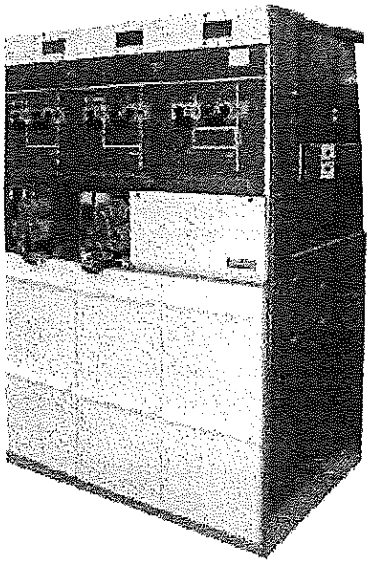
FBX Switchboard

End of life Guide

SF6 gas insulated secondary distribution switchboard



Schneider Electric

End of life Guide - FBX

Contents

Introduction

The end-of-service phase is considered to be a very important part of the life cycle of T&D products. The environmental impact inherent in the disposal of equipment is, sometimes, greater than that of the manufacturing, delivery or utilisation phases. European directives, such as WEEE[1], ELV[2] and RoHS[3], have confirmed this point and all insist upon the recovery of waste products and their valorisation at the end of the equipment's service life. Even though our switchgear is not covered by this legislation, Schneider Electric is willingly attempting to optimise recycling, the processing of waste and, as a consequence, the end of service phase of our products.

This guide is aimed at facilitating the disposal of Schneider Electric products whilst minimalising their impact on the environment. The separation of the component elements making up the switchgear is completed by:

- Either by disconnecting the mechanical linkages,
- Or, by dismantling, that is to say, by breaking or shearing the connections.

[1] DIRECTIVE 2002/96/EC of the European Parliament and the Council of 27 January 2003 on Waste Electrical and Electronic Equipment

[2] DIRECTIVE 2000/53/EC of the European Parliament and the Council of 18 September 2000 on end-of-life vehicles

[3] DIRECTIVE 2002/95/EC of the European Parliament and the Council of 27 January 2003 on Restriction of Hazardous Substances

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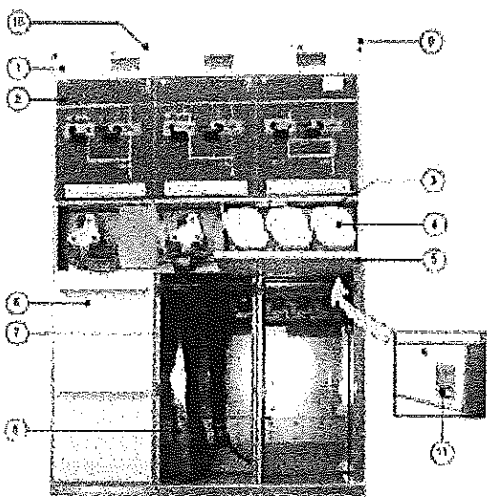
Presentation

This end-of-service-life guide is applicable across the full range of SF6 gas-insulated FBX products. The switchboard taken as an example is the FBX-C (EDF); 24kV. Its composition is representative of its category.

Description of the switchboard

Reference	FBX-C
Type	EDF
Switchboard	CCT1
From left to right:	2 x C functions + 1 x T1 function



Key

1 Voltage presence indicator light and low voltage compartment panel.

2 Mimic diagram panel

3 Fuse compartment

4 End plug

5 Fuse compartment access panel

6 Cable compartment access panel

7 HVA connections

8 Adjustable cable mounts

9 Lifting ring

10 Removable top panel – low voltage connections

11 Technical data rating plate

Dimensional characteristics

Width	1 m
Depth	0.75 m
Height	1.38 m
Surface area	0.75 m²
Weight	330 kg

Technical documentation

FBX EDF	Installation - Commissioning	AMTNoT106-02
FBX EDF	Operations - Maintenance	AMTNoT107-02
FBX International Standard	Installation - Commissioning	AMTNoT131-02
FBX International Standard	Operations - Maintenance	AMTNoT132-02

Ecological declarations

FBX Switchboard	August 2006	6 pages
SFU/SFU Controls	June 2007	6 pages
CD10 Control	June 2007	5 pages

Service life

The service life of the FBX switchboard is 30 years. This may vary with the environmental conditions, conditions of use and maintenance.

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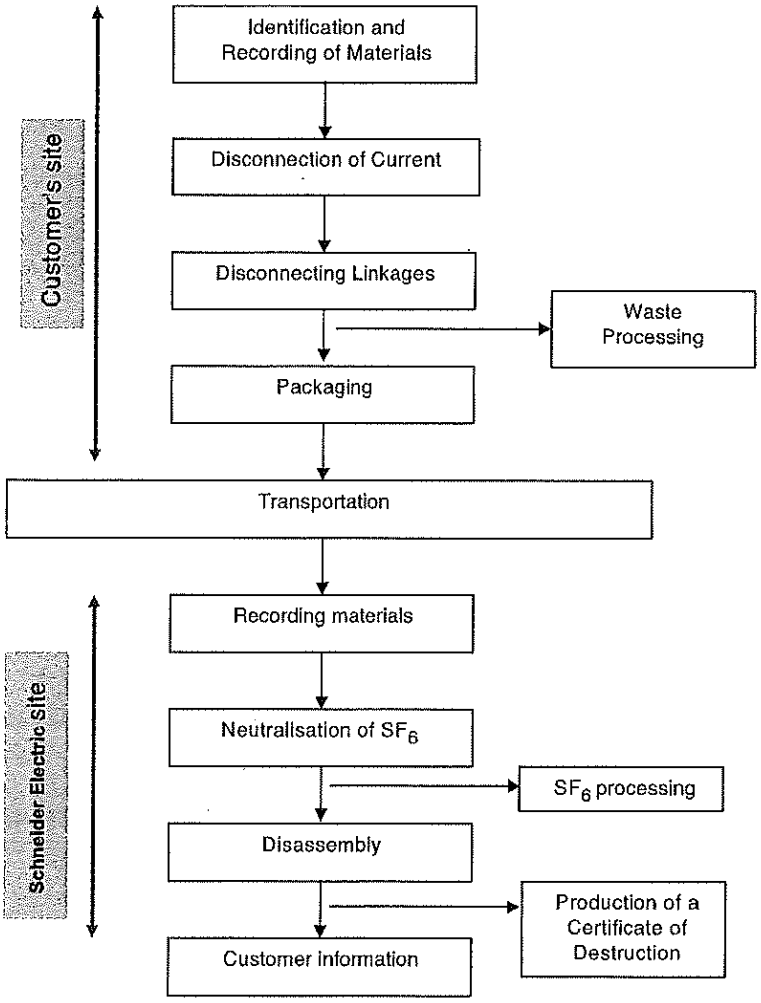
Example of the complete life cycle and end-of-service process



General safety instructions

- Before any dismantling operation:
  - Turn off the current and earth the functions of the Fluokit M24+ switchboard (follow the procedure given in disconnecting the supply to a switchboard).
  - Turn off current to all Low Voltage servo systems.
  - Release the springs on the mechanical controls.
  - The wearing of individual protective equipment is obligatory (gloves, goggles, safety hat and boots, etc.)
- To neutralise the SF6 gas, which, regardless of specific indications, must be considered to be highly polluted:
  - Transport the materials as category ADR[4]
  - Carry out all SF6 gas recovery work within a dedicated space (See End-of-service – decommissioning zone).
  - Within the same space, clean and wash down all parts of the Fluokit M24+ before valorising.

[4] ADR French regulation for hazardous substances transport by road (applied to hazardous waste)
[5] Schneider Electric Instruction T&D EHS OI - 3 - Electrical Risk Prevention LOTO

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Identification of materials and logging

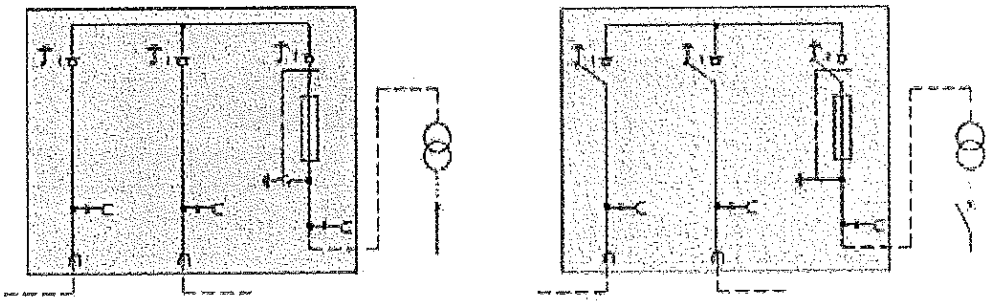
The FBX range includes two types of switchboard: FBX-C (Compact) and FBX-E (Extensible) The information on the Technical Data plate (N° 11 - Description of the switchboard) is indispensible to the identification of the switchboard concerned and the determination of its makeup.

Disconnecting the supply to a switchboard

- Shutting down the energy consumer units
- HVA lockouts by User and Distributer

The disconnection of the current from a unit must be followed by an electrical lock-out of the unit. This procedure, carried out by the client's manager responsible for lock-outs, is broken down into five stages (Lockout – Tag Out[5]).

Configuration



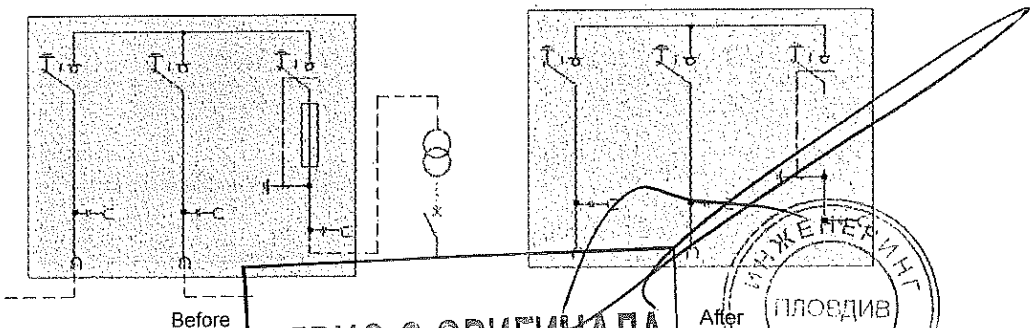
Before After

[4] ADR French regulation for hazardous substances transport by road (applied to hazardous waste)
[5] Schneider Electric Instruction T&D EHS OI - 3 - Electrical Risk Prevention LOTO

Disconnecting linkages

Operations	Duration	Operator
Remove the fuse access cover		
Remove the HV fuses		
Remove the cable access panel.		
Disconnect and remove the HVA cable clamps	1 h 30	1
Disconnect any LV connections		
Disconnect the general earth connector		
Remove the floor mounting points		

Configuration



Before After

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Recycling

- Material to be disposed of via Household Waste channels:
  - The HV fuses
- The following ferrous metals should be sent for recycling:
  - Operating handles,
  - Door panels and fuse protection cover
  - Rear deflector
  - Cable clamps and floor mountings

Packaging

The switchboard is always filled with SF6 gas:

- Respect the centre-of-gravity markings when handling the equipment.
- Do not pierce the tank.
  - Attach the FBX unit to a transport pallet.
  - Identify the switchboard.
  - Protect the switchboard from any physical shocks likely to cause an SF6 gas leak.

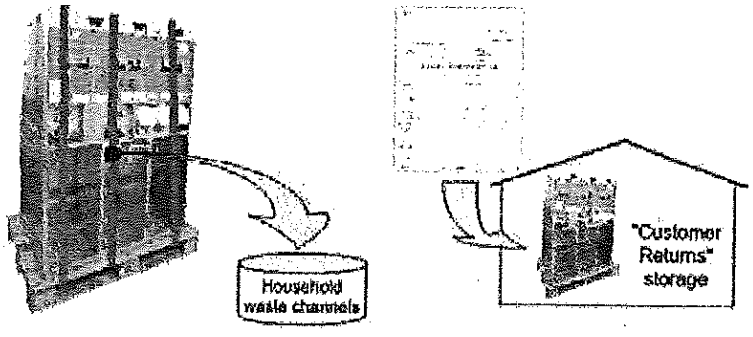
Transportation

Respect the restrictions laid down for ADR[6] transportation (Production\ of a Hazardous Waste Monitoring Form) and declare to the authorities (Prefecture in France) if necessary.

Schneider Electric recording

Operations	Duration	Operator
Unpack the FBX switchboard – keep the wooden pallet to facilitate further handling operations.	30 mins.	1
Identify and log the material by opening a 'Equipment Return' form		
Possible storage of the FBX unit.		

Configuration



Before After

Recycling

Dispose of plastics via the household waste channels

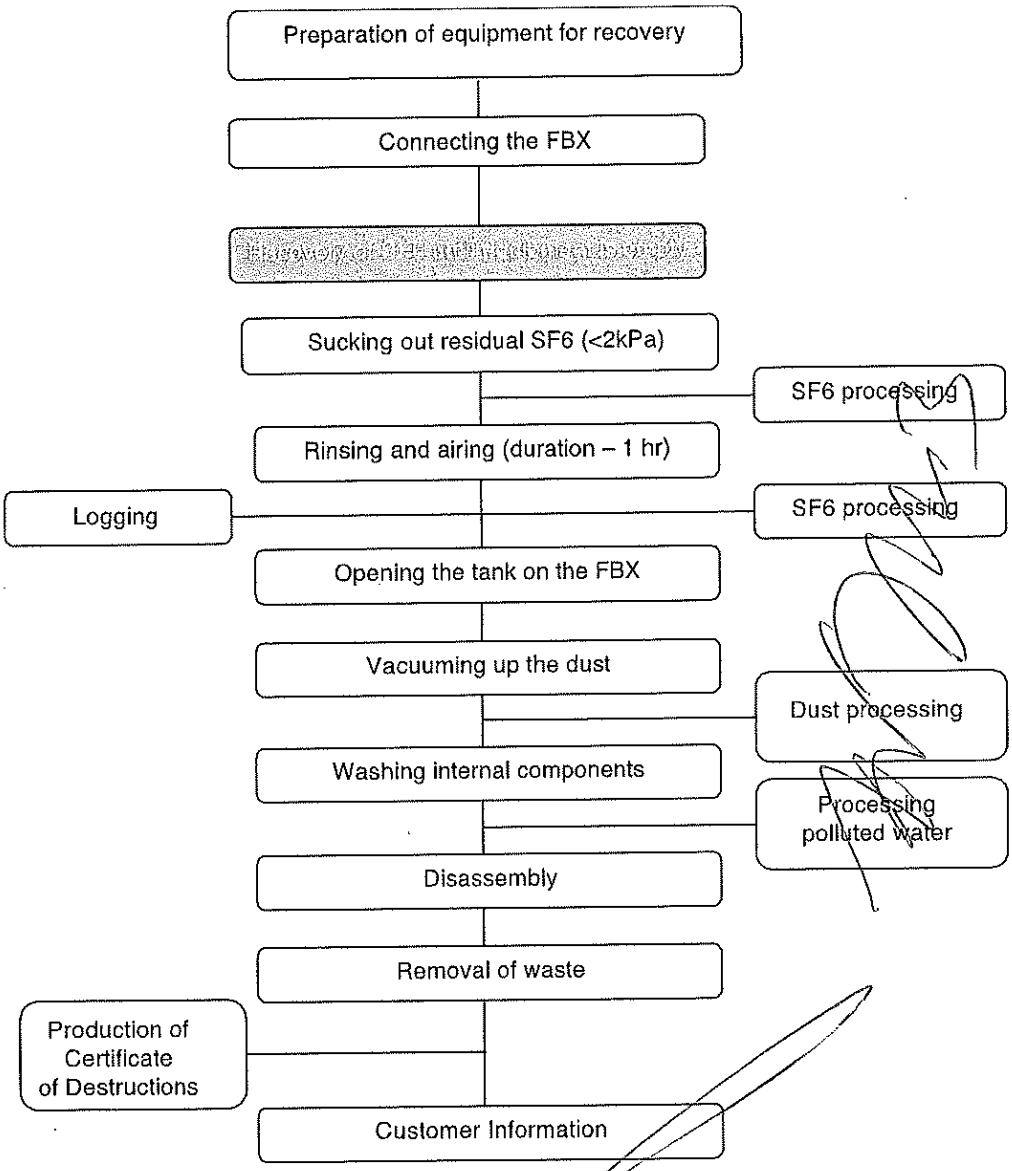
[6] ADR French regulation for hazardous substances transport by road (applied to hazardous waste)
[7] « SF6 Handling Guide » Schneider Electric

Neutralisation of SF6 gas

General instructions for the recovery of the SF6 gas[7]

- SF6 gas recovery operations must be carried out within a dedicated space (See End-of-service – decommissioning zone).
- The operators must be:
  - Trained in this work,
  - Wearing the required items of Individual Protective Equipment,
  - Aware of the risks inherent in the chemicals produced by the decomposition of sulphur hexafluoride, as well as the measures to be taken in the event of an accident.

Successive stages of SF6 gas recovery



[6] ADR French regulation for hazardous substances transport by road (applied to hazardous waste)

[7] « SF6 Handling Guide » Schneider Electric

End of life Guide - FBX

End-of-service – decommissioning zone

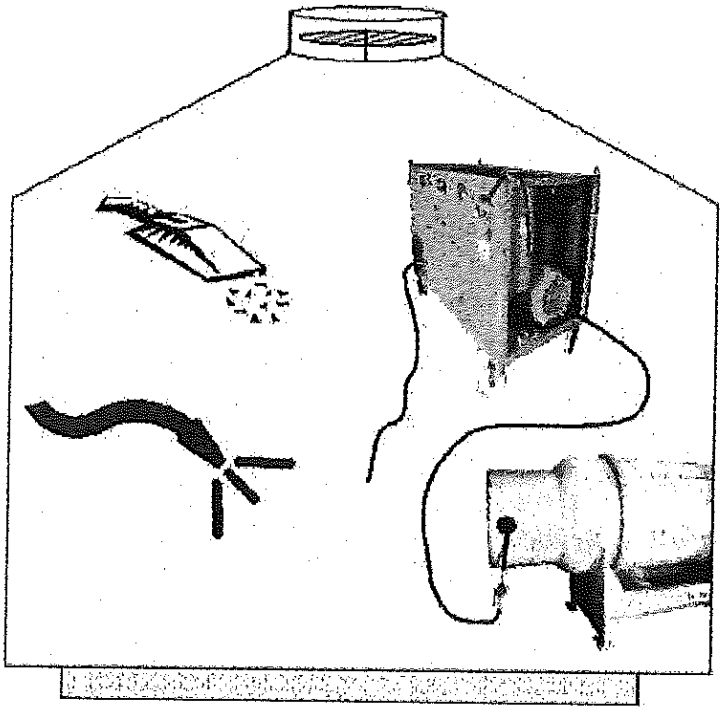
The SF6 recovery operations and the disassembly of polluted equipment must be carried out within a suitably designed space.

This space must be fitted out with:

- A forced air, filtered extraction system.
- A containment basin to recover any polluted liquids,
- A heating system protected from any projections of liquid.

The room must also be furnished with equipment to:

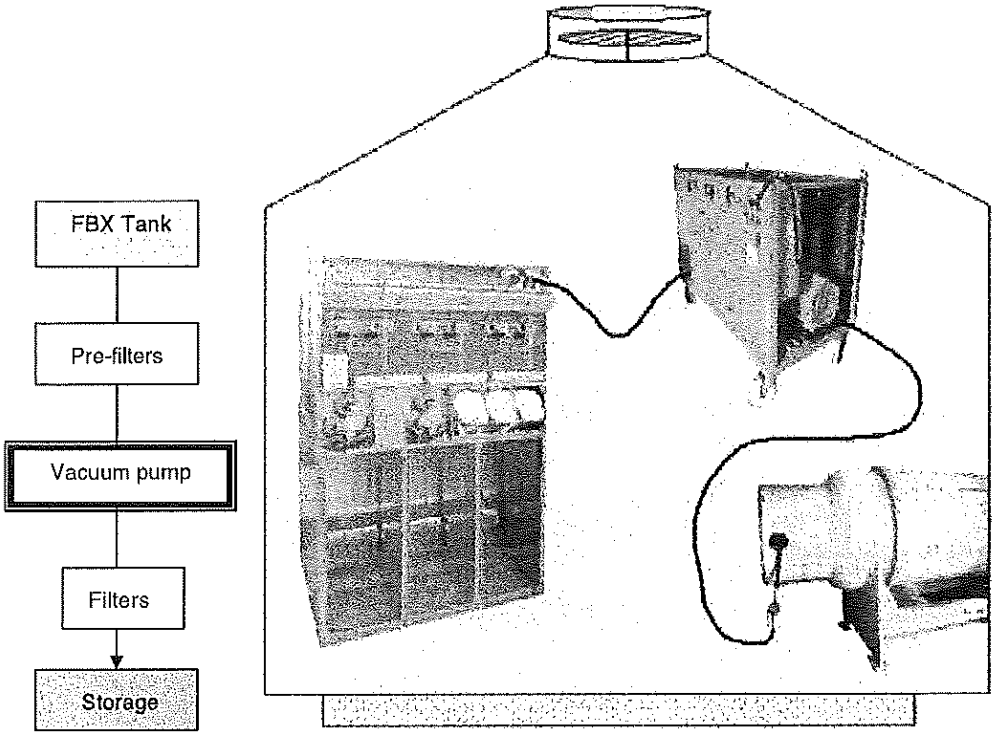
- Recovering the SF6 gas:
  - Vacuum pump (Dilo unit, for example) with a connection for a valve and a second connection for a press-fit nozzle.
  - A specially designed, yellow container for used SF6.
- Parts cleaning:
  - A vacuum cleaner with a dust recovery tank and filter bag.
  - A pressure washer with a neutralisation solution.



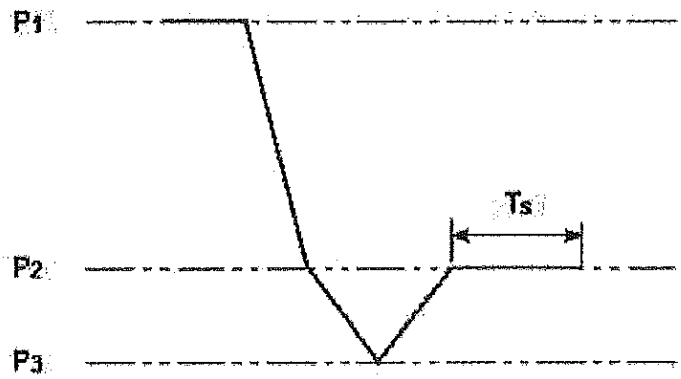
SF6 gas recovery

Operations	Duration	Operator
Lower the rated pressure (P1) to atmospheric pressure(P2).	2 h 00	2
Continue recovery to eliminate residual pressure(P3). Note: P3 < 2 k P2.		
Gently let the air in then leave the device to stabilise for 1 hour (Ts).		

Principle



Pressure variation graph



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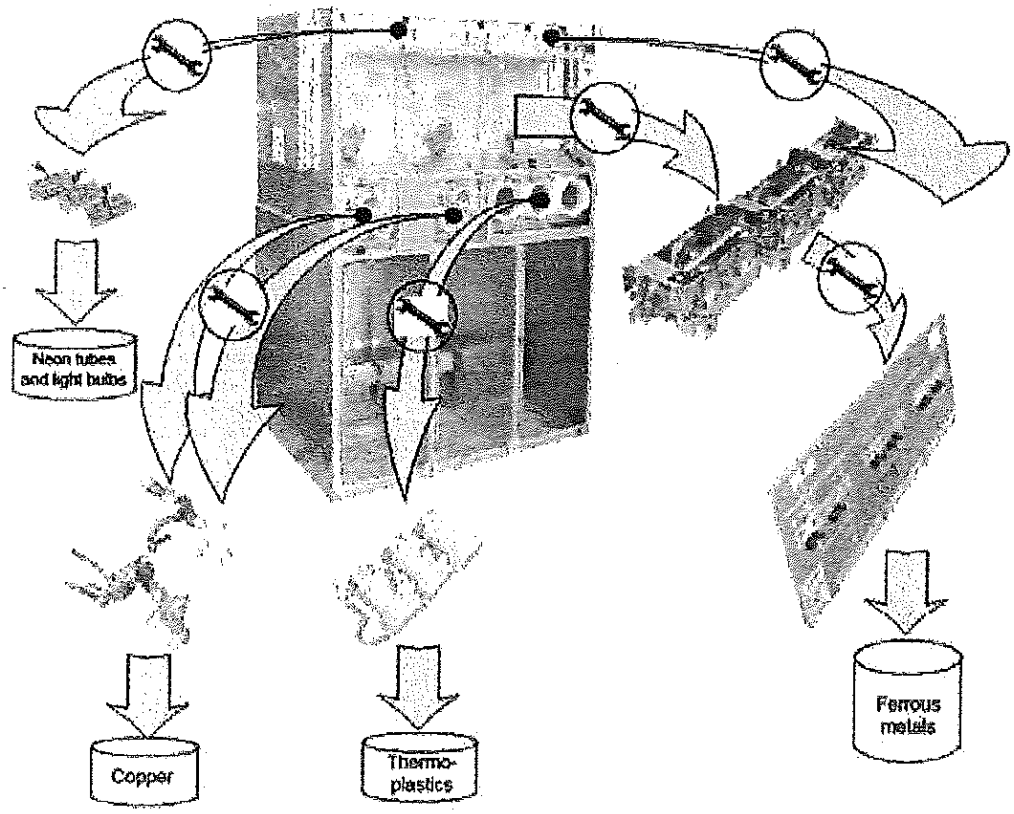
Disassembly

Dismantling the equipment [See Manual AMTNoT131-02]

Operations	Duration	Operator
Remove the front panel from the switchboard	2 h 00	2
Extract the 3 mechanical commands (See Instructions in Technical documentation)		
Dismantle the voltage warning indicators		
Remove the small panel on the LV cabinet and the roof panel		
Dismantle the 2 earthing tripods.		

Configuration



Recycling

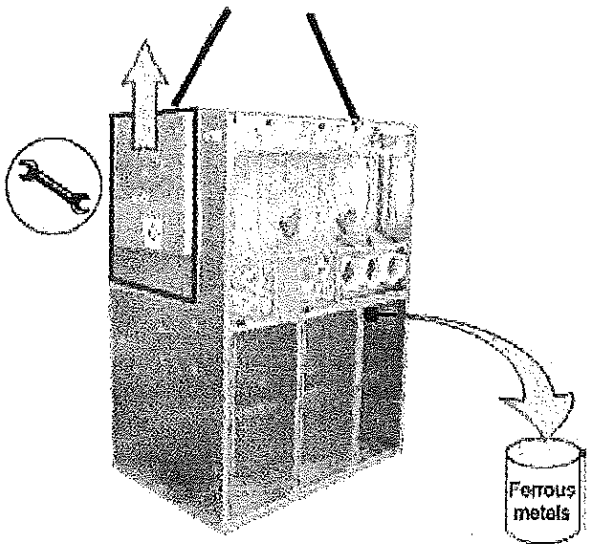
Dispose of:

- The three voltage warning units via the neon tube and light bulb disposal channels
- The 2 covers, the roof panel and the 3 mechanical commands via the ferrous metal disposal channel.
- The 3 fuse pugs via the thermo-plastics channel
- The 2 tripods via the Copper disposal channel

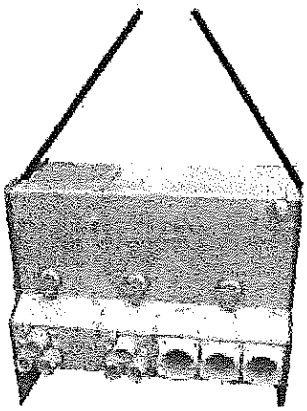
Separation of the tank from the chassis

Operations	Duration	Operator
Unpack the FBX switchboard – keep the wooden pallet to facilitate further handling operations.	30 mins.	2
Identify and log the material by opening a 'Equipment Return' form		

Configuration



Before



After

Recycling

Dispose of the complete chassis via the ferrous metal channels

Opening the FBX tank in a dedicated zone

Operations	Duration	Operator
Cut out the rear panel of the tank, following the line of the bead welding.	1 h 00	2
Protect the edges of the cut-out panel with a suitable protective cover		
Vacuum and filter the dust then place it in a plastic bag.		
Recover the molecular filter and slide it into a plastic bag.		

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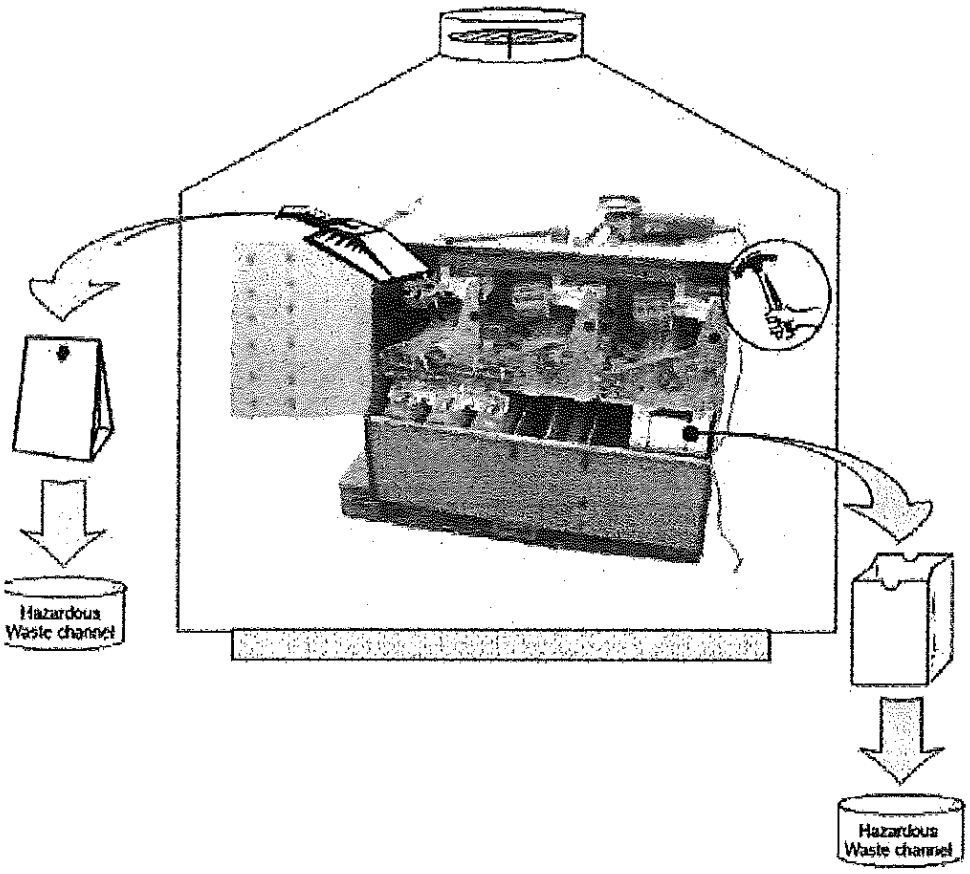
Configuration



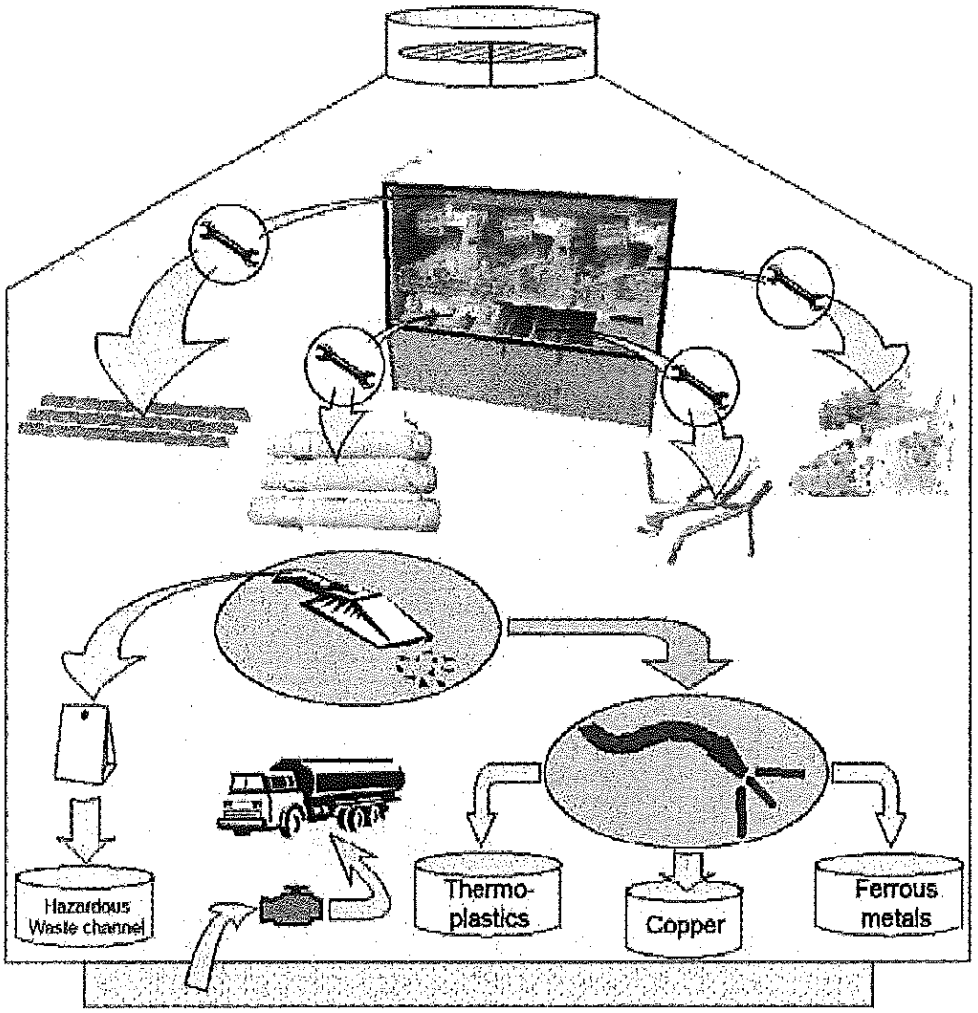
Recycling

Dispose of the two hermetically-sealed plastic bags via a Hazardous Waste disposal channel.

Disassembly, cleaning and washing of internal tank fittings

Operations	Duration	Operator
Dismantle the busbar, the three interrupter switches, the copper connectors and the three fuse holders	2 h 00	2
Vacuum all parts as well as the inside of the tank itself.		
Wash all parts as well as the inside of the tank itself.		

Configuration



Recycling

Dispose of the waste in accordance with its category (copper, thermoplastics, etc.)

Dispose of the dust bags via the Hazardous Waste channels

Recover the polluted liquids and dispose of them via a treatment centre

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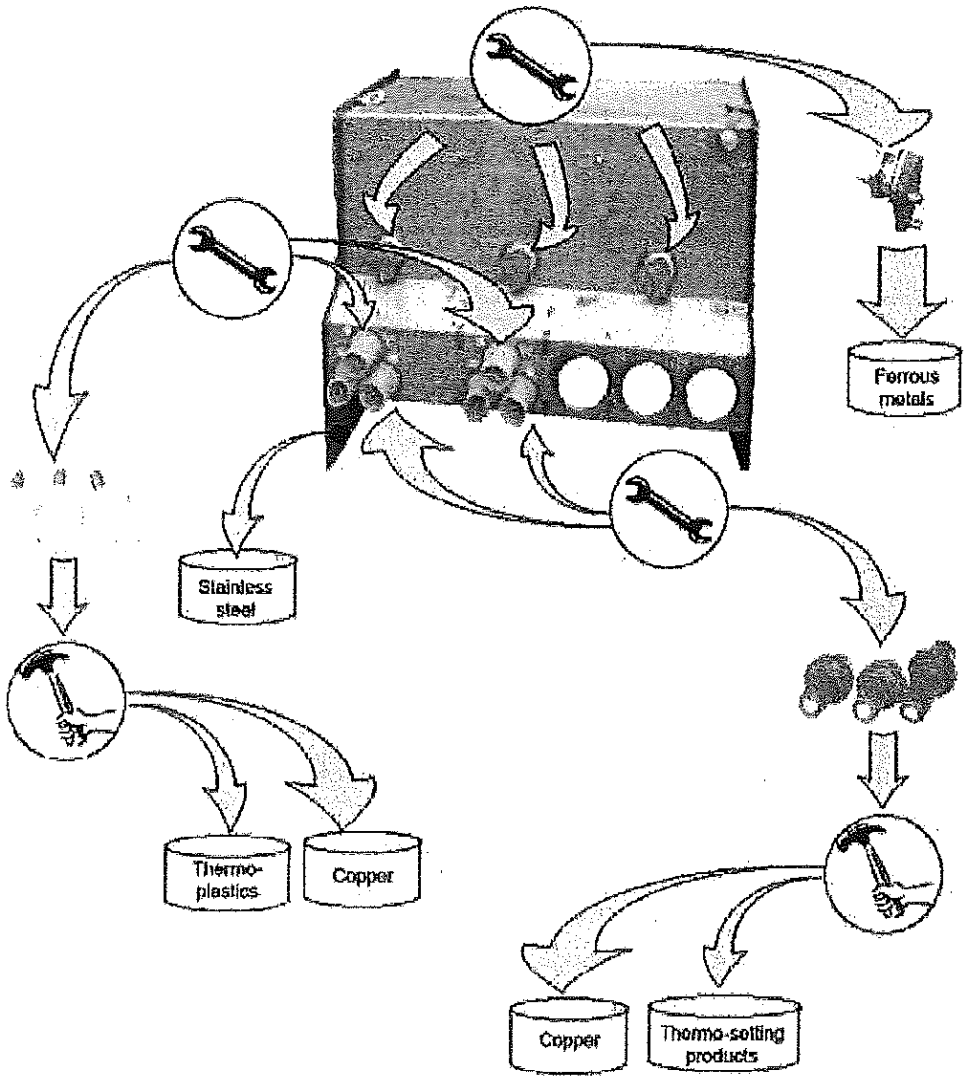
Disassembly and dismantling of external tank equipment

Operations	Duration	Operator
Dismantle the three interrupter switch drive shafts	1 h 30	2
Remove then dismantle the three HV cross members		
Remove then dismantle the three tripod cross members		

Configuration



Recycling

Dispose of the 3 drive shafts via the ferrous metal disposal channels

Dispose of the cross member debris via the copper, thermoplastics and thermohardening product channels

Dispose of the tank via stainless steel disposal channels

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Definitions

B.S.D.I. (Bordereau de Suivi de Déchet Industriel – Hazardous Waste Monitoring Form): A form, produced by Schneider Electric or the transporter, accompanying the hazardous waste until its arrival at the elimination site.

C.E.T: Centre d'Enfouissement Technique (Landfill Site).

Waste : Designates all substances or objects that the holder must dispose of or has the intention or obligation of disposing of. Final waste is a waste product incapable of being processed in the current technical and economic situation

Dismantling: Dismantling is a more complex process, requiring the use of specific tools (saws, drills, etc.) and additional safety restrictions (protection, fire-permits, etc.) Pieces may be dismantled if they are riveted, welded, glued, etc.

Disassembly: Elements to be disassembled are those that can be separated without destroying the mountings using conventional tools These include assemblies that are bolted, click-fit, sleeve-fit, etc.

D.I.B. (Déchets Industriels Banal – Household Waste): Waste products collected and treated without the requirement of specific precautions Assimilated into domestic waste. This group includes, in particular, household waste such as paper, card, plastic, wood and metal.

D.I.D. (Déchets Industriels Dangereuxl – Hazardous Waste): Waste products presenting a potential risk to the environment. These are collected and treated separately from household waste products to minimise their impact on the environment and to recover any elements capable of being reused or energetically valorised. Covers, in particular, oils, solvents, used chemical products.

Elimination A term relating to any operation not meeting the conditions of valorisation or re-use.

Treatment Designates the valorisation or elimination, including intermediate treatment operations.

Recycling: Involves the treatment of materials contained within waste using a production-based process so as to allow them to be reused or incorporated into new products, materials or substances.

Re-use The use of products or components in identical roles to those for which they were designed without having to resort to processing (excepting cleaning or repair work).

Valorisation: All waste processing which meets the following criteria:

- The waste is used to replace other resources
- Use of the waste as a genuine substitution.
- Efficiency criteria
- Global negative environmental impact reduction
- Conformity to regulations and standards
- Maximum possible reduction in the formation and dispersal of hazardous substances

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Waste processing

After dismantling (or disassembling), the recovered elements must be forwarded for treatment in the following manner:

Materials		Weight		Valorisation	Incineration		Landfill	Loss
		kg	%	kg)	kg	MJ	(kg)	(kg)
Metals	Steel	160.23	51.69	151.53			8.7	
	Stainless steel	83.85	27.04	79.66			4.19	
	Copper	26.51	8.55	23.86			2.65	
	Aluminium	9.76	3.14	8.30			1.46	
	Total	**280.35**	**90.44**	**263.35**			**17**	
Thermoplastics	Epoxy resin	12.14	3.92		12.14	121.40		
	Thermoplastics	11.64	3.75	7.57	4.07	142.45		
	Total	**23.78**	**7.67**	**7.57**	**16.21**	**263.85**		
Gas	SF6	2.45	0.79	2.43				0.02
Others	Porcelain	2.99	0.96				4.98	
	Paper	0.43	0.14		0.43	3.87		
	Total	**5.87**	**1.89**		**0.43**	**3.87**	**4.98**	
	Total	**310**	**100**	**273.35**	**16.64**	**267.72**	**21.98**	**0.02**
* Technical Burial Centre (Landfill site)			**Percentages**	**88 %**	**5 %**		**7 %**	**0 %**

These values were based upon an FBX-C, Type C-C-T1, weighing 310 kg. These may vary a little from one product to another.

Destination of waste products

Type of Waste	Destination	Recommended treatment
SF6 gas	Supplier	Recovery, storage and regeneration
Steel & stainless steel	Local recovery agent	Shredding, sorting and recycling
Non-ferrous metals	Local recovery agent	Shredding, sorting and recycling
Epoxy Resin	Cement works	Revalorisation for added value
Thermo-plastics	Local recovery agent	Incineration
Molecular sieve	Authorised network	Controlled elimination
Soiled protective equipment	Authorised network	Incineration
Cables	Local recovery agent	Separation of sheathing and conductors

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Customer information

The regularisation of the administrative monitoring for the end-of service phase of the M24+ Fluokit is achieved through the production of a Destruction Certificate or completed BSDI form. This document is transmitted to the customer to inform them that all materials taken back by Schneider Electric have been eliminated.

Contacts

For any further questions relating to this document, or for any additional information, please contact Bernard Valette.

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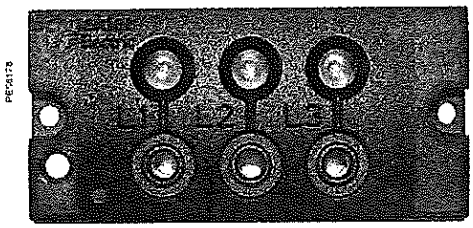
COM-MVP

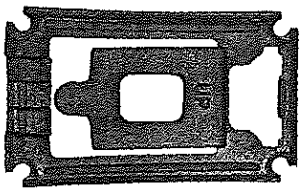
11-2010

VPIS V2

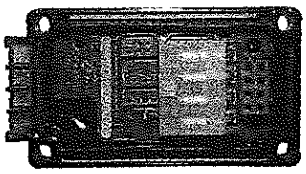


PE56178

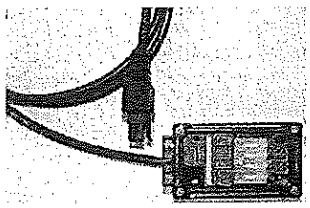
Voltage indicator


PE56142

"Open" seal


PE56143

Standard surge protection


PE56144

VPIS-VO surge protection


PE56145

Cover joint (not available as spare part)

Voltage presence indicating system for MV cubicles

Description

- The VPIS V2 is a self-powered voltage presence indicating system, in compliance with the IEC 62271-206 standard
- Connectors on the front panel allow the use of a phase comparator (see corresponding section in the document)
- Extended lifetime of LEDs on the front panel
- Compatibility with existing MV network devices for replacement.

The VPIS V2 consists of two parts:

- the surge protection part (always connected)
- the voltage presence indicating part (replaceable for maintenance)

- Retrofit: no change necessary for the replacement of a VPIS V1 (production from 01-2000 → 02-2009) with a VPIS V2.
However, a special "open" seal is necessary (supplied with each VPIS V2) for installation on an existing wiring harness.

Thresholds

- In compliance with the IEC 62271-206 standard, the indicator lamp outputs of the VPIS are lit or flashing when the network voltage is > 45% of the rated voltage.

	IEC 62271-206: percentage of network voltage U	Equivalent percentage of rated voltage V	Status of VPIS indicator lamps
	Phase-to-phase	Phase-to-earth	
Voltage value at VPIS input	10%	17%	Extinguished
	45%	78%	Lit or flashing

The flashing frequency increases depending on the level of the network voltage. At rated voltage, the indicator lamps seem to be lit steadily.

Customer benefits

- Voltage presence indicating system in compliance with the IEC 62271-206 standard (and also with the old IEC 61958 standard)
- 9 references available to adapt to all applications
- Voltage output option for source changeover switch application

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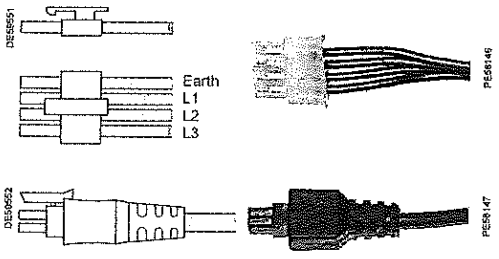


Connection

■ The VPIS V2 includes a 4-pin connector for connection to the cubicle coupling elements: 1 pin for connection to earth and 1 pin for connection of the coupling elements on each phase

□ The wires used have a cross-section of 1 mm², with an outside diameter ranging between 2.5 mm and 2.9 mm

□ The connector contacts are Minifit 5556 type

□ The connector housing is of MOLEX 39-01-4040 or 39-01-4041 type.

■ The optional voltage output cable (supplied with the VPIS-VO, for the Flair 22D, 23D, 23DM and VD23) is 1 m long (MOLEX 79516 type cable): the output signals of this cable are of positive half-wave type for each phase (L1, L2 and L3). Two extensions of length 1 m and 2 m are available if needed for the optional voltage output:

□ EMS58422:
extension cable for connection VPIS-VO - VD23/Flair 2xD, length 1 m

□ EMS58423:
extension cable for connection VPIS-VO - VD23/Flair 2xD, length 2 m.

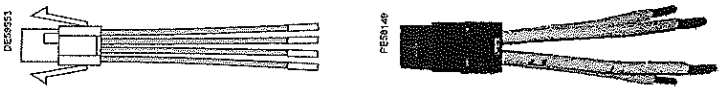
Installation recommendation

It is important to respect certain rules regarding the installation of the wiring harness. It must be fixed so that in case of condensation, water flowing along the wires is guided to the ground and not to the wiring harness input of the VPIS.

Power supply source changeover application

■ The VPIS V2 is designed to be connected directly to the new VD23 voltage relay. The VPIS V2 connectors are therefore adapted to those of the VD23.

■ The VPIS V2 can also be connected to the old-generation voltage relays of VD3H type, using a specific adapter (ref.: RCL62454).



Characteristics

Electromagnetic compatibility		Standards	Criteria	Comments
Radiated Interference	Emitted radiation	IEC 62271-1 § 6.9.1.2		30 MHz-1 GHz
Immunity test	Immunity to electrostatic discharge	IEC 61000-4-2 IEC 62271-1 § 6.9.2.1	B	±6 kV contact discharge ±8 kV discharge in air
	Radiated, radio-frequency, electromagnetic field immunity	IEC 6100-4-3 IEC 62271-1 § 6.9.2.1	A	10 V/m 80% AM at 1 kHz 80 MHz to 3 GHz
	Immunity to electrical fast transients	IEC 6100-4-4 IEC 62271-1 § 6.9.2.3	B	±2 kV: mains power supply
	Slow damped oscillatory wave immunity	IEC 6100-4-18 IEC 62271-1 § 6.9.2.4	B	±1 kV in differential mode ±2.5 kV in common mode
	Radiated magnetic field immunity	IEC 6100-4-8 IEC 62271-1 § 6.9.2.1	B	Permanent magnetic field at 100 A/m, 1000 A/m during 1 s
	Immunity to voltage dips and short interruptions	IEC 6100-4-11 IEC 62271-1 § 6.9.3.3	B B B	100% (reduction) during 5 and 50 periods 60% (reduction) during 50 periods 30% (reduction) during 1 period
Climatic tests		**Standards**		**Comments**
In storage	Temperature variation (cyclic with humidity, dry heat and cold)			Low temperature: -40°C (240 min.) Plateau temperature: +20°C (35 min.) High temperature: +85°C (180 min.) Variation: 2°C/min. Cycle time: 870 min. Complete test duration: 1000 hours
In operation	Temperature variation	IEC 60068-2-14		Low temperature: -25°C High temperature: +85°C Variation: 0.5°C/min. Plateau: 3 hours Number of cycles: 2
Mechanical tests		**Standards**		**Comments**
Impacts	De-energized	IEC 61958-1 IEC 60068-2-75		2 Joules 3 impacts in the weakest places

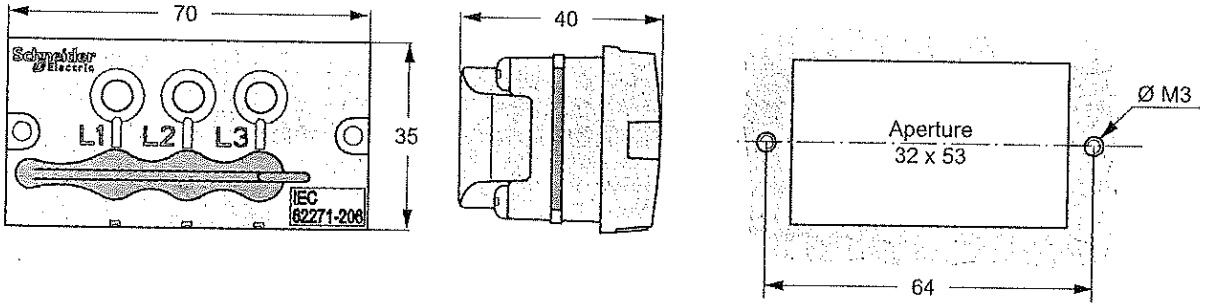
VPIS V2 references selection table

The range of use for each VPIS-V2 depends on Service voltage, network frequency and the switchgear capacitor. Here are typical range of use for 50Hz/60Hz. In case of use only for 50Hz or only 60Hz, the range of use could be expand, please consult the switchgear offer manager.

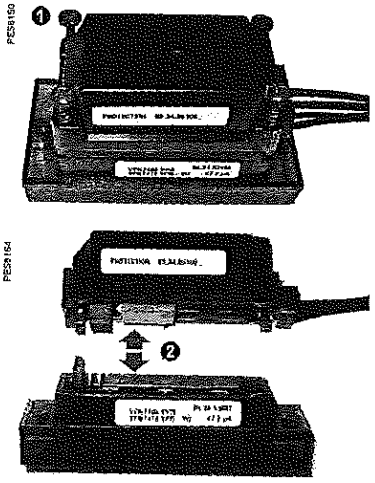
			3 kV	6 kV	10 kV	15 kV	20 kV	30 kV	40 kV
SM6-24	First choice	Without VO With VO 50/60 Hz	VPI62403 VPI62413 (2kV-4kV)	VPI62404 VPI62414 (3.4 kV-6.3 kV)	VPI62407 VPI62417 (9 kV-17 kV)	VPI62407 VPI62417 (9 kV-17 kV)	VPI62408 VPI62418 (13 kV-25 kV)		
	Second choice	Without VO With VO 50/60 Hz		VPI62405 VPI62415 (4 kV-8 kV)	VPI62406 VPI62416 (7 kV-13 kV)	VPI62408 VPI62418 (13 kV-25 kV)			
RM6	First choice	Without VO With VO 50/60 Hz	VPI62403 VPI62413 (2.5 kV-5 kV)	VPI62404 VPI62414 (4 kV-7 kV)	VPI62406 VPI62416 (8 kV-15 kV)	VPI62407 VPI62417 (10.1 kV-24 kV)	VPI62408 VPI62418 (17 kV-24 kV)		
	Second choice	Without VO With VO 50/60 Hz			VPI62405 VPI62415 (5 kV-11 kV)		VPI62407 VPI62417 (10.1 kV-24 kV)		
Ringmaster	First choice	Without VO With VO 50/60 Hz	VPI62401 VPI62411 (3.4 kV-7.5 kV)	VPI62401 VPI62411 (3.4 kV-7.5 kV)	VPI62403 VPI62413 (7.1 kV-16 kV)	VPI62403 VPI62413 (7.1 kV-16 kV)			
	Second choice	Without VO With VO 50/60 Hz		VPI62402 VPI62412 (5.8 kV-10 kV)					
Genie	First choice	Without VO 50/60 Hz		VPI62401 (4.5 kV-11 kV)	VPI62402 (7 kV-15 kV)				
	Second choice	Without VO 50/60 Hz			VPI62401 (4.5 kV-11 kV)				
SM6-36	First choice	Without VO With VO 50/60 Hz				VPI62404 VPI62414 (13 kV-24 kV)	VPI62404 VPI62414 (13 kV-24 kV)	VPI62406 VPI62416 (26 kV-50 kV)	VPI62406 VPI62416 (26 kV-50 kV)
	Second choice	Without VO With VO 50/60 Hz			VPI62403 VPI62413 (9 kV-17 kV)	VPI62403 VPI62413 (9 kV-17 kV)		VPI62405 VPI62415 (21 kV-35 kV)	
CAS 36	First choice	Without VO With VO 50/60 Hz			VPI62406 VPI62416 (8.5 kV-14 kV)	VPI62407 VPI62417 (12 kV-20 kV)	VPI62408 VPI62418 (17 kV-30 kV)	VPI62409 VPI62419 (21 kV-42 kV)	VPI62409 VPI62419 (21 kV-42 kV)
	Second choice	Without VO With VO 50/60 Hz					VPI62407 VPI62417 (12 kV-20.2 kV)	VPI62408 VPI62418 (17 kV-30 kV)	
MCSet 1, 2, 3 Nex 17 Nex 24 Evotech	First choice	Without VO 50/60 Hz	VPI62403 (2 kV-4 kV)	VPI62404 (3 kV-6.3 kV)	VPI62407 (9 kV-17 kV)	VPI62407 (9 kV-17 kV)	VPI62408 (13 kV-25 kV)		
	Second choice	Without VO 50/60 Hz		VPI62405 (4 kV-8 kV)	VPI62406 (7 kV-13 kV)	VPI62408 (13 kV-25 kV)			
F400				F400-24 / F400-Xe (*)				F400-36 kV	
	First choice	Without VO 50/60 Hz		VPI62402 (4 kV-6.2 kV)	VPI62404 (9 kV-13 kV)	VPI62405 (13 kV-19 kV)	VPI62406 (16 kV-27 kV)	VPI62407 (26 kV-50 kV)	VPI62407 (26 kV-50 kV)
Premset	First choice	Without VO With VO 50/60 Hz	VPI62403 VPI62413 (2.5 kV-5.5 kV)	VPI62404 VPI62414 (4 kV-7 kV)	VPI62406 VPI62416 (8 kV-15 kV)	VPI62406 VPI62416 (8 kV-15 kV)			
PIX STD PIX MCC	First choice	Without VO With VO 50/60 Hz	VPI62403 VPI62413 (2.1 kV-4 kV)	VPI62405 VPI62415 (4.8 kV-8.4 kV)	VPI62407 VPI62417 (9.3kV-17.6kV)	VPI62407 VPI62417 (9.3kV-17.6kV)	VPI62408 VPI62418 (13.8kV-25.5kV)		
	Second choice	Without VO With VO 50/60 Hz			VPI62406 VPI62416 (6.6kV-12.1kV)				
FBX C, RE, R, T1	First choice	Without VO With VO 50Hz	VPI62403 VPI62413 (3 kV-7 kV)	VPI62403 VPI62413 (3 kV-7 kV)	VPI62405 VPI62415 (6 kV-13 kV)	VPI62408 VPI62416 (10 kV-24 kV)	VPI62406 VPI62416 (10 kV-24 kV)		
FBX T2, CB,	First choice	Without VO With VO 50Hz	VPI62406 VPI62416 (3 kV-7 kV)	VPI62406 VPI62416 (3 kV-7 kV)	VPI62408 VPI62418 (6 kV-13 kV)	VPI62409 VPI62419 (12 kV-24 kV)	VPI62409 VPI62419 (12 kV-24 kV)		

(*) Theses references are no longer manufactured.

Dimensions



Maintenance



Replacement of a complete VPIS V2

The whole VPIS V2 (indicator + protection) must be replaced, in the event of:

- VPIS cable damaged
- Substation flooded.

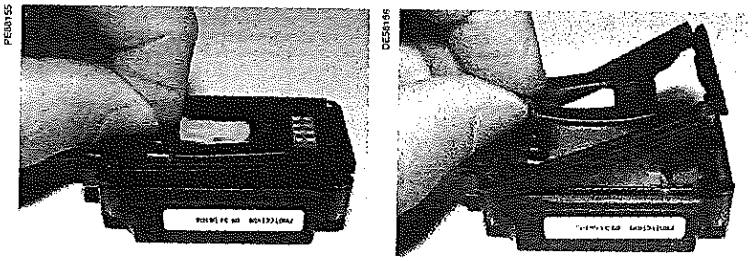
Dismounting the VPIS V2

1 Loosen four screws on protection enclosure (Pozidrive no.1 or flat 4.5 screwdriver).

2 Separate the two parts of the VPIS enclosure.

3 Pull the tab of the seal to the rear to remove it from the connector clip and pass it above the latter.

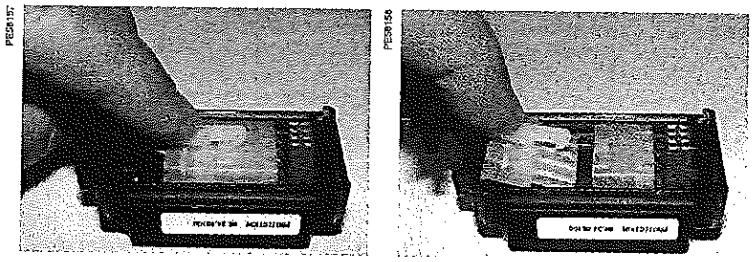
4 Remove the seal from its housing to obtain access to the connector.



Note: if the seal is of the "closed" type, it remains fixed on the wiring harness and will be re-used at remounting. The "open" type seal supplied with the VPIS V2 is not used in this case.

Recovery of the existing wiring harness

5 Press on the connector clip and at the same time pull on it to disconnect it from the VPIS.

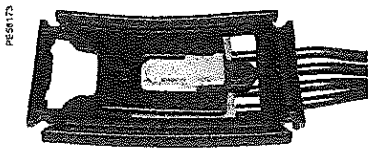


Put aside the two VPIS V2 elements in fault condition and replace them with those of a new VPIS V2. Then mount the new VPIS V2.

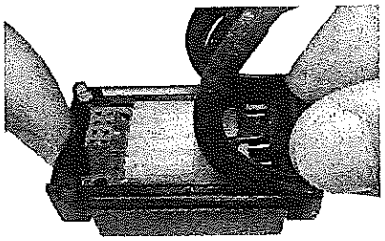
Mounting the new VPIS V2

Installation of the seal + wiring harness assembly on the protection part:

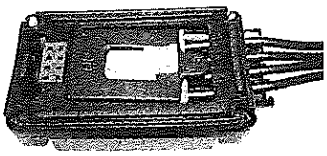
❻ Pass the tab behind the connector clip.



❼ Insert the wiring harness connector in the protection part of the VPIS V2.

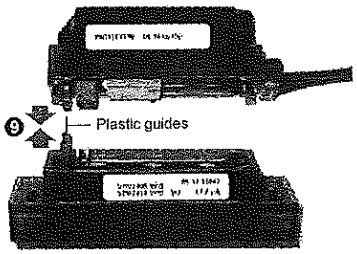


❽ Insert the seal in its housing.



Note: check that the seal is correctly positioned over the entire perimeter of the enclosure to ensure satisfactory tightness.

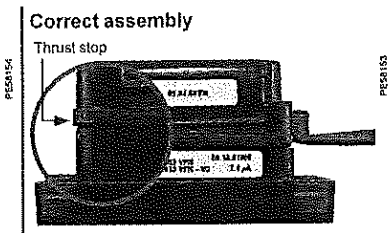
Assembly of the indicator on the surge protection part



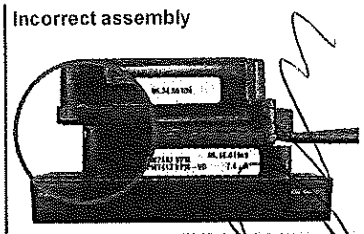
❾ Insert the two parts of the VPIS V2 over one another (indicator part over the protection part). During the assembly phase, the wiring harness stays in position in the protection part.

Note: use the plastic guides to ensure that the two items are positioned correctly. The guides should be aligned at the time of connection. If the positioning is not correct, this causes a poor electrical connection.

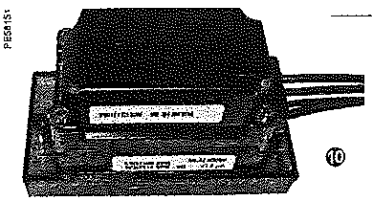
Correct assembly



Incorrect assembly



		Status of VPIS LEDs			Status of VPIS LEDs		
		L1	L2	L3	L1	L2	L3
Phases powered	L1	ON	OFF	OFF	OFF	OFF	OFF
	L2	OFF	ON	OFF	OFF	OFF	OFF
	L3	OFF	OFF	ON	ON	ON	OFF
	L1+L2+L3	ON	ON	ON	ON	ON	OFF

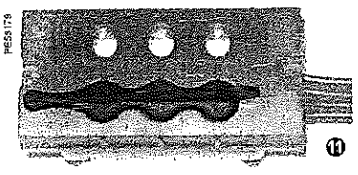


Enclosure mounting

❿ Place in position and tighten the 4 enclosure mounting screws (Pozidrive no.1 or flat 4.5 screwdriver). Tighten the screws until the thrust stops in each corner of the protection enclosure are in contact with the indicator part.

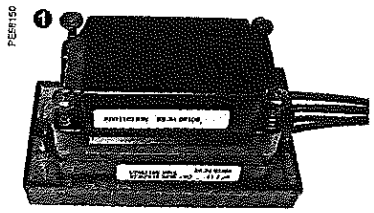
Warning: do not tighten screws beyond what is mentioned above, otherwise the seal will be crushed and so tightness of VPIS will be degraded.

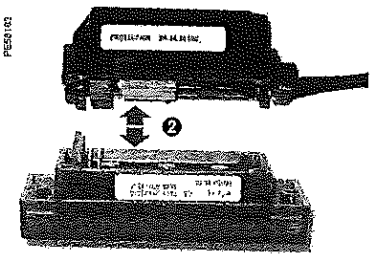
Note: when the seal is placed in position, it ensures that the screws are held in place in the protection part and prevents them from coming out of the enclosure.

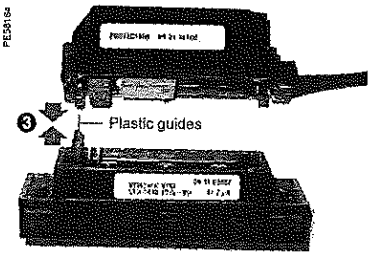


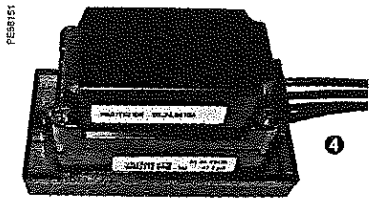
Installation of the cover joint on the VPIS V2

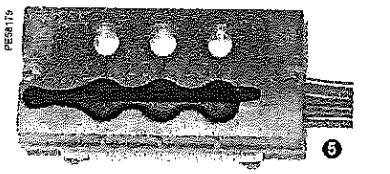
⓫ Install the joint concealing the phase comparator test points. Press on it firmly to place it correctly in position.











Replacement of the VPIS V2 indicator

The indicator should be replaced if one or more indicator lamps are no longer lit when the MV network voltage seems to be present.

NB: never disconnect the wiring harness protection part when the MV network voltage is present.

Dismounting the indicator

❶ Loosen four screws on protection enclosure (Pozidrive no.1 or flat 4.5 screwdriver)

Note: when the seal is placed in position, it ensures that the screws are held in place in the protection part and prevents them from coming out of the enclosure.

❷ Separate the two parts of the VPIS enclosure and put aside the defective indicator.

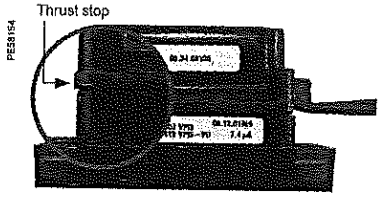
Note: the protection part is kept and its wiring harness should remain in position during the dismounting phase.

Assembly of the new indicator on the surge protection part

❸ Insert the new indicator on the existing protection part. During the assembly phase, the wiring harness stays in position in the protection part.

Note: use the plastic guides to ensure that the two items are positioned correctly. The guides should be aligned at the time of connection. If the positioning is not correct, this causes a poor electrical connection.

Correct assembly



Incorrect assembly

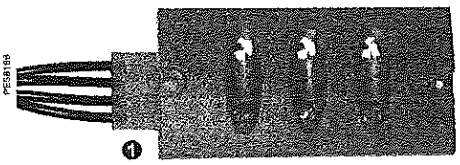
Enclosure mounting

❹ Place in position and tighten the 4 enclosure mounting screws (Pozidrive no.1 or flat 4.5 screwdriver). Tighten the screws until the thrust stops in each corner of the protection enclosure are in contact with the indicator part.

Warning: do not tighten screws beyond what is mentioned above, otherwise the seal will be crushed and so tightness of VPIS will be degraded.

Installation of the cover joint on the VPIS V2

❺ Install the joint concealing the phase comparator test points. Press on it firmly to place it correctly in position.



Replacement of a VPIS V1 with a VPIS V2

Dismounting the VPIS V1 wiring harness

❶ Press on the wiring harness connector clip and then pull on the connector to disconnect it from the VPIS V1.

Note: the wiring harness will be re-used for the phase of remounting on the VPIS V2.

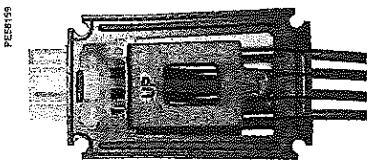
Installation of the seal on the wiring harness

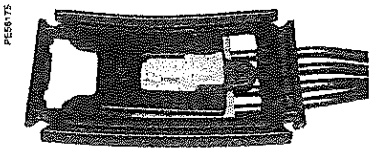
Note: this operation is necessary only in the case of replacement of a VPIS V1 with a VPIS V2. For the replacement of a VPIS V2, the seal is already assembled in factory on the wiring harness. This operation is therefore not necessary.

Note: the seal available with the VPIS V2 for the replacement is of the "open" type, so as to be able to be mounted on an existing wiring harness cable.

❷ Insert the wiring harness wires in the opening parts of the seal (wireway).

❸ Pass the tab behind the connector clip.





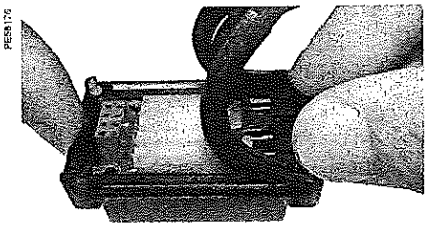
NB: the seal should be handled with care:

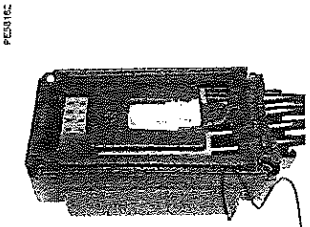
- Do not make the cable slide more than 10 cm in the seal
- Do not run stripped wires in the seal
- Do not run wires with crimped contacts in the seal.

Installation of the seal + wiring harness assembly on the protection part:

❹ Insert the wiring harness connector in the protection part of the VPIS V2.

❺ Insert the seal in its housing.



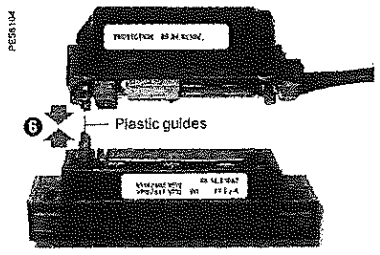


Note: check that the seal is correctly positioned over the entire perimeter of the enclosure to ensure satisfactory tightness.

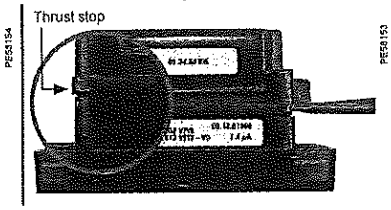
Assembly of the indicator on the surge protection part

❻ Insert the two parts of the VPIS V2 over one another (indicator part over the protection part). During the assembly phase, the wiring harness stays in position in the protection part.

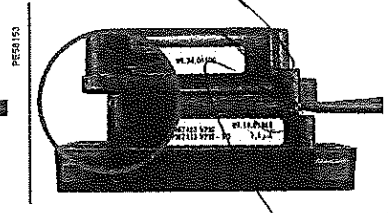
Note: use the plastic guides to ensure that the two items are positioned correctly. The guides should be aligned at the time of connection. If the positioning is not correct, this causes a poor electrical connection.

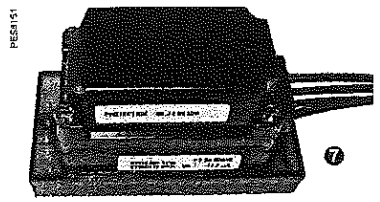


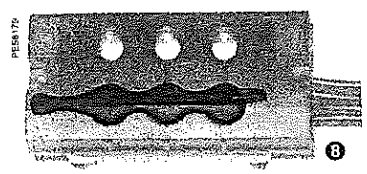
Correct assembly



Incorrect assembly







Enclosure mounting

❼ Place in position and tighten the 4 enclosure mounting screws (Pozidrive no.1 or flat 4.5 screwdriver). Tighten the screws until the thrust stops in each corner of the protection enclosure are in contact with the indicator part.

Warning: do not tighten screws beyond what is mentioned above, otherwise the seal will be crushed and so tightness of VPIS will be degraded.

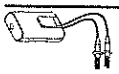
Installation of the cover joint on the VPIS V2

❽ Install the joint concealing the phase comparator test points. Press on it firmly to place it correctly in position.

Phase concordance unit

Via the VPIS, the phase concordance unit allows a check of the phase concordance between 2 energised functional input units on the same panel. It is a way of making sure that all three cables are each connected to the corresponding phase of the panel.

- **Balanced phase:** the phase concordance light remains unlit.
- **Unbalanced phase:** the phase concordance unit light is lit.

Phase concordance unit	Functional unit no. 1	Functional unit no. 2	Compatibility result	Corrective actions
 *Phase concordance unit V1 Ref.: 51191954FA*	V1	V1	OK	
	V2	V2	✗	Use a phase concordance unit V2
	V1	V2	✗	Replace VPIS V1 by VPIS V2 and use a phase concordance unit V2
 *Phase concordance unit V2 without adapter Ref.: VPI62421*	V1	V2	✗	OR use a phase concordance unit V2 with adapter
	V1	V1	✗	Replace both VPIS V1 units by VPIS V2 units OR test with the phase concordance unit V1
	V2	V2	OK	

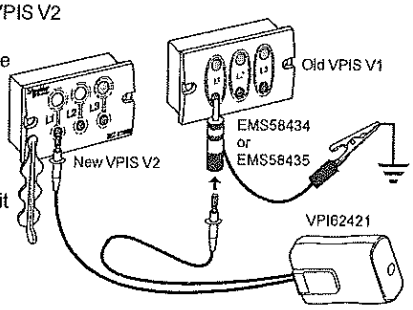
Comparison between a VPIS V1 and VPIS V2 is also possible with using an adapter on VPIS V1 side and a VPI62421 phase concordance unit.

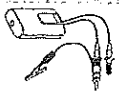
Adapter stand alone for VPIS V1:

- EMS58434 (2.5 - 7.7 kV)
- EMS58435 (8.8 - 23 kV).

Kit including a phase concordance unit + adapter:

- EMS58431 (15 - 20 kV ERDF)
- EMS58438 (8.8 - 23 kV).



Phase concordance unit	Functional unit no. 1	Functional unit no. 2	Compatibility result	Corrective actions
 *Phase concordance unit V2 with adapter Ref.: EMS58431 or EMS58438*	V1	V1	✗	Replace both VPIS V1 units by VPIS V2 units OR test with the phase concordance unit V1
	V1	V2	OK	The adapter must be used on VPIS V1 side
	V2	V2	OK	Do not use the adapter

Safety warning

- **The VPIS indication alone is insufficient to ensure that the system is power off: if operating rules require, then appropriate voltage detectors in compliance with the IEC 61243-1, IEC 61243-2 and IEC 61243-5 standards must be used for this purpose.**
- **In certain situations of high luminosity, it may be necessary to improve the visibility of the indicator lamps, for example by creating shade around them.**
- **Never disconnect the surge protection part when the MV network voltage is present.**

DE59165

Used electronic products must be deposited in the appropriate collection points

For more product information, consult the phase concordance unit user's manual (NT00214-FR-EN-xx).

Schneider Electric Industries SAS

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As standards, specifications and designs change from time to time, please ask for confirmation of the information given in this publication.

Publishing: Schneider Electric Industries SAS
Design: Schneider Electric Industries SAS
Printing: Altavia St-Etienne - Made in France

PEFC 10-31-1247

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ENMED309037EN

02-2014

Schneider Electric

Schneider Electric Energy 381 Boulevard de la Résistance B.P. 84019 71040 MACON CEDEX 9 FRANCE	**DECLARATION DE CONFORMITE** ***ÜBEREINSTIMMUNGSERKLÄRUNG*** ETABLI CONFORMEMENT A LA NORME NF L 00-015 C *ETABLIERT GEMÄSS STANDARD NF L 00-015 C*	N° de la déclaration *Nr. der Deklarierung* ***16-004*** Nombre de feuilles *Anzahl der Seiten*

Client : *WIS Munster*
Kunde

Etablissement : ***Humboldstr. 100***
Firma ***D-29633 Munster***

Numéro de commande : ***S000101591***
Auftrags Nr.

Référence du contrat : ***DS11-5400014522***
Vertragsdaten

Dénomination : ***FBX Schaltanlage Kompakt und Erweiterbar***
Bezeichnung

Référence ou type : ***FBX-C/24-16/C-C-T2 (1 St.)***
Gerätenummer oder Typ ***FBX-E/24-16/R (1 St.)***
FBX-E/24-16/T1-T1 (1 St.)

N° de série ou de lot : ***FBX--1537122/AMT, FBX--1536050/AMT*** ***quantité : 3 St. Anlagen***
Serien oder Chargen Nr. ***FBX--1536048/AMT,*** ***Menge***

Numéro et date du bordereau de livraison : ***3139-84134566 vom 22.09.2015***
Nr. und Datum des Lieferscheins

Nous déclarons que la fourniture citée est conforme aux exigences du contrat et que, après vérifications et essais, elle répond en tout point, aux exigences spécifiées, aux normes et règlements applicables, sauf exceptions, réserves ou dérogations énumérées dans la présente déclaration de conformité.

Wir erklären hiermit, dass die vorliegende Lieferung in Übereinstimmung mit den Vertragsanforderungen hergestellt wurde und dass sie, nach Durchführung aller Kontrollen und Prüfungen, in jeder Hinsicht den in den diesbezüglich gültigen Normen und Vorschriften festgelegten Anforderungen, bis auf die in dieser Übereinstimmungserklärung genannten Ausnahmen, Vorbehalte oder Abweichungen, entspricht.

На основание чл. 2
от ЗЗЛД

DAMQA261E

ВЯРНО С ОРИГИНАЛА

ИНЖЕНЕРИНГ ПЛОВДИВ ЕАД

1/1

866

BUREAU VERITAS
Certification

SCHNEIDER ELECTRIC ENERGY FRANCE APPAREILLAGE MOYENNE TENSION

381 BOULEVARD DE LA RESISTANCE BP 84019 FR-71040 MACON CEDEX 9

Bureau Veritas Certification Holding SAS - UK Branch certifies that the Management System of the above organisation has been audited and found to be in accordance with the requirements of the management system standards detailed below

ISO 9001:2015

Scope of certification

ENGINEERING AND PRODUCTION OF MEDIUM VOLTAGE SWITCHGEARS AND SWITCHBOARDS

Original cycle start date:	**26-DECEMBER-2016**
Expiry date of previous cycle:	**NA**
Certification / Recertification audit date:	**NA**
Certification / Recertification cycle start date:	**31-JULY-2017**

Subject to the continued satisfactory operation of the organisation's Management System, this certificate expires on: **30-JULY-2020**

Master Certificate No. : **195538-UK** Version: **No. 1**, Revision date: **26-JULY-2017**
Sub-Certificate No.: **195538-185-UK**

На основание чл. 2
от ЗЗЛД

UKAS MANAGEMENT SYSTEMS
0008

Certification body address: 5th Floor, 66 Prescot Street, London E1 8HG, United Kingdom
Local office address: Rm. 23-25, 10/F, Pacific Trade Centre, 2 Kai Hing Road, Kowloon Bay, KLN, H.K.

Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organisation.
To check this certificate validity please call: (+852-2815 2092)

ВЯРНО С ОРИГИНАЛА

867

МАЖЕНЕРИНГ ПЛОВДИВ ЕАД

BUREAU VERITAS
Certification

SCHNEIDER ELECTRIC ENERGY FRANCE APPAREILLAGE MOYENNE TENSION

381 BOULEVARD DE LA RESISTANCE BP 84019 FR-71040 MACON CEDEX 9

Bureau Veritas Certification Holding SAS - UK Branch certifies that the Management System of the above organisation has been audited and found to be in accordance with the requirements of the management system standards detailed below

ISO 14001:2015

Scope of certification

ENGINEERING AND PRODUCTION OF MEDIUM VOLTAGE SWITCHGEARS AND SWITCHBOARDS. REFURBISHING SOLUTIONS AND SUPPLY OF SPARE PARTS FOR ELECTRICAL INSTALLATIONS

Original cycle start date:	**26-DECEMBER-2016**
Expiry date of previous cycle:	**NA**
Certification / Recertification audit date:	**NA**
Certification / Recertification cycle start date:	**31-JULY-2017**

Subject to the continued satisfactory operation of the organisation's Management System, this certificate expires on: **30-JULY-2020**

Master Certificate No. : **195539-UK** Version: **No. 1**, Revision date: **26-JULY-2017**
Sub-Certificate No.: **195539-171-UK**

На основание чл. 2
от ЗЗЛД

UKAS MANAGEMENT 0008

Certification body address: 6th Floor, 66 Prescot Street, London E1 8HG, United Kingdom
Local office address: Rm. 23-25, 10/F, Pacific Trade Centre, 2 Kai Hing Road, Kowloon Bay, KLN, H.K.

Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organisation.
To check this certificate validity please call: (+852-2615 2082)

ВЯРНО С ОРИГИНАЛА
868

ИНЖЕНЕРИНГ ПЛОВДИВ ЕАД

BUREAU VERITAS
Certification

SCHNEIDER ELECTRIC ENERGY FRANCE APPAREILLAGE MOYENNE TENSION

381 BOULEVARD DE LA RESISTANCE BP 84019 FR-71040 MACON CEDEX 9

Bureau Veritas Certification Holding SAS - UK Branch certifies that the Management System of the above organisation has been audited and found to be in accordance with the requirements of the management system standards detailed below

OHSAS 18001:2007

Scope of certification

ENGINEERING AND PRODUCTION OF MEDIUM VOLTAGE SWITCHGEARS AND SWITCHBOARDS. REFURBISHING SOLUTIONS AND SUPPLY OF SPARE PARTS FOR ELECTRICAL INSTALLATIONS.

Original cycle start date:	**26-DECEMBER-2016**
Expiry date of previous cycle:	**NA**
Certification / Recertification audit date:	**NA**
Certification / Recertification cycle start date:	**31-JULY-2017**

Subject to the continued satisfactory operation of the organisation's Management System, this certificate expires on: **30-JULY-2020**

Master Certificate No. : **OH-HK-10077** Version: **No. 1**, Revision date: **26-JULY-2017**
Sub-Certificate No.: **OH-HK-10077-158**

На основание чл. 2
от ЗЗЛД

Certification body address: Rm. 23-25, 10/F, Pacific Trade Centre, 2 Kai Hing Road, Kowloon Bay, KLN, H.K.
Local office address: Rm. 23-25, 10/F, Pacific Trade Centre, 2 Kai Hing Road, Kowloon Bay, KLN, H.K.

Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organisation.
To check this certificate validity please call: (+852-2815 2092)

ВЯРНО С ОРИГИНАЛА

869

ИНЖЕНЕРИНГ ПЛОВДИВ ЕАД

АБВ студио

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гр. София 1000, ул. "Граф Игнатиев"№ 5, ет. 2, офис 209
тел.: (02) 9 505 345; тел./факс: (02) 9 505 346, E-mail: abv_studio@yahoo.com

TRANSLATION AGENCY **ABV STUDIO LTD**
Bulgaria, Sofia 1000, 5 Graf Ignatiev Str., Fl. 2, office 209
tel.: (+ 359 2) 9 505 345; tel./fax: (+ 359 2) 9 505 346, E-mail: abv_studio@abv.bg

Превод от английски език

Алстом

Шнайдер Електрик

Париж, 09.07.2010 г.

Уважаеми клиенти,

Както вече знаете, на 07.07.2010 г. нашият консорциум на Алстом и Шнайдер Електрик финализира придобиването на дейностите по Пренос и Разпределение на Арева.

За нас е удоволствие да ви представим двата нови бизнеса на Алстом и Шнайдер Електрик – бизнеси, чиито хора и дейности добре познавате.

Алстом Грид, най-новият сектор на групата, сформиран от дейностите по Пренос на Арева T&Д, става третото основно направление заедно с Алстом Транспорт и Алстом Пауър. Предоставя продукти, системи, автоматика и услуги на нашите комунални и големи промишлени клиенти, които отговарят на нуждите им за по-стабилни, ефективни, екологични и „смарт" мрежи.

С водещи позиции в няколко пазара и технологии Алстом Грид се състои от над 20.000 служители и има оборот, надхвърлящ 3,5 милиарда евро.

Обхватът на продуктите достига до 1200 kV AC. Системите включват AC и DC подстанции „до ключ", мрежови взаимовръзки и усъвършенствана силова електроника. Решенията за автоматизиране на мрежите обхващат енергийни пазари, системи за управление на мрежите и генерирането, автоматика на подстанции, защита и контрол. Благодарение на научноизследователската дейност, която е в центъра на стратегията на този сектор, се подпомага интегрирането на възобновяемите източници на енергия в мрежата и изграждането на взаимовръзки със свръхвисоко напрежение, високо напрежение с променлив ток и супер мрежи на бъдещето.

ВЯРНО С ОРИГИНАЛА

870

Като глобален специалист в сферата на управление на енергията Шнайдер Електрик има за цел да направи енергията безопасна, надеждна, ефективна и екологична за всички лица и организации.

Събирането на дейностите по Средно напрежение на Шнайдер Електрик и тези по Разпределение на Арева сформира нашият пети глобален бизнес: Енергетиката. Този бизнес ще има оборот от почти 5 милиарда евро, около 18 000 служители, стабилен научноизследователски екип и присъствие в повечето сегменти и географски райони.

Шнайдер Електрик ще може да предоставя системи и решения с добавена стойност, които отговарят на енергийните предизвикателства, които срещате в днешно време, например управление и ефективност на енергията, екологичност, интелигентно съставяне на мрежи и смарт мрежи.

Алстом и Шнайдер Електрик са заедно и изцяло отдадени на изпълнението на всички текущи договори, продължаването на съществуващи оферти по целия обхват на високо, средно и ниско напрежение и предоставянето на съответните услуги.

Вашето удовлетворение остава приоритет за нашите екипи, които се стремят да постигнат плавен преход от Арева T&Д и непрекъснатост на бизнеса.

Ще бъдете запознати със съответните лица за връзка с Алстом и Шнайдер Електрик, които ще бъдат на разположение за всякакви въпроси от ваша страна и ще се погрижат за бъдещите ви бизнес нужди, както винаги.

Искрено благодарим за подкрепата ви и ще направим всичко по силите ни, за да заслужим доверието ви в бъдеще.

С уважение,

На основание чл. 2
от ЗЗЛД

На основание чл. 2
от ЗЗЛД

Долуподписаният, Борис Христов Стойчев, удостоверявам верността на извършения от мен превод от английски на български език на приложения документ. Преводът се състои от 2 страници.
Борис Христов Стойчев *Преводач:*

ВЯРНО С ОРИГИНАЛА

ВЯРНО С ОРИГИНАЛА

ALSTOM

Schneider Electric

Paris, June 9th, 2010

Dear Customer,

As you know, on June 7, 2010, our Alstom and Schneider Electric consortium concluded its acquisition of the Transmission and Distribution activities of Areva.

It is now our great pleasure to introduce you to the two new businesses of Alstom and Schneider Electric - businesses whose people and activities you know well.

Alstom Grid, the group's newest sector, formed from the Transmission activities of Areva T&D, becomes a natural third pillar alongside Alstom Transport and Alstom Power. It delivers products, systems, automation and services to our utility and large industrial customers that answer their need for more stable, efficient, environmentally friendly and 'SMART' grids.

With leadership positions in several markets and technologies, Alstom Grid comprises over 20,000 employees and has a turnover in excess of 3.5 billion euros.

Products range to 1,200 kV AC. Systems include turnkey AC and DC substations, grid interconnections and advanced power electronics. Grid Automation solutions range from energy market, network and generation management systems, to substation automation, protection and control. The sector, with R&D at the heart of its strategy, is helping to integrate renewable energies into the grid and build the Ultra High Voltage and HVDC interconnections and supergrids of the future.

As a global specialist in energy management **Schneider Electric** is dedicated to making energy safe, reliable, efficient, and green for individuals and organizations.
Bringing together Schneider Electric Medium Voltage and Areva Distribution activities forms our fifth global Business: Energy. This business will have a turnover close to 5 billion euros, around 18,000 employees, a robust R&D team, and a presence in most segments and geographies.
Schneider Electric will be able to provide value added systems and solutions meeting the energy challenges you are facing today, such as energy efficiency and management, environmental friendliness, grid intelligence, and SMARTGrids.

Alstom and Schneider Electric are jointly and fully committed to the execution of all on-going contracts, the continuation of existing offers across the high, medium and low voltage ranges and the provision of related services.

Your satisfaction remains the priority for our teams, who are focused on managing a smooth transition from Areva T&D and continuity of business.

ВЯРНО С ОРИГИНАЛА

ВЯРНО С ОРИГИНАЛ

872

You will be introduced to your dedicated contacts for both Alstom and Schneider Electric, who will be available to answer all your questions and are ready to take care of your future business needs, as usual.

We sincerely thank you for your continued support and will do our utmost to deserve your confidence in the future.

Yours sincerely,

На основание чл. 2
от ЗЗЛД

На основание чл. 2
от ЗЗЛД

ВЯРНО С ОРИГИНАЛА

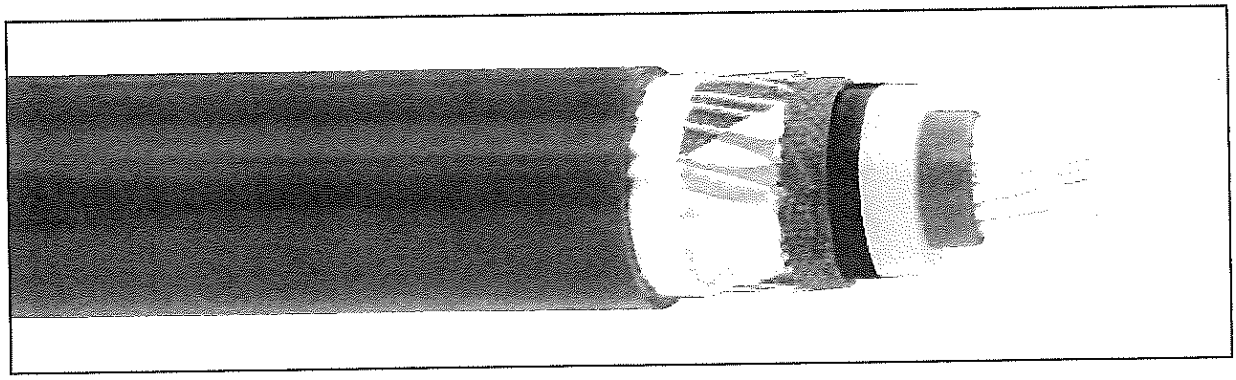
ВЯРНО С ОРИГИНАЛА

873

NA2XS(F)2Y

Uo/U - 12/20 kV

Силов кабел средно напрежение с надлъжна водоустойчивост, XLPE изолация и Al жила



ПРИЛОЖЕНИЕ

Силов кабел с омрежена полиетиленова изолация с водоблокираща лента в областта на екрана за изграждане на градски и районни електрозахранващи мрежи, за захранване на трансформаторни подстанции в промишлени предприятия и обекти, предназначен за пренасяне и разпределение на електроенергия при номинални напрежения *Uo/U - 12/20 kV* с честота *50 Hz*.

ТЕХНИЧЕСКИ ДАННИ

- произведен съгласно **DIN VDE 0276** част **620** и **HD 620 S1**
- отговарящ на изискванията за надлъжна водоустойчивост
- експлоатация при температури на околната среда от - *30°C* до + *70°C*
- монтаж при температури, не по-ниски от - *20°C*
- мин. радиус на еднократно огъване - *15 D*
- за полагане в земя, положени в изкоп, помещения, тунели, канали
- макс. продължителна температура на нагряване на токопроводимите жила + *90°C*
- макс. допустима температура на нагряване на токопроводимите жила в режим на късо съединение + *250°C*, за не повече от *5 s*
- изпитвателно напрежение за *12/20 kV* - променливо *30 kV*, постоянно *96 kV*
- цвят на защитната обвивка - черен
- ниво на частичните разряди при напрежение *2 Uo - 2 pC*
- изпитвателно напрежение след полагане и монтаж на кабелите в продължение на *60 min:*
  - променливо *2 Uo, 45 - 65 Hz* или
  - променливо *3 Uo, 0,1 Hz*

КОНСТРУКЦИЯ НА КАБЕЛА

- усукано уплътнено алуминиево жило, **клас 2** по **DIN VDE 0295**
- вътрешен екструдиран полупроводим слой
- омрежена полиетиленова изолация
- външен екструдиран полупроводим слой
- водоблокираща полупроводима лента
- екран от медни телове и медна контактна лента
- разделителна лента
- полиетиленова обвивка

Артикулен №	Брой и сечения на жилата NA2X(F)SY	Форма на жилото	Дебелина на изолацията	Дебелина на обвивката	Диаметър на кабела	Тегло на медта	Тегло на алуминия	Тегло на кабела
	бр x мм²		мм	мм	мм	кг/км	кг/км	кг/км
	12/20 kV							
011362079	1x50/16	rm	5,5	2,5	33	182	145	930
011362082	1x70/16	rm	5,5	2,5	34	182	203	1040
011362085	1x95/16	rm	5,5	2,5	36	182	276	1160
011362088	1x120/16	rm	5,5	2,5	37	182	348	1290
011362091	1x150/16	rm	5,5	2,5	38	182	435	1390
011362100	1x150/25	rm	5,5	2,5	39	283	435	1480
011362094	1x185/16	rm	5,5	2,5	40	182	537	1550
011362103	1x185/25	rm	5,5	2,5	41	283	537	1640
011362097	1x240/16	rm	5,5	2,5	40	182	696	1750
011362106	1x240/25	rm	5,5	2,5	43	283	696	1840
011362109	1x300/25	rm	5,5	2,5	45	283	870	2110
011362112	1x400/35	rm	5,5	2,5	48	394	1160	2540
011362115	1x500/35	rm	5,5	2,5	52	394	1450	2920

HELLENIC CABLES S.A.

HELLENIC CABLE INDUSTRY S.A.

Registered Office: Athens Tower, 2 [d] Building, 2-4 Mesogeion Ave., Athens GR 11527, Greece
Head Office: 33, Amarousiou - Halandriou Str., Maroussi GR 151 25, Greece, Tel.: (+30)-210-6787900, Fax: (+30)- 210-6787406

Code No. S.A.: 2131/06/B/86/19
Ministry of Development
VAT Number: EL 094039428
G.E.MI. Number: 281701000
Tax office: FAE Athens
E-mail: info@cablel.vionet.gr
www.cablel.com

Certificate of conformance

No 287/2015 **Date 08-11-2015**

ORDER No	PO7933
CUSTOMER	FILKAB JSCO
TYPE OF CABLE	NA2XS(F)2Y
CROSS SECTION	1X50 RM
WORKING VOLTAGE	12/20 KV
SPECIFICATIONS	VDE 0276/620
SALES ORDER No	467796

WE CERTIFY THAT:

1. The construction of the above mentioned cable was effected according to the above specification.

2. All routine, special and type tests foreseen by the above specification were carried out satisfactory.

3. All measured values were compared with those data and values given by the above specification and found to meet the requirements.

На основание чл. 2
от ЗЗЛД

ВЯРНО С ОРИГИНАЛА

CABLEL®
HELLENIC CABLES
GROUP

HELLENIC CABLES S.A.

HELLENIC CABLE INDUSTRY S.A.

Registered Office: Athens Tower, 2[d] Building, 2-4 Mesogeion Ave., Athens GR 11527, Greece
Head Office: 33, Amarousiou - Halandriou Str., Maroussi GR 151 25, Greece, Tel.: (+30)-210-6787900, Fax: (+30)- 210-6787406

Code No. S.A.: 2131/06/B/86/19
Ministry of Development
VAT Number: EL 094039428
G.E.MI. Number: 281701000
Tax office: FAE Athens
E-mail: info@cablel.vionet.gr
www.cablel.com

Date 08-11-2015

ROUTINE TEST REPORT

ORDER No	PO7933
CUSTOMER	FILKAB JSCO
TYPE OF CABLE	NA2XS(F)2Y
CROSS SECTION	1X50 mm²
WORKING VOLTAGE	12/20 KV
SPECIFICATIONS	VDE 0276/620
SALES ORDER No	467796

No of DRUM	LENGTH m	DC RESISTANCE at 20°C in Ω/Km (max measured)		PARTIAL DISCHARGE at 24 KV AC in pC
		OF CONDUCTOR	OF CWS	
1039173001	2026	0.638	1.12	1.1
1039173002	2005	0.640	1.14	1.0

SHEATH MARKING: • CABLEL 0317 2015 NA2XS(F)2Y 1X50RM/16 12/20 KV ◄VDE► 0276

All of the above drums were subjected to a high voltage test of 42 KV AC for 5 min between conductor and screen without any breakdown.
Specified values: Max conductor resistance is 0.641 Ω/Km, max cws resistance is 1.15 Ω/Km and max partial discharge is 2 pC at 24 KV AC after 1 minute at 28.8 KV AC.
The sheath of the above was spark tested at 15 KV AC.

All of the above tests were found to be satisfactory, and the measured values found to meet the requirements of the specifications.

На основание чл. 2
от ЗЗЛД

ВЯРНО С ОРИГИНАЛА

876

CABLEL®
HELLENIC CABLES
GROUP

HELLENIC CABLES S.A.

HELLENIC CABLE INDUSTRY S.A.

Registered Office: Athens Tower, 2[d] Building, 2-4 Mesogeion Ave., Athens GR 11527, Greece
Head Office: 33, Amarousiou - Halandriou Str., Maroussi GR 151 25, Greece, Tel.: (+30)-210-6787900, Fax: (+30)- 210-6787406

Code No. S.A.: 2131/06/B/86/19
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VAT Number: EL 094039428
G.E.MI. Number: 281701000
Tax office: FAE Athens
E-mail: info@cablel.vionet.gr
www.cablel.com

Date 08-11-2015

TESTS ON SAMPLES OF XLPE INSULATED CABLES

ORDER No PO7933
CUSTOMER FILKAB JSCO
TYPE OF CABLE NA2XS(F) 2Y
CROSS SECTION 1X50 mm^2
WORKING VOLTAGE 12/20 KV
SPECIFICATIONS VDE 0276/620
SALES ORDER No 467796
SAMPLE FROM DRUM No 1039173001

	CHARACTERISTICS		specified values	measured values
A	**Check of dimensions**			
1	Number of wires	min	6	12
	Conductor diameter mm	min-max	7.7-8.6	8.4
2	Inner semiconductive thickness	mm	min 0.3	0.50
3	Insulation thickness min average	mm	5.5	5.6
	Insulation thickness minimum at any point	mm	4.85	5.56
	Difference max thick-min thick		max 0.7	0.26
	Diameter over insulation mm	min- max	20.2-21.7	20.9
4	Extruded outer semiconductive thickness	min- max	0.3-0.6	0.36-0.49
5	Difference diameter max-min	mm	max 0.5	0.20
6	SC waterblocking tape helically applied with overlap			OK
7	Copper wire screen			39X0.70
	Copper tape	mm		0.1X10
	Cross section	mm^2	min 16	16.1
	Mean distance between wires	mm	max 4	1.2
	Distance between wires	mm	max 8	1.7
8	Tape PP-SR with overlap			OK
9	Oversheath MDPE minimum	mm	2.03	2.26
B	Hot set test for XLPE insulation elongat.			
	200^{0}C for 15min under 0.2 N/mm^2 stress %		max 175	60
	without load after cooling elongation %		max 15	0
C	Shrinkage measurement of sheath PE	mm	max 7	2.6

All of the above measurements were satisfactory, and the measured values found to meet the requirements of the specifications.

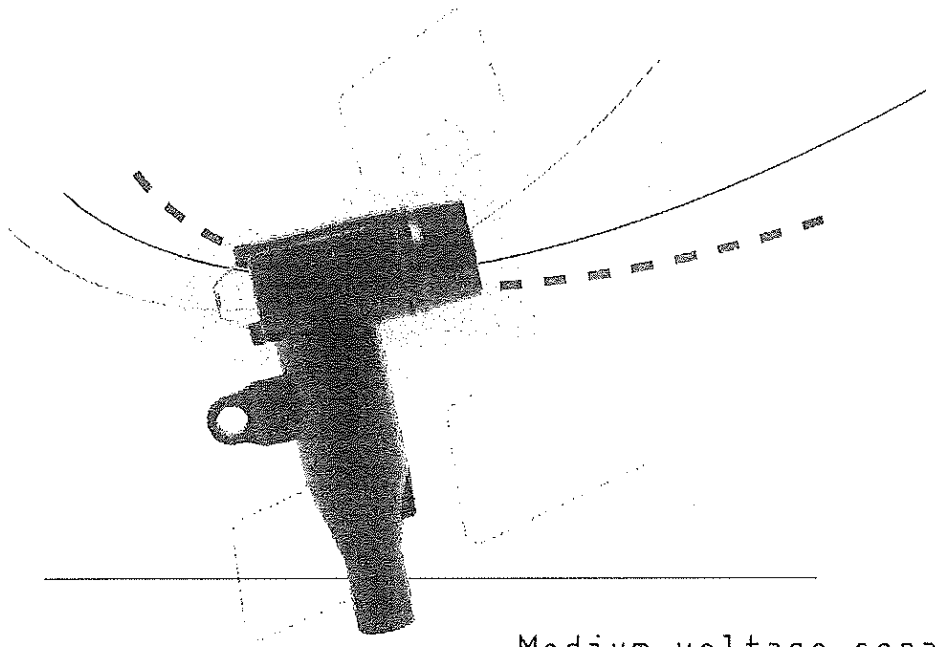
На основание чл. 2
от ЗЗЛД

ВЯРНО С ОРИГИНАЛА

CABLEL HELLENIC CABLES GROUP

Euromold

a Nexans company



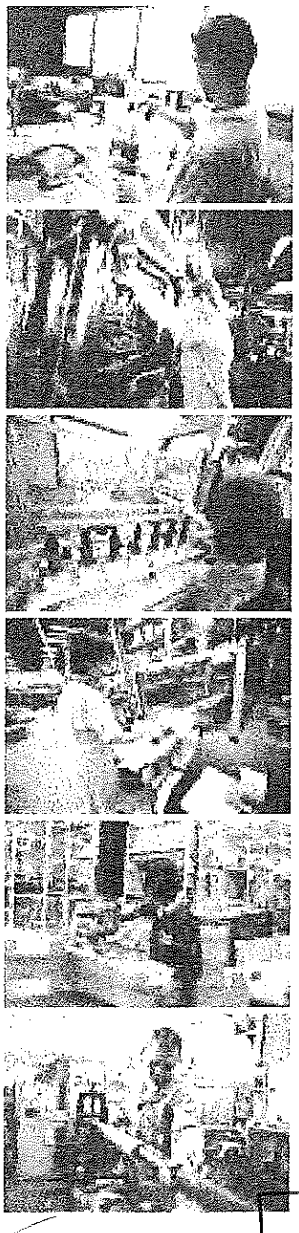
Medium voltage separable connectors and bushings

- Interface A -

Catalogue 2012

Euromold
a Nexans company

Nexans Network Solutions
Div. Euromold
COMPANY PRESENTATION



EUROMOLD
Euromold is the leading European specialised designer, manufacturer and distributor of prefabricated cable accessories for medium voltage energy distribution. Euromold provides a complete range of accessories for underground cables: premoulded EPDM rubber connectors for cables and epoxy bushings for transformers and switchgear, as well as a large range of cold-shrinkable terminations and joints from 12 to 42 kV. Euromold is also the manufacturer of electrical components for the high voltage accessories of the Nexans group.

ISO 9001 Certificate
Since 1992, Euromold's commitment to quality is demonstrated by its ISO 9001 certification.

International standards
All our products meet the International standards like CENELEC HD 629.1, CENELEC EN 50180, IEC 60137, IEC 60502-4... or country specifications. Official certificates, CESI, KEMA, ATEX... prove the conformity of our products. Long duration tests of existing or new products are continuously performed in our test fields.

Laboratory accreditation
Since June 2000, Euromold's independent ELAB laboratory obtained the BELAC accreditation no.144-TEST conform with the European standards for laboratories ISO 17025 for electrical testing of low and medium voltage cable accessories according to the international standards HD 623 and HD 629.

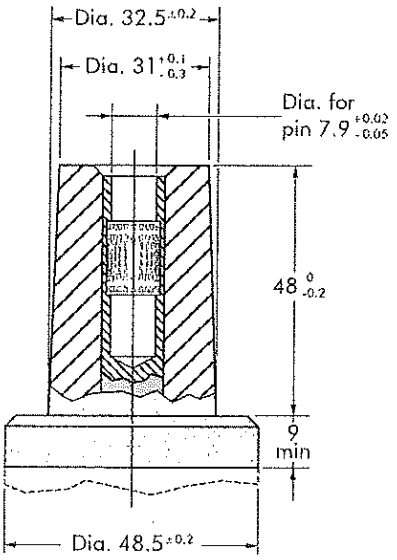
Euromold
a Nexans company

SEPARABLE CONNECTORS AND BUSHINGS
INTERFACE A

Table of contents

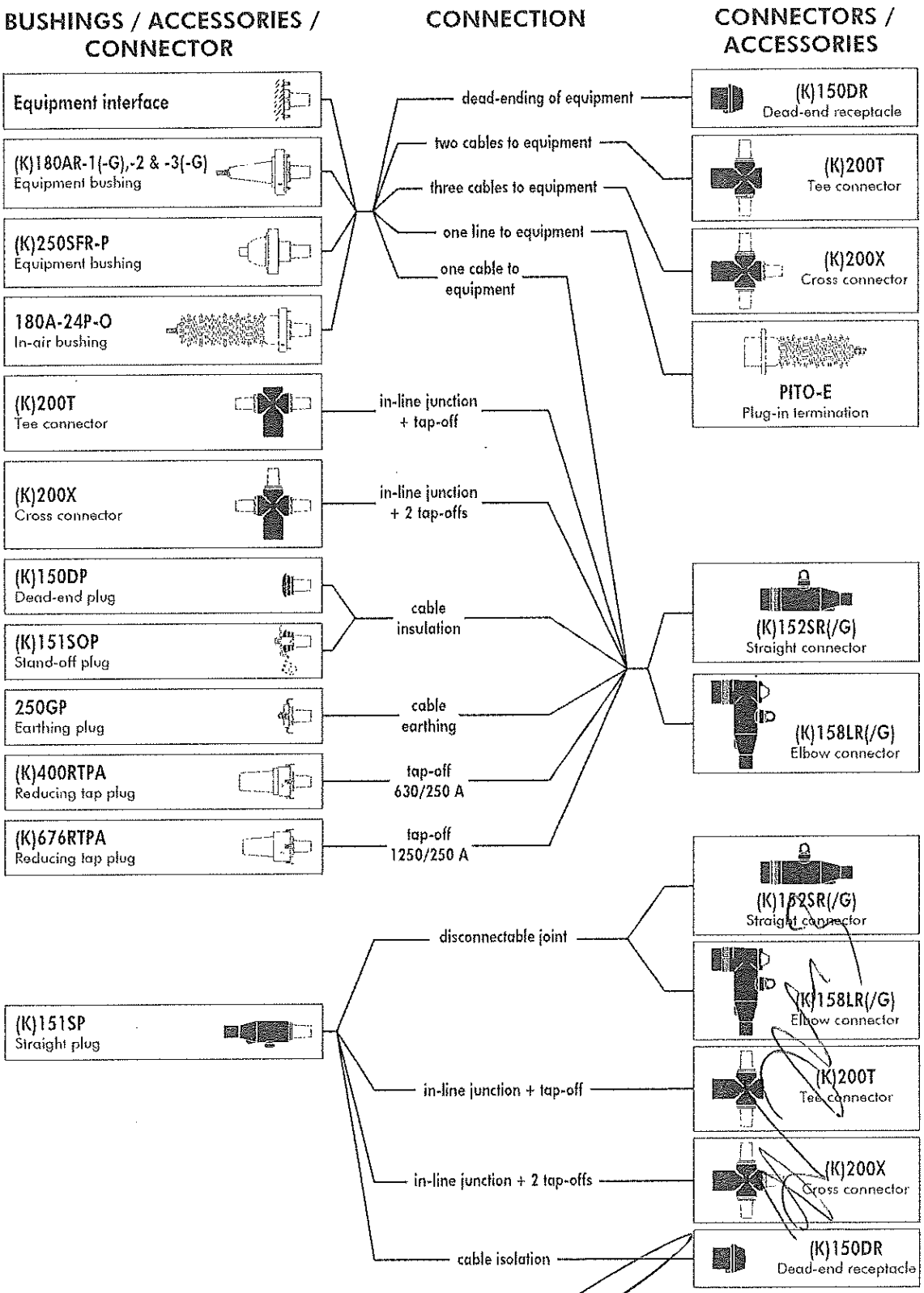
Interface A

Dimensions according to European CENELEC EN 50180 and 50181 (in mm).



01/2012

Connecting possibilities



01/2012

ВЯРНО С ОРИГИНАЛА

Euromold
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Euromold
a Nexans company

158LR
INTERFACE A
ELBOW CONNECTOR

Up to 24 kV - 250 A

Application

Separable elbow connector designed to connect polymeric insulated cable to equipment (transformers, switchgear, motors...).
Also connects cable to cable, using the appropriate mating part.

Technical characteristics

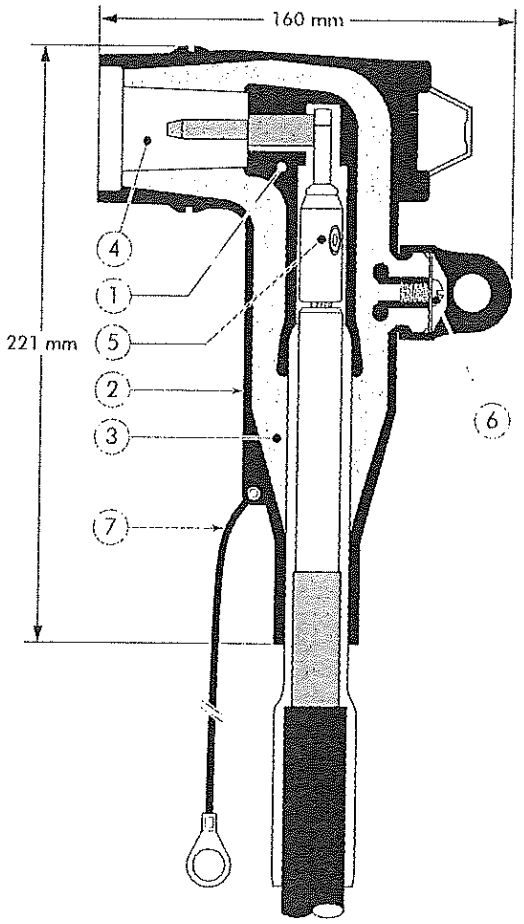
- The thick conductive EPDM jacket provides a total safe to touch screen which ensures safety for personnel.
- Each separable connector is tested for AC withstand and partial discharge prior to leaving the factory.

6/10 (12) kV
6.35/11 (12) kV
8.7/15 (17.5) kV
12/20 (24) kV
12.7/22 (24) kV

Design

Separable connector comprising:

1. Conductive EPDM insert.
2. Conductive EPDM jacket.
3. Insulating EPDM layer moulded between the insert and the jacket.
4. Type A - 250 A interface as described by CENELEC EN 50180 and 50181.
5. Conductor connector.
6. Voltage test point.
7. Earthing lead (-/G version only).



Specifications and standards

The separable connector 158LR meets the requirements of CENELEC HD 629.1.

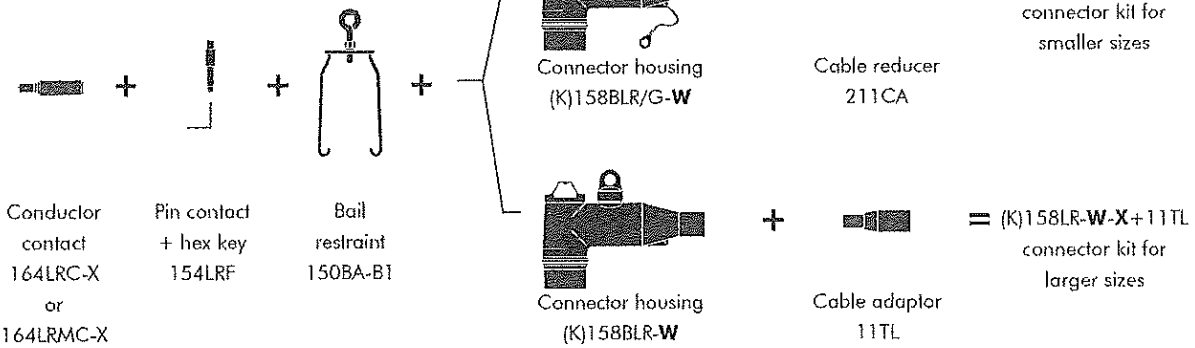
Separable connector type	Voltage Um (kV)	Current Ir (A)	Conductor sizes (mm²)	
			min	max
158LR/G	12	250	16	95
158LR	12	250	70	95
K158LR/G	24	250	16	70
K158LR	24	250	25	95

01/2012

Kit contents

The complete (K)158LR or (K)158LR/G elbow connector kit comprises the following components:

The kit also comprises lubricant, wipers, installation instructions and crimp chart.



Ordering instructions

Select the part number which gives the best centring to the cable core insulation diameter and substitute **X** using table X, according to the conductor size and type.
Add a 'K' for use up to 24 kV.

Example:
The copper wire screened cable is 24 kV, 50 mm² stranded aluminium with a diameter over core insulation of 20.4 mm. Order a K158LR-FG-50(K)M-12-2+11TL elbow connector kit.

For an option with a bolted conductor contact, specify the ordering part number below.

Table W

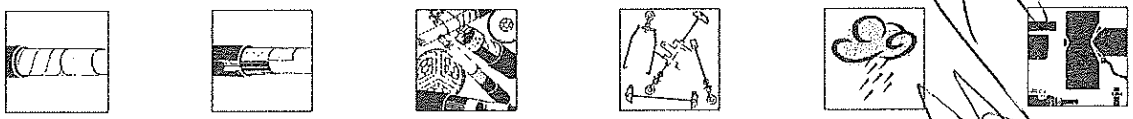
Ordering part number	Dia. over core insulation (mm)	
	min	max
158LR/G-11-**X**	12.6	16.1
158LR/G-13-**X**	14.6	18.7
158LR-FB-**X**+11TL	17.5	20.2
158LR-FG-**X**+11TL	18.4	21.2
158LR-GA-**X**+11TL	19.7	22.5
158LR-GAB-**X**+11TL	21.0	23.8
158LR-GH-**X**+11TL	23.2	26.4

Table X

Conductor sizes (mm²)	Aluminium		Copper
	DIN hexagonal	Deep indent	DIN hexagonal
16	-	-	16(K)M-11-2
25	25(K)M-12-2	25KM-12-1	25(K)M-11-2
35	35(K)M-12-2	35KM-12-1	35(K)M-11-2
50	50(K)M-12-2	50(K)M-12-1*	50(K)M-11-2
70	70(K)M-12-2	70(K)M-12-1*	70(K)M-11-2
95	95(K)M-12-2*	95(K)M-12-1*	95(K)M-11-2

* The 158LR-FB is not compatible with these conductor contacts.

Ordering part number	Dia. over core insulation (mm)	Conductor sizes (mm²)
158LR/G-13-25.95-14-5	14.6 - 22.7	35 - 70
158LR-GAS-50.95-14-5+11TL	19.7 - 25.4	25 - 95



For use with copper tape screened cables. Order: Kit MT.

For use with Alupe or C 33-226 cables. Please contact our representative.

For use with other cable types. Please contact our representative.

For adopted bail restraints: see 'Bail restraints and typical applications'.

For outdoor applications. Order +MWS.

Components can be ordered individually.

Euromold
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152SR
INTERFACE A
STRAIGHT CONNECTOR

Up to 24 kV - 250 A

Application

Separable straight connector designed to connect polymeric insulated cable to equipment (transformers, switchgear, motors...).
Also connects cable to cable, using the appropriate mating part.

Technical characteristics

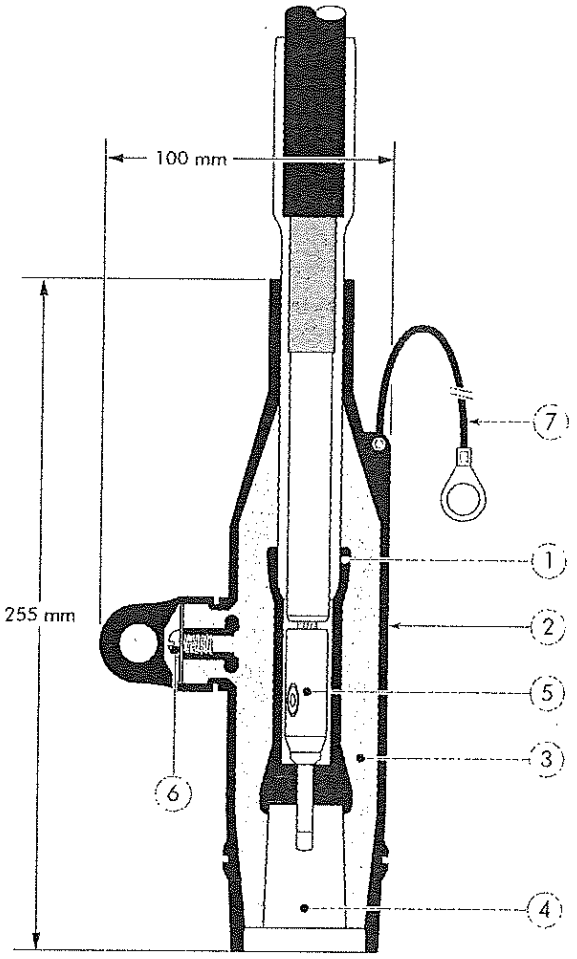
- The thick conductive EPDM jacket provides a total safe to touch screen which ensures safety for personnel.
- Each separable connector is tested for AC withstand and partial discharge prior to leaving the factory.

6/10 (12) kV
6.35/11 (12) kV
8.7/15 (17.5) kV
12/20 (24) kV
12.7/22 (24) kV

Design

Separable connector comprising:

1. Conductive EPDM insert.
2. Conductive EPDM jacket.
3. Insulating EPDM layer moulded between the insert and the jacket.
4. Type A - 250 A interface as described by CENELEC EN 50180 and 50181.
5. Conductor connector.
6. Voltage test point.
7. Earthing lead (-/G version only).



Specifications and standards

The separable connector 152SR meets the requirements of CENELEC HD 629.1.

Separable connector type	Voltage Um (kV)	Current Ir (A)	Conductor sizes (mm²)	
			min	max
152SR/G	12	250	16	70
152SR	12	250	70	95
K152SR/G	24	250	16	25
K152SR	24	250	25	95

01/2012

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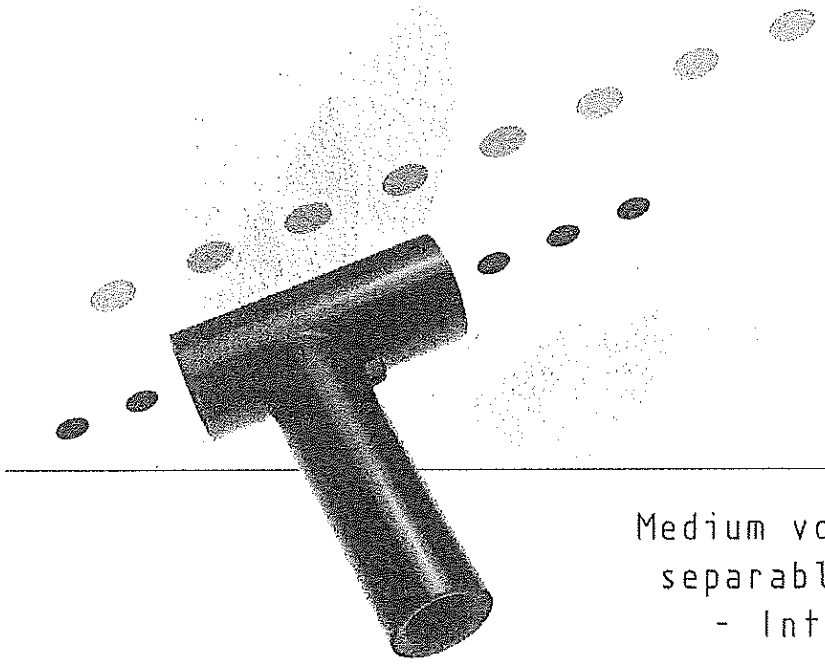

Medium voltage compact separable connectors - Interface C -

Catalogue 2011

Euromold
a Nexans company

Nexans Network Solutions
Div. Euromold
COMPANY PRESENTATION

EUROMOLD
Euromold is the leading European specialised designer, manufacturer and distributor of prefabricated cable accessories for medium voltage energy distribution. Euromold provides a complete range of accessories for underground cables: premoulded EPDM rubber connectors for cables and epoxy bushings for transformers and switchgear, as well as a large range of cold-shrinkable terminations and joints from 12 to 42 kV. Euromold is also the manufacturer of electrical components for the high voltage accessories of the Nexans group.

ISO 9001 Certificate
Since 1992, Euromold's commitment to quality is demonstrated by its ISO 9001 certification.

International standards
All our products meet the International standards like CENELEC HD 629.1, CENELEC EN 50180, IEC 60137, IEC 60502-4... or country specifications. Official certificates, CESI, KEMA, ATEX... prove the conformity of our products. Long duration tests of existing or new products are continuously performed in our test fields.

Laboratory accreditation
Since June 2000, Euromold's independent ELAB laboratory obtained the BELAC accreditation nb. 144-TEST conform with the European standards for laboratories ISO 17025 for electrical testing of low and medium voltage cable accessories according to the international standards EN 50393, IEC 60502-4, IEC 61442 and HD 629.

Euromold
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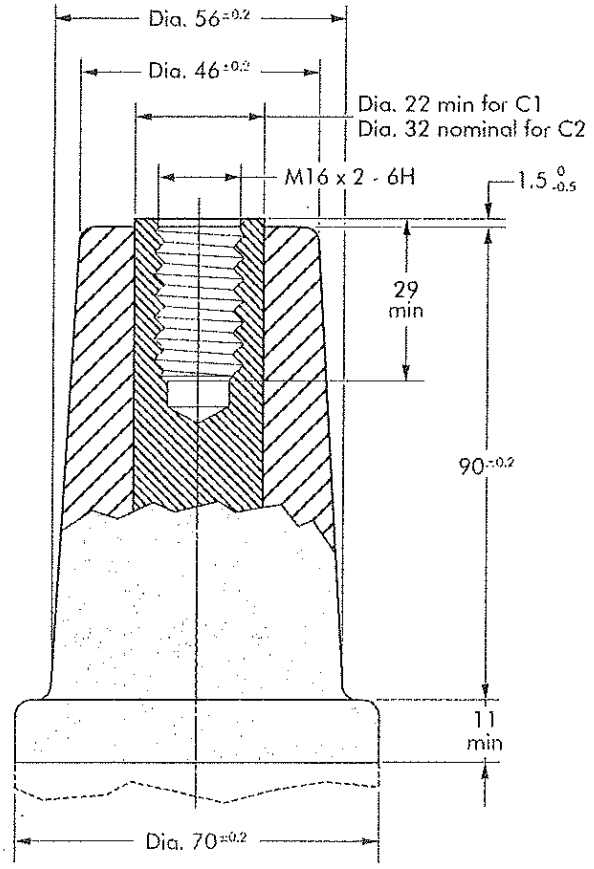
SEPARABLE CONNECTORS
INTERFACE C

Table of contents

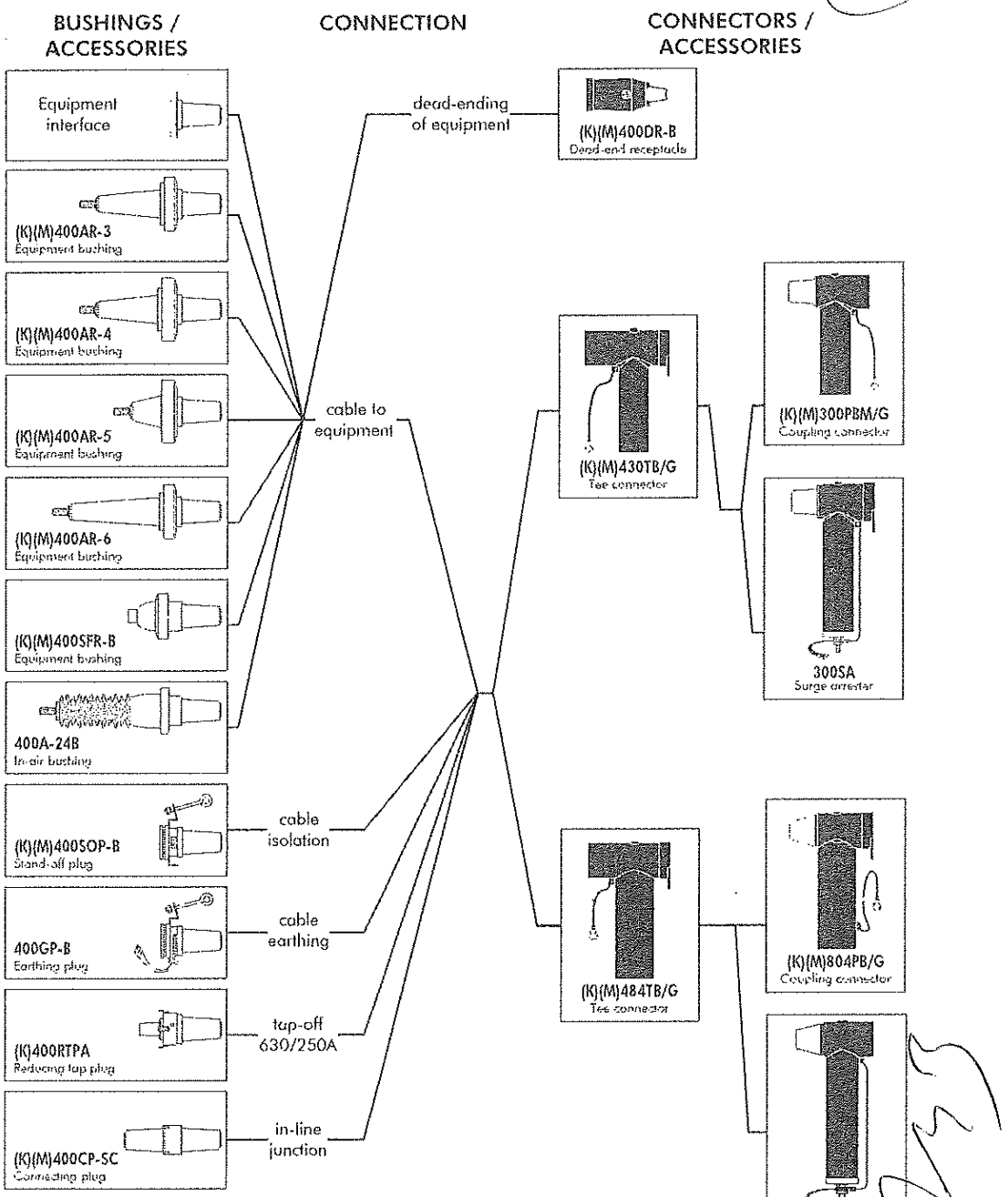
Interface C1 & C2

Dimensions according to European CENELEC EN 50180 and 50181 (in mm).



08/2011

Connecting possibilities



For information on our bushings please refer to our bushing catalogue.

ВЯРНО С ОРИГИНАЛА

Euromold
a Nexans company

430TB
INTERFACE C
TEE CONNECTOR

Up to 36 kV
630 A (800 A)

6/10 (12) kV
6.35/11 (12) kV
8.7/15 (17.5) kV
12/20 (24) kV
12.7/22 (24) kV
18/30 (36) kV
19/33 (36) kV

Application

Separable tee shape connector (bolted type) designed to connect polymeric insulated cable to equipment (transformers, switchgear, motors, ...).
Also connects cable to cable when using the appropriate mating parts.

Technical characteristics

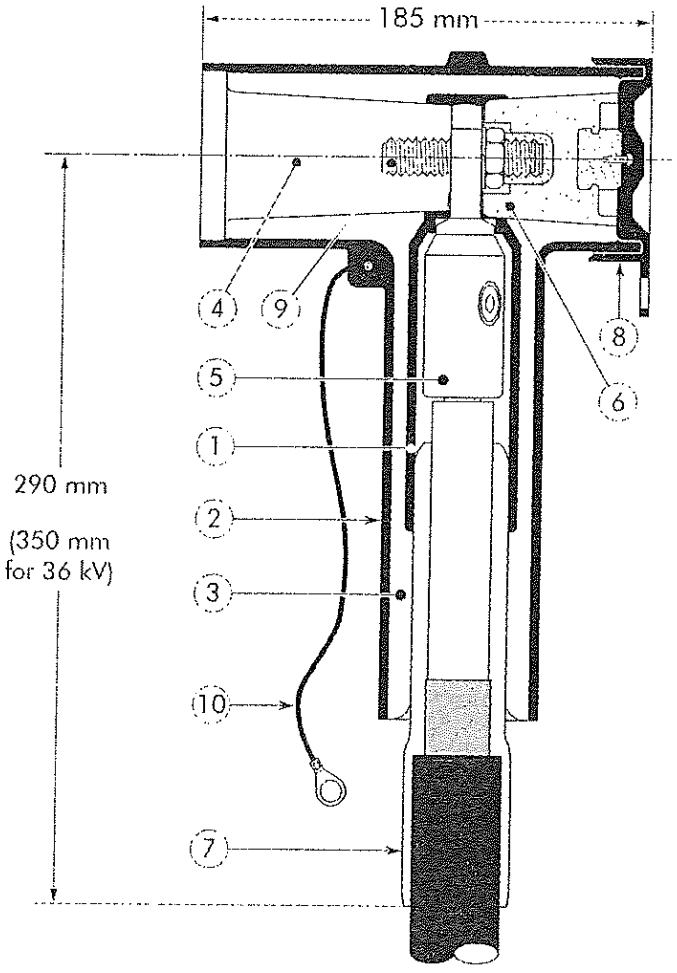
- A thick conductive EPDM jacket provides a total safe to touch screen.
- Each separable connector is tested for AC withstand and partial discharge prior to leaving the factory.

Design

Separable connector comprising:

1. Conductive EPDM insert.
2. Conductive EPDM jacket.
3. Insulating EPDM layer moulded between the insert and the jacket.
4. Type C interface as described by CENELEC EN 50180 and 50181.
5. Conductor connector.
6. Basic insulating plug (with VD point).
7. Cable reducer.
8. Conductive rubber cap.
9. Clamping screw.
10. Earthing lead.

The screen break design enables cable outer sheath testing without removing or dismantling the connector.



Specifications and standards

The 430TB separable connector meets the requirements of CENELEC HD 629.1.

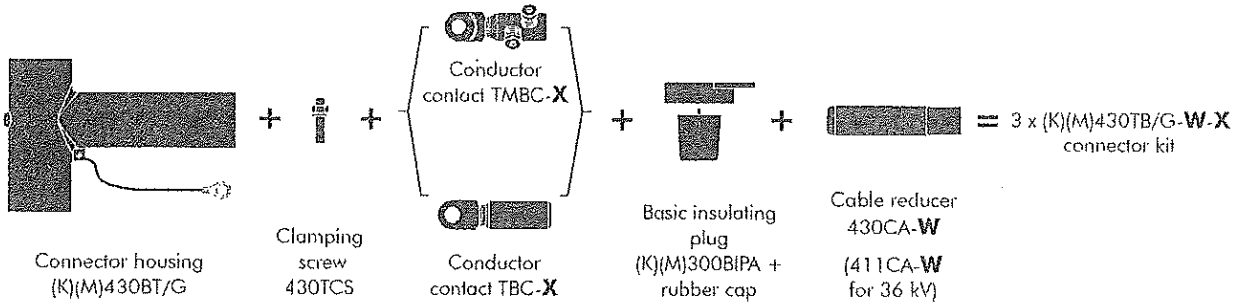
Separable connector type	Voltage Um (kV)	Current Ir (A)	Current Ir (A) When installed on an appropriate equipment bushing and when using a copper (-11-2) or a bolted (-12-5 or -14-5) conductor contact	Conductor sizes (mm^2)	
				min	max
430TB/G	12	630	800	35	300
K430TB/G	24	630	800	35	300
M430TB/G	36	630	800	50	240

09/2011

Kit contents

The complete (K)(M)430TB/G tee connector kit comprises 3 x the following components:

The kit also comprises silicone grease, field control mastic, installation rod, installation instructions and crimp chart.



Connector housing (K)(M)430BT/G

Clamping screw 430TCS

Conductor contact TBC-X

Basic insulating plug (K)(M)300BIPA + rubber cap

Cable reducer 430CA-W (411CA-W for 36 kV)

Ordering instructions

To order the tee connector, select the ordering part number which gives you the best centring of your core insulation diameter and substitute **X** using table X, according to your conductor size and type.

Example:

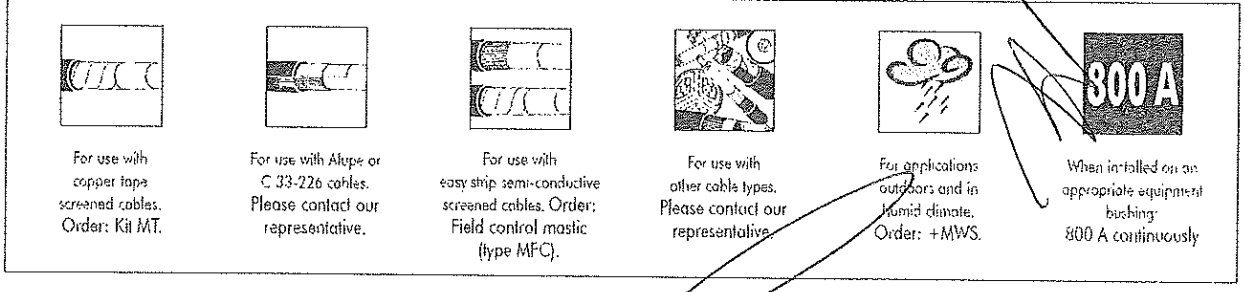
The cable is 24 kV, 150 mm² compact stranded copper with a diameter over core insulation of 27.5 mm.
Order 3 x K430TB/G-18-95.240-14-5 tee connector kit.

Table W

Ordering part number	Voltage (Um) (kV)	Dia. over core insulation (mm)	
		min	max
3 x 430TB/G-11-**X**	12	12.0	17.5
3 x 430TB/G-16-**X**	12	17.0	23.5
3 x 430TB/G-18-**X**	12	19.0	32.6
3 x K430TB/G-11-**X**	24	12.0	17.5
3 x K430TB/G-16-**X**	24	17.0	23.5
3 x K430TB/G-18-**X**	24	19.0	32.6
3 x M430TB/G-11-**X**	36	12.0	17.5
3 x M430TB/G-15-**X**	36	16.0	22.0
3 x M430TB/G-19-**X**	36	20.0	26.5
3 x M430TB/G-22-**X**	36	23.5	31.0
3 x M430TB/G-25-**X**	36	26.5	32.5
3 x M430TB/G-27-**X**	36	28.5	37.5

Table X

Conductor sizes (mm²)	Aluminium conductor		Aluminium and copper conductor	Copper conductor
	DIN hexagonal	Deep indent	Bolted	DIN hexagonal
35	35(K)M-10-2	35KM-10-1	16-95-14-5	35(K)M-11-2
50	50(K)M-10-2	50(K)M-10-1		50(K)M-11-2
70	70(K)M-10-2	70(K)M-10-1	50-150-14-5	70(K)M-11-2
95	95(K)M-10-2	95(K)M-10-1		95(K)M-11-2
120	120(K)M-10-2	120(K)M-10-1	95-240-14-5	120(K)M-11-2
150	150(K)M-10-2	150(K)M-10-1		150(K)M-11-2
185	185(K)M-10-2	185(K)M-10-1	120-300-14-5	185(K)M-11-2
240	240(K)M-10-2	240(K)M-10-1		240(K)M-11-2
300	300(K)M-10-2	–		300(K)M-11-2



For use with copper tape screened cables. Order: Kit MT.

For use with Alupe or C 33-226 cables. Please contact our representative.

For use with easy strip semi-conductive screened cables. Order: Field control mastic (type MFC).

For use with other cable types. Please contact our representative.

For applications outdoors and in humid climate. Order: +MWS.

When installed on an appropriate equipment bushing: 800 A continuously

Euromold
a Nexans company

484TB
INTERFACE C
TEE CONNECTOR

Up to 42 kV
630 A (1250 A)

6/10 (12) kV
6.35/11 (12) kV
8.7/15 (17.5) kV
12/20 (24) kV
12.7/22 (24) kV
18/30 (36) kV
19/33 (36) kV
20.8/36 (42) kV

Application

Separable tee shape connector (bolted type) designed to connect polymeric insulated cable to equipment (transformers, switchgear, motors, ...).
Also connects cable to cable when using the appropriate mating parts.

Technical characteristics

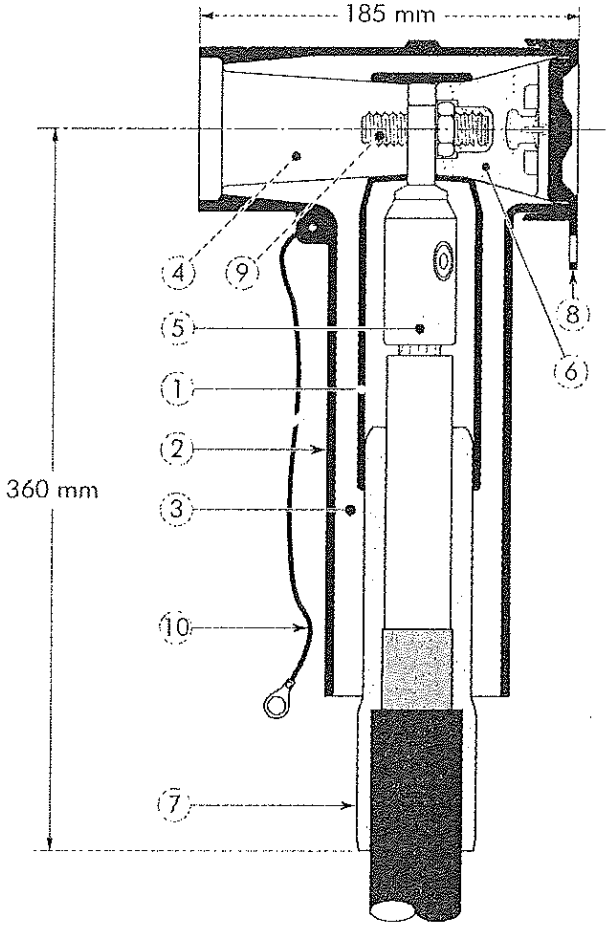
- The thick conductive EPDM jacket provides a total safe to touch screen which ensures safety for personnel.
- Each separable connector is tested for AC withstand and partial discharge prior to leaving the factory.

Design

Separable connector comprising:

1. Conductive EPDM insert.
2. Conductive EPDM jacket.
3. Insulating EPDM layer moulded between the insert and the jacket.
4. Type C - interface as described by CENELEC EN 50180 and 50181.
5. Conductor connector.
6. Basic insulating plug (with VD point).
7. Cable reducer.
8. Conductive rubber cap.
9. Clamping screw.
10. Earthing lead.

The screen break design enables cable outer sheath testing without removing or dismantling the connector.



Specifications and standards

The 484TB separable connector meets the requirements of CENELEC HD 629.1.

Separable connector type	Voltage Um (kV)	Current Ir (A)	Current Ir (A) When installed on an appropriate equipment bushing	Conductor sizes (mm²)	
				min	max
484TB/G	12	630	1250	50	630
K484TB/G	24	630	1250	35	630
M484TB/G	36	630	1250	35	630
P484TB/G	42	630	1250	35	630

08/2011

MAKRIS GPH
a Nexans company

МАКРИС – ГПХ ООД
1336 София , ул. Ген. Константин Константинов ' N5
т./ф. 02-925 26 20; 02-925 08 68 GSM 0887 511 261
e-mail: office@makris-gph.com http:www.gph.net/bul

ДЕКЛАРАЦИЯ ЗА СЪОТВЕТСТВИЕ

Долуподписаният, фирма " МАКРИС-ГПХ " ООД

ул. " Ген. Константин Константинов " № 5, гр. София 1336

декларирам на собствена отговорност, че продуктът :

ЩЕПСЕЛНА КАБЕЛНА ГЛАВА 20 kV, ЗА ПРИСЪЕДИНЯВАНЕ НА СИЛОВ ТРАНСФОРМАТОР КЪМ КРУ – 200 А, ПРСЪЕДИНЯВАНЕ ВЪНШЕН КОНУС А, AL 50 mm^2

Каталожен номер

3X(K158LR+11TL-FG+50AL)

за който се отнася настоящата декларация,

е в съответствие със следните европейски стандарти и нормативи :

CENELEC HD 629.1

Произвеждат се от **NEXANS POWER ACCESSORRIES GERMANY – EUROMOLD, Германия** в съответствие с цитираните стандарти.

Декларирам, че ми е известна отговорността, която нося съгласно чл. 313 от НК.

Гр. София
януари.2016 г.

На основание чл. 2
от ЗЗЛД

ВЯРНО С ОРИГИНАЛА

886

MAKRIS GPH
a Nexans company

МАКРИС – ГПХ ООД
1336 София , ул. Ген. Константин Константинов' N5
т./ф. 02-925 26 20; 02-925 08 68 GSM 0887 511 261
e-mail: office@makris-gph.com http:www.gph.net/bul

ДЕКЛАРАЦИЯ ЗА СЪОТВЕТСТВИЕ

Долуподписаният, фирма " МАКРИС-ГПХ " ООД

ул. " Ген. Константин Константинов " № 5, гр. София 1336

декларирам на собствена отговорност, че продуктът :

ЩЕПСЕЛНА КАБЕЛНА ГЛАВА 20 kV, ЗА ВЪНШНА ВРЪЗКА КЪМ КРУ – 630 A, ПРИСЪЕДИНЯВАНЕ ВЪНШЕН КОНУС C, AL и CU 95-240 mm^2

Каталожен номер

3X(K430TB/G-18+TMBC-10-M16)

за който се отнася настоящата декларация,

е в съответствие със следните европейски стандарти и нормативи :

CENELEC HD 629.1

Произвеждат се от **NEXANS POWER ACCESSORRIES GERMANY – EUROMOLD, Германия** в съответствие с цитираните стандарти.

Декларирам, че ми е известна отговорността, която нося съгласно чл. 313 от НК.

Гр. София
януари.2016 г.

На основание чл. 2
от ЗЗЛД

ВЯРНО С ОРИГИНАЛА

887

BUREAU VERITAS
Certification

Certification

Awarded to

NEXANS NETWORK SOLUTIONS NV

Divisie Euromold Zuid III Industrielaan 12, 9320 Erembodegem, Belgium

Bureau Veritas Certification certify that the Management System of the above organisation has been audited and found to be in accordance with the requirements of the management system standards detailed below

STANDARD

ISO 9001:2015

SCOPE OF SUPPLY

Development, design, manufacturing and sales
of electrical cable accessories for medium and high voltage networks.

Original Approval Date : ***18/06/1992***

Subject to the continued satisfactory operation of the organisation's Management System, this certificate is valid until : ***16/06/2019***

To check the validity of this certificate please call +32 (0)3 247 94 00.

Further clarification regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organisation

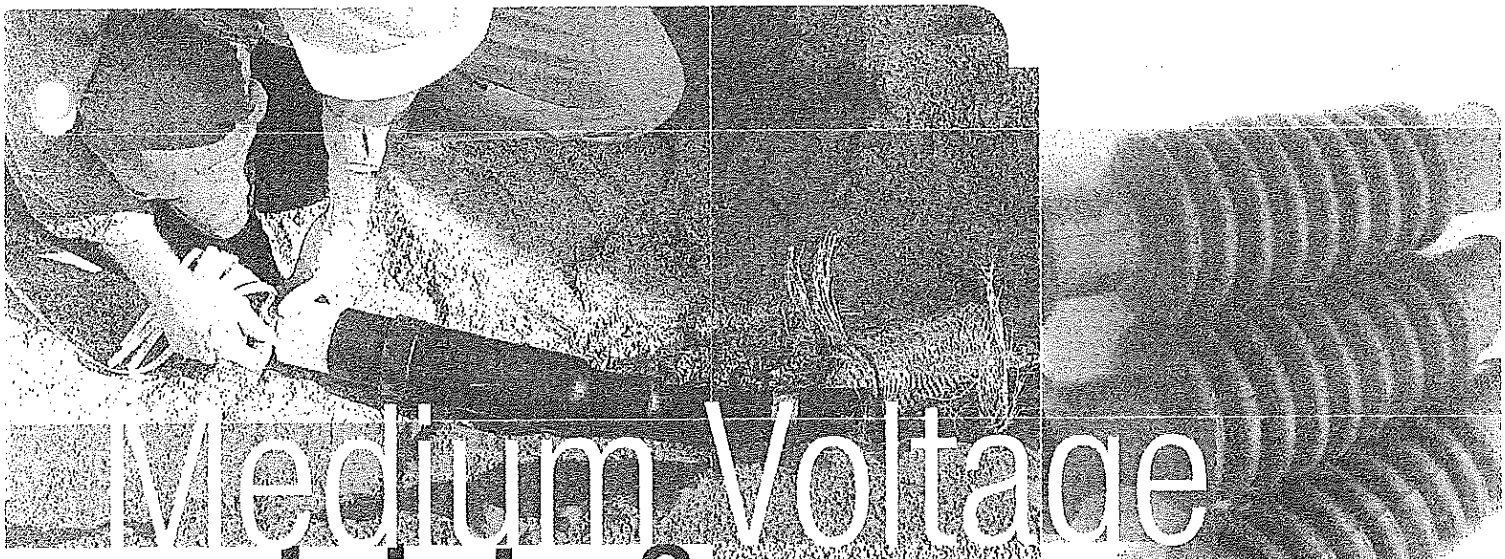
Certificate Number: ***BE010047-1*** *Date:* ***22/07/2016***

На основание чл. 2
от ЗЗЛД

022-QMS

ВЯРНО С ОРИГИНАЛА

888

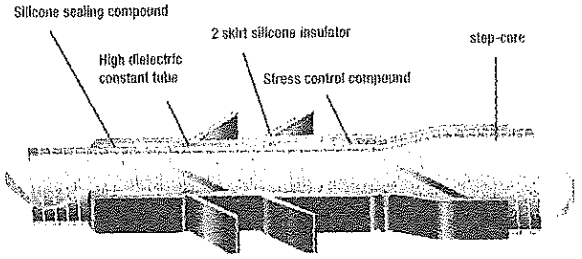


Medium Voltage Joints & Terminations

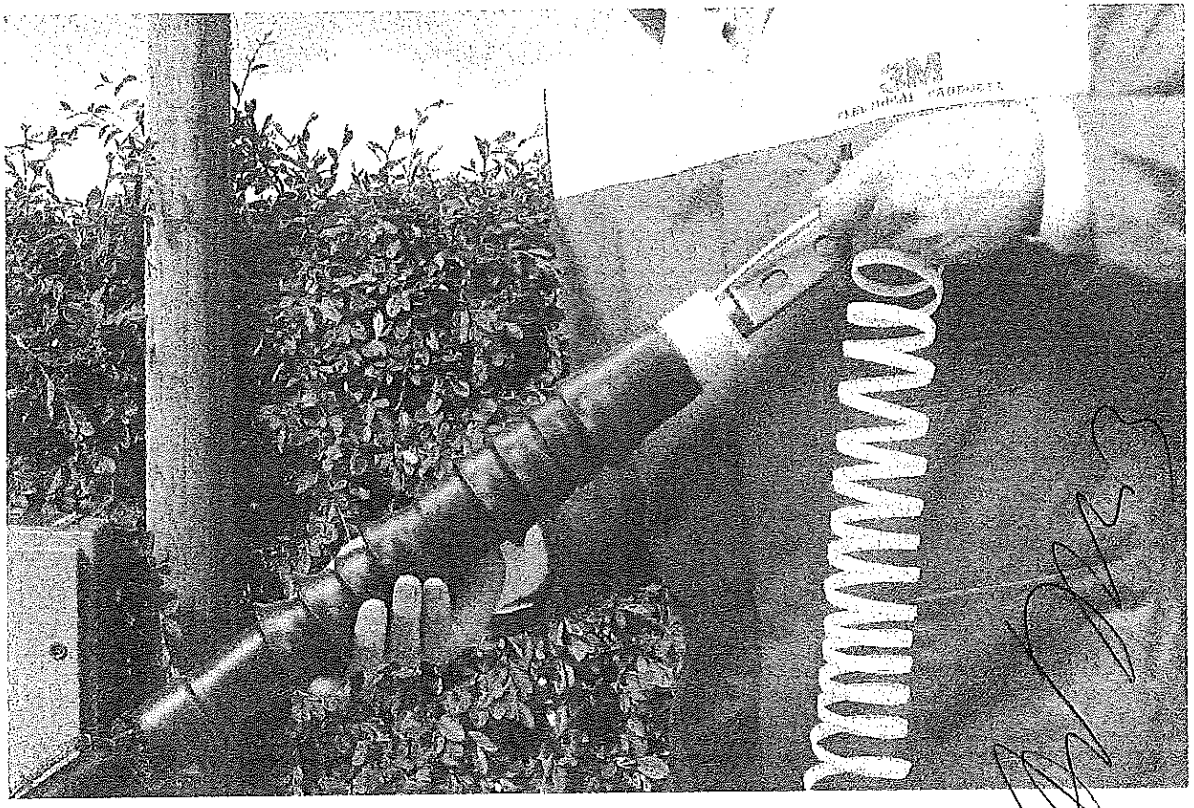
QTIII terminations offer easy installation and reliable performance when terminating indoor and outdoor medium voltage cables. QTIII is a one-piece silicone rubber termination, which is expanded and loaded onto a removable supporting core, which allows the termination to be installed without the need for tools or heat. The core is stepped to allow a greater application range for armoured cables. QTIII consists of a tubular silicone insulator, with a built in refractive stress control tube and compound, and a built in top seal. Due to this unique design the QTIII termination is installed in one operation without the need for any additional components.

QTIII terminations are suitable for use on polymeric cables medium voltage up to 52kV.

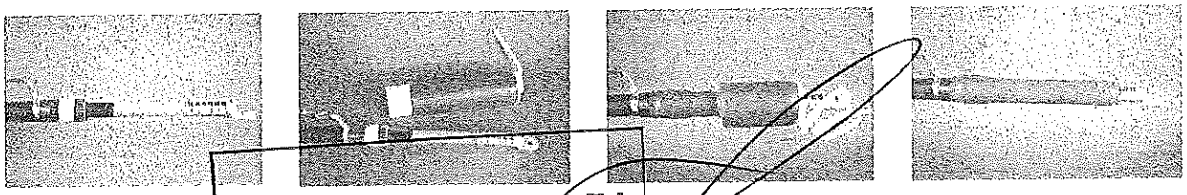
Both indoor and outdoor terminations are available for single core and three core cables. QTIII terminations have been tested in accordance with IEEE Std 48-1990, VDE 0278 Part 4 and IEC/CENELEC. Details of type tests are available upon request.



Outdoor Termination



Indoor Termination



890

3M™ Cold Shrink Termination Kits

(For XLPE, Screened Armoured Cables)

VOLTAGE	NO. CORES	DESCRIPTION	CABLE SIZE	[illegible]
15kV	1	Indoor	25 – 95 mm²	92-EB 62-1 META
			120 – 240 mm²	92-EB 63-1 META
			300 – 500 mm²	92-EB 64-1 META
			600 – 1000 mm²	92-EB 65-1 META
	1	Outdoor	35 – 70 mm²	92-EB 62-2 META
			95 – 185 mm²	92-EB 63-2 META
			240 – 400 mm²	92-EB 64-2 META
			630 mm²	92-EB 65-2 META
	3	Indoor	25 – 35 mm²	92-EB 62-3 META
			50 – 150 mm²	92-EB 63-3 META
			185 – 300 mm²	92-EB 64-3 META
	3	Outdoor	25 – 35 mm²	92-EB 62-4 META
			50 – 150 mm²	92-EB 63-4 META
			185 – 300 mm²	92-EB 64-4 META
20kV	1	Indoor	25 – 95 mm²	93-EB 62-1 META
			70 – 150 mm²	93-EB 63-1 META
			185 – 300 mm²	93-EB 64-1 META
			400 – 800 mm²	93-EB 65-1 META
	1	Outdoor	25 – 95 mm²	93-EB 62-2 META
			70 – 150 mm²	93-EB 63-2 META
			185 – 300 mm²	93-EB 64-2 META
			400 - 800 mm²	93-EB 65-2 META
	3	Indoor	25 – 70 mm²	93-EB 62-3 META
			95 – 240 mm²	93-EB 63-3 META
			300 – 400 mm²	93-EB 64-3 META
	3	Outdoor	25 – 70 mm²	93-EB 62-4 META
			95 – 240 mm²	93-EB 63-4 META
			300 – 400 mm²	93-EB 64-4 META
36kV	1	Indoor	35 – 95 mm²	94-EB 62-1 META
			120 – 185 mm²	94-EB 63-1 META
			240 – 500 mm²	94-EB 64-1 META
			630 mm²	94-EB 65-1 META
	1	Outdoor	35 – 95 mm²	94-EB 62-2 META
			120 – 185 mm²	94-EB 63-2 META
			240 – 500 mm²	94-EB 64-2 META
			630 mm²	94-EB 65-2 META
	3	Indoor	25 – 120 mm²	94-EB 62-3 META
			150 – 240 mm²	94-EB 63-3 META
			300 mm²	94-EB 64-3 META
	3	Outdoor	25 – 120 mm²	94-EB 62-4 META
			150 – 240 mm²	94-EB 63-4 META
			300 mm²	94-EB 64-4 META

Paper Termination Kits

(For Belted, PILC MIND Cable)

VOLTAGE	NO. CORES	DESCRIPTION	CABLE SIZE	[illegible]
15kV	3	Indoor	70 - 300 mm²	MT - 16
	3	Outdoor	35 - 70 mm²	MO - 16

ВЯРНО С ОРИГИНАЛА

САСИН БЪЛГАРИЯ ЕООД
гр. София, ж.к. „Изгрев”, ул. „Тинтява” № 122
тел./факс: 02/ 989 00 06, E-mail: sales@sassin-bg.com

Декларация за съответствие

Наименование на издаващата организация:
„САСИН БЪЛГАРИЯ” ЕООД

Адрес на издаващата организация:
гр. София, ул. “Тинтява”, №122

Производител: 3М Италия,
ул. Карло Гаваци №25, 20010 Маркало кон Казоне (Милано), Италия

Предмет на декларацията:
Кабелна глава 93-EB 6x-1

Предметът на декларацията, описан по-горе, е в съответствие с изискванията на следните документи и/или приложими стандарти:

Документ №	Заглавие	Издание/Дата на издаване
БДС HD 629.1	Изисквания за изпитване на аксесоари за използване със силови кабели с обявено напрежение от 3,6/6(7,2) kV до 20,8/36(42) kV. Част 1: Кабели с екструдирана изолация	S2:2006 A1:2008
БДС EN 61442	Методи за изпитване на принадлежности за силови кабели с обявени напрежения от 6 kV (Um = 7,2 kV) до 36 kV (Um = 42 kV) (IEC 61442:2005, с промени)	2006

и са съобразени със съществените изисквания за безопасно използване на електрически съоръжения и не застрашават живота и здравето на хората, домашните животни или вещите.

Специфични изисквания: Да се спази инструкцията за монтаж, придружаваща изделието.
Допълнителна информация:
В случай на несъгласувано изменение на продуктите, тази декларация губи валидност.

гр. София
02. 10. 2017 г.

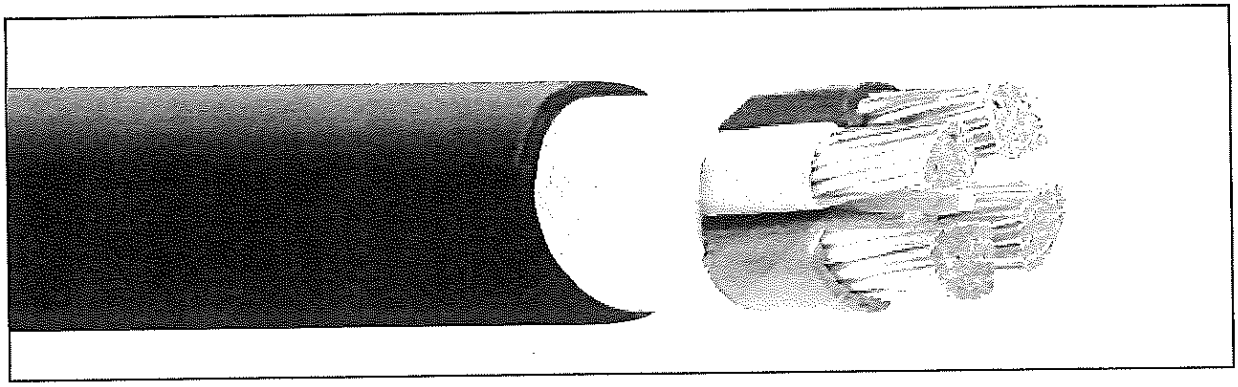
На основание чл. 2
от ЗЗЛД

ВЯРНО С ОРИГИНАЛ

89

NYY
Uo/U - 0.6/1 kV

Силов кабел ниско напрежение с PVC изолация и Cu жила



ПРИЛОЖЕНИЕ

За изграждане на предимно подземни разпределителни електрически мрежи и инсталации на промишлени и обществени обекти, където не се очакват механични повреди, за пренасяне и разпределение на електроенергия при номинални напрежения Uo/U до 0.6/1 kV.

ТЕХНИЧЕСКИ ДАННИ

- произведен съгласно **DIN VDE 0276 част 603, HD 603 S1**
- експлоатация при температури на околната среда:
  - при фиксиран монтаж от - *30°C* до + *50°C*
- монтаж при температури, не по-ниски от - *5°C*
- допустим радиус на огъване:
  - едножилни кабели - *15 D*
  - многожилни кабели - *12 D*
- за полагане във вътрешни помещения, в изкопи в земя, в бетон, във вода, канали, тунели и шахти
- макс. продължителна температура на нагряване на токопроводимите жила + *70°C*
- макс. допустима температура на нагряване на токопроводимите жила в режим на късо съединение, за не повече от *5 s*
  - за номинални сечения до *300 мм²* + *160°C*
  - за номинални сечения над *300 мм²* + *140°C*
- неразпространение на горенето - по IEC 332-1
- изпитвателно напрежение - променливо *4 kV*, постоянно *12 kV*
- цвят на защитната обвивка - черен

КОНСТРУКЦИЯ НА КАБЕЛА

- плътни или усукани медни жила, клас 1 или 2 по **DIN VDE 0295**
- поливинилхлоридна изолация
- запълнение на фугите
- поливинилхлоридна обвивка

ОЗНАЧЕНИЕ НА ФОРМАТА НА ЖИЛАТА

re-кръгло плътно
rm-кръгло многожично
se-секторно плътно
sm-секторно многожично

ЦВЯТ НА ИЗОЛАЦИЯТА НА ЖИЛАТА НА КАБЕЛИТЕ

едножилни - черен или жълто-зелен

	Оцветяване на жилата до 2006		**Оцветяване на жилата след 2006**
брой на жилата	**без жълто-зелено жило**	**брой на жилата**	**без жълто-зелено жило**
2-жилни	черен, син	2-жилни	син, кафяв
3-жилни	черен, син, кафяв	3-жилни	кафяв, черен, сив
4-жилни	черен, син, кафяв, черен	4-жилни	син, кафяв, черен, сив
5-жилни	черен, син, кафяв, черен, черен	5-жилни	син, кафяв, черен, сив, черен
многожилни	черен с цифрова номерация на жилата	многожилни	черен с цифрова номерация на жилата
брой на жилата	**с жълто-зелено жило**	**брой на жилата**	**с жълто-зелено жило**
3-жилни	жълто-зелен, черен, син	3-жилни	жълто-зелен, син, кафяв
4-жилни	жълто-зелен, черен, син, кафяв	4-жилни	жълто-зелен, кафяв, черен, сив
5-жилни	жълто-зелен, черен, син, кафяв, черен	5-жилни	жълто-зелен, син, кафяв, черен, сив
многожилни	черен с цифрова номерация на жилата и едно жълто-зелено жило	многожилни	черен с цифрова номерация на жилата и едно жълто-зелено жило

NYY

Uo/U - 0.6/1 kV

Силов кабел ниско напрежение с PVC изолация и Cu жила

Артикулен №	Брой и сечения на жилата NYY	Форма на токопро-водимото жило	Диаметър на кабела	Тегло на медта	Тегло на кабела
	бр. х мм²		мм	кг / км	кг / км
010815032	1 x1,5	re	7,1	14	63
010815035	1 x 2,5	re	7,5	23	76
010815036	1 x 4,0	re	8,4	37	104
010815037	1 x 6,0	re	8,9	56	128
010815038	1 x 10,0	re	9,7	94	183
010815039	1 x 16,0	re	10,7	149	247
010815040	1 x 25,0	rm	12,7	243	359
010815041	1 x 35,0	rm	13,9	337	462
010815042	1 x 50,0	rm	15,4	454	603
010815043	1 x 70,0	rm	17,1	656	817
010815044	1 x 95,0	rm	19,4	911	1092
010815045	1 x 120,0	rm	20,8	1147	1334
010815046	1 x 150,0	rm	22,7	1415	1627
010815047	1 x 185,0	rm	25,0	1770	2013
010815048	1 x 240,0	rm	27,8	2327	2598
010815049	1 x 300,0	rm	30,7	2887	3200
010815050	1 x 400,0	rm	34,1	3692	4048
010815051	1 x 500,0	rm	38,1	4725	5141
010815091	2 x 1,5	re	12,2	28	192
010815094	2 x 2,5	re	12,9	46	229
010815095	2 x 4,0	re	14,9	75	315
010815096	2 x 6,0	re	15,9	112	382
010815097	2 x 10,0	re	17,5	188	509
010815098	2 x 16,0	re	19,4	298	676
010815099	2 x 25,0	rm	23,5	485	1027
010815100	2 x 35,0	rm	25,7	673	1301
010815101	2 x 50,0	rm	29,1	908	1703
010815146	3 x 1,5	re	12,1	43	201
010815149	3 x 2,5	re	12,9	70	247
010815150	3 x 4,0	re	15,0	112	350
010815151	3 x 6,0	re	16,1	168	435
010815152	3 x 10,0	re	18,0	282	606
010815153	3 x 16,0	re	20,1	447	828
010815154	3 x 25,0	rm	24,4	728	1260
010815155	3 x 35,0	rm	26,7	1010	1622
010815156	3 x 50,0	rm	30,4	1363	2139
010815157	3 x 70,0	sm	29,2	1968	2380
010815158	3 x 95,0	sm	33,2	2732	3233
010815159	3 x 120,0	sm	35,4	3440	3962
010815160	3 x 150,0	sm	39,2	4245	4867
010815161	3 x 185,0	sm	42,7	5311	6046
010815162	3 x 240,0	sm	48,1	6981	7869
010815195	3 x 25,0 +16	rm re	25,4	876	1422
010815198	3 x 35,0 +16	rm re	27,7	1159	1790
010815201	3 x 50,0 +25	sm rm	29,2	1605	2091
010815204	3 x 70,0 +35	sm rm	33,4	2304	2820
010815207	3 x 95,0 +50	sm rm	37,8	3187	3824
010815210	3 x 120,0+70	sm rm	40,8	4096	4779
010815213	3 x150,0 +70	sm rm	44,8	4901	5685
010815216	3 x 185,0 +95	sm rm	49,3	6222	7163
010815219	3 x 240,0 +120	sm rm	55,3	8128	9227

Артикулен №	Брой и сечения на жилата NYY	Форма на токопро-водимото жило	Диаметър на кабела	Тегло на медта	Тегло на кабела
	бр. х мм²		мм	кг / км	кг / км
010815268	4 x 1,5	re	12,9	57	232
010815269	4 x 2,5	re	13,8	93	289
010815270	4 x 4,0	re	16,2	149	419
010815271	4 x 6,0	re	17,4	223	525
010815272	4 x 10,0	re	19,5	376	741
010815273	4 x 16,0	re	21,8	595	1024
010815274	4 x 25,0	rm	27,2	970	1615
010815275	4 x 35,0	rm	30,1	1346	2095
010815276	4 x 50,0	sm	29,2	1817	2311
010815277	4 x 70,0	sm	33,4	2624	3142
010815278	4 x 95,0	sm	37,8	3643	4281
010815279	4 x 120,0	sm	40,8	4587	5256
010815280	4 x 150,0	sm	44,8	5660	6442
010815281	4 x 185,0	sm	49,3	7082	8033
010815282	4 x 240,0	sm	55,3	9308	10426
010815330	5 x 1,5	re	13,7	71	272
010815331	5 x 2,5	re	14,8	116	341
010815332	5 x 4,0	re	17,4	187	494
010815333	5 x 6,0	re	19,0	279	635
010815334	5 x 10,0	re	21,6	470	911
010815335	5 x 16,0	re	24,1	744	1262
010815336	5 x 25,0	rm	29,9	1213	1964
010815337	5 x 35,0	rm	33,5	1683	2593
010815338	5 x 50,0	rm	38,1	2271	3435
010815339	5 x 70,0	rm	43,3	3280	4638
010815340	5 x 95,0	rm	50,1	4554	6318
010815726	7 x 1,5	re	14,7	100	323
010815727	8 x 1,5	re	16,0	114	385
010815728	10 x 1,5	re	17,7	142	472
010815729	12 x 1,5	re	18,2	171	509
010815730	14 x 1,5	re	19,0	199	559
010815731	16 x 1,5	re	19,9	227	617
010815733	19 x 1,5	re	20,8	270	689
010815736	24 x 1,5	re	23,9	341	904
010815739	30 x 1,5	re	25,3	426	1030
010815743	37 x 1,5	re	27,0	526	1195
010815765	7 x 2,5	re	15,8	163	413
010815766	8 x 2,5	re	17,4	186	483
010815767	10 x 2,5	re	19,3	232	609
010815768	12 x 2,5	re	19,8	279	662
010815769	14 x 2,5	re	20,7	325	733
010815770	16 x 2,5	re	21,7	372	807
010815771	19 x 2,5	re	22,8	441	916
010815772	24 x 2,5	re	26,2	557	1203
010815775	30 x 2,5	re	27,8	697	1386
010815782	37 x 2,5	re	29,9	859	1641
010815819	7 x 4,0	re	19,3	261	639
010815822	10 x 4,0	re	23,8	373	950
010815844	7 x 6	re	20,5	403	850
010815859	7 x 10	re	23,5	672	1200

Prysmian Group

OP-SL-RQMS-8.2.4 A11

CERTIFICATE OF CONFORMITY NO. 27408

We, SC Prysmian Romania Cabluri şi Sisteme SA, declare under our sole responsibility that the products delivered to FILKAB JS.Co with delivery notes:

4950036816 / 21-07-2015
4950036817 / 21-07-2015
4950036818 / 21-07-2015

are in conformity with the following standard(s) or other normative document(s) listed below.

No.	Product	Quantity	Batch	Drum	Standard	
1	NFA2X 3x70+54.6 0.6/1 kV (6E)(CEZ) [BG]	1996 M	1006950709	DWP2200 22504950	HD-626-S1	*
2	NFA2X 3x70+54.6 0.6/1 kV (6E)(CEZ) [BG]	2033 M	1006950699	DWP2200 22504816	HD-626-S1	*
3	NFA2X 3x70+70 0.6/1 kV (6E) (EVN) [BG]	709 M	1007073632	DWP2200 22504870	HD-626-S1	*
4	NFA2X 3x70+70 0.6/1 kV (6E) (EVN) [BG]	2017 M	1007170355	DWP2200 22505010	HD-626-S1	*
5	NFA2X 3x70+70 0.6/1 kV (6E) (EVN) [BG]	2018 M	1007146224	DWP2200 22504925	HD-626-S1	*
6	NFA2X 3x70+70 0.6/1 kV (6E) (EVN) [BG]	2016 M	1007170309	DWP2200 22505008	HD-626-S1	*
7	(N)AY2Y-J 4x185SM 1kV [NO EF] (EVN) [BG]	467 M	1006942594	DWP2100 21506658	HD - 603 S1	*
8	(N)AY2Y-J 4x185SM 1kV [NO EF] (EVN) [BG]	538 M	1006941846	DWP2100 21506684	HD - 603 S1	*
9	NYY-O 1x185RM 0.6/1 kV	1006 M	1007170209	DWP1800 18515588	HD - 603 S1	*
10	NYY-O 1x240RM 0.6/1 kV (EVN) [BG]	1023 M	1007170220	DWP1800 18515434	HD - 603 S1	*

* See attached measurement reports

На основание чл. 2
от ЗЗЛД

(Place and date of issue)
SLATINA
SC Prysmian Romania Cabluri şi Sisteme SA
21-07-2015

ВЯРНО С ОРИГИНАЛА

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Capital Social
103.850.920 lei

895

Prysmian Group

OP-SL-RQMS-8.2.4 A8-en

QUALITY AND LABORATORIES	Test No.: 38036
FINAL TESTS LABORATORY	Date: 20-07-2015

TESTS CERTIFICATE

Product: NYY-O 1x240RM 0.6/1 kV (EVN) [BG] Nominal voltage: 0.6/1 kV

Drum no.: DWP1800 18515434 Manufacturing code: Length: 1023 m

Routine test according with: HD-603 S1

High voltage test:

REQUIREMENTS	MEASUREMENT
- Duration of test: 5 minutes - Voltage: 4 kV AC - No breakdown	No breakdow

Conductor D.C. resistance at 20 degree Celsius:

Section	Requirement	Measurements
240	max. 0,0754 ohm/km	0,0744 ohm/km

Conclusion: PASSED

QUALITY AND LABORATORIES MANAGER	Badalica Vasile	SIF EN	Ghioca Nicolae	Page 1/1

ВЯРНО С ОРИГИНАЛА

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