py
Motivo: Soy el autor de este documento
Ubicación: Luque

Comprador Responsable : Abel Mora - ULS

Aprobador(es) : Aprob JEFATURA [OK] - Yeny Pedrozo [OK] - Oscar Lopez [OK] -

FIRMA DEL PROVEEDOR

Leyendas de la Aprobacion : BLQ:Bloqueado | Ok:Aprobado | ??:Esper.Lib | ##:Nivel Lib
Estado Actual: PEDIDO PENDIENTE

NOTA: El proveedor cumplirá enteramente con la provisión de esta orden de compra, sus anexos y las condiciones generales adjuntas

Kawaro Trade S.A.

XD-GE 项目框架采购合同（2015 年）

第一部分

特订商务条款

项目名称：
巴西Geo Group Aneel Lot A&C项目

采购合同

合同编号: SPL-GE-14-009

买方：西安西电国际工程有限责任公司

卖方：西安西电避雷器有限责任公司

Kawara Trade S.A

2015年2月10日

采购合同

根据《中华人民共和国合同法》等法律法规的规定和双方于 15 年 2 月 10 日签订的 SPL-GE-14-014 号框架协议的约定，买、卖双方经过充分协商，就美国 GE 公司为 Geo Group 项目销售的避雷器设备达成本合同，以资共同遵守。本合同是 XD-GE 项目框架采购合同的特订商务条款部分，应与«XD-GE 项目框架采购合同»的第二部分“通用商务条款”一起使用。本合同内容与«XD-GE 项目框架采购合同»内容冲突时，应以本合同条款内容为准。

一、产品

1. 项目信息

项目：巴西 Geo Group Aneel Lot A&C 项目

业主：GE Digital Energy do Brasil Ltda

总承包方：美国 GE 数字能源公司(Digital Energy, Inc.)

工程设计单位：GEO PROJETOS ENGENHARIA E ASSOCIADOS LTDA

2. 产品规格

名称	数量
500kV 避雷器	21
230kV 避雷器	76
145kV 避雷器	19
72.5kV 避雷器	32

3. 技术参数、产品参数、验收标准等详见《技术协议》。

二、合同价格及支付方式

1. 合同价格：1577488 元，包括卖方履行合同义务所需的一切费用。价格明细见下表。

序号	名 称	规格型号	单位	数量	单价	总价	备注
1	500kV 避雷器		台	21	42500	892500	

Kawara Trade S.A

E-mail machuang@xianelectric.com.cn。

卖方联系人 高戈 电话 +86 29 86065078 ，传真+86 29 86065058 ，

E-mail gao.ge@263.net 。

十、其他

1. 本合同以中文书写，一式肆份，买卖双方各执贰份。

2. 本合同经双方盖章或授权代表签字后生效。

3. 本合同内容与«XD-GE 项目框架采购合同»内容冲突时，应以本 内容为准。

买方：西安西电国际工程有限责任公司	卖方：西安西电避雷器有限责任公司
法定代表人/授权代表：程岩	法定代表人/授权代表：孙杰
日期：2015.2.10	日期：2015年2月10日

Kawara Trade S.A.

Contrato de adquisición del marco del proyecto XD-GE (2015)
Primera parte
Términos de negocios

Nombre del proyecto

Brasil Geo Group_Aneel Lot A&C proyecto

Número de contrato: SPL-GE-14-009

Comprador: Xian Electric Engineering Company Limited

Vendedor: Xian XD Arrester Co., Ltd.

Kawara Trade S.A

10 de febrero de 2015

Contrato de compra

De conformidad con las disposiciones de la "Ley de contratos de la Rep ública Popular de China" y otras leyes y reglamentos y el acuerdo del ac uerdo marco de SPL-GE-14-014 firmado por las dos partes el 10 de fe brero de 2015, las partes para la compra y venta han sido completamen te consultadas y El equipo de pararrayos vendido por el proyecto del Gr upo Geo ha alcanzado este contrato para el cumplimiento mutuo. Este contrato forma parte de los términos comerciales especiales del contrat o de adquisición del marco del proyecto XD-GE y se debe utilizar junto con la segunda parte del Contrato de Adquisición del Marco del Proyec to XD_GE, Términos Comerciales Generales. En caso de conflicto entre e l contenido de este contrato y el contenido del «Contrato de Adquisició n del Marco del Proyecto XD-GE, prevalecerá el contenido de este cont rato.

formación del proyecto
Proyecto: Brasil Geo Group Aneel Lot A&C
Propietario del proyecto: GE Digital Energy do Brasil Ltda.
Contratista general: Digital Energy, Inc., EE.UU.
Unidad de diseño de ingeniería: GEO PR0.TET0S ENGENHARIA E ASSO CIADQS LTDA

2. Especificaciones del producto

Nombre	Cantidad
descargador de 500kV	21
descargador de 230kV	76
descargador de 145kV	19
descargador de72. 5kV	32

3. Los parámetros técnicos, los parámetros del producto, los criterios de aceptación, etc. se pueden encontrar en el Acuerdo Técnico.
En segundo lugar, el precio del contrato y el método de pago.
1. Precio del contrato: yuanes, incluidos todos los honorarios de pr ecios requeridos por el vendedor para cumplir con las obligaciones con

Kawara Trade S.A

tractuales.

Diez, otro

1. Este contrato está escrito en chino, construcción de una sola pieza, y cada parte del comprador y el vendedor.
2. Este contrato entrará en vigencia una vez firmado por ambas partes o por un representante autorizado.
3. En caso de conflicto entre el contenido de este contrato y el contenido del Contrato de Adquisición del Marco del Proyecto XD-GE, este contenido prevalecerá.

Numero de serie	Nombre	Modelo de especificación	Unidad	Cantidad	Precio total	Observaciones
1	Pararrayos de 500kV		21			

Comprador: Xian Electric Engineering Company Limited 公司

法定代表人/授权代表：

程岩

Vendedor: Xian XD Arrester Co., Ltd. 司

法定代表人/授权代表：孙杰

Kawara Trade S.A

日期：2015年2月10日

Energy & Telecom Engineers

Regd Off 11, Bardiya Colony Museum Road (Near Ram Nivas Bagh) Jaipur (Raj.) - 302 004 INDIA Ph (0) +91-141-2602032 Fax +91 141-2609892 (M) +91-9829942390
Gurgaon Off L-17A/5 1st Floor DLF Phase 2 Behind ABW Tower IFFCO Chowk Gurgaon - 122002 (Haryana) INDIA Ph (O) 0124-4202146, E-mail energyandtelecomengineers@gmail.com

PERFORMANCE CERTIFICATE

TO WHOM IT MAY CONCERN

This is to certify that 24 nos of 624kv Surge Arrester (Type : YH20W5-624/1480) has manufactured , Tested and supplied by M/s Xian XD Arrester Co., Ltd , having registered office at No. 130 Weiyang Road Kaixin Building Xian, China for our project in January 2016 .

The above mentioned surge arrester is commissioned in June 2016, since then same are in successfully operation to till date.

This certificate is issued on the specific request of M/ Xian XD Arrester Co., Ltd , for the purpose of bidding.

Kawara Trade S.A

Energy & Telecom Engineers

ENERGY & TELECOM ENGINEERS JAIPUR

Project Manager

Date : 15.05.2019

Certificado de rendimiento a quien corresponda

Esto es para certificar que 24 Unidades de Pararrayos de 624KV (tipo: YH20W5-624 / 1480) ha fabricado, probado y suministrado por XIAN XD Arraster Co., Ltd., para nuestro proyecto en Enero de 2016.

Los Pararrayos mencionados anteriormente fueron puestos en servicios en Junio de 2016, ya que desde entonces se encuentran en la operación con éxito hasta la fecha.

Este certificado se emite sobre la solicitud específica de XIAN XD ARTESTER Co., Ltd, con el propósito de ofertar.

Energy & Telecom Engineers

Project Manager

Fecha:15.05.2019

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EXPERIENCIA EN 10 AÑOS

Kawara Trade S.A.

运行证明

西安西电避雷器有限责任公司(原西安西电高压电瓷有限责任公司)，于 2009 年 6 月提供的 330kV 氧化锌避雷器 Y10W5-300/727 9 台，至今各项指标运行良好！

特此证明！

宁夏发电集团有限责任公司
生产技术部

2011 年 12 月 10 日

Kawara Trade S.A

宁夏发电集团有限责任公司
地址：宁夏银川凤凰东路 663 号，宁夏，750002
电话：0951-4933628
传真：0951-4933627
网址：http://ningfa.solarbe.com/ http://www.nxfdjt.com

Running Certificate

In June 2009, Xian XD Arrester Co.,Ltd paies a return visit to Ningxia Electric Power Group the MOA of the 330kV substation with charge. 9 Type Y10W5-300/727 MOA from Xian XD Arrester Co.,Ltd run well and no quality problem appear.

Ningxia Electric Power Group

December 10th,2014

Kawara Trade S.A

FORMULARIO Nº 13

Formulario de Experiencia y Capacidad en Suministros

Fecha: 20 de Agosto del 2022]

[*El siguiente formulario deberá ser completado por cada material o equipo indicado del apartado 8 de SUMINISTROS – Requisitos de Participación y Criterios de Calificación.*]

Equipo/Material: _**Descargadores de tensión de Oxido de ZINC(Zno) - 198kV**___

Nombre del fabricante y país de procedencia: _**XI´AN XD ARRESTER CO., LTD.**__

N°	Requisito	**Documento de acreditación***[especificar tipo de documento y fecha de emisión]*	**Emisor** *[especificar empresa o institución]*	**Folio de su oferta** *[indicar ubicación del documento en su oferta]*
1	Acreditar como mínimo *diez (10)* años la experiencia en la fabricación de bienes similares a los ofertados	Certificado en ejecución 2009	Ningxia Electric Power Group **China**	Anexo 1

N°	Requisito	**Documento de acreditación** *[especificar tipo de documento y fecha de emisión]*	**Emisor** *[especificar empresa o institución]*	**Cantidad certificada**	**Folio de su oferta** *[indicar ubicación del documento en su oferta]*
2	Acreditar haber fabricado bienes de similares características a los requeridos en el llamado, según descripción y las cantidades mínimas totales indicados en las columnas (b) y (c) de los cuadros indicados en el numeral 8 (para cada uno de los lotes 1, 2 y 3)	Contrato 2015	Geo Group Aneel Lot A&C **Brasil**	148 unidades	Anexo 2
		Contrato 2016	Energy & Telecom Engineers **India**	24 Unidades	Anexo 3

N°	Requisito	**Documento de acreditación** *[especificar tipo de documento y fecha de emisión]*	**Emisor** *[especificar empresa o institución]*	**Cantidad certificada**	**País del suministro**	**Folio de su oferta** *[indicar ubicación del documento en su oferta]*
3	De las cantidades totales mínimas requeridas en el punto 2 anterior, por lo menos el cuarenta por ciento (40%) deberá corresponder a suministros realizados para clientes en América y la Unión	Contrato 2015	GE Digital Energy do Brasil Ltda	148 unidades	**BRASIL**	Anexo 2
		2022	CIE S.A.	11 Unidades	**Paraguay**	Anexo 4

Kawara Trade S.A.

	Europea.					

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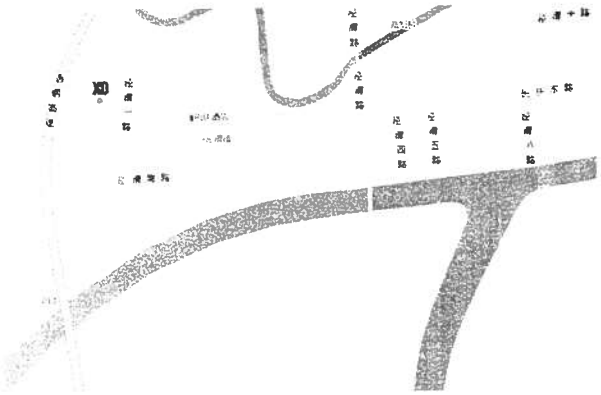
CATÁLOGO TÉCNICO

Kawara Trade S.A.



西安西电避雷器有限责任公司
XIAN XD ARRESTER CO.,LTD.
（原西安西电高压电器有限责任公司西安电器研究所避雷器厂改制）
地址：西安经开区泾河工业园泾渭一路
电话：029-86030558
传真：029-86033033
邮编：710200

西安西电避雷器有限责任公司
XIAN XD ARRESTER CO.,LTD.

金属氧化物避雷器
Metal Oxide Surge Arresters

Kawara Trade S.A

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GIS MOA for AC system

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Polymeric MOA for AC system

4 直流输电系统用避雷器 16
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11谐波器 22
Harmonic repressor

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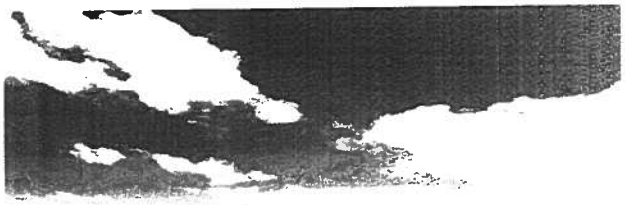
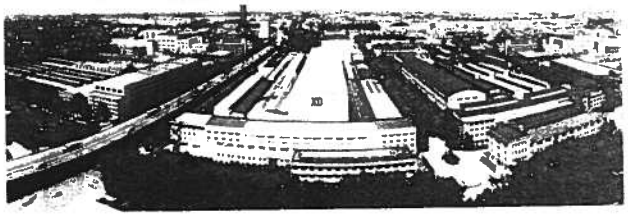
Monitors

公司概况
General Introduction





企业简介

西安西电避雷器有限责任公司（以下简称西电避雷器公司）是一家专业研发、设计、生产、销售、服务于电力系统、铁路、工业、民用等领域的避雷器、电涌保护器、电容器保护用成套装置等产品的专业化企业。公司是经国家有关部门批准的大型国有控股合资企业，是中国西电电气股份有限公司、西安西电高压电器有限责任公司、陕西电力科学研究院有限责任公司的避雷器业务进行整合，建立的避雷器专业化生产企业，隶属于中国西电电气股份有限公司。

西电避雷器公司地处西安市经济技术开发区经济工业园区，具有年产1000kV及以下电压等级各类、各高容量避雷器产品5亿元的生产能力。本公司产品在750kV～1000kV级（特）高压交流输电工程、±800kV及以下直流输电工程、±500kV葛洲坝上海直流输电工程、±500kV三峡上海直流输电工程、三峡输电工程、西电东送工程等大型工程中得到广泛应用。同时本公司产品已出口到东欧、大洋洲、东南亚、中东、非洲等地区。

西电避雷器公司现有员工三百余人，各类专业技术人员占总人数的20%以上，技术力量雄厚，科研、生产、检测设备齐全，拥有先进的生产和检测设备。本公司生产的110kV～500kV瓷外套避雷器、GIS避雷器等产品通过荷兰KEMA认证等国际权威产品技术水平达到国际先进和国内领先水平。本公司的金属氧化物避雷器产品先后获陕西省、西安市优质产品。

Kawara Trade S.A

Enterprise Briefing

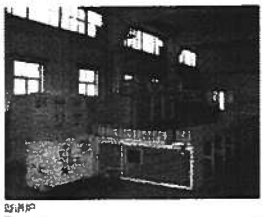
Xi' an XD Surge Arrester Co. Ltd (hereafter abbreviated as XA) is a state-holding joint-stock large professional company, subordinate to China XD Electric Co. Ltd., dealing with development, designing, manufacture and marketing of surge arresters, other overvoltage protective devices and their accessories, integrated from surge arrester business of Xi' an XD HV Insulator Co. Ltd and Xi' an Electroceramic Research Institute.

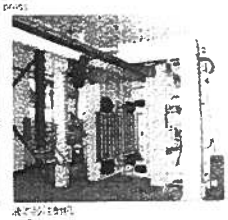
XA, located at Jinghe Industrial estate of Xi' an Economic Technology Development Zone, has capacity of annual output totaled 500 mil Yuan for production of DC and AC metal oxide surge arresters (MOA) and their accessories up to 1000 kV. The XDSA products have been used at China' s key projects such as 750 kV~1000 kV UHV AC power transmission projects, Yunnan-Guangdong ±800kV UHV DC transmission project, Gezhouba-Shanghai ±500kV DC transmission project, Three Gouges transmission project and power transmission projects from West to East China etc, and sold out to America, Oceania, Southeast Asia, Middle east and Africa.

XA has a staff of above 300 people, from which 205 constitute skillful engineers and technicians, possesses complete measurement and experimental instruments, up-to- date manufacturing and testing facilities. The 110~500 kV MOA and GIS MOA of worldwide advanced level passed successfully test at KEMA laboratory, Netherlands. MOA of XDSA made have appreciated by Shaanxi Provincial and Xi' an Municipal governments as products of famous trade mark.

重要证书 | Essential certificates

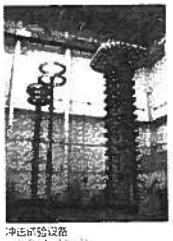
先进的生产和检测设备 | Up-to-date manufacturing and testing facilities





PF test facility

LSR jet press



Kawara Trade S.A

公司概况 General Introduction

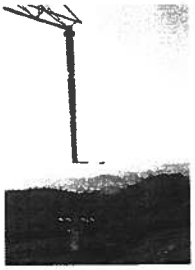
质量方针 | Quality policy

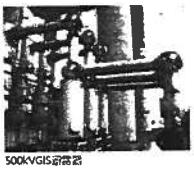
严格工艺管理，不断创新开发，
全面精品意识，注重达到高效，
持续不断改进，追求顾客满意。
Strict process management, Permanent innovation and development
Overall awareness of fine product, Care to top quality and high effectiveness
Continuous system improvement, pursuit of customer satisfaction

国内领先的技术实力 | Leading technology in China

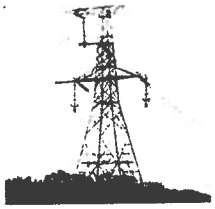
西安电瓷避雷器公司作为国内最大的避雷器产品的生产企业，不断追求为电力事业的发展多作贡献的目标，一直致力于避雷器技术的创新和产品质量的提高，生产全系列各种规格的瓷外套避雷器、GIS避雷器及复合外套避雷器。本公司生产的避雷器产品广泛应用于变电站、输电线路、直流输电工程及铁路电气化等领域的过电压保护。本公司多年研究、开发和生产避雷器的工艺，依靠雄厚的技术力量，可以根据用户的要求生产各种交流、直流避雷器产品。

XDSA, as the largest MOA manufacturer in China, constantly pursuing to make greater contribution for power industry development, always devotes herself to MOA technology innovation and quality enhancement in manufacturing full line of porcelain housed MOA, GIS MOA and polymeric MOA, which being widely used at power substations, transmission lines, DC power transmission projects, and electrified railways for overvoltage protection. Based on long term experience and relied on skilful technical staff, XDSA can supply all kinds of AC and DC MOA as required by clients.


500kV带间隙复合外套避雷器
500 kV polymeric gapped MOA


500kVGIS避雷器
500 kV GIS MOA

1000kV瓷外套避雷器
1000 kV porcelain housed MOA


500kV复合外套避雷器
500 kV polymeric MOA

750kV瓷外套避雷器
750 kV porcelain housed MOA

500kV直流母线避雷器
500kV DC bus MOA

Kawara Trade S.A

产品简介
General introduction

西电避雷器公司批量生产35kV～1000kV瓷外套避雷器、6kV～750kV复合外套避雷器、66kV～750kV GIS避雷器，生产各种应用于特殊地区及场合使用的避雷器，如：高海拔、重污秽以及相间和相对地限制过电压的三相组合式避雷器，生产6kV～35kV谐波器、电力机车用非线性电阻片及避雷器用监测器和计数器等产品。

The product line of XDSA covers 35kV～1000kV porcelain housed MOA, 6kV～750kV polymeric MOA, 66kV～750kV GIS MOA; MOA for specific applications and conditions such as MOA for high altitude or heavy pollution regions, 3-phases combined MOA for limiting inter-phase and phase-to-ground votage surges, 6kV～35kV harmonic suppressor, non-linear resistors for electric locomotives, monitors and discharge counters for MOA etc.

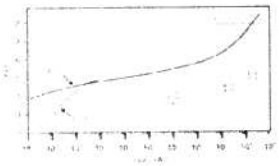
本公司研制和生产的避雷器具有以下特点：MOA developed by XDSA features:

● 优异的保护性能

西电避雷器公司用氧化锌压敏电阻片具有优异的非线性伏安特性和大的通流容量，使保护裕度大为提升，限制电压波及操作过电压效果显著，保证电器设备安全。

● Superior protective performance

The metal oxide resistors made of XDSA possesses superior nonlinear volt-ampere characteristics and high discharge capacity, making a great protective margin of discharge voltages at steep, lightning and switching current surges, and have remarkable effect for limiting voltage surges.



伏安特性曲线
Volt ampere characteristics curve

●可靠的密封性能

采用了耐全天候的高度防密封圈、独特的密封结构及本公司专利技术的微正压结构，并采用高灵敏度的氦质谱检漏技术，保证避雷器在正常寿命期内具有可靠的密封性能。

● Reliable sealing performance

During the whole MOA service life, the reliable sealing is ensured by application of weatherproof O shaped rubber ring, specific sealing design, patented pattern of positive micro- pressure and high sensitive helium mass spectrometric detecting technology.

●优异的老化特性

产品的老化寿命特性优异，抗浪涌能力大、过电压吸收能力强、电气性能稳定，长期可靠。

● Excellent ageing performance

XDSA resisters characterized by superior ageing proof performance, high discharge capacity, great overvoltage absorption capability, stable electrical characteristics, resulting to reliable service performance.

●安全可靠的压力释放能力

结合电力系统的特殊需求设计的避雷器压力释放装置，具有安全可靠的压力释放能力，使避雷器在[illegible]安全释放内部压力，不控制扩大事故隐患。

● Secure pressure relief capability

Pressure relief device, specially designed for power utilities, has reliable pressure relief capability which ensures safe relief inner pressure of MOA in event of failure to prevent any failure spread.

●高的机械强度

避雷器产品的机械应力大于导线拉力和风力之和，承受2.5倍以上的电力，抗弯力可与地震力相当于1.67倍以上的电力，抗震产品可耐受9级地震烈度。

● High mechanical intensity.

The bending stress of the product surge arrest should be more than the stresws of both the wire pull and wind power possessing more than 2.5 times allowance. The bending stress possess more than 1.67 times allowance relative to seismic force. The eseismatic products can stand 9 degree seismic intensity.

●不断创新，开发高技能产品

西电避雷器公司在不断研究、探索新领域的同时，结合国际避雷器的发展趋势，开发出生产具有高技术含量的高端避雷器产品，使西电避雷器公司成为国际避雷器生产品种最全和产品性能优异的一流企业。

● Unintermpted innovation in Hi-tech product development

Unceasing aimed at worldwide trend of MOA development, XDSA constantly devotes herself to development of Hi-tech MOA of worldwide advanced level, making XDSA a top-ranking MOA manufacturer in China capable of supplying MOA of most complete varieties and supenor performance.

Kawara Trade S.A

产品简介
General introduction

产品系列涵盖35kV～1000kV瓷外套避雷器、6kV～750kV聚合外套避雷器、66kV～750kV GIS避雷器，生产适用于高海拔及污秽地区的特殊避雷器，如：高原、重污区及从相间相对地间和相对地的三相组合式避雷器，生产6kV～35kV谐波器、电力机车用非线性电阻片及避雷器用监测器和计数器等产品。

The product line of XDSA covers 35kV ~ 1000kV porcelain housed MOA, 6kV ~ 750kV polymeric MOA, 66kV ~ 750kV GIS MOA; MOA for specific applications and conditions such as MOA for high altitude or heavy pollution regions, 3-phases combined MOA for limiting inter-phase and phase-to-ground voltage surges, 6kV ~ 35kV harmonic suppressor, non-linear resistors for electric locomotives, monitors and discharge counters for MOA etc.

本公司研制和生产的避雷器具有以下特点：MOA developed by XDSA features:

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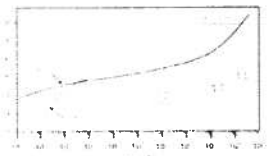
西电避雷器采用氧化锌阀片具有优异的非线性伏安特性和大的冲击容量，使内陆冲击波具有很大的保护裕度，雷电冲击波和操作冲击波的限压水平大幅降低。

● Superior protective performance

The metal oxide resistors made of XDSA possesses superior nonlinear volt-ampere characteristics and high discharge capacity, making a great protective margin of discharge voltages at steep, lightning and switching current surges, and have remarkable effect for limiting voltage surges.



伏安特性曲线
Volt ampere characteristics curve

● 可靠的密封性能

采用了多个专利的防潮密封结构，独特的密封结构及专公司专用技术的内压力测试，并采用高灵敏度的氦质谱检漏技术，保证避雷器在正常寿命期内具有可靠的密封性能。

● 优异的老化特性

产品的老化寿命特性好、通流容量大、运电性能稳定，电气性能稳定，运行可靠。

● 安全可靠的压力释放能力

为适电力系统的特殊需求而设计的避雷器压力释放装置，具有安全可靠的压力释放能力，使内避雷器在内部发生故障时，安全释放避雷器压力，不致造成扩大事故的发生。

● 高的机械强度

避雷器产品的抗弯应力大于风荷载力和拉线力之和，具有2.5倍以上的裕度，风荷载力可于地震烈度为Ⅷ度的1.67倍以上的裕度，抗震型产品可抗提9级地震烈度。

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西电避雷器公司在不断研究、探索新领域的基础，结合国际避雷器的发展趋势，开发相关产品，有力地保证了西电避雷器产品，使西电避雷器公司成为国内避雷器生产品种最全、产品性能优异的一流企业。

● Reliable sealing performance

Dunng the whole MOA service life, the reliable sealing is ensured by application of weatherproof O shaped rubber ring, specific sealing design, patented pattern of positive micro- pressure and high sensitive helium mass spectrometric detecting technology.

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XDSA resisters characterized by superior ageing proof performance, high discharge capacity, great overvoltage absorption capability, stable electrical characteristics, resulting to reliable service performance.

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Unceasing aimed at worldwide trend of MOA development, XDSA constantly devotes herself to development of Hi-tech MOA of worldwide advanced level, making XDSA a top-ranking MOA manufacturer in China capable of supplying MOA of most complete varieties and supenor performance.

Kawara Trade S.A

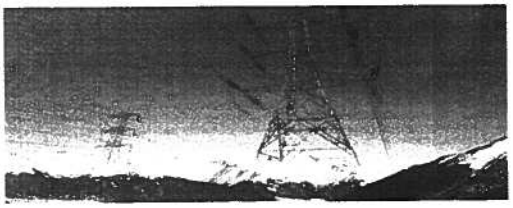
主要产品
Main products

高压交流系统按GB11032、IEC60099-4及其它相关标准生产各种类型避雷器、高压避雷器和其它配套产品。

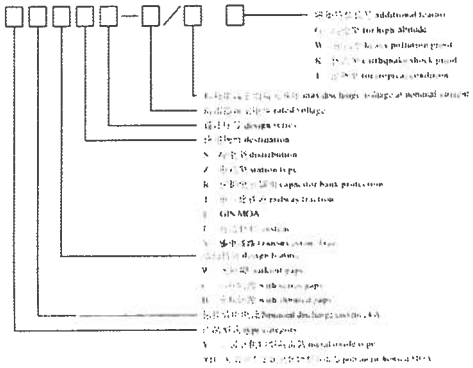
a) 35kV～1000kV瓷外套无间隙金属氧化物避雷器；
b) 66kV～750kV GIS无间隙金属氧化物避雷器；
c) 6kV～750kV聚合外套无间隙金属氧化物避雷器；
d) 35kV～500kV线路型聚合外套内串联间隙金属氧化物避雷器；
e) 高压直流输电工程用无间隙金属氧化物避雷器；
f) 电气化铁路用无间隙金属氧化物避雷器；
g) 避雷器用计数器和监测器；
h) 电缆保护器；
i) 6kV～35kV电力系统用谐波抑制器。

DC and AC MOA and other accessories manufactured by XDSA in according with IEC60099-4 and GB11032

a) 35kV～1000kV porcelain housed gapless MOAb)
b) 66kV～750kV GIS gapless MOA
c) 6kV～750kV polymeric gapless MOA
d) 35kV～500kV polymeric line type MOA with serious gaps
e) Complete set of gapless MOA for DC transmission project
f) Gapless MOA for electrified railway
g) Discharge counters and monitors for MOA
h) Cable protector
i) Harmonic repressors for 6kV～35kV power systems



● 避雷器型号说明 MOA type designations



● 采用标准 Normative adoptions

GB 11032 交流无间隙金属氧化物避雷器
GB 11032 Metal oxide surge arresters without gaps for a.c. systems
GB/T 16434 高压架空线路和发电厂、变电所环境污秽分级及外绝缘选择标准
GB/T 16434 High voltage overhead line and power station,transmission substation,environmental pollution area grading and external insulation choice standards.
GB 50260 电力设备抗震设计规范
GB 50260 electric power aseismatic equipment design standards
JB/T 7617 六氟化硫封闭式无间隙金属氧化物避雷器
JB/T 7617 SF6-type Metal oxide surge arresters without gaps
JB/T 8952 交流系统用瓷外套无间隙金属氧化物避雷器
JB/T 8952 Polymer-housed metal oxide surge arresters without gaps for a.c. systems
JB/T 10497 交流系统用有串联间隙聚合外套金属氧化物避雷器
JB/T 10497 Polymeric housed metal oxide surge arresters with series gap for a.c. electric power transmission line
IEC 60099-4 交流无间隙金属氧化物避雷器
IEC 60099-4 Metal oxide surge arresters without gaps for a.c. systems
Cigre33/14.05 高压直流输电换流站无间隙金属氧化物避雷器使用导则
Cigre33/14.05 Guidelines for the application of metal oxide surge arresters without gaps for HVDC converter stations

Kawara Trade S.A

交流系统用瓷外套避雷器 Porcelain housed MOA for a.c. System

表1 35kV～1000kV用氧化锌无间隙金属氧化物避雷器典型产品技术参数和外形尺寸
Tab 1 Typical technical parameters and outline dimensions of 35kV～1000kV station type gapless MOA

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
				[illegible]	[illegible]	[illegible]									
35	Y5W-51/134W	51	40.8	154	134	114	73.0	51	400	31	1095	250	78	1	图1
35中性点 neutral	Y1.5W-40/85W	30	24	/	88	75	46	30	400	21	1095	250	78	1	图1
66	Y5W-84/221W Y5W-90/235W Y10W-90/235W	84 90 90	67.2 72.5 72.5	254 270 264	221 235 236	188 201 201	121 130 130	84 90 90	600, 800 600, 800 600, 800	25/31	1704/1835	310	178/202	1	图1
110	Y10W-84/232W Y20W-102/268W Y20W-102/268W Y16W-108/281W	84 102 102 108	75 76 76.6 84	230 281 287 315	230 280 286 281	213 221 226 250	140 145 140 157	96 108 102 108	600, 800 600, 800 600, 800 600, 800	25/31	1704/1835	310	178/202	1	图1
110中性点 neutral	Y1.5W-40/144W Y1.5W 72/188W	40 72	40 58	/ /	144 188	131 174	85 108	40 72	400 400	24/31	1005	250	78/92	1	图1
220	Y20W 192/500W Y20W 208/538W Y20W 204/532W Y20W 216/562W	192 208 204 216	150 156 159 168.3	500 532 534 560	500 539 532 562	426 442 452 478	280 290 284 314	192 208 204 216	600, 800 600, 800 600, 800 600, 800	25/31	3138/3400	460	408/422	3	图2
220中性点 neutral	Y1.5W 144/370W	144	116	/	370	298	305	144	400, 600	25	1835	310	202	1	图1
330	Y20W-288/804W Y20W-312/868W	288 312	259 257	782 847	698 760	598 649	468 492	288 312	1200 1200	25/31	5722/6862	1320	980/	2	图3
330中性点 neutral	Y1.5W-207/440W	207	166	/	440	416	292	207	600	31	3400	650	412	2	图2
500	Y20W-420/1040W Y20W-444/1100W Y20W-468/1160W	420 444 468	318 334 350	1170 1238 1308	1040 1108 1168	858 907 958	583 597 630	420 444 468	2000, 2500 2000, 2500 2000, 2500	25/31	8888/9111	1800	1352/1480	3	图4
500中性点 neutral	Y1.5W-102/260W Y1.5W-96/240W	102 96	155 137	/ /	260 240	243 243	62 77	102 96	600 600	31	1835	310	202	1	图1
750	Y20W-600/1360W Y20W-648/1480W	600 648	462 488	1516 1639	1388 1481	1342 1226	818 875	600 648	2500 2500	25/31	8028/8884	2500	2352/2553	4	图5
1000	Y20W-828/1620W	828	638	1782	1620	1469	1180 (4mA)	828	3000	25	11600	3200	6300	5	图6

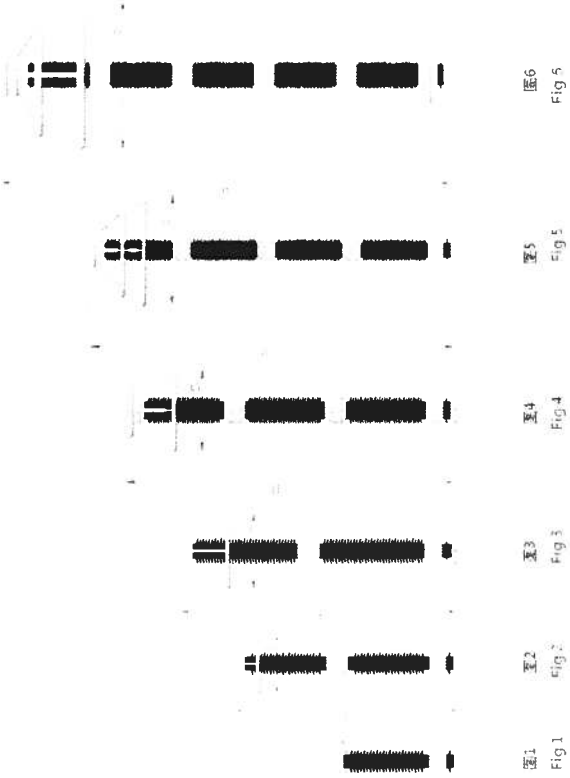


图6 Fig 6

图5 Fig 5

图4 Fig 4

图3 Fig 3

图2 Fig 2

图1 Fig 1

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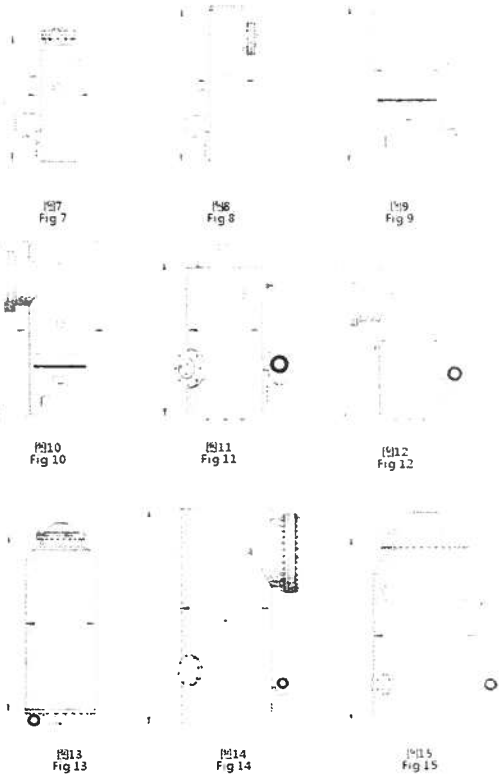
交流系统用GIS避雷器 GIS MOA for a.c. System

表2 66kV～750kV插式结构金属氧化物避雷器典型产品技术参数和外形尺寸
Tab 2 Typical technical parameters and outline dimensions of 66kV～750kV metal clad gapless MOA

U_m kV rms	型号 Type	U_r kV rms	U_{ac} kV rms	U_{sw} kV peak			U_{lim} kV peak	U_{10} kV peak	I_{sw} A	结构 Construction	外形图 Outline	H mm	D mm	重量 Weight kg	图号 Fig No.
				1.2/50	45/90	75/150									
66	YSWF-84/221	84	67.2	254	221	188	121	84	600	顶出线 Top outlet	A* 单相单箱，可直立，水平安装	1200 1600	350	218 256	图7 图8
	Y10WF-90/235	90	72.5	264	235	201	130	90	800	侧出线 Side outlet	B* 三相单箱，可直立，水平安装	1385 1830	618	656 742	图9 图10
110	Y10WF-96/250	96	75.0	280	250	218	142	96	600	顶出线 Top outlet	A* 单相单箱，可直立，水平安装	1200 1600	350	230 275	图7 图8
	Y10WF-100/260	100	78.0	291	260	221	145	100							
	Y10WF-102/264	102	79.6	297	264	226	148	102	800	侧出线 Side outlet	B* 三相单箱，可直立，水平安装	1385 1830	618	686 772	图9 图10
	Y10WF-108/281	108	84.2	313	281	239	157	108							
220	Y10WF-200/520	200	156.0	582	520	442	290	200	800	顶出线 Top outlet 侧出线 Side outlet	A* 单相单箱，可直立，水平安装	1665 1900 1550 1830	460 718	312 361 768 890	图7 图8 图11 图12
	Y10WF-204/532	204	159.0	594	532	452	296	204							
	Y10WF-216/562	216	168.5	630	562	478	314	216							
330	Y10WF-288/808	288	219	782	698	593	408	288	1200	顶出线 Top outlet	单相单箱 Single phase in one inclosure	1900	812	975	图13
	Y10WF-300/727	300	228.0	814	727	618	425	300							
	Y10WF-324/789	324	246	880	789	668	459	324							
500	Y20WF-420/1006	420	318	1096	1006	852	586	420	2000 2500	顶出线 Top outlet	单相单箱 Single phase in one inclosure	2540 2505	987 1108	892* 1072*	图11 图13
	Y20WF-444/1063	444	324	1159	1063	882	620	444							
	Y20WF-468/1120	468	330	1222	1120	926	653	468							
750	Y20WF-600/1380	600	462	1518	1380	1142	810	600	2000	侧出线 Side outlet 顶出线 Top outlet	单相单箱 Single phase in one inclosure	3500 2900	1400	2300* 2200*	图14 图15
	Y20WF-648/1491	648	498	1639	1491	1228	875	648							

注1：带括号的数值为无间隙的三相单箱的产品参数。
注2：带括号的数值为无间隙单相单箱产品的参数。
Note 1: Data in parenthesis are for three-phase gapless MOA with aluminum shell.
Note 2: For A type, data in parenthesis are for single phase gapless MOA.
A*：单相单箱，可直立安装，带有安装支架，可选用安装支架。
B*：三相单箱，可直立安装，带有安装支架，可选用安装支架。



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交流系统用复合外套避雷器 Polymeric MOA for AC system

表3 6kV～500kV中性点接地用复合外套无间隙金属氧化物避雷器典型产品技术参数和外形尺寸

Tab 3 Typical technical parameters and outline dimensions of 6kV～500kV station and distribution type polymeric gapless MOA

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6	YHSW5-10/30W	10	8	34.6	30	25.6	15	10	100	31	257	100	3	1	图16
	YHSWZ-10/27W	10	8	31	27	23	14.4	10	150						
10	YHSW5-17/50W	17	13.6	53.5	50	42.5	25	17	100	31	257	100	3	1	图16
	YHSWZ-17/45W	17	13.6	51.6	45	38.7	24	17	150						
35	YHSW-51/134W	51	40.8	154	134	114	73	51	400	31	682	140	15	1	图17
35中性点 neutral	LYH1.5W-36/80W	30	24	/	80	76	44	30	400	31	1095	290	78	1	图1
66	YHSW-84/221W	84	67.2	254	221	188	121	84	600, 800	31	1264	220	62	1	图18
	YH10W-90/215W	90	72.5	264	235	201	130	90	600, 800						
110	YH10W-100/260W	100	78	291	260	221	145	100	600, 800	31	1264	220	62	1	图18
	YH10W-102/285W	102	78.6	297	285	226	148	102	600, 800						
	YH10W-108/285W	108	84	315	285	239	157	108	600, 800						
110中性点 neutral	YH1.5W-60/144W	60	48	/	144	135	85	60	400	31	949	184	32	1	图18
	YH1.5W-72/180W	72	58	/	186	174	103	72	400						
220	YH10W-200/520W	209	158	582	520	442	280	209	600, 800	31	2835	630	136	2	图20
	YH10W-204/532W	204	159	594	532	452	286	204	600, 800						
	YH10W-216/562W	216	168.5	630	562	478	314	216	600, 800						
220中性点 neutral	YH1.5W-144/320W	144	116	/	320	299	205	144	400	31	1856	184	65	2	图19
330	YH10W-288/480W	288	219	792	688	588	408	288	1200	31	3520	963	450	2	图21
	YH10W-300/727W	300	228	824	727	618	425	300	1200						
	YH10W-306/742W	306	233	831	742	630	433	306	1200						
	YH10W-312/780W	312	237	847	780	643	442	312	1200						
	YH10W-324/780W	324	246	880	780	680	458	324	1200						
330中性点 neutral	YH1.5W-207/440W	207	166	/	440	410	292	207	600	31	2535	220	124	2	图20
500	YH20W-420/1040W	420	318	1170	1040	858	595	420	2000	31	8000	362	862	3	图22
	YH20W-444/1100W	444	334	1238	1100	907	587	444	2000						
	YH20W-468/1180W	468	330	1308	1180	956	630	468	2000						
500中性点 neutral	YH1.5W-102/260W	102	82	/	260	243	155	102	600	31	1264	220	62	1	图18
	YH1.5W-96/260W	96	77	/	260	243	137	96	600						

注：[illegible]

Note: Different types of porcelain and polymeric bases are available in our company.

图22 Fig 22

图21 Fig 21

图20 Fig 20

图19 Fig19

图18 Fig 18

图17 Fig 17

图16 Fig16

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表4 35kV～750kV线路保护用复合外套无间隙金属氧化物避雷器典型产品技术参数和外形尺寸
Tab 4 Typical technical parameters and outline dimensions of 35kV～750kV line protection polymeric gapless MOA

| U_m 系统最高电压 kV rms | Type 型号 | U_r 额定电压 kV rms | U_{ow} 工频耐受电压 kV rms | U_{ow} 操作冲击耐受电压 kV peak | | | U_{ow} 雷电冲击耐受电压 kV peak | U_{ow} 雷电冲击耐受电压 kV peak | U_{ow} 雷电冲击耐受电压 kV peak | U_{ow} 雷电冲击耐受电压 kV peak | U_{ow} 雷电冲击耐受电压 kV peak | U_{ow} 雷电冲击耐受电压 kV peak | U_{ow} 雷电冲击耐受电压 kV peak | 爬电距离 mm | 爬电距离 mm | 爬电距离 mm

主要产品 Main products

直流输电工程用避雷器 MOA for DC transmission system

西电避雷器公司生产的高压系统用避雷器于1983年其他江南变系统中应用，本公司配为国内各电压等级的多个直流输电工程提供了各种型号的高压避雷器。

在1983年，为"舟山"直流工程提供了±100kV直流工程用的成套避雷器；

在1998年，为"林洞"±50kV直流工程提供成套避雷器，并于2001年投入运行；

在1998年，为"葛南"、"上海"±500kV直流工程提供直流母线、中性母线、直流滤波器避雷器；

在2003年，为"南桥"背靠背直流工程提供成套阀避雷器；

在2005年，为"三峡"±500kV直流输电工程提供成套滤波器避雷器；

在2007年，为"高岭"背靠背直流工程提供成套阀避雷器；

在2008年，为"葛南"直流工程提供成套阀避雷器，交流滤波器避雷器；

在2008年，为"云南—广东"±800kV特高压直流工程提供成套交流滤波器避雷器、直流滤波器避雷器。

In 1983, XDSA started to supply MOA for DC system. Since then various types of DC MOA have been supplied to DC projects of different voltage classes.

In 1983, complete set of ±100kV DC arresters for Zhoushan DC project

In 1998, complete set of DC MOA for ±50kV Zhensi DC project, which put into service in 2001

In 1998, MOA for DC bus, neutral bus, DC filter for Gezhouba Shanghai ±500kV DC project

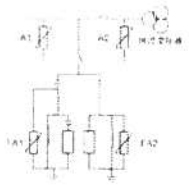
In 2003, complete valve MOA for Unbao back to back DC project

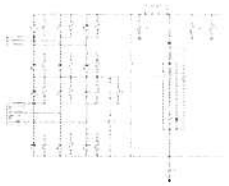
In 2005, complete filters MOA for Three Gouges-Shanghai ±500kV DC project

In 2007, complete valve MOA for Gaolin back to back DC project

In 2008, complete valve MOA and filter MOA for Heihe back-to-back DC project

In 2008, complete MOA for AC and DC filters for ±800kV Yunnang Guangdong UHV DC project

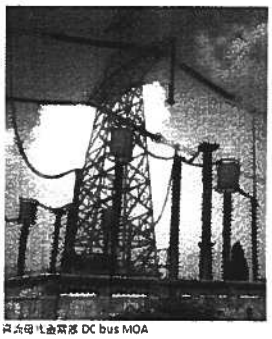




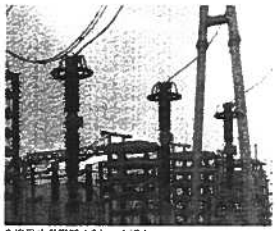
高压换流站避雷器配置
Layout of MOA at DC converter station

A交流母线避雷器，B桥臂避雷器，C换流器避雷器，CB换流器直流母线避雷器，DB直流母线避雷器，DL直流线路避雷器，DR平波电抗器避雷器，E中性母线避雷器，FA交流滤波器避雷器，FD直流滤波器避雷器，M直流中性母线避雷器，V阀避雷器

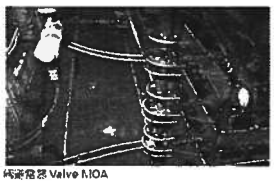
A: AC bus MOA, B: converting bridge MOA, C: converter MOA, CB: converter DC bus MOA, DB: DC bus MOA, DL: DC line arrester, DR: smoothing filter MOA, E: neutral bus MOA, FA: AC filter MOA, FD: DC filter MOA, M: DC neutral bus MOA, V: valve arrester



直流母线避雷器 DC bus MOA

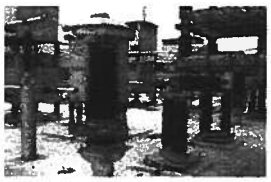


交流母线避雷器 AC bus MOA

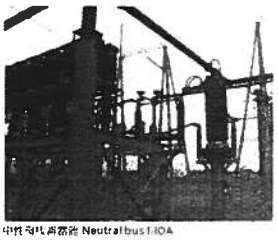


阀避雷器 Valve MOA

直流滤波器避雷器DC filter MOA



交流滤波器避雷器 AC filter MOA



中性母线避雷器 Neutral bus MOA

Kawara Trade S.A

电气化铁电用避雷器 MOA for electrified railway

表6 电气化铁路保护用无间隙金属氧化物避雷器典型产品技术参数和外形尺寸

Tab 6 Typical technical parameters and outline dimensions of gapless MOA for electrified railway protection

U_{Nm} 额定电压 -kV rms	Type 型号	U_c 持续运行电压 kV rms	U_{res} 残压 kV					I_{pr} 额定电流 A	I_{sc} 短路电流 kA	H mm	D mm	Weight 净重 kg	Unit number 单位数量	Fig No. 图号
			1/4C	1/2C	1C	2C	10C							
27.5	YSWT-42/120W	42	34	138	120	98	65	42	400	31	1005	250	78	1	图1
	YLOWT-42/140W	42	34	157	140	119	65	42	400						
	YHSWT-42/120W	42	34	138	120	98	65	42	400	31	682	140	15	1	图18
	YHLOWT-42/105	42	31.5	118	105	89	58	40	400	31	562	150	17		图18
55	YSWT-84/240W	84	68	278	240	196	130	84	400	31	1505	310	202	1	图1
	YSLOWT-84/260W	84	68	301	260	221	130	84							
	YHSWT-84/240W	84	68	278	240	196	130	84			1268	230	62		图18
	YHLOWT-84/240W	84	68	278	240	196	130	84							
110	YSWT-100/280W	100	78	299	260	221	146	100	600	31	1495	310	202	1	图1
	YSLOWT-100/275W	100	73	316	275	234	145	100							
	YHSWT-100/260W	100	78	299	260	221	145	100			1264	230	62		图18
	YHLOWT-100/275W	100	73	316	275	234	145	100							

发电机、电动机保护用避雷器 MOA for protecting electric rotating machines

表7 发电机、电动机保护用无间隙金属氧化物避雷器的主要技术参数

Tab7 Typical technical parameters and outline dimensions of MOA for protecting electric rotating machines

Destination 用途	Type 型号	U_c 持续运行电压 kV rms	U_{res} 残压 kV				I_{sc} 短路电流 kA	I_{pr} 额定电流 A
			1/4C	1/2C	1C	2C		
发电机 generator	YHSW-4/9.5	4	3.2	10.7	9.5	7.6	5.7	3.8	400
	YHSW-8/18.7	8	6.3	21	18.7	15	11.2	7.7	
	YHSW-13.5/31	13.5	10.5	34.7	31	25	18.6	13	
	YHSW-17.5/40	17.5	13.8	44.8	40	32	24.4	17	
	YHSW-20/45	20	15.8	50.4	45	36	28	19.5	
	YHSW-23/51	23	18.0	57.2	51	40.8	31.9	21.9	
	YHSW-25/56.2	25	20.0	62.9	56.2	45.0	35.4	24.3	
电动机 motor	YH2SW-4/9.5	4	3.2	10.7	9.5	7.6	5.7	3.8	400
	YH2SW-8/18.7	8	6.3	21	18.7	15	11.2	7.7	
	YH2SW-13.5/31	13.5	10.5	34.7	31	25	18.6	13	
电机中性 neutral of electric machine	YH1.5W-2.4/6	2.4	1.9	-	6.0	5.0	3.4	2.4	400
	YH1.5W-4.8/12	4.8	3.8	-	12.0	10.0	6.8	4.8	
	YH1.5W-8/19	8	6.4	-	19.0	15.9	11.4	8	
	YH1.5W-10.5/23	10.5	8.4	-	23.0	19.2	14.9	10.5	
	YH1.5W-12/26	12	9.6	-	26.0	21.6	17.0	12	
	YH1.5W-13.7/29.2	13.7	11.0	-	29.2	24.3	19.5	13.7	
	YH1.5W-15.2/31.7	15.2	12.2	-	31.7	26.4	21.6	15.2	

并联补偿电容器组保护用避雷器 MOA for protecting shunt compensation capacitor bank

表8 并联补偿电容器组用无间隙金属氧化物避雷器典型产品技术参数和外形尺寸

Tab 8Typical technical parameters and outline dimensions of gapless MOA for shunt compensation capacitor bank

U_{Nm} 额定电压 kV rms	Type 型号	U_c 持续运行电压 kV rms	U_{res} 残压 kV					I_{pr} 额定电流 A	I_{sc} 短路电流 kA	H mm	D mm	Weight 净重 kg	Unit number 单位数量	Fig No. 图号
			1/4C	1/2C	1C	2C	10C							
6	YHSWR-10/27W	10	8.0	27.0	21.0	14.4	10	400	31	297	108	3.4	1	图16
10	YHSWR-12/32.4W	12	9.6	32.4	25.2	17.4	12	400	31	297	108	3.4	1	图16
	YHSWR-15/40.5W	15	12.0	40.5	31.5	21.8	15							
	YHSWR-17/46W	17	13.6	46	35	24	17							
35	YHSWR-51/134W	51	40.8	134	105	73	51	400～2500	31	682	140	15	1	图18
	YHLOWR-52.7/134W	52.7	42.2	134	105	74.5	52.7			680	210	34		
	YHLOWR-54/134W	54	43.2	134	105	76	54			844	238	54		
	YSWR-51/134W	51	40.8	134	105	73	51	400～2500	31	1005	250	78	1	图1
	YLOWR-52.7/134W	52.7	42.2	134	105	74.5	52.7			1175	290	140		
	YLOWR-54/134W	54	43.2	134	105	76	54			1192	345	205		
110	YSWR-84/222W	84	67.2	221	176	123	84	600～2000	25/31	1704	310	176	1	图1
	YSWR-90/238W	90	72.3	238	190	130	90			2062	351	202		

静止补偿装置用成套避雷器 Complete MOA for static Var compensation device (SVC)

表9 静止补偿装置用成套金属氧化物避雷器技术参数 Tab 9 Technical parameters for SVC

U_{Nm} 额定电压 kV rms	Type 型号	U_c 持续运行电压 kV rms	U_{res} 残压 kV	U_{pl} 工频参考电压 kV rms	U_{pl} 工频参考电压 kV rms	I_{sc} 短路电流 kA	I_{pr} 额定电流 A	U_{res} 残压 kV 8/20
35	YO.5WR-45/106	45	41.26	76.4	45	600	106	
	YO.5WR-45/110	45	38.8	76.3	45	1200	110	
	YO.5WR-42/98.7	42	34.8	69.6	42	600	98.7	
	YO.5WR-36/81.6	36	28.36	56.6	36	600	81.6	
	YO.5WR-42/92	42	23	60	42	600	92	
	YO.5WR-24/56.2	24	23	37.8	24	600	56.2	

三相组合式避雷器 3-phases combinative MOA

表10 三相组合式聚合物外套金属氧化物避雷器典型产品技术参数

Tab 10 Typical technical parameters of 3-phases polymeric combinative MOA

U_{Nm} 额定电压 kV rms	Type 型号	接线方式	U_{res} 残压 kV (max)	U_{pl} 工频参考电压 kV rms			U_{res} 残压 kV	I_{pr} 额定电流 A
				1/4C	1/2C	1C		
10	YHSWZ-17/45×2	相-相	13.6	51.8	45.0	38.3	25	200
		相-地	13.6	51.8	45.0	38.3	24	200
35	YHSWZ-51/134×51/150	相-相	40.8	170.0	150.0	134.0	84.0	400
		相-地	40.8	154.0	134.0	114.0	73.0	400

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主要产品 Main products

电缆保护器 Cable protectors

为了防止电缆绝缘免受过电压的损害而设计的电缆保护器，具还具有自动记录保护器在过电压下动作次数的作用。其技术参数、外形尺寸见表11

The cable protector is designated for protecting insulating sheath from damage of overvoltages and automatic counting its operation number at overvoltages. The dimensions and weight see tab 11.

表11 BYLJS 系列电缆保护器典型产品技术参数和外形尺寸

Tab 11 Typical technical parameters and outline dimensions of BYLJS type cable protector

U_{op} 额定电压 kV rms	Type 型号	$U_{dischargeover}$ 工频放电电压 kV rms/s	U_{res} at 10kA 残压 10kA kVp	U_{max} 最大电压 kVp	H mm	Weight 重量 kg
35	BYLJS-35	5/4	13	5.5	365	6.2
110	BYLJS-110 (Ⅰ)	5/4	15	5.5	365	6.2
	BYLJS-110 (Ⅱ)	10/4	30	11.0	365	6.5
220	BYLJS-220	6/3	35	37.0	365	6.3
500	BYLJS-500	5/4	18(16kA)	5.5	365	6.2

消谐器 Harmonic repressor

6 kV - 35 kV消谐器用于中性点不接地系统，阻尼由电压互感器引起的铁磁谐振，限制系统在一相接地或非先接地时高过电压感应的电磁干扰，保护电压互感器免于烧损而专门设计的。本系列产品属专利型，专利号：85200817.1主要技术参数和外形尺寸，见表12。

Harmonic repressor is a out patented device (patent number 85200817.1) to be used in system with non grounded neutral being designed for damping ferro-resonance caused by voltage inter-reaction and arresting overcurrent passing through HV winding of instrument transformer at one-phase earthing or arcing earthing thus protecting potential transformer from burst. The main technical parameters, dimensions and weight see tab 12.

表12 6 kV - 35 kV消谐器典型产品技术参数和外形尺寸

Tab 12 Typical technical parameters and outline dimensions of 6kV - 35kV harmonic repressors

Type 型号	Nominal coef 额定阻尼率	$U_{dischargeover}$ 放电电压	10min 外加电压电流 额定 1min 1A(mA)	I_{1min} at U_{n} 10min	I_{1phase} at U_{n} 2h	高度 height mm	宽度 width mm	深度 depth mm
RXQ1-6~10	0.5~0.6	1.45~1.7(15mA)	9	250	20	430	125	8.5
RXQ1-35	0.22~0.277	≥2.8(50mA)	5	350	350	322	125	6.5

监测器 Monitors

JCQ3型避雷器监测器是用来在避雷器下面用来监测和记录避雷器动作次数的一种装置。用于6kV - 750kV交流电力系统的避雷器的监测器的型号说明如下所示，其电气性能参数见表13。

JCQ3 Monitor is a device to be connected senously beneath 6kV - 750kV MOA for monitoring leakage current and counting discharge number, with designation of type letters given as follows, and electrical parameters in Tab 13

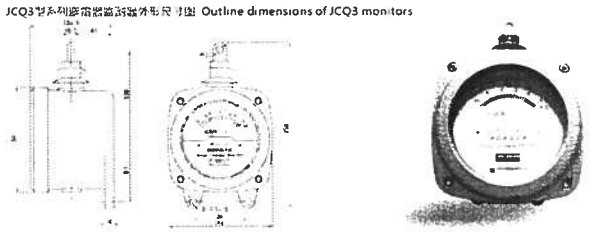
□□□－□/□

方波冲击电流
Rectangular 2ms withstand discharge current
额定工频电流
Rated current
设计序号，用A，B，C等表示
Design series, mean with A,B,C,ect
铝壳结构，J表示为铝壳结构
Design feature, J mean for the cast aluminum hull body
产品名称，用JCQ表示
Product name, mean with JCQ

表13 监测器技术参数 Tab 13 Technical parameters of monitors

U_{op} 额定电压 kV	Type 型号	I_{n} 额定电流 8/20 kA	I_{d} 方波冲击电流 8/20 kA	I_{dw} 2000μs 方波冲击电流 2ms kA	Impulse current 4/10 冲击电流 kA	U_{res} 残压 kVp	Basic scale of current 电流基本刻度 mA rms	Mass 重量 kg
6~110	JCQ3A-10/600	10	50	600	100	1.5	0~2	3
330	JCQ3A-10/1500	10	50	1500	100	1.5	0~5	3
500	JCQ3A-20/2000	20	50	2000	20	50	0~5	3
750	JCQ3C-20/2500	20	50	2500	20	50	0~60(广角型)	3.5
6~220	JCQ3A-10/800	10	50	800	100	1.5	0~2	3

JCQ3型系列避雷器监测器外形尺寸图 Outline dimensions of JCQ3 monitors



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● 售后服务 After-sales service

[illegible]产品的运行安全性，对投入使用的避雷器及其附属产品，本公司指定用户定期派出专业技术人员，严格按照GB 11032《交流无间隙金属氧化物避雷器》标准和DL/T 596《电力设备预防性试验规程》进行服务检测。

For operation security of MOA and accessories in service, XDSA undertakes to make regular tour or dispatch professional technicians to users for site inspection according to standard GB11032 "AC metal oxide surge arrester without gaps" and DL/T 596 "Regulations of prophylactic tests on power installations".

● 订货须知 Information to be provided at ordering

产品型号 Type of product
结构类型 Design category
运行要求（污秽、海拔、爬电距离），Service requirements (pollution level, altitude, creapage distance)
必须的附件（监测器、计数器），Accessory required (monitor, counter)
订货数量 order quantity
其它特殊要求。Other specific requirements

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ISO

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THE INTERNATIONAL CERTIFICATION NETWORK

CERTIFICATE

CQC *has issued an IQNet recognized certificate that the organization:*

Xi'an XD Arrester Co.,Ltd.

Registration Address:Kaixin Building,No.130 Weiyang Road,Weiyang District,Xi'an,Shaanxi,China
Operation Address: No.18 Jingwei 1st Road,Jinghe Industrial Park,Xi'an Economic & Technological Development Zone,Weiyang District,Xi'an,Shaanxi,China

has implemented and maintains a

Quality Management System

for the following scope:

Design,Development,Manufacture and Marketing Service of Surge Arresters,Over-voltage Protection Devices)and the Relative Products,Composite Insulators

which fulfils the requirements of the following standard:

GB/T 19001-2016 / ISO 9001:2015

Issued on: July 8, 2021

Expires on: June 11, 2024

Registration Number: ***CN00121Q36276R4M/6100***

This attestation is directly linked to the IQNet Partner's original certificate and shall not be used as a stand-alone document

Partner of IQNet

Alex Stoichitoiu
President of IQNet

谢肇煦
Xie ZhaoXu
President of CQC

CQC
Kawara Trade S.A

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FCAV *Brazil* FONDONORMA *Venezuela* ICONTEC *Colombia* Inspecta Sertifiointi Oy *Finland* INTECO *Costa Rica*
IRAM *Argentina* JQA *Japan* KFQ *Korea* MIRTEC *Greece* MSZT *Hungary* Nemko AS *Norway* NSAI *Ireland*
NYCE-SIGE *México* PCBC *Poland* Quality Austria *Austria* RR *Russia* SII *Israel* SIQ *Slovenia*
SIRIM QAS International *Malaysia* SOS *Switzerland* SRAC *Romania* TEST St Petersburg *Russia* TSE *Turkey* YUQS *Serbia*

ENVIRONMENTAL MANAGEMENT SYSTEM CERTIFICATE

Certificate No. 00119E30238R3M/6100

We hereby certify that

XI'AN XD ARRESTER CO., LTD.

Registered Adds: Kaixin Building, No.130，Weiyang Road, Weiyang District, Xi' an City, Shaanxi Province, P.R.China

Operating Adds: No.18，Jingwei 1st Road, Jinghe Industrial Park, Economic Technology Development Zone, Weiyang District, Xi' an City, Shaanxi Province, P.R.China

by reason of its

Environmental Management System

has been awarded this certificate for compliance with the standard

GB/T 24001-2016 / ISO 14001:2015

The Environmental Management System Applies in the following area:

Design, Development, Manufacture of Surge Arresters（ Over-voltage Protection Devices） and the Relative Products and Related Management Activities

Certified since: February 23, 2010 Valid from: January 21, 2019 Valid until: January 27, 2022

After a surveillance cycle, the certificate is valid only when used together with an Acceptance Notice of Surveillance Audit issued by CQC. Please access www.cqc.com.cn for checking validity of the certificate.

中国认可
国际互认
管理体系
MANAGEMENT SYSTEM
CNAS C001-M

Signed by: Lu Mei

CHINA QUALITY CERTIFICATION CENTRE

Section 9, No.188, Nansihuan(the South Fourth Ring Road) Xilu(West Road), Beijing 100070,China

http://www.cqc.com.cn

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OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEM CERTIFICATE

Certificate No. 00119S20174R3M/6100

We hereby certify that

XI'AN XD ARRESTER CO., LTD.

Registered Adds: Kaixin Building, No.130, Weiyang Road, Weiyang District, Xi' an City, Shaanxi Province, P.R.China
Operating Adds: No.18, Jingwei 1st Road, Jinghe Industrial Park, Economic Technology Development Zone, Weiyang District, Xi' an City, Shaanxi Province, P.R.China

has been awarded this certificate for compliance with the standard

GB/T 28001-2011/OHSAS 18001: 2007

The Occupational Health and Safety Management applies in the following area:

Design, Development, Manufacture of Surge Arresters（Over-voltage Protection Devices） and the Relative Products and Related Management Activities

Certified since: February 23, 2010 Valid from: January 21, 2019 Valid until: January 27, 2022

The expiry date of the OHSAS18001:2007 certificates are 11/03/2021, please migration to ISO45001:2018 certificates before that time.
After a surveillance cycle, the certificate is valid only when used together with an Acceptance Notice of Surveillance Audit issued by CQC.
Please access www.cqc.com.cn for checking validity of the certificate.

中国认可 管理体系 MANAGEMENT SYSTEM CNAS C001-M

Signed by: Lu Mei

Partner of IQNet

CHINA QUALITY CERTIFICATION CENTRE 中国质量认证中心

CHINA QUALITY CERTIFICATION CENTRE

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TEST REPORT

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KEMA

Report

TIC 3137-14

Type tests on 72-420 kV porcelain-housed metal oxide surge arrester without gaps, type Y10W3L-72 to Y10W3L-420 10 kA Class 3

Manufacturer
Xi'an XD Arrester Co., Ltd.
China.

Kawara Trade S.A.

Arnhem, 5 February 2015

Experience you can trust.

INSPECTION REPORT

Report no.	TIC 3137-14
Client	Xi'an XD Arrester Co., Ltd.
Reference	72130634
Concerning	Type test
Date	5 Mai up to 18 June 2014
Place	XIHARI, Xi'an, China
Object	72-420 kV porcelain-housed metal oxide surge arrester
Type	Y10W3L-72, Y10W3L-100, Y10W3L-123, Y10W3L-145, Y10W3L-170, Y10W3L-245, Y10W3L-300, Y10W3L-362, and Y10W3L-420.
Manufacturer	Xi'an XD Arrester Co., LTD. Xi'an, China

REQUIREMENTS

As per IEC 60099-4 Edition 2.2 (2009-05).

INSPECTION PROGRAMME

The programme was specified by the manufacturer.
For the programme we refer to page 3.

SUMMARY AND CONCLUSION

The results obtained relate only to the work ordered and to the material inspected.
The arrester withstood all type tests as per inspection programme of page 3.

KEMA Nederland B.V.

S.A.M. Verhoeven
Director Testing, Inspections & Certification The Netherlands

Author E.Hanique

This report consists of:
68 pages incl. 3 annexes (53 pages)

Arnhem, 5 February 2015

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Utrechtseweg 310, 6812 AR Arnhem. Telephone + 31 26 3 56 22 85. Telefax + 31 26 3 51 36 83

MATERIAL DATA

Object		Porcelain-housed metal oxide surge arrester without gaps.
Type		Y10W3L-72, Y10W3L-100, Y10W3L-123, Y10W3L-145, Y10W3L-170, Y10W3L-245, Y10W3L-300, Y10W3L-362 and Y10W3L-420.
Manufacturer		Xi'an XD Arrester Co., LTD
Manufacturer of ZnO blocks		Xi'an XD Arrester Co., LTD
System voltage	kV	420 (72 ~ 420)
Rated voltage	kV	420 (54 ~ 420)
Number of phases		1
Rated frequency	Hz	50 ~ 60
Nominal discharge current	kA	10
Continuous operating voltage Ucov	kV	336 (43.2 ~ 336)
Residual voltage at		
- nominal discharge current 8/20 µs	kV	≤ 988 (127 ~ 988)
- steep current 1/10 µs	kV	≤ 1116 (144 ~ 1116)
- switching impulse current 40/100 µs	kV	≤ 832 (107 ~ 832)
Line discharge class		3
Insulation level		
- lightning impulse	kV	619
- wet switching impulse	kV	416
- wet power frequency	kV	285
Block dimensions		
- outer diameter	mm	70
- height	mm	20
Rated short-circuit withstand current	kA	-

Some photographs taken during tests are shown in annex A.
The exact data of arrester as well the drawings are summarized in annex B, pages 19 to 27.

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INSPECTION PROGRAM

		Standard	Clause
0	INSPECTION OF THE TEST SET-UP		
1	COMPLETE ARRESTER		
1.1	Internal partial discharge test	IEC 60099-4	8.8
1.2	Test of the bending moment	IEC 60099-4	8.9
1.2.1	Bending moment test to determine the average Value of the breaking load (MBL)	IEC 60099-4	8.9.3.1
1.2.2	Static bending moment test	IEC 60099-4	8.9.3.2
1.3	Environmental test	IEC 60099-4	8.10
1.3.1	Temperature cycling test	IEC 60099-4	8.10.3.1
1.3.2	Salt mist test	IEC 60099-4	8.10.3.2
1.4	Artificial pollution test	IEC 60099-4	Annex F
1.5	Seal leak rate test	IEC 60099-4	8.11
1.6	Radio Interference Voltage test	IEC 60099-4	8.12
2	ARRESTER HOUSING		
2.1	Lightning impulse voltage test	IEC 60099-4	8.2.6
2.2	Wet switching impulse test	IEC 60099-4	8.2.7
2.3	Wet power frequency voltage test	IEC 60099-4	8.2.8
3	ARRESTER SECTION		
3.1	Residual voltage test		
3.1.1	Lightning impulse	IEC 60099-4	8.3.2
3.1.2	Steep current	IEC 60099-4	8.3.1
3.1.3	Switching impulse	IEC 60099-4	8.3.3
3.2	Long duration current impulse withstand test	IEC 60099-4	8.4.2
3.3	Operating duty test		
3.3.1	Accelerated ageing test	IEC 60099-4	8.5.2
3.3.2	Test to verify thermal equivalency	IEC 60099-4	Annex B
3.3.3	Switching surge operating duty test	IEC 60099-4	8.5.5
3.3.3.1	Conditioning	IEC 60099-4	8.5.5.1
3.3.3.2	Applied class 3 line discharge withstand current	IEC 60099-4	8.5.5.2
3.3.4	Verification of the power-frequency voltage-versus-time characteristics	IEC 60099-4	Annex D

The inspection program was specified by the manufacturer. All measurements and tests ~~are~~ in accordance with IEC 60099-4 Edition 2.2 (2009-05).

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PERSONS ATTENDING THE INSPECTION

Mr. Lyu Wei	Xi'an XD Arrester Co., LTD, Xi'an, China
Mr. Zhu Jiaxi	Xi'an XD Arrester Co., LTD, Xi'an, China
Mr. Sang Jian Ping	XIHARI, Xi'an, China

THE INSPECTION WAS CARRIED OUT BY

Mr. E. Hanique	KEMA Nederland B.V.

PURPOSE OF THE INSPECTION

Purpose of the inspection was to verify whether the arrester complies with the specified requirements.

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DESCRIPTION AND RESULTS OF THE TEST

0 INSPECTION OF THE TEST SET-UP

The tests were carried out in the laboratory of Xi'an High Voltage Apparatus Research Institute Co. LTD (XIHARI) in Xi'an, China, who is therefore jointly responsible for the correctness of the results obtained. The measuring devices and the test set-up were checked by KEMA and where necessary calibrated.

Result

The inspection results did not give rise to remarks.

1 COMPLETE ARRESTER

1.1 Internal partial discharge test

The internal partial discharges were measured on a Y10W3L-168 type of arrester when applying a power frequency voltage to the arrester. The voltage was first raised to the rated voltage, held for 10 s and then decreased to 1,05 times the continuous operating voltage at which level the partial discharges were measured.
The partial discharge level should be below 10 pC.
The results of this measurement are summarised in annex B, page 4.

Result

The test results fulfilled the requirements.

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1.2 Test of bending moment

The test was performed on a sample with the maximum physical length of this design.
This test consists of two parts:

- bending moment test to determine the mean value of the breaking load (MBL)
- static bending moment test.

The results of this measurement are summarised in annex B, pages 15 and16.

1.2.1 Bending moment test to determine the mean value of the breaking load (MBL)

The test was performed on three samples with the maximum physical length of this design. The bending load was increased smoothly until breaking occurs within 30 s to 90 s. Also the kind of fracture was recorded. Next the average value of the breaking moment was calculated.
The results of this measurement are summarised in annex B, page 15.

Result

The test results fulfilled the requirements.

1.2.2 Static bending moment test

For this test three samples were used. The bending load was increased smoothly to the specified short-term load (SSL) of 18kN•m during 90 s. During this time the deflection was measured. Then the load was realised smoothly. Next the residual deflection was measured. Before and after this test the following tests were performed and compared:

- seal leak rate test
- internal partial discharge test.

The results of this measurement are summarised in annex B, page 16.

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Result

The test results fulfilled the requirements.

1.3 Environmental test

The used test sample was representative for this design.
This test consists of two parts:

- temperature cycling test
- salt mist test.

Before and after this test a Seal leak test was performed and compared
The results of this measurement are summarised in annex B, page 17.

1.3.1 Temperature cycling test

For this test the test sample was placed in a temperature controlled chamber. First the sample was heated to 60 °C and this temperature was maintained for 3 hours. Next, the sample was cooled down to -25 °C and this temperature was also maintained for 3 hours. The whole procedure was repeated 10 times.
The results of this measurement are summarised in annex B, page 17.

Result

The test results fulfilled the requirements.

1.3.2 Salt mist test

For this test the samples was placed in an environmental controlled chamber of 10 m^3 during 96 hours. The salt mist was generated from a salt solution density of 5,1%.
The results of this measurement are summarised in annex B, page 17.

Result

The test results fulfilled the requirements.

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1.4 Artificial pollution test

This sample was a Y10W3L-168 type of arrester. The sample was heated to 120 °C within 10 minutes. The applied charge was recorded. Next the sample was allowed to cool-down to 60 °C and the time to reach this temperature recorded. This data was used for the calculation of the maximum theoretical temperature rise in service. This resulted in a value lower < 40 K, which made therefor the performance of a pollution test unnecessary.
The results of this measurement are summarised in annex B, page 18.

Result

The test results fulfilled the requirements.

1.5 Seal leak rate test

The used test sample was representative for this design. The sample was connected to a vacuum pump. At vacuum, helium gas was externally prayed over the sealing. With a gas detector the leakage rated was measured.
The results of this measurement are summarised in annex B, page 15.

Result

The test results fulfilled the requirements.

1.6 Radio Interference Voltage test

The test was performed on the longest arrester, with the highest rated voltage for this design. The measurement circuit was calibrated to determine the correction factor. Next a test voltage of 353 kV was applied between the terminals and the earthed base and the RIV measured.
The results of this measurement are summarised in annex B, page 4.

Result

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The test results fulfilled the requirements.

2 ARRESTER HOUSING

2.1 Lightning impulse voltage test

For this test type Y10W3L-168 was used. During this test all metal-oxide blocks were removed from the arrester. The insulation to ground was tested with a standard lightning impulse voltage of 619 kV, with 15 impulses of positive polarity and 15 impulses of negative polarity. The results of this measurement are summarised in annex B, page 14.
The results of this test are summarised in annex B, page 42.
No disruptive discharges during the application of the impulses.

Result

The test results fulfilled the requirements.

2.2 Wet switching impulse voltage test

This test was performed on the same arrester used for the Lightning Impulse test described in section 2.1. The insulation to ground was tested with a switching impulse voltage of 416 kV, with 15 impulses of positive polarity and 15 impulses of negative polarity while sprayed by artificial rain.
The rain density was 1,40 mm/min horizontal and 1,90 mm/min vertical. The conductivity of the rain water was 97,1 µS/cm
The results of this measurement are summarised in annex B, page 14.
The results of this test are summarised in annex B, page 43.
No external disruptive discharge during the test

Result

The test results fulfilled the requirements.

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2.3 Wet power-frequency voltage test

This test was performed on the same arrester used for the Lightning Impulse test described in section 2.1. The insulation to ground was tested with a power frequency voltage of 285 kV and 50 Hz during 1 minute while sprayed by artificial rain. The rain density was 1.2 mm/min horizontal and 1.55 mm/min vertical. The conductivity of the rain water was 105.9 µS/cm
The results of this test are summarised in annex B, page 14.
No external disruptive discharge during the test

Result

The test results fulfilled the requirements.

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3 ARRESTER SECTION

3.1 Residual voltage test

All residual voltage tests were carried out on the same three arrester sections. By multiplying the measured residual voltage by the number of sections per arrester the equivalent residual voltage of the arrester was calculated.

3.1.1 Lightning impulse

Three lightning current impulses with a waveform of 8/20 µs with a peak value of respectively 1,5, 3, 5, 10 and 20 kA were applied to each of the three sections. The maximum value of the residual voltage was recorded.
The results of this test are summarised in annex B, pages 5 and 36
The acceptance criterion is:

- The equivalent residual voltage of the arrester at nominal discharge current (10 kA) should be below the specified residual voltage given in annex B, page 5.

Result

The test results fulfilled the requirements.

3.1.2 Switching impulse current

One switching impulse current with a waveform of 40/100 µs and a peak value of respectively 0,5, 1 and 2 kA was applied to each of the three sections. The maximum value of the residual voltage was recorded.
The results of this test are summarised in annex B, pages 7 and 38.
The acceptance criterion is:

- The equivalent residual voltage of the arrester at nominal discharge current should be below the specified steep current impulse residual voltage given in annex B, page 7.

Result

The test results fulfilled the requirements.

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3.1.3 Steep current

One steep current impulse with a waveform of 1/5 µs and a peak value of 10 kA was applied to each of the three sections. The maximum value of the residual voltage was recorded.
The results of this test are summarised in annex B, pages 6 and 37.
The acceptance criterion is:

- The equivalent residual voltage of the arrester at nominal discharge current should be below the specified steep current impulse residual voltage given in annex B, page 6.

Result

The test results fulfilled the requirements.

3.2 Long duration current impulse withstand test

The long duration current impulse withstand test of 670 A during 2650 µs to obtain a total energy of 9,97 kJ was carried out on three arrester sections consisting of one metal-oxide block. The line discharge class is 3.
Before this test the lightning impulse residual voltage at nominal discharge was measured.
Each sample was tested with 18 long duration impulses divided in 6 groups. Between each impulse there is a pause of 50 to 60 s and between each group the samples are cooled down to ambient.
Following the test and after the samples are cooled down to ambient the lightning impulse residual voltage at nominal discharge current was measured again and compared with the initial measurements.
The results of this test are summarised in annex B, pages 8 and 9.

The acceptance criteria are:

- no evidence of puncture, flashover or other significant damage
- change of residual voltage should be less than 5%.

Result

The test results fulfilled the requirements.

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3.3 Operating duty test

The operating duty test was carried out on three arrester sections mounted in a thermal equivalent test housing. The continuous operating voltage of one section is 2,4 kV and consisted of one metal-oxide block. Successively the following tests were carried out.

3.3.1 Accelerated ageing test

This test is designed to determine the elevated test voltages and to decide whether new or aged samples shall be used in the operating duty test.
The three samples were subjected to a long duration test with a corrected Ucov of 2,70 kV during 1000 hours. During the whole test duration the resistive power losses are measured. Taken into account the results of these loss measurements and using the calculation method described in the IEC standard the choice between aged and new samples for the following tests has to be made. The result of this test is summarized in annex B, page 10.

Result

The test results fulfilled the requirements.

3.3.2 Test to verify thermal equivalency

In order to prove that the test samples as used during the operating duty test, paragraph 3.3.2 are thermal equivalent to the complete arrester a test following the procedure in IEC 60099-4, Annex B has been carried out. The result of this test is summarized in annex C, pages 1 to 3, figure 1. It was proved that the test sample is thermal equivalent.

Result

The test results fulfilled the requirements.

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3.3.3 Switching surge operating duty test

These tests were performed on three new samples and consisted of two tests:

- conditioning
- applied class 3 line discharge withstand current.

Before the conditioning test the lightning impulse residual voltage at nominal discharge current was determined.

3.3.3.1 Conditioning

For this test the three samples were exposed to 20 lightning current impulses of 8/20 µs with nominal discharge current. The impulses were applied while the sample was energized at 1,2 x Ucov. The 20 impulses are applied in four groups of 5 impulses. The interval between each impulse was 50 - 60 s and between each group 25 - 30 min.
Next, two high current impulses of 100 kA, 4/10 µs were applied.
The results of this test are summarised in annex B, page 11.

Result

The test results fulfilled the requirements.

3.3.3.2 Applied class 3 line discharge withstand current

Before these test the samples were preheated to a temperature of 60 °C. For this test the samples were exposed to two class 3 line discharge impulse withstand current of 760 A to obtain the requested impulse energy of 10,07 kJ. Within 75 ms after each test a power frequency of 3,0 kV during 30 min was applied. During these 30 min. the power dissipation of the sample was measured.
Before and after this test a lightning impulse residual voltage test with 8/20 µs at 10 kA were performed and compared.
The results of this test are summarised in annex B, page 12.

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The acceptance criteria are:

- the measurement of the losses during the voltage application did not show thermal instability
- change of residual voltage should be less than 5%
- no evidence of puncture, flashover or other significant damage.

Result

The test results fulfilled the requirements.

3.3.4 Verification of the power-frequency voltage-versus-time characteristics

During this test four samples were used. They were all pre-heated to 60 °C and two shots of class 3 line discharge withstand current impulses were applied to give the energy prior to the power-frequency voltage application according IEC 60099-4 Table D.3. The time interval between the two shots was 55 s. After the last shot an overvoltage was applied of 3,6 kV during 0,1 s followed by an applied voltage of 2,4 kV during 30 min for the first sample. For the second sample an overvoltage of 3,45 kV during 1 s followed by an applied voltage of 2,4 kV during 30 min. For the third sample an overvoltage of 3,30 kV during 11 s followed by an applied voltage of 2,4 kV during 30 min and last for the fourth sample an overvoltage of 3,00 kV during 1200 s followed by an applied voltage of 2,4 kV during 30 min.
The results of this test are summarised in annex B, page 13.

Result

The test results fulfilled the requirements.

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ANNEX A PHOTOGRAPHS TAKEN DURING TYPE TESTING

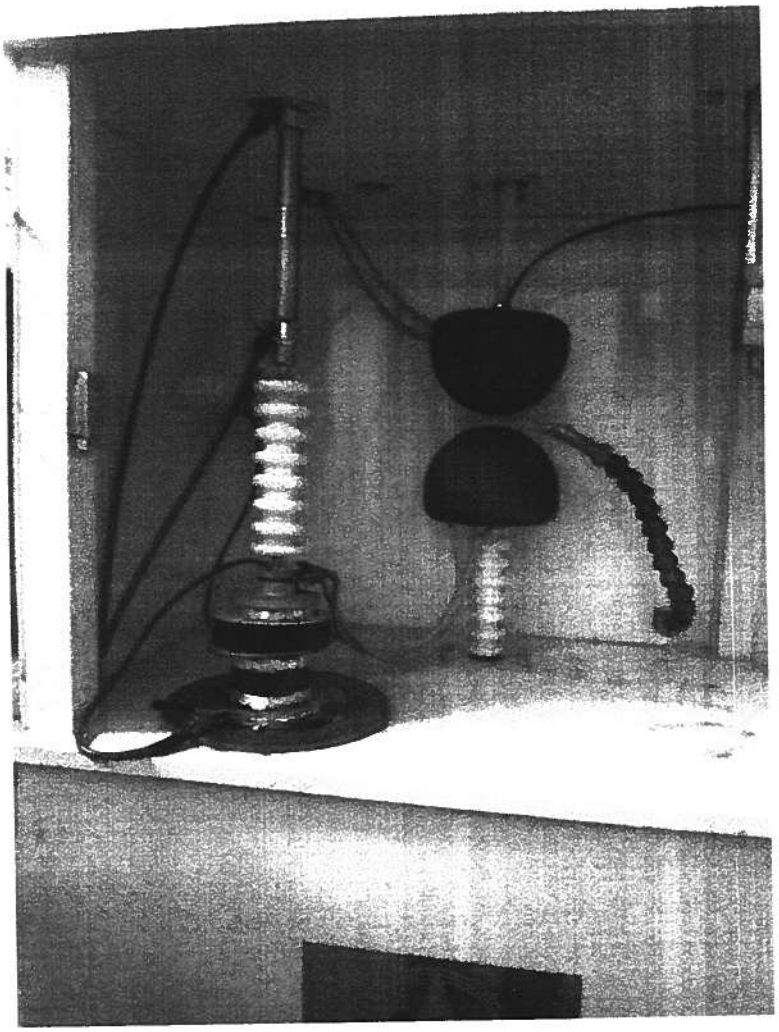

Photo 1: Varistor sample ready for current discharge test

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ANNEX B **INSPECTION REPORT OF XHIHARI**

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2012000196Z (2012)国认监认字(059)号

TESTING CNAS L0223

XIHARI

No. 140001B

TEST REPORT

TEST OBJECT: Y10W3L 10kA Class 3 Series Porcelain Housed Metal-oxide Surge Arresters without gaps

CLIENT: XIAN XD ARRESTER CO., LTD.

TEST CLASSIFICATION: Type Test

XI'AN HIGH VOLTAGE APPARATUS RESEARCH INSTITUTE CO., LTD.

NATIONAL QUALITY SUPERVISION & INSPECTION CENTER FOR INSULATOR & SURGE ARRESTER

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REMARK

1、 The test report will be invalid without the "Special stamp for test repot" or the seal.

2、 While without the laboratory permission in writing form, it's only allowed to completely copy this report; or copy these pages--the test conclusion pages and summary pages in the same time.

3、 The test report will be invalid without the original signature of edit by, checked by and approval by.

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6、 This test report is only for the testedobject. It's manufacturer's duty to keep the uniformity of any products of the same type using the same design and the test object.

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Address: Xi'an High Voltage Apparatus Research Institute Co.,Ltd. No.18 North Section of Xi'erhuan, Shaanxi, China
Zip : 710077
Tel. : (029)84225675 (029)84221456
Fax. : (029)84225680
E-mail: lab@xihari.com

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XIHARI

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XIHARI	Test Report	No. 140001B Page 2 of 44

Summary

Apparatus		Y10W3L 10kA Class 3 Series Porcelain Housed Metal-oxide Surge Arresters without gaps
Client	Name Connection	Xi'an XD Arrester Co., Ltd. Jingwei Road , Jinghe Industry Estate XI'AN Economic Technology Development Zone, (710200) Tel: 029-86065031 Fax: 029-86065050
Manufacturer		XIAN XD ARRESTER CO., LTD.
Manufacture date and serial No.		/
Manufacture date and serial No.		/

Rated value assigned by the client	Systems voltage	kVrms	420(72~420)
	Rated voltage U_r	kVrms	420(54~420)
	Continuous operating voltage U_c	kVrms	336(43.2~336)
	Rated frequency	Hz	50~60
	Line discharge withstand		Class 3
	Nominal discharge current I_n	kAp	10
	Lightning impulse residual voltage ≤	kVp	998(127~988)
	Steep impulse residual voltage ≤	kVp	1116(144~1116)
	Switching impulse residual voltage ≤	kVp	832(107~832)
	The size of resistors	mm	Φ70×20
	Materials and colors of housing	Brown porcelain-housed	
	The arrester shape and dimension please see "Drawing included" of page 19~27 and "Photographs "of page 28~30 of this report .		

The tested object is guaranteed by the manufacturer to comply with the following technical documents and drawings	283091-JT-2013 Y10W3L 10kA Class 3 Series Porcelain Housed Metal-oxide Surge Arresters without gaps technical requirement
	283091-SG-2013 Y10W3L 10kA Class 3 Series Porcelain Housed Metal-oxide Surge Arresters without gaps type test outline
	283011~283091 Y10W3L 10kA Class 3 Series Porcelain Housed Metal-oxide Surge Arresters without gaps outline drawing
Note	1. Serial Number: arrester: 010,012,014~016,020 ; housing:017~019,025-W; section: A1~A3, L1~L3,O1~O3,T1~T4. 2. This series of arresters include Y10W3L(72~420kV) for the AC system.All technical parameter and production size please see 283091-JT-2013 techincal specifications. 3. This series of arresters are design A,This series of arresters are the same design,houses and sheds are the same size,and the blocks are the same size. 4. The longest electrical unit and mechanical unit is Y10W3L-168 in this series of arresters. the shortest electrical unit is Y10W3L-96,the maximum rated voltage unit is Y10W3L-420.
Tests witnessed by:	Miao Kui
Date of sample arrived:	2014-03-21
Date of tests:	From 2014-05-05 To 2014-06-18

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Test Conclusion

Client: XI'AN XD ARRESTER CO.,LTD

Apparatus: Y10W3L 10kA Class 3 Series Porcelain Housed Metal-oxide Surge Arresters without gaps

Manufacturer: XI'AN XD ARRESTER CO.,LTD

Test Classification: Type Test

Tests have been performed:

- Internal partial discharge test
- Radio interference voltage test
- Residual voltage test
- Long duration current impulse withstand test [Class 3 line discharge withstand, 18 times]
- Operating duty test [100kA, 2 times]
- Power frequency voltage versus time characteristics test
- Insulation withstand tests on the arrester housing
- Seal leak rate test
- Bending moment test
- Environmental tests
- Artificial pollution tests

The tests have been performed in accordance with:

IEC 60099-4:2009 Metal-oxide surge arresters without gaps for a.c. systems

Conclusion:

All the tests above satisfied the requirements of standards.

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Translated by: 艾利 Checked by: Approved by:

Date: 2014-09-11 Date: 2014-09-11 Date: 2014-09-11

XIHARI

Date of tests: 2014-05-06

1 Internal Partial Discharge Test

Environmental temperature :19.9 ℃ Relative humidity: 44% P=96.7 kPa

No.	Applied voltage U_r kVrms	Continuous times s	Applied 1.05U_c kVrms	P.D. Value pC
014	168	10	141.1	≤6
Req.	168	2 - 10	141.1	<10

Test Conclusion: Satisfied. (No.014 sample is Y10W3L-168 arrester)

2 Radio Interference Voltage Test

Environmental temperature :19.9 ℃ Relative humidity: 44% P=96.7 kPa
Testing frequency:1.0MHz

No.	Applied 1.05U_c kVrms	Field density dB	RIV value μV
012	352.9	41.1	113.5
Req.	352.8	/	≤2500

Test Conclusion: Satisfied.(No.012 sample is Y10W3L-420 arrester)

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Date of tests: 2014-05-05

3 Residual Voltage Test

3.1 8/20μs Lightning impulse residual voltage test

Environmental temperature : 19.6℃ Relative humidity:42%

(Oscillogram see fig 140003B 28-1～140003B 28-3)

No.	Residual voltage of sections kV				
	1.5kA	3kA	5kA	10kA	20kA
R1	5.87	6.16	6.41	6.84	7.54
R2	5.87	6.15	6.38	6.86	7.51
R3	5.84	6.12	6.40	6.87	7.50

Arrester type	Max voltage of system kVrms	Sections ratio n	Residual voltage of arrester at 10kA kV	Req. kV
Y10W3L-96	72	32	220	<226
Y10W3L-96	100	32	220	<226
Y10W3L-126	123	42	289	<296
Y10W3L-144	145	48	330	<339
Y10W3L-168	170	56	385	<395
Y10W3L-228	245	76	522	<536
Y10W3L-276	300	92	632	<649
Y10W3L-288	362	96	660	<677
Y10W3L-420	420	140	962	<988

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Date of tests: 2014-05-07

3.2 1/5μs Steep impulse residual voltage test

Environmental temperature : 22.7℃ Relative humidity:50%

(Oscillogram see fig 140003B 28-4～140003B 28-6)

No.	Residual voltage of arrester at 10kA kV		
	Residual voltage of sections kV	Residual voltage of the metal blocks kV	Corrected residual voltage kV
R1	7.37	0.16	7.21
R2	7.28		7.12
R3	7.30		7.14

Arrester type	Max voltage of system kVrms	Sections ratio n	Corrected residual voltage multiplies the scale factor kV	Height of arrester H m	The inductive voltage drop U_L kV	Residual voltage of arrester at 10kA kV	Req. kV
Y10W3L-96	72	32	230.7	1.275	12.75	243	≤255
Y10W3L-96	100	32	230.7	1.444	14.44	245	≤255
Y10W3L-126	123	42	302.8	1.613	16.13	319	≤335
Y10W3L-144	145	48	346.1	1.782	17.82	364	≤383
Y10W3L-168	170	56	403.8	1.951	19.51	423	≤447
Y10W3L-228	245	76	548.0	3.105	31.05	579	≤606
Y10W3L-276	300	92	663.3	3.443	34.43	698	≤734
Y10W3L-288	362	96	692.2	3.783	37.83	730	≤765
Y10W3L-420	420	140	1009.4	5.104	51.04	1060	≤1116

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Date of tests: 2014-05-05

3.3 40/100μs Switching impulse residual voltage test

Environmental temperature : 19.6℃ Relative humidity:42%

(Oscillogram see fig 140003B 28-7～140003B 28-9)

No.	Residual voltage of sections kV		
	0.5kA	1kA	2kA
R1	5.62	5.80	5.99
R2	5.62	5.79	5.95
R3	5.58	5.76	5.95

Arrester type	Max voltage of system kVrms	Sections ratio n	Residual voltage of arrester at 1kA kV	Req. kV
Y10W3L-96	72	32	186	<190
Y10W3L-96	100	32	186	<190
Y10W3L-126	123	42	244	<250
Y10W3L-144	145	48	278	<285
Y10W3L-168	170	56	325	<333
Y10W3L-228	245	76	441	<452
Y10W3L-276	300	92	534	<547
Y10W3L-288	362	96	557	<571
Y10W3L-420	420	140	812	<832

Test Conclusion: Satisfied. (The test data come from report of 140003B)

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Date of tests: 2014-05-05～2014-05-06

4 Long Duration Current Impulse Withstand Test (Class 3 line discharge withstand)

Environmental temperature :19.6℃ Relative humidity:42 % P=97.3 kPa

(Oscillogram see fig 140001B 9-1～140001B 9-3)

No.			L1	L2	L3	Req.
U_{sr}		kV	3.00	3.00	3.00	3～12
8/20μs,U_{10kA} before		kV	6.87	6.84	6.80	/
40/100μs, U_{250A}		kV	5.40	5.42	5.42	/
Virtual time (T)		μs	2650 (Class 3 line discharge)			2400 (100%～120%)
1st.	Current	A	667	669	669	/
	Voltage	kV	5.80	5.80	5.80	/
	Energy	kJ	10.25	10.28	10.28	9.97 (90%～110%)
2nd.	Current	A	667	673	673	/
	Voltage	kV	5.80	5.80	5.80	/
	Energy	kJ	10.25	10.34	10.34	9.97 (100%～110%)
3rd.	Current	A	675	673	673	/
	Voltage	kV	5.80	5.80	5.80	/
	Energy	kJ	10.37	10.34	10.34	9.97 (100%～110%)
4th.	Current	A	667	667	669	/
	Voltage	kV	5.80	5.80	5.80	/
	Energy	kJ	10.25	10.25	10.28	9.97 (100%～110%)
5th.	Current	A	669	673	669	/
	Voltage	kV	5.80	5.80	5.80	/
	Energy	kJ	10.28	10.34	10.28	9.97 (100%～110%)
6th.	Current	A	669	669	673	/
	Voltage	kV	5.80	5.80	5.80	/
	Energy	kJ	10.28	10.28	10.34	9.97 (100%～110%)
7th.	Current	A	673	673	675	/
	Voltage	kV	5.80	5.80	5.80	/
	Energy	kJ	10.34	10.34	10.37	9.97 (100%～110%)
8th.	Current	A	673	673	673	/
	Voltage	kV	5.80	5.80	5.80	/
	Energy	kJ	10.34	10.34	10.34	9.97 (100%～110%)
9th.	Current	A	669	673	667	/
	Voltage	kV	5.80	5.80	5.80	/
	Energy	kJ	10.28	10.34	10.25	9.97 (100%～110%)
10th.	Current	A	673	669	669	/
	Voltage	kV	5.80	5.80	5.80	/
	Energy	kJ	10.34	10.28	10.28	9.97 (100%～110%)

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Following Date of tests: 2014-05-05~2014-05-06

11th.	Current	A	673	669	669	/
	Voltage	kV	5.80	5.80	5.80	/
	Energy	kJ	10.34	10.28	10.28	9.97（100%~110%）
12th.	Current	A	669	667	667	/
	Voltage	kV	5.80	5.80	5.80	/
	Energy	kJ	10.28	10.25	10.25	9.97（100%~110%）
13th.	Current	A	675	673	673	/
	Voltage	kV	5.80	5.80	5.80	/
	Energy	kJ	10.37	10.34	10.34	9.97（100%~110%）
14th.	Current	A	675	673	673	/
	Voltage	kV	5.80	5.80	5.80	/
	Energy	kJ	10.37	10.34	10.34	9.97（100%~110%）
15th.	Current	A	675	673	673	/
	Voltage	kV	5.80	5.80	5.80	/
	Energy	kJ	10.37	10.34	10.34	9.97（100%~110%）
16th.	Current	A	675	673	669	/
	Voltage	kV	5.80	5.80	5.80	/
	Energy	kJ	10.37	10.34	10.28	9.97（100%~110%）
17th.	Current	A	673	673	675	/
	Voltage	kV	5.80	5.80	5.80	/
	Energy	kJ	10.34	10.34	10.37	9.97（100%~110%）
18th.	Current	A	673	675	675	/
	Voltage	kV	5.80	5.80	5.80	/
	Energy	kJ	10.34	10.37	10.37	9.97（100%~110%）
Withstand times			18	18	18	18
Checking samples			all right	all right	all right	all right
8/20μs, U_{10kA} after		kV	6.81	6.80	6.75	/
Change of U_{10kA}		%	0.9	0.6	0.7	<5

Test Conclusion:Satisfied.

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Date of tests: 2014-05-05 ~ 2014-06-16

5 Operating Duty Test

5.1 Accelerated ageing test

The parameter of complete arrester:

U_r=420kV, U_c= 336kV U_{10kA} < 988kV

The section parameter:

Potential distribution parameter β=1.105 (Declared by the client); Sections ratio n=140

$U_{ct}=U_{sc}\times\beta$; Testing time: 1001h ; Testing temperature: 115℃±4K

No.	A1	A2	A3	Req.
U_{sc} kV	2.40	2.40	2.40	2.40
Applied U_{ct} kV	2.70	2.70	2.70	2.65

Power losses w / Time \ No.	A1	A2	A3	Temperature ℃
2014.05.05 15:30	4.143	4.252	4.005	115.0
2014.05.05 16:30	3.904	3.951	3.899	115.0
2014.05.05 17:30	3.329	3.415	3.318	115.1
2014.05.09 20:30	2.064	2.121	2.061	115.0
2014.05.14 00:30	1.908	1.924	1.915	115.0
2014.05.18 04:30	1.852	1.864	1.837	115.0
2014.05.22 08:30	1.794	1.801	1.795	115.1
2014.05.26 12:30	1.769	1.769	1.758	115.0
2014.05.30 16:30	1.733	1.741	1.725	115.0
2014.06.03 20:30	1.718	1.726	1.709	115.0
2014.06.08 00:30	1.722	1.716	1.712	115.0
2014.06.12 04:30	1.686	1.689	1.679	115.0
2014.06.16 08:30	1.674	1.685	1.683	115.0
Stop test				
P_{1ct}	3.904	3.951	3.899	$P_{2ct}<1.1\times P_{3ct}$ $P_{1ct}>P_{2ct}$
P_{2ct}	1.674	1.685	1.683	
P_{3ct}	1.674	1.685	1.679	

Because $P_{2ct}<1.1\times P_{3ct}$,$P_{1ct}>P_{2ct}$, switching surge operating duty test shall perform on the new sample.

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Date of tests: 2014-06-16

5.2 Switching surge operating duty test (Class 3 line discharge withstand)

Environmental temperature :27.5 ℃ Relative humidity:58 % P=95.8 kPa

Because $P_{2ct}<1.1\times P_{3ct}$, $P_{1ct}>P_{2ct}$, this test shall perform on the new sample.

(Oscillogram see fig 140001B 9-4～140001B 9-9)

No.		O1	O2	O3
U_{sr} kV		3.00	3.00	3.00
8/20μs,U_{10kA},before kV		6.77	6.77	6.81
40/100μs, U_{250A} kV		5.37	5.33	5.35
U_{sc} kV		2.40	2.40	2.40
Preparing test: Applied $1.2U_{sc}$=2.88 kV, 8/20μs, I_n=10 kA , 20 times, 60 ° before peak				
Current kA	1st.	9.68	10.33	10.33
	2nd.	10.25	10.27	10.12
	3rd.	10.24	10.26	10.14
	4th.	10.24	10.20	10.14
	5th.	10.33	10.34	10.08
	6th.	10.25	10.24	10.15
	7th.	10.30	10.10	10.06
	8th.	10.18	10.11	10.10
	9th.	10.23	10.14	10.05
	10th.	10.16	10.02	10.10
	11th.	10.16	10.26	9.99
	12th.	10.08	10.06	9.92
	13th.	10.15	10.13	10.10
	14th.	10.17	10.06	10.10
	15th.	10.08	10.15	10.01
	16th.	10.13	10.05	10.13
	17th.	10.08	9.97	9.95
	18th.	10.21	10.03	9.93
	19th.	10.16	10.02	9.95
	20th.	10.14	10.02	9.93

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following Date of tests: 2014-06-16

No.		O1	O2	O3
4/10μs high current impulse withstand	1st. Current kA	100.2	99.3	98.9
	Cool to 27.5 ℃			
	2nd. Current kA	100.9	100.5	101.0
Heated to 60.0 ℃ Applied 2 times class 3 line discharge withstand				
Applied class 3 line discharge impulse energy kJ		10.07 (100% ~ 110%)		
1st. class 3 line discharge impulse withstand	Current A	747	760	751
	Voltage kV	5.60	5.60	5.62
	Energy kJ	10.45	10.72	10.62
2nd. class 3 line discharge impulse withstand	Current A	751	766	754
	Voltage kV	5.65	5.67	5.69
	Energy kJ	10.76	10.91	10.76
Applied power frequency voltage within 75 ms				
Applied U_{sr}	kV	3.00	3.00	3.00
Power losses (max) at U_{sr}	W	40.8	40.0	32.0
Applied U_{sc}	kV	2.40	2.40	2.40
Power losses at U_{sc} W	1st min	2.96	2.90	2.46
	15th min	1.74	1.70	1.67
	30th min	1.57	1.55	1.59
Checking samples		all right	all right	all right
8/20μs, U_{10kA}, after	kV	6.81	6.81	6.83
Change of U_{10kA} % (Req. < 5 %)		0.6	0.6	0.3

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Test Conclusion: Satisfied.

XIHARI	Test Report	No. 140001B Page 13 of 44

Date of tests: 2014-06-16~2014-06-17

6 Power-Frequency Voltage Versus Time Characteristics Test (Class 3 line discharge withstand)

Environmental temperature :27.5℃ ; Relative humidity:58% P= 95.8 kPa

No.		T1	T2	T3	T4
U_{sr}	kV	3.00	3.00	3.00	3.00
8/20μs,U_{10kA},before	kV	6.78	6.77	6.77	6.73
40/100μs, U_{250A}	kV	5.35	5.35	5.38	5.35
U_{sc}	kV	2.40	2.40	2.40	2.40
Applied Class 3 line discharge energy	kJ	10.04（100%~110%）			
Heated to 60.0 ℃ Applied 2 times class 3 line discharge withstand					
1st. class 3 line discharge impulse withstand	Current A	744	738	746	753
	Voltage kV	5.58	5.57	5.58	5.54
	Energy kJ	10.41	10.39	10.36	10.41
2nd. class 3 line discharge impulse withstand	Current A	740	740	744	752
	Voltage kV	5.64	5.64	5.63	5.62
	Energy kJ	10.54	10.54	10.44	10.50
Overvoltage time	K	1.2	1.15	1.1	1.0
Applied overvoltage K×U_{sr}	kV	3.60	3.45	3.30	3.00
Keeping time		0.1s	1s	11s	1200s
Applied U_{sc}	kV	2.40	2.40	2.40	2.40
Keeping time at U_{sc}	min	30	30	30	30
Checking samples		all right	all right	all right	all right
Req.	Overvoltage time K	1.2	1.15	1.10	1.0
	Keeping time	0.1s	1s	11s	1200s
Test conclusion		passed	passed	passed	passed

Test Conclusion: Satisfied.

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Date of tests: 2014-05-08

7 Insulation Withstand Tests on The Arrester Housing

7.1 Lightning impulse voltage withstand test

t_{dry}=23.6℃ RH=44% P=96.0kPa Arc distance L=1.55m

Req.=619 kV K=0.928 (According to client's requirement, choosing K=1.000 during test.)

Applied voltage after adj.=619kV

No.	Test value kV		Times	Result
025-W	(+)	618.6 ~ 619.9	15	no puncture no flashover
	(-)	618.3~625.2	15	no puncture no flashover

(The test data come from report 140003B)

7.2 Switching impulse voltage withstand test(wet)

t_{dry}= 22.6℃ t_{water}=20.5℃ RH=45% P= 96.1 kPa Arc distance L=1.55m

Rain conductivity: 97.1μS/cm Horizon: 1.4mm/min Vertical: 1.9mm/min

Req.=416.2 kV, K=0.981(According to client's requirement, choosing K =1.000 during test.)

Applied voltage after adj.=416.2kV

(Oscillogram see fig IPVBT140001B-001~IPVBT140001B-002)

No.	Test value kV		Times	Result
025-W	(+)	420.3 ~ 421.3	15	no puncture no flashover
	(-)	416.6 ~ 419.5	15	no puncture no flashover

7.3 Power-frequency insulation withstand test (wet)

t_{dry}= 21.8 ℃ RH=47% t_{water}=19.5℃ P= 96.0kPa

Rain conductivity : 105.9μS/cm Rainfall: Horizon=1.2 mm/min Vertical=1.55 mm/min

Voltage frequency: 60.0Hz Arc distance L=1.55m

Req.=284.5 kV, K=0.991 (According to client's requirement, choosing K =1.000 during test)

Applied voltage after adj.= 284.5 kV

No.	Test value kV		Keeping time min	Result
025-W	wet	284.8	1	no puncture no flashover

(The test data come from report 140003B)

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Test Conclusion: Satisfied. (No.025-W samlpe is Y10W3L-168 arrester housing)

Date of tests: 2014-05-05～2014-05-06

8 Seal Leak Rate Test

P= 97.3kPa t_{dry}= 19.6 ℃ RH=42%

No.	Leak rate Pa.m³/s	Result
015	0.4×10^{-8}	no leakage
Req.	$\leqslant1\times10^{-6}$	no leakage

Test Conclusion: Satisfied.

9 Bending Moment Test

9.1 Breaking load test

No	Load kN·m	Sample test result
017	29.1	the end of the porcelain is damaged
018	26.4	the end of the porcelain is damaged
019	29.3	the end of the porcelain is damaged
MBL	28.3	/
MBL Req.	≥21.6	/

9.2 Bending load test

9.2.1 Seal leak rate test

P= 97.3kPa t_{dry}= 19.6 ℃ RH=42%

No.	Leak rate Pa.m³/s	Result
014	0.6×10^{-8}	no leakage
015	0.4×10^{-8}	no leakage
016	0.6×10^{-8}	no leakage
Req.	$\leqslant1\times10^{-6}$	no leakage

9.2.2 Internal partial discharge test

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P=96.7 kPa t=19.9 ℃ RH=44 %

No.	Applied voltage U_r kV(r.m.s)	Continuous times s	Applied $1.05U_c$ kV (r.m.s)	P.D. Value pC
014	168.0	10	141.1	≤6.0
015	168.0	10	142.0	≤5.0
016	168.0	10	142.0	≤5.0
Req.	168.0	2～10	141.1	<10

Date of tests: 2014-05-06～2014-05-08

9.2.3 Bending load

SLL= 18 kN·m;

(Applied on the top , and the value of load is given by consignor)

No	Load kN·m	Time s	Max. deflection mm	Residual deflection mm	Residual deflection /housing height	Result
014	18.1	90	10.0	1.0	/	passed
015	18.1	90	9.5	1.0	/	passed
016	18.1	90	9.0	0.5	/	passed
Req.	18	60～90	/	≤3	/	passed

9.2.4 Seal leak rate test

P= 96.8 kPa t_{dry}= 19.3 ℃ RH = 43%

No.	Leak rate Pa.m³/s	Result
014	0.8×10^{-8}	no leakage
015	0.6×10^{-8}	no leakage
016	1×10^{-8}	no leakage
Req.	$\leq1\times10^{-6}$	no leakage

9.2.5 Internal partial discharge test

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P=96.0 kPa t=19.3 ℃ RH=46 %

No.	Applied voltage Ur kV(r.m.s)	Continuous times s	Applied 1.05Uc kV (r.m.s)	P.D. Value pC
014	168.0	10	142.0	≤5.0
015	168.1	10	142.3	≤5.0
016	168.0	10	141.7	≤4.0
Req.	168.0	2～10	141.1	<10

Test Conclusion: Satisfied.(No.017~No.019 samlpes are Y10W3L-168 arrester housings, No.014~No.016 samlpes are Y10W3L-168 arresters.)

Date of tests:: 2014-05-05 ~ 2014-06-18

10 Environmental Tests

10.1 Seal leak rate test

P= 97.3kPa t_{dry}= 19.6 ℃ RH=42%

No.	Leak rate Pa.m³/s	Result
020	0.8×10^{-8}	no leakage
Req.	$\leqslant1\times10^{-6}$	no leakage

10.2 Temperature cycling test

Test time:2014.05.05 ~ 2014.05.08 No.020

Cycle times	High tempreture W1 ℃	Holding time h	Low voltage W2 ℃	Holding time h
1	60.6 ~ 60.1	3	-25.1~-25.1	3
2	60.3 ~ 60.1	3	-25.3 ~ -25.2	3
3	60.2 ~ 60.1	3	-25.1 ~ -25.0	3
4	60.2 ~ 60.0	3	-25.2 ~ -25.1	3
5	60.3 ~ 60.3	3	-25.6 ~ -25.1	3
6	60.1 ~ 60.1	3	-25.8 ~ -25.0	3
7	60.4 ~ 60.1	3	-25.2 ~ -25.2	3
8	60.1 ~ 60.0	3	-25.3 ~ -25.1	3
9	60.5 ~ 60.1	3	-25.6 ~ -25.2	3
10	60.9 ~ 60.3	3	-25.2 ~ -25.1	3
Req.	40 ~ 70	3	-50 ~ (W1-85)	3

10.3 Salt mist test

Fog room area:10m³ Salt density:5.1%

Test time: 2014.05.08 ~ 2014.05.12

No.	Test time	Temperature ℃	Relative humidity %	PH	Flow rate ml/h·80cm²
020	2014.05.08 14:00	35	87	7.0	1.5
	2014.05.09 14:00	35	87	7.0	1.5
	2014.05.10 14:00	35	87	7.0	1.5
	2014.05.11 14:00	36	87	7.0	1.5
	2014.05.12 14:00	35	87	7.0	1.5
	2014.05.12 14:01	Stop test			
Req.	96h	35±2	>85	6.5 ~ 7.2	1.0 ~ 2.0

10.4 Seal leak rate test

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P= 95.7kPa t_{dry}= 26.8 ℃ RH=59%

No.	Leak rate Pa.m³/s	Result
020	0.4×10^{-8}	no leakage
Req.	$\leqslant1\times10^{-6}$	no leakage

Test Conclusion: Satisfied. (No.020 samlpe is Y10W3L-96 arrester)

Date of tests:2014-06-18

11 Artificial Pollution Tests

11.1 The parameter of complete arrester:

No.	Arrester rated voltage Ur kV	Arrester minimum rated voltage Urmin kV	The diameter of big sheds D1 m	The diameter of small sheds D2 m	The outer diameter of the house D3 m	The mean diameter of the house Dm m
010	168	0	0.365	0.335	0.205	0.278

11.2 Artificial pollution tests

Environmental temperature Ta:32.4 ℃ Decreased temprature: 22+0.63Ta=42.4 ℃

Test data:

1) Temprature rise & the parameter ΔT_h = 89.7 K β = 1.50

2) Time t_h =0.158 h

3) Total charge Q_h =59.8 C

4) Dm =(D1+D2+D3)/3

5) Equivalent thermal time constant(from 60℃ decreased to requiered tempreture) τ = 2.375 h

Pollution level	Minimum specific creepage distance mm/kV	Mean external charge q_z C		ΔT_{zmax} K	
		t_z=2h	t_z=6h	t_z=2h	t_z=6h
Ⅳ	31	55	36	30.9	32.7
/	/	/	/	≤40	≤40

Note: $\Delta T_{zmax} = \beta q_z D_m \tau (1-e^{-t_z/\tau}) \left(\frac{U_r - U_{rmin}}{U_r}\right)$

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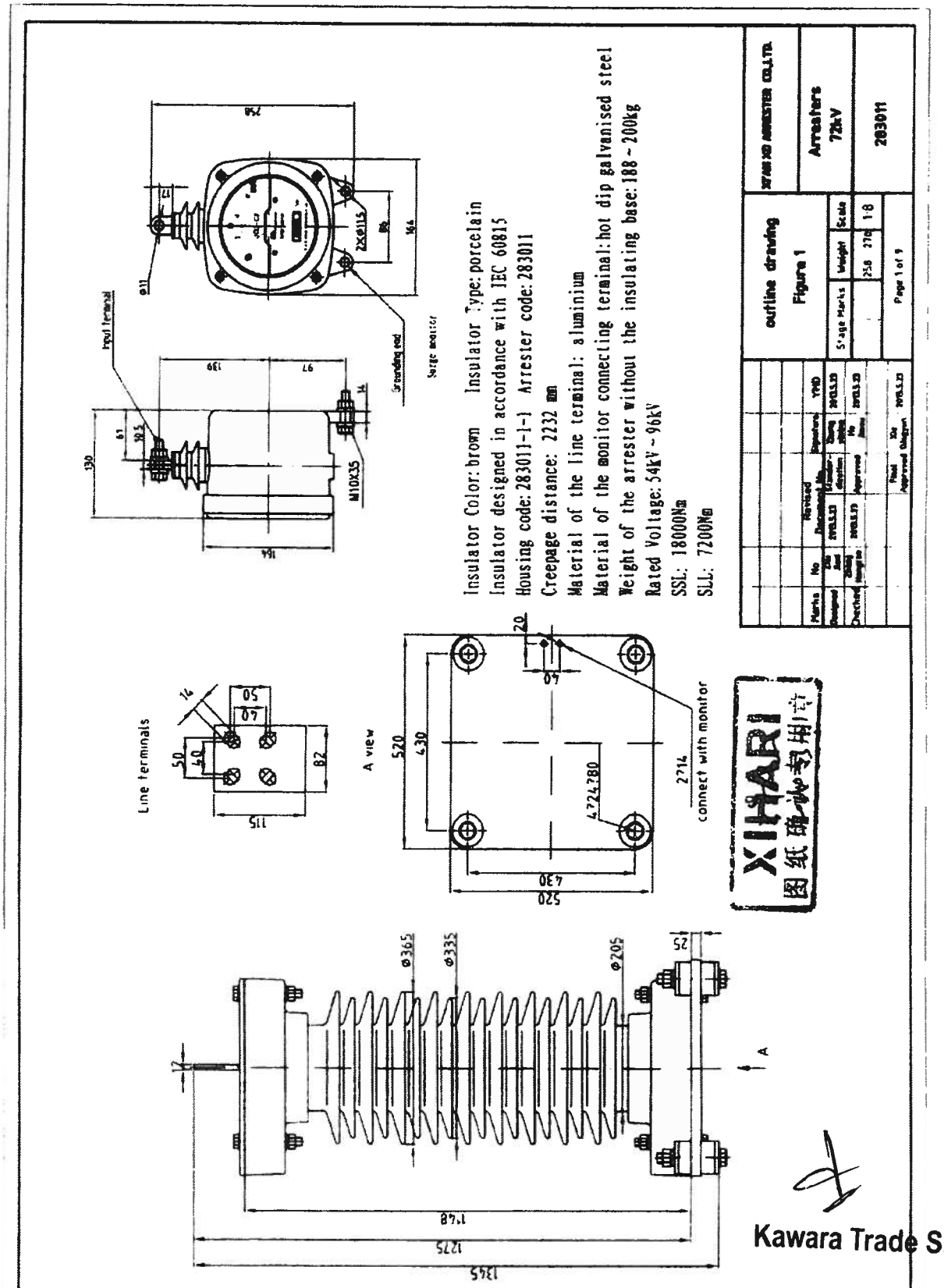
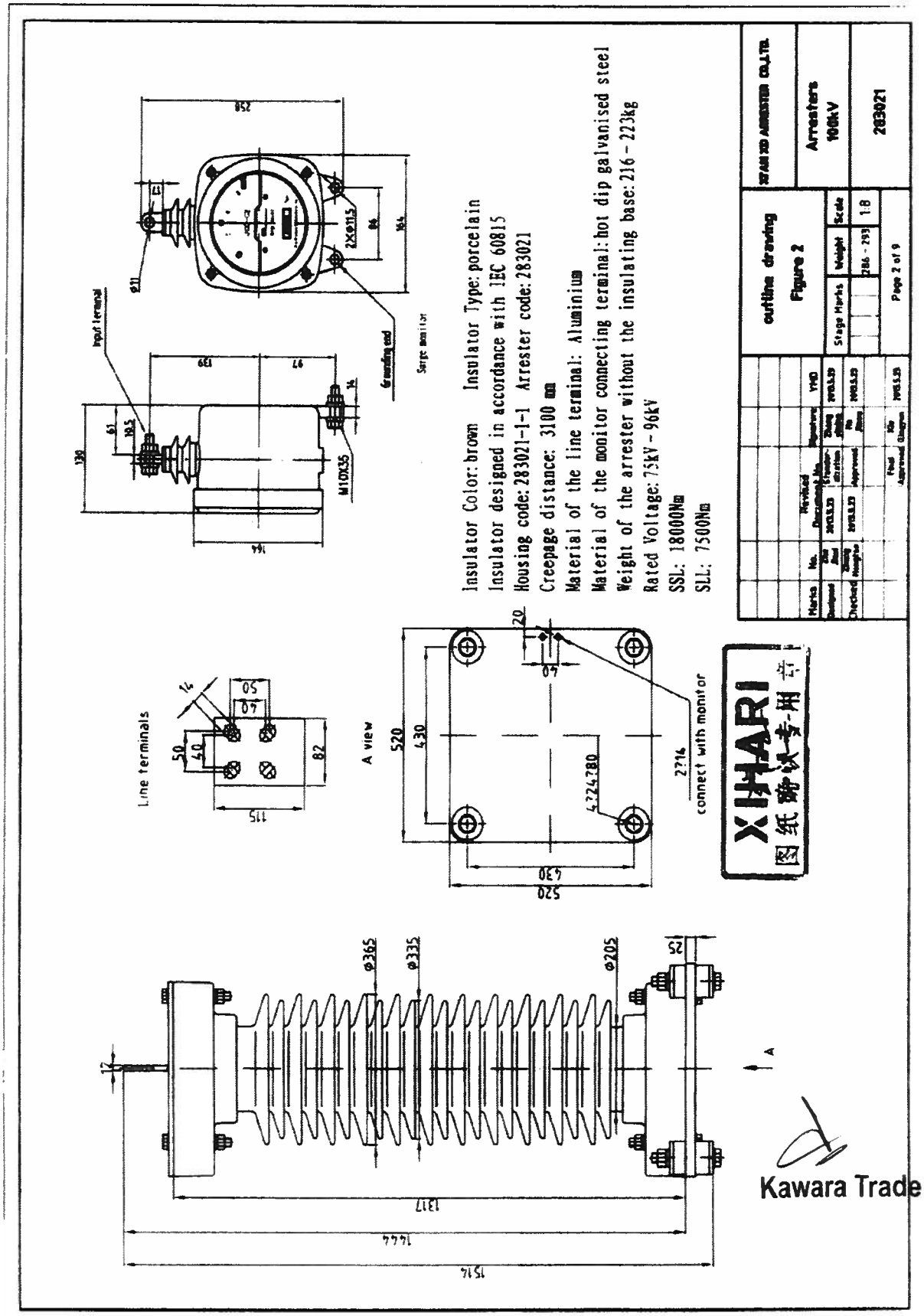
Test Conclusion: $\Delta T_{z\,max}$ less than 40 K,the pollution tests are not required and the starting temperature of the operating duty test shall be 60 °C.(No.010 samlpe is Y10W3L-168 arrester)

Drawing included



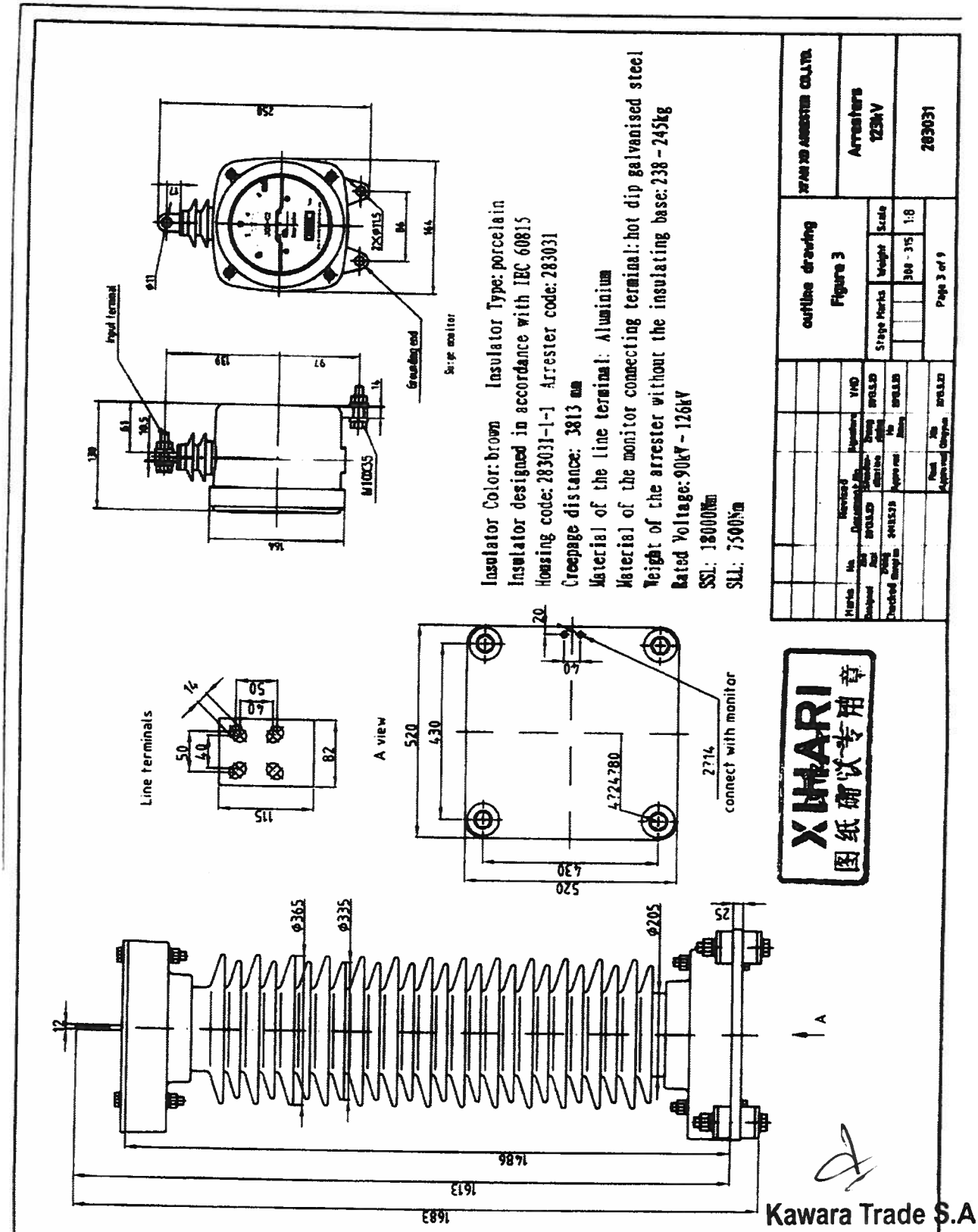
Kawara Trade S.A

Drawing included



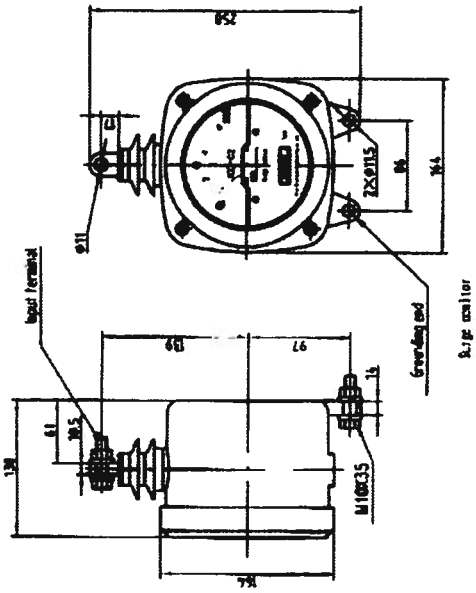
Kawara Trade S.A

Drawing included



Kawara Trade S.A

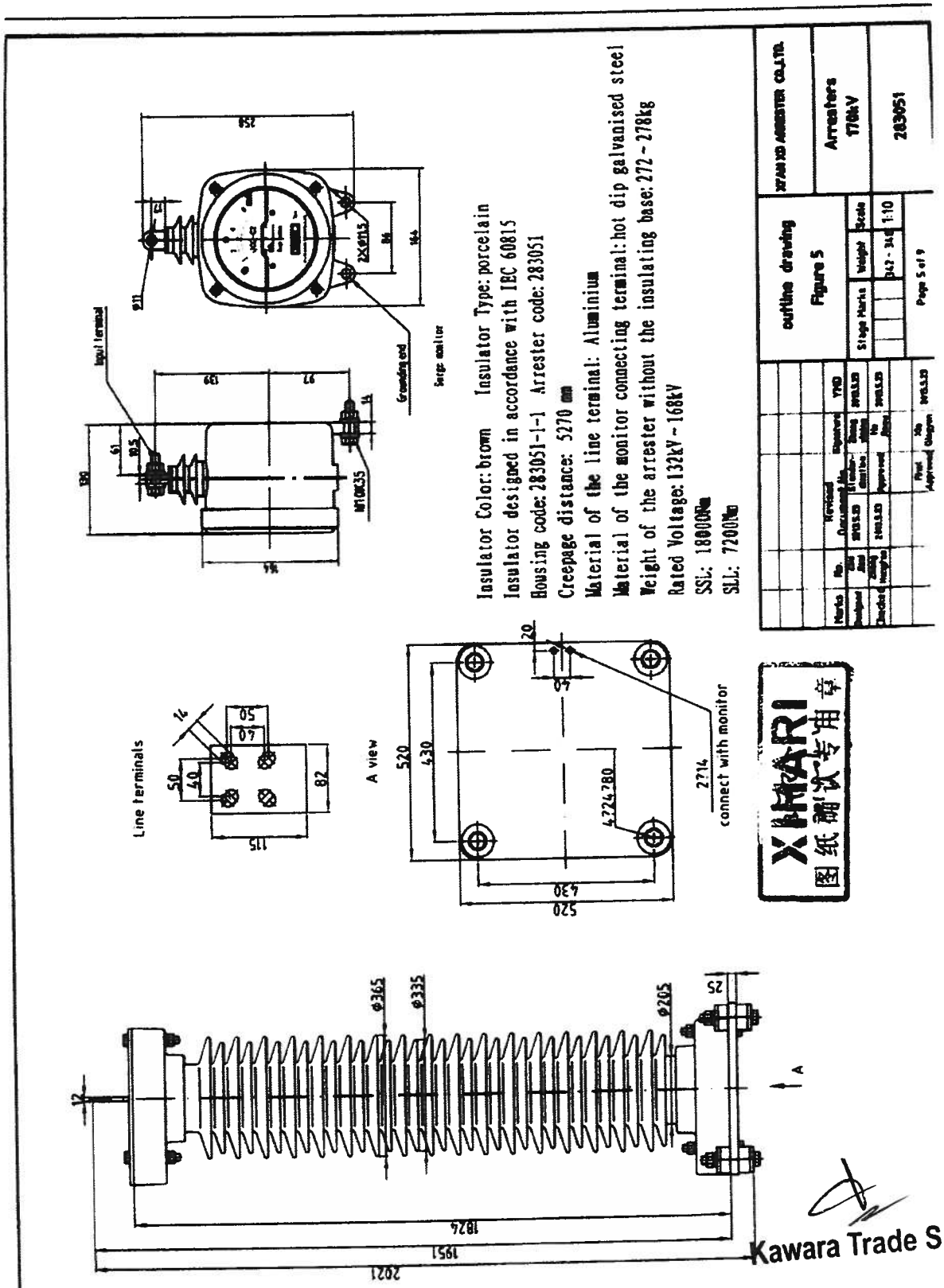
Drawing included



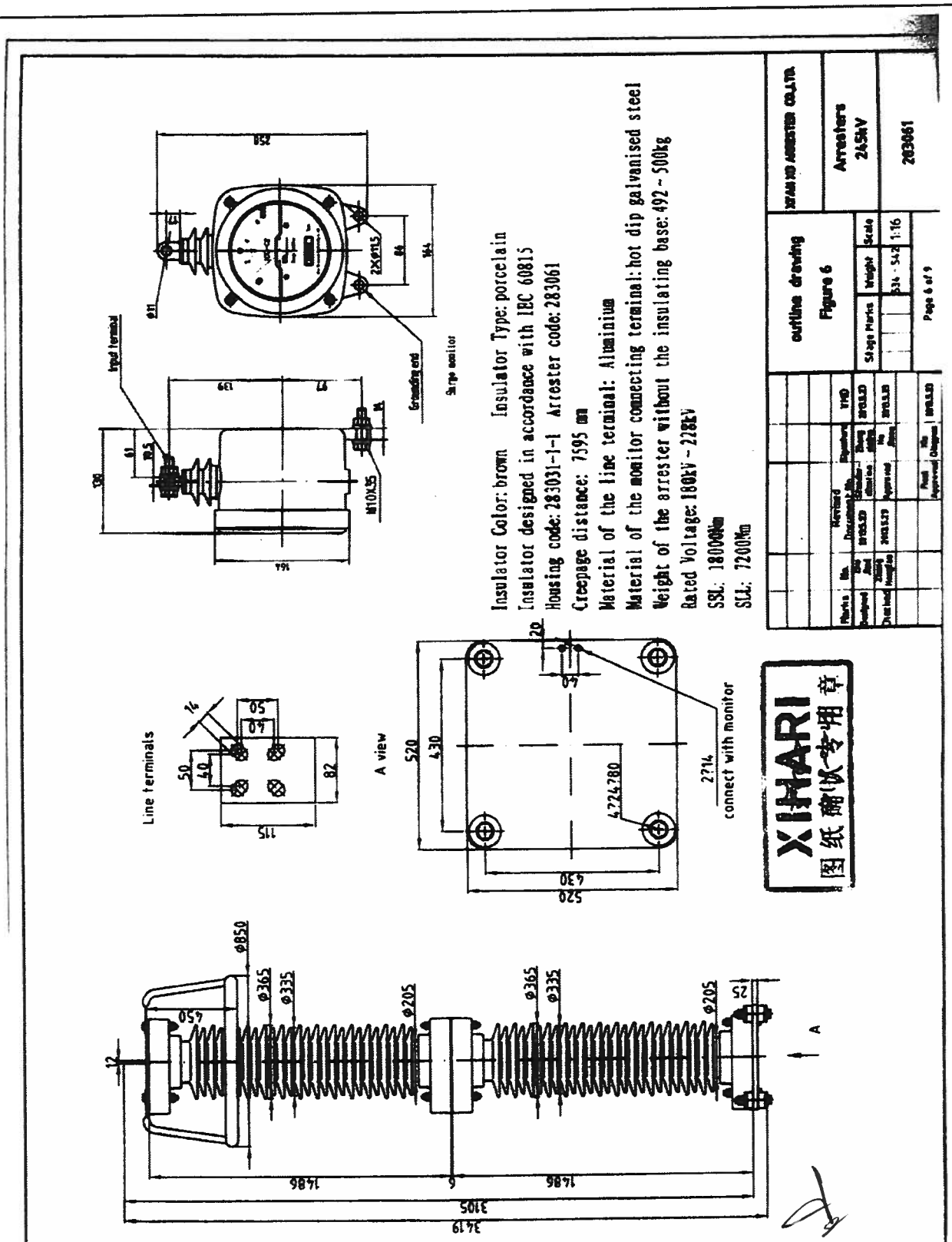
Insulator Color: brown Insulator Type: porcelain
Insulator designed in accordance with IEC 60815
Housing code: 283041-1-1 Arrester code: 283041
Creepage distance: 4495 mm
Material of the line terminal: Aluminium
Material of the monitor connecting terminal: hot dip galvanised steel
Weight of the arrester without the insulating base: 251 ~ 256kg
Rated Voltage: 114kV ~ 144kV
SSL: 1800Nm
SLL: 720Nm

| | | |

Drawing included



Drawing included



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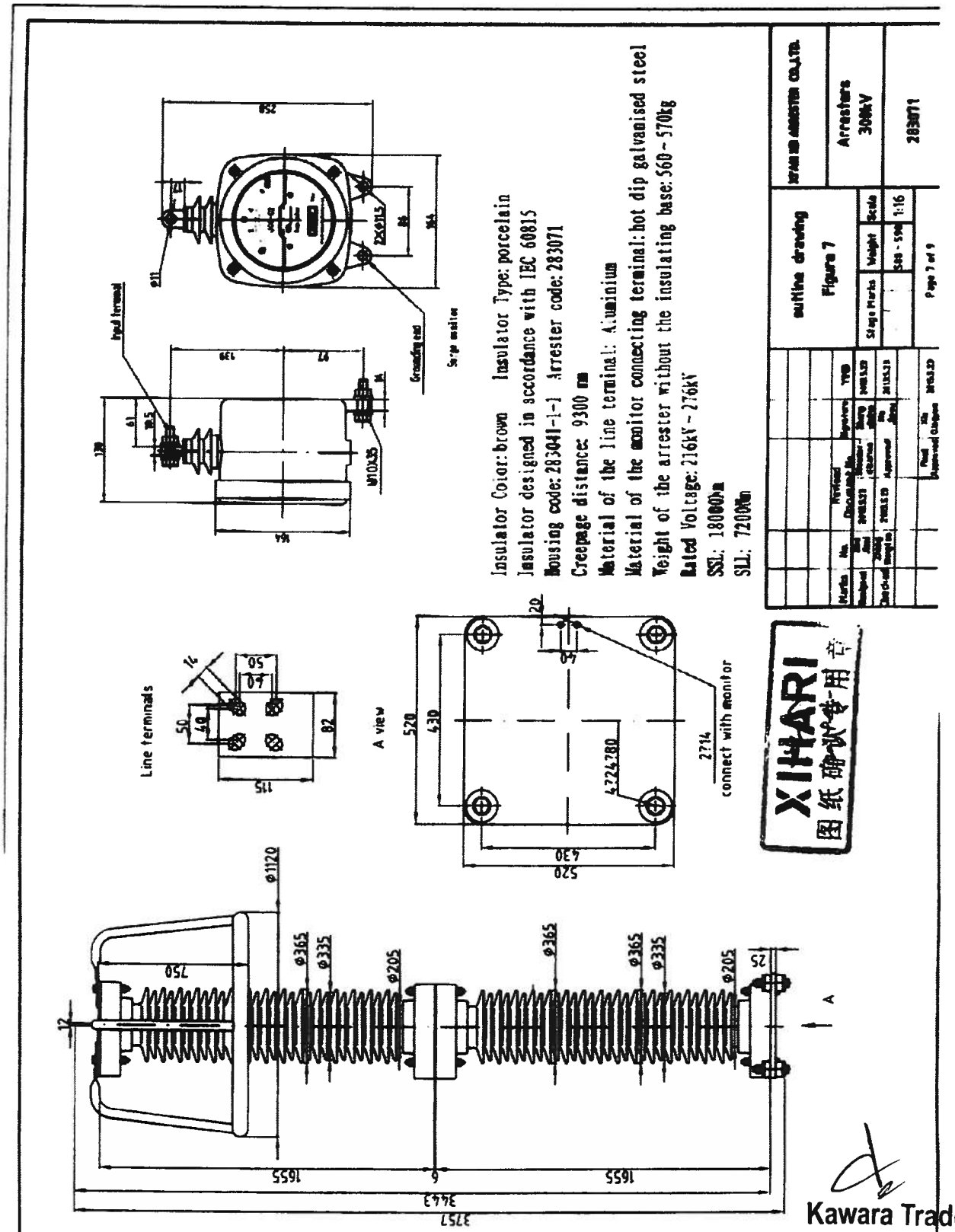
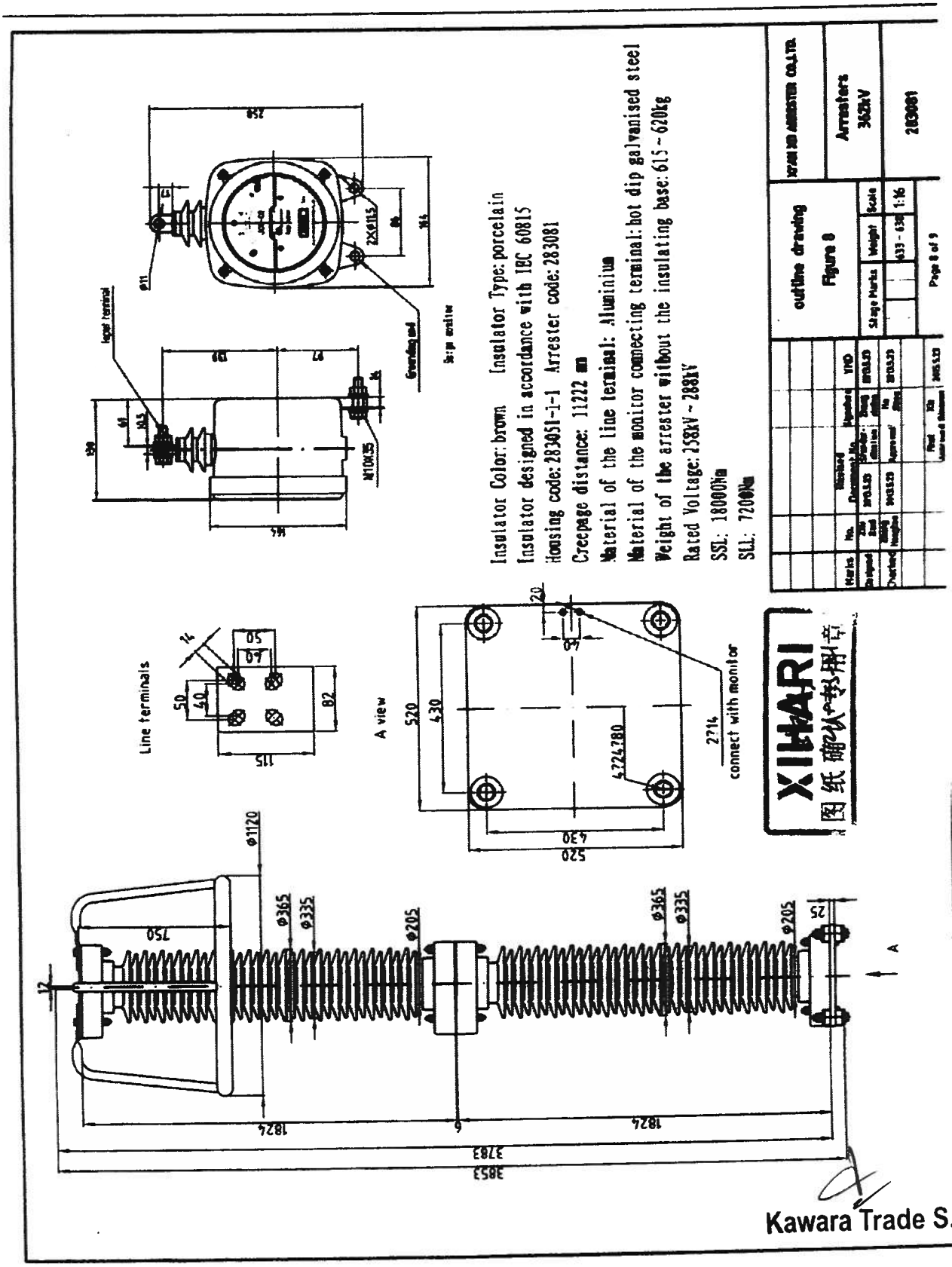


Kawara Trade S.A

Drawing included



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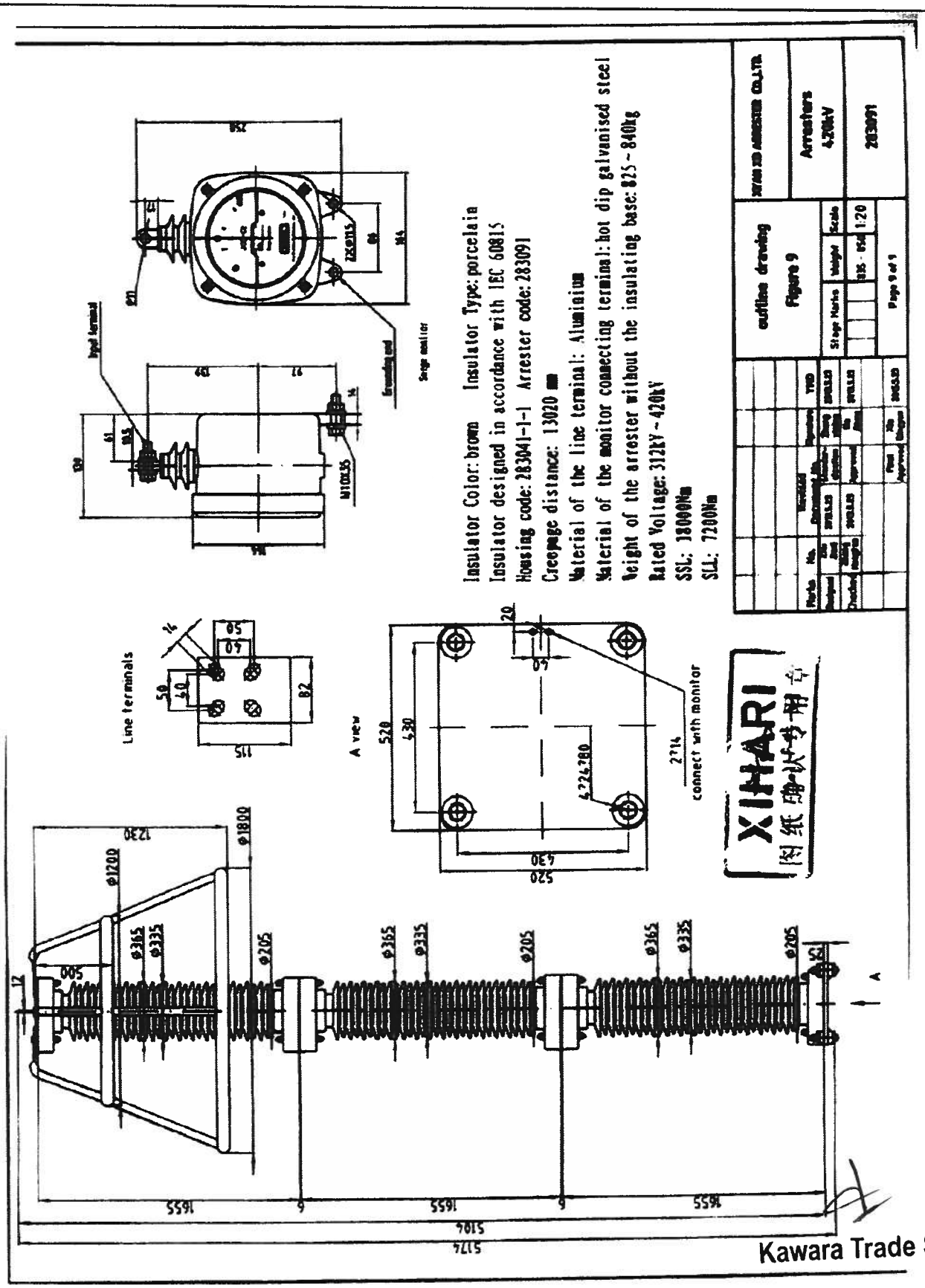
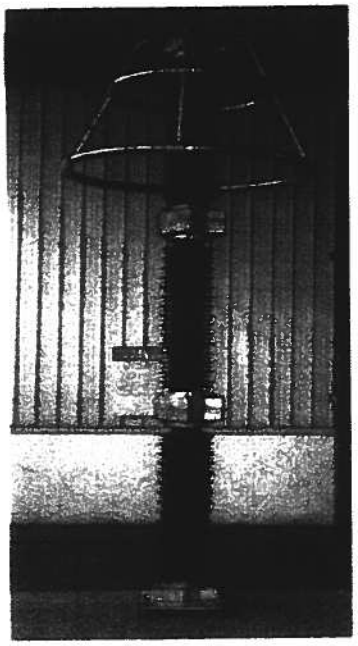
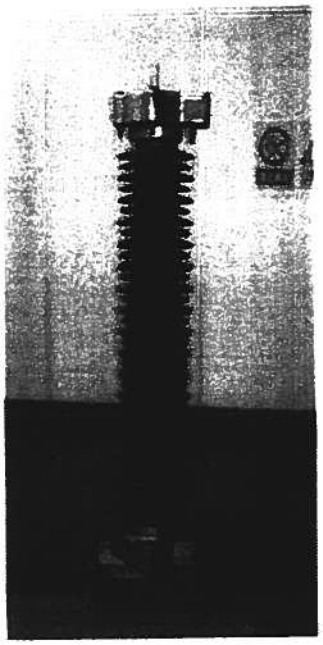


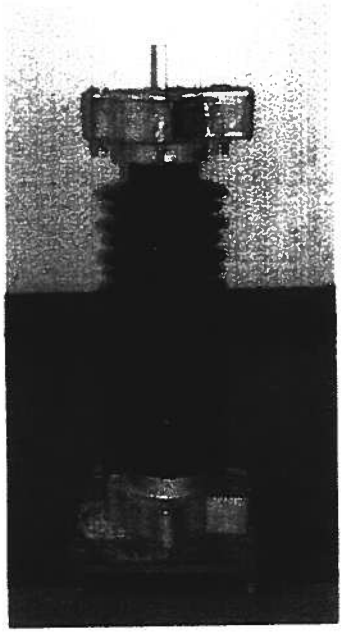
Photographs



Photograph 1 (Y10W3L-420)



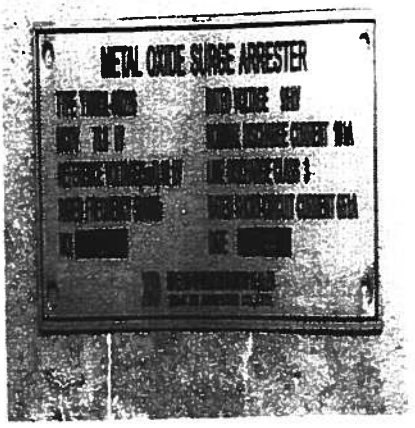
Photograph 2 (Y10W3L-168)



Photograph 3 (Y10W3L-96)

Photograph 4

Photograph 5



Photograph 6

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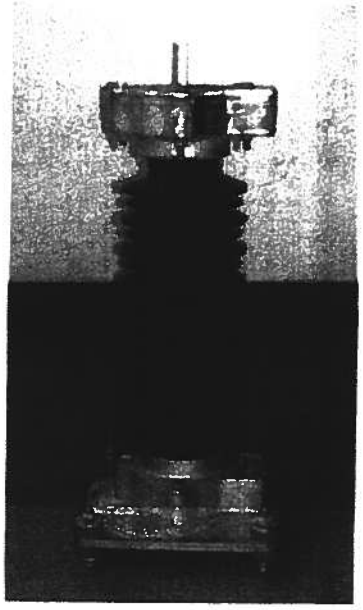
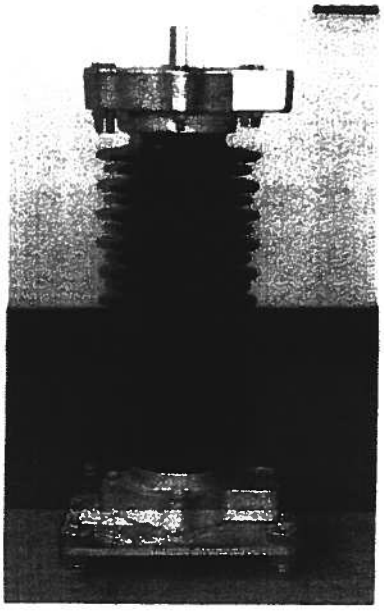
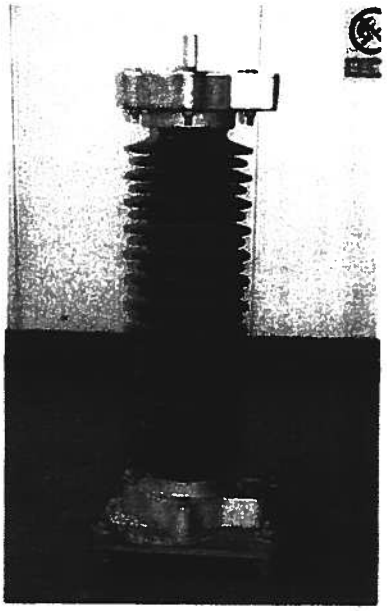
Photographs



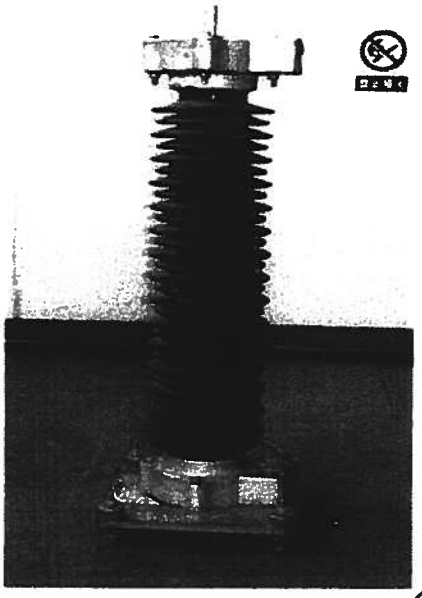
Photograph 7 (Y10W3L-54)



Photograph 8 (Y10W3L-96)



Photograph 9 (Y10W3L-126)



Photograph 10 (Y10W3L-144)

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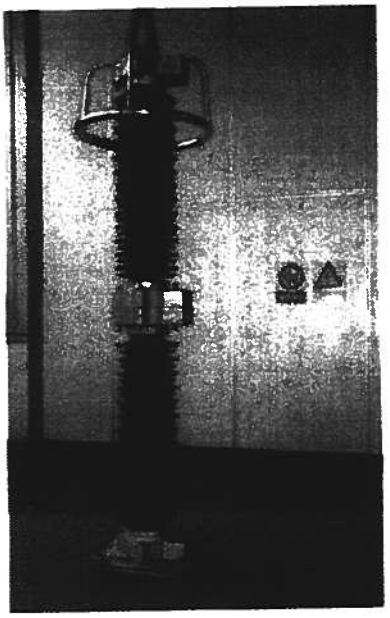
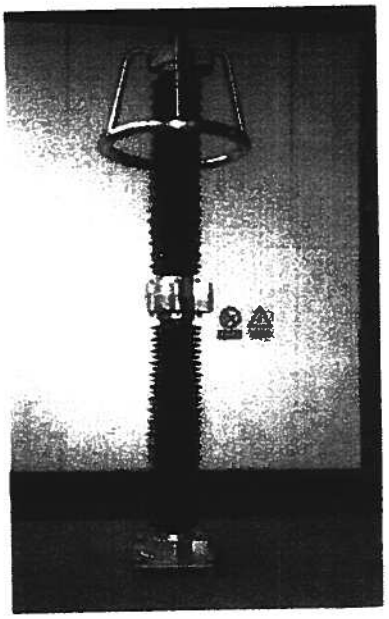
Photographs

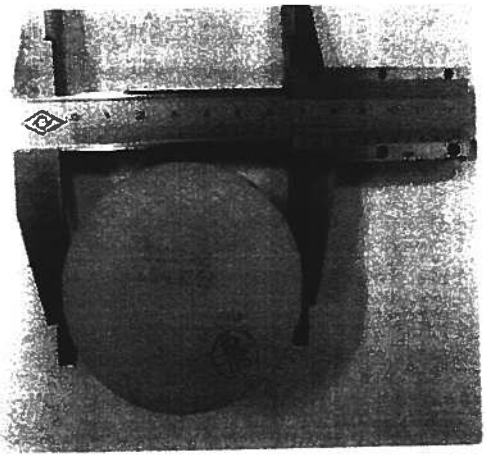


Photograph 11 (Y10W3L-228)

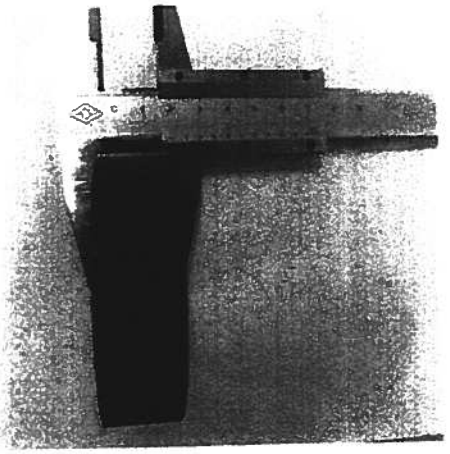
Photograph 12 (Y10W3L-276)



Photograph 13 (Y10W3L-288)



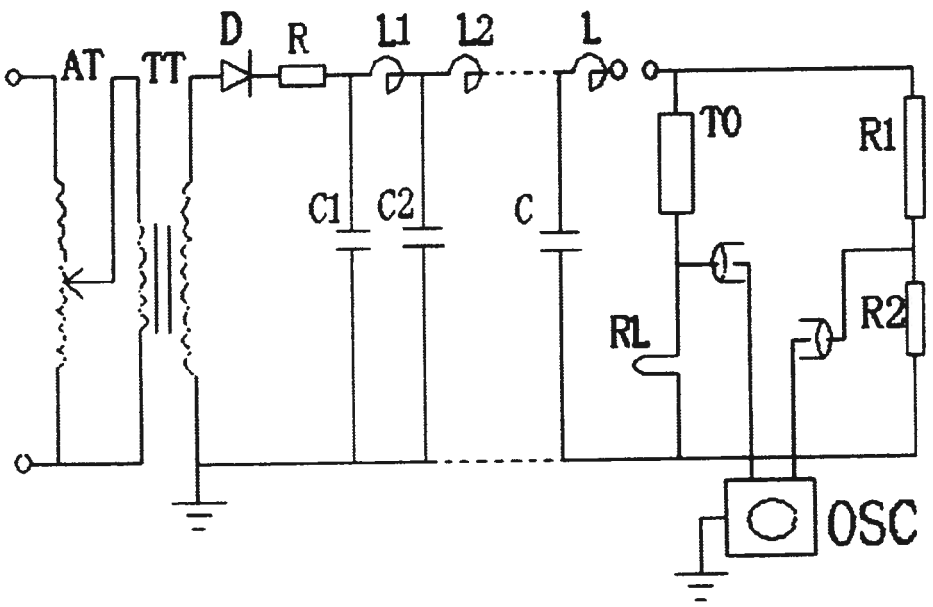
Photograph 14



Photograph 15

Test circuit diagram

	线路放电耐受试验线路图 （Circuit diagram of line discharge withstand testing）	XGBT006



AT--- 调压器（Power supply ）

TT--- 工频试验变压器（Power frequency testing transformer）

C1、C2、C--- 电容器（Capacitor）

D --- 二极管（Diode）

R1--- 分压器高压臂电阻（High voltage resistor for voltage divider）

R2--- 分压器低压臂电阻（Low voltage resistor for voltage divider ）

OSC---数字示波器 (Digital oscilloscope)

R--- 充电电阻（Chang resistor）

TO--- 试品（Tested object）

RL--- 分流器（Shunt）

L1、L2、L--- 电感（Inductance）

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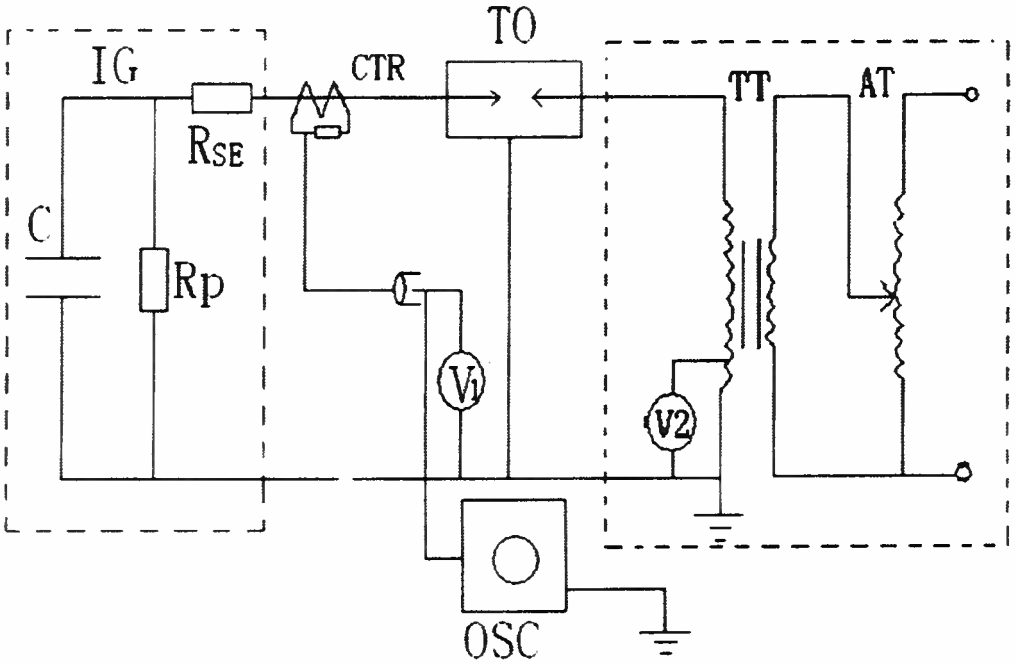
Test circuit diagram

	动作负载试验线路图 (Circuit diagram of operating duty testing)	XGBT007



AT--- 调压器（Power supply ）

TT--- 工频试验变压器(Testing transformer)

TO---试品(Tested object)

Rp---发生器并联电阻(Generator parallel resistor)

R_{SE}—发生器串联电阻(Generator series resistor)

CTR---罗克夫斯基线圈（Rogowski coil ）

V_1,V_2--电压表（Voltmeter)

C---冲击发生器主电容(Capacitor of impulse voltage generator)

OSC---数字示波器(Digital oscilloscope)

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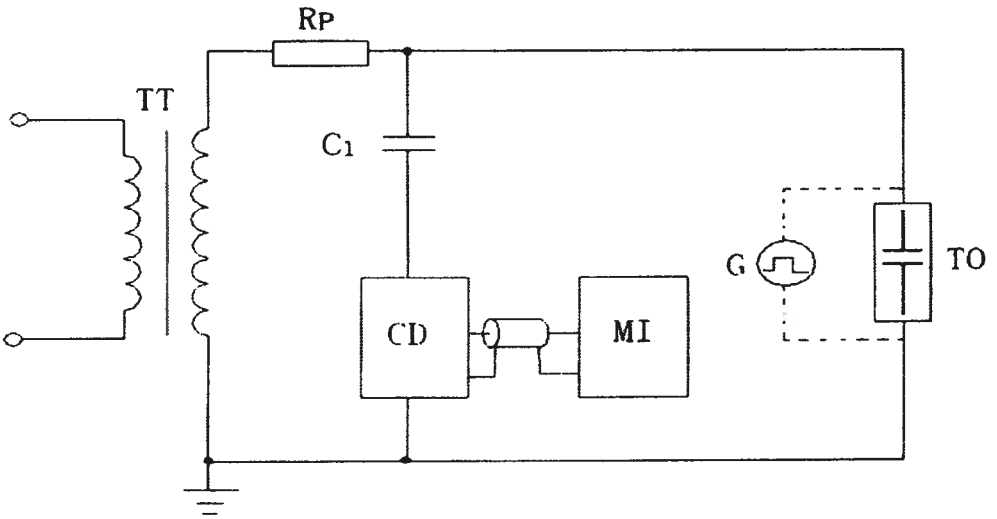
Test circuit diagram

XIHARI	局部放电试验回路图 Partial discharge measurement circuit	No.140001B



TT	工频试验变压器	PF transformer	R_p	保护电阻	protection resistance
C_1	高压臂电容	H.V arm capacitance	CD	耦合装置	coupling device
TO	试品	test object			
G	方波校准器(step voltage generator) 型号(type): LDC-5/S8 编号(SN): 200311007				
MI	局放测量仪(measuring instrument) 型号(type): LDS-6 编号(SN): 203709015 频率 (frequency): 300 kHz ~30MHz				
1200kV/4800kVA 工频电压及局部放电测量系统有效期 (validity of 1200kV/4800kVA power frequency voltage and partial discharge measuring system)					2014-08-16

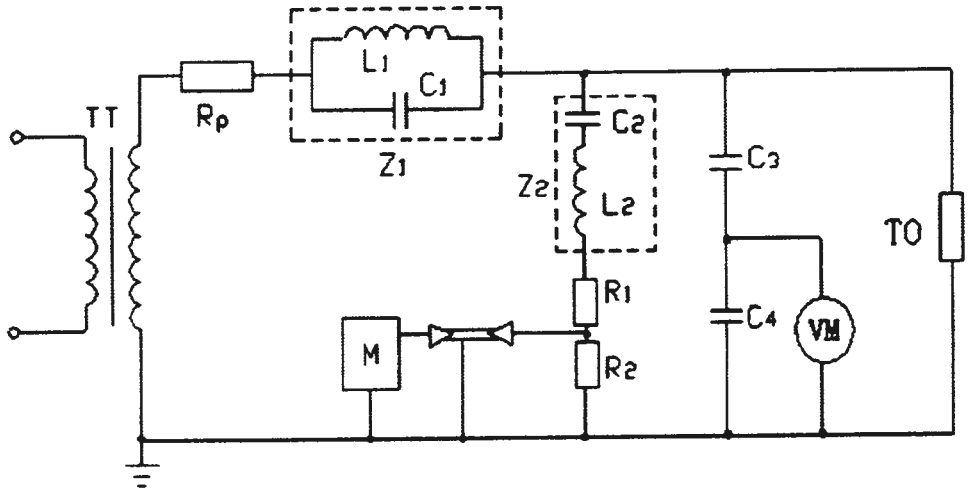
工频系统主要参数(parameters of TT system)

U/S (kV/kVA)	f_{TT}(Hz)	Rp(kΩ)	C_1(pF)	C_{CD}(μF)
1200/4800	50	12	500	5.0

Kawara Trade S.A

Test circuit diagram

XIHARI	无线电干扰电压试验回路图 Radio interference voltage test circuit	No.140001B



TT	工频试验变压器	PF transformer	R_p	保护电阻	protection resistance
Z_1	阻塞阻抗	blocking impedance	Z_2	耦合阻抗	coupling impedance
C_3	高压臂电容	H.V arm capacitance	C_4	低压臂电容	L.V arm capacitance
TO	试品	test object			
VM	数字电压表(voltmeter)	型号(type): DMI551		编号(SN): 173762	
M	RIV 测量仪(RIV measuring device)	型号(type): PMM9010		编号(SN): 153WJ80210	

1200kV/4800kVA 工频电压测量系统有效期 (validity of 1200kV/4800kVA power frequency voltage measuring system)	2014-07-30
无线电干扰电压测量系统有效期 (validity of radio interference voltage measuring system)	2014-07-28

工频系统主要参数 (parameters of TT system)

U/S (kV/kVA)	f_{TT}(Hz)	Rp(kΩ)	C_3(pF)	C_4(μF)
1200/4800	50	12	500	5.0

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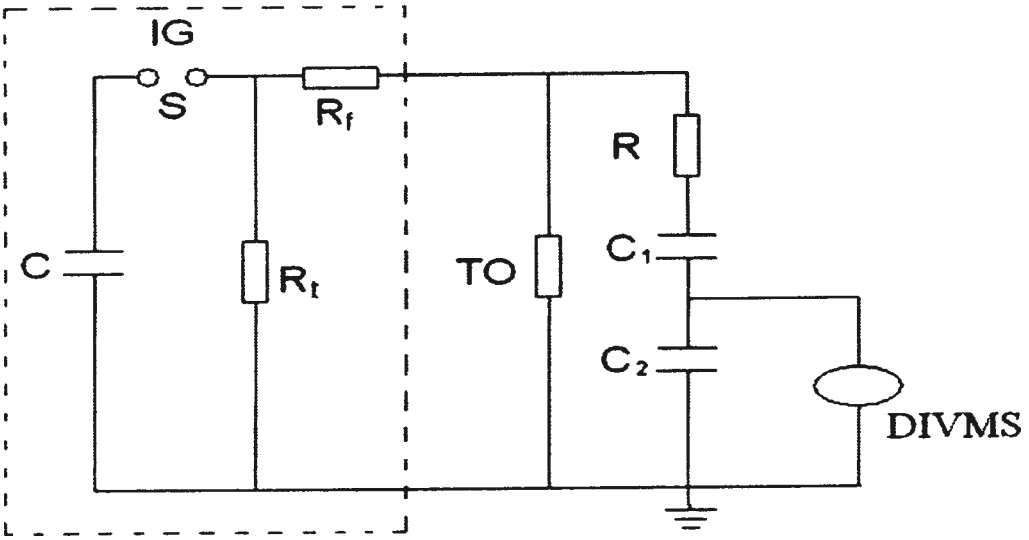
Test circuit diagram

XIHARI	操作冲击耐受电压试验回路图 Switching impulse withstand voltage test circuit	No.140001B



C	冲击发生器主电容	IG capacitance	R_f	波头电阻	front resistance
R_t	波尾电阻	tail resistance	S	冲击点火球隙	sphere gap
R	阻尼电阻	damping resistance	C_1	高压臂电容	H.V arm capacitance
TO	试品	test object	C_2	低压臂电容	L.V arm capacitance
DIVMS	数字冲击电压测量系统(Impulse voltage measuring systems) 型号(type): MIRA25 编号(SN): 11162011				
4800kV/480kJ 冲击电压测量系统有效期 (validity of 4800kV/480kJ impulse voltage measuring system)			2015-04-04		

冲击系统主要参数 (parameters of IG system)

U(kV)	C(μF)	R_f(kΩ)	R_t(kΩ)	C_1(pF)	C_2(μF)
3000	0.0556	135	100.8	266.9	0.97

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Typical oscillogram

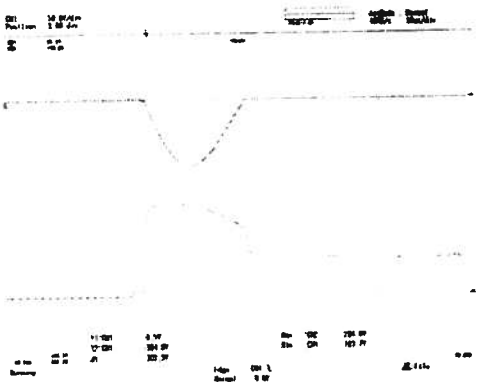

Fig 140003B 28-1, R1
8/20μs Lightning impulse residual voltage test (10kA)
(The oscillogram come from the report of 140003B)

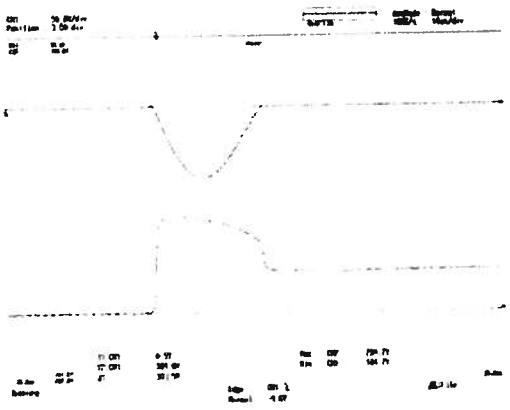

Fig 140003B 28-2, R2
8/20μs Lightning impulse residual voltage test (10kA)
(The oscillogram come from the report of 140003B)

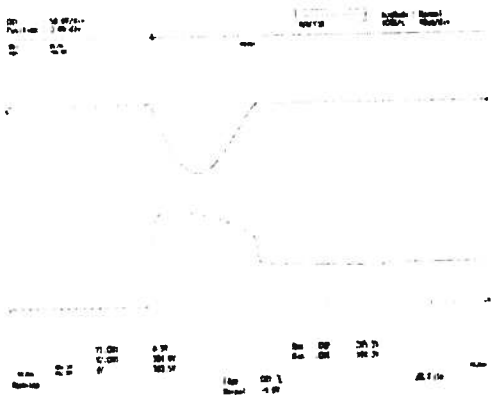

Fig 140003B 28-3, R3
8/20μs Lightning impulse residual voltage test (10kA)
(The oscillogram come from the report of 140003B)

Date of tests: 2014-05-05

Kawara Trade S.A

Typical oscillogram

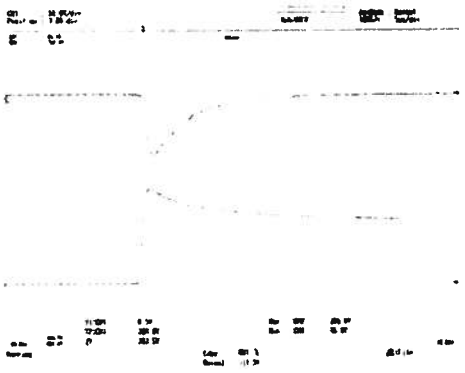

Fig 140003B 28-4, R1

1/5μs Steep impulse residual voltage test (10kA)

(The oscillogram come from the report of 140003B)

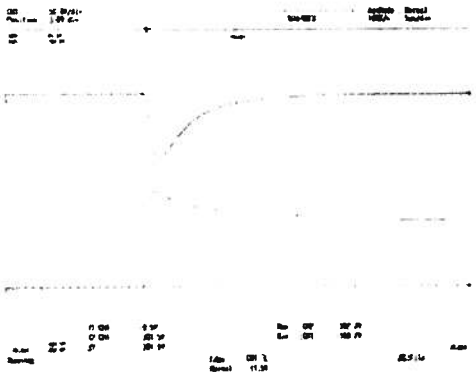

Fig 140003B 28-2, R2

1/5μs Steep impulse residual voltage test (10kA)

(The oscillogram come from the report of 140003B)

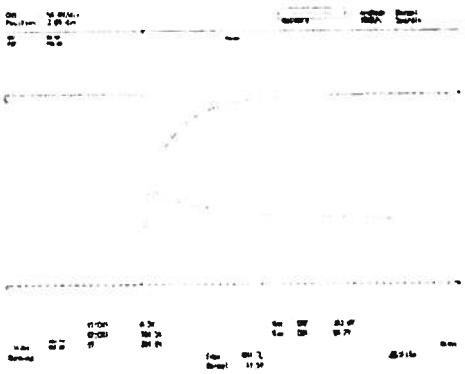

Fig 140003B 28-6, R3

1/5μs Steep impulse residual voltage test (10kA)

(The oscillogram come from the report of 140003B)

Date of tests: 2014-05-07

Kawara Trade S.A

Typical oscillogram

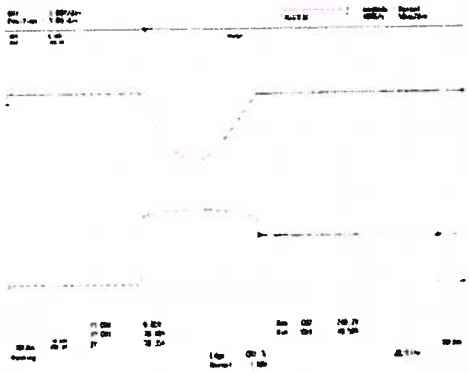

Fig 140003B 28-7, R1

40/100μs Switching impulse residual voltage test (1kA)

(The oscillogram come from the report of 140003B)

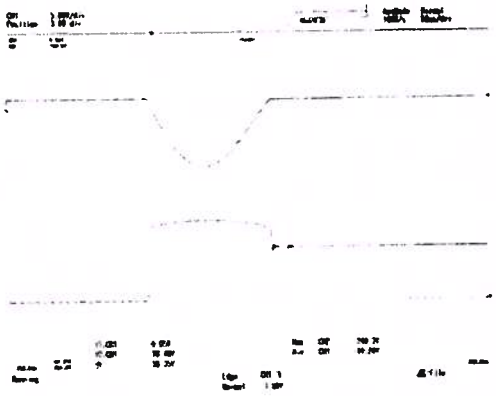

Fig 140003B 28-8, R2

40/100μs Switching impulse residual voltage test (1kA)

(The oscillogram come from the report of 140003B)

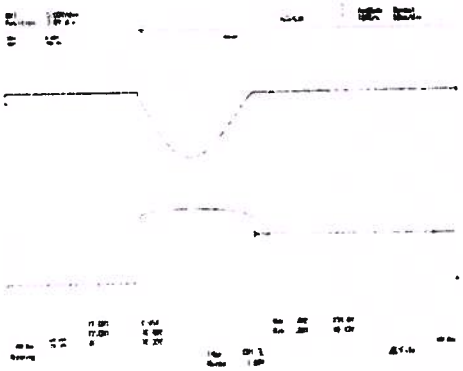

Fig 140003B 28-9, R3

40/100μs Switching impulse residual voltage test (1kA)

(The oscillogram come from the report of 140003B)

Date of tests: 2014-05-05

Kawara Trade S.A

Typical oscillogram

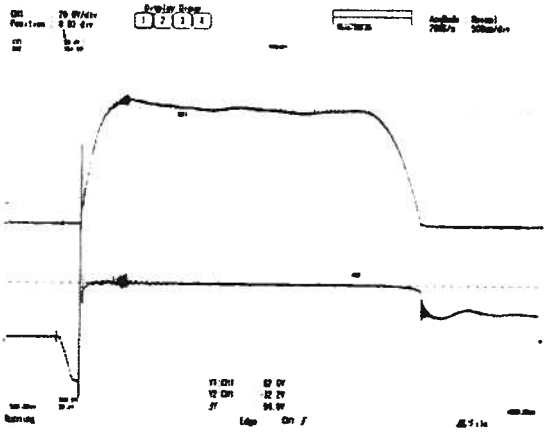

Fig 140001B 9-1. L1

Long duration current impulse withstand test (Class 3, 1st)

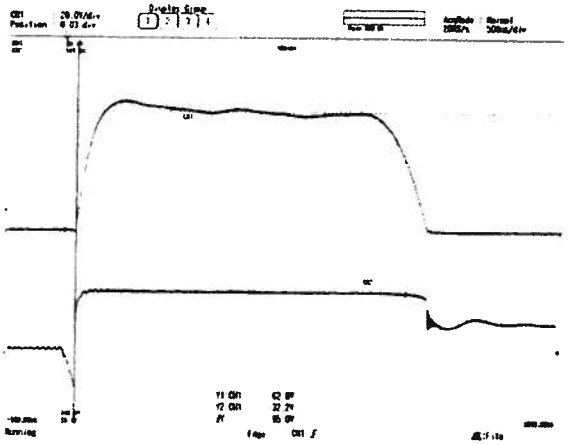

Fig 140001B 9-2. L2

Long duration current impulse withstand test (Class 3, 1st)

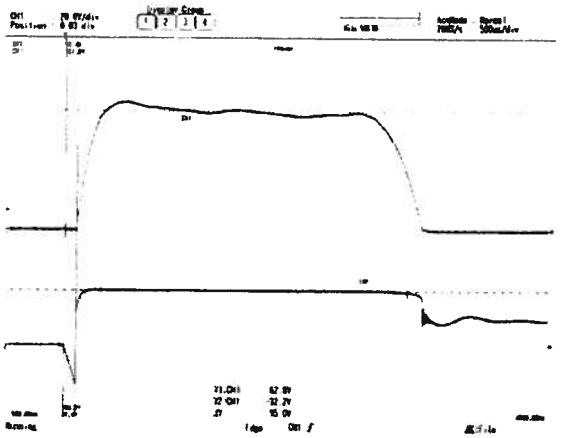

Fig 140001B 9-3. O3

Long duration current impulse withstand test (Class 3, 1st)

Date of tests:2014-05-05～2014-05-06

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Typical oscillogram

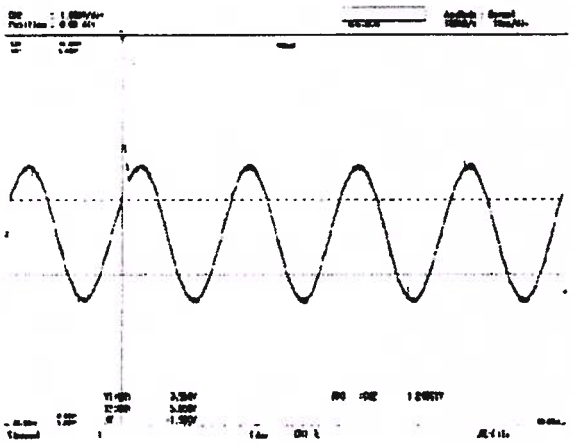

Fig 140001B 9-4, O1

Switching surge operating duty test (8/20μs , 10kA, 1st)

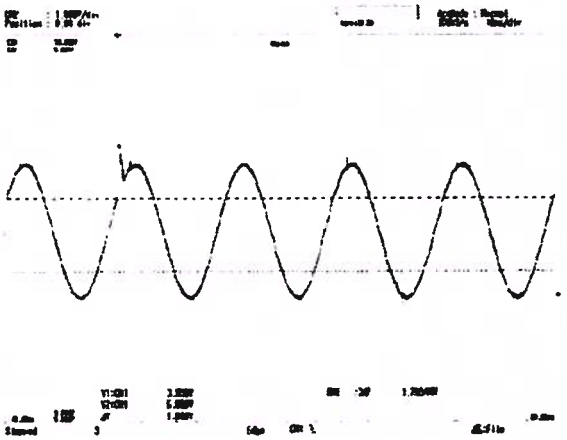

Fig 140001B 9-5, O2

Switching surge operating duty test (8/20μs , 10kA, 1st)

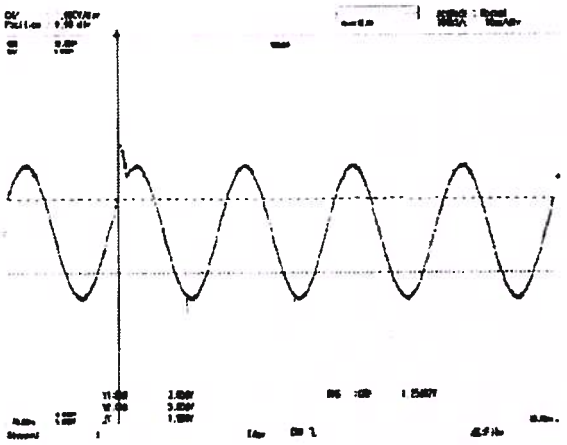

Fig 140001B 9-6, O3

Switching surge operating duty test (8/20μs , 10kA, 1st)

Date of tests: 2014-06-16

Kawara Trade S.A

Typical oscillogram

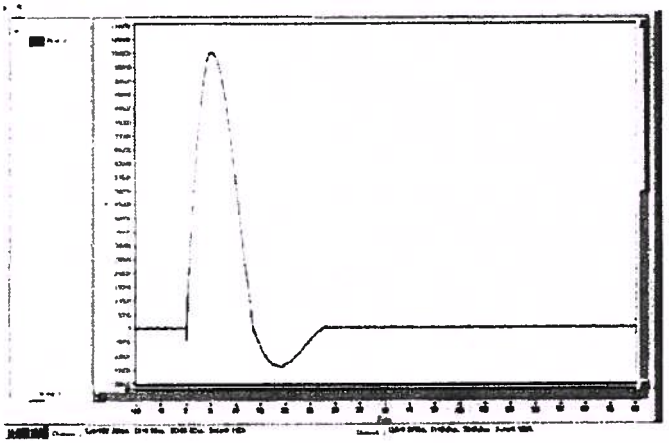

Fig 140001B 9-7, O1

Switching surge operating duty test (4/10μs , 100kA, 1st)

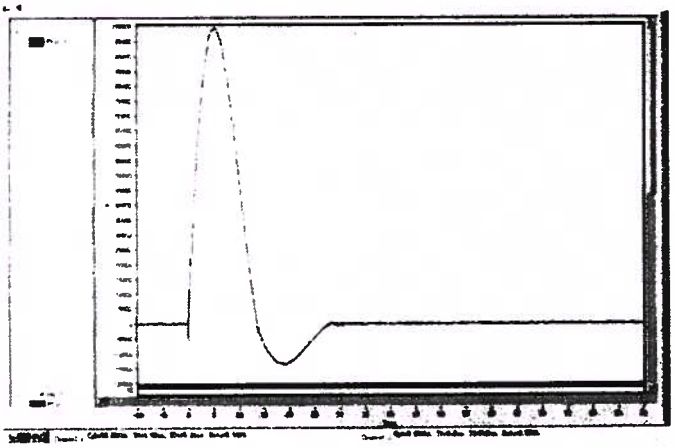

Fig 140001B 9-8, O2

Switching surge operating duty test (4/10μs , 100kA, 1st)

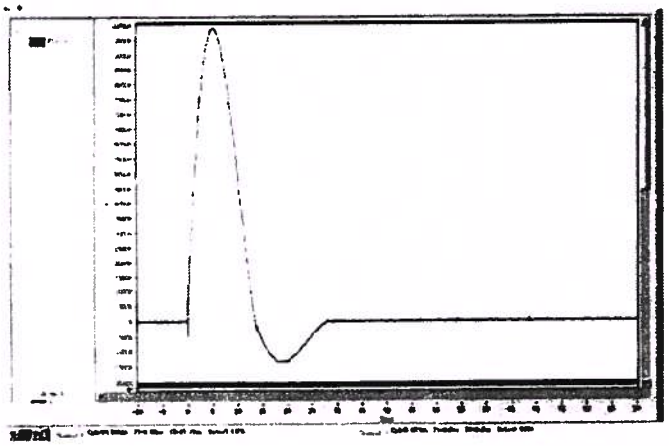

Fig 140001B 9-9, O3

Switching surge operating duty test (4/10μs , 100kA, 1st)

Date of tests: 2014-06-16

Kawara Trade S.A

Typical oscillogram

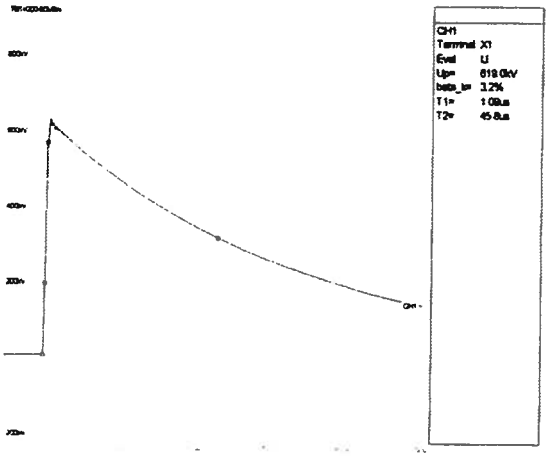

Fig IPVBT140003B-001 025-W

Lightning impulse withstand voltage test (1.2/50μs, positive polarity ,1st)

(The oscillogram come from the report of 140003B)

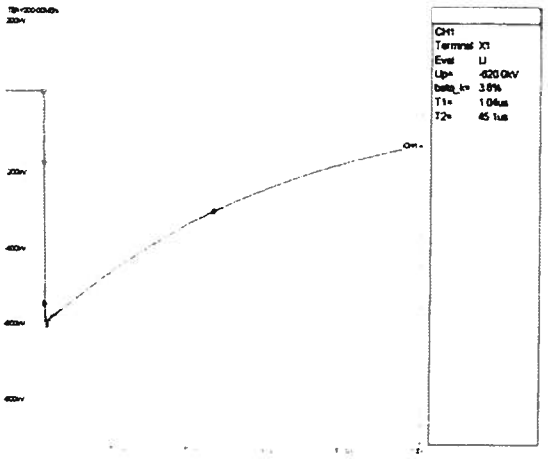

Fig IPVBT140003B-002 025-W

Lightning impulse withstand voltage test (1.2/50μs, negative polarity,1st)

(The oscillogram come from the report of 140003B)

Date of tests: 2014-05-09

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Typical oscillogram

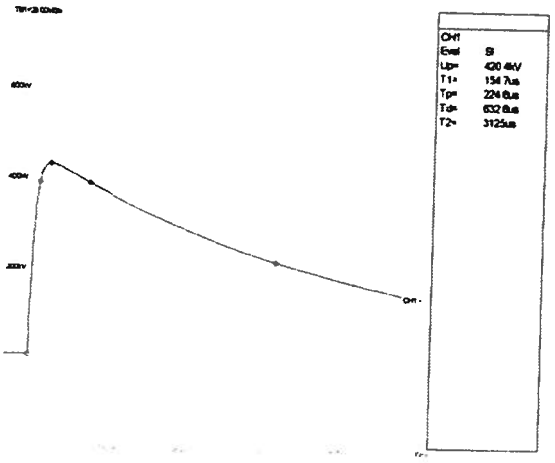

Fig IPVBT140001B-001 025-W

Switching impulse voltage withstand test(wet) (250/2500μs,positive polarity ,1st)

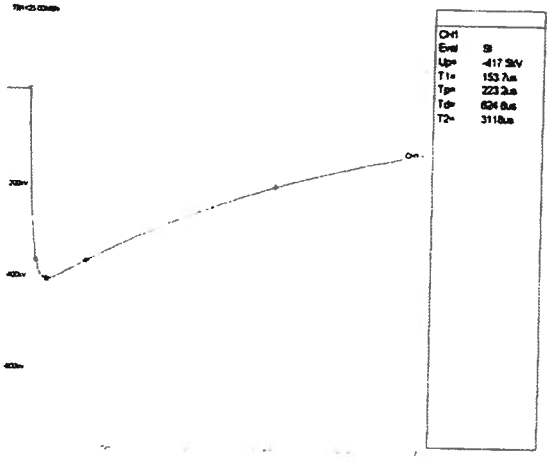

Fig IPVBT140001B-002 025-W

Switching impulse voltage withstand test(wet) (250/2500μs,negative polarity,1st)

Date of tests: 2014-05-08

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The arrester main parameters (offered by consignor)

Table1 Y10W3L 10kA Class 3 Series Porcelain Housed Metal-oxide Surge Arresters Main Parameters

NO 序号	项目(Project)	型号(Type)		Y10W3L-54	Y10W3L-96	Y10W3L-96	Y10W3L-126	Y10W3L-144	Y10W3L-168	Y10W3L-228	Y10W3L-276	Y10W3L-288	Y10W3L-420
1	Max voltage of system 系统最高运行电压 Um		kVrms	72	72	100	123	145	170	245	300	362	420
2	Rated voltage of an arrester 避雷器额定电压 Ur		kVrms	54	96	96	126	144	168	228	276	288	420
3	Continuous operating voltage 持续运行电压 Uc		kVrms	43.2	76.8	76.8	100.8	115.2	134.4	182.4	220.8	230.4	336
4	Nominal discharge current 标称放电电流 In		kA	10	10	10	10	10	10	10	10	10	10
5	Power-frequency reference voltage（Ir=5mA） 交流参考电压（Ir= 5mA）		≥kVp/√2	54	96	96	126	144	168	228	276	288	420
6	Residual voltage 残压	Steep current impulse residual voltage 陡波冲击电流下残压	≤kVp	144	255	255	335	383	447	606	734	765	1116
		Lighting impulse residual voltage 雷电冲击电流下残压	≤kVp	127	226	226	296	339	395	536	649	677	988
		Switching impulse residual voltage 操作冲击电流下残压	≤kVp	107	190	190	250	285	333	452	547	571	832
7	Long-duration current impulse （Line discharge class）线路放电等级			3	3	3	3	3	3	3	3	3	3
8	High current impulse withstand 大电流冲击耐受电流 kAp			100	100	100	100	100	100	100	100	100	100
9	Internal partial discharge 局部放电 ≤ pC			10	10	10	10	10	10	10	10	10	10
10	Minimum creepage distance 爬电距离		mm	2232	2232	3100	3813	4495	5270	7595	9300	11222	13020
11	Insulation distance 绝缘距离		mm	870	870	1050	1210	1380	1550	2420	2760	3100	4140
12	Potential distribution coefficient 电位分布系数			1.026	1.026	1.029	1.058	1.073	1.083	1.095	1.097	1.092	1.105
13	Bending moment 弯曲负荷 SLL		N·m	18000	18000	18000	18000	18000	18000	18000	18000	18000	18000
	MBL 破坏负荷		N·m	21600	21600	21600	21600	21600	21600	21600	21600	21600	21600
14	Arrester dimention 避雷器尺寸	Diameter (shed)伞直径 D	mm	365/335	365/335	365/335	365/335	365/335	365/335	365/335	365/335	365/335	365/335
		Diameter(Arrester)直径 D1	mm	205	205	205	205	205	205	205	205	205	205
		Number of shed 伞数	（Single unit）	9/9	9/9	11/11	13/13	15/15	17/17	13/13	15/15	17/17	15/15
		Height 高度 H	mm（Single unit）	1148	1148	1317	1486	1655	1824	1486	1655	1824	1655
		Number of unit 元件数	节	1	1	1	1	1	1	2	2	2	3
15	Blocks 电阻片	Diameter 直径×Height 厚度	mm	Φ70×20±1									
		Number of blocks 数量		18	32	32	42	48	56	76	92	96	140
16	short circuit current 短路电流	Rate short circuit current 额定短路电流		65kA/0.2s									
		Reduced short circuit current 降低的短路电流		25kA/0.2s, 12kA/0.2s									
		Low short circuit current 小短路电流		600±200A /1.0s									
17	Material of housing 外套材料			Porcelain 瓷									
18	Design type 避雷器设计类型			A									

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ANNEX C **INSPECTION REPORT OF THERMAL EQUIVALANCY OF XIHARI**

Kawara Trade S.A

XDBLQ/SB-001-2014

西安西电避雷器有限责任公司

XIAN XD ARRESTER CO., LTD.

TEST REPORT

Object: Metal Oxide Surge Arrester

Client: Xi'an XD Arrester Co.,Ltd

Classification: Performance Test

2014 4 17

Kawara Trade S.A

西安西电避雷器有限责任公司
XIAN XD ARRESTER CO., LTD.

TEST REPORT

XDBLQ/SB-001-2014

Name	Metal Oxide Surge Arrester	Type	/
		Trade Mark	XD
Consignor	Xi'an XD Arrester Co.,Ltd.	Manufacturer	Xi'an XD Arrester Co.,Ltd.
Representative	ZHU JIAXI	Classification	Performance Test
Quantity of Samples	Units of Arrester:2, Section:1.	Samples Received Date	2014.03.11
		Test Date	2014.03.12~2014.03.13
Serial Number	Section :S1; Unit of Porcelain Arrester:A1;Unit of Polymer Arrester:A2		
Test Judge	IEC60099-4 Metal Oxide Surge Arresters Without Gaps for A.C. Systems IEEE Std C62.11 Metal-Oxide Surge Arresters for AC Power Circuits		
Test Items	Test to verify thermal equivalency between complete arrester and arrester section		
Test Conclusion	This test only applied test data. (Official sign) Confirmed on		
Remarks	1.This test made on YH10W3L and Y10W3L series arresters, rated up to 420 kV for IEC and IEEE. 2.Unit type of porcelain arrester is Y10W3L-168,Unit type of polymer arrester is Y10W3L-168. 3.The temperature sensor of optical fibre is attached to the resistor between 1/3 of the arrester length from the top.		

Approved: Checked: Editor:

Kawara Trade S.A

1 Test to verify thermal equivalency between complete arrester and arrester section

1.1 Test of thermal equivalency between complete arrester and arrester section for IEC

Air ambient temperature: 11.8℃, Relative humidity: 45%

Heating time of section: 9min; Heating time of porcelain unit: 10min;

Heating time of polymer unit: 9min;

Type	Time s	Temperature ℃	Type	Time s	Temperature ℃	Type	Time s	Temperature ℃
section S	0	120.4	unit of porcelain A1	0	120.3	unit of polymer A2	0	120.2
	300	116.3		300	115.7		300	115.5
	600	113.0		600	111.8		600	111.1
	900	109.9		900	108.3		900	107.3
	1200	107.0		1200	105.0		1200	104.1
	1500	104.2		1500	101.8		1500	100.9
	1800	101.6		1800	98.7		1800	97.9
	2100	99.1		2100	95.7		2100	95.0
	2400	96.7		2400	92.9		2400	92.7
	2700	94.3		2700	90.1		2700	90.0
	3000	92.0		3000	87.5		3000	87.5
	3300	89.8		3300	84.9		3300	85.0
	3600	87.7		3600	82.4		3600	82.8
	3900	85.8		3900	80.1		3900	80.5
	4200	83.9		4200	77.8		4200	78.4
	4500	82.1		4500	75.7		4500	76.4
	4800	80.4		4800	73.6		4800	74.4
	5100	78.7		5100	71.6		5100	72.6
	5400	77.1		5400	69.6		5400	70.8
	5700	75.5		5700	67.8		5700	69.0
	6000	74.0		6000	66.0		6000	67.3
	6300	72.6		6300	64.3		6300	65.6
	6600	71.3		6600	62.6		6600	64.0
	6900	70.0		6900	61.0		6900	62.5
	7200	68.7		7200	59.5		7200	61.1

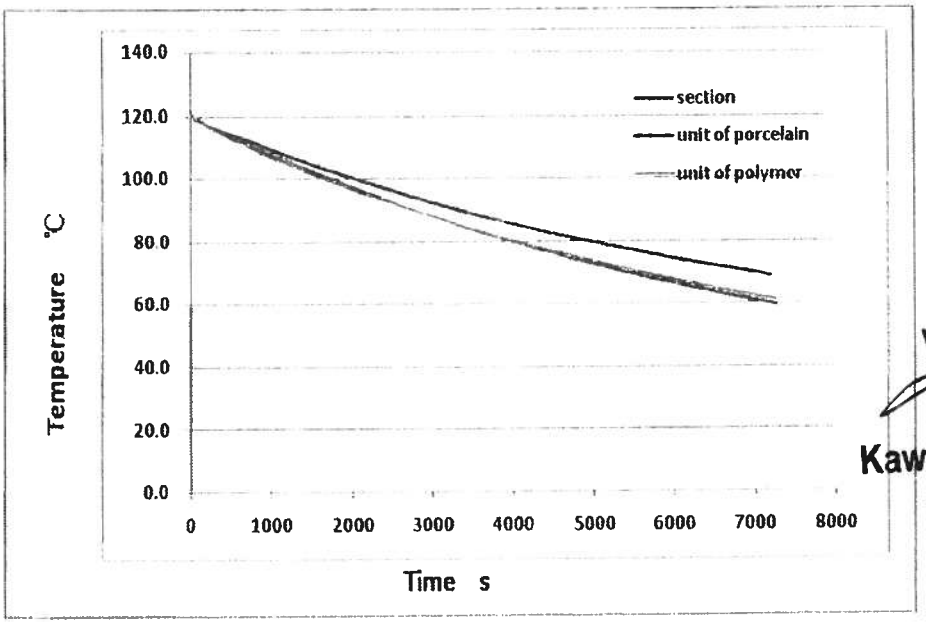

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fig1. Thermal equivalency curve between complete arrester and arrester section for IEC

1.2 Test of thermal equivalency between complete arrester and arrester section for IEEE

Air ambient temperature: 10.8℃, Relative humidity: 48%

Heating time of section:11.0min; Heating time of porcelain unit: 10.6min;

Heating time of polymer unit: 10.8min;

Type	Time s	Temperature ℃	Type	Time s	Temperature ℃	Type	Time s	Temperature ℃
section S	0	140.8	unit of porcelain A1	0	140.6	unit of polymer A2	0	140.7
	300	135.8		300	132.8		300	134.1
	600	129.7		600	125.1		600	127.1
	900	125.8		900	120.6		900	122.9
	1200	122.0		1200	116.7		1200	118.8
	1500	118.4		1500	112.8		1500	114.8
	1800	114.9		1800	109.2		1800	111.1
	2100	111.6		2100	105.6		2100	107.6
	2400	108.9		2400	102.3		2400	104.6
	2700	106.3		2700	99.1		2700	101.7
	3000	103.9		3000	96.1		3000	98.9
	3300	101.6		3300	93.3		3300	96.2
	3600	99.3		3600	90.7		3600	93.6
	3900	97.0		3900	88.2		3900	91.0
	4200	94.8		4200	85.7		4200	88.5
	4500	92.6		4500	83.3		4500	86.1
	4800	90.4		4800	81.1		4800	83.8
	5100	88.3		5100	78.9		5100	81.5
	5400	86.2		5400	76.7		5400	79.2
	5700	84.2		5700	74.8		5700	77.0
	6000	82.3		6000	72.8		6000	74.9
	6300	80.4		6300	70.8		6300	72.8
	6600	78.7		6600	69.0		6600	71.1
	6900	77.3		6900	67.3		6900	69.7
	7200	76.0		7200	66.0		7200	68.4

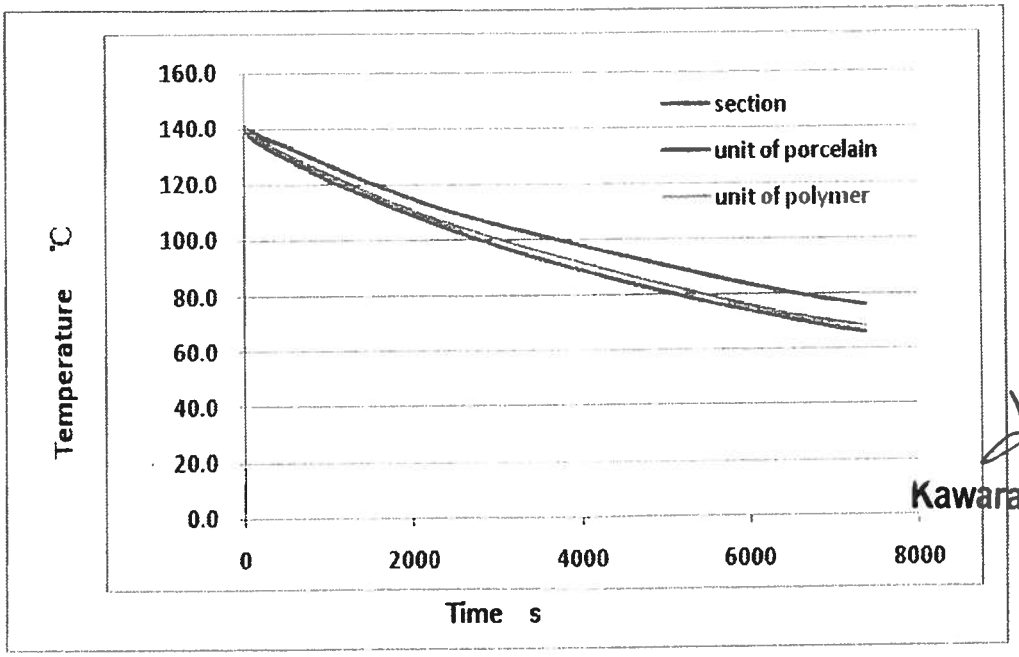

fig2. Thermal equivalency curve between complete arrester and arrester section for IEEE

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PLANILLA DE DATOS GARANTIZADOS

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9. PLANILLA DE DATOS GARANTIZADOS

DESCARGADORES DE TENSIÓN DE OXIDO DE ZINC (ZnO) - 198 kV			
1.	Nombre del fabricante, país donde se fabrica:	Xi'an XD Arrester Co., Ltd. China	
2.	Denominación dada por el fabricante, tipo, modelo:	Y 10W-198/460	
3.	Dibujos de dimensiones Nros.:	Se presentará en la etapa de Workstatement	
4.	Diagrama de conexiones, Nros.:	Se presentará en la etapa de Workstatement	
5.	Características técnicas:		
5.1.	Tipo:	Y10W-198/460	
5.2.	Número de secciones por fase	1	
5.3.	Frecuencia:	50/60	Hz
5.4.	Corriente nominal de descarga:	10	kApico
5.5.	Tensión Nominal del descargador (Rated Voltage):	198	kVrms
5.6.	Máxima tensión de operación continua (Uc)	156	kVrms
5.7.	Niveles de sobre tensión temporaria (TOV)		
a)	Para 1 seg.:	227,7	kVrms
b)	Para 10 seg.:	217,8	kVrms
5.8.	Tensión disruptiva a frecuencia industrial:	>198	kVrms
5.9.	Nivel de Radio interferencia (RIV)	500	µV
5.10.	Tensión residual máxima p/ frente de onda de 8/20 µs:		
	a) De 5 kA	440	kVpico
	b) De 10 kA	460	kVpico
	c) De 20 kA	510	kVpico
	d) De 40 kA	550	kVpico
5.11.	Tensión residual p/ frente de onda de impulso de maniobra de corriente:		

	a) De 0,5 kA	405	kVpico
	b) De 1 kA	440	kVpico
	c) De 2 kA	480	kVpico
5.12.	Corriente de impulso de corta duración (High current impulse - 4/10 µs):	100	kApico
5.13.	Capacidad de absorción de energía:	7,5	kJ/kVUr
5.14.	Clase de Descarga de Línea (Según IEC)	3	
5.15.	Esfuerzo o Carga de Cantilever		
5.15.1	Carga de servicio estática máxima admisible (PSSL):	8000	N.m
5.15.2	Carga de servicio dinámica máxima admisible (MPDSL):	17500	N.m
5.16	Conectores de potencia ofertados:		

6. Lista de folletos, planos y catálogos necesarios para describir con claridad el equipo ofertado (deben acompañarse): .....
Se detalle los anexos

7. Número del Certificado de aprobación correspondiente al prototipo del equipo ofertado o de características similares: .....
TIC 3137-14

8. Normas aplicadas y año de publicación: .....
IEC 60099-4

9. Diferencias con la especificación: .....
NO

10. Observaciones: .....
NO

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PLANOS

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APROBADO

La Aprobacion no releva al Contratista de cualquiera de sus obligaciones de cumplir con los requisitos del Contrato o de la responsabilidad de que sus diseños y planos estén correctos

APROBADO	Dpto. Control de Suministros de Ingeniería

HOJA A3

REV	FECHA	NOMBRE	DESCRIPCIÓN	MAUT APROB	FECHA
0	18/03/22	RD	EMISIÓN INICIAL		

ANDE ADMINISTRACION NACIONAL DE ELECTRICIDAD
ASUNCION-PARAGUAY

CIE CONSORCIO CIE TESA

L.P.I. ANDE-BID N° 1482/2010 - LOTE 1 - CONTRATO N° 5138/2020
PROYECTO DE CONSTRUCCIÓN E INTERCONEXIÓN DE LA SUBESTACIÓN
ALTO PARANÁ 220/66/23kV

PROY	FERNANDEZ	FD	18/03/22
REVISO	FERNANDEZ	FD	18/03/22
APROBO	LOPEZ		18/03/22

SUB. ALTO PARANÁ
DESCARGADOR DE 198kV
DISEÑO DIMENSIONAL

Esc. S/E

143-2620G-001-DF-R0

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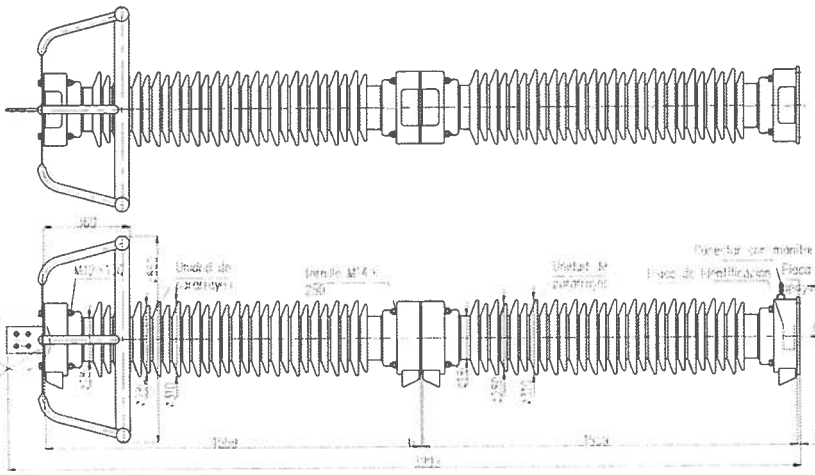
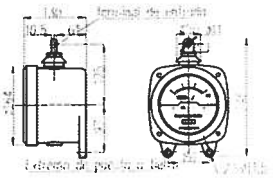
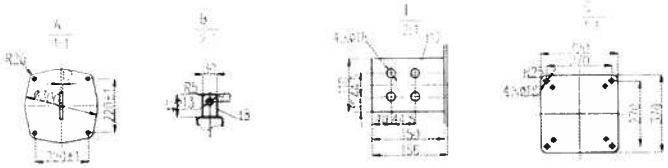


ontador del Descargador
2:1



Placa de Identificación
2:1



Especificacion:

1 Distancia de fuga del pararrayos 7812 mm.
2 Pararrayos Area seco Distancia 2600mm.
3 El pararrayos debe observar las especificaciones del dibujo
Fijación (vertical, no redirigir.
4 Area efecta al viento del pararrayos: 1,00 m
5 Centro de gravedad del pararrayos: 1990 mm desde abajo
Tarea de base;
6 El material de la placa de cubierta de conexion es Q235, (Poder
gitar 90 grados)

					Descargador de Tensión de Onda de Zinc	[illegible]
MARCA	NOMBRE	FIRMA	SIGNATURE	FECHA		
DISEÑO	L Y Q	ESTANDARIZADO	Y H F			
DIBUJO	Z H F	APROBADO				
EXAMINAR	D J L	APROBADO				
AUDITADO	L W	FECHA				

XD 西安西电避雷器有限责任公司
XIAN XD ARRESTER CO., LTD.

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