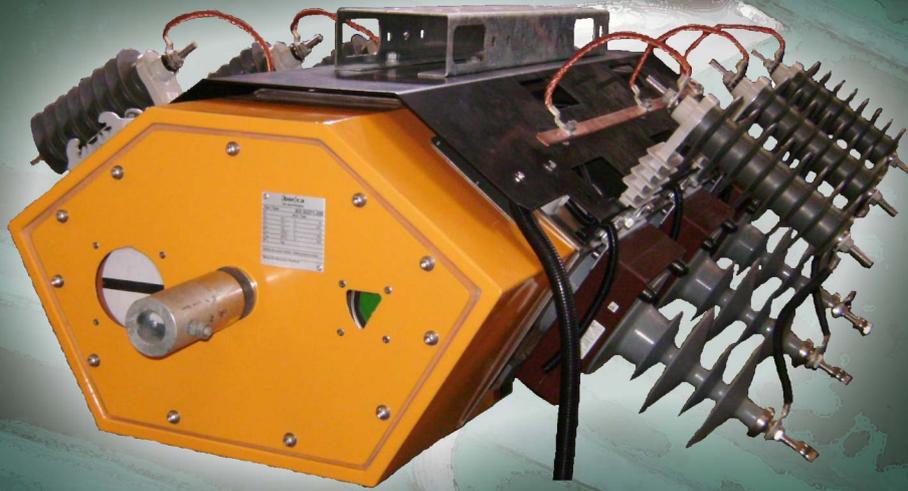


SF6 LOAD BREAK SWITCH

2

REMOTE
CONTROLLED

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people on power solutions



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IA 780 MOTOR

OVERVIEW

Presentation

The IA780 MOTOR OPERATED product range corresponds to a load break switch-disconnectors in SF6 insulation designed for outdoor installation in medium voltage overhead lines either on supports of concrete, lattice or studs.



Standards

The equipment manufacturing follows a program of quality management according to international standard ISO 9001.

Development and manufacturing on the equipment are done in compliance with the standards detailed below:

- IEC / UNE 62271-1 (IEC 60694): *High voltage switchgear. Part 1: Common specifications.*
- IEC / UNE 62271-102 (IEC 60129): *High voltage switchgear. Part 102: disconnectors and earthing AC.*
- IEC / UNE 62271-103 (IEC 60265-1): *High voltage switches. Part 1: High voltage switches for rated voltages above 1kV and less than 52kV.*
- IEC / UNE 62271-200 (IEC 60298): *Metal-enclosed switchgear for AC voltages above 1kV and less than or equal to 52kV.*
- IEC / UNE 60044-1: *Transformers. Part 1: Current transformers.*
- IEC / UNE 60044-2: *Transformers. Part 2: Inductive voltage transformers.*

Functional Characteristics

It is defined as a network switching element with the following features:

- Manieuver in rated active load
- Short-circuit breaker
- Effective switching in accordance to IEC / UNE 62271-102

IA 780 MOTOR OPERATED

STRUCTURAL CHARACTERISTICS

Components

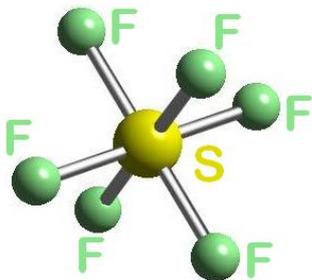
The supplied equipment is made of the following elements:

- Switch disconnector motor operated
- Current transformers mounted in terminals
- Electric control
- Manual control on the base with override tube
- Control cabinet and remote control
- Voltage transformer for power control cabinet (phase to phase)
- Surge arresters (optional)
- Interconnecting cables.
- Chassis support for various items



Breaking technology

SF6 Switch disconnectors IA 780 are designed to fit properly in the environment; compact, small, with an anti-bird protection system, etc.



These equipments have a stainless steel enclosure filled in with SF6 gas.

Inside the envelope is located the breaking switch chambers, as the busbar and drive mechanism. Thus these elements are protected from bad weather and environmental conditions such as corrosion, wind, industrial pollution, etc.

During the IA780 manufacturing, Iberica de aparellajes use processes and materials that ensure minimal leakage rate (sealed for life).

IA 780 MOTOR OPERATED

STRUCTURAL CHARACTERISTICS

Operating mechanism and electrical control

The opening and closing mechanism of the switch-disconnector is composed by:

- *A self-extinguishing insulating material chamber.*

It consists of a rotating copper contact and two fixed contacts for each phase (also copper coated with silver to provide electrical conductivity). The cut is made in two points simultaneously.

- *Drive mechanism*

Switch actuation is performed by a single spring mechanism, which performs the maneuver regardless of the operator speed. The spring is loaded and unloaded by turning the lever in either direction. The mechanism has two positions (open or closed).

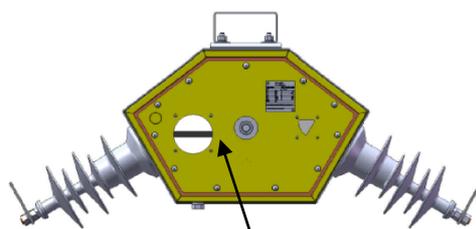
- *Electric control*

The aforementioned spring is activated through a 48 Vdc motor control (optional 12 to 24 VDC) and with power rated of 50 W that performs the opening and closing electrically, both from the control cabinet at the foot of the tower as through the control center via remote control.

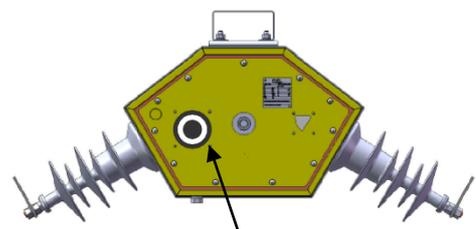
The engine, the limit positions and the transmission assembly, are housed inside a stainless steel painted and sealed by a gasket.

- *Position Indicator*

A linked to the movement of the switch contacts assures its position indicator: open or closed. This is clearly visible from the ground.



POSITION INDICATOR
CLOSED



POSITION INDICATOR
OPEN

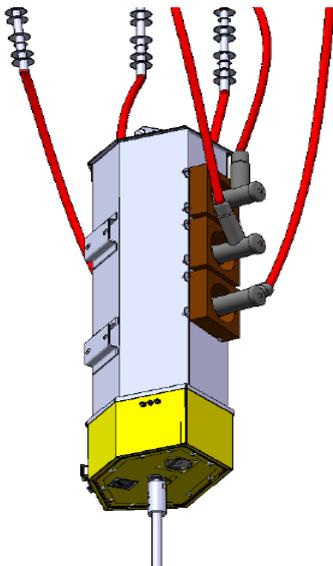
IA 780 MOTOR OPERATED

STRUCTURAL CHARACTERISTICS

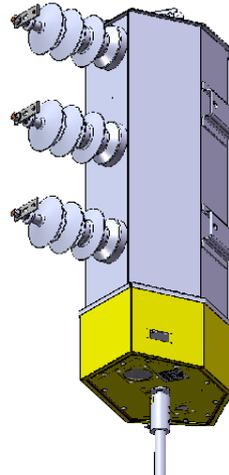
Connections MV

The switch-disconnector supports the following configurations:

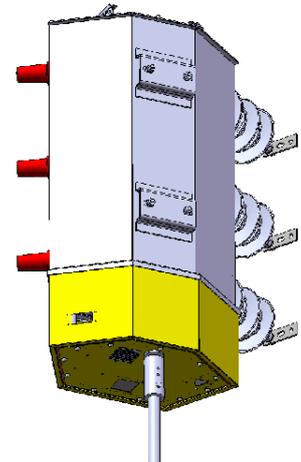
Bushing type C



Silicone terminals



A combination of bushing type C and silicone terminals



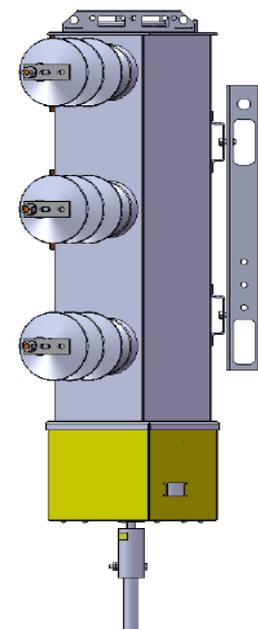
Anchorage

The equipment includes a support piece to the tower where it is installed.

This support is a universal type for all types of supports, both concrete and metal lattice.

IA 780 motor operated configuration provides horizontal installation.

For special fittings, please consult Iberica de Aparellajes.



Vertical stand

IA 780 MOTOR OPERATED

STRUCTURAL CHARACTERISTICS

Manual control

Besides being operated by remote control motor, the IA 780 motor operated can be maneuvered locally from the base. The manual control system comprises a manually operated knob to the base of the tower operated by lever with the possibility of being locked mechanically by padlock. The equipment and the control hand are physically connected by pipe 1".



The command base has 3 positions:

- OPEN and locked
- REMOTE and locked
- CLOSED and locked



CONTROL CABINET

Description

The control cabinet is stainless steel housing with front door opening to 180°, including fixation to prevent closures done by the wind.

Closure is performed in two lateral sides and top points of the central body; built in stainless steel the padlock allows hosting a normalized lock by the Company.

The cabinet has a level of protection IP45 according to UNE 20324. The connection of the control cabinet with cables of equipment has to be done with INDUSTRIAL connectors with high reliability, and fully tighten screwed and latched.



IA 780 MOTOR OPERATED

CONTROL CABINET

Components

Its design is primarily created to facilitate his maintenance. It has a hinged front where the main elements of control are located. The connections of the components are fully accessible thanks to an open frame. Inside the cabinet are housed the following components:

- Integrated controller with functions for measurement, control and signal management.
- Rectifier / charger biphas equipment with protected entry through thermal breaker with auxiliary contact. This provides energy to the control cabinet and the drive motor and manages the battery.
- Voltage converter: It supplies voltages 12/24 / 48Vdc to feed the various communications equipment.
- Configurable control terminals.
- Monolithic battery 12V 38Ah sealed PbGEL. It has a fuse protection against overcurrent. (*Other possibilities consult*)
- Relays opening / closing of high durability.
- GPRS modem communication / digital radio



All equipment in the cabinet are easily removable for repair / replacement. The battery has an industrial connector that allows quick replacement. The cabinet has a removable tray to install telecommunications equipment and allow proper configuration and maintenance.

Optional items

Can be added to the control cabinet the following modules:

- Surge arresters for DC circuits and AC.
- AC power up to 100W.
- Computer Communications (DIGITAL RADIO / ANALOGIC or GPRS ROUTER) + ANTENNA

IA 780 MOTOR OPERATED

CONTROL CABINET

Controller

The switch-disconnector controller incorporates the following functions:

- Status indication open, closed and locked.

- Current supply and motor control of the switch disconnector.

- Fault detection step.
 1. Presence detector of voltage.
 2. Sectionaliser Automation.
 3. Attracting measures of current and voltage line.
 4. Interphase connection with communications equipment RJ45 / RS232.

- Protocols: PID-1, IEC101, SAP20, GESTEL, DNP3, Procome (managed through RS232), IEC104 (managed via RJ45)



The controller can be configured locally or remotely via WEB page.

Sectionaliser Automation

The controller implements an option sectionaliser automatism that autonomously performs the motorized opening of the switch disconnector when programmed requirements are met.

In coordination with the reclosing cycle header, the switch-disconnector is able to distinguish the faults of the phase, with the homopolar faults, and thus signalized on indicators on the front cover, the sectionaliser automation and remote control.

The detection is always operational and linked to the following functions:

- Voltage detection: no line voltage caused by the opening of switch header on MV line.
- Current Senses: overcomming of current threshold (I_f , I_o) scheduled for a longer time set.

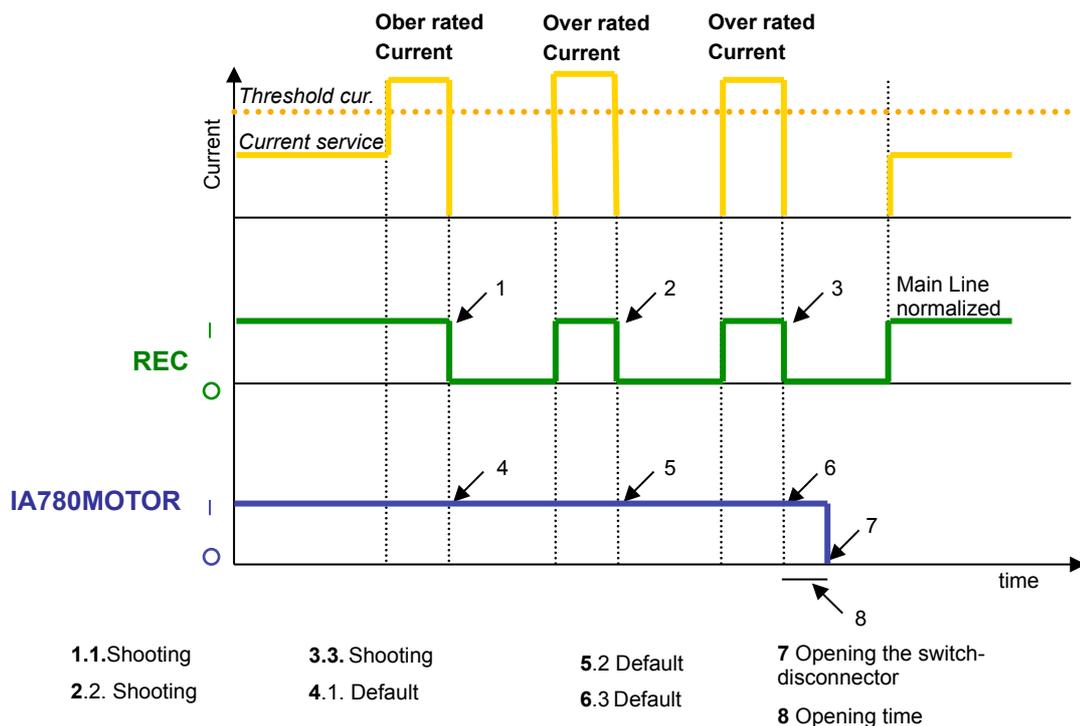
Detection signals fault passage is automatically disabled when resetting the line voltage, when normalizing current step or after a programmable time since activation.

IA 780 MOTOR

CONTROL CABINET

The sectionaliser operator allows to configure the following parameters:

- Enabling automatic disconnecter (locally or remotely).
- Number of missing steps and times for automatic opening.
- Release time to initial conditions of the automation.



Features of Integrated Protection and Control System

Automation:

- Automatic programming sequences.
- Programming conditions (crashes) command.

Reduces the possibility of error. Increased safety of operation.

Information management:

- Monitoring and analysis tools. Programming Console.
- Monitoring, reporting and graphing.

Self-monitoring:

- Real-time information on the internal state of the system. Maintenance.

Security:

- Possibility of redundant architectures.

Configuration:

- Programming tools. Downloading.

IA 780 MOTOR OPERATED

OTHER EQUIPMENT

Voltage transformer

Sometimes, the places for the installation of this equipment do not have a low voltage main power to supply the components of the control cabinet. In these cases it is necessary to have an auxiliary power supply: voltage transformer.



The voltage transformers or power supply have a dual function:

- Providing an auxiliary power supply to the control cabinet.
- Get signals of the presence or absence of voltage necessary for the proper performance of the switch-disconnector network function.

Other functions:

- Cycloaliphatic resin transformers.
- Transformers with metal casing in oil and porcelain insulators.

Voltage transformer Features:

Rated power: 300-500 VA

Rated voltage:	15kV	} 230Vac
	21kV	
Terminals silicone / porcelain	30kV	

Playing with metallized surface resin or metal casing and transformer oil.

Included transformer support.

Current transformers

Measurements of phase current and default are through 3 toroidal current transformers, one for each phase, placed on the equipment itself.



Current transformers Features:

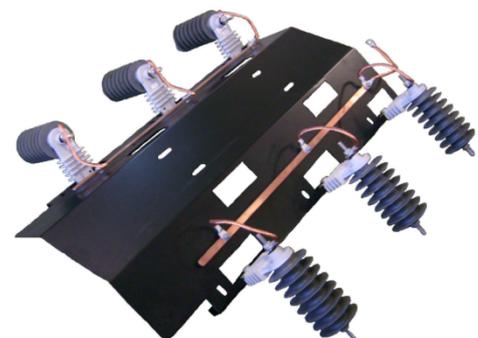
Transformation ratio 500/1

Rated power: 1VA

Class 2

Surge Arresters

There is the possibility of including a lightning rod set on the equipment. This item does not require assembly, as it is already built in factory ensuring a correct assembly. The set of 3 or 6 arrester is mounted on a support which is fixed to the equipment.



Joint Support + 6 lightning arrestors

IA 780 MOTOR OPERATED

ELECTRICAL CHARACTERISTICS

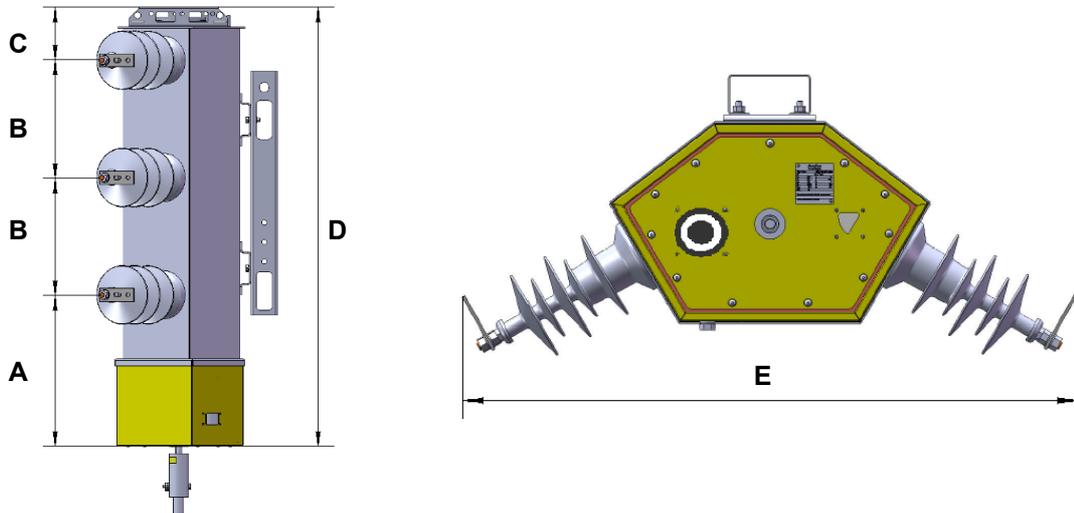
Table of electrical characteristics

RATED VOLTAGE	Ur	kV	24	36
RATED FREQUENCY	Fr	Hz	50	50
ISOLATION LEVEL			GROUND	ISOLATING
Impulse 1.2 / 50 us	Up	kVpk	125	145
Indus. power frequency 50 Hz 1min	Ud	kV	50	60
			GROUND	ISOLATING
			170	195
			70	80
RATED CURRENT	Go	A	400/630	400
Short time current	Ik	kA	05/12/16	12.5 / 16
Peak current	Ip	kApk	31.5 / 40	31.5 / 40
Time of short-circuit	tk	s	One	One
Rated mainly active load breaking current	I load	A	400/630	400
Rated closed-loop breaking current	I loop	A	400/630	400
Rated cable-charging breaking current	I cc	A	16	16
Rated line-charging breaking current	I 1c	A	1.5	1.5
Breaking current earth fault	I ef1	A	50	50
Breaking current when cable or line blank if earth fault	I EF2	A	16	16
Breaking current in short- circuit (5 latch)	I ma	kA	31.5 / 40	31.5 / 40
ALLOWABLE TEMPERATURE	T	°C	-25 / + 50	-25 / + 50
CLASS BY IEC 62271-103			M1E3 *	M1E3 *
CREEPAGE DISTANCE	LF	mm	(III) - 780 (IV) - 1055	1055

* Other values , please consult us

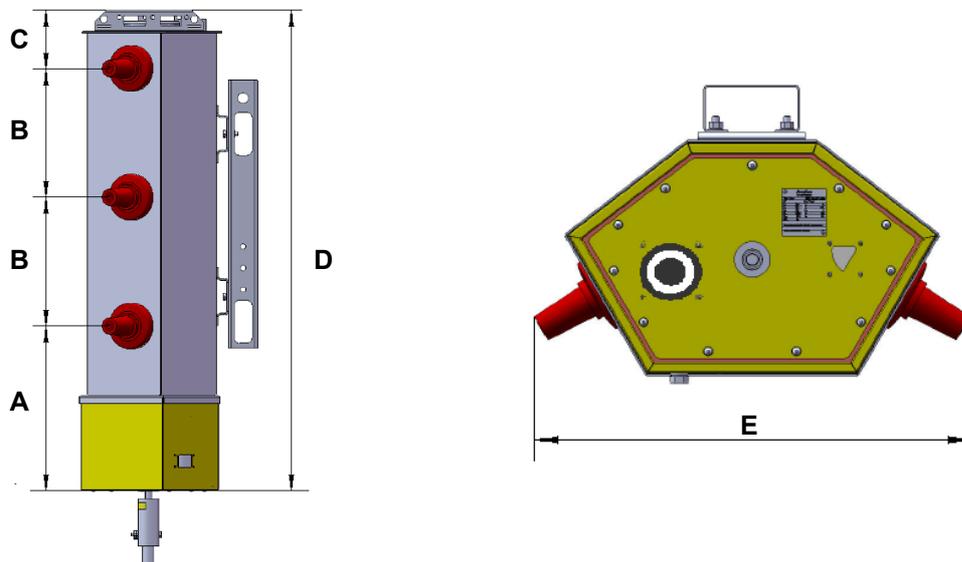
DIMENSIONS

SILICONE TERMINALS CONNECTIONS (*aerial connection*)



	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
IA780VTM / 24/400	460	360	163	1343	1202
IA780VTM / 36/400	647	360	346	1713	1306

BUSHING CONNECTIONS TYPE C (*plug-in terminals connection*)



	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
IA780VBM / 24/400	460	360	163	1343	731
IA780VBM / 36/400	647	227	346	1447	689

ORDERS

HOW TO ORDER?

Equipment IA780

IA 780	to	b	c	d	and	F	/	Ur	g	h	/	Go
--------	----	---	---	---	-----	---	---	----	---	---	---	----

Rated current
A 400/630 (12/24 kV)
400 A (36 kV)

0: without gauge.
-: with manometer

Rated short time current 1 s. (Ith)
A= 12'5kA
B= 16kA
C= 20kA

Rated voltage (12/24 / 36kV)

X: Equipment specially adapted to high pollution environments (AISI-316)
If normal environment do not include this index

S: With interlocking (only for control by rod). Interlocking included in the other models.

B: Override IA74 for driving control devices in horizontal mounting (Does not apply for the IA 780 motor operated configuration)

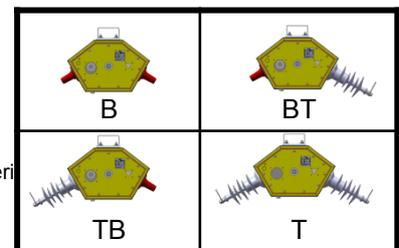
M: Drive by 48Vdc electric motor and remote control. Consult Iberica de Aparellajes for other power supplies.

0: No drive by motor (manual only). Consult Iberica de Aparellajes to know features of this model.

B: Switch disconnecter with bushing type C
T: Switch disconnecter with silicon terminals
BT: Bushing type C and silicon terminals
TB: Silicon terminals and bushing type C

H: Horizontal mounting and pole vault command (consult Iberica de Aparellajes)

V: Vertical mounting and rotating mechanical control



Example:

IA780VTBM / 24C0 / 630

Vertical switch disconnecter with silicon terminals and bushing type C, with auxiliary drive with motor and remote control. Rated voltage of 24kV, Ith = 20 kA without gauge incorporated and rated current of 630 A.

ACCESSORIES

- Surge arresters: **IA780SPDV + 6 pcs. 214 217 / CVBC**
- Voltage transformer: **IA780-TT / 15-22KV** for lines 15-22KV
IA780-TT / 31KV for 30KV lines
- Intermediate insulator: **IA74 / 9**
- Intermediate support: **IA74 / 10**
- Extending drive tube: **TUBE 1 "/ 5M**
- Union tube: **IA74 / 14**

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