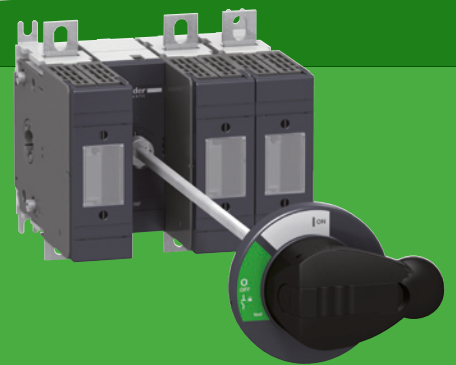




Fupact



Catalogue 2018
Fusegear range from 32 to 1250 A



schneider-electric.com

Life Is On

Schneider
Electric



Green Premium™

Endorsing eco-friendly products in the industry



Green Premium™ Product

Green Premium is the only label that allows you to effectively develop and promote an environmental policy whilst preserving your business efficiency. This ecolabel guarantees compliance with up-to-date environmental regulations, but it does more than this.

Over 75% of Schneider Electric manufactured products have been awarded the Green Premium ecolabel



Discover what we mean by green ...

Check your products!

Schneider Electric's Green Premium ecolabel is committed to offering transparency, by disclosing extensive and reliable information related to the environmental impact of its products:

RoHS

Schneider Electric products are subject to RoHS requirements at a worldwide level, even for the many products that are not required to comply with the terms of the regulation. Compliance certificates are available for products that fulfil the criteria of this European initiative, which aims to eliminate hazardous substances.

REACH

Schneider Electric applies the strict REACH regulation on its products at a worldwide level, and discloses extensive information concerning the presence of SVHC (Substances of Very High Concern) in all of its products.

PEP: Product Environmental Profile

Schneider Electric publishes complete set of environmental data, including carbon footprint and energy consumption data for each of the lifecycle phases on all of its products, in compliance with the ISO 14025 PEP ecopassport program. PEP is especially useful for monitoring, controlling, saving energy, and/or reducing carbon emissions.

EoLI: End of Life Instructions

Available at the click of a button, these instructions provide:

- Recyclability rates for Schneider Electric products.
- Guidance to mitigate personnel hazards during the dismantling of products and before recycling operations.
- Parts identification for recycling or for selective treatment, to mitigate environmental hazards/ incompatibility with standard recycling processes.

Life Is On



An alternative approach to electrical protection



The essentials of electrical protection

Schneider Electric is committed to bringing you the most flexible and comprehensive fuse device offer on the market. We bring you essential functions combined with advanced features such as measurement and turnable hooks to deliver a “best in class” solution that guarantees electrical protection for your industrial applications with single and double breaking switch fuses.

Fuse devices are designed to perform the three essential functions of electrical protection:

- Switch function for circuit on-load control
- Fuse function against short-circuits and overloads
- Isolation from the power circuit.

A complete solution

Schneider Electric offers complete electrical protection for distribution systems including fuse devices that fully integrate in Schneider’s functional and universal enclosures (Prisma P and G, Prisma iPM), and busbar trunking systems (Canalis KSA, KSB)

Simple and flexible

- Easy to install and flexible in terms of footprint, cable connections, and product position. Includes mounting plates or can be mounted directly onto busbars or DIN rail.
- Easy to operate and simple to maintain

Designed for safety

Interlocking to prevent access to fuses when the switch is in closed position, high IP and IK level

Fully compatible

Fusegear solutions have been designed to be used with all fuse-links and complying with standard:

- IEC 60269-1 and -2

Fully certified

Fuse offer complies with international standards, certifications and markings:

- IEC 60947-1 and -3
- CCC certificates
- EAC certificates



Fupact ISFL
160 to 1250 A



Fupact ISFT
100 to 630 A

Single breaking offer: Fuse switch disconnectors

Functions:

- Short-circuit and overload protection
- Isolation
- On-load switching of circuits



- High level of reliability against short-circuits
- High flexibility on busbar systems thanks to its turnable hooks
- Opening and closing operations are dependent on the operator’s action

Components that work great together by design

All Schneider Electric components, from electrical devices and busbars, to splitter blocks and switchboards, work together for optimal performance. Their electrical and mechanical functions and communications features integrate seamlessly.

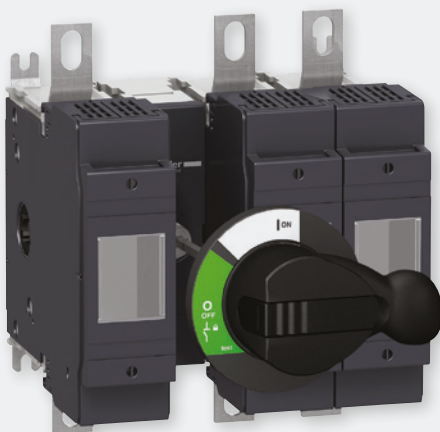
Our range of fuse devices ensure:

- People and property safe are protected
- Energy quality and availability
- Performance and high uptime
- Easy operation, thanks to standard operating process and simple maintenance.

Combine efficiency and intelligent control thanks to the fuse monitor

Available for the complete Fupact ranges, the fuse monitor is more than just an accessory. Its protection and monitoring functions makes it indispensable:

- A common monitoring solution for the complete range
- Automatic reset of the fuse monitor once blown fuse is replaced
- Auxiliary contacts for different functions: alarm, tripping of a remote device
- No need for striker fuses, leading to a significant cost reduction



Fupact INF
32 to 800 A

Double breaking offer: Switch disconnecter fuses

Functions:

- Short-circuit and overload protection
- Isolation
- On-load switching of circuits



- High level of safety thanks to upstream and downstream double breaking
- Fast opening and closing
- Opening and closing operations occur independently of the operator's action



SINGLE BREAKING FUSE SOLUTIONS
FUPACT ISFT - FUSE SWITCH DISCONNECTORS

Fupact ISFT devices are evolving!

The new Fupact ISFT generation helps you remain competitive in today's market. Its new features offer more flexibility in terms of mounting and cabling. ISFT also has the smallest product of the market at just 53 mm width for NH 000 fuse-links (100A).

Fuse switch disconnectors can be mounted and fixed effortlessly!

- **Less stock:** new ISFT range includes turnable hooks to enable downstream or upstream distribution with the same product.
- **Save time:** less assembling steps. The product can be fixed very quickly for a faster mounting.
- **More safety:** the product offers optimized user protection against arc flash.



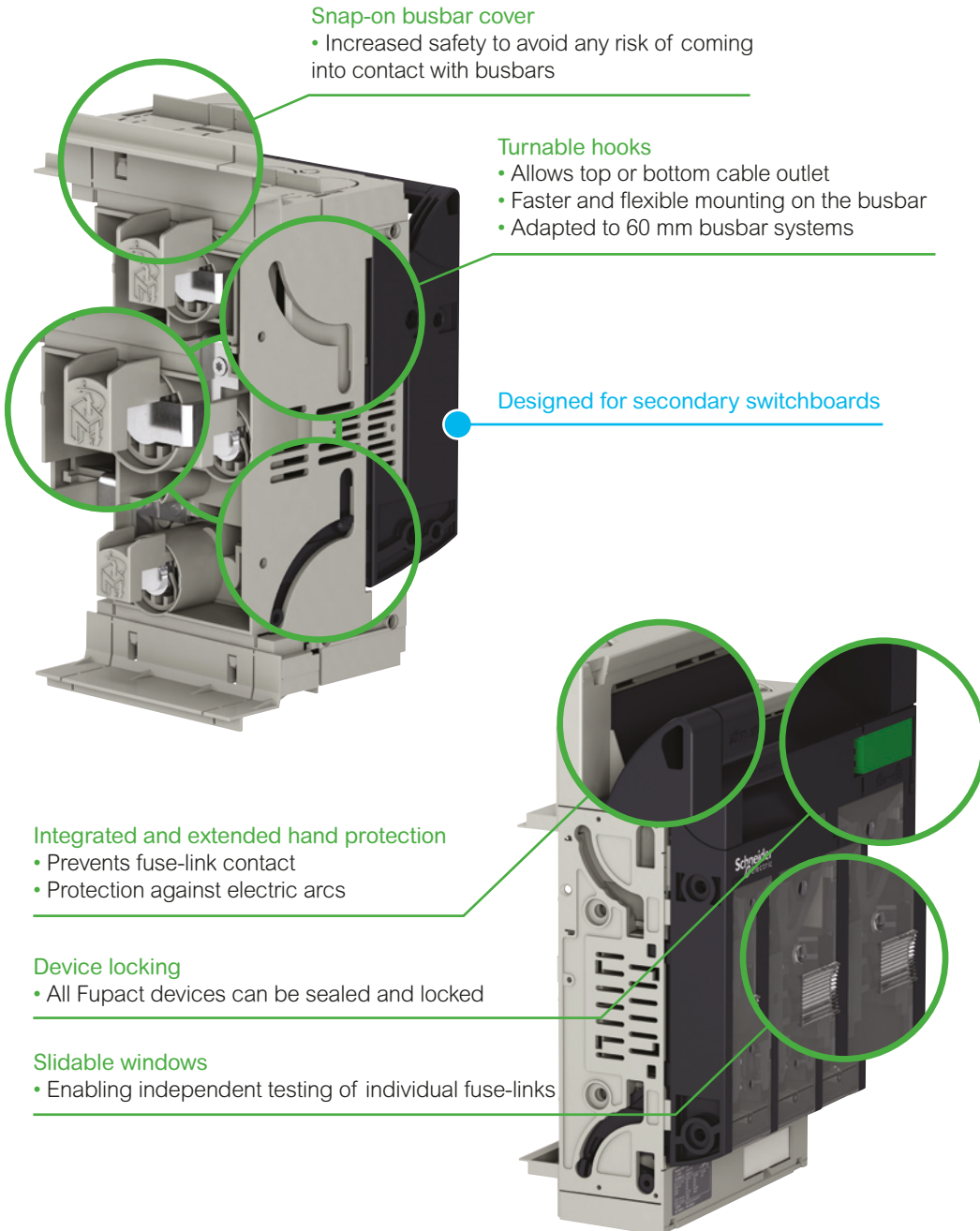
The smallest product of the market
 ISFT 100N (100A)



Less space needed
 (53 mm width instead of standardized 106 mm)

Fupact ISFT and ISFL combine efficiency and intelligent control and reduce costs:

- The fuse monitor ensures:
- Precise location and fast correction of short-circuit and overload faults
 - No need of striker-type fuses
 - Auxiliary contacts for different functions: alarm, tripping of a remote device, etc.
 - Automatic reset of the fuse monitor after blown fuse is replaced



Snap-on busbar cover
 • Increased safety to avoid any risk of coming into contact with busbars

Turnable hooks
 • Allows top or bottom cable outlet
 • Faster and flexible mounting on the busbar
 • Adapted to 60 mm busbar systems

Designed for secondary switchboards

Integrated and extended hand protection
 • Prevents fuse-link contact
 • Protection against electric arcs

Device locking
 • All Fupact devices can be sealed and locked

Slidable windows
 • Enabling independent testing of individual fuse-links

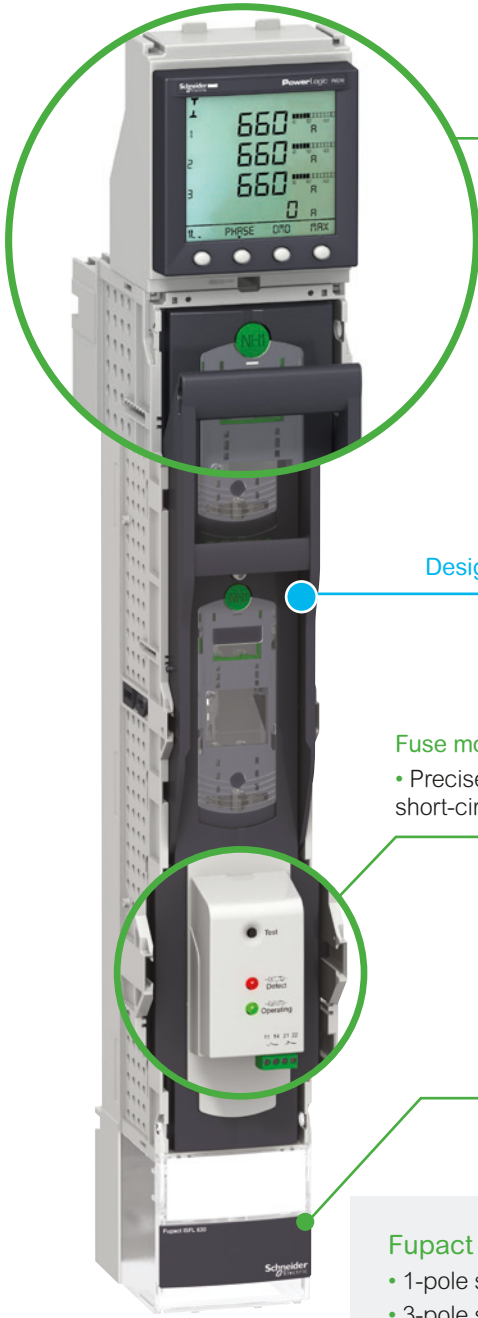


SINGLE BREAKING FUSE SOLUTIONS
FUPACT ISFL - FUSE SWITCH DISCONNECTORS

More flexibility with Fupact ISFL

Fupact ISFL is one of the most efficient vertical fuse switch disconnectors ever designed with compact form and a modular system.

Thanks to its size, Fupact ISFL doesn't require extra space for current transformer installation. Its interface is standardized for all types of measurement devices.



Measuring device

- Energy consumption control is feasible by the easy installation of a measuring device

Easy to hook

- Turnable contact hooks available for ISFL 160 A 3-pole (60 mm busbars)
- Fast mounting with reduced manual operations
- Adapted to all busbar systems: 60/100/185 mm, present in main switchboards

Designed for main switchboards

Fuse monitor

- Precise location and fast correction of short-circuit and overload faults

- Fast connection with variable box terminals

Fupact ISFL is available in two different versions

- 1-pole switchable dedicated to 185mm busbars
- 3-pole switchable available for 60/100/185 mm busbars

Same length and depth for size 00 (160A) to size 3 (630A)



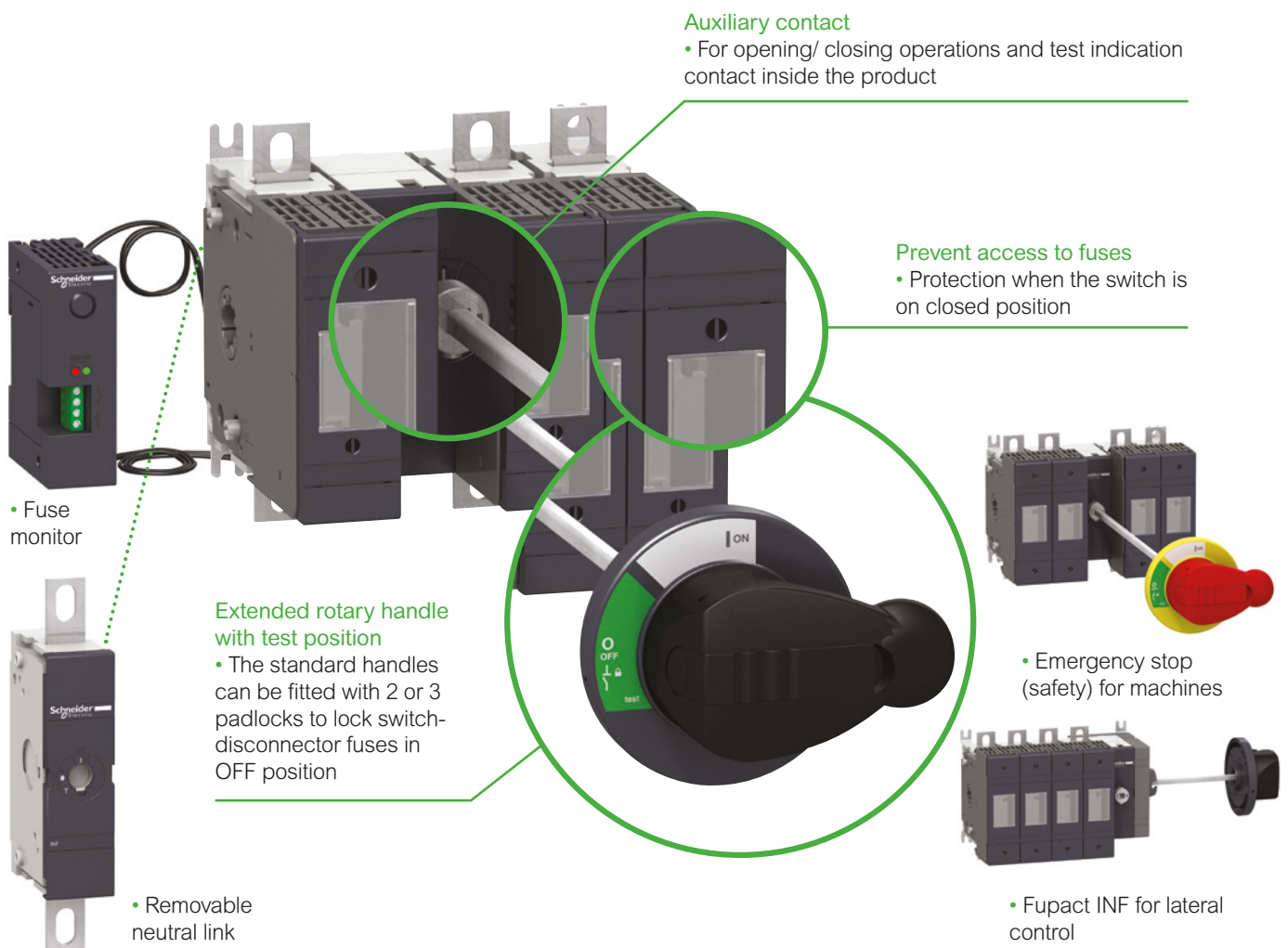


DOUBLE BREAKING FUSE SOLUTIONS
FUPACT INF - SWITCH DISCONNECTOR FUSES

High performance ensured with Fupact INF

Fupact INF offer provides reliable protection for personnel thanks to its double isolation, upstream and downstream when switch is open.

It also ensures high system availability in buildings, infrastructure and even in industrial plants. It is compatible with fuse-links BS, NFC and NH.



Ensure your power distribution with Fupact INF

- Distribution switchboards.
- Disconnection, isolation, locking and primary control of incoming circuits.
- Categories AC21/AC22 for electrical distribution, AC23 for motor feeders.

+ Power and control your industrial motors with Fupact INF

- Motor starters: DOL, Star-Delta, softstarters.
- Variable speed starters with frequency converters.
- Machine types: HVAC units, industrial cranes, hoists.
- Industries: paper, steel, ports, automotive, power, mining, rail, oil & gas.

A complete fuse-link offer

Schneider Electric provides a fuse-link offer with NH fuses to ensure a complete solution for our customers.

All fuse-links are provided under 500V and 690V, from 25A to 800A.

We offer fuse-links with different curves, available with and without strikers:



- Fuse-links type aM

Ensure the protection of equipment with current peaks like motor applications.



- Fuse-links type gG

Offers protection of circuits without significant electrical distribution current peaks.

Most of fuse-links are delivered without strikers because Fupact offer includes Fuse monitor devices which offer significant cost reductions.

Functional installation

in Prisma product range

Easy implementation

Fupact fusegear can be installed on mounting plates or mounted directly on the busbar from 60 to 185 mm.

Installation is made easy by special components for each type of mounting and clear instructions in accordance with standard working practices.

Multiple combinaisons in switchboard

Fupact ISFL devices can be installed in the same rows with all the different ratings.

Same accessories are existing to have the same lenght and new products have been developed to have same lenght and deph.

Depending on the rating, 6 to 9 devices can be installed per row.



Simplified distribution in switchboard

Fupact ISFT100 and 160 can be supplied via feeding busbars connected to the main busbars.

All Fupact ISFT range (except 630 A rating) could be supplied directly by busbars with connection by hook-on.

Full functional-unit performance

For INF, ISFT and ISFL fusegear, a complete set of mounting plates, front plates and prefabricated connection accessories offer all the advantages of the Prisma installation in terms of safety and ease of installation.

General contents

Fupact

Presentation

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Functions and characteristics

A

Installation recommendations

B

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C

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D

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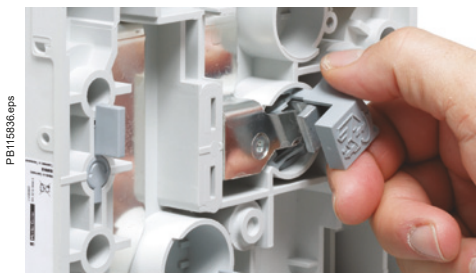
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General description of Fupact fusegear

2



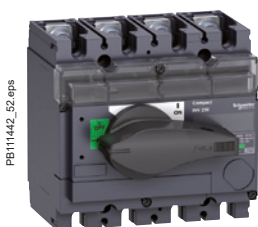
ISF● fuse-switch disconnectors.



ISFT with turnable hooks.



INF● switch-disconnector fuses.



INS switch-disconnectors.



Fuse-link.

Fupact ISF● (ISFT and ISFL)

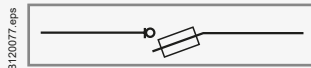
ISFT horizontal fuse-switch disconnectors and ISFL vertical fuse-switch disconnectors have the following functions:

- on-load switching of circuits. The speed and force of the operation of this type of fusegear are dependent on the action of the operator
- the fuse-link blades form the moving contacts of the switch
- the fuse-links are mounted in a fuse-carrier assembly
- via the handle, the fuse-carriers operate the main moving contacts
- isolation when the fuse-carrier assembly is in the open position (OFF)
- protection against short-circuits and overloads on distribution circuits.

This function is provided by DIN blade-type industrial fuse-links (NH).

- possibility for ISFL vertical fuse-switch disconnectors to have a 1-pole or 3-pole variant.

- Turnable contact hooks which is advantage in terms of installation. Possibility to have an upstream or downstream distribution with the same product.



ISF● fuse-switch disconnectors

Fupact INF● (INFC, INFD and INFB)

INF● switch-disconnector fuses provide the following functions:

- on-load switching of circuits. The speed and force of the operation of this type of fusegear are independent of the action of the operator (fast opening and closing)
- isolation with positive contact indication when the switch is in the open position (OFF). The fuse-link is completely isolated from the power circuit (double breaking technology)
- protection against short-circuits and overloads on distribution circuits.

This function is provided by industrial fuse-links (NFC, DIN, BS) used in conjunction with the switch-disconnector fuse device

- safety or emergency stop (red/yellow rotary handle option).

Fupact operating modes

The Fupact range integrates control, isolation and fuse-carrier functions in a single device.

These functions can also be implemented by combining separate components.



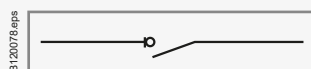
INF● switch-disconnector fuses

Solutions combining separate components

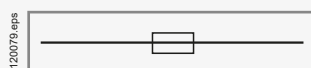
It is also possible to protect distribution circuits and/or motors by combining switch-disconnectors with fuse-links mounted on separate fuse-carriers.

The functions provided by each component are:

- on-load switching of circuits (opening and closing) and isolation (switch-disconnector)
- protection against overloads and short-circuits (fuse).
- The combination can implement Compact INS or INV switch-disconnectors from 40 to 2500 A.



Control.



Protection.

General description of Fupact fusegear

Compliance with standards

Fupact fusegear complies with international standards and recommendations:

- IEC 60947-1: general rules
- IEC 60947-3: switches, disconnectors
- IEC 60947-5.1 and following: control-circuit devices and switching elements; automatic control components.

These standards and recommendations are applied in most countries.

Fupact fusegear and auxiliaries comply with International standards (IEC 60947-1 and IEC 60947-3).

Fupact INF● and Fupact ISF● are designed for use with industrial fuse-links complying with the following standards:

- IEC 60269
- BS 88 (only for Fupact INF●)
- DIN 43620 / VDE 0636.

Fupact INF● switch-disconnector fuses are suitable for the control of machine-tools:

- they comply with the requirements of the new machine directive IEC 60204 (EN 60204)
- they comply with French standard NF C 79-130 and the recommendations issued by the CNOMO organisation.

Climatic environment

Fupact fusegear meets climatic requirements as defined in the following standards:

- IEC 60068-2-30: damp-heat tests under off-load conditions, 95 % relative humidity at 55 °C (hot and humid climate conditions)
 - IEC 60068-2-52: salt-mist tests, KB severity 2 tests
 - IEC 60068-2-56: damp-heat tests under on-load conditions for 48 hours, environment category C2 following Schneider quality specifications.
- The fusegear can therefore be used in all climates.

Degree of pollution

Fupact fusegear is certified for operation in pollution-degree 3 environments as defined by IEC 60947 standard applying to industrial environments.

Ambient temperature

The Fupact range can be used between -25 °C and +70 °C. Above 40 °C, you will have to take account of the derating indicated in the documentation.

The devices must be commissioned at the ambient temperature indicated above. Exceptionally, they can be commissioned at an ambient temperature of between -35 °C and +70 °C.

The Fupact range must be stored in its original packaging at a temperature of between -50 °C and +85 °C.

Degree of protection

For Fupact fusegear with terminal shield, the degree of protection against direct contact complies with standard IEC 60529 (IP index of protection) and IEC 62262:

- with direct rotary handle: IP20/IK07
- with extended rotary handle (Fupact INF): IP65/IK10.

Positive contact indication

IEC 60947-3 standard defines isolation with positive contact indication as follows:

- the isolation position corresponds to the O (OFF) position
- the operating handle cannot indicate the OFF position unless the main contacts are not totally opened
- locking in the OFF position is not possible unless the main contacts are actually open.

INF● switch-disconnector fuses are suitable for isolation with positive contact indication.

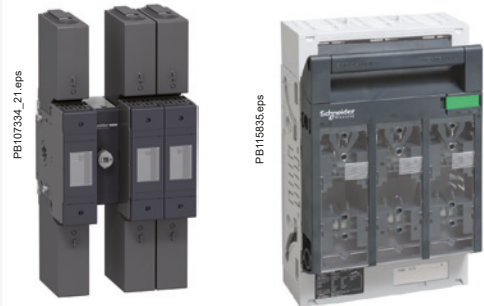
Installation of an extended handle on INF● fusegear does not alter the suitability for isolation.

The isolation with positive contact indication function is certified by tests guaranteeing:

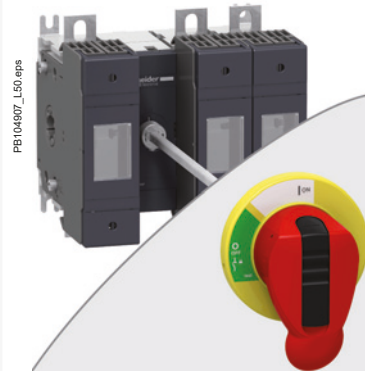
- the mechanical reliability of the position-indication system
- the absence of leakage currents
- overvoltage withstand capacity between upstream and downstream connections.

Fupact ISFT160			Ith 160A 40°C
Ui 1000V	Uimp 8kV		
IEC 60947-3			50/60 Hz
Ue (V) / Ie (A)	AC21B	AC22B	AC23B
380/415V	160	160	-
500V	160	160	-
690V	160	-	-
	DC21B	DC22B	
220V / nb pole	160/3	160/3	-
440V / nb pole	125/3	-	-
Max(A) 160		Max(W) 12	
HD 60269-2		DIN 43620-1	

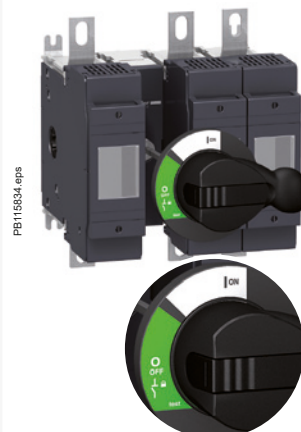
ISFT label.



Fusegear with terminal shields. **IP20 and IK07.**



Fusegear in an enclosure or cabinet (extended handle); **INF● only. IP65 and IK10.**



Positive contact indication.

A

D



ISFT100N



ISFT100



ISFT160



ISFT250
ISFT400
ISFT630

Fupact ISFT

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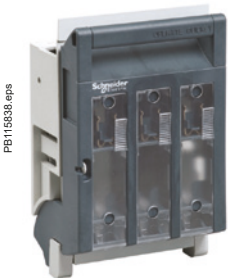
Fuse switch-disconnector selection

Fupact ISFT100N to ISFT630

A



ISFT100N.



ISFT100.



ISFT160.



ISFT250-400-630.

Fuse switch-disconnectors

Number of poles / type of fuse-link IEC 60269-2-1 Section 1

Electrical characteristics as defined by IEC 60947-1 / IEC 60947-3

Conventional thermal current (A)	In free air	I_{th}	at 40 °C
	Maximum fuse power dissipation (W)		
	In enclosure	I_{the}	at 40 °C
Maximum fuse power dissipation (W)			

Rated insulation voltage (V) **U_i** AC 50/60 Hz / DC

Rated impulse withstand voltage (kV) **U_{imp}**

Rated operational voltage (V) **U_e** AC 50/60 Hz
DC

Rated operational voltage AC20 and DC20 (V) **U_e**

Rated operational current (A) **I_e** AC 50/60 Hz

220/240 V

380/415 V

440/480 V ^[1]

500 V

660/690 V

DC/poles in series

220 V /no. of poles

440 V /no. of poles

Rated duties Uninterrupted duty

Rated short-circuit breaking capacity (kA rms)/Rated short-circuit making capacity (kA peak)/Fuse-link In (A) ^[2]	I_{cn}/I_{cm}/I_n	415 V
		500 V
		690 V

Endurance (category B) (CO cycles) Mechanical

Electrical AC AC22B 415 V

AC23B 415 V

AC22B 500V

AC21B 500V

AC22B 690V

AC21B 690 V

Suitability for isolation

Positive contact indication

Pollution degree

Control

Direct front rotary handle (operator-dependent opening and closing)

Locking	Padlocks
	Lead seal

Indication auxiliaries

Auxiliary contacts

Fuse monitor

Installation and connection accessories

Possible mounting positions	Horizontal
	Vertical

Bare cable connectors

Other connectors	For bare Cu/Al cables
	For flexible bars

Distribution connectors

Lugs for copper cables

Incoming connector for feeding busbars

Terminal shields

Dimensions and weight

Overall dimensions H x W x D (mm) 3P

Approximate weight without fuse-links (kg) 3P

[1] Suitable for 480 V NEMA.

[2] Fuse-switch disconnectors with fuse-links.

[3] AC23B 160A

[4] AC23B 250 A.

[5] AC23B 400 A.

[6] AC23B 630 A.

Note: Connecting two NS-fuse switches reduces the utilization category to AC22B to 80 kA.

Fuse switch-disconnector selection

Fupact ISFT100N to ISFT630



ISFT100N		ISFT100		ISFT160		ISFT250		ISFT400		ISFT630	
3P/DIN (NH)		3P/DIN (NH)		3P/DIN (NH)		3P/DIN (NH)		3P/DIN (NH)		3P/DIN (NH)	
100		100		160		250		400		630	
9		9		12		23		34		48	
100		100		160		250		400		630	
9		9		12		23		34		48	
1000		800		1000		1000		1000		1000	
6		6		8		8		8		8	
690		690		690		690		690		690	
440		440		440		440		440		440	
800		800		800		800		800		800	
AC21B	AC22B	AC21B	AC22B	AC21B	AC22B	AC21B	AC22B	AC21B	AC22B	AC21B	AC22B
100	100	100	100	160	160 ^[3]	250	250 ^[4]	400	400 ^[5]	630	630 ^[6]
100	100	100	100	160	160 ^[3]	250	250 ^[4]	400	400 ^[5]	630	630 ^[6]
100	100	100	-	160	160	250	250	400	400	630	630
100	100	100	-	160	160	250	250	400	400	630	630
100	-	100	-	160	-	250	250	400	400	630	630
DC21B	DC22B	DC21B	DC22B	DC21B	DC22B	DC21B	DC22B	DC21B	DC22B	DC21B	DC22B
100/3	100/3	100/3	-	160/3	160/3	250/3	250/3	400/3	400/3	630/3	630/3
100/3	100/3	100/3	-	125/3	-	250/3	-	400/3	-	630/3	-
80/5.1kA peak/100 A		80/ 3 kA /100 A		80/ 5 kA peak /160 A		80/ 15 kA peak /250 A		80/ 22.1 kA peak /400A		80/ 25.2 kA peak /630 A	
80/5.1kA peak/100 A		50/ 3 kA /100 A		80/ 5 kA peak /160 A		80/ 15 kA peak /250 A		80/ 22.1 kA peak /400A		80/ 25.2 kA peak /630 A	
80/5.1kA peak/100 A		50/ 3 kA / 100 A		80/ 5 kA peak /160 A		80/ 15 kA peak /250 A		50/ 22.1 kA peak /400A		80/ 25.2 kA peak /630 A	
2000		2000		1600		1600		1000		1000	
300		300		200		200		200		200	
300		-		200		200		200		200	
300		-		200		200		200		200	
-		300		-		-		-		-	
-		-		-		200		200		-	
300		300		200		200		200		200	
3		3		3		3		3		3	

Fuse switch-disconnector selection

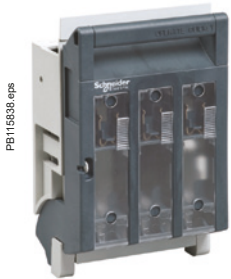
Fupact ISFT100N to ISFT630

A



PE115837.eps

ISFT100N.



PE115838.eps

ISFT100.



PE115839.eps

ISFT160.



PE115835.eps

ISFT630.

Fuse switch-disconnectors

Type of fuse-link

- DIN/NH00
- DIN/NH00
- DIN/NH1
- DIN/NH2
- DIN/NH3

Installation and connection

- Symmetrical rail
- Direct connection on backplate
- Hook-on connection to 60 mm busbars
- Tightening torque (Nm)

Temperature derating (with gG fuse-link) ^{[1][2]}

"Vertical mounting" fuse-links in vertical position	Ith (A)	40 °C
		45 °C
		50 °C
		55 °C
		60 °C
		65 °C
		70 °C
"Horizontal mounting" fuse-links in horizontal position	Ith (A)	40 °C
		45 °C
		50 °C
		55 °C
		60 °C
		65 °C
		70 °C
Degree of protection (from the front face and inclosed position)		IP3X
Mechanical shock		IK07

[1] Derating data is based on:

- the maximum rating for fuse-links intended for the device,
- maximum power dissipation.

[2] For installation on a ceiling, derate an additional 10 %.

Note: Connecting two NS-fuse switches reduces the utilization category to AC22B to 80 kA.

Functions and characteristics

Fuse switch-disconnector selection

Fupact ISFT100N to ISFT630

	ISFT100N	ISFT100	ISFT160	ISFT250	ISFT400	ISFT630
	○	○	-	-	-	-
	-	-	○	-	-	-
	-	-	-	○	-	-
	-	-	-	-	○	-
	-	-	-	-	-	○
	○	○	-	-	-	-
	○	○	○	○	○	○
	○	-	○	○	○	-
	see page B-4					
	100	100	160	250	400	630
	95	95	152	238	380	599
	90	90	144	225	360	567
	85	85	136	213	340	536
	80	80	128	200	320	504
	75	75	120	188	300	473
	70	70	112	175	280	441
	100	100	160	250	400	630
	95	95	152	238	380	599
	90	90	144	225	360	567
	85	85	136	213	340	536
	80	80	128	200	320	504
	75	75	120	188	300	473
	70	70	112	175	280	441
	○	○	○	○	○	○
	○	○	○	○	○	○



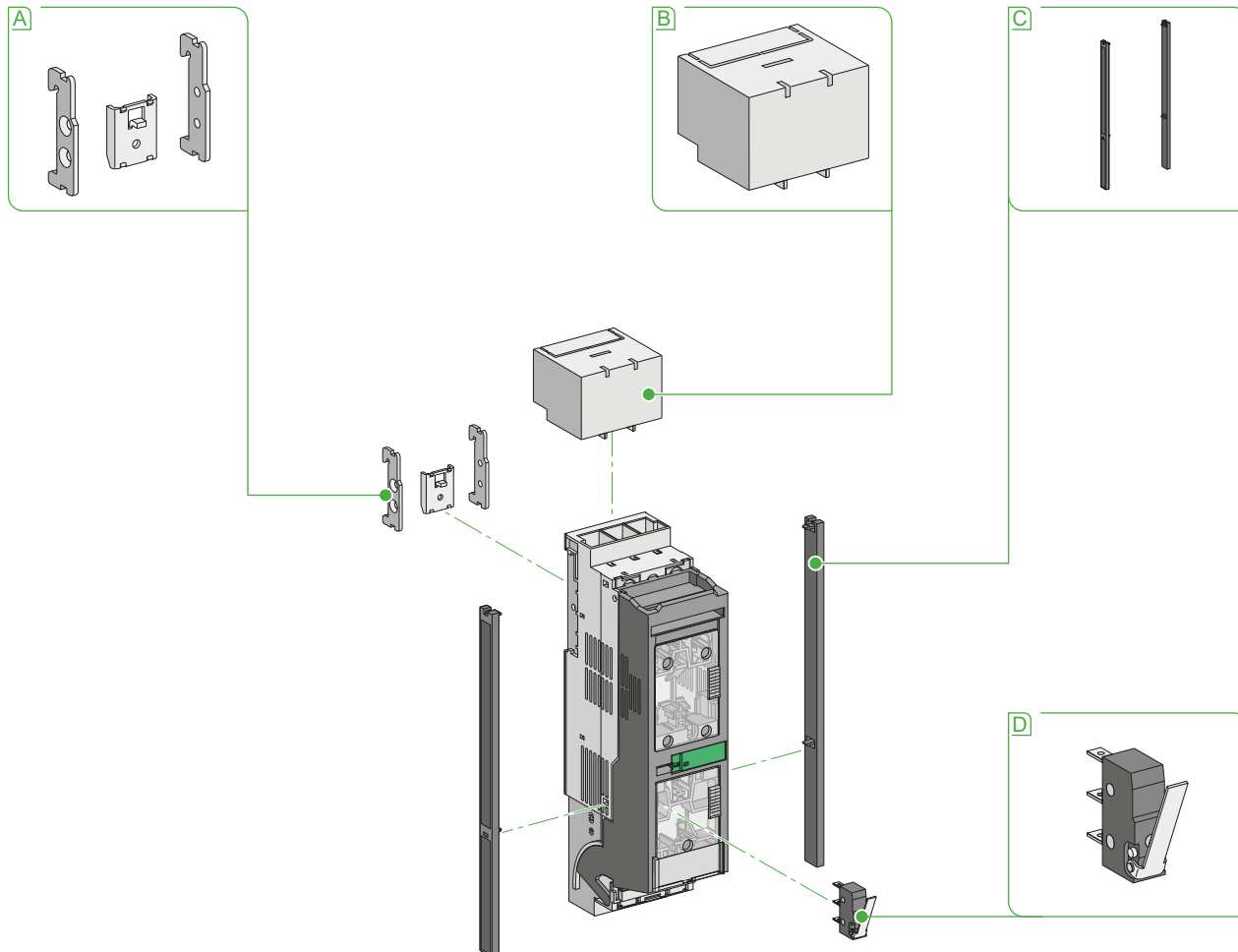
Accessories and auxiliaries

Fupact ISFT100N

Fupact ISFT100N

DB40852.ai

A



A DIN rail fixing kit

B Terminal cover

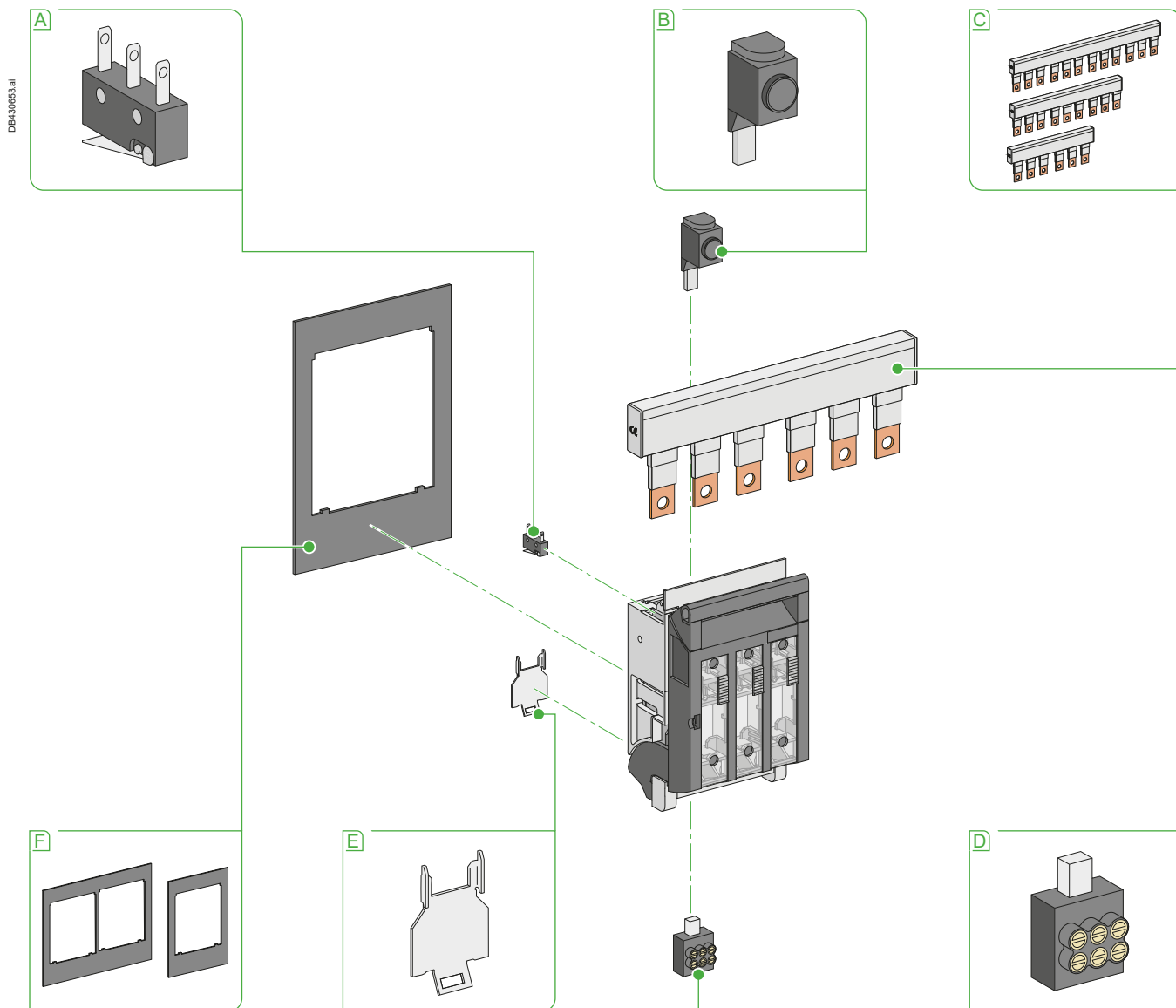
C Laterally attachable support profile

D NO + NC auxiliary changeover contacts

Functions and characteristics

Accessories and auxiliaries

Fupact ISFT100



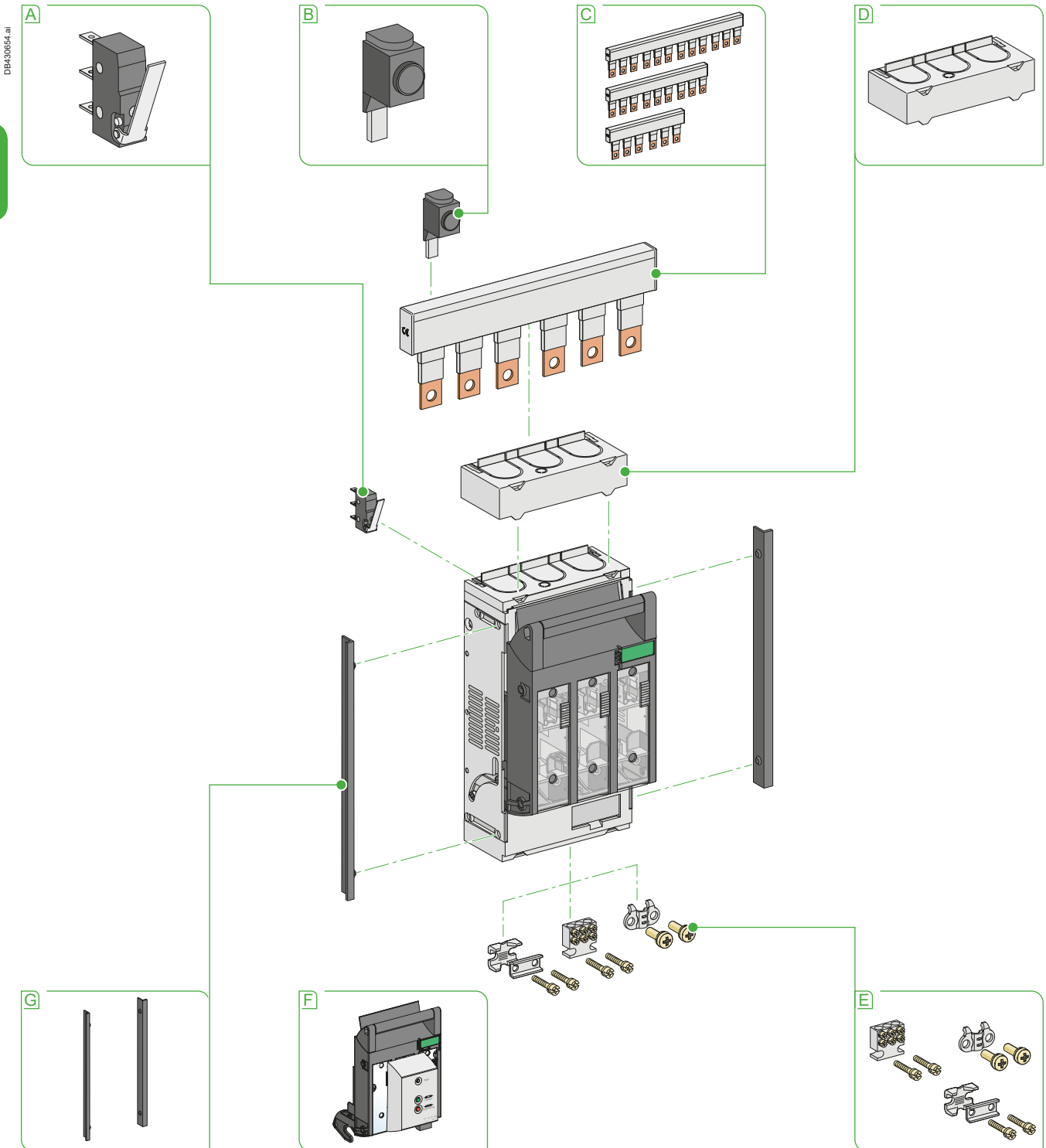
- A** NO + NC auxiliary changeover contacts
- B** Incoming connector for feeding busbars

- C** Feeding busbars to supply :
 - 2 devices
 - 3 devices
 - 4 devices
- D** Distribution connector

- E** Accessory for mounting on DIN rail
- F** Escutcheons for:
 - 1 device
 - 2 devices

Accessories and auxiliaries

Fupact ISFT160



- A** NO + NC auxiliary changeover contacts
- B** Incoming connector for feeding busbars
- C** Feeding busbars to supply :
 - 2 devices
 - 3 devices
 - 4 devices

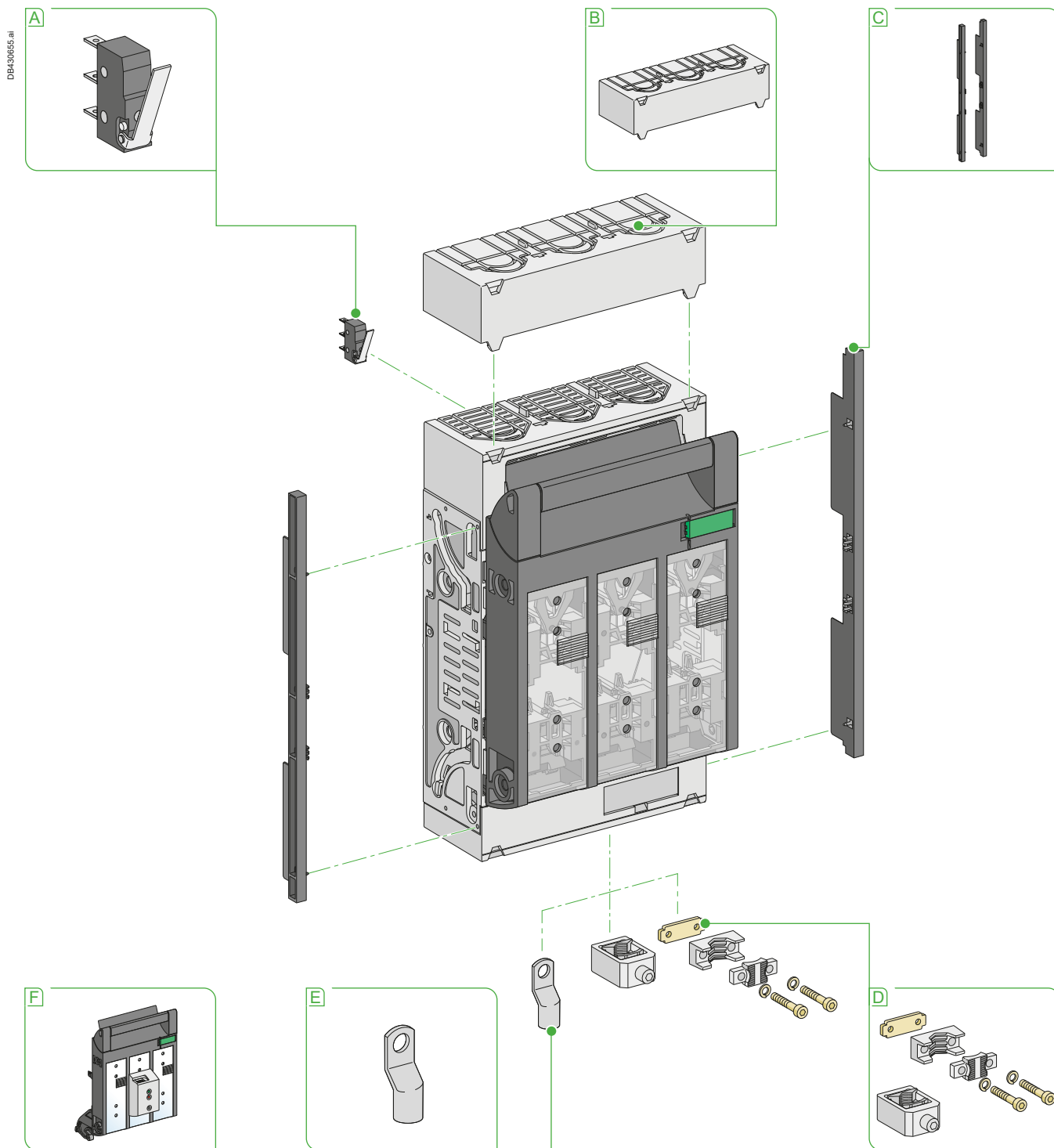
- E** Connectors for :
 - bare cable
 - distribution
 - flexible bar
- F** Fuse monitor
- G** Laterally attachable support profile

D Long terminal shield

Functions and characteristics

Accessories and auxiliaries

Fupact ISFT250 to ISFT630



- A** NO + NC auxiliary changeover contacts
- B** Long terminal shield
- C** Laterally attachable support profile

- D** Connectors for bare cable
- E** Lug for copper cable
- F** Fuse monitor

General characteristics: ISFT

Fupact ISFT100N to ISFT630

A

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PB115837.eps



PB117723_L54.eps



PB115845.eps



Presentation

With this new Fupact ISFT generation, customers will have a range of are provided with a range of devices that will help them remain competitive in the face of ever tougher market requirements. After all, modern approaches to power distribution demand modular switchgear that is simple to install and safe and reliable in operation. A cost-benefit ratio in line with the market and ease of service are absolute musts.

Fupact ISFT offers innovative solutions

On the new Fupact ISFT models for mounting on base plates and for bus mounting, the entire covers can be easily removed while the switching cover is closed, thus eliminating the need for elaborate trim frames and extensions.

Integrated hand protection and a sliding viewing window enable voltage tests to be conducted on contact blades or strap handles.

Besides reliable connection are provided such as cable lug or clamp connector for copper and aluminum conductors. It has the dual advantage of reducing the connection installation time and eliminating the need for cable lugs.

All Fupact ISFT can be sealed and fitted with a locking mechanism.

Another unique feature is the patented system of turnable hooks for converting the outgoing arrangement from top to bottom and vice versa. A few simple adjustments are all that is needed.

The fuse-switch-disconnectors can be attached, positioned and tightened effortlessly.

Smallest 100 A solution on market: ISFT100N

Fupact ISFT has two possibilities to propose a 100 A rating.

- The basic one (without conversion on busbar system) which has a width of 106 mm.

- The narrow product which is the smallest 100 A solution on the market (connection on busbar system possible) with a width of 53 mm.

Objectives of this product is to reduced installation space and to propose two 100 A (106 mm width) replace one 160 A product (106 mm width also).

Fupact ISFT for mounting on base plates

The disconnectors for mounting on base plates, sizes 000, 00, 1, 2 and 3, come with a number of predrilled fastening holes that allow these models to be used on base plates or on profiles. With the appropriate accessories, the sizes 000 and 00 can be mounted on DIN rail.

Accessories

Support Profile Laterally attachable

This accessory allows to enlarge the cut-out tolerances of the cover plates while also supporting these plates.

- Latchable bracket on the side.
- Allows greater cutting tolerances.

Switching cover position indicator:

- 1 close contact and 1 open contact.

Intelligent measurement

Electronic Fuse-Monitoring - Everything under control

Thanks to the electronic Fuse Monitor, technician could receive an information to localize a short circuit or overload. Maintenance will be more reactive to change fuse which is broken.

Fupact ISFT range from size 00 to 3 has an electronic fuse monitor

The electronic fuse monitor is directly attached to the switching cover.

This installation depth is 28 mm.

A light-emitting diode starts blinking red the moment the fuses fail. A test button and a 4-pole connector for remote indication are attached to the housing.

Note: for more technical informations, see [page A-22](#).

Functions and characteristics

General characteristics: ISFT

Fupact ISFT100N to ISFT630

Safety

Fupact ISFT is the most reliable horizontal fuse-switch thanks to:

- Protection against accidental contact in the standard model:
 - terminal housing closed
 - simple break-out for all versions
 - terminal shield needed for specific application (> 500 V)
 - IP3X
 - life part are covered.
- Reliable switching with integrated and extended hand protection feature:
 - prevents fuse-unit contact
 - protection against electric arc.
- Ideal voltage test: slidable windows
 - windows are independant easy to measure with total safety.
- Snap-on busbar cover to protect against direct contact.
- Locking cover with sealing facility:
 - locking mechanism for switching cover for non-instructed individuals
 - switching cover is sealable.

Fast connection with variable box terminals

For Fupact 160 A size 00

- Advantageous box terminals:
 - Cu conductor from 2,5 to 95 mm²
 - no cable lug needed.
- Or universal screw terminal for M8 cable lug.

Options

- Prism clamp 6...70 mm² Cu/Al.
- Terminal 3 x 16 mm².

For Fupact 250 to 630 A sizes 1–3

- The standard version:
 - size 1 and 2 for M10 cable lug
 - size 3 for M12 cable lug.
- Easy to change the various types of connection.

Options

- Prism clamp for Cu.
- Prism clamp for Cu/Al (1x cable).
- Prism clamp for Cu/Al (2x cables).

Turnable contacts hooks

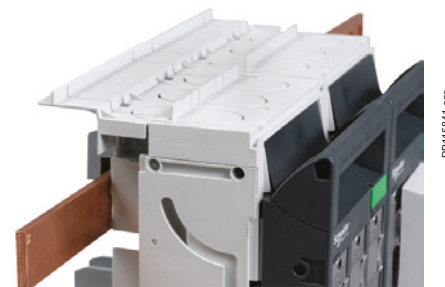
Fupact ISFT is the first horizontal fuse switch-disconnector to propose turnable contacts hooks. This makes it much easier to mount Fupact ISFT on the busbar in addition to being much more flexible. Due to its symetry, Fupact ISFT can be turned around at any time. Terminal top or bottom can be chosen freely. Thus, only one version needs to be placed on stock.

- One universal solution for top or bottom cable outlet.
- Reduced stock.
- Universal to busbar thickness.
- More installation flexibility.

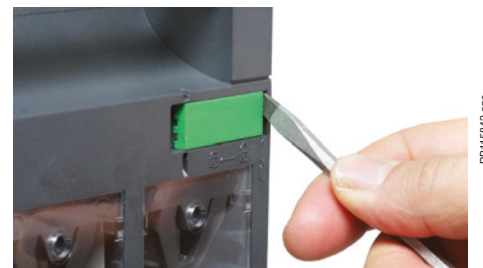


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A



PB115941.eps



PB115942.eps



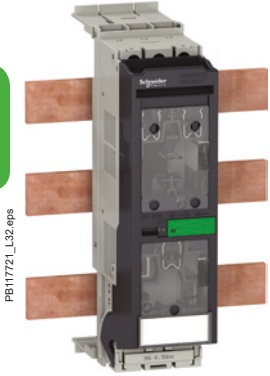
PB115943.eps

ISFT installation

Fupact ISFT100N to ISFT630

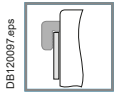
ISFT fusegear is installed on a mounting plate, DIN rail or on busbars, depending on the power rating. Connections are made via cables or directly to the busbars via hook-on.

A



PE117721_L32.eps

ISFT100N (hook-on connection).



DB120057.eps

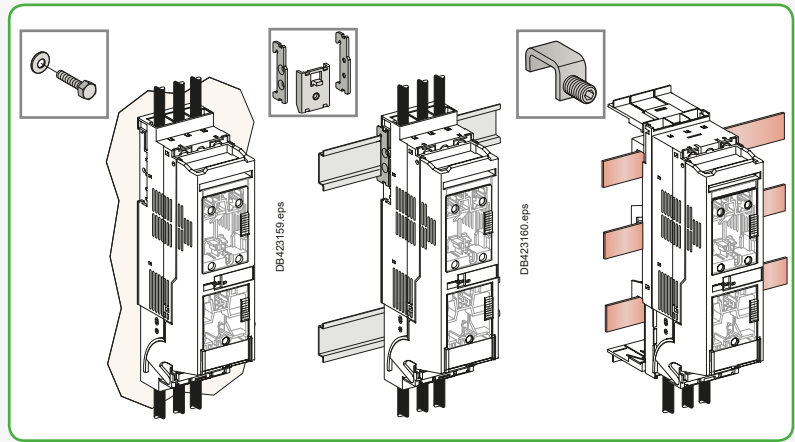
Hook-on connection to busbars: the device tightly hooks on to the busbars via three hooks that ensure both electrical connection and secure mechanical mounting. The connection systems can also be reversed to supply distribution circuits via the upstream terminals. This system ensure direct contact of the power circuit to the busbars (no cables, no bars, no drilling, etc.) and traditional connections for downstream distribution (bare cable connectors, lugs, bars, distribution connectors, etc.).

ISFT100N fusegear

Installation on a mounting plate, on busbars 60 mm or DIN rail on busbars with:

- cables or flexible bars
- hook-on connection to 60 mm busbars.

Upstream or downstream connection of distribution circuits requires cables or flexible bars.



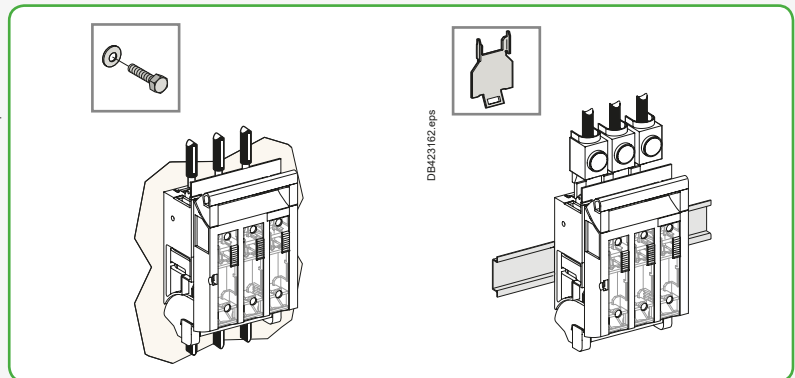
DB423158.eps

DB423159.eps

DB423160.eps

ISFT100 fusegear

Installation on a mounting plate or symmetrical DIN rail. Power and distribution circuit connections require cables and built-in connectors.



DB423161.eps

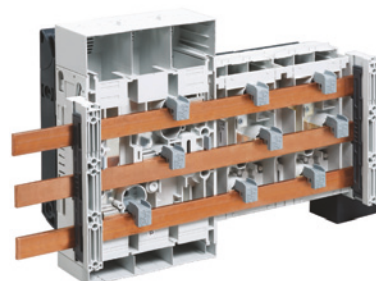
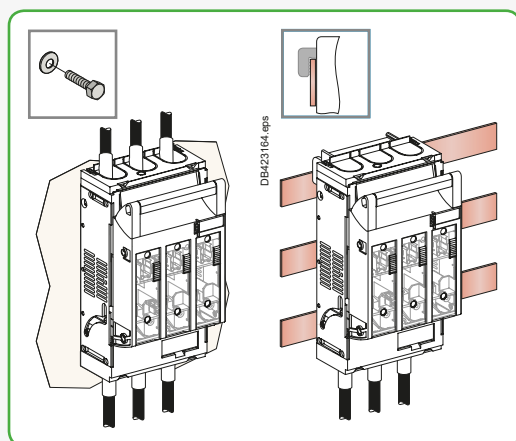
DB423162.eps

ISFT160 fusegear

Installation on a mounting plate or on busbars with:

- cables or flexible bars
- hook-on connection to 60 mm busbars

Downstream connection of distribution circuits requires cables or flexible bars.



Hook-on connection (ISFT250 and 2 x ISFT160).



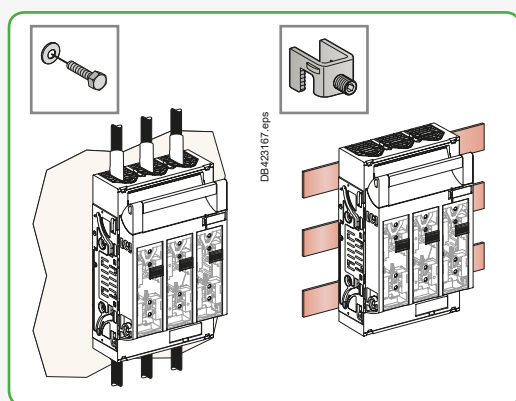
PB115844.eps

ISFT250 to ISFT630 fusegear

Installation on a mounting plate or on busbars with:

- cables or flexible bars
- hook-on connection to 60 mm busbars (except ISFT630)

Downstream connection of distribution circuits requires cables or flexible bars.



Connection and accessories

Fupact ISFT100N to ISFT630 - Connection

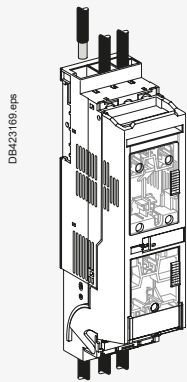
Fupact fuse-switch disconnectors can supply distribution circuits via either the upstream or downstream terminals. Devices intended for connection to busbars are configured as standard for distribution via the downstream terminals.

A

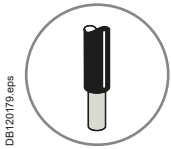
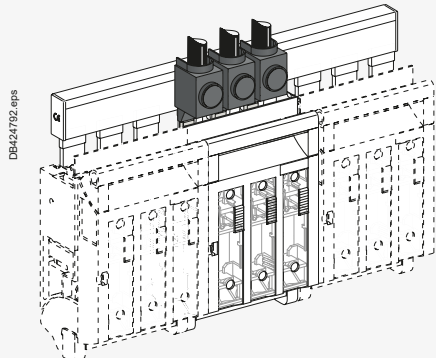
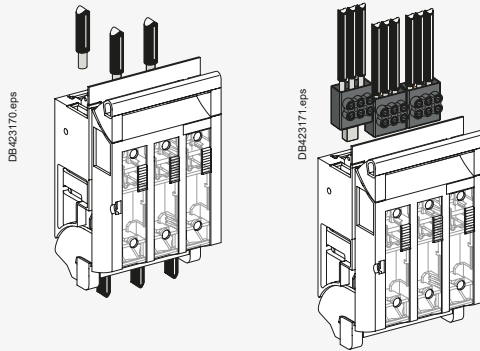
- ISFT fusegear is equipped as standard with connectors or terminals for front connection of:
- bare cables for ISFT100N to ISFT160 devices
 - cables with lugs for ISFT160 to 630 devices
 - flexible bars for ISFT160 to 630 devices.

	ISFT100N	ISFT100	ISFT160	ISFT250	ISFT400	ISFT630
Cables						
Connector (as standard)	2.5 to 50 mm ²	1.5 to 50 mm ²	-			
Lug to terminal	-	-	120 to 185 mm ²		120 to 300 mm ²	
Connector to terminal	-	-	2.5 to 95 mm ²	6 to 150 mm ²	6 to 240 mm ²	
box clamp re/se			6 to 50 mm ²	35 to 150 mm ²	95 to 300 mm ²	
rm/sm			6 to 25 mm ²	50 to 150 mm ²	120 to 300 mm ²	
Pressure Plate						
Connector	-	-	6 to 70 mm ²	70 to 150 mm ²	120 to 240 mm ²	150 to 300 mm ²

ISFT100N fusegear



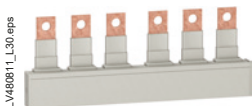
ISFT100 fusegear



Distribution connector.



Incoming connector for feeding busbar.

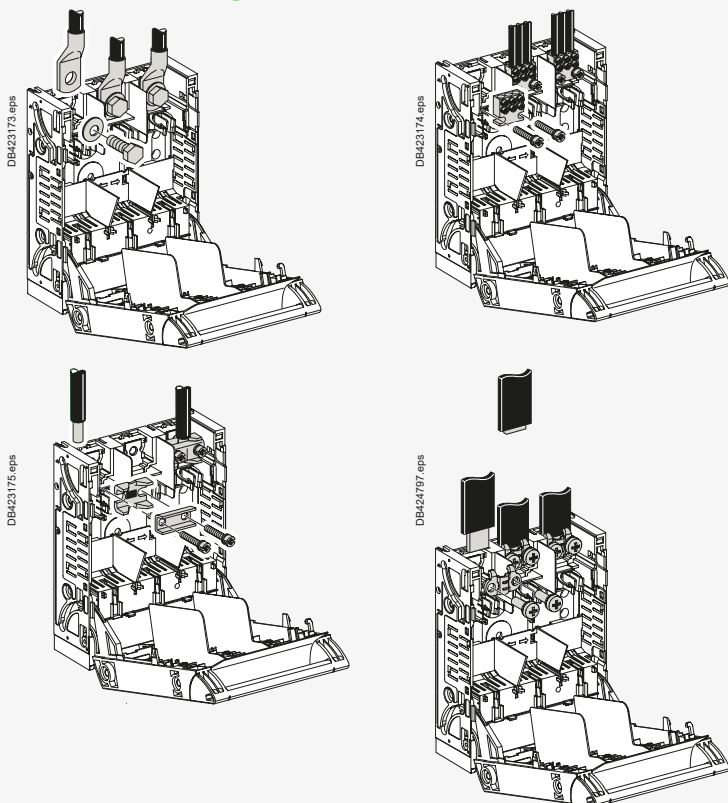


Feeding busbar.

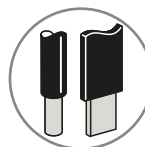
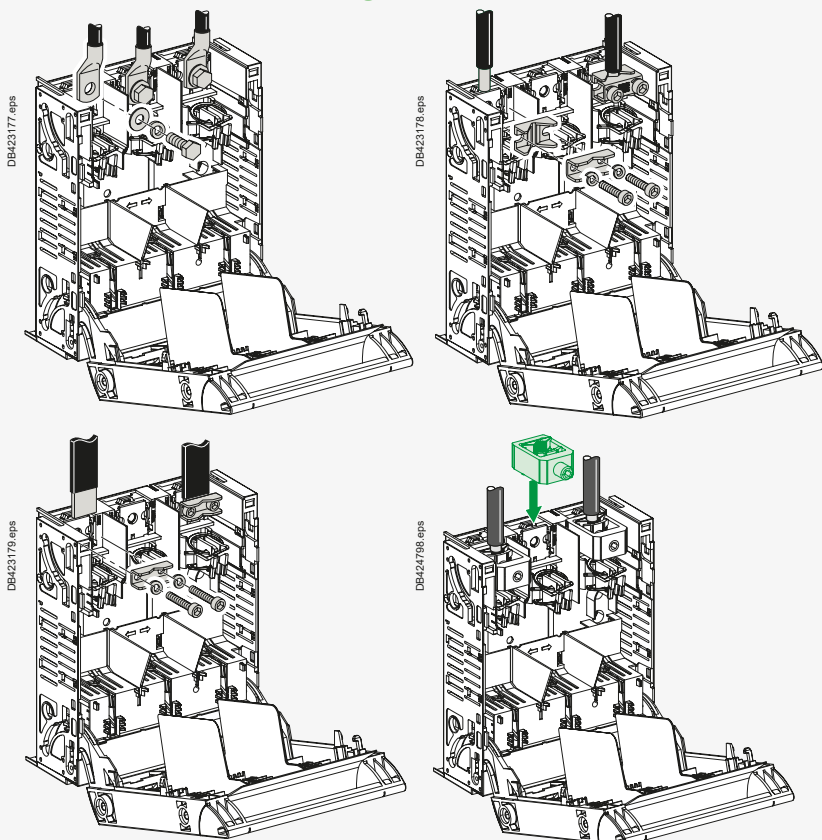
Connection and accessories

Fupact ISFT100N to ISFT630 - Connection

ISFT160 fusegear



ISFT250/400/630 fusegear



DB120162.eps



62330a_1_2.eps

Lug for copper cables.



LV480814_L17.eps

Distribution connector.



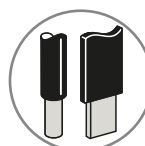
LV480816_L15.eps

Connector for bare Cu/Al cables.



LV480815_L19.eps

Connector for flexible bars.



DB120162.eps



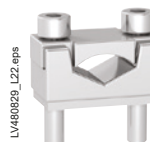
62330a_1_2.eps

Lug for copper cables.



LV480823_L19.eps

Connector for bare Cu/Al cables.



LV480829_L22.eps

Connector for flexible bars.

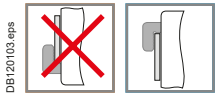


Connection and accessories

Fupact ISFT160 to ISFT630 - Reverse distribution

Fupact fuse-switch disconnectors designed for connection to busbars supply distribution circuits via the downstream terminals as standard. In the case of ISFT160 to ISFT630 devices, simple installation operations allow power to be supplied to the distribution circuits from upstream. In the case of ISFT100N devices, the method of distribution cannot be reversed simply by changing the direction of the mounting. There are separate references for each particular case.

A



DB120103.eps

Hook-on connection: the orientation of the hooks on the busbars is always the same, whether the distribution circuits are connected to the upstream or downstream terminals. The fuse-switch disconnectors must physically hang on the busbars.



DB120104.eps

Symmetrical slots on the side of the base make it possible to raise and lower the cover that forms the fuse-carrier.

To reverse supply, depending on the model, simply turn 180°:

- either the base with its connection kit
- or the connection kit alone.

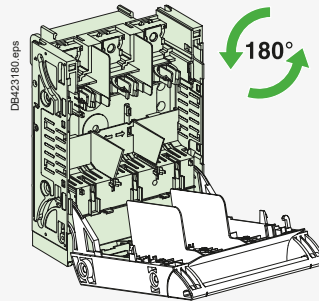
For fusegear with a fuse monitor, the fuse monitor cover must be changed given that different versions are used depending on whether supply is via the upstream or downstream terminals.

Operation to reverse supply (upstream/downstream terminals)

	180° rotation		Change Fuse monitor cover
	Base	Turnable hooks	
	DB401353.eps	DB401355.eps	DB425101.eps
	ISFT160 to 400 yes	yes	yes
	ISFT630 yes	no	yes
	ISFT160 yes	-	yes
	ISFT250 yes	-	yes

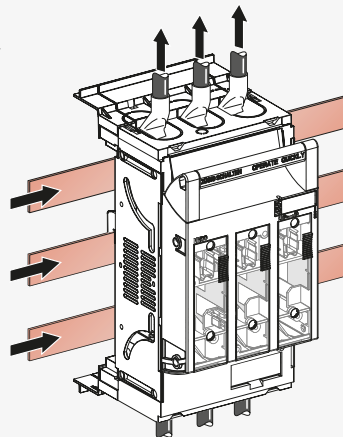
Fusegear with hook-on connection

ISFT160/400



DB423160.eps

Turnable hooks



DB425096.eps

Connection and accessories

Fupact ISFT100 and ISFT160 - Connection, coupling

A

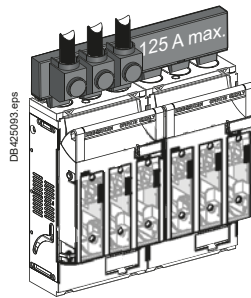
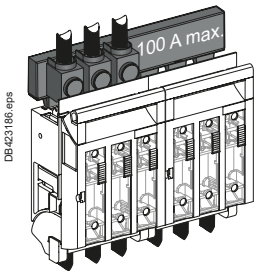
It could be possible to supply a number of ISFT100 and ISFT160 fusegear devices by using feeding busbars via a single incomer.

Supplying a number of devices via feeding busbars

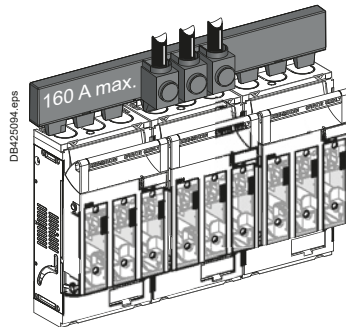
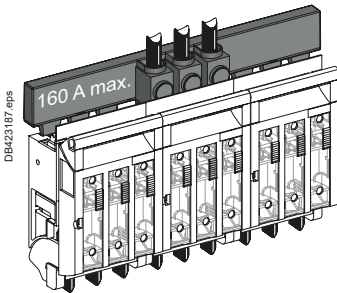
Incoming connectors are used for the upstream power cables. Power is distributed to the other devices via feeding busbars or a combination of feeding busbars. Downstream connection of distribution circuits is done via cables.

ISFT100	ISFT160
---------	---------

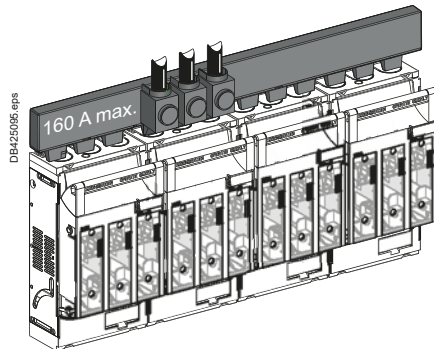
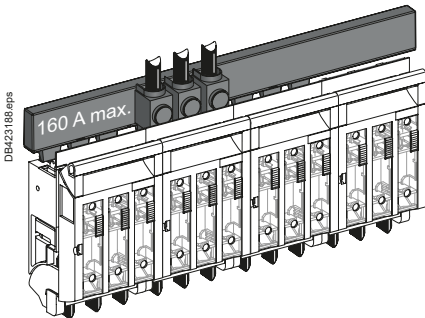
2 devices



3 devices



4 devices



Combinations:

- 2 devices:
 - 1 incomer for 2 outgoers
- 3 devices [1]:
 - 1 incomer for 3 outgoers
- 4 devices [1]:
 - 1 incomer for 4 outgoers.

If the feed is connected at the center of the busbar, the total outgoing current of each busbar branch must not exceed the maximum busbar current I_s /phase.

[1] For combinations of more than 2 ISFT100 devices, it is recommended to connect incoming power to the second device to reduce temperature rise.

Note: Connecting two NS-fuse switches reduces the utilization category to AC22B to 80 kA.

Feeding busbars

Maximum operating voltage	690 VAC
Insulation coordination	overvoltage category III / pollution degree 2
Busbar cross-section	35 mm ²

Maximum busbar current I_s /phase when feed connected at busbar start or end 125 A.

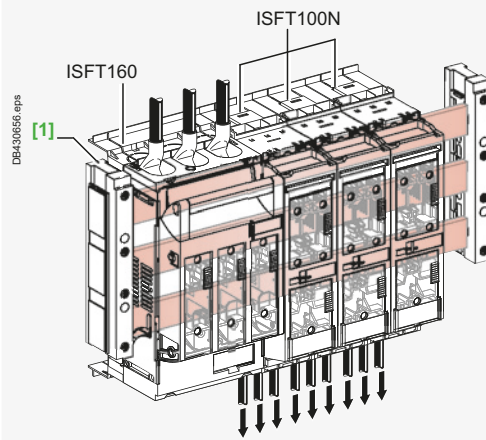
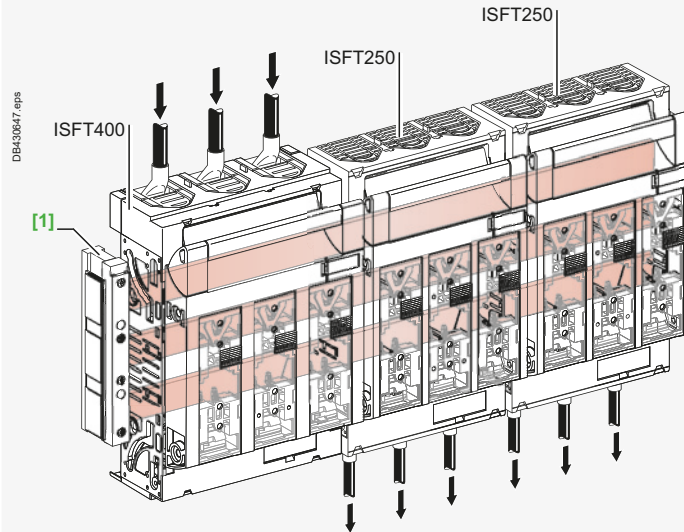
Maximum busbar current I_s /phase when feed connected at any other position 160 A.

Connection and accessories

Fupact ISFT100N, ISFT160 to ISFT400 - Different installation systems

A

Many connection and supply possibilities Supplying a set of busbars from an incoming device



[1] Linergy BZ busbar system: for more technical informations, see [page B-12](#).

Fuse monitor

Fupact ISFT160 to ISFT630

PE115445.eps



ISFT160 fuse monitor.

A

Functions

This device provides remote indication of the status of standard fuses (without strikers). It serves to:

- signal a blown fuse
- prevent the risks of abnormal voltages on the neutral.

Standards

- Compliance with international standard IEC 60947-5-1.
- Compliance with:
 - EN 50204
 - EN 61000 for electromagnetic compatibility (EMC).

Description

- Characteristics:
 - operation with DIN fuses.
 - degree of protection: IP20.
- May be used on capacitor bank circuits.
- Simplified power supply:
 - does not require a specific power supply
 - operates with unbalanced phases
 - supplied via connection to the fuse terminals on the fusegear devices
 - operational voltage: 400...690 V AC, ±10 %, 50/60 Hz.
- Tested for electromagnetic compatibility (EMC).
- Mounting:
 - connected to the fuse-carrier assembly forming the cover.
- The package consists of:
 - a fuse-carrier/handle and fuse monitor sub-assembly supplied as a kit composed of:
 - fuse monitor equipped with one NO contact and one NC contact
 - fuse-carrier with the handle
 - the customer must remove his fuse-carrier/handle assembly from his product and replace it with this kit.
- Characteristics:
 - IP20 degree of protection
 - product with fuse monitor must be integrated inside switchboards and not in front face in case of customers wants to have a complete class II insulation. Class II insulation with switchboard in front face is ensured only when Fupact ISFT is in closed position and with a door or a protection behind the fuse monitor.

Operation

Reset

The device is automatically reset when the fuse-links are replaced.

Indications

- Normal operation:
 - the green LED is ON when voltage is present at the fuse terminals
 - the contacts are in the rest position.
- Operation when a fuse blows:
 - the green LED goes off and the red LED goes on
 - the contacts are actuated:
 - the NO contact is for remote fault indication
 - the NC contact may be used, for example, to control an undervoltage device in order to shut down equipment that may be sensitive to single-phasing.

> Fupact ISFT160 to 630 fuse monitor
Instruction sheet



NVE88766



Electrical characteristics

Power circuit

Rated operational voltage	400 to 690 V AC 50/60 Hz ±10 %
Consumption	< 3 VA
Rated frequency	50/60 Hz
Measurement impedance	> 1000 Ω/V
Rated impulse withstand voltage (1.2 / 50 µs)	8 kV

Auxiliary contact output terminals

Terminal indications	NO	13 - 14
	NC	21 - 22
Cable capacity	Flexible	≤ 1.5 mm ² Cu
	Rigid	≤ 2.5 mm ² Cu

Output contact characteristics (1NO + 1NC)

Conventional thermal current I _{th} (A)	5
Rated insulation voltage (V)	250
Minimum load	10 mA at 24 V

Characteristics

		AC		DC	
Utilisation category (IEC 60947-5-1)		AC12	AC15	DC12	DC13
Operational current (A)	24 V	-	3	-	2
	48 V	-	3	-	-
	110 V	-	3	-	-
	220/240 V	-	3	-	-
	250 V	-	3	-	-
	380/415 V	-	-	-	-
	440 V	-	-	-	-
660/690 V	-	-	-	-	
Rated operational voltage / max. breaking voltage (V AC)		250/440			
Breaking capacity (VA)		2000			

General characteristics

Operating temperature range (°C)	-25...+55 (≤ 500 V)	-25...+45 (> 500 V)
Storage and transport temperature range (°C)	-40...+70	
Fuse blowing detection time (s)	< 2	
Overvoltage category / degree of pollution	IEC 60947-1 3	
Dielectric test voltage (between power circuit and output terminals)	5 kV rms / 1 min 50 Hz	

Electromagnetic compatibility - emission

Conducted	EN 55022 Class B
Radiated	EN 55022 Class B
Harmonic currents	EN 61000-3-2 Class A

Electromagnetic compatibility - immunity

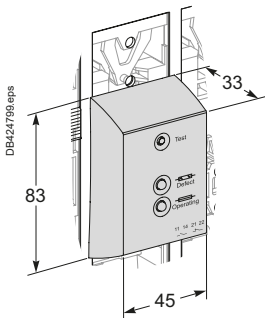
Electrostatic discharge (ESD)	EN 61000-4-2 category B level 2/3
Radiated field susceptibility (RF)	EN 61000-4-3 category A level 3
Surge immunity test	EN 61000-4-5 level 4
Conducted low energy susceptibility (EFT)	EN 61000-4-4 category B level 3
Conducted high energy susceptibility (RF)	EN 61000-4-6 category A level 3
Radio-frequency interference (GSM)	ENV 50204 category A

Magnetic field immunity

Continuous	EN 61000-4-8 level 5
------------	----------------------

Mechanical characteristics

Degree of protection	IP20
Weight (fuse monitor alone) (kg)	0.2
Dimensions	



Insulation

Fupact ISFT100N to ISFT630




Some accessories for insulation are used to protect people against direct contacts with the main circuits. For ISFT100, we have single and double escutcheon (with 1 free slot). These escutcheons, which could be used in combination, allow one type of cut-out on the front panel of switchboard. But in case of feeding busbars, it's not compliant to use escutcheon. In this case, it's up to the switchboard manufacturer to ensure protection. For ISFT100N and ISFT160 to 630, side profiles (or laterally attachable) ensure vertical IP level across the door. The switchboard manufacturer must provide the horizontal IP. For those products, it's mandatory to use terminal shield when voltage is upper or equal to 500 V.

A

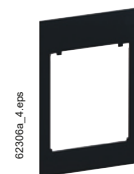
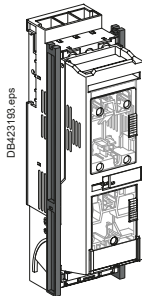
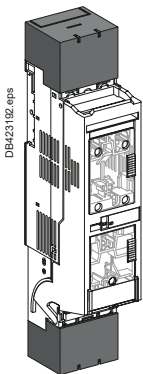
Insulation of live parts

Escutcheon

Clipped on the device, escutcheons ensure IP20 and IK07 degrees of protection.

Type	Escutcheon type			Terminal shield
				
ISFT100N	●	-	-	●
ISFT100	-	●	●	-
ISFT160	●			●
ISFT250	●			●
ISFT400	●			●
ISFT630	●			●

ISFT100N fusegear - Terminal shield and escutcheon

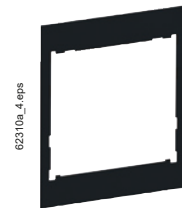
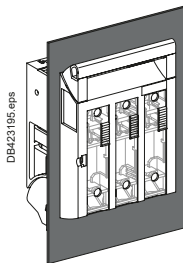


Escutcheon.



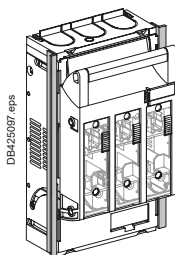
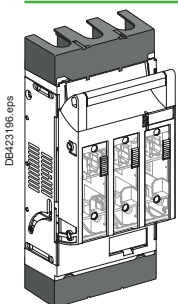
Terminal shields.

ISFT100 fusegear - Escutcheon



Escutcheon.

ISFT160 to ISFT630 fusegear - Terminal shields and escutcheon



Laterally attachable support profile.

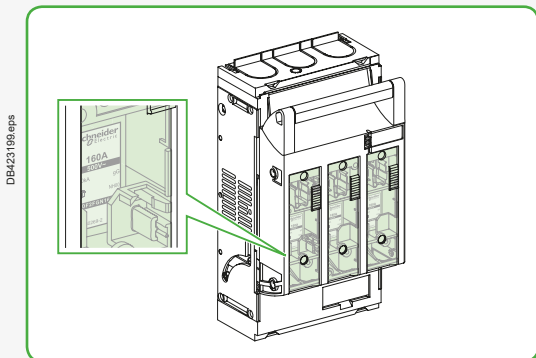
Functions and characteristics

Fuse-link monitoring and testing

Fupact ISFT160 to ISFT630

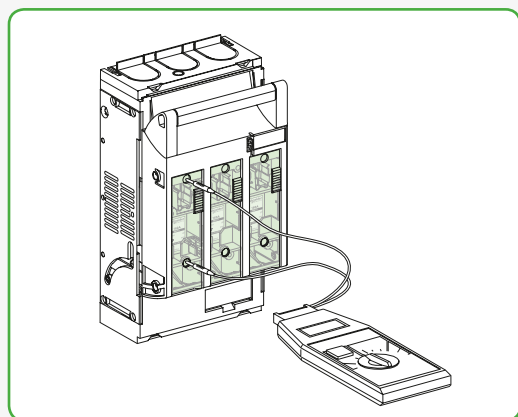
Monitoring

ISFT 160 to 630 fuse-switch disconnectors are equipped with independent large windows so that the fuse-link technical characteristics are clearly visible.



ISFT160.

Testing



Independent sliding covers on the front panel provide access to the fuse-link status test points while maintaining the IP20 protection index.

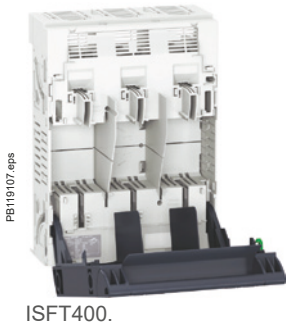
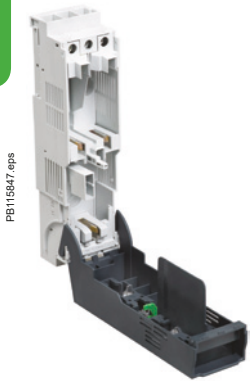


Control, locking and operation

Fupact ISFT100N to ISFT630

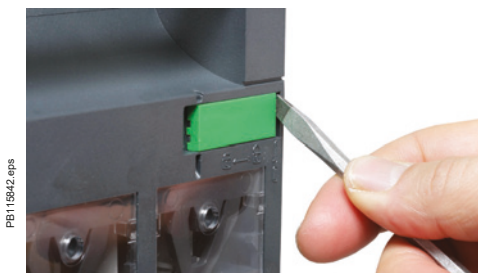
The main moving contacts are controlled by the pivoting fuse-carrier assembly forming the cover for the ISFT devices
In open position, the fuse-switch disconnecter fuse-carrier assembly guarantees isolation with visible break.

A

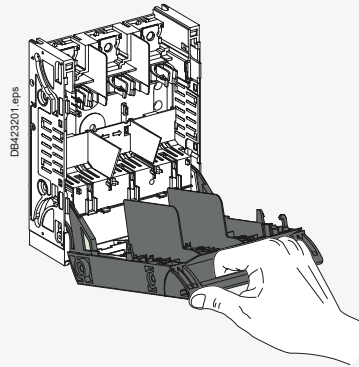


Access to the fuse-links:
■ may be protected by lead seals on the ISFT devices

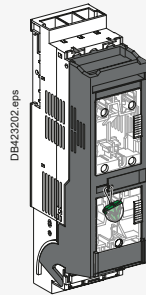
To lock the fuse-switch disconnecter in closed (ON) position, the fuse-carrier is equipped as standard with a locking part.



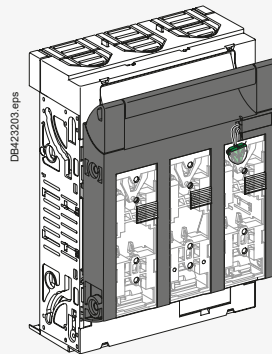
Control



Locking



Lead-seal locking for the ISFT100N.



Lead-seal locking for the ISFT100 to ISFT630 devices.

Locking in open (OFF) position guarantees isolation as defined by IEC 60947-3.

Type	Function	Means	Accessory
ISFT100N	Device locking in closed (ON) position	Lead seal	Built-in
ISFT100			
ISFT160			
ISFT250 to ISFT630			

Functions and characteristics

Control, locking and operation

Fupact ISFT100N to ISFT630

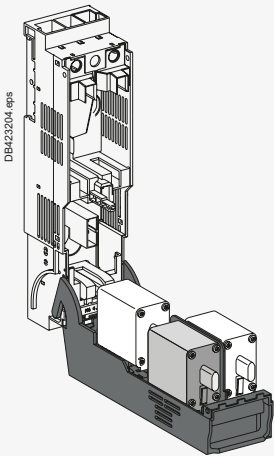


For ISFT fusegear devices, the fuse-carrier assembly is used both to control the device and house the fuse-link.

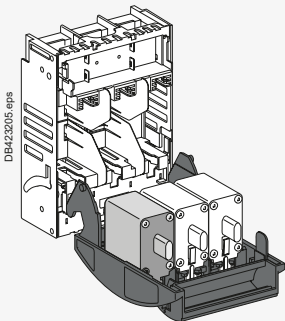
- ISFT100N: the pivoting fuse-carrier assembly accepts two fuse-links side by side and a third situated under the first two fuse-links.
- ISFT100 to ISFT630: the pivoting fuse-carrier assembly accepts the three fuse-links side by side.

Fuse-carriers

Compatibility between ISFT fuse-switch disconnectors and fuse-links (NH)



Pivoting fuse-carrier assembly for the ISFT100N.



Pivoting fuse-carrier assembly for the ISFT100 to ISFT630 devices.

Type of DIN fuse-link	NH000	NH00	NH1	NH2	NH3
ISFT100N	●	-	-	-	-
ISFT100	●	-	-	-	-
ISFT160	-	●	-	-	-
ISFT250	-	-	●	-	-
ISFT400	-	-	-	●	-
ISFT630	-	-	-	-	●

Insertion and removal of fuse-links

Fuse-links are held in place by clips behind the front panel of the fuse-carriers, thus making removal possible without touching the fuse-links.

Auxiliary contacts and indications

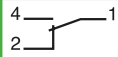
Fupact ISFT100N to ISFT630

A

The optional auxiliary contacts carry out indication functions. They provide remote indication of the fuse-switch disconnecter status. They may also be used to indicate and carry out automatic functions such as electrical interlocking.

Standards: compliance with international recommendation IEC60947-5-1.
Description: NC/NO changeover contact.

Functional table of contact status

Auxiliary changeover contact		
		Maximum number
ISFT100N		1
ISFT100		2
ISFT160		2
ISFT250		2
ISFT400		2
ISFT630		2

Auxiliary changeover contact for ISFT100N and ISFT160

Conventional thermal current I _{th} (A)		2			
Rated insulation voltage (V)		250			
Minimum load		100 mA at 24 V			
		AC		DC	
Load		AC12	AC15	DC12	DC13
Rated operational current (A)	24 V	6	-	3	-
	48 V	6	-	1	-
	110 V	6	-	0.5	-
	220/240 V	6	-	0.25	-

Auxiliary changeover contact for ISFT100 and ISFT250 to 630

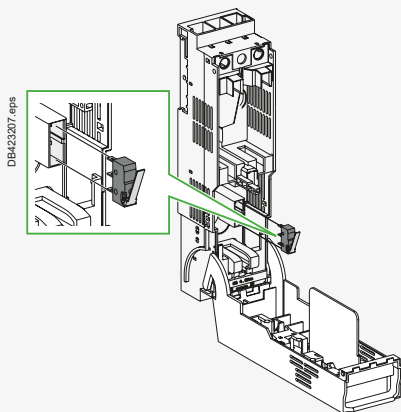
Conventional thermal current I _{th} (A)		2			
Rated insulation voltage (V)		250			
Minimum load		100 mA at 24 V			
		AC		DC	
Load		AC12	AC15	DC12	DC13
Rated operational current (A)	24 V	2	-	0.2	-
	48 V	2	-	0.2	-
	110 V	2	-	0.2	-
	220/240 V	2	-	0.2	-

Auxiliary contacts and indications

Fupact ISFT100N to ISFT630

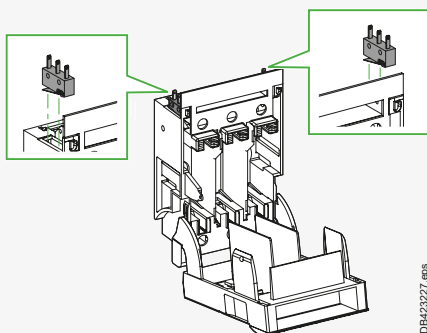
Position of auxiliary contacts for ISFT devices

ISFT100N



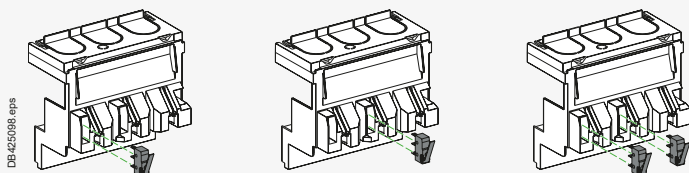
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ISFT100



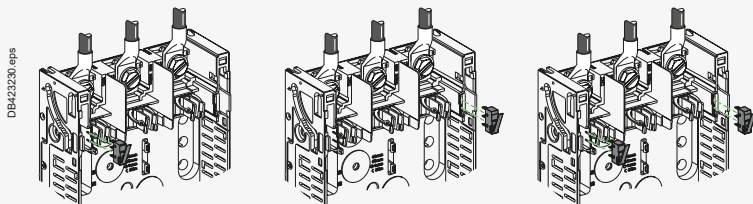
DB42327.eps

ISFT160

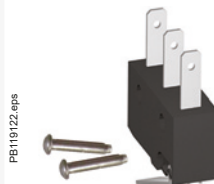


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ISFT250/400/630

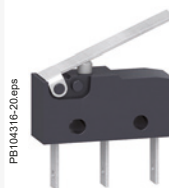


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PB119122.eps

Auxiliary contact for ISFT100.



PB104316-20.eps

Auxiliary contact for ISFT100N/160.



LV480833_L16.eps

Auxiliary contact for ISFT250/400/630.



A

D



ISFL160



ISFL250/400/630/1250



Fupact ISFL



Fuse switch-disconnector selection	
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Installation recommendation.....	B-1
Dimensions and connection	C-1
Wiring diagrams.....	D-1
Technical characteristics	E-1
Catalogue numbers	F-1

Fuse switch-disconnector selection

Fupact ISFL160 to ISFL1250

A



Fuse switch-disconnectors

Number of poles / type of fuse-link IEC60 269-2-1 Section 1

Electrical characteristics as defined by IEC 60947-1 / IEC 60947-3 and EN 60947-1 / EN 60947-3

Conventional thermal current (A)	In free air	I_{th}	at 40 °C
			Maximum fuse power dissipation (W)
	In enclosure	I_{the}	at 40 °C
			Maximum fuse power dissipation (W)
Rated insulation voltage (V)		U_i	AC 50/60 Hz / DC
Rated impulse withstand voltage (kV)		U_{imp}	
Rated operational voltage (V)		U_e	AC 50/60 Hz
Rated operational voltage AC20 and DC20 (V)		U_e	
Rated operational current (A)		I_e	AC 50/60 Hz
			220/240 V
			380/415 V
			440/480 V ^[1]
			500 V
			660/690 V
			DC/poles in series
			125 V /nbr of poles
			220 V /nbr of poles
			440 V /nbr of poles

Rated duties	Uninterrupted duty	
Rated short-circuit breaking capacity (kA _{rms})/ Rated short-circuit making capacity (kA peak)/ Fuse-link I _n (A) ^[2]	I_{cn}/I_{cm}/I_n	415 V 500 V 690 V
Endurance (category B) (CO cycles)	Mechanical	
	Electrical AC	AC23B 415 V AC22B 500 V AC21B 690 V

Suitability for isolation
Positive contact indication
Pollution degree

Control

Direct handle (operator-dependent opening and closing)
Locking Padlocks
Lead seal

Indication auxiliaries

Auxiliary contacts
Current transformer

Installation and connection accessories

Possible mounting position Horizontal
Vertical
Connector For bare Cu/Al cables
For flexible bars
Lugs for Cu/Al cables
Terminal shields

Dimensions and weight

Overall dimensions H x W x D (mm)	3P
Approximate weight without fuse-links (kg)	3P

[1] Suitable for 480 V NEMA.
[2] Fuse-switch disconnectors with fuse-links.
[3] Only for ISF160 with direct connection to the busbars.
[4] AC22B 690 V.

Fuse switch-disconnector selection

Fupact ISFL160 to ISFL1250



ISFL160		ISFL250			ISFL400			ISFL630			ISFL1250	
3 x 1P or 3P/DIN (NH)		3 x 1P or 3P/DIN (NH)			3 x 1P or 3P/DIN (NH)			3 x 1P or 3P/DIN (NH)			3P/DIN (NH)	
160		250			400			630			1250	
12		23			34			48			2 x 48	
160		250			400			630			1250	
12		23			34			48			2 x 48	
1000		1000			1000			1000			1000	
8		8			8			8			8	
690		690			690			690			690	
800		800			800			800			800	
AC22B	AC23B	AC21B	AC22B	AC23B	AC21B	AC22B	AC23B	AC21B	AC22B	AC23B	AC21B	AC22B
160	160	250	250	250	400	400	400	630	630	630	1250	1250
160	160	250	250	250	400	400	400	630	630	630	1250	1250
160	-	250	250	-	400	400	-	630	630	-	1250	1250
160	-	250	250	-	400	400	-	630	630	-	1250	1250
100	-	250	-	-	400	-	-	630	-	-	1250	-
DC21B	DC22B	DC21B	DC22B		DC21B	DC22B		DC21B	DC22B		DC21B	DC22B
-	-	-	-		-	-		-	-		-	-
-	-	-	-		-	-		-	-		-	-
-	-	-	-		-	-		-	-		-	-
⊙		⊙			⊙			⊙			⊙	
100 / 210 / 160		120 / 250 / 250			120 / 250 / 400			120 / 250 / 630			120 / 250 / 630	
100 / 210 / 160		120 / 250 / 250			120 / 250 / 400			120 / 250 / 630			120 / 250 / 630	
100 / 210 / 160		100 / 210 / 200			100 / 210 / 315			100 / 210 / 500			100 / 210 / 500	
1400		1400			800			800			800	
200		200			200			200			200	
200 ^[4]		200			200			200			200	
200		200			200			200			200	
⊙		⊙			⊙			⊙			⊙	
⊙		⊙			⊙			⊙			⊙	
3		3			3			3			3	
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-		-			-			-			-	
⊙		⊙			⊙			⊙			⊙	
⊙ ^[3]		⊙			⊙			⊙			⊙	
⊙		-			-			-			-	
⊙		⊙			⊙			⊙			⊙	
⊙		⊙			⊙			⊙			⊙	
⊙		-			-			-			-	
⊙		-			-			-			-	
included		included			included			included			included	
405 x 50 x 123		741 x 100 x 190			741 x 100 x 190			741 x 100 x 190			834 x 200 x 190	
1.30		4.70			5.00			5.60			15.20	

Fuse switch-disconnector selection

Fupact ISFL160 to ISFL1250

A



ISFL160 - 3P.

ISFL160 - 3 x 1P.



ISFL250 - 3P.

ISFL250 - 3 x 1P.

Fuse switch-disconnectors

Type of fuse-link

- DIN NH000
- DIN NH00
- DIN NH1
- DIN NH2
- DIN NH3

Installation and connection

- ISFL160 for 60 mm busbar hook-on contact mounting with multiple use terminal (screw M8)
- ISFL160 for 60 mm busbar hook-on contact mounting with box terminal 95 mm²
- ISFL160 for 100 mm busbar hook-on contact mounting with multiple use terminal (screw M8)
- ISFL160 for 100 mm busbar hook-on contact mounting with box terminal 95 mm²
- Conversion kit for 185 mm busbar direct contact mounting (for 1 or 2 x ISFL160)
- ISFL160 for 185 mm busbar 1-pole switchable direct mounting
- ISFL160 for 185 mm busbar 1-pole switchable hook-on mounting

Terminal tightening torque (Nm)

Temperature derating (with gG fuse-link)^[1]

"Vertical mounting" fuse-links in vertical position	I _{th} (A)	40 °C
		45 °C
		50 °C
		55 °C
		60 °C
		65 °C
		70 °C
"Horizontal mounting" fuse-links in horizontal position	I _{th} (A)	40 °C
		45 °C
		50 °C
		55 °C
		60 °C
		65 °C
		70 °C

[1] Derating data is based on:
 - the maximum rating for fuse-links intended for the device
 - maximum power dissipation.

Fuse switch-disconnector selection

Fupact ISFL160 to ISFL1250

	ISFL160	ISFL250	ISFL400	ISFL630	ISFL1250
	○	-	-	-	-
	○	-	-	-	-
	-	○	-	-	-
	-	-	○	-	-
	-	-	-	○	○
	○	-	-	-	-
	○	-	-	-	-
	○	-	-	-	-
	○	-	-	-	-
	○	-	-	-	-
		○	○	○	○
		○	○	○	○
	see page B-4				
	160	250	400	630	1250
	150	240	380	600	1200
	145	225	360	570	1130
	135	215	340	535	1070
	130	200	320	500	1000
	120	190	300	475	940
	110	175	280	440	880
	160	-	-	-	-
	150	-	-	-	-
	145	-	-	-	-
	135	-	-	-	-
	130	-	-	-	-
	120	-	-	-	-
	110	-	-	-	-

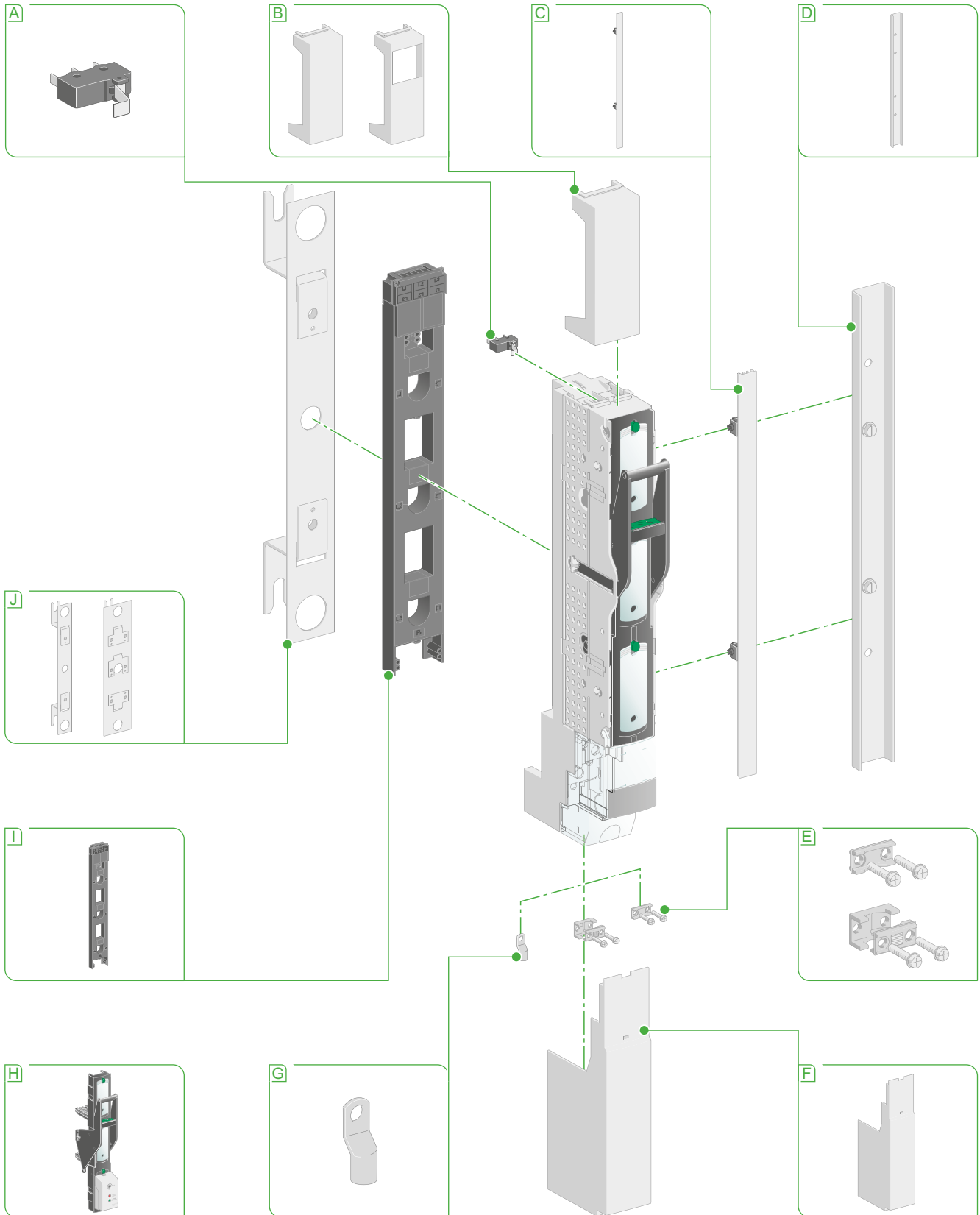


Accessories and auxiliaries

Fupact ISFL160 - 3P

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A



A NO + NC auxiliary changeover contacts

B Length adapter

C Side cover for front panel cut-out

D Blank panel cover for free slot

E Connectors for :

- bare cable
- flexible bars

F Length adapter

G Lug for copper cable

H Fuse monitor

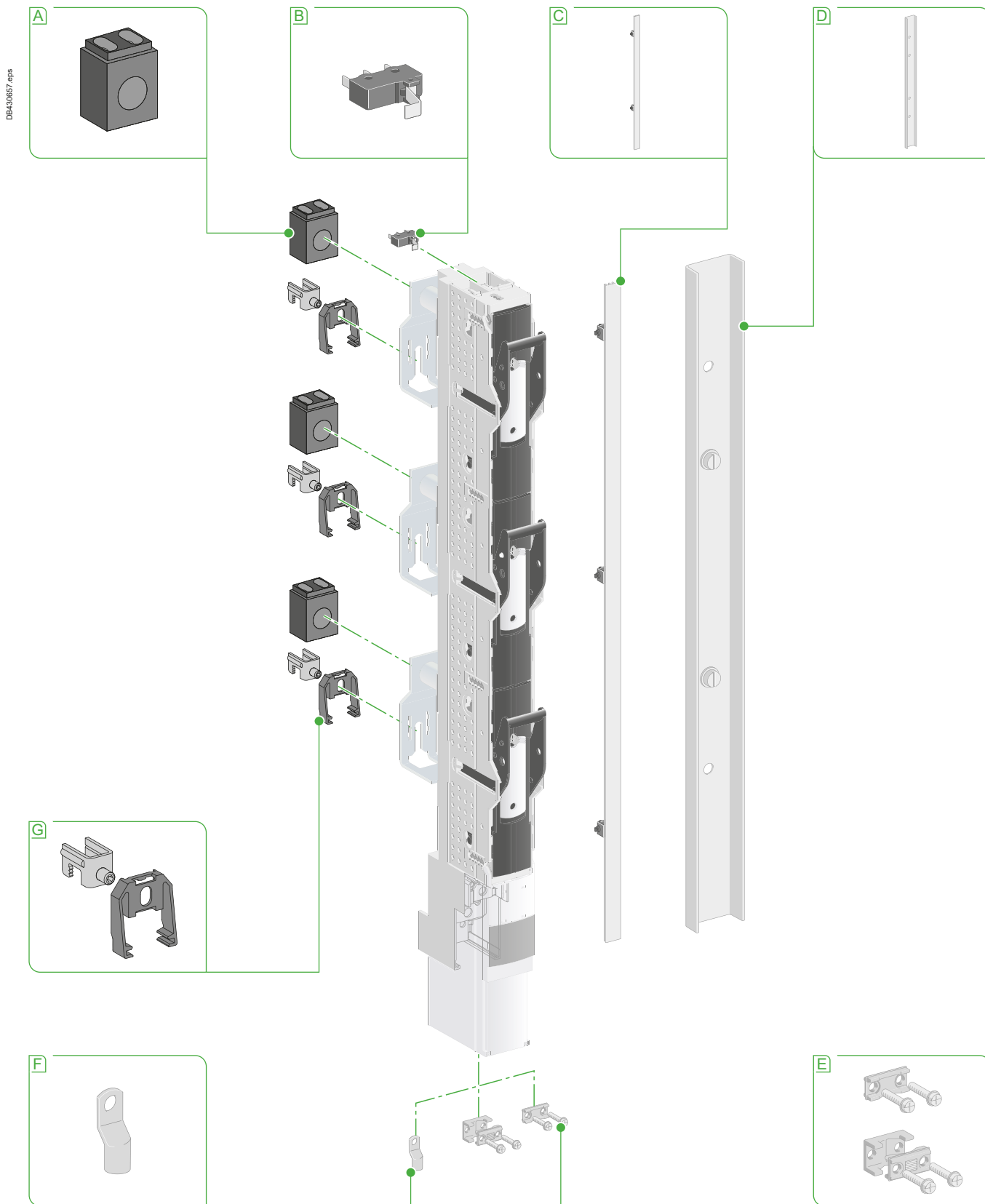
I Current transformer

J Conversion kit for direct connection to 185 mm busbars

Functions and characteristics

Accessories and auxiliaries

Fupact ISFL160 - 3 x 1P



- A** Current transformer
- B** NO + NC auxiliary changeover contacts
- C** Side cover for front panel cut-out
- D** Blank panel cover for free slot

- E** Connectors for :
 - bare cable
 - flexible bars
- F** Lug for copper cable
- G** Hooks

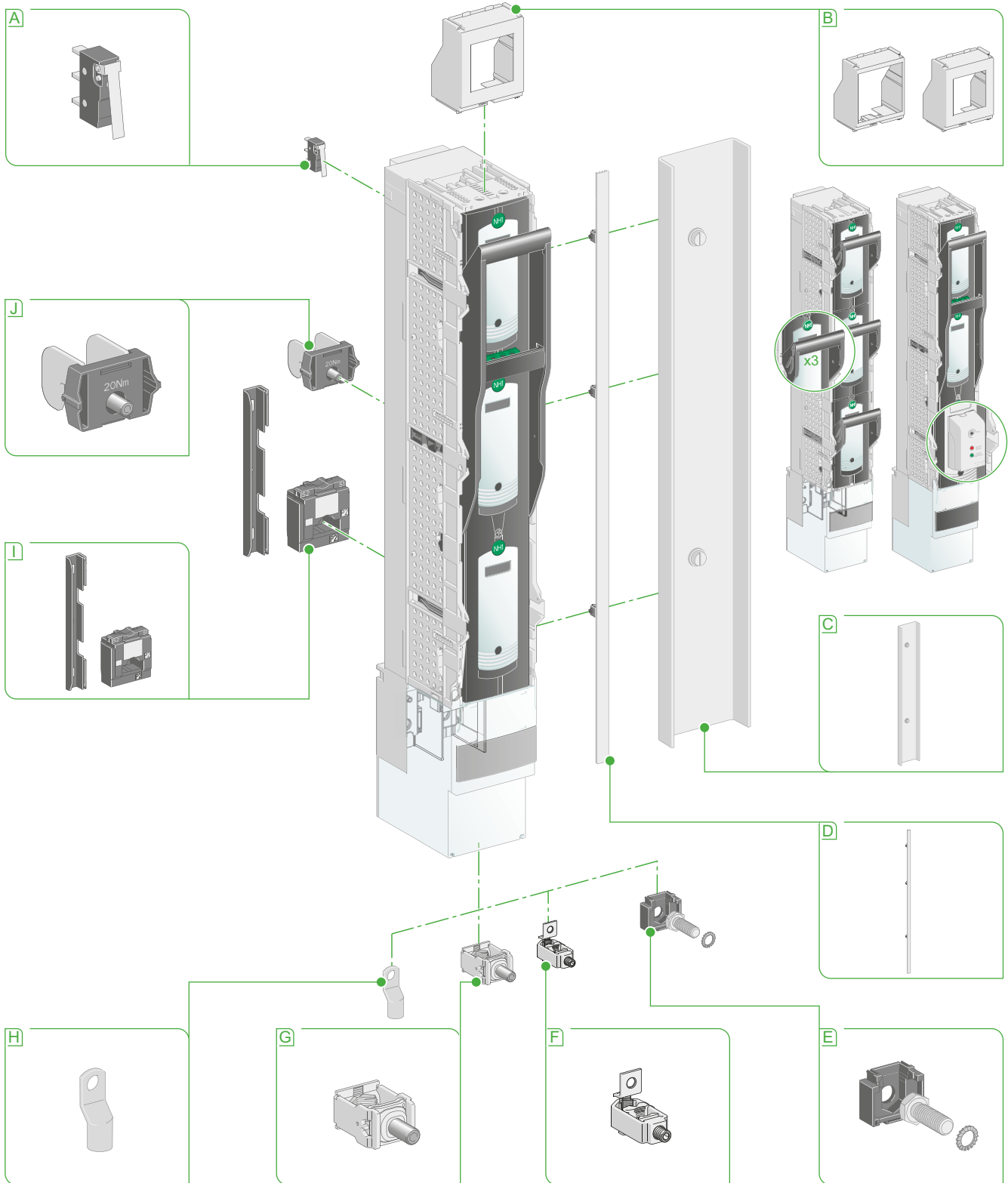


Accessories and auxiliaries

Fupact ISFL250 to ISFL630

DE42394.eps

A



- A** NO + NC auxiliary changeover contacts
- B** Empty plastic box
- C** Blank panel cover for free slot
- D** Side cover for front panel cut-out

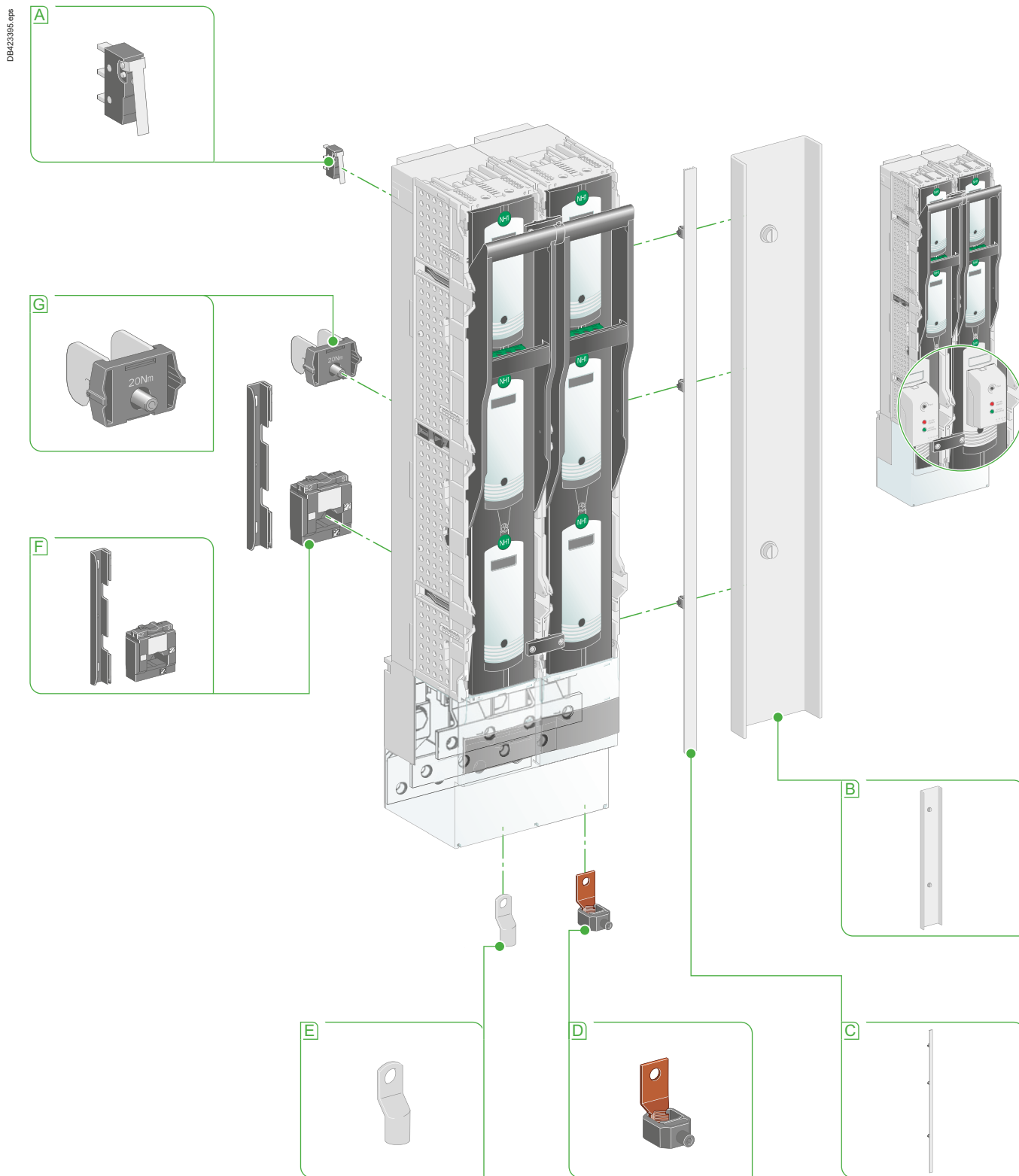
- E** Screws with plastic support
- F** Connector for Cu/Al bare cables 2 x 50 to 185 mm²
- G** Connector for Cu/Al bare cables 1 x 35 to 300 mm²

- H** Lug for copper cable
- I** Current transformer
- J** Hooks

Functions and characteristics

Accessories and auxiliaries

Fupact ISFL1250



- A** NO + NC auxiliary changeover contacts
- B** Blank panel cover for free slot
- C** Side cover for front panel cut-out
- D** Connector 4 x 240 mm²

- E** Lug for copper cable
- F** Current transformer
- G** Hooks

General characteristics: ISFL

Fupact ISFL160 to ISFL1250

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ISFL turnable hooks.

With Fupact ISFL, you have one of the most efficient vertical NH fuse switch-disconnectors ever designed with compact dimensions, a modular system and an elegant design. Your benefit are as follows:

Future proof

The trend is moving from simple power distribution stations to more intelligent power distribution stations. Fupact ISFL is made for the future: with interfaces for measurement and control equipment which can be integrated in a space-saving manner.

Reduced heat development

Safeguarding high currents requires one thing above all: keeping a cool head. This is where Fupact ISFL leads the pack. They feature one of the lowest heat development values of all products available on the market. This pays off for your entire facility: reduced energy loss, improved operating safety and durability.

Faster mounting

All installation and connecting components of the Fupact ISFL were optimised and the number of assembling steps was reduced. This puts your switch “on the track” even more quickly and saves you time.

Safety at its best

The switch gears are very user friendly and provide optimal user protection due to parallel switching. Two disconnected positions per phase produce two smaller electrical arcs. This causes only half the arc voltage.

Turnable contact hooks

Fupact ISFL fuse-switches, vertical design, 00/60 are the first of its kind to feature turnable contact hooks. This makes it much easier to mount the NH Fuse-Switch on the busbar in addition to being much more flexible. Due to its symmetry, the NH Fuse-Switch can be turned around at any time. Terminal top or bottom can be chosen freely. Thus, only one version needs to be placed on stock.

Fast connection – with variable box terminals

High currents require large cable cross-sections. At the same time, modern switchboard cabinets are becoming more and more compact. They accommodate three cables of up to 95 mm² in the smallest possible. No one else can do that with a Fupact ISFL 160 A. This is possible only due to the stepped and slightly offset arrangement of the box terminals. Captive screws enable a quick and reliable securing of the cable.

Perfect back-up with space-saving current-transformer installation

Do you wish to measure currents in addition to safeguarding them? We have redefined space for you. Our new current transformers can be installed behind the Fupact ISFL, vertical design, without an alteration of installation depth. After removing the break-out-pieces from the socket, the current transformers is simply plugged on – ready for use. With or without a current transformer, the Fupact ISFL always has the same installation depth, so no adaptors are required.

Functions and characteristics

General characteristics: ISFL

Fupact ISFL160 to ISFL1250

The elegant solution

To obtain the same installation depth with surrounding devices, the Fupact ISFL vertical design, size 00/185 does not only come with conventional adapters but also features raised busbar connections. This makes it easy to mount the fuse-switch adjacent to devices of size 1 to 3. Simply hook the elevated feeding bracket onto the pre-mounted bolts or attach it with the contact hooks. There is no need for drilling. This allows the same installation depth for all sizes, giving the front face a clear uniform look.

No trouble with large cross-sections

Standard universal terminals allow the direct connection of cable lugs as well as cables with cross-sections up to 300 mm². Easy-to-install terminal hardware gives you great flexibility. No other small-sized Fupact ISFL can do that.

Appealing at first sight

Rotating nameplates turn your installation possibilities into a real eye-catcher. No matter if the terminal is located on top or at the bottom, technical data and installation labels of all Fupact ISFL are always correctly aligned. Don't take any risks when it comes to making the first impression.

Secure turn-off-position – up to three padlocks

Even fuse-protection-devices need to be protected: from electricity-theft, manipulation and unauthorised use. This is why every 3-pole Fupact ISFL, vertical design, may be locked with up to three locks. This is possible in both, the closed and the secure park lock position.

Intelligent measurement

The future belongs to more intelligent switchboards. Fupact ISFL is well prepared for the future: it offer standardised interface for measurement devices.

Contemporary power management

Fupact ISFL measuring devices offers a large selection of measuring and monitoring options: from basic current measurements and power metering, harmonic wave analysis to remote management and alarm relays, and many more. All electrical parameters are visualised on an LCD and can be centralised. EM measuring devices are normally installed separately in the switchboard. Fupact ISFL offer an integrated solution which can simply be plugged on.

Electronic Fuse-Monitoring - Everything under control

You know what happens and where it happens almost instantly to a notification, technician receives the information required to precisely locate and quickly correct short-circuits and overloads. Your technician will be faster to analyse and change fuse which is broken. This makes to have network highly effective while at the same time being extremely reliable.



Fupact ISFL 160 - 3 x 1P.



Fupact ISFL630 with fuse monitor.

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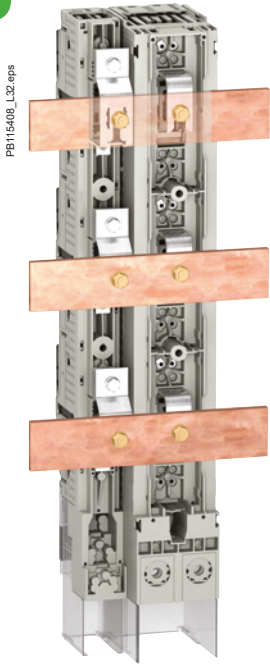
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ISFL installation

Fupact ISFL160

Fupact ISFL fusegear is installed vertically and connected directly to the busbars. The connection is bolted or could be made by the hook-on connection.

A



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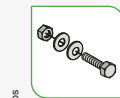
Direct connection to the busbars (ISFL160 and ISFL400).

ISFL160 fusegear

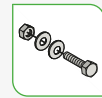
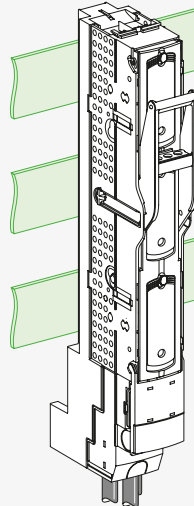
Connection to busbars.

The power circuit is connected:

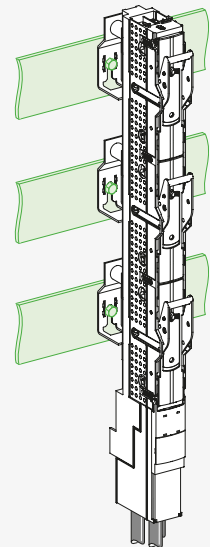
- either directly to the 100 mm busbars for 3-pole version or to the 185 mm busbars for 1-pole version
 - or using a hook-on connection to 60 mm busbars (3-pole version)
 - or via a conversion kit for connection to 185 mm busbars (3-pole version)
 - or via a conversion kit for two devices and for connection to 185 mm busbars.
- Downstream connection of distribution circuits requires cables (3-pole version).



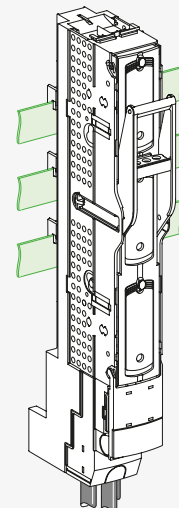
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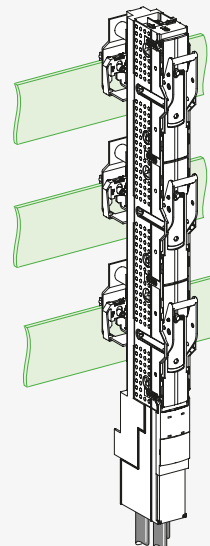
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Functions and characteristics

ISFL installation

Fupact ISFL250 to ISFL1250

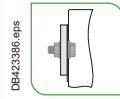
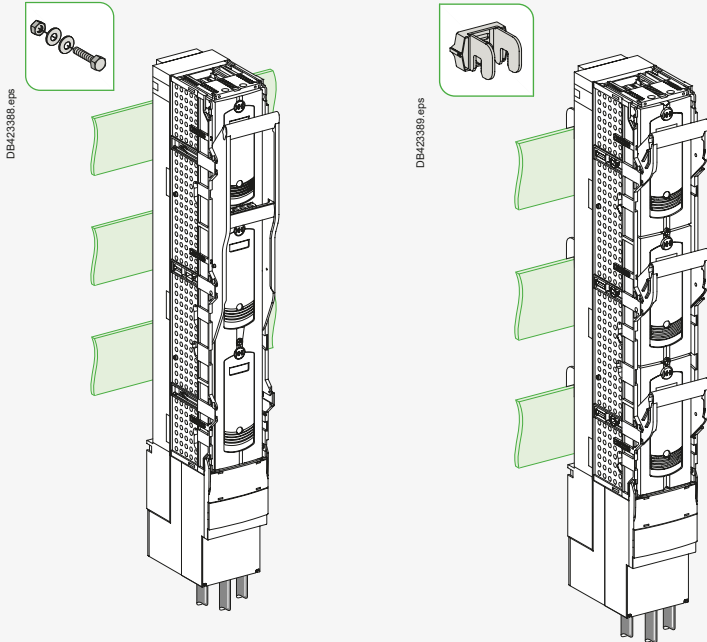


ISFL250/400/630 fusegear

Connection to busbars.

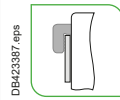
The power circuit is connected:

- either directly to the 185 mm busbars for 1-pole and 3-pole version
- or using a hook-on connection to 185 busbars
- downstream connection of distribution circuits requires cables.



DB423386 eps

Direct connection to the busbars: the device is bolted to the busbars with one connection point per phase that ensures both electrical connection and secure mechanical mounting.



DB423387 eps

Hook-on connection to busbars: the device tightly hooks on to the busbars via three hooks that ensure both electrical connection and secure mechanical mounting.

These two systems ensure direct contact of the power circuit to the busbars and traditional connections for downstream distribution (bare cable connectors, lugs, bars, distribution connectors, etc.).

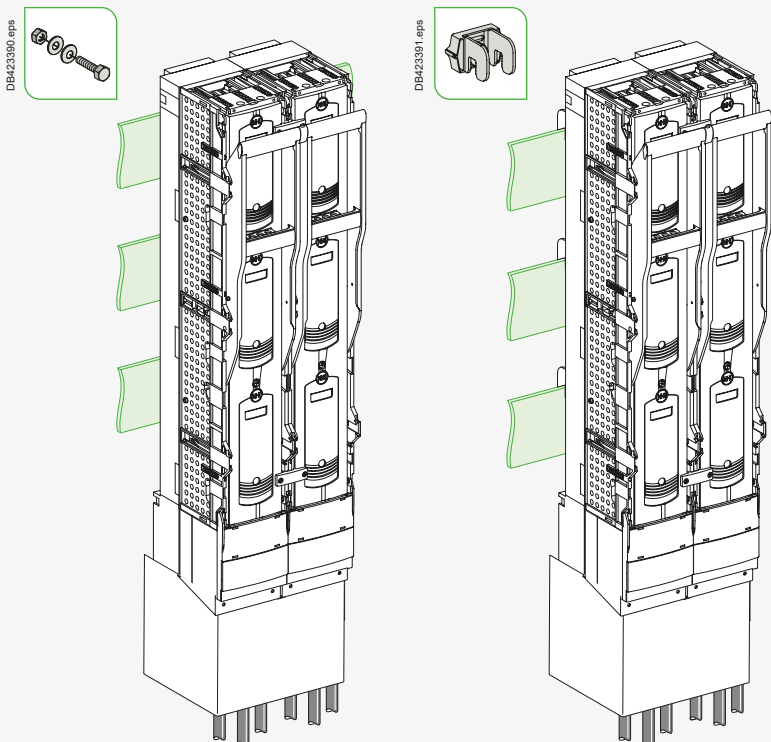
The two connection systems can also be reversed to supply distribution circuits via the upstream terminals.

ISFL1250 fusegear

Connection to busbars.

The power circuit is connected:

- either directly to the 185 mm busbars for 3-pole version
- or using a hook-on connection to 185 mm busbars
- downstream connection of distribution circuits requires cables.



DB423390 eps

DB423391 eps

Connection and accessories

Fupact ISFL160 to ISFL1250 - Connection

Fupact ISFL fuse-switch disconnectors can supply distribution circuits via either the upstream or downstream terminals.
 Devices intended for connection to busbars are configured as standard for distribution via the downstream terminals.

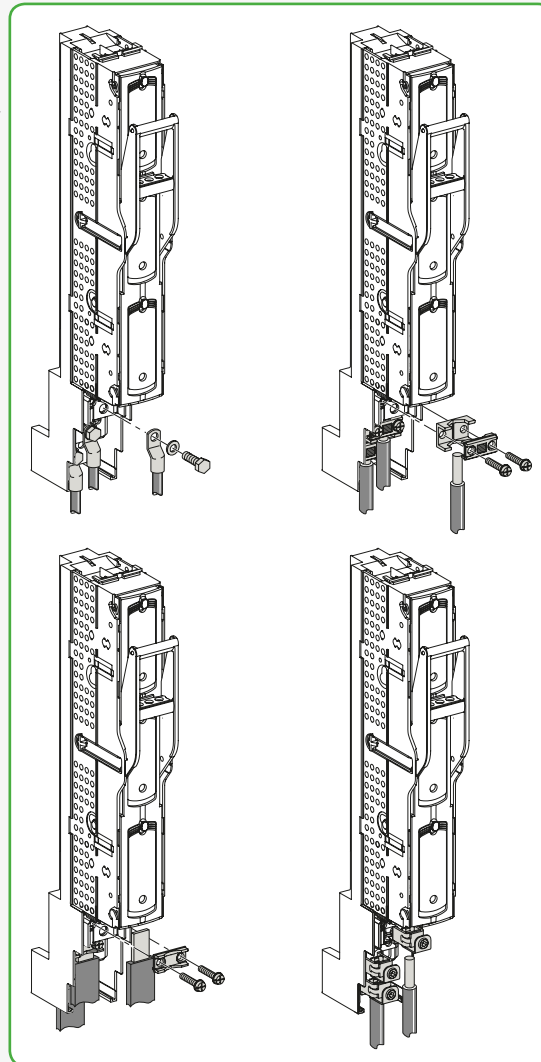
A

ISFL fusegear is equipped as standard with connectors or terminals for front connection of:

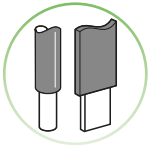
- cables with lugs for the ISFL160 and ISFL1250 devices
- flexible bars for the ISFL160 devices
- bare cables for ISFL160 to 630 devices.

	ISFL160	ISFL250	ISFL400	ISFL630	ISFL1250
Cables					
Lug (as standard)	95 mm ²	-	-	-	-
Cable connector to terminal	1.5 to 95 mm ²	1 x 35 to 300 mm ²	-	-	-
	-	2 x 50 to 185 mm ²	-	-	-
Flexible bars					
Connector	12 x 6 mm	-	-	-	-

ISFL160 fusegear ^[1]



[1] Connections and accessories are identical for ISFL single phase.



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Lug for copper cables.



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Connector for bare Cu/Al cables.



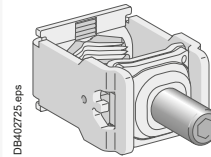
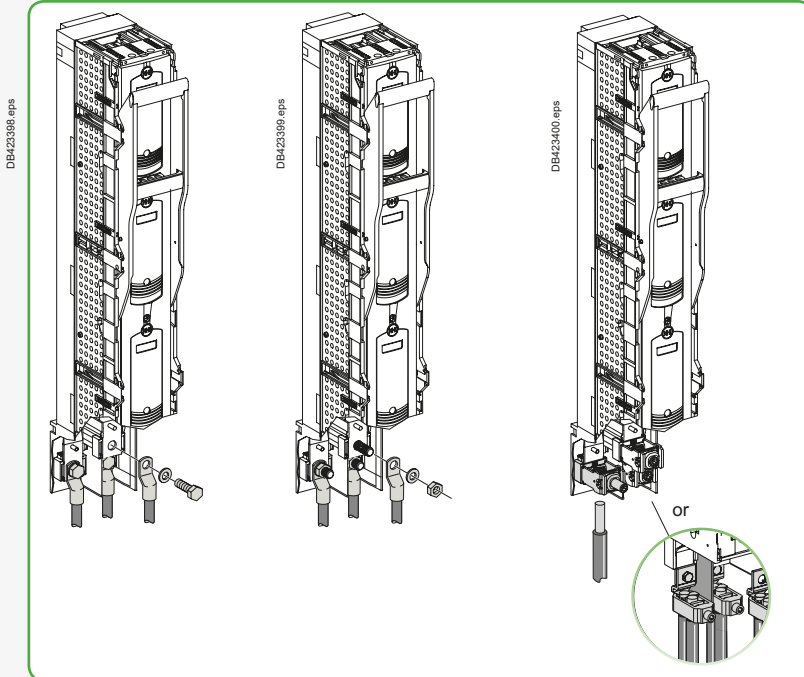
62324a_3.eps

Connector for flexible bars.

Connection and accessories

Fupact ISFL160 to ISFL1250 - Connection

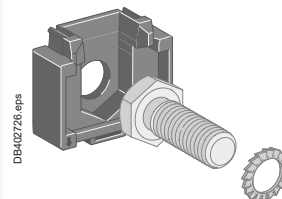
ISFL250/400/630 fusegear [1]



Connector for Cu/Al bare cable 1 x 35 to 300 mm².



Connector for Cu/Al bare cable 2 x 50 to 185 mm².

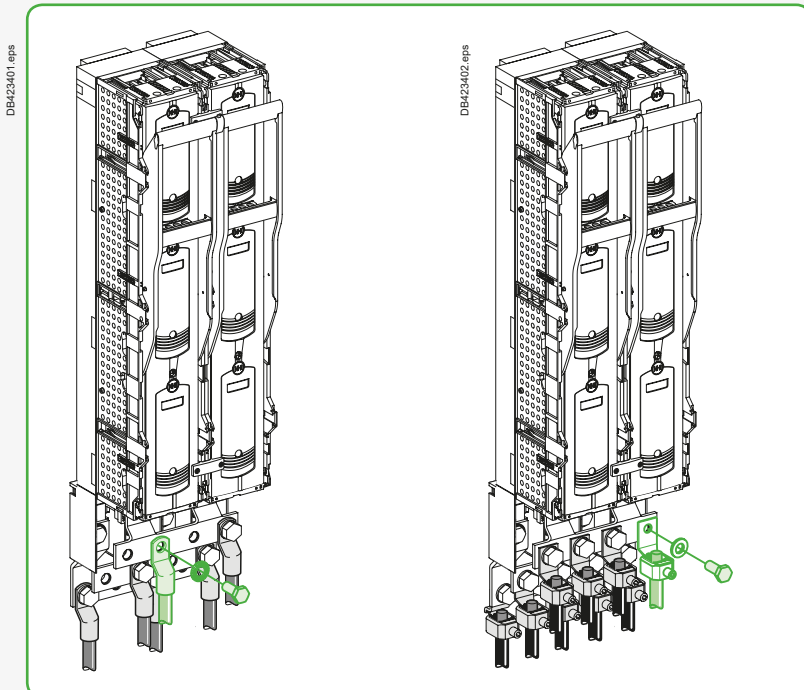


Connector for cables with lugs.



Connector 4 x 240 mm².

ISFL1250 fusegear



[1] Connections and accessories are identical for ISFL single phase.



Connection and accessories

Fupact ISFL160 to ISFL630 - Connection, coupling

Two conversion kits are available for ISFL160 3-pole switchable to adapt the 100 mm standard fixing centres to 185 mm fixing centres.

Direct connection to 185 mm busbars

Conversion from 100 to 185 mm

The kit connects to the busbars via hook-on connection.

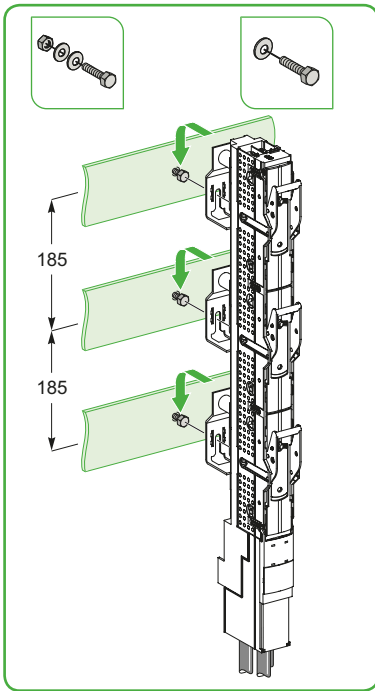
Conversion kit for 185 mm busbars:

■ both electrical and mechanical connection to the busbars is ensured by a set of nuts and bolts.

Electrical and mechanical connection of the device to 100/185 mm conversion kit is ensured by three screws.

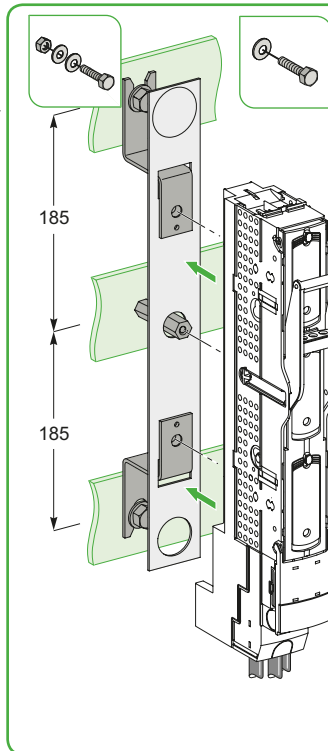
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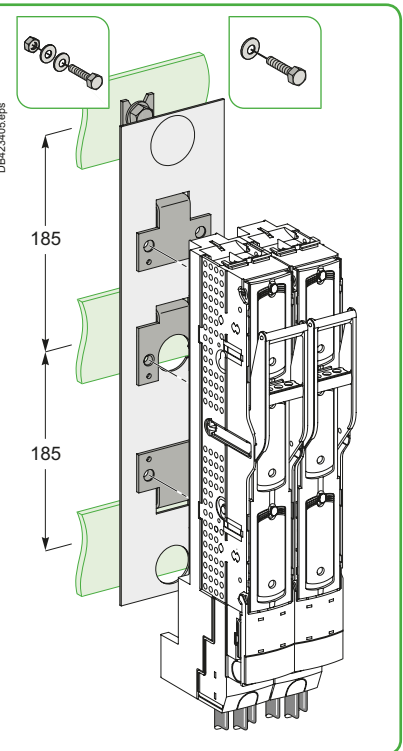


ISFL160 1P.

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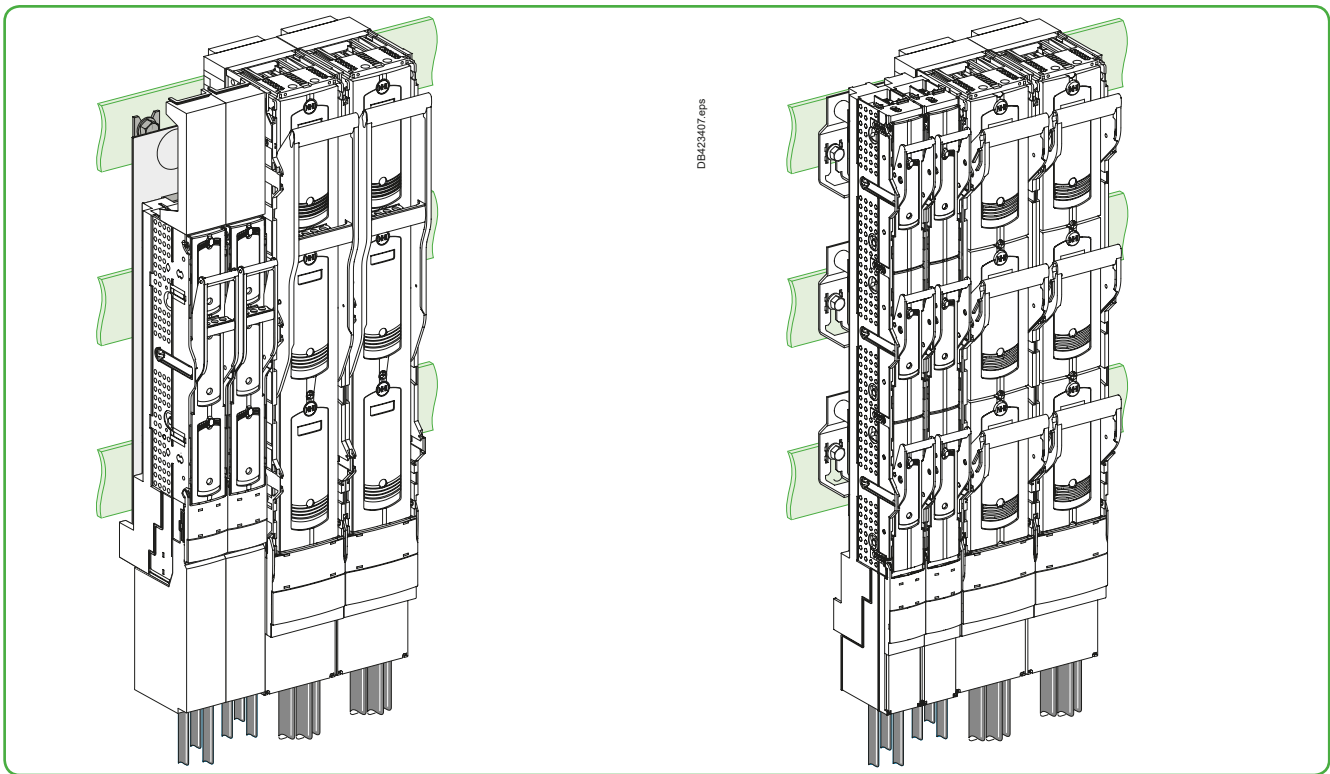


ISFL160 (185 mm kit).

Connection and accessories

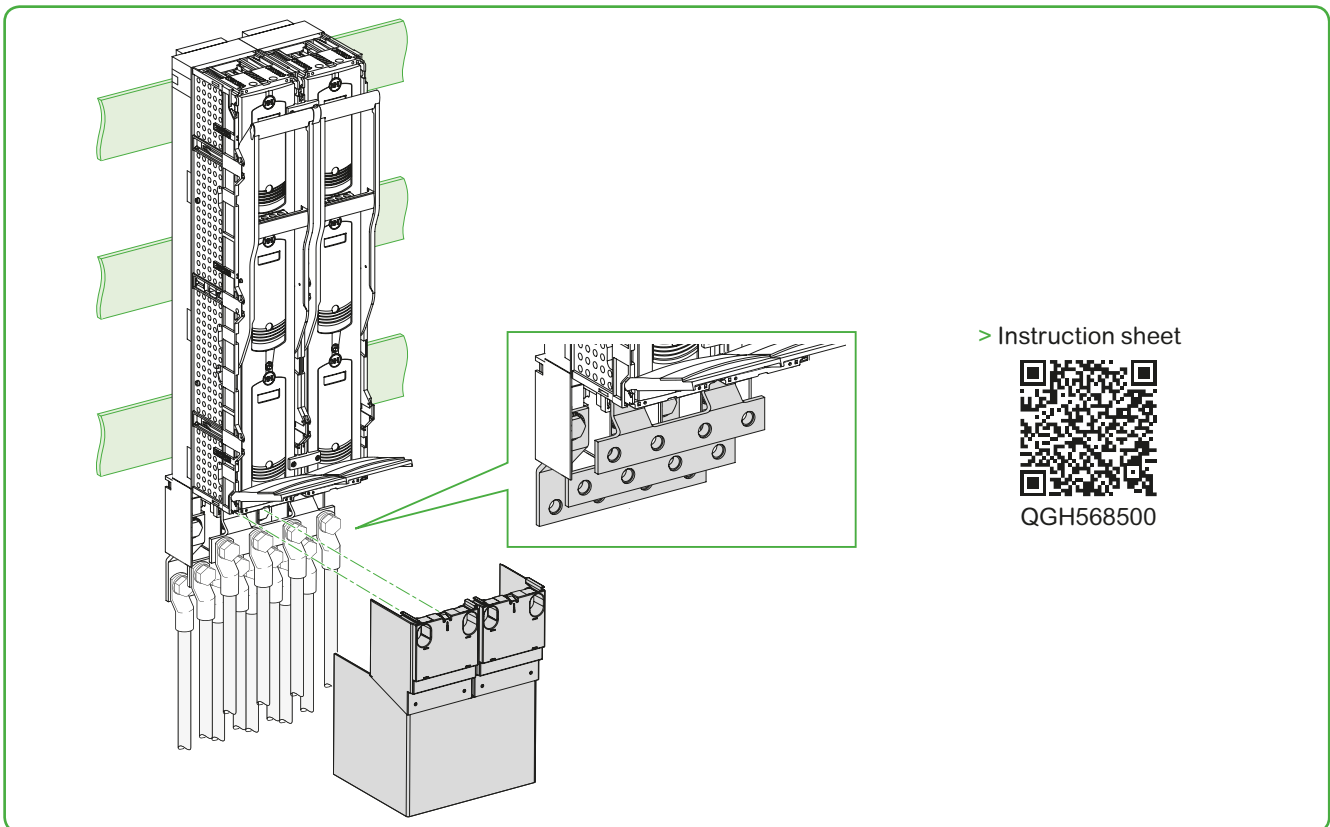
Fupact ISFL160 to ISFL630 - Connection, coupling

Installation of devices with different ratings on a given set of busbars



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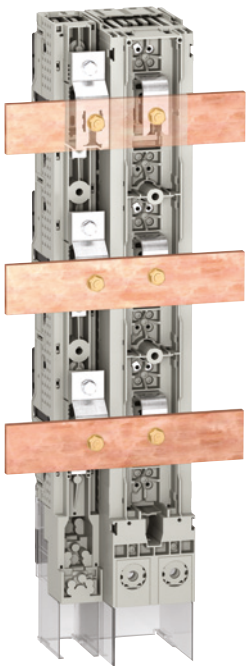
Coupling kit from ISFL250 to ISFL630



Connection and accessories

Fupact ISFL160 to ISFL630 - Reverse distribution

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Direct connection on 185 mm busbar (ISFL160 with ISFL630).

Release tab for the ISFL160:

with the device in open position, press the release tab :

- down, to remove the fuse-carrier assembly from the base
- up, lock the device in open (OFF) position.

Release tab for the ISFL250/400/630:

with the device in open position, press the release tab :

- to remove the fuse-carrier assembly from the base or install it on the base
- up, lock the device in open (OFF) position.

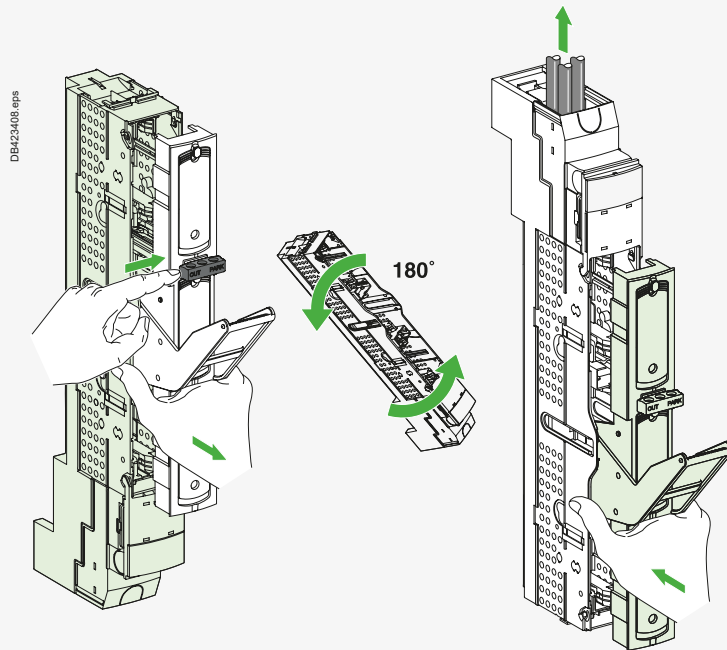
ISFL160 fusegear devices with hook-on connection to 60 mm bars are available in two versions:

- connection via M8 screws
- connection via a 95 mm² terminal.

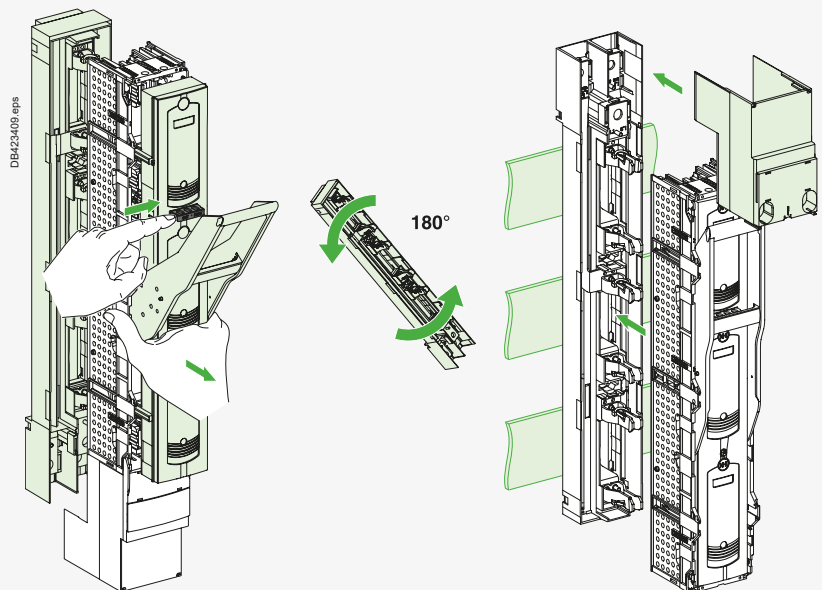
For each of these versions, the distribution reversal mode is achieved by rotating the hooks located at the rear, which gives the possibility of distribution from upstream. The fuse-carrier assembly does not change position.

All the various connection modes could be reversed also.

ISFL160 fusegear with turnable hooks [1]



ISFL250/400/630 fusegear [1]



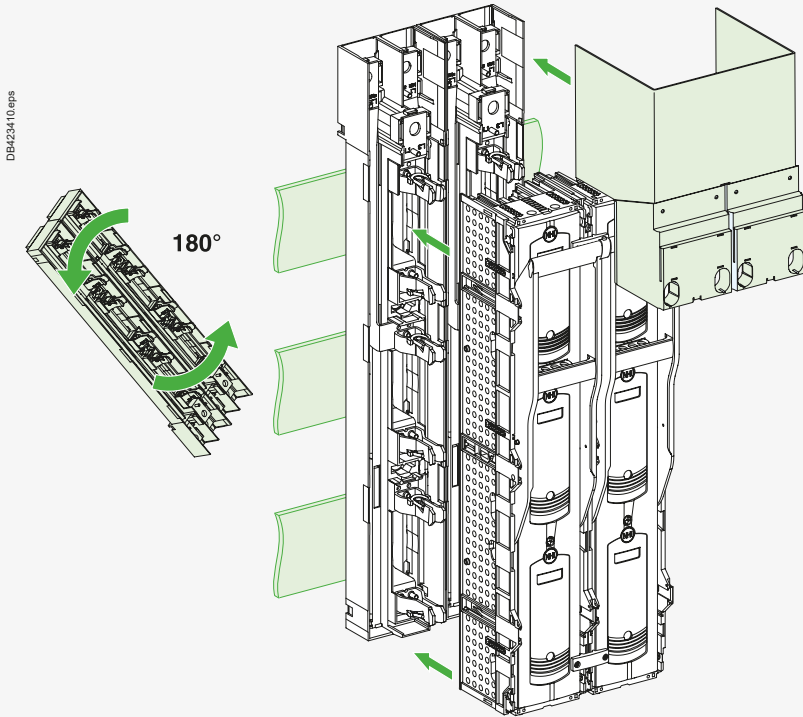
[1] For ISFL 1-pole switchable: identical reversed distribution could be done distribution.

Connection and accessories

Fupact ISFL1250 - Reverse distribution

ISFL1250 fusegear devices can be reversed to have the possibility of distribution from upstream.

ISFL1250 fusegear



Functions and characteristics

Insulation

Fupact ISFL160 to ISFL630

A



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Length adapter.



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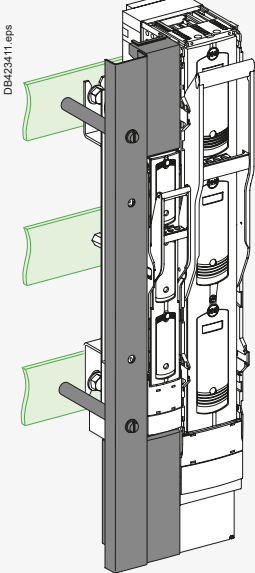
Sideframe door cut out.



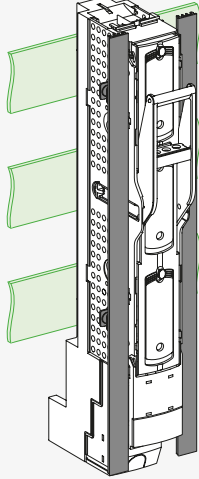
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Sidewise angle bracket for side frame.

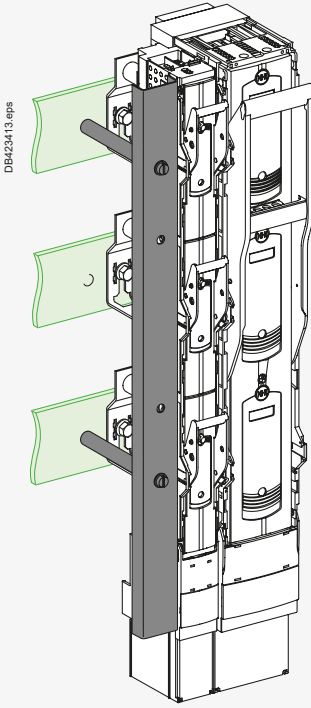
ISFL160 fusegear



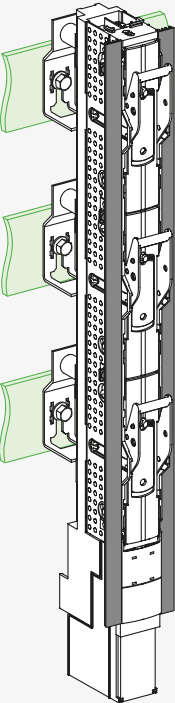
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DB423412.eps



DB423413.eps



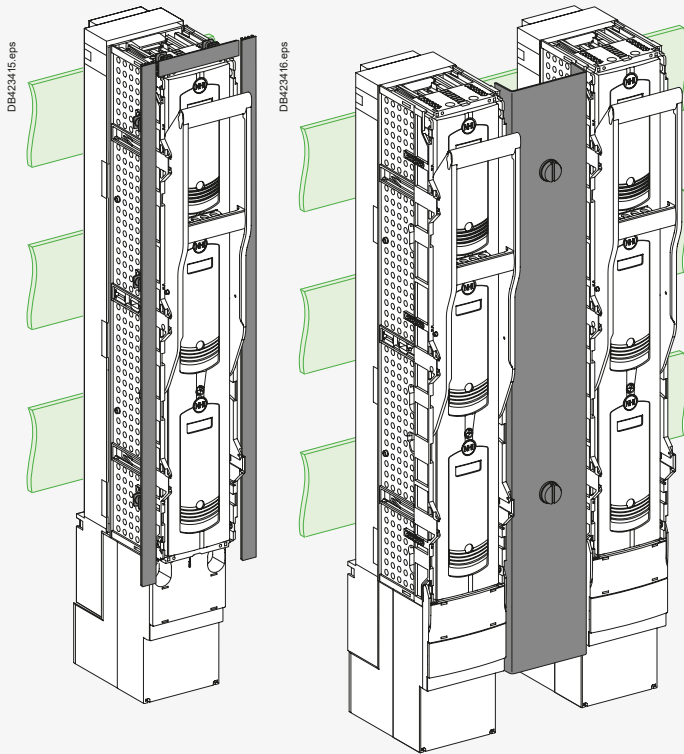
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Functions and characteristics

Insulation

Fupact ISFL250 to ISFL1250

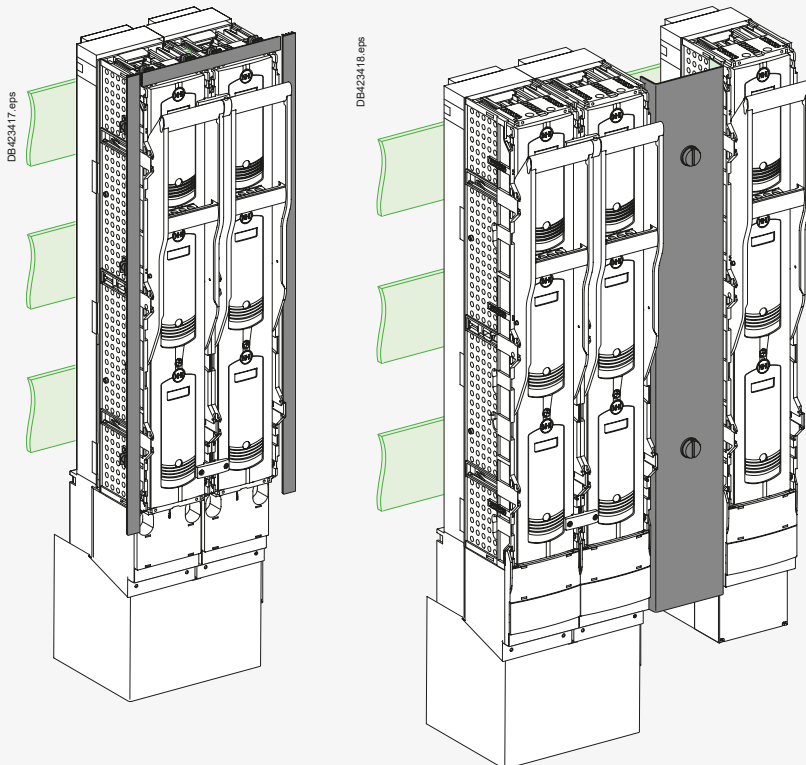
ISFL250/400/630 fusegear^[1]



Blank panel cover.

[1] Accessories are identical for ISFL 1-pole switchable.

ISFL1250 fusegear



Fuse monitor

Fupact ISFL160 to ISFL1250

A



Functions

The device provides remote indication of the standard fuse status (without strikers). It is used to:

- signal a blown fuse
- protect motors from overloads caused by single-phase operation.

Standards

- Compliance with international standard IEC 60947-5-1.
- Compliance with:
 - EN 50204
 - EN 61000 for electromagnetic compatibility (EMC).

Description

- Fuse monitor function only for 3P.
 - Operation with DIN fuses.
 - May be used on capacitor bank circuits.
 - Simplified power supply:
 - does not require a specific power supply
 - operates with unbalanced phases
 - supplied via connection to the fuse terminals on the switch-disconnector fuse
 - operational voltage 400...690 V AC, ±10 %, 50/60 Hz.
 - Tested for electromagnetic compatibility (EMC).
 - ISFL160:
 - it is a fuse-carrier/handle and fuse monitor sub-assembly supplied as a kit composed of:
 - fuse monitor equipped with one NO contact and one NC contact
 - fuse-carrier with the handle
 - the customer must remove his fuse-carrier/handle assembly from his product and replace it with this kit.
 - ISFL250 to 1250:
 - in this case, customer needs to order directly fuse monitor mounted on a product
 - Characteristics:
 - IP20 degree of protection
 - product with fuse monitor must be integrated inside switchboards and not in front face in case of customers wants to have a complete class II insulation.
- Class II insulation with switchboard in front face is ensured only when Fupact ISFL is in closed position.

Note: lugs for connection to the fuse-carrier are not supplied.

Operation

Reset

The device is automatically reset when the fuse-links are replaced.

Indications

- Normal operation:
 - the green LED is ON when voltage is present at the fuse terminals
 - the contacts are in the rest position
- Operation when a fuse is blown:
 - the green LED goes off and the red LED goes on
 - the contacts are actuated:
 - the NO contact is for remote fault indication
 - the NC contact may be used, for example, to control an undervoltage device in order to shut down equipment that may be sensitive to single-phasing.

Fuse monitor

Fupact ISFL160 to ISFL1250

A

Electrical characteristics

Power circuit

Rated operational voltage	(Ue)	400 to 690 V AC 50/60 Hz ±10 %
Consumption		< 3 VA
Rated frequency		50/60 Hz
Measurement impedance		> 1000 Ω/V
Rated impulse withstand voltage (1.2 / 50 µs)	(Uimp)	8 kV

Auxiliary contact output terminals

Terminal indications	NO	13 - 14
	NC	21 - 22
Cable capacity	Flexible	≤ 1.5 mm² Cu
	Rigid	≤ 2.5 mm² Cu

Output contact characteristics (1NO + 1NC)

Conventional thermal current Ith (A)	5
Rated insulation voltage (V)	250
Minimum load	10 mA at 24 V

Characteristics

Utilisation category (IEC 60947-5-1)		AC		DC	
		AC12	AC15	DC12	DC13
Operational current (A)	24 V	-	3	-	2
	48 V	-	3	-	-
	110 V	-	3	-	-
	220/240 V	-	3	-	-
	250 V	-	3	-	-
	380/415 V	-	-	-	-
	440 V	-	-	-	-
660/690 V	-	-	-	-	
Rated operational voltage / max. breaking voltage (V AC)		250/440			
Breaking capacity (VA)		2000			

General characteristics

Operating temperature range (°C)	-25...+55 (≤ 500 V)	-25...+45 (> 500 V)
Storage and transport temperature range (°C)	-40...+70	
Fuse blowing detection time (s)	< 2	
Overvoltage category / degree of pollution	IEC 60947-1 3	
Dielectric test voltage (between power circuit and output terminals)	5 kV rms / 1 min 50 Hz	

Electromagnetic compatibility - emission

Conducted	EN 55022 Class B
Radiated	EN 55022 Class B
Harmonic currents	EN 61000-3-2 Class A

Electromagnetic compatibility - immunity

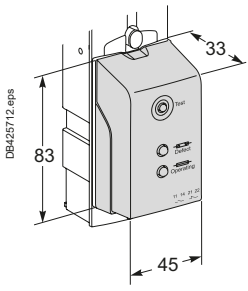
Electrostatic discharge (ESD)	EN 61000-4-2 category B level 2/3
Radiated field susceptibility (RF)	EN 61000-4-3 category A level 3
Surge immunity test	EN 61000-4-5 level 4
Conducted low energy susceptibility (EFT)	EN 61000-4-4 category B level 3
Conducted high energy susceptibility (RF)	EN 61000-4-6 category A level 3
Radio-frequency interference (GSM)	ENV 50204 category A

Magnetic field immunity

Continuous	EN 61000-4-8 level 5
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Mechanical characteristics

Degree of protection	IP20
Weight (fuse monitor alone) (kg)	0.2
Dimensions	



Measurement accessory

Fupact ISFL160 to ISFL1250

The current transformers (CTs) produce a current (1 - 5 A) on the secondary winding that is proportional to the current measured on the primary winding. They can therefore be used in conjunction with measurement devices (ammeters, energy meters), load-shedding devices, control relays, etc.

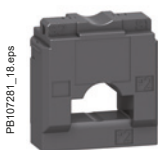
A



Single block current transformer for ISFL160 (1 or 3 CTs).



Current transformer for ISFL160 (1-pole version).



Current transformer for ISFL250/400/630/1250.

Operation and implementation

Fupact ISFL160 to 1250 fusegear can be equipped with tube-unit current transformers (CT).

The CT modules are available in two versions:

- 3-pole module with one or three CTs for ISFL160 fusegear (3-pole version):
 - 1 rating 150 A
- Single-pole module with one CT for ISFL160 (1-pole version) /250/400/630/1250 fusegear:
 - 4 ratings from 150 to 600 A
 - the CT modules clip onto the back of the fusegear
 - connections are made:
 - via terminal blocks for the 3-pole modules (ISFL160) with output current of 1 A
 - via cables directly connected with output current of 5 A.
 - via lugs for the single-pole modules (ISFL160 (1 pole version)/250/400/630/1250).

Selection table

ISFL160 class 1

1-pole version

Ip/5	Ip/1	Power (VA)
150/5	-	5

ISFL160 accuracy class 1

3-pole version

Ip/5	Ip/1	Power (VA)	ISFL250 to 1250 class 1 and 3-pole version	
			Ip/5	Power (VA)
150/5	-	1	150/5	2.5
		1	250/5	5
	2.5	400/5	5	
	150/1	2.5	600/5	5

Environment

- Compliance with standards: IEC 60044-1, NFC 42502, VDE 0414, BS 7626 and IEC 60038-1.
- Degree of protection: IP20.
- Operating temperature range: -25 °C to +70 °C, relative humidity 95 %.
- Storage temperature range: -40 °C to +80 °C.

Technical characteristics

CT electrical characteristics:

- maximum operational voltage: 800 V
- secondary current: 5 A and 1 A
- frequency: 50 to 60 Hz
- continuous overload current: 1.2 In
- safety factor: $F_s \leq 5$.

Transformation ratio:

- Ip/5 A.

Select the ratio just above the measured current (In).

Example: In = 550 A → select a ratio of 600/5.

CT accuracy class:

- the accuracy class depends on the transformer rating and the consumption of the measurement system. Consumption must take into account the devices and cables
- for a given accuracy class, measurement system consumption must not exceed the transformer rating.

Caution:

- never open the secondary circuit of a current transformer when the primary winding is energised
- before any work on the secondary circuit, the terminals of the transformer secondary must be short-circuited.

Functions and characteristics

Measurement accessory

Fupact ISFL160 to ISFL1250

CT accuracy class:

Measurement system

Schneider Electric device	Consumption in VA
72 x 72 mm ammeter	1.1
Analogue ammeter	1.1
Digital IM ammeter	0.5
Digital ammeter	0.3
PM/CM Power Meter	0.15
PM9	0.55

Primary copper cross-section in mm ²	Rating in VA per meter of double wire at 20 °C
1	1
1.5	0.685
2.5	0.41
4	0.254
6	0.169
10	0.0975

For each ten-degree increase in temperature, the power drawn by the cables increases by 4 %.

Example of measurement system consumption at 40 °C:

4 m of 2.5 mm ² double wire	1.7 VA
PM	+ 0.15 VA
Total consumption	= 1.85 VA

The accuracy class of the CT is determined:

- using the selection table
- by the fact that consumption must be < the transformer rating:
 - class 1 for a CT with a ratio of 150/5
 - class 0.5 for a CT with a ratio of 200/5.

If measurement accuracy must be to within 0.5 %, it is necessary to select a CT with a transformation ratio of 200/5.



ISFL250/400/630 (with CT).



ISFL160 (with CT).



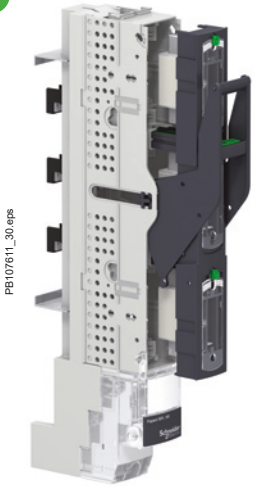
ISFL250 (with CT).



Fuse-link monitoring and testing

Fupact ISFL160 to ISFL1250

A

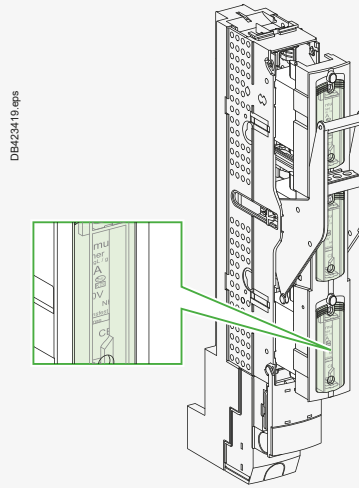


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ISFL160.

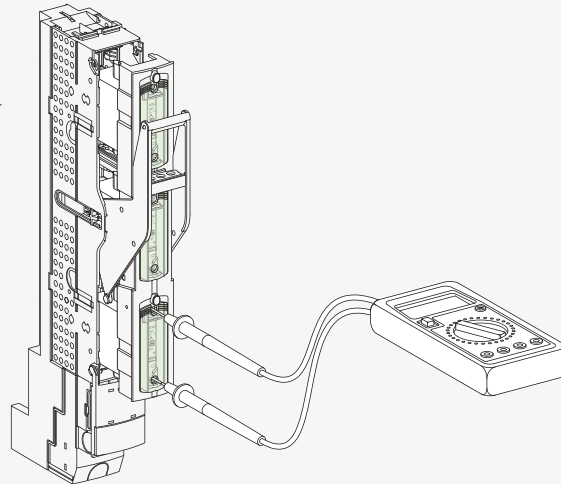
Monitoring ^[1]

ISFL fuse-switch disconnectors are equipped with large windows so that the fuse-link technical characteristics are clearly visible.



DB423419_eps

Testing ^[1]



DB423420_eps

Sliding covers on the front panel provide access to the fuse-link status test points while maintaining the IP20 protection index.

^[1] Monitoring and testing function are the same for ISFL 1-pole switchable.

Functions and characteristics

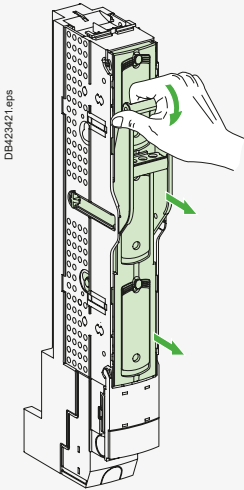
Control, locking and operation

Fupact ISFL160 to ISFL1250

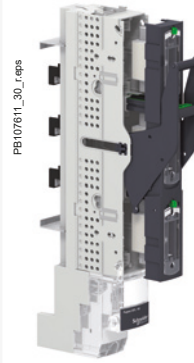
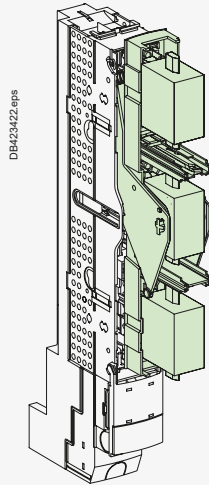


The main moving contacts are controlled by the drawout fuse-carrier assembly for the ISFL devices. In open position, the fuse-switch disconnecter fuse-carrier assembly guarantees isolation with visible break.

Control



Removed sub-assembly [1]



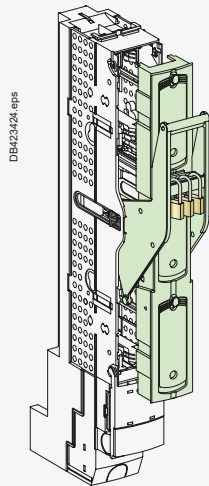
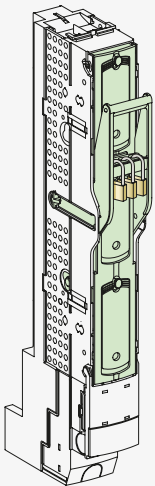
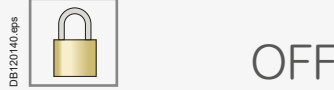
ISFL160.

To ensure safe and visible isolation, for maintenance operations for example, the ISFL fuse switch-disconnector must be put in the "PARK" position by pressing the lock on the front of the product. In this position, the handle is free and the fuses are physically separated from the contacts. The product can then be padlocked (3 x 6 mm dia. padlocks for ISFL160 and 8 mm dia. for other ISFL). Press the lock again to close the product when the padlocks have been removed. Another solution is to removed the upper sub-assembly by pressing the lock in the "OUT" position. After the sub-assembly must be reversed and put directly on the product.

Locking ON [2]



Locking OFF [2]



Access to the fuse-links:
 ■ is automatically blocked on the ISFL devices when the fusegear is closed
 ■ may be protected using padlocks on the ISFL devices.

To lock the fuse-switch disconnecter in closed (ON) or open (OFF) position, the fuse-carrier is equipped as standard with lead-seal or padlocking accessories (not supplied).

Padlocking for the ISFL160 to ISFL630 devices.

[2] Except for ISFL160 - 1P to ISFL630 - 1P.

Locking in open (OFF) position guarantees isolation as defined by IEC 60947-3.

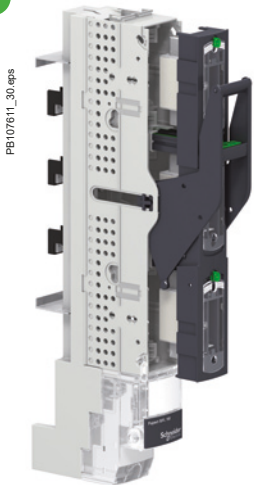
Type	Function	Means	Accessory
ISFL160	Device locking in closed (ON) or open (OFF) position	Padlocks 3 max Ø6	Built-in
ISFL250 to ISFL1250		Padlocks 3 max Ø8	

Control, locking and operation

Fupact ISFL160 to ISFL1250

For Fupact ISFL fusegear devices, the fuse-carrier assembly is used both to control the device and house the fuse-link.

A

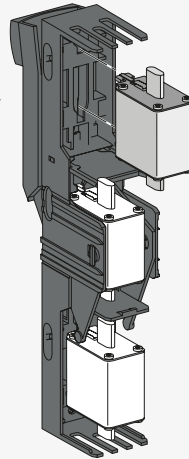


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ISFL160.

Fuse-carriers [1]

Compatibility between ISFL fuse-switch disconnectors and fuse-links (NH)



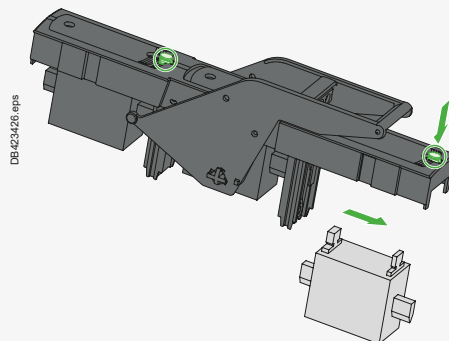
DB-423425.eps

Drawout fuse-carrier assembly for the ISFL 160 to 1250 devices.

Type of DIN fuse-link	NH000	NH00	NH1	NH2	NH3
ISFL160	●	●	-	-	-
ISFL250	-	-	●	-	-
ISFL400	-	-	-	●	-
ISFL630	-	-	-	-	●
ISFL1250	-	-	-	-	●

Insertion and removal of fuse-links

Fuse-links are held in place by clips behind the front panel of the fuse-carriers, thus making removal possible without touching the fuse-links.



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ISFL 160 and ISFL250 to ISFL1250.

[1] Control, locking and operation are the same for ISFL 1-pole switchable.

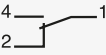
Auxiliary contacts and indications

Fupact ISFL160 to ISFL1250

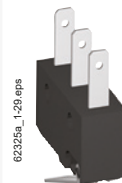
The optional auxiliary contacts carry out indication functions. They provide remote indication of the fuse-switch disconnecter status. They may also be used to indicate and carry out automatic functions such as electrical interlocking.

Standards: compliance with international recommendation IEC60947-5-1.
Description: NC/NO changeover contact.

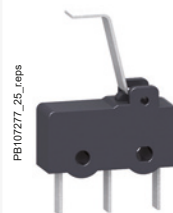
Functional table of contact status

Auxiliary changeover contact		
		Maximum number
ISFL160		2
ISFL250		4
ISFL400		4
ISFL630		4
ISFL1250		8

Auxiliary changeover contact for ISFL160 to 1250			
Rated thermal current I _{th} (A)		2	
Rated insulation voltage (V)		250	
Minimum load		100 mA at 24 V	
		AC12	DC12
Operational current (A)	24 V	2	0.2
	48 V	2	0.2
	110 V	2	0.2
	220/240 V	2	0.2



Auxiliary contact for ISFL160 .



ISFL250/400/630/1250.



Functions and characteristics

Auxiliary contacts and indications

Fupact ISFL160 to ISFL630

A

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Auxiliary contact for ISFL160 .

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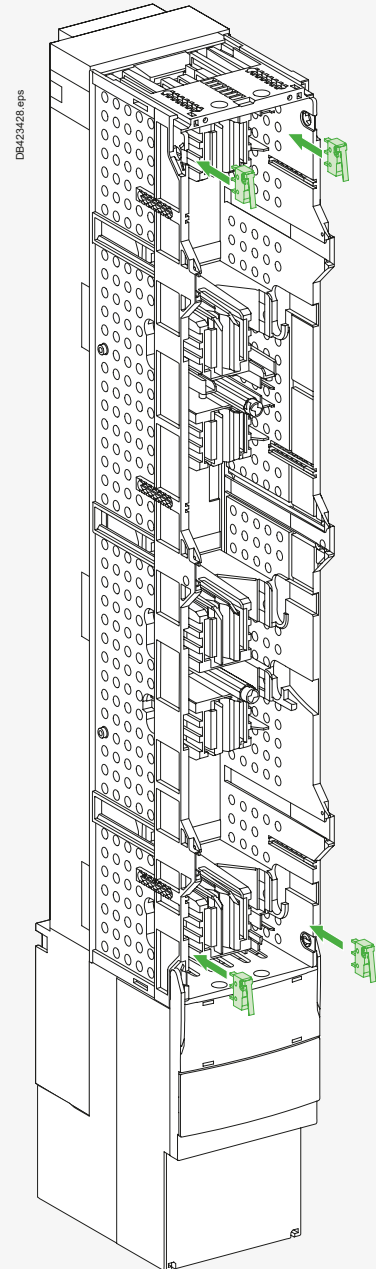
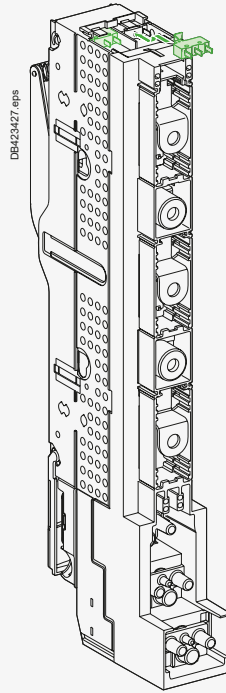


ISFL250/400/630/1250.

Position of auxiliary contacts for ISFL devices

ISFL160

ISFL250/400/630



Functions and characteristics

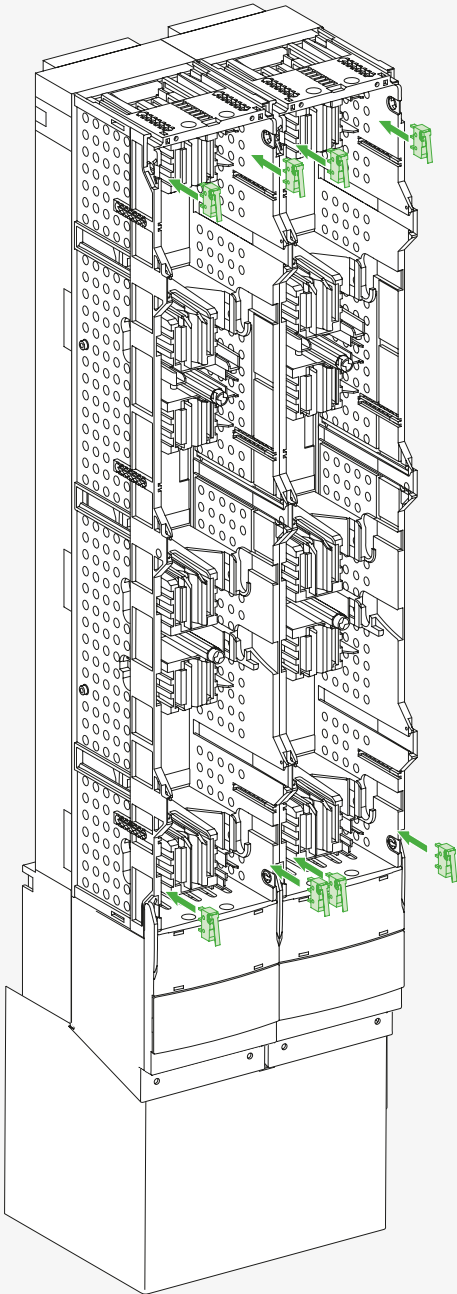
Auxiliary contacts and indications

Fupact ISFL1250

Position of auxiliary contacts for ISFL devices

ISFL1250

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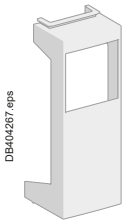
ISFL250/400/630/1250.



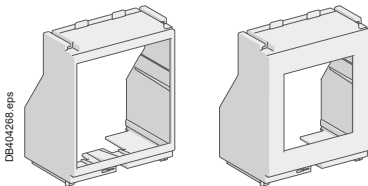
Intelligent measurement

Fupact ISFL160 to ISFL630

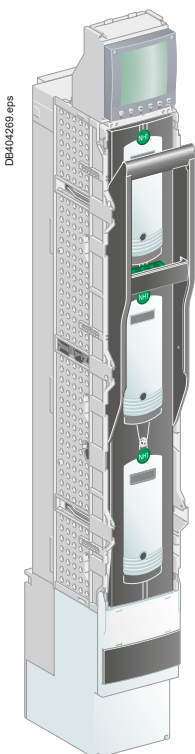
A



Empty plastic box for ISFL160.



Empty plastic box for ISFL250/400/630.



ISFL250-630 + Empty box with power meter

The future belongs to more intelligent switchboards. The new ISFL generation, vertical design, are well prepared for the future: they offer standardised interfaces for all types of measurement devices.

Schneider Electric is offering a complete and large offer of metering devices: PowerLogic range.

PowerLogic series meter - Power Meter

The Power Meter serie offers many high-performance capabilities needed to meter and monitor an electrical installation in a compact unit.

All models include an easy-to-read display that presents measurements for all three phases and neutral at the same time, total harmonic distortion (THD) metering, and alarming on critical conditions.

Some models offer an incremental choice of custom logging and power quality analysis capabilities.

Expand any model with field-installable option modules that offer a choice of additional digital inputs and outputs, analog inputs and outputs, and ethernet port.

Flexible measurement options - the amperemeter

Additional measurement options can be realised with an amperemeter which is adjusted onto the new amperemeter-bracket. The installation is incredibly simple and the returns extremely versatile.

How to install device

- For ISFL160, we can add an empty box to include measurement device:
 - plastic box
 - dimension 46 x 46 mm for the cut-out
 - length: the same as the length adaptor to be able to put the ISFL160 beside ISFL250 to ISFL630
 - fixation by mounting it directly to the top of the product.
- For ISFL250 to 630, we can add empty boxes to include measurement devices:
 - plastic box
 - dimension 72 x 72 mm and 96 x 96 mm for the cut-out
 - fixation by mounting it directly to the top of the product.

A

C



INFC32



INFC63



INFC125

D



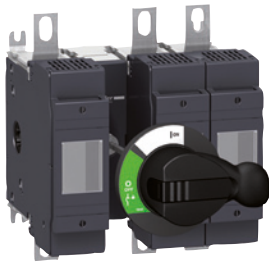
INFD40



INFD63



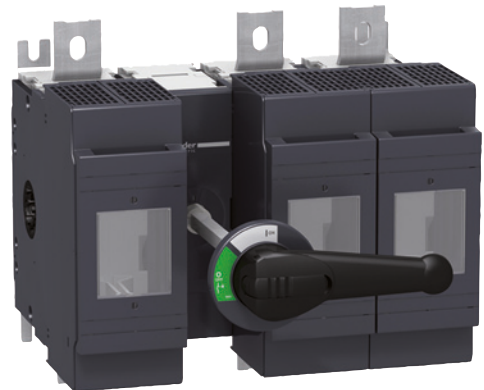
INFD160



INFD200/250



INFD400



INFD630/800

B



INFB32



INFB63



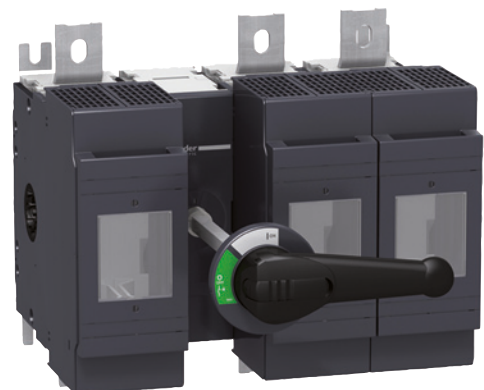
INFB100/160



INFB200/250



INFB400



INFB630/800

Fupact INF

Fuse switch-disconnector selection	
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Wiring diagrams	D-1
Technical characteristics	E-1
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Fuse switch-disconnector selection

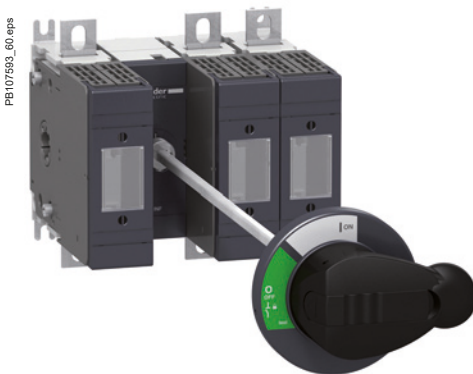
Fupact INF●32 to INF●160



INF32.



INFC63.



INF160.

A

Fuse switch-disconnectors

Number of poles / type of fuse-link	3 poles / 3 fuse-links
	4 poles / 3 fuse-links + switched neutral
	4 poles / 4 fuse-links

Electrical characteristics as defined by IEC 60947-1 / IEC 60947-3 and EN 60947-1 / EN 60947-3

Conventional thermal current (A)	In free air	I_{th}	at 40 °C
			Maximum fuse power dissipation (W)
	In enclosure	I_{the}	at 40 °C
			Maximum fuse power dissipation (W)
Rated insulation voltage (V)		U_i	AC 50/60 Hz / DC
Rated impulse withstand voltage (kV)		U_{imp}	
Rated operational voltage (V)		U_e	AC 50/60 Hz DC
Rated operational voltage AC20 and DC20 (V)		U_e	
Rated operational current (A)		I_e	AC 50/60 Hz
			220/240 V
			380/415 V
			440/480 V ^[1]
			500/525 V
			660/690 V
			DC/poles in series
			250 V/no. of poles
			440 V/no. of poles
			750 V/no. of poles
Rated operational power (kW) ^[3] (motor power given for direct on-line starting)	AC		220/240 V
			380/400 V
			415 V
			500/525 V
			660/690 V
Rated duties			Uninterrupted duty
			Intermittent duty
Rated short-circuit making capacity (kA peak) Switch-disconnector without fuse (refer to single-phase fuse limitation curves)	I_{cm}		415 V
			500 V
			690 V
Rated short-circuit breaking capacity (kA rms) / Rated short-circuit making capacity (kA peak) ^[4]	I_{cn} / I_{cm}		415 V
			500 V
			690 V
Rated short-time withstand current (A rms)	I_{cw}		1 s
			3 s
			20 s
			30 s
Endurance (category A) (CO cycles)			Mechanical
			Electrical AC
			AC22A 500 V
			AC22A 690 V
			AC23A 500 V
			AC23A 690 V

Suitability for isolation

Positive contact indication

Pollution degree

Control

Direct front rotary handle

Extended front rotary handle

Extended lateral rotary handle

Locking by padlocks

Operating torque (typical for 3-pole switch-disconnector fuses) (Nm)

Indication auxiliaries

Auxiliary contacts

Blown-fuse indicator

Fuse monitor

Auxiliary contact test position

[1] Suitable for 480 V NEMA.

[2] AC23B.

[3] Some fuse-links limit these values. Motor starting current must be considered separately.

[4] Switch-disconnector combined with fuses.

Fuse switch-disconnector selection

Fupact INF●32 to INF●160

INF●32		INFD40		INF●63		INFB100		INFC125		INF●160	
NFC-BS		DIN		NFC-DIN-BS		BS		NFC		DIN-BS	
NFC-BS		DIN		NFC-DIN-BS		BS		NFC		DIN-BS	
NFC		DIN		NFC-DIN		-		NFC		DIN	
32		40		63		100		125		160	
3.5		7.5		7.5		12		12		12	
32		40		63		100		125		160	
3.5		7.5		7.5		12		12		10	
1000		1000		1000		1000		1000		1000	
12		12		12		12		12		12	
690		690		690		690		690		690	
250		440		440		440		440		440	
690		1000		1000		1000		1000		1000	
AC22A	AC23A	AC22A	AC23A	AC22A	AC23A	AC22A	AC23A	AC22A	AC23A	AC22A	AC23A
32	32	40	40	63	63	100	100	125	125	160	160
32	32	40	40	63	63	100	100	125	125	160	160
32	32	40	40	63	63	100	100	125	125	160	160
32	32	40	40	63	63	100	100	125	125	160	160
32	32	40	40	63	63 ^[2]	100	100 ^[2]	125	125 ^[2]	160	160 ^[2]
DC22A	DC23A	DC21B	DC23B	DC21B	DC23B	DC21B	DC23B	DC21B	DC23B	DC21B	DC23B
32/2	32/2	40/2	40/2	63/2	63/2	100/2	100/2	125/2	125/2	125/2	125/2
32/4	32/4	40/4	-	50/4	-	100/4	-	125/2	-	125/2	-
-	-	-	-	-	-	-	-	-	-	-	-
8		18.5		18.5		30		37		45	
14		30		30		55		55		75	
15		30		30		55		55		75	
18		37		37		55		55		90	
25		55		55		90		90		132	
class 120-60 %		class 120-60 %		class 120-60 %		class 120-60 %		class 120-60 %		class 120-60 %	
9		17		17		23		29		29	
7.5		17		17		22		22		22	
6		13		13		16		16		16	
80/176		80/176		80/176		80/176		80/176		80/176	
100/220		100/220		100/220		100/220		100/220		100/220	
50/105		50/105		50/105		50/105		50/105		50/105	
1000		2500		2500		5000		5000		5000	
570		1440		1440		2900		2900		2900	
220		560		560		1150		1150		1150	
180		460		460		950		950		950	
10000		10000		10000		10000		10000		10000	
1500		1500		1500		1500		1500		1500	
1500		1500		1500		1500		1500		1500	
1500		1500		1500		1500		1500		1500	
1500		1500		1500		1500		1500		1500	
		yes		yes		yes		yes		yes	
3		3		3		3		3		3	
3		5		5		7		7		7	



Fuse switch-disconnector selection

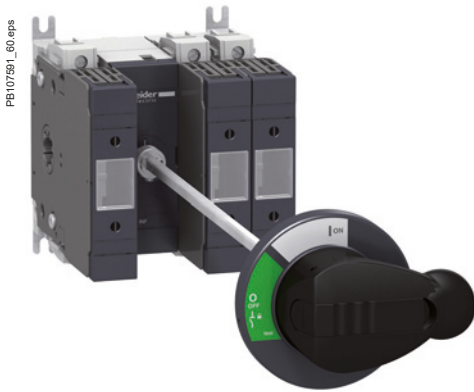
Fupact INF●32 to INF●160

A



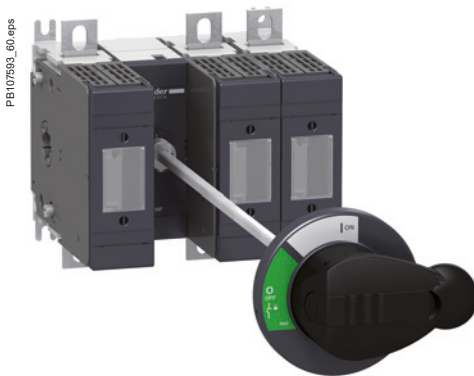
PB11439_eps

INF32.



PB107591_00_eps

INF63.



PB107593_00_eps

INF160.

Fuse switch-disconnectors

Type of fuse-link

NFC	10 x 38
	14 x 51
	22 x 58
DIN (NH)	NH000
	NH00
BS (fixing centres in mm) ^[2]	A1 (44.5)
	A2 (73.0)
	A3 (73.0)
	A4 (93.7)

Installation and connection

- Fixed front connection
- Terminal tightening torque (Nm)
- Fuse-link bolt tightening torque (Nm)

Installation and connection accessories

- Bare cable connectors
- Terminals
- Neutral link
- Terminal shields

Dimensions and weight

Overall dimensions H x W x D (mm)	3P
Front DIN/NFC version	4P
Overall dimensions H x W x D (mm)	3P
Lateral DIN/NFC version	4P
Overall dimensions H x W x D (mm)	3P
Front BS version	4P
Overall dimensions H x W x D (mm)	3P
Lateral BS version	4P
Approximate weight without fuse and without accessory (kg)	3P
	4P

Enclosure dimensions for Ithe

H x W x D (mm)

Temperature derating^{[3][4]}

"Vertical mounting" fuse-links in vertical position	Ith (A)	40 °C
		45 °C
	50 °C	
	55 °C	
	60 °C	
	65 °C	
	70 °C	
"Horizontal mounting" fuse-links in horizontal position	Ithe (A)	35 °C
		40 °C
	45 °C	
	50 °C	
	55 °C	
	60 °C	
	65 °C	
		70 °C

[1] Maximum fuse body diameter: Ø32 mm.

[2] A: fuse-link with centre bolted tags.

[3] Derating data is based on:
- the maximum rating for fuse-links intended for the device
- maximum power dissipation.

[4] For installation on a ceiling, derate an additional 10 %.

Fuse switch-disconnector selection

Fupact INF●32 to INF●160

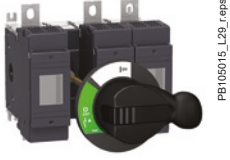


	INF●32	INFD40	INF●63	INFB100	INFC125	INF●160
	○	-	-	-	-	-
	○	-	○ (50 A)	-	-	-
	-	-	○	-	○	-
	-	○	○	-	-	○
	-	-	○	-	-	○
	○	-	-	-	-	-
	○	-	○	○	-	○
	-	-	○	○	-	○
	-	-	-	○ [1]	-	○ [1]
	○	○	○	○	○	○
	2	4	4	M8 x 25	M8 x 25	M8 x 25
	2	3.5	3.5	M5: 3.5 M8: 5	M5: 3.5 M8: 5	M5: 3.5 M8: 5
	○ (standard)	○ (standard)	○ (standard)	○ (optional)	○ (optional)	○ (optional)
	-	-	-	○	○	○
	○	○	○	○	○	○
	-	-	-	○	○	○
	97 x 106 x 105	100 x 114.5 x 120.5	100 x 114.5 x 120.5	140 x 148 x 130	140 x 148 x 130	140 x 148 x 130
	97 x 142 x 105	100 x 138 x 120.5	100 x 138 x 120.5	140 x 183 x 130	140 x 183 x 130	140 x 183 x 130
	97 x 129 x 105	100 x 146.5 x 132.5	100 x 146.5 x 132.5	140 x 181.5 x 142	140 x 181.5 x 142	140 x 181.5 x 142
	97 x 165 x 105	100 x 170 x 132.5	100 x 170 x 132.5	140 x 216.5 x 142	140 x 216.5 x 142	140 x 216.5 x 142
	97 x 106 x 105	100 x 114.5 x 105.5	100 x 114.5 x 105.5	140 x 148 x 114.5	140 x 148 x 114.5	140 x 148 x 114.5
	97 x 142 x 105	100 x 138 x 105.5	100 x 138 x 105.5	140 x 183 x 114.5	140 x 183 x 114.5	140 x 183 x 114.5
	97 x 129 x 105	100 x 146.5 x 120.5	100 x 146.5 x 120.5	140 x 181.5 x 126.5	140 x 181.5 x 126.5	140 x 181.5 x 126.5
	97 x 165 x 105	100 x 170 x 120.5	100 x 170 x 120.5	140 x 216.5 x 126.5	140 x 216.5 x 126.5	140 x 216.5 x 126.5
	0.7	1.1	1.1	1.4	1.4	1.4
	0.9	1.3	1.3	1.8	1.8	1.8
	300 x 350 x 200					
	NFC-BS	DIN	NFC-DIN-BS	BS	NFC	DIN-BS
	32	40	63	100	125	160
	30	37	58	93	116	148
	29	35	56	89	111	142
	27	34	53	85	106	135
	26	32	51	80	100	128
	25	30	48	76	95	121
	24	28	45	71	88	113
	32	40	63	100	125	160
	30	40	61	96	120	154
	28	37	58	93	116	148
	27	35	56	89	111	142
	25	34	53	85	106	135
	24	32	51	80	100	128
	22	30	48	76	94	121
	21	28	45	71	88	113

Fuse switch-disconnector selection

Fupact INF●200 to INF●800

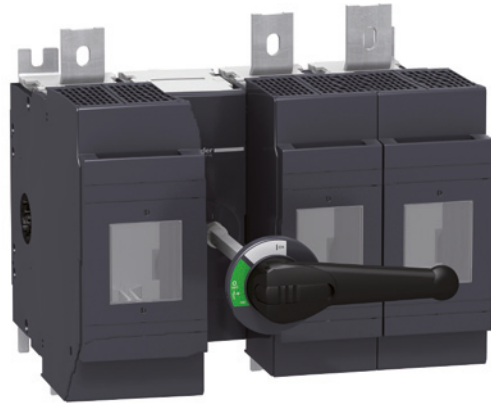
A



INF200.



INF400.



INF800.

Fuse switch-disconnectors

Number of poles / type of fuse-link	3 poles / 3 fuse-links
	4 poles / 3 fuse-links + switched neutral
	4 poles / 4 fuse-links

Electrical characteristics as defined by IEC 60947-1 / IEC 60947-3 and EN 60947-1 / EN 60947-3

Conventional thermal current (A)	In free air	I_{th}	at 40 °C
	Maximum fuse power dissipation (W)		
	In enclosure	I_{the}	at 40 °C
	Maximum fuse power dissipation (W)		
Rated insulation voltage (V)	U_i	AC 50/60 Hz / DC	
Rated impulse withstand voltage (kV)	U_{imp}		
Rated operational voltage (V)	U_e	AC 50/60 Hz	
	DC		
Rated operational voltage AC20 and DC20 (V)	U_e		
Rated operational current (A)	I_e	AC 50/60 Hz	
	220/240 V		
	380/415 V		
	440/480 V ^[1]		
	500/525 V		
	660/690 V		
	DC/poles in series		
125 V/nbr of poles			
250 V/nbr of poles			
500 V/nbr of poles			
750 V/nbr of poles			
Rated operational power (kW) ^[2] (motor power given for direct on-line starting)	AC	220/240 V	
		380/400 V	
		415 V	
		500/525 V	
		660/690 V	
Rated duties	Uninterrupted duty		
	Intermittent duty		
Rated short-circuit making capacity (kA peak) Switch-disconnector without fuse (refer to single-phase fuse limitation curves)	I_{cm}	415 V	
		500 V	
		690 V	
Rated short-circuit breaking capacity (kA rms) / Rated short-circuit making capacity (kA peak) ^[3]	I_{cn} / I_{cm}	415 V	
		500 V	
		690 V	
Rated short-time withstand current (A rms)	I_{cw}	1 s	
		3 s	
		20 s	
		30 s	
		Endurance (category A) (CO cycles)	
Mechanical			
Electrical AC			
AC22A 500 V			
AC22A 690 V			
AC23A 500 V			
AC23A 690 V			

Suitability for isolation
Positive contact indication
Pollution degree

Control

Direct front rotary handle
Extended front rotary handle
Extended lateral rotary handle
Locking by padlocks
Operating torque (typical for 3-pole switch-disconnector fuses) (Nm)

Indication auxiliaries

Auxiliary contacts
Blown-fuse indicator
Fuse monitor
Auxiliary contact test position

[1] Suitable for 480 V NEMA.

[2] Some fuse-links limit these values.

Motor starting current must be considered separately.

[3] Switch-disconnector combined with fuses.

[4] Category B.

[5] Only for DIN fuse-links.

Fuse switch-disconnector selection

Fupact INF●200 to INF●800

A

INF●200		INF●250		INF●400		INF●630		INF●800	
DIN-BS		DIN-BS		DIN-BS		DIN-BS		DIN-BS	
DIN-BS		DIN-BS		DIN-BS		DIN-BS		DIN-BS	
DIN		DIN		DIN		DIN		DIN	
200		250		400		630		800	
17		23		45		60		65	
200	180	250	230	400	360	570		720	
15	18	20	27	30	37	50		55	
1000		1000		1000		1000		1000	
12		12		12		12		12	
690		690		690		690		690	
750		750		750		750		750	
1000		1000		1000		1000		1000	
AC22A	AC23A	AC22A	AC23A	AC22A	AC23A	AC22A	AC23A	AC22A	AC23A
200	200	250	250	400	400	630	630	800	800
200	200	250	250	400	400	630	630	800	800
200	200	250	250	400	400	630	630	800	800
200	200	250	250	400	400	630	630	800	800
200	200	250	250	400	400	630	630	800	800
DC22A	DC23A	DC22A	DC23A	DC22A	DC23A	DC22A	DC23A	DC22A	DC23A
200/1	200/1	250/1	250/1	400/2	400/2	630/1	630/1	800/1	800/1
200/2	200/2	250/2	250/2	400/3	400/3	630/2 ^[4]	630/2 ^[4]	800/2 ^[4]	800/2 ^[4]
200/3	200/3	250/3	250/3	400/4 ^[4]	400/4 ^[4]	630/3 ^[4]	630/3 ^[4]	720/3 ^[4]	720/3 ^[4]
180/4	180/4	230/4	230/4	400/4 ^[4]	400/4 ^[4]	630/4 ^[4]	630/4 ^[4]	720/4 ^[4]	720/4 ^[4]
60		75		132		200		250	
110		140		220		355		450	
110		145		230		355		450	
132		170		280		450		560	
200		250		400		630		710	
⊙		⊙		⊙		⊙		⊙	
class 120-60 %		class 120-60 %		class 120-60 %		class 120-60 %		class 120-60 %	
35		40.5		59		77		77	
37.5		37.5		63.5		83		83	
28		28		48		55		55	
80/176		80/176		80/176		80/176		80/176	
100/220		100/220		100/220		100/220		100/220	
80/176		80/176		80/176		80/176		80/176	
8000		8000		14000		18000		18000	
4620		4620		8080		10400		10400	
1790		1790		3130		4000		4000	
1460		1460		2550		3300		3300	
10000		10000		8000		5000		5000	
1000		1000		1000		1000		500	
1000		1000		1000		1000		500	
1000		1000		1000		1000		500	
1000		1000		1000		1000		500	
⊙		⊙		⊙		⊙		⊙	
⊙		⊙		⊙		⊙		⊙	
3		3		3		3		3	
⊙		⊙		⊙		⊙		⊙	
⊙		⊙		⊙		⊙		⊙	
-		-		-		-		-	
⊙		⊙		⊙		⊙		⊙	
7		7		19		38		38	
⊙		⊙		⊙		⊙		⊙	
⊙ ^[5]		⊙ ^[5]		⊙ ^[5]		⊙ ^[5]		⊙ ^[5]	
⊙		⊙		⊙		⊙		⊙	
⊙		⊙		⊙		⊙		⊙	

Fuse switch-disconnector selection

Fupact INF●200 to INF●800

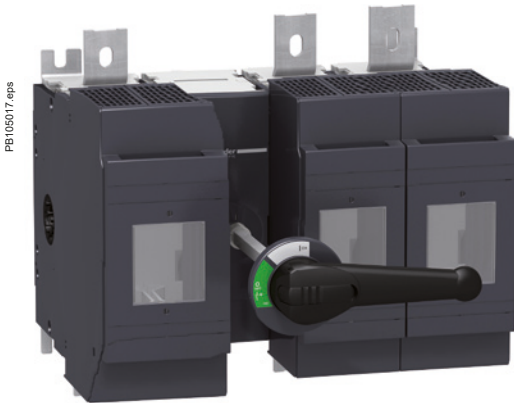
A



INF200.



INF400.



INF800.

Fuse switch-disconnectors

Type of fuse-link

DIN (NH)	NH (0)
	NH (0, 1)
	NH (0, 1, 2)
	NH (3)
BS (fixing centres in mm) ^[1]	B1 (111)
	B2 (111)
	B3 (111)
	B4 (111)
	C1 (133)
	C2 (133)
	C3 (133)

Installation and connection

Fixed front connection
Terminal tightening torque (Nm)
Fuse-link bolt tightening torque (Nm)

Installation and connection accessories

Bare cable connectors
Terminals
Neutral link
Terminal shields

Dimensions and weight

Overall dimensions H x W x D (mm)	3P (DIN)
	3P (BS)
	4P (DIN)
	4P (BS)
Approximate weight without fuses (kg)	3P
	4P

Enclosure dimensions for Ithe

H x W x D (mm)

Temperature derating ^{[2] [3]}

"Vertical mounting" fuse-links in vertical position	Ith (A)	40 °C
		45 °C
		50 °C
		55 °C
		60 °C
		65 °C
"Horizontal mounting" fuse-links in horizontal position	Ith (A)	35 °C
		40 °C
		45 °C
		50 °C
		55 °C
		60 °C
		65 °C
		70 °C

[1] B: fuse-link with offset bolted tags.

[2] Derating data is based on:
- the maximum rating for fuse-links intended for the device
- maximum power dissipation.

[3] For installation on a ceiling, derate an additional 10 %.

[4] Maximum fuse body diameter: Ø 52 mm.

[5] Maximum fuse body diameter: Ø 62 mm.

Fuse switch-disconnector selection

Fupact INF●200 to INF●800



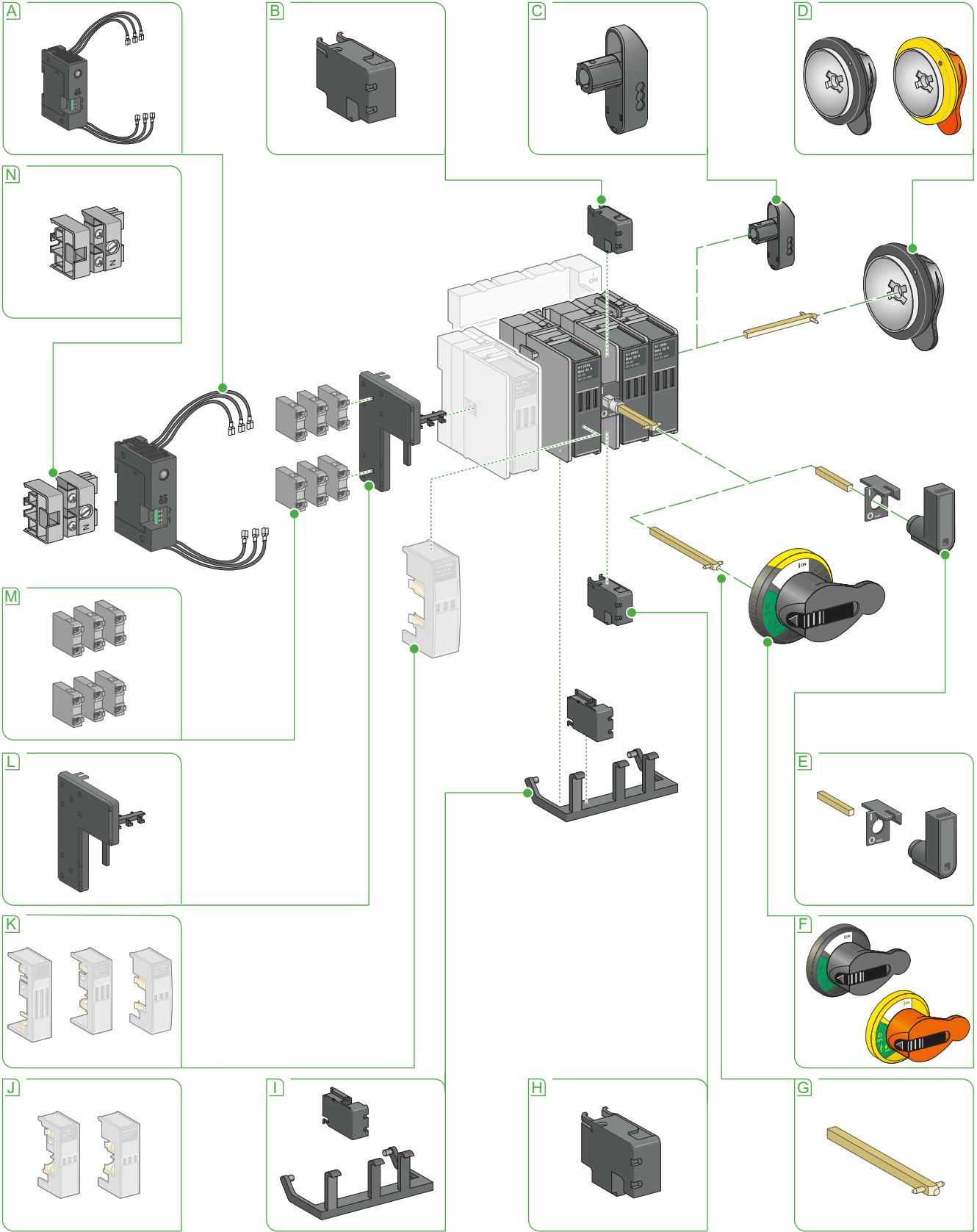
	INF●200	INF●250	INF●400	INF●630	INF●800
	○	-	-	-	-
	-	○	-	-	-
	-	-	○	-	-
	-	-	-	○	○
	○	○	○	-	-
	○	○	○	-	-
	-	○ ^[4]	○	-	-
	-	-	○ ^[5]	-	-
	-	-	-	○	○
	-	-	-	○	○
	-	-	-	-	○
	○	○	○	○	○
	15-22	30-44	30-44	50-75	50-75
	4	5	20	M10 : 30 M12 : 40	M10 : 30 M12 : 40
	○ (optional)	○ (optional)	○ (optional)	○ (optional)	○ (optional)
	○	○	○	○	○
	○	○	○	○	○
	○	○	○	○	○
	199 x 175.5 x 149	193 x 206 x 154	230 x 254 x 193	306 x 341 x 233	306 x 341 x 233
	199 x 175.5 x 130		230 x 254 x 176		
	199 x 219 x 149	193 x 260 x 154	230 x 318 x 193	306 x 429 x 233	306 x 429 x 233
	199 x 219 x 130		230 x 318 x 176		
	2.6	3.1	5.7	11.5	11.5
	3.6	4.1	7.7	14.4	14.4
	600 x 350 x 300	800 x 400 x 330	610 x 508 x 254	800 x 1000 x 330	800 x 1000 x 330
	DIN-BS	DIN-BS	DIN-BS	DIN-BS	DIN-BS
	200	250	400	630	800
	185	232	370	583	741
	177	222	355	558	709
	169	211	338	532	676
	160	200	321	505	641
	151	189	302	476	605
	141	177	283	446	566
	200	250	400	570	720
	193	241	385	549	694
	185	231	370	528	667
	177	222	355	505	638
	169	211	338	482	609
	160	200	321	457	577
	151	189	302	431	544
	141	177	283	403	509

Accessories and auxiliaries

Fupact INF●32

A

DB423968 eps

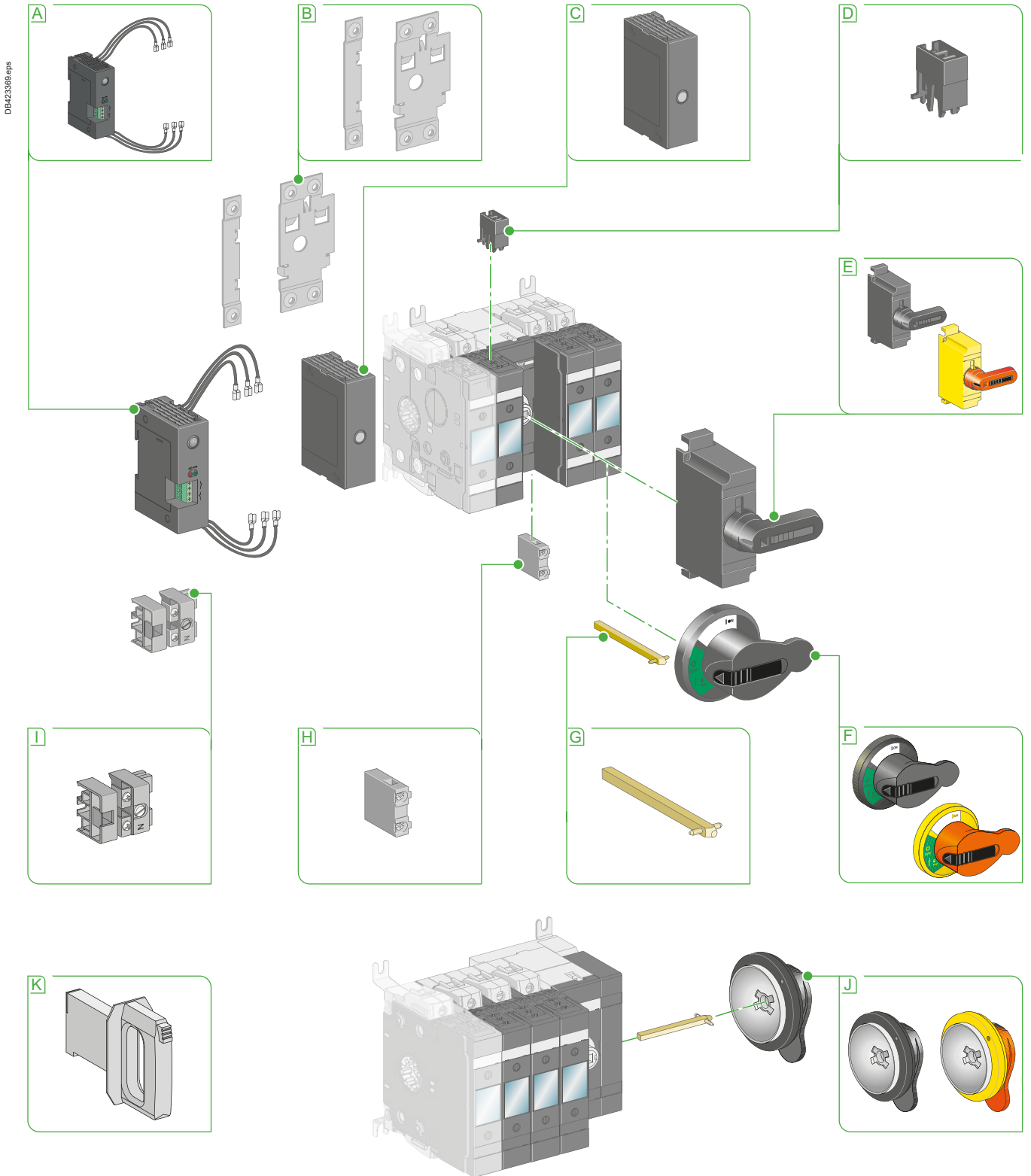


- A** Fuse monitor
- B** NO/NC auxiliary contact
- C** Direct lateral handle
- D** Extended lateral handles
- E** Direct front handle
- F** Extended front handles
- G** 430 mm extension shaft
- H** NO/NC auxiliary contact
- I** Blown-fuse indicator
- J** NFC fuse-carriers
- K** BS fuse-carriers
- L** Contact support
- M** NO or NC auxiliary contacts

Functions and characteristics

Accessories and auxiliaries

Fupact INF40 - INF63



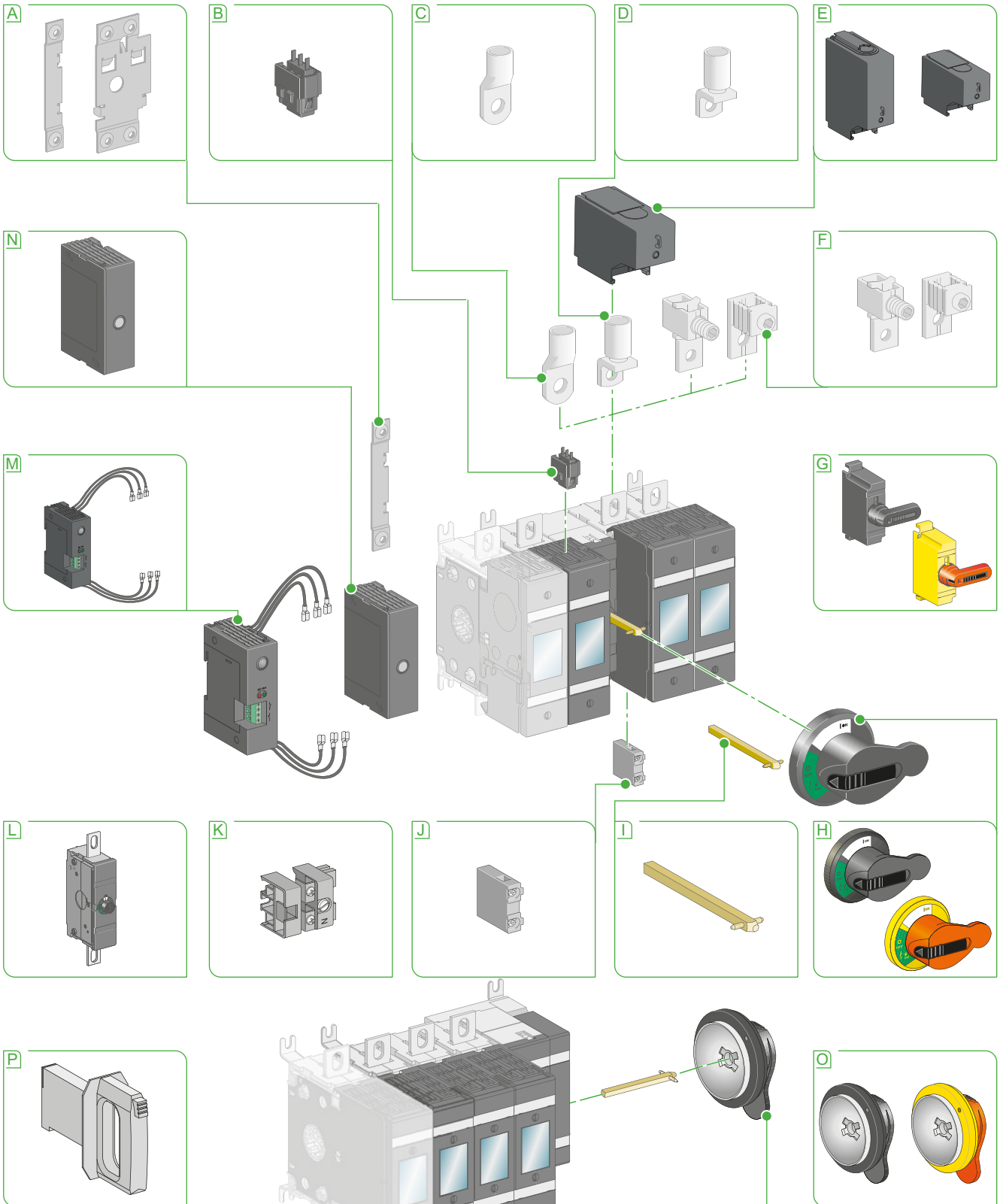
- A** Fuse monitor
- B** DIN rail
- C** Module for auxiliary contact
- D** Blown-fuse indicator
- E** Direct front handle
- F** Extended front handles
- G** 430 mm extension shaft
- H** NO or NC auxiliary contacts
- I** External neutral link
- J** Extended lateral handles
- K** Fuse replacement handle

Accessories and auxiliaries

Fupact INFB100 to INF●160

DBP23370/eps

A

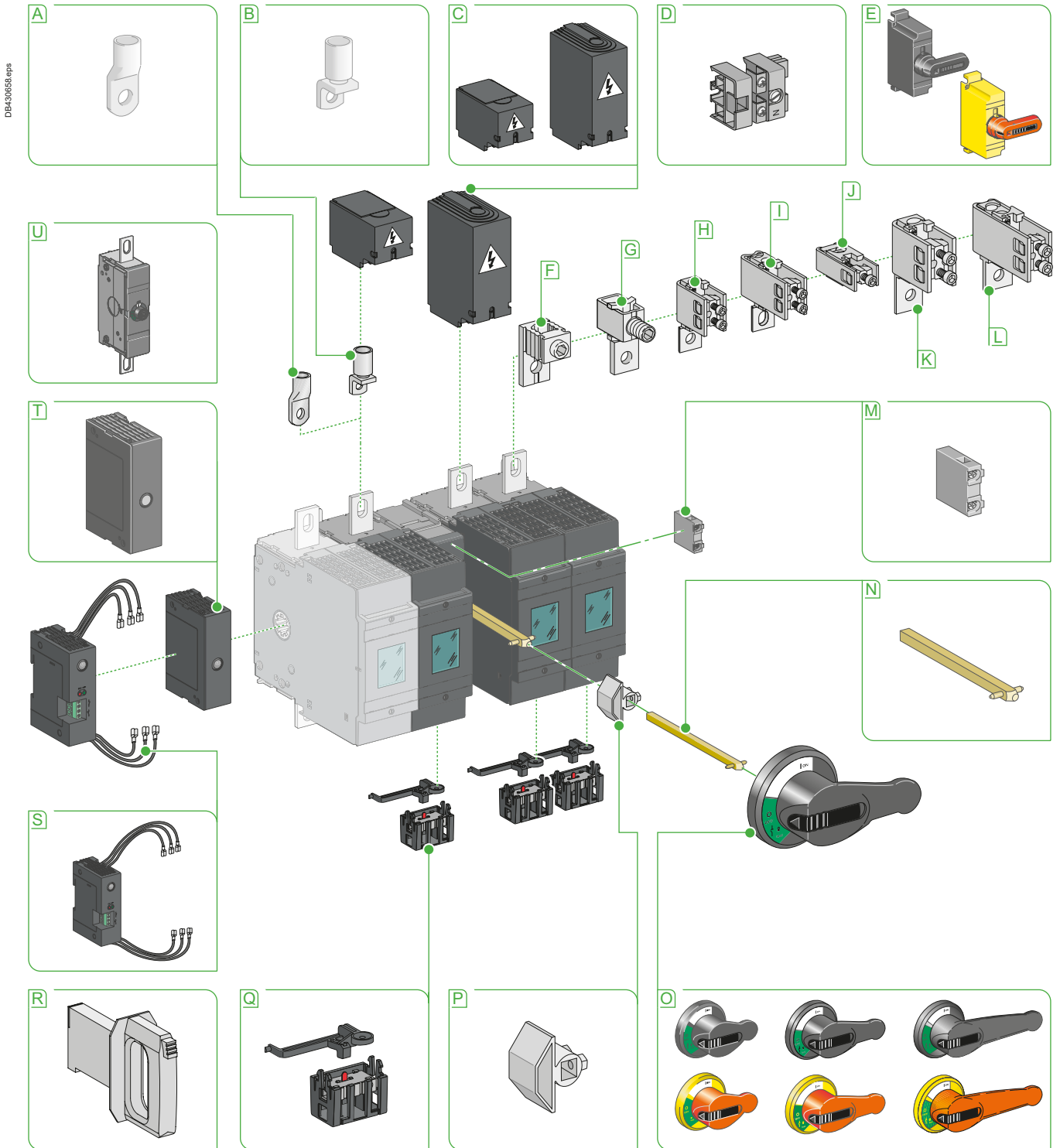


- | | | | |
|-----------------------------------|--|--------------------------------------|---------------------------------------|
| A DIN rail | E Terminal shield | I 430 mm extension shaft | M Fuse monitor |
| B Blown-fuse indicator | F Bare cable 25 to 20 mm ² | J NO or NC auxiliary contacts | N Module for auxiliary contact |
| C Lug for copper cables | G Direct front handle | K External neutral link | O Extended lateral handles |
| D Lug for aluminium cables | H Extended front handles | L Removable neutral link | P Fuse replacement handle |

Functions and characteristics

Accessories and auxiliaries

Fupact INF●200 to INF●800



DB-3065eps

A

- | | | |
|---|--|---------------------------------------|
| A Lug for copper cables | I Bare cable connector 2 x 95 to 185 mm ² Al/Cu | Q Blown-fuse indicator |
| B Lug for aluminium cables | J Bare cable connector 95 to 240 mm ² Al/Cu | R Fuse replacement handle |
| C Terminal shield | K Bare cable connector 95 to 300 mm ² Al/Cu | S Fuse monitor |
| D External neutral link | L Bare cable connector 2 x 185 to 300 mm ² Al/Cu | T Module for auxiliary contact |
| E Direct front handle | M NO or NC auxiliary contacts | U Removable neutral link |
| F Bare cable connector 6 to 95 mm ² Al | N 430 mm extension shaft | |
| G Bare cable connector 25 to 95 mm ² Steel | O Extended front handles | |
| H Bare cable connector 95 to 185 mm ² Al/Cu | P Handle locking by keylock | |

General characteristics: INF

Fupact INF●32 to INF●800

A



PE107607_43.eps

Emergency-off switch-disconnector fuse.

Emergency-off (safety) switch-disconnector fuses

The Fupact switch-disconnector fuses can be used as emergency-off devices. For this application, it must be easily visible, accessible and identifiable (see standards and rules concerning the safety of machines: VDE 0660, VDE 0113, CNOMO...).

For easy identification, the emergency-off switch-disconnector fuses use special colours stipulated by the standards and different from those of the standard version:

- yellow for the front face of the device or the control plate
- red for the handle.

The performance characteristics of the Fupact emergency-off switch-disconnector fuse are the same as those of the standard version.

The emergency-off switch-disconnector fuses are available:

- for extended handle versions:
 - on the front for the entire range
 - at the side for ratings < 200 A
- for direct front control models from INF●200 to INF●800.

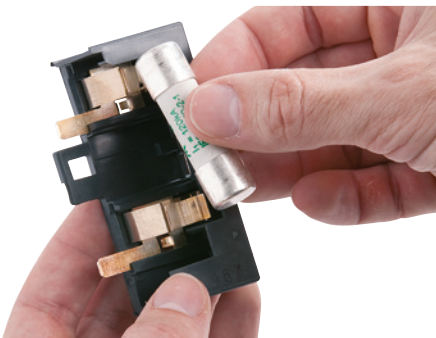
Compatible fuse-links

Fupact switch-disconnector fuses can be used with all fuse-links found on IEC markets (NFC, DIN, BS).

Switch-disconnector fuse	Type of fuse-link		
	NFC	DIN	BS
INF●32	●	-	●
INF●40 to INF●63	●	●	●
INF●100 to 160	● [1]	●	●
INF●200 to 800	-	●	●

[1] Up to 125 A.

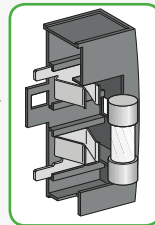
_MG_6514_08.eps



_MG_6511_04.eps



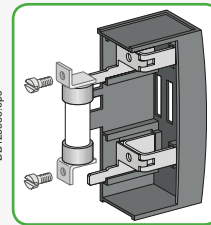
NFC



DB121545.eps

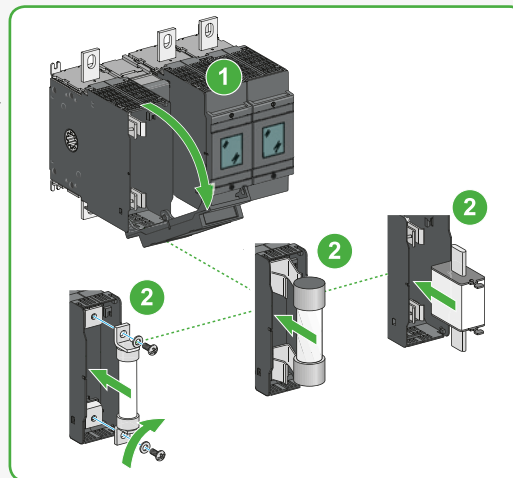
Fuse-carrier for INF32.

BS



DB121585.eps

Fuse-carrier for INF32.



DB423366.eps

INF40 to INF●800.

Note: for ratings ≤ 63 A, the fuse-carriers are different for each type of fuse-link. For ratings ≥ 100 A, the switch-disconnector fuses are different for each type of fuse-link.

Functions and characteristics

General characteristics: INF

Fupact INF●32 to INF●800

Fuse replacement handle

For Fupact INF, it could be possible to use fuse replacement handle. This handle allows to remove fuse when they are blown. In this case, customer use this handle to deplug fuse from blades without risks of burns and without using a tool not dedicated. All fuses NH type could be removed from size 000 to type 4. A push button is actionned when customer wants to put old fuses in bin for recycling.

Total user safety

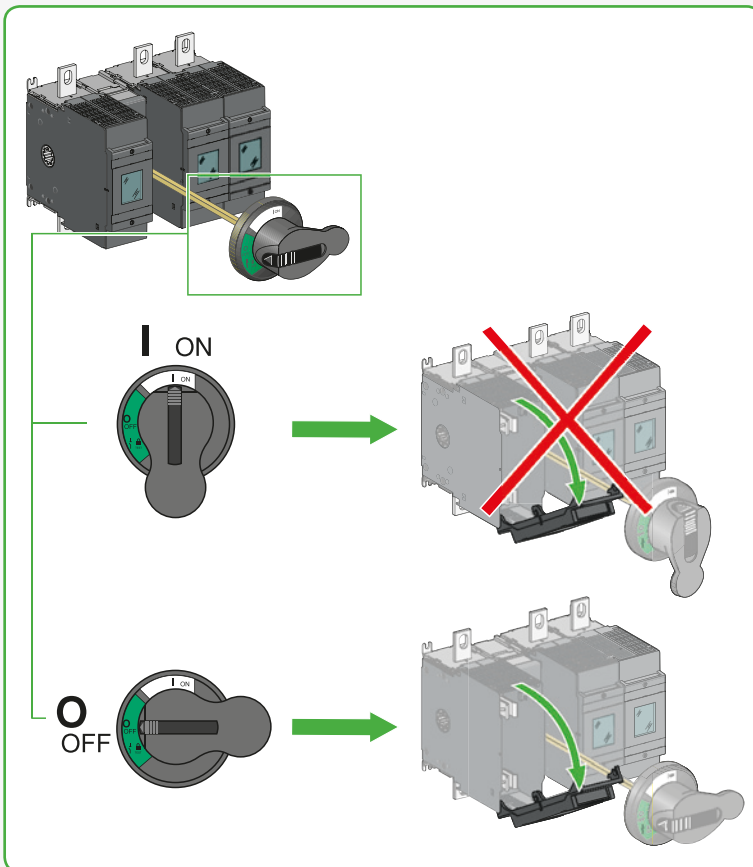
Switch-disconnector fuses equipped with terminal shields offer IP20 protection. They are totally protected against accidental direct contact.

Access to the fuses is:

- blocked when INF●32 to INF●800 switch-disconnector fuses are in the ON position (the fuse-carriers and the fuse-covers INFD40 to INF●800 are maintained)
- only possible when the handle is in the OFF position.
- when product is in the ON position with door closed, nevertheless, it's possible to unlock best with a specific tool (please refer to your support sales).

The double-isolation feature of the switch-disconnector fuse ensures isolation of the fuse-link and, if necessary, its replacement without any risk.

The switch-disconnector fuses have high making and breaking capacities (see page A-64). The operating mechanism (opening and closing) features is independent from a manual operation (speed and force independent of operator action).



Protection against access to live fuses.



Fuse replacement handle



PB115949.eps

PB115948.eps

PB115950.eps

Connection and accessories

Fupact INF●32, INF●40 and INF●63

A



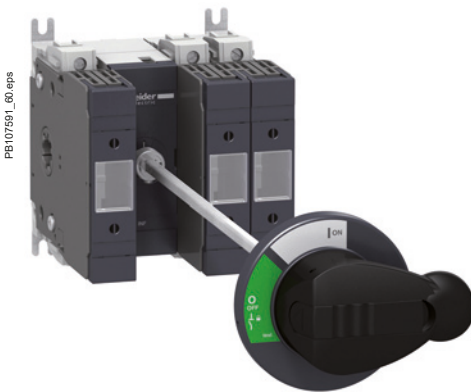
PB113440.eps

INF●32.



_MG_6524_11.eps

External neutral link.



PB107591_00.eps

INF●40 and INF●63.



_MG_6524_11.eps

External neutral link.

Fixed front connection is possible on Fupact devices. Incoming power to Fupact switch-disconnector fuses may be via the top or bottom terminals. The standard connection method depends on the rating of the device.

Fupact INF●32

Connection of bare cables

Fupact INF●32 devices are equipped with built-in connectors for bare copper or aluminium cables of the following types:

- 0.5 to 10 mm² flexible cables
- 0.5 to 10 mm² rigid cables.

External neutral link

Three-pole devices may be optionally equipped with a external neutral link that is mounted either on the side of the switch-disconnector fuse, or on the backplate or the DIN rail. Copper cables ≤ 16 mm² may be connected.

Fupact INF●40 and INF●63

Connection of bare cables

Fupact INF●40 and INF●63 devices are equipped with built-in connectors for bare copper or aluminium cables of the following types:

- 2.5 to 25 mm² flexible cables
- 2.5 to 25 mm² rigid cables.

External neutral link

The 3-pole or 4-pole devices can be fitted with an external neutral link, which is either fixed to a panel or to a DIN rail. It can be connected by 16 to 35 mm² cables.

Functions and characteristics

Connection and accessories

Fupact INFB100 to INF●160



Front connection of bars or cables with lugs

Fupact INF●100/125/160 devices are equipped as standard with 20 mm wide terminals and M8 screws and nuts for direct connection of bars or cables with lugs.

Lugs

Lugs are different for copper and aluminium cables. They are compatible with the long terminal shields.

- The narrow lugs for copper cables may be used for cables with cross-sectional areas of 120, 150 or 185 mm². Crimping by hexagonal barrels or punching.
- The narrow lugs for aluminium cables may be used for cables with cross-sectional areas of 150 or 185 mm². Crimping by hexagonal barrels.

Terminal shields for bars or cables with lugs

- Maintain IP20 protection.
- Clip-on with knock-outs.
- One shield per connection.
- Terminal shield short or long.

Front connection of bare cables

The optional connectors may be used for both copper and aluminium cables with cross-sectional areas of 25 to 95 mm².

1-cable connectors

These connectors facilitate auxiliary connections with a special connection point for cables with cross-sectional areas of 1.5 to 4 mm². They snap directly onto the device terminals.

Terminal shields for devices equipped with connectors

Terminal shields ensure IP20 protection.

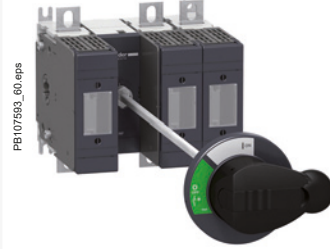
External neutral link

The 3-pole or 4-pole devices can be fitted with an external neutral link, which is either fixed to a panel or to a DIN rail. It can be connected by 16 to 35 mm² cables.

Removable neutral link

The 3-pole or 4-pole devices can be fitted with an removable neutral link, which is either fixed to a panel. It can be connected by < 16 mm² cross-section copper cables.

Another type of neutral can be fixed to the side of the product or to a panel. In this case, the removable neutral link is fixed, but it can be detached by removing the cover.



PB107593_50.eps

INF●160.



DB423372.eps



DB423373.eps

Narrow lug for copper cable.



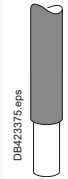
DB423374.eps

Narrow lug for aluminium cable.

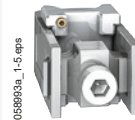


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Terminal shield for bars and cables with lugs.



DB423375.eps



068883a_1-5.eps

Bare cable connector.



_MG_6524_11.eps

External neutral link.



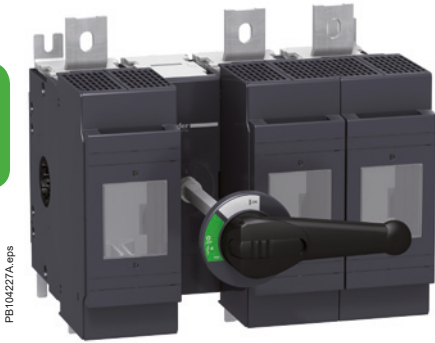
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Removable neutral link.

Connection and accessories

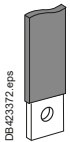
Fupact INF●200 to INF●800

A

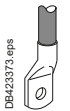


PB104227A.eps

INF●800.



DB423372.eps



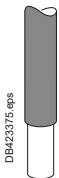
DB423373.eps

Narrow lug for copper cable.

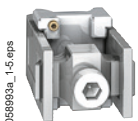


DB423374.eps

Narrow lug for aluminium cable.

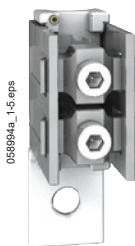


DB423375.eps



058995a_1-5.eps

1-cable snap-on connector.



058994a_1-5.eps

2-cable screw-on connector.



PB104213A.eps

Terminal shields.



PB104219A.eps

Removable neutral link.

Front connection of bars or cables with lugs

Fupact INF●200 to 800 devices are equipped as standard with terminals and screws and nuts for direct connection of bars or cables with lugs:

- 200 and 400 ratings have 25 mm² terminals with M10 screws and nuts
- 630 and 800 ratings have 40 mm² terminals with M12 screws and nuts.

Lugs

Lugs are different for copper and aluminium cables. They are compatible with the long terminal shields.

- The narrow lugs for copper cables may be used for cables with cross-sectional areas of 240 or 300 mm².

Crimping by hexagonal barrels or punching.

- The narrow lugs for aluminium cables may be used for cables with cross-sectional areas of 240 or 300 mm².

Crimping by hexagonal barrels.

Terminal shields for lug connections

Separate references for each rating:

- short terminal shield
- long terminal shield.

Front connection of bare cables

The optional connectors may be used for both copper and aluminium cables:

1-cable snap-on connectors for Fupact INF●200 to INF●400

The connectors snap directly onto the device terminals: cross-sectional areas of 120 to 240 mm².

1-cable connectors for Fupact INF●200 to INF●800

The connectors are screwed to the device terminals:

- 200/250 A ratings: cross-sectional areas of 6 to 185 mm²
- 400 A rating: cross-sectional areas of 95 to 300 mm²

2-cable connectors for Fupact INF●200 to INF●800

The connectors are screwed to the device terminals:

- 200/250 A ratings: cross-sectional areas of 2 x (95 to 185) mm²
- 400 A rating: cross-sectional areas of 2 x (95 to 185) mm²
- 630/800 A ratings: cross-sectional areas of 2 x (185 to 300) mm².

Removable neutral link

Three-pole devices may be optionally equipped with a removable neutral link mounted on the left side of the device or separately.

Three models:

- one with 250 A thermal current I_{th} for the 200 and 250 A ratings
- one with 400 A thermal current I_{th} for the 400 A rating
- one with 800 A thermal current I_{th} for the 630 and 800 A ratings.

Auxiliary contacts and indications: general

Fupact INF●32 to INF●800

Auxiliary contacts

Auxiliary contacts can be used to remotely indicate the switch-disconnector fuse status and for automated functions such as electrical interlocking.

Functions

- OF (NO/NC): indicates the position of the switch-disconnector fuse poles
- CAM (early-make or early-break function): indicates the position of the switch-disconnector fuse handle.

Used in particular for:

- CAO early-break contact (auxiliary contacts open before the main contacts), used for example to automatically open a circuit breaker or a contactor before opening the switch-disconnector fuse
- CAF early-make contact (auxiliary contacts closed before the main contacts)
- Testing of the control/monitoring circuit with power off. Simulates the closed position poles for the switch-disconnector fuse auxiliaries.

Standards

Compliance with international standard IEC 60947-5-1.

Description

- NO contacts (positive opening).
- NC contacts.
- NC/NO changeover contacts.
- With just seven different auxiliary contact blocks, it is possible to implement all the functions mentioned above. They are mounted on the switch-disconnector fuses.

Blown-fuse indicator

Fuses with strikers (NFC or DIN) must be used with this device, which provides remote indication of the fuse status. It is used to:

- signal a blown fuse
- protect motors from overloads caused by single-phase operation
- prevent the risks of abnormal voltages on the neutral.

Fuse monitor

This device is used to remotely indicate the status of standard fuses (without strikers). It provides the following functions:

- signalling a blown fuse
- protecting motors from overloads caused by single-phase operation
- preventing the risks of abnormal voltages on the neutral.

The optional auxiliary contacts are used for the following functions:

- indications
 - early make and early break
 - testing of the control/monitoring circuit with power off.
- The optional fuse monitor signals blowing of standard fuses without strikers.



058009a_1-5.eps



OF auxiliary contact (INF●32).

058029a_1-7.eps



Contact support (INF●32).

058014a_1-41.eps



NO or NC auxiliary contact (INF40 to INF●800).

PB104216A.eps



NO or NC auxiliary contact module (INF40 to INF●800).

Functions and characteristics

Auxiliary contacts and indications

Fupact INF●32

A

058989a_4-5_SE.eps



OF contacts and test.

059012a_4-5_SE.eps



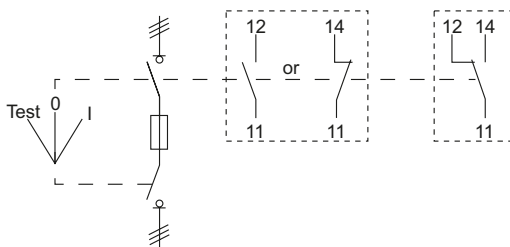
NO and NC contacts.

059013a_5-5_SE.eps



Possible combinations.

DB42377.eps



OF auxiliary contacts indicating the device ON/OFF/Test positions

- Consists of one contact per block.
- Mounted between the device poles.
- Possible configuration: one or two changeover blocks. If the blown-fuse indicator is used, there is only one free location because the other is taken up by the similar contact supplied with the indicator.

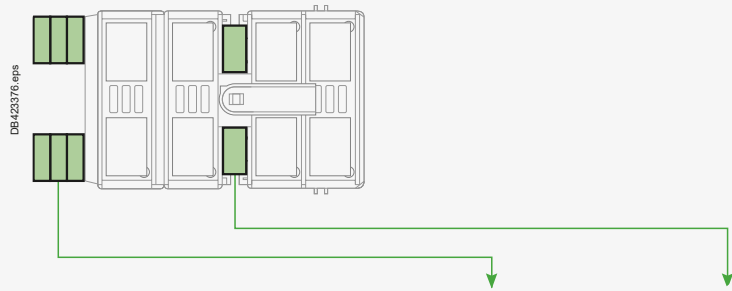
NO or NC auxiliary contacts indicating the device ON/OFF positions

- Mounting:
 - left-hand side
 - snap-on
 - requires the contact support (ordered separately)
- Possible configuration: one to six contact blocks. If the fuse monitor is used, only three contact blocks may be mounted because the remaining space is taken up by the fuse monitor.

Description

- Consists of one contact per block.
- NO contact (positive opening) or NC contact.
- IP20 degree of protection.
- Connection terminals for cables with cross-sectional areas between 0.75 and 2 x 2.5 mm².

Functional table of contact status



Position of operating handle	Status of poles	Status of auxiliary contacts		Status of OF auxiliary contact
		NO	NC	
I				
O				
Test				
Function		ON / OFF		ON / OFF / Test

Possible combinations

Front or lateral handle

Maximum block configuration	OF and Test	NO or NC
INF● alone	2	6
With blown-fuse indicator	1	6
With fuse monitor	2	6

Functions and characteristics

Auxiliary contacts and indications

Fupact INF●32

Electrical characteristics of OF contacts

ON / OFF / Test positions (OF and test) and blown-fuse indicator
Mounting between poles

Electrical characteristics				
Conventional thermal current I _{th} (A)	10			
Rated insulation voltage (V)	690			
Minimum load	100 mA at 24 V			
	AC		DC	
Utilisation category (IEC 60947-5-1)	AC12	AC15	DC12	DC13
Operational current (A)	10	8	-	5
24 V	10	8	-	-
48 V	10	8	-	-
110 V	10	8	-	1.1
220/240 V	10	6	-	0.55
250 V	-	-	-	0.55
380/415 V	-	4	-	-
440 V	-	-	-	-
660/690 V	-	2	-	-



OF auxiliary contact (INF●32).

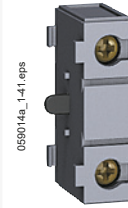


Electrical characteristics of NO or NC auxiliary contacts

ON/OFF positions

Side mounting

Electrical characteristics				
Conventional thermal current I _{th} (A)	16			
Rated insulation voltage (V)	690			
Minimum load	10 mA at 24 V			
	AC		DC	
Utilisation category (IEC 60947-5-1)	AC12	AC15	DC12	DC13
Operational current (A)	24 V	6	10	2
48 V	-	6	4	0.8
110 V	-	6	2	0.55
220/240 V	-	6	0.55	-
250 V	-	6	0.55	0.27
380/415 V	-	4	0.1	-
440 V	-	-	0.1	-
660/690 V	-	2	-	-



NO or NC contact.

Blown-fuse indicator

Fuses with strikers must be used with this device, which provides remote indication of the fuse status. It is used to:

- signal a blown fuse
- protect motors from overloads caused by single-phase operation
- prevent the risks of abnormal voltages on the neutral.

Description

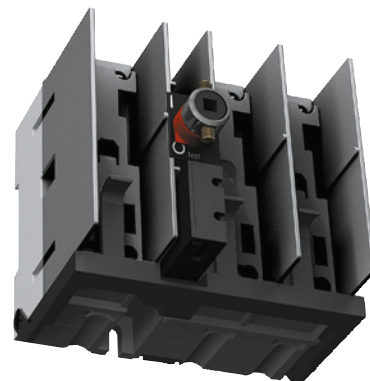
Two models for size 100/160 (22 x 58) NFC:

- three-pole (3P) INF●32 switch-disconnector fuses
- four-pole (4P) INF●32 switch-disconnector fuses.

The indicator is made up of:

- a mechanical transmission system
- an OF auxiliary contact block (identical to the OF block for ON/OFF/Test position indication).

059027a_5_eps



Blown-fuse indicator.

Mounting possibilities	
INFC32	Yes
INFB32	No

Fuse monitor

See page A-90.

Auxiliary contacts and indications

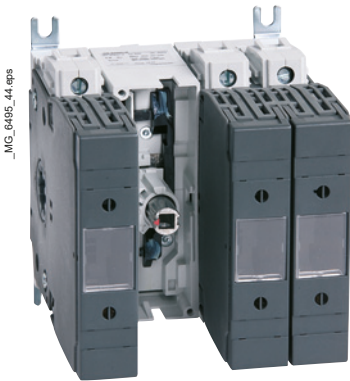
Fupact INFD40 to INF●63

The same auxiliary contact is used for the ON/OFF/Test and “Test indication” functions. The function is determined by where the contact is installed in the switch-disconnector fuses.

A



ON/OFF NO or NC auxiliary contacts.



ON/OFF and “Test indication” NO or NC auxiliary contacts.

Description

- Composition: 2 contacts max. per block
- Positive opening NO contact (breaks on opening) or NC contact (makes on closing)
- IP20 degree of protection
- Connection terminals for cables with cross-sectional areas between 0.75 and 2 x 2.5 mm².

Auxiliary contacts indicating the device ON/OFF positions

For INFD40 to INF●63

- Installation: on the left-hand side of the device.
- Possible configuration: 1 to 8 NO or NC contacts.

Auxiliary contacts indicating the device ON/OFF/Test positions

For INFD40 to INF●63

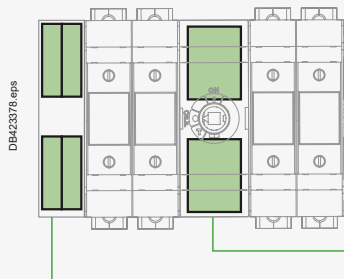
- Installation: between the poles of the device, at the top and bottom.
- Possible configuration: 1 to 2 NO or NC contacts (depending on the contact installation).

“Test indication” auxiliary contacts

For INFD40 to INF●63

- Installation: between the poles of the device, at the top.
- Possible configuration: 1 to 2 NO or NC contacts (depending on the contact installation).

Functional table of contact status



Position of operating handle	Status of poles	Status of auxiliary contacts		Status of auxiliary contacts	
		NO	NC	NO	NC
I					
O					
Test					
Function		ON / OFF		ON / OFF / Test	

Possible combinations

Product	INFD40 to INF●63		
	ON / OFF / Test	Test indication	ON / OFF
INF● alone	2	2	8
	4	0	8
With blown-fuse indicator	2	2	8
	4	0	8
With fuse monitor	2	2	8
	4	0	8

Functions and characteristics

Auxiliary contacts and indications

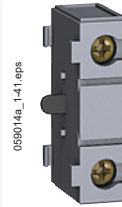
Fupact INFD40 to INF●63

Electrical characteristics of NO or NC auxiliary contacts

ON/OFF/Test positions, ON/OFF positions and blown-fuse indicator

Electrical characteristics

Conventional thermal current I _{th} (A)	16			
Rated insulation voltage (V)	690			
Minimum load	10 mA at 24 V			
	AC	DC		
Utilisation category (IEC 60947-5-1)	AC15	DC12	DC13	
Operational current (A)	24 V	6	10	2
	48 V	6	4	0.8
	110 V	6	2	0.55
	220/240 V	6	0.55	0.27
	250 V	6	0.55	-
	380/415 V	4	0.1	-
	440 V	-	0.1	-
	660/690 V	2	-	-



NO or NC contact.

Blown-fuse indicator

Fuses with strikers must be used with this device, which provides remote indication of the fuse status. It is used to:

- signal a blown fuse
- protect motors from overloads caused by single-phase operation
- prevent the risks of abnormal voltages on the neutral.

Description

Two models for:

- three-pole (3P) INF●50 switch-disconnector fuses
- four-pole (4P) INF●50 switch-disconnector fuses.

The indicator is made up of:

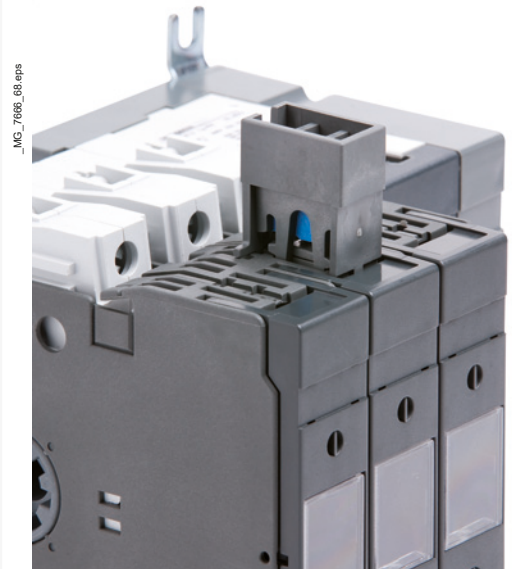
- a mechanical transmission system
- an NO and NC auxiliary contact block identical to the NO and NC contacts described on [page A-84](#) (a mounting adapter is supplied).

Mounting possibilities

INFC50	Yes
INFD40/63	No
INFB63	No

Fuse monitor

See [page A-90](#).



Blown-fuse indicator.



Auxiliary contacts and indications

Fupact INFB100 to INF●160

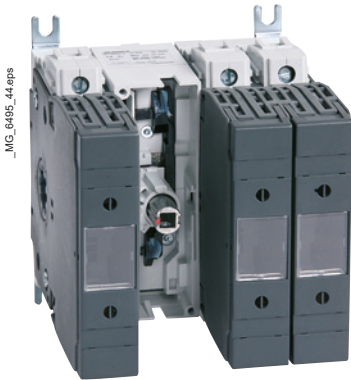
The same auxiliary contact is used for the ON/OFF/Test and "Test indication" functions. The function is determined by where the contact is installed in the switch-disconnector fuses.

A



PB107332_06.eps

ON/OFF NO or NC auxiliary contacts.



_MG_6495_44.eps

ON/OFF and "Test indication" NO or NC auxiliary contacts.

Description

- Composition: 2 contacts max. per block.
- Positive opening NO contact (breaks on opening) or NC contact (makes on closing).
- IP20 degree of protection.
- Connection terminals for cables with cross-sectional areas between 0.75 and 2 x 2.5 mm².

Auxiliary contacts indicating the device ON/OFF positions

For INFB100 to INF●160

- Installation: on the left-hand side of the device.
- Possible configuration: 1 to 8 NO or NC contacts.

Auxiliary contacts indicating the device ON/OFF/Test positions

For INFB100 to INF●160

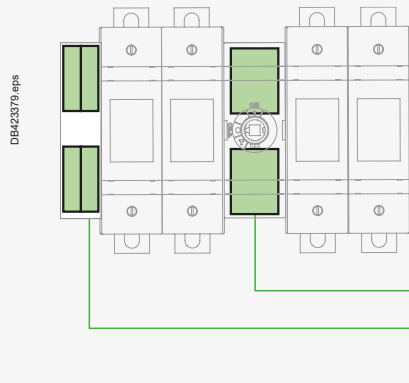
- Installation: between the poles of the device, at the top and bottom.
- Possible configuration: 1 to 2 NO or NC contacts (depending on the contact installation).

"Test indication" auxiliary contacts

For INFB100 to INF●160

- Installation: between the poles of the device, at the top.
- Possible configuration: 1 to 2 NO or NC contacts (depending on the contact installation).

Functional table of contact status



Position of operating handle	Status of poles	Status of auxiliary contacts		Status of auxiliary contacts	
		NO	NC	NO	NC
I					
O					
Test					
Function		ON / OFF		ON / OFF / Test	

Functions and characteristics

Auxiliary contacts and indications

Fupact INFB100 to INF●160

Electrical characteristics of NO or NC auxiliary contacts

ON/OFF/Test positions, ON/OFF positions and blown-fuse indicator

Electrical characteristics

Conventional thermal current Ith (A)	16		
Rated insulation voltage (V)	690		
Minimum load	10 mA at 24 V		
	AC	DC	
Utilisation category (IEC 60947-5-1)	AC15	DC12	DC13
Operational current (A)		10	2
	24 V	6	0.8
	48 V	6	0.55
	110 V	6	0.27
	220/240 V	6	-
	250 V	6	-
	380/415 V	4	-
	440 V	-	-
	660/690 V	2	-

Blown-fuse indicator

Fuses with strikers must be used with this device, which provides remote indication of the fuse status. It is used to:

- signal a blown fuse
- protect motors from overloads caused by single-phase operation
- prevent the risks of abnormal voltages on the neutral.

Description

Two models for:

- three-pole (3P) INFC63/125 switch-disconnector fuses
- four-pole (4P) INFC63/125 switch-disconnector fuses.

The indicator is made up of:

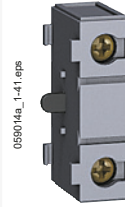
- a mechanical transmission system
- an NO and NC auxiliary contact block identical to the NO and NC contacts described on [page A-86](#) (a mounting adapter is supplied).

Mounting possibilities

INFC63/125	Yes
INFD160	No
INFB100/160	No

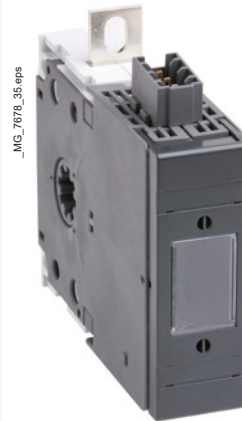
Fuse monitor

See [page A-90](#).



089014a_1-41.eps

NO or NC contact.



_IMG_7878_38.eps

Blown-fuse indicator.



Auxiliary contacts and indications

Fupact INF●200 to INF●800

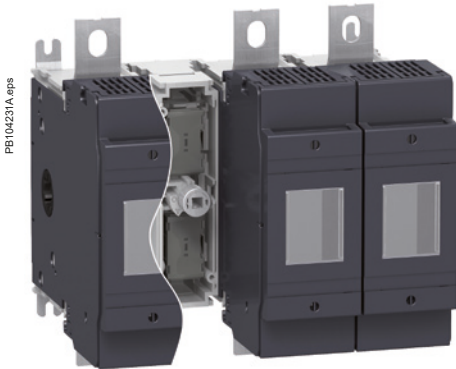
The same auxiliary contact is used for the ON/OFF/Test and "Test indication" functions. The function is determined by where the contact is installed in the switch-disconnector fuses.

A



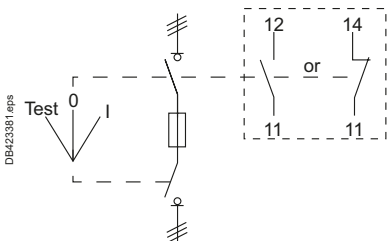
PB104235A.eps

ON/OFF NO or NC auxiliary contacts.



PB104231A.eps

ON/OFF and "Test indication" NO or NC auxiliary contacts.



DB423381.eps

Description

- Composition: 2 contacts max. per block.
- Positive opening NO contact (breaks on opening) or NC contact (makes on closing).
- IP20 degree of protection.
- Connection terminals for cables with cross-sectional areas between 0.75 and 2 x 2.5 mm².

Auxiliary contacts indicating the device ON/OFF positions

For INF●200 and INF●800

- Installation: on the left-hand side of the device.
- Possible configuration: 1 to 8 NO or NC contacts.

Auxiliary contacts indicating the device ON/OFF/Test positions

For INF●200 to INF●250

- Installation: between the poles of the device, at the top and bottom.
- Possible configuration: 1 to 4 NO or NC contacts (depending on the contact installation).

For INF●400 to INF●800

- Installation: between the poles of the device, at the top only.
- Possible configuration: 1 to 4 NO or NC contacts.

"Test indication" auxiliary contacts

For INF●200 and INF●250

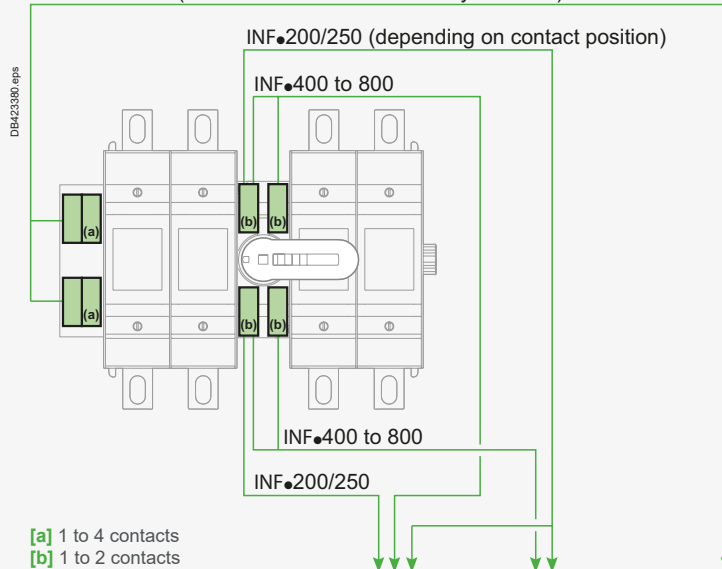
- Installation: between the poles of the device, at the top.
- Possible configuration: 1 to 2 NO or NC contacts (depending on the contact installation).

For INF●400 to INF●800

- Installation: between the poles of the device, at the bottom only.
- Possible configuration: 1 to 4 NO or NC contacts.

Functional table of contact status

INF●200 to 800 (LV480565 module for auxiliary contacts)



- [a] 1 to 4 contacts
- [b] 1 to 2 contacts

Position of operating handle	Status of poles	Status of auxiliary contacts		Status of auxiliary contacts		Status of auxiliary contacts	
		NO	NC	NO	NC	NO	NC
I							
O							
Test							
Function		ON / OFF / Test		Test indication		ON / OFF	

Functions and characteristics

Auxiliary contacts and indications

Fupact INF●200 to INF●800

Possible combinations

Product	INF●200 and INF●250			INF●400 to INF●800		
	ON / OFF / Test	Test indication	ON / OFF	ON / OFF / Test	Test indication	ON / OFF
INF● alone	2 4	2 0	8 8	4	4	8
With blown-fuse indicator	2 4	2 0	8 8	4	4	8
With fuse monitor	2 4	2 0	8 8	4	4	8

Electrical characteristics of NO and NC auxiliary contacts

ON/OFF positions, ON/OFF/Test positions, "Test indication" and blown-fuse indicator

Electrical characteristics				
Conventional thermal current I _{th} (A)	16			
Rated insulation voltage (V)	690			
Minimum load	10 mA at 24 V			
		AC	DC	
Utilisation category (IEC 60947-5-1)		AC15	DC12	DC13
Operational current (A)	24 V	6	10	2
	48 V	6	4	0.8
	110 V	6	2	0.55
	220/240 V	6	0.55	-
	250 V	6	0.55	0.27
	380/415 V	4	0.1	-
	440 V	-	0.1	-
	660/690 V	2	-	-

Blown-fuse indicator

Fuses with strikers must be used with this device, which provides remote indication of the fuse status. It is used to:

- signal a blown fuse
- protect motors from overloads caused by single-phase operation
- prevent the risks of abnormal voltages on the neutral.

Description

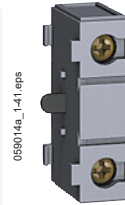
Two models for INF●200/800 switch-disconnector fuses:

- three-pole (3P)
- four-pole (4P).

The indicator is made up of a mechanical transmission system and mounting adapter with 1 x NO + 1 x NC contacts.

Fuse monitor

See page A-90.



059014a_1-1.eps

NO or NC contact.



PB104232A.eps

Blown-fuse indicator.

Fuse monitor

Fupact INF●32 to INF●800



Fuse monitor: DIN rail or backplate mounted.



Fuse monitor: can be fixed on the left-hand side of INF●40 to INF●800 devices.

Functions

The device provides remote indication of the standard fuse status (without strikers). It is used to:

- signal a blown fuse
- protect motors from overloads caused by single-phase operation
- prevent the risks of abnormal voltages on the neutral.

Standards

- Compliance with international standard IEC 60947-5-1
- Compliance with:
 - EN 50204
 - EN 61000 for electromagnetic compatibility (EMC).

Description

- Operation with standard fuses: NFC, DIN and BS
- May be used on capacitor bank circuits
- Simplified power supply:
 - does not require a specific power supply
 - operates with unbalanced phases
 - supplied via connection to the fuse terminals on the switch-disconnector fuse
 - operational voltage for two distinct versions:
 - either 100...260 V AC, ±10 %, 50/60 Hz
 - or 380...690 V AC, ±10 %, 50/60 Hz
- Tested for electromagnetic compatibility (EMC)
- Small size, can be mounted on the entire range of switch-disconnector fuses
- Mounting:
 - DIN rail or backplate mounted, using the mounting brackets provided
 - can be screwed directly on to the left-hand side of the INF●40 to INF●800 devices.
- Characteristics:
 - IP20 degree of protection
 - weight: 140 g.
- Product with fuse monitor doesn't have a class II insulation as this product isn't installed on the front face of the switchboard.
- The package consists of:
 - the fuse monitor equipped with one NO contact and one NC contact
 - mounting brackets.

Note: lugs for connection to the fuse-carrier are not supplied.

Operation

Reset

The device is automatically reset when the fuse-links are replaced.

Indications

- Normal operation:
 - the green LED is ON when voltage is present at the fuse terminals
 - the contacts are in the rest position
- Operation when a fuse blows:
 - the green LED goes off and the red LED goes on
 - the contacts are actuated:
 - the NO contact is for remote fault indication
 - the NC contact may be used, for example, to control an undervoltage device in order to shut down equipment that may be sensitive to single-phasing.

Fuse monitor

Fupact INF●32 to INF●800

A

Electrical characteristics

Power circuit		
Rated operational voltage	(Ue)	100 to 260 V AC 50/60 Hz ±10 % 380 to 690 V AC 50/60 Hz ±10 %
Upstream connection (1, 3, 5)		Double insulated Cu conductor 0.75 mm ² , length 60 cm
Downstream connection (2, 4, 6)		Standard Cu conductor 0.75 mm ² , length 60 cm
Consumption		< 3 VA
Rated frequency		50/60 Hz
Measurement impedance		> 1000 Ω/V
Rated impulse withstand voltage (1.2 / 50 μs)	(Uimp)	8 kV

Auxiliary contact output terminals		
Terminal indications	NO	11 - 14
	NC	21 - 22
Cable capacity	Flexible	≤ 1.5 mm ² Cu
	Rigid	≤ 2.5 mm ² Cu

Output contact characteristics (1NO + 1NC)

Conventional thermal current Ith (A)	4
Rated insulation voltage (V)	440
Minimum load	10 mA at 24 V

Characteristics		AC	DC	
Utilisation category (IEC 60947-5-1)		AC15	DC12	DC13
Operational current (A)	24 V	3	-	2
	48 V	3	-	-
	110 V	3	-	-
	220/240 V	3	-	-
	250 V	3	-	-
	380/415 V	-	-	-
	440 V	-	-	-
	660/690 V	-	-	-
Rated operational voltage / max. breaking voltage (V AC)		250/440		
Breaking capacity (VA)		2000		

General characteristics

Operating temperature range (°C)	-25...+55
Storage and transport temperature range (°C)	-40...+70
Fuse blowing detection time (s)	< 2
Overvoltage category / degree of pollution	IEC 60947-1
Dielectric test voltage (between power circuit and output terminals)	5 kV rms / 1 min 50 Hz

Electromagnetic compatibility - emission

Conducted	EN 55022 Class B CISPR 16-2-1 ; CISPR 16-1-2
Radiated	EN 55022 Class B CISPR 16-2-3
Harmonic currents	EN 61000-3-2 Class A

Electromagnetic compatibility - immunity

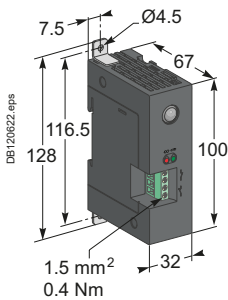
Electrostatic discharge (ESD)	EN 61000-4-2 criteria B level 2/3
Radiated field susceptibility (RF)	EN 61000-4-3 criteria A level 3
Conducted low energy susceptibility (EFT)	EN 61000-4-4 criteria B level 3
Conducted high energy susceptibility (RF)	EN 61000-4-6 criteria A level 3
Radio-frequency interference (GSM)	ENV 50204 criteria A (≤ 1 Ghz)

Magnetic field immunity

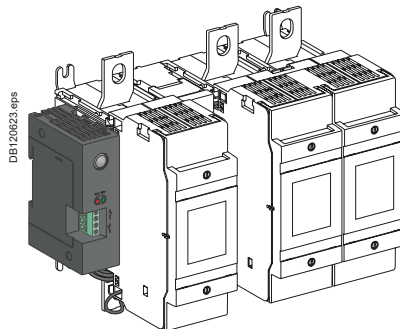
Continuous	EN 61000-4-8 level 5
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Mechanical characteristics

Degree of protection	IP20
Weight (kg)	0.16
Dimensions	



DIN rail or backplate mounting (lugs provided).



Can be fixed on the left-hand side of INF●200 to INF●800 devices.

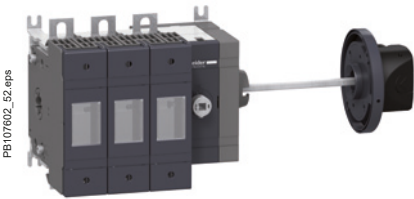
Rotary handles

Fupact INF●32 to INF●800

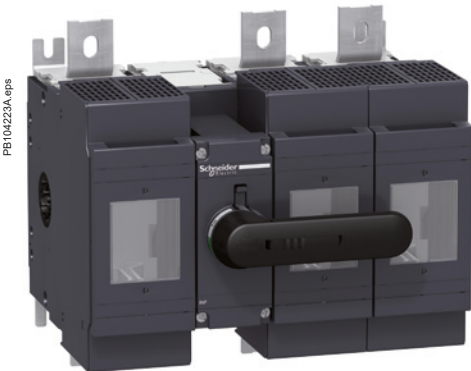
A



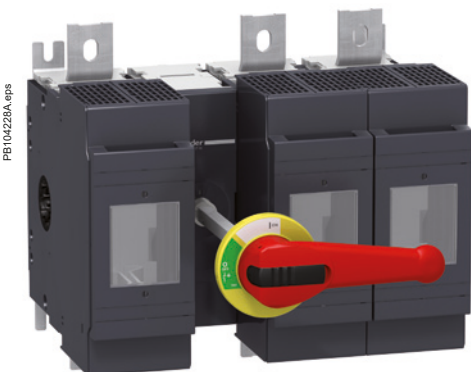
Switch-disconnector fuses with extended front rotary handle.



Emergency-off switch-disconnector fuses with extended lateral rotary handle.



Switch-disconnector fuses with direct rotary handle.



Emergency-off switch-disconnector fuses with extended front rotary handle.

	INF●32	INFD40 INF●63	INF●100/125/160	INF●200/400 INF●630/800
Rotary control with black handle				
Direct front	Optional	Optional	Optional	Optional
Direct lateral	No	No	No	No
Extended front	Optional	Optional	Optional	Optional
Extended lateral	Optional	Optional	Optional	No
Rotary control with red and yellow handle for emergency-off switch-disconnector fuses				
Direct front	No	Optional	Optional	Optional
Direct lateral	No	No	No	No
Extended front	Optional	Optional	Optional	Optional
Extended lateral	Optional	Optional	Optional	No

Direct rotary control

Direct rotary control is available only for front handles.

Degree of protection: IP20.

- INF●32:
 - switch locking in OFF (O) position for INF●32 using 1 or 2 padlocks (not supplied) with 5 to 6 mm shackle diameter
 - "Test O I" indication plate
- INFD40 to INF●250:
 - switch locking in OFF (O) position for INFD40 to 250 using 1 to 3 padlocks (not supplied) with 5 to 6 mm shackle diameter
 - "Test O I" indication plate
- versions:
 - standard with black handle
 - emergency-off version with red handle and yellow front plate.
- INF●400 to INF●800:
 - switch locking in OFF (O) position for INF●400 to 800 using 1 to 3 padlocks
- versions:
 - standard with black handle
 - emergency-off version with red handle and yellow front plate.

Extended rotary handle

It makes it possible to operate switch-disconnector fuses installed at the back of a switchboard from outside the switchboard.

The extended rotary handle may be installed on the front or the side of the switch-disconnector fuses.

Degree of protection: IP65.

Operation

- Suitability for isolation is maintained
- Door opening is prevented when the switch-disconnector fuses are in the ON position (for front handle only). Door interlocking can be defeated by authorised personnel for servicing purposes.
- The switch-disconnector fuses may be locked in the OFF (O) or ON (I) position by one to three padlocks (not supplied) with 5 to 10 mm shackle diameter. Locking prevents opening of the switchboard door (for front handle only).

Versions

- Standard with black handle.
- Emergency-off version with red handle and yellow front plate.
- "Test O I" indication plate:
 - test function as standard for basic INF●32 to INF●800 switch-disconnector fuses
 - the test function makes it possible to test the control and monitoring circuits when the power circuit off (see page A-23). We put the handle in the test position to operate the auxiliary test contacts.

Installation

The extended rotary handle is made up of:

- an extension shaft that can be cut to the right length (a 430 to 465 mm shaft is available as an option)
- a handle and front plate assembly that is installed on the door or the side of the switchboard.

To satisfy installation standards and practices, the handles of electrical switchgear devices indicate:

- ON position (main contacts closed) when vertical
- OFF position (main contacts open) when horizontal.

Fupact extended rotary handles can be installed parallel or at 90° with respect to the device to comply with installation standards and practices whether the device is mounted horizontally or vertically.

Functions and characteristics

Protection / locking

Fupact INF●32 to INF●800

Protection to prevent fuse access

The Fupact range includes a system designed to maintain the fuse-carriers or fuse compartment covers when the switch-disconnector fuses are in the ON (I) position.

Padlocking

To lock switch-disconnector fuses in ON or OFF position, the standard handles can be fitted with 2 or 3 padlocks (not supplied).

Locking in the OFF (O) position ensures isolation complying with standard IEC 60947-3.

Type of locking		Type of rotary control		
		Direct front	Extended front	Extended lateral
Locking by 3 padlocks in position:	ON (I)	● [1]	● [1]	● [1]
	OFF (O)	●	●	●
Door interlock	ON (I)		●	
Door interlock defeat	ON (I)		● [2]	
Door locking with switch-disconnector fuses padlocked	OFF (O)		● [3]	

[1] After a simple modification.

[2] Using a special tool.

[3] Cannot be defeated.



Padlocking.



B



Installation recommendations

Possible installation positions and mounting

Fupact ISFT100N to ISFT630.....	B-2
Fupact ISFL160 to ISFL1250	B-2
Fupact INF●32 to INF●800	B-3

Implementation and power dissipation

Fupact ISFT, ISFL and INF	B-4
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Installation in Prisma

General.....	B-6
Fupact ISFT.....	B-7
Fupact ISFL.....	B-8
Fupact INF - Direct front rotary handle.....	B-9

Tap-off units for fuse switch-disconnectors

From 125 to 400 A.....	B-10
------------------------	------

Tap-off units for Fupact INF fuses switch-disconnectors

From 160 to 400 A.....	B-11
Linergy	B-12



Other chapters	
Presentation.....	2
Functions and characteristics	A-1
Dimensions and connection	C-1
Wiring diagrams.....	D-1
Technical characteristics	E-1
Catalogue numbers	F-1

Possible installation positions and mounting

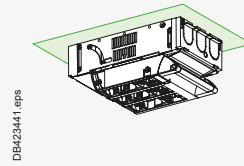
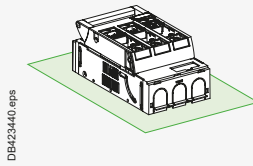
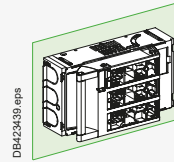
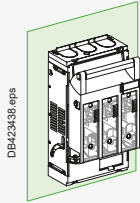
Fupact ISFT100N to ISFT630

Fupact ISFL160 to ISFL1250

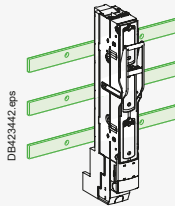
B

Possible installation positions

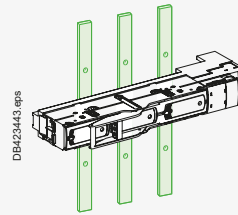
ISFT100N to ISFT630



ISFL160 to 1250

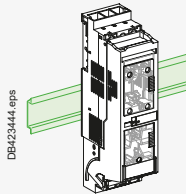


ISFL160 to 630



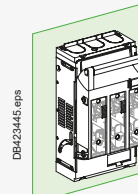
Possible mounting

ISFT100N and ISFT100



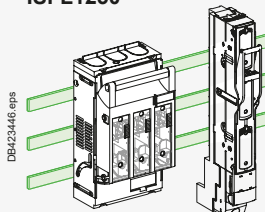
DIN rail.

ISFT100N to ISFT630



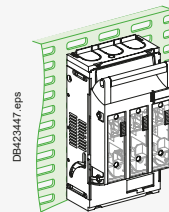
Plain mounting plate.

ISFT100N ISFL160 to ISFL630 ISFL1250



Secured to busbars.

ISFT100N to ISFT630



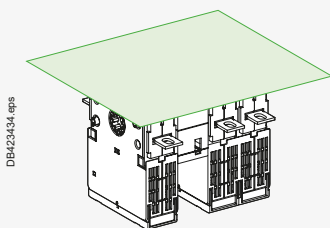
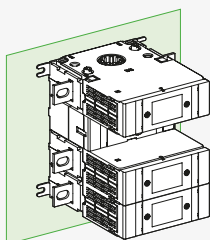
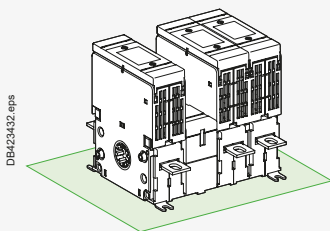
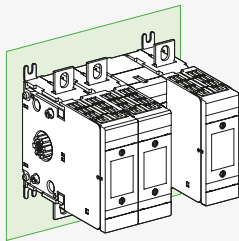
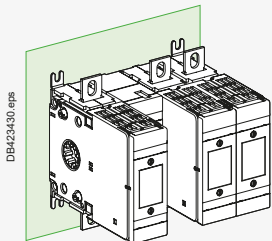
Slotted mounting plate.

Possible installation positions and mounting

Fupact INF●32 to INF●800

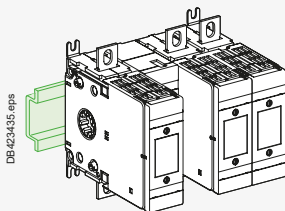
Possible installation positions

INF●32 to INF●800



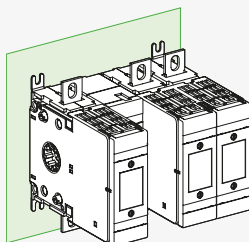
Possible mounting

INF●32 to INF●160



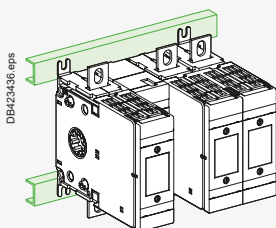
DIN rail.

INF●32 to INF●800



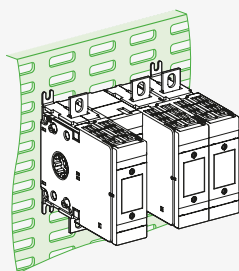
Plain mounting plate.

INF●32 to INF●800



Rails.

INF●32 to INF●800

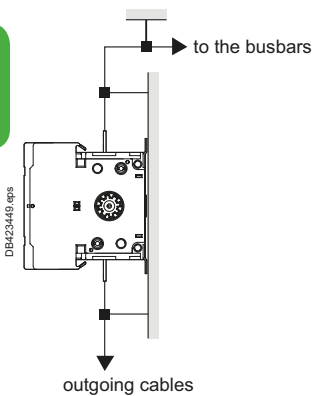
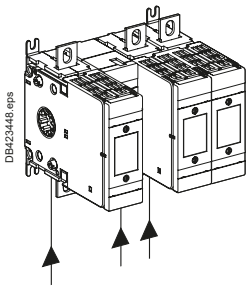


Slotted mounting plate.

B

Implementation and power dissipation

Fupact ISFT, ISFL and INF



Reverse supply

Fupact fusegear may be supplied equally well via the upstream or downstream terminals, without any reduction in performance.

Neutral pole position for INF fusegear

On Schneider Electric fusegear ranges, the neutral pole is traditionally located on the left-hand side.

On the INF●32 to INF●800 ranges, the 4 poles are identical in the case of a 4P/4F product. The neutral pole can therefore be located on the right-hand side, simply by adding a label. This is not possible with a 4P/3F product.

Conductor materials and electrodynamic forces

Fupact fusegear may be connected using either bare copper, tinned copper or tinned aluminium conductors (flexible or rigid bars, cables).

In the event of a short-circuit, thermal and electrodynamic forces are exerted on the conductors. The conductors must therefore be adequately sized and suitably supported.

Note that the terminals of electrical devices (switch-disconnectors, contactors, circuit breakers, etc.) should not be considered to contribute to the support of the conductors.

Cable ties and flexible bars

The table below indicates the maximum distances between cable ties depending on the prospective short-circuit current.

Care must be taken not to exceed a distance of 400 mm between ties mechanically secured to the switchboard frame.

Type of tie	"Panduit" type			"Sarel" type				
	Width: 4.5 mm			Width: 9 mm				
	Max. load: 22 kg			Max. load: 90 kg				
	Colour: white			Colour: black				
Max. distance between ties (mm)	200	100	50	350	200	100	70	50 (double ties)
Short-circuit current (kA rms)	10	15	20	20	27	35	45	100

Note: for cables $\geq 50 \text{ mm}^2$, 9 mm wide ties must be used.

Tightening torque for ISFT and ISFL with screw connection

	Type	Torque (Nm)
ISFT	ISFT100N mounted on backplate with connection terminals	4.5
	ISFT100N with hook-on connection to 60 mm busbars	4.5
	ISFT100 mounted on backplate with connection terminals	3
	ISFT160 mounted on backplate with connection terminals	12
	ISFT160 with hook-on connection to 60 mm busbars	12
	ISFT250 mounted on backplate with connection terminals	20
	ISFT250 with hook-on connection to 60 mm busbars	20
	ISFT400 mounted on backplate with connection terminals	20
	ISFT400 with hook-on connection to 60 mm busbars	20
ISFL	ISFT630 mounted on backplate with connection terminals	20
	ISFL160 1-pole version with direct connection to 185 mm busbars	14
	ISFL160 1-pole version with hook-on connection to 185 mm busbars	14
	ISFL160 3-pole version with direct connection to 100 mm busbars	14
	ISFL160 3-pole version with hook-on connection to 60 mm busbars	6
	ISFL160 3-pole version with direct connection to 185 mm busbars with kit	14
	ISFL160 3-pole version with connectors for flexible bars	4
	ISFL160 3-pole version with connectors for bare Cu/Al cables	4
	ISFL250 1-pole and 3-pole version with direct connection to 185 mm busbars	32
	ISFL400 1-pole and 3-pole version with direct connection to 185 mm busbars	32
	ISFL630 1-pole and 3-pole version with direct connection to 185 mm busbars	32
ISFL1250 3-pole version with direct connection to 185 mm busbars	32	

Implementation and power dissipation

Fupact ISFT, ISFL and INF

Power dissipated by ISFT and ISFL fuse-switch disconnectors

Power dissipated per pole

	Rating (A)	Switchgear		Resistance per pole ($\mu\Omega$)	Power dissipated per pole (W)	Fuse-link Max. power dissipated		Total power dissipated per pole (W)
		Model				Rat. (A)	P (W)	
Fixed front-connected device (without conversion kit)	100	ISFT100N		0.33	3.3	100	7.5	11
	100	ISFT100		0.150	3.6	100	7.5	11
	160	ISFT100		0.151	3.8	160	8.2	12
	160	ISFT160		0.117	3.0	160	12	15
	250	ISFT 250		0.056	6	250	23	29
	400	ISFT400		0.046	10	400	34	44
Device bolted directly to busbars (without conversion kit)	160	ISFL160	1-pole	0.268	6.7	160	12	19
			3-pole					
	250	ISFL250	1-pole	0.144	9.0	250	32	32
			3-pole					
	400	ISFL400	1-pole	0.117	18.7	400	45	53
			3-pole					
630	ISFL630	1-pole	0.093	37	630	48	85	
		3-pole						
1250	ISFL1250	3-pole	0.093	37	630	48	85	
With conversion kit	60 mm hook-on connection	100	ISFT100N	0.37	3.7	100	7.5	11
	60 mm hook-on connection	160	ISFT160	0.220	5.6	160	12	17
	60 mm hook-on connection	250	ISFT250	0.086	6.7	250	23	30
	60 mm hook-on connection	400	ISFT400	0.075	5.3	400	34	46
With conversion kit	160	ISFL160		0.230	5.9	160	12	18

B

Power dissipated by INF switch-disconnector fuses

Power dissipated per pole

Rating (A)	Switchgear		Resistance per pole ($\mu\Omega$)	Power dissipated per pole (W)	Fuse-link Max. power dissipated		Total power dissipated per pole (W)
	Model				Rat. (A)	P (W)	
16	INFC / INFB32		2.03	0.5	16	3.5	4
20	INFC / INFB32		2.03	0.8	20	3.5	4.3
25	INFC / INFB32		2.03	1.3	25	3.5	4.8
32	INFC / INFB		2.03	2	32	3.5	5.5
40	INFD40		1.00	1.6	40	4.5	6.1
50	INFC		1.00	2.5	50	7.5	10
63	INFB / INFD63		1.00	4	63	7.5	11.5
	INFC		0.35	1.4	63	7.5	8.9
100	INFB100		0.35	4	100	12	16
125	INFC125		0.35	5	125	12	17
160	INFB / INFD160		0.35	9	160	12	21
200	INFB / INFD200		0.2	8	200	17	25
250	INFB / INFD250		0.21	13	250	23	36
400	INFB / INFD400		0.19	30	400	45	75
630	INFB / INFD630		0.12	46	630	60	106
800	INFB / INFD800		0.12	75	800	65	140

Installation in Prisma General

Prisma is the Schneider Electric installation system for distribution switchboards in commercial and industrial buildings. Whatever the switchboard configuration, Prisma solutions are tested to guarantee the safety of life and property. Positioning and mounting of the devices in the switchboard and the percentage of space occupied take into account temperature rise, short-circuit withstand capacities, clearances, etc. Everything has been taken into account, tested and certified. Front plates with cut-outs make it possible to change fuse-links without any risk of direct contact with live parts.

B

PB115851 eps



PB115816 eps



Prisma functional system

- Mounting of Schneider Electric devices guarantees correct operation of installations.
- The supplied configuration complies with standard IEC 60439-1 and -2 and the system has been tested in the most difficult configurations.
- The panel builder can use prefabricated, tested solutions for connections upstream and downstream of the switchboard, connections from the busbars to devices and from devices to busbars, main distribution or distribution to a row of outgoing devices.
- Selection of enclosures depends on the characteristics of the installation premises.
- The user can upgrade or expand the switchboard.

Prisma includes two ranges

Prisma G wall-mount and floor-standing enclosures up to 630 A

IP index	IP20 ^[1] / IP30/31/43	IP55
IK index	IK07/08	IK10
Height (mm)	11 heights Wall-mount from 330 to 1380 Floor-standing from 1530 to 1830 (including the plinth)	7 heights Wall-mount enclosures from 450 to 1750
Width of cable ducts (mm)	305	305
Depth (mm)	205/250	230/290
Frameworks	Can be combined side by side and one on top of the other	Can be combined side by side and one on top of the other

Prisma P cubicles up to 3200 A

IP index	IP20 ^[1] / IP30/31/IP55
IK index	IK08/IK10
Height (mm)	2000
Width of cable ducts (mm)	300/400
Depth (mm)	400/600
Frameworks	Can be combined side by side and back to back

[1] Fupact installed, doors open.

Fupact in Prisma

As for all switchgear used in electrical distribution, Fupact devices are easy to install in Prisma tested switchboards.

The fusegear fits perfectly in the enclosure without any risk of disturbing the other devices.

Depending on the model, fusegear can be installed horizontally or vertically in the switchboard, in the device compartment or in a lateral duct.

Prefabricated connections provide a safe and easy way to supply Fupact fusegear from the busbars.

ISFT100 fusegear can be supplied by feeding busbars connected to the main busbars. The ISFT100N and ISFT160 to ISFT630 products can be directly supplied by a busbar, by hook-on contact. The busbar is connected to the main busbar by a prefabricated link.

Fusegear concerned

ISFT100N to 250 for Prisma G wall-mount or floor-standing enclosures.
 ISFT100N to 630 for Prisma P cubicles.

Types of Prisma enclosures and cubicles

Prisma G wall-mount and floor-standing enclosures and Prisma P cubicles.

Fusegear installation

Installation in Prisma G wall-mount and floor-standing enclosures

Vertical or horizontal mounting (incomer)

- Horizontal mounting (ISFT160, ISFT250):
 - 1 device per row, six 50 mm modules (300 mm), for ISFT160
 - 1 device per row, six 50 mm modules (300 mm), for ISFT250
 - mounting plates secured to the back of wall-mount enclosures
 - upstream connections via cables
 - downstream connections are made by the panel builder.
- Vertical mounting:
 - depending on the rating, one to eight devices can be installed per row.

Rating	Number of devices	Number of modules
100 A (ISFT100N) (on mounting plate)	8	8
100 A (ISFT100) (on mounting plate)	5	6
100 A (ISFT100) (on busbars)	6	8
160 A (on mounting plate)	4	8
160 A (on busbars)	4	8
160 A (in duct)	1	6
250 A (in duct)	1	9

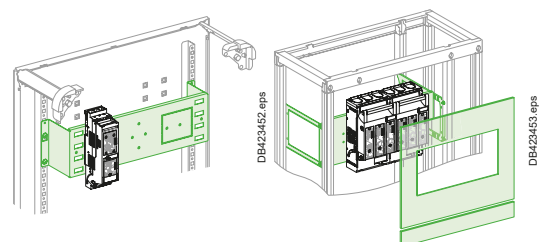
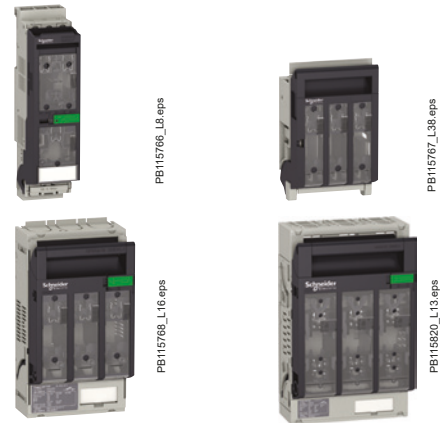
- Installation of devices:
 - ISFT100N and ISFT100, on mounting plates secured to the back of wall-mount enclosures
 - ISFT160 equipped with terminal shields, on mounting plates secured to the back of wall-mount enclosures or ducts, or on lateral cross-members with direct connection to busbars (60 mm fixing centres).
- ISFT100 devices can be supplied by feeding busbars. Connections are made by the panel builder. Front plates with cut-outs can be used as blanking plates to maintain the degree of protection IPxxB.

Installation in Prisma P cubicles

- Vertical mounting:
 - depending on the rating, one to eight devices can be installed per row

Rating	Number of devices	Number of modules
100 A (ISFT100N) (on mounting plate)	8	8
100 A (ISFT100) (on mounting plate)	5	7
100 A (ISFT100) (on busbars)	6	8
160 A (on mounting plate)	4	6
160 A (on busbars)	4	6
250 A (on mounting plate)	2	9
400 A (on mounting plate)	2	9
630 A (on mounting plate)	1	10

- devices are installed on mounting plates secured to lateral cross-members
- ISFT100 devices can be supplied by feeding busbars
- a connection kit comprising busbar supports (60 mm fixing centres), bars for direct supply of devices and a connector for Linergy busbars is available for ISFT160 devices.



Installation in Prisma Fupact ISFL

ISFL devices with different ratings can be installed in the same row. Depending on the rating, six to nine devices can be installed per row.

B



Fusegear concerned

ISFL160 1-pole and 4P switchable,
ISFL 250 to 630 1P-3P,
ISFL 1250 3P.

Types of Prisma cubicles

Prisma P cubicles only.

Fusegear installation

Installation in Prisma P cubicles

Vertical mounting only.

Rating	Number of modules		Number of devices	
	Standard front plate	2/3 front plate	Standard front plate	2/3 front plate
160 A	11	24	9	10
250 A	-	24	-	5
400 A	-	24	-	5
630 A	-	24	-	5
1250 A	-	24	-	2

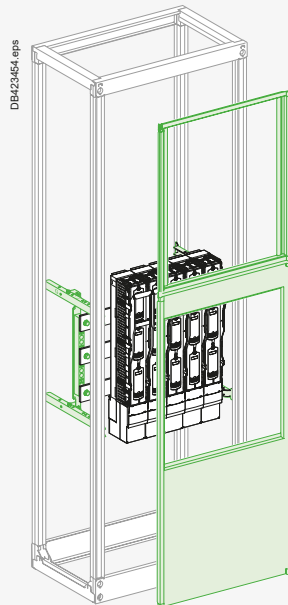
A row may contain devices with different ratings.

Devices can be installed:

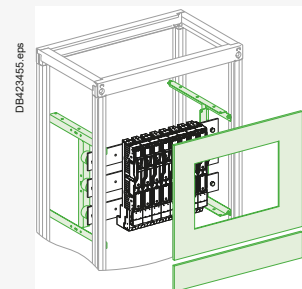
- behind front plate supports (with cut-outs or plain), with or without a door
- behind a front plate support door.
- Installation of devices:
 - ISFL160 on busbars (100 mm fixing centres) mounted on lateral cross-members
 - ISFL250, ISFL400 and ISFL1250 on busbars (185 mm fixing centres) mounted on lateral cross-members.

CTs can be installed behind the ISFLs.

Blanking plates are available to maintain the degree of protection IP.



Mounting through 2/3 front plate with cut-outs.



Mounting through standard front plate with cut-outs.

Installation recommendations

Installation in Prisma

Fupact INF - Direct front rotary handle

The same auxiliary contact is used for the ON/OFF/Test and "Test indication" functions. The function is determined by where the contact is installed in the switch-disconnector fuses.

Fusegear concerned

INF●63 to 160 for Prisma G wall-mount and floor-standing enclosures
 INF●32 to 800 for Prisma P cubicles

Types of Prisma enclosures and cubicles

Prisma G wall-mount and floor-standing enclosures and Prisma P cubicles.

Fusegear installation

Installation in Prisma G wall-mount and floor-standing enclosures

Vertical or horizontal mounting.

Depending on the rating, one to four devices can be installed per row.

Rating	Vertical		No. of modules	Horizontal		No. of modules
	3P	4P		3P	4P	
32/40 A	4	3	3	1	1	3
63 A	3	2	5	1	1	5
100/160 A	2	2	7	1	1	7

Devices are installed on mounting plates secured to the back of the enclosures.
 Connections are made by the panel builder.

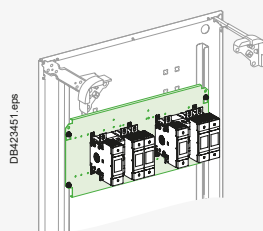
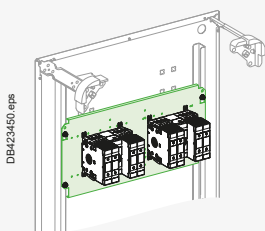
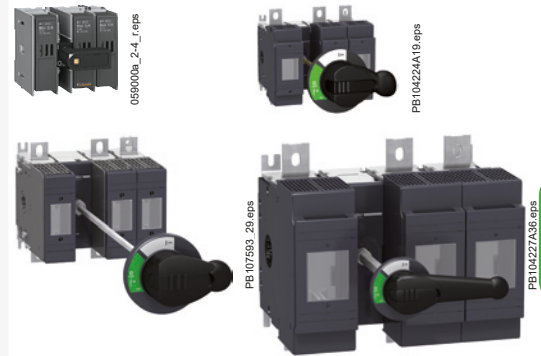
Installation in Prisma P cubicles

Vertical or horizontal mounting.

Depending on the rating, one to four devices can be installed per row.

Rating	Vertical		No. of modules	Horizontal		No. of modules
	3P	4P		3P	4P	
32/40 A	4	3	3	1	1	3
63 A	3	2	5	1	1	5
100/160 A	2	2	5	1	1	5
200 A	1	1	9	1	1	7
250 A	1	1	9	1	1	7
400 A	1	1	9	1	1	8
630/800 A	1	1	11	1	1	11

Devices are installed on mounting plates secured to lateral cross-members.
 Connections are made by the panel builder.



Tap-off units for fuse switch-disconnectors

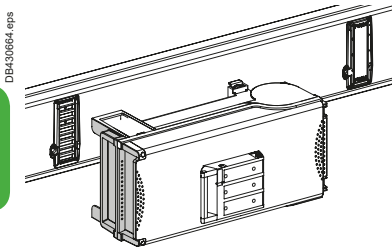
From 125 to 400 A

For rapid connection of loads or secondary lines, tap-off units can be handled and removed under off-load conditions with the trunking energized. They are automatically disconnected by opening and closing the cover. When the cover is opened no live parts are accessible.

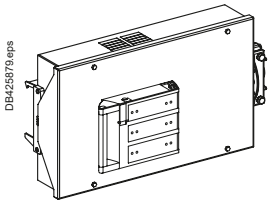
Fupact products are integrated in this offer with two types of tap-off:

- tap-off units for Fupact ISFT from 125 A to 400 A
- tap-off units for Fupact INF from 160 A to 400 A.

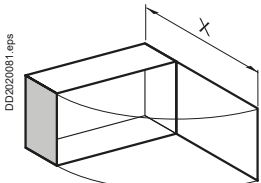
B



KSB125HD5



KSA...HD502



X = 622.5 (KSB125HD5)
X = 763 (KSA...HD502)

IP30 tap-off units for fuses

Disconnection by unplugging the tap-off unit.

Earthing system of the busbar trunking:

Earthing system of the tap-off unit:

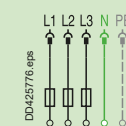
Tap-off polarity

Tap-off diagram (e.g. circuit-breaker protection)

TT - TNS - TNC - IT ^[1]

TT - TNS - TNC - IT ^[1]

3L + N + PE ^[2]



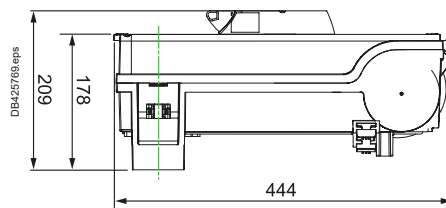
Rating (A)	Fuses (not supplied)	Connection	Max. size (mm ²) Cable		Dim. gland ^[3] (mm)	Weight (kg)	Catalogue numbers
			Flexible	Rigid			
125	NHL 00 IN U5U5 Type 00	Cable clamp U5U5 terminals	50	50	ISO 63	2	KSB125HD5
260	NHL 1 IN U5U5 Type 1	Cable clamp U5U5 terminals	185	185	42	9	KSA25HD502
400	NHL 00 IN U5U5 Type 2	Cable clamp U5U5 terminals	240	240	50	9	KSA40HD502

[1] The neutral must be not distributed (3L + PE) for the IT system.

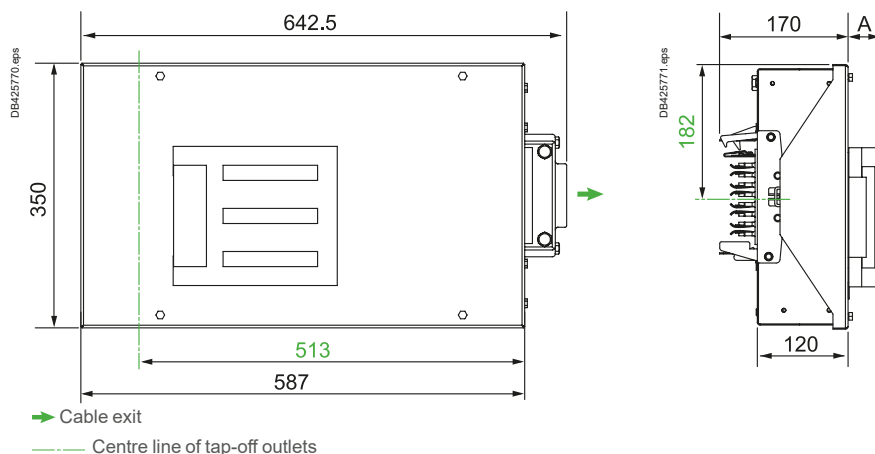
[2] Also suitable for tap-off unit 3L + PE (N not distributed, IT system also possible only if N not distributed).

[3] Cable gland not supplied. Maximum diameter for a multipolar cable.

KSB125HD5



KSA...HD502



→ Cable exit

--- Centre line of tap-off outlets

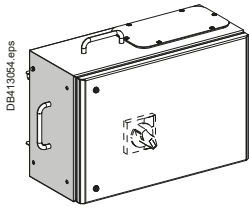
Tap-off units for Fupact INF fuses switch-disconnectors

From 160 to 400 A

Tap-off units for Fupact INF, fixed, front-connected switch-disconnector fuses

The cover of the tap-off unit may be opened only when the INF is in the off position.

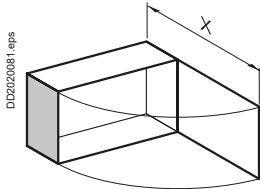
Earthing system of the busbar trunking	TT - TNS - TNC - IT ^[1] TNC
Earthing system of the tap-off unit:	TT - TNS - TNC - IT ^[1] TNC
Tap-off polarity	3L + N + PE ^[2] 3L + PEN
Tap-off diagram (e.g. circuit-breaker protection)	



KSB●●●SDF●

Rating (A)	Type of Fupact (not supplied)	Conn.	Max. size Cable gland ^[3] Weight (kg)		Catalogue numbers
			Flexible	Rigid	
160	INFD160 or INFB250 with extended rotary handle	INF	70	70 ISO 32 9	KSB160SDF4 KSB160SDF5
260	INFD250 or INFB250 with extended rotary handle 49619	INF	70	150 ISO 32 12.5	KSB250SDF4 KSB250SDF5
400	INFD400 or INFB400 with extended rotary handle LV480540	INF	150	240 ISO 40 18	KSB400SDF4 KSB400SDF5

- [1] The neutral must be protected or not distributed (3L + PE) for the IT system.
- [2] Also suitable for tap-off unit 3L + PE (N not distributed, IT system also possible).
- [3] Cable gland not supplied. Maximum diameter for a multipolar cable.

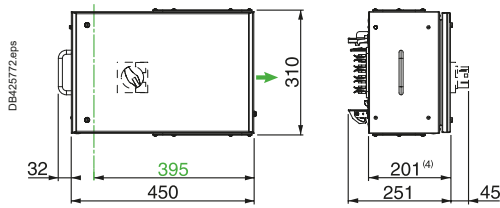


X = 577.5 (KSB160SDF●)
 X = 726.5 (KSB250SDF●)
 X = 976.5 (KSB400SDF●)

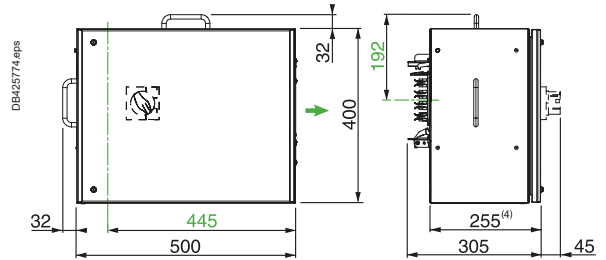
Fupact INF to be mounted on Canalis KS tap-off units

Rating (A)	4P/3F		3P/3F	
	Fupact INF B	Fupact INF D	Fupact INF B	Fupact INF D
160	LV480422	LV480417	LV480421 + LV480562	LV480416 + LV480562
250	LV480518	LV480504	LV480517 + LV480562	LV480503 + LV480562
400	LV480520	LV480507	LV480519 + LV480563	LV480506 + LV480563

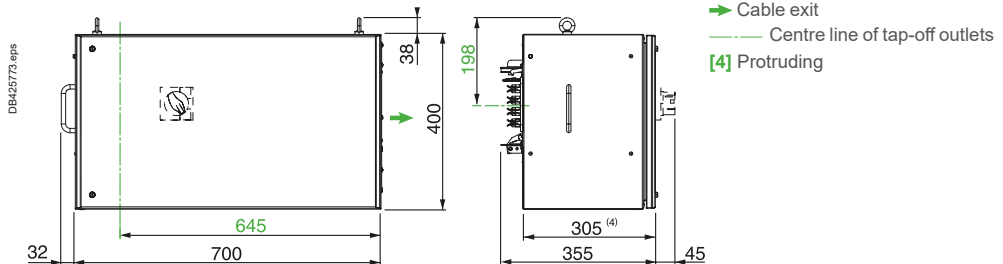
KSB160SDF4



KSB250SDF4



KSB400SDF4



Installation recommendations

Installation in Prisma Linery

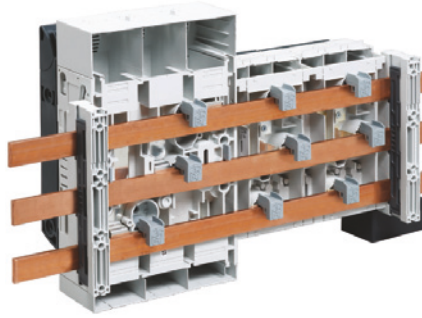
Linery BZ is a multistandard power busbar system up to 630 A which combines ease of installation and space saving in enclosures:

- quick connection and disconnection
- components are directly mounted on the busbar.

PB119120.eps



PB119844.eps



B

Linery BZ could be mounted on busbars with Fupact ISFT. Objective is to limit space on busbar system.

In this case benefits are :

- to have more units on one busbars system compare to conventional solution
- smaller enclosure system needed
- best use of entire busbar string.

PB119119.eps



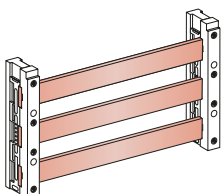
PB119100.eps



Busbar supports characteristics

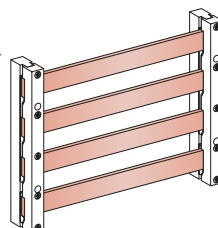
		LA9ZX01495 and LA9ZX01485 (IEC 60439-1)							
Bar dimensions compatibility	mm	12 x 5	15 x 5	20 x 5	25 x 5	30 x 5	12 x 10	20 x 10	30 x 10
Max. rated operating current	A	200	250	320	400	450	360	520	630
Min. peak permissible rated current	kA	30	30	30	30	45	35	35	53
Distance max. between 2 busbars supports	mm	570	570	570	570	570	570	570	570
Degree of protection	IP	20 (with cover LA9ZX01244 or LA9ZX01245)							
Thermal resistance	°C	125							
Rated current frequency	Hz	50/60							
Rated insulation voltage	V	690							
Rated operating voltage	V	690							

DB430650.eps



LA9ZX01495

DB430651.eps



LA9ZX01485

Note: for more details of applications, see page A-18.

Dimensions and connection

Fupact ISFT100N	
Dimensions and mounting	C-2
Front panel cut-outs - Connection and accessories	C-3
Fupact ISFT100	
Dimensions	C-4
Mounting and front panel cut-outs	C-5
Connection and accessories	C-6
Fupact ISFT160	
Dimensions	C-8
Mounting and front panel cut-outs	C-9
Connection and accessories	C-10
Fupact ISFT250 to 630	
Dimensions and mounting	C-12
Mounting and front panel cut-outs	C-13
Connection and accessories	C-14
Fupact ISFL160 3 x 1P	
Dimensions and mounting	C-16
Fupact ISFL160 1 x 3P	
Dimensions and mounting	C-18
Connection and accessories	C-20
Fupact ISFL250 to 630 1 x 3P	
Dimensions and mounting	C-21
Fupact ISFL1250	
Dimensions and mounting	C-23
Connection and accessories	C-25
Fupact INF●32	
Dimensions	C-26
Mounting and front panel cut-outs	C-27
Connection and accessories	C-28
Fupact INFD40 and INF●63	
Dimensions	C-29
Mounting and front panel cut-outs	C-31
Connection and accessories	C-32
Fupact INFB100 to INF●160	
Dimensions	C-33
Mounting and front panel cut-outs	C-35
Connection and accessories	C-36
Fupact INF●200 to INF●800	
Dimensions	C-37
Mounting and front panel cut-outs	C-38
Connection and accessories	C-39

Other chapters

Presentation	2
Functions and characteristics	A-1
Installation recommendations	B-1
Wiring diagrams	D-1
Technical characteristics	E-1
Catalogue numbers	F-1



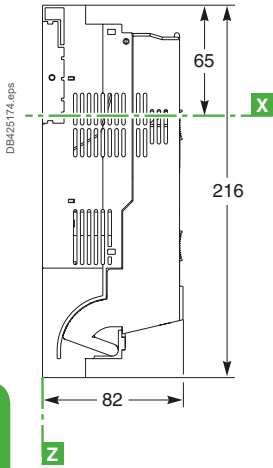
Fupact ISFT100N

Dimensions and mounting

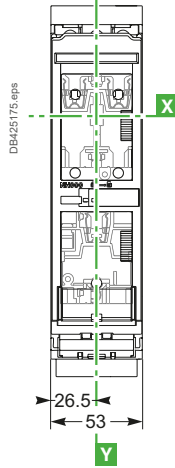
Dimensions

Device to be installed on a backplate or DIN rail

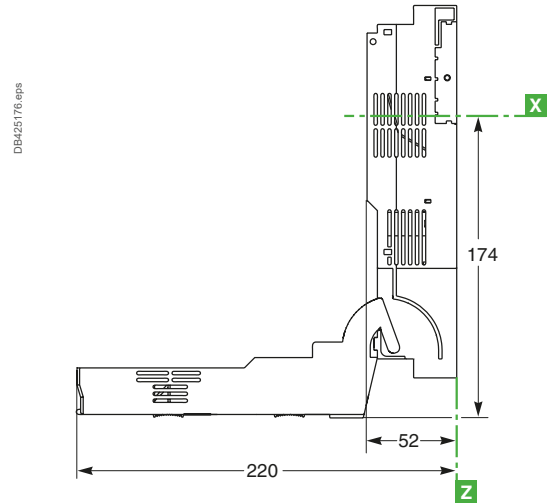
Fuse-carrier closed



Front

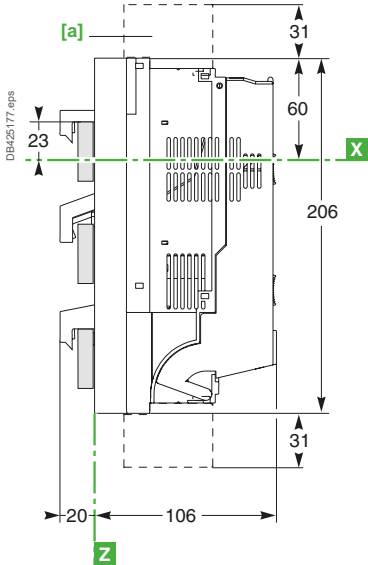


Fuse-carrier open

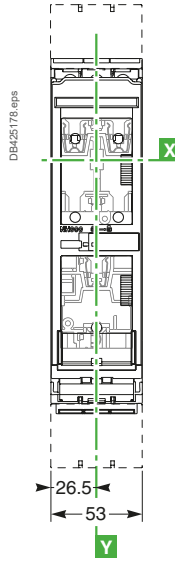


Device to be installed on a busbar

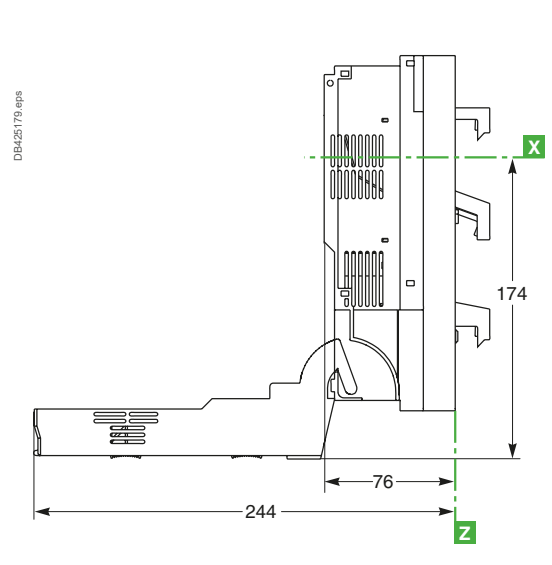
Fuse-carrier closed



Front



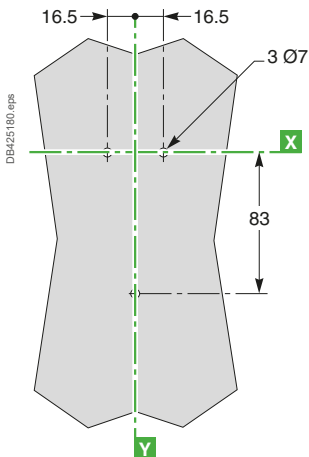
Fuse-carrier open



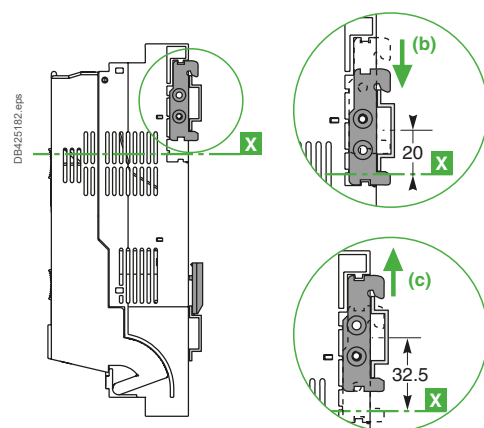
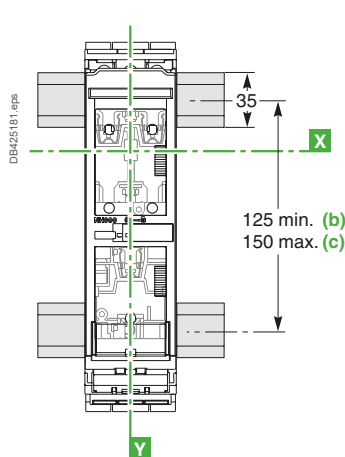
[a] Terminal shields.

Mounting

On backplate



On DIN rail

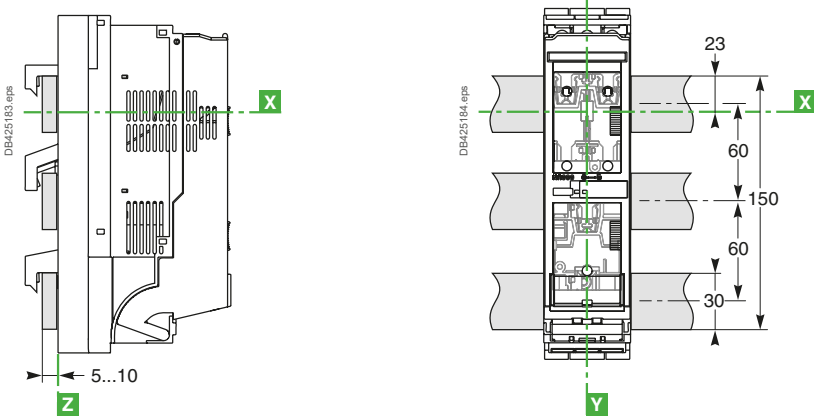


Fupact ISFT100N

Front panel cut-outs - Connection and accessories

Mounting (cont.)

On 60 mm busbars

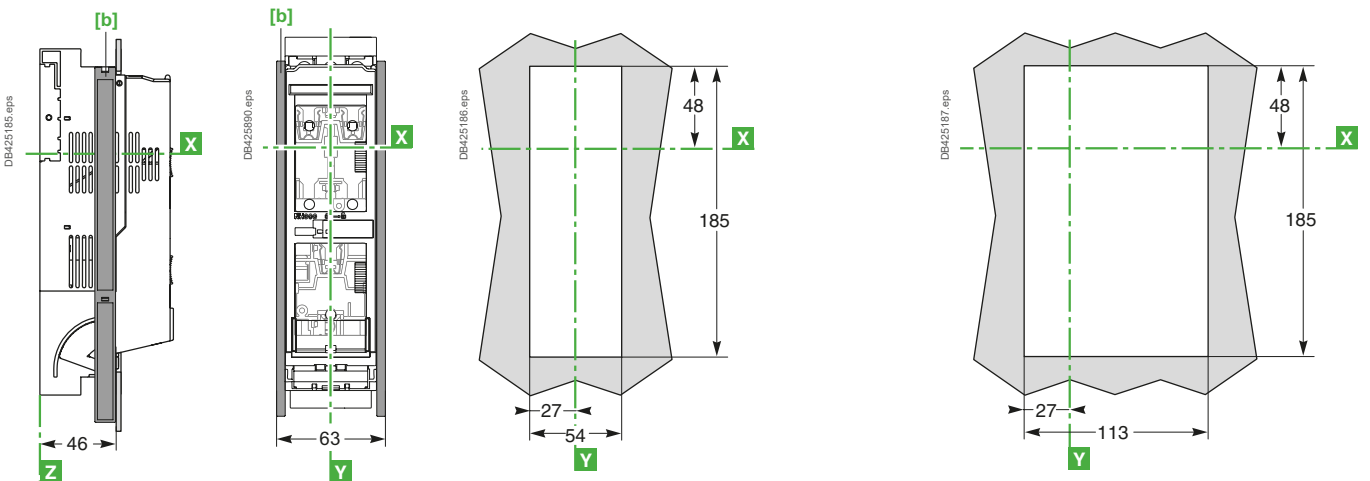


Front panel cut-outs

Device to be installed on a backplate or DIN rail

Cut-out for 1 device ^[1]

Cut-out for 2 devices ^[2]

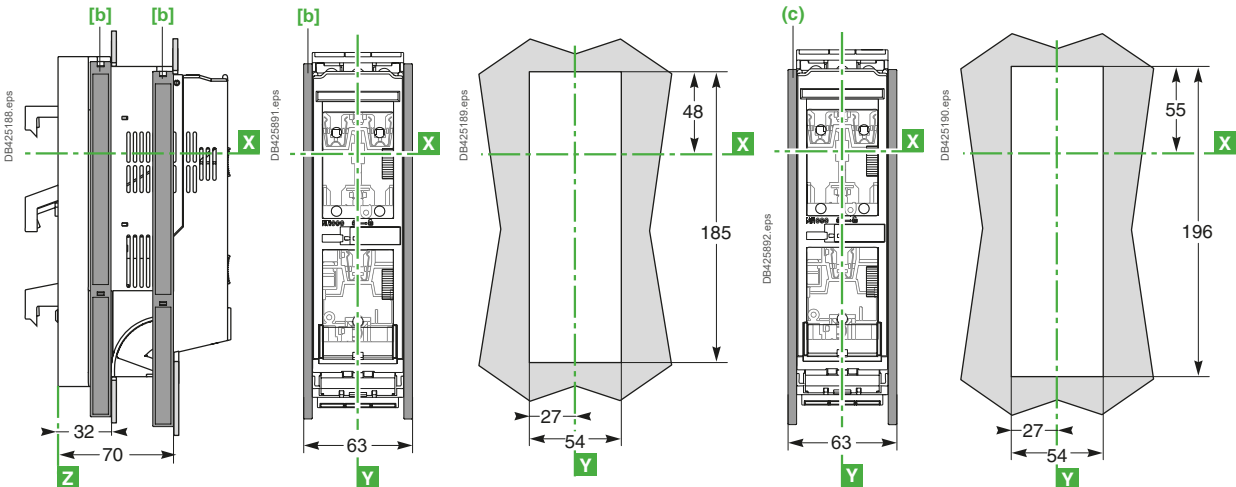


[1] With or without side profile, see page A-22. - [2] With side profile, see page A-22. -

Device to be installed on a busbar

Cut-out (c) for 1 device

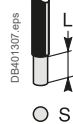
Cut-out (d) for 1 device



Front connection of cables

Fupact ISFT100N devices are equipped as standard with connectors for bare copper cables from 2.5 to 50 mm² for mounting on backplates.

Standard device	
Fupact connectors	L (mm) 18
	S (mm ²) 2.5 to 50 rigid
	Cu/Al 2.5 to 35 flexible
	Torque (Nm) 3



[b] Laterally attachable support profile.



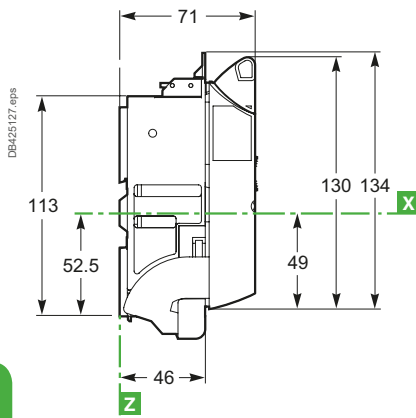
Fupact ISFT100

Dimensions

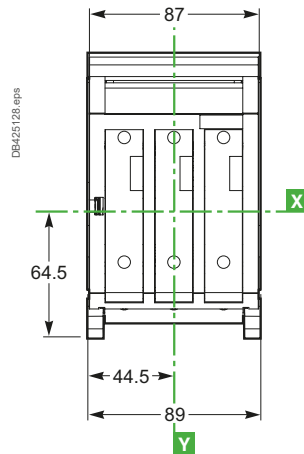
Dimensions

Device to be installed on a backplate or DIN rail

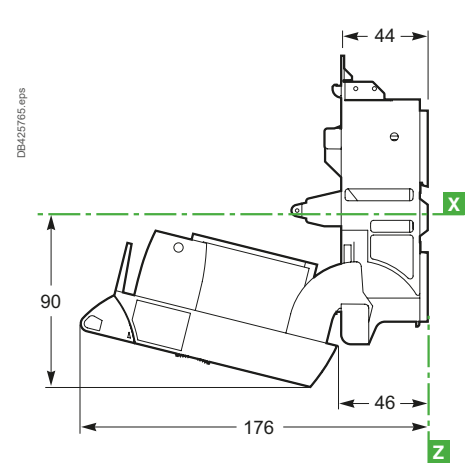
Fuse-carrier closed



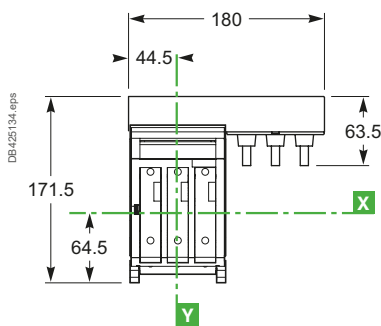
Front



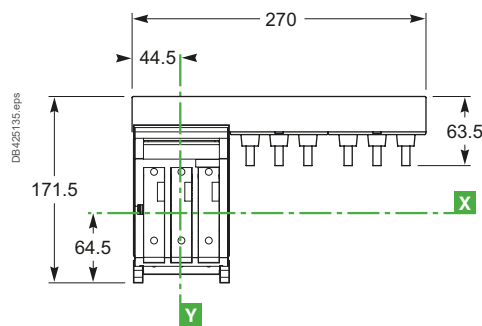
Fuse-carrier open



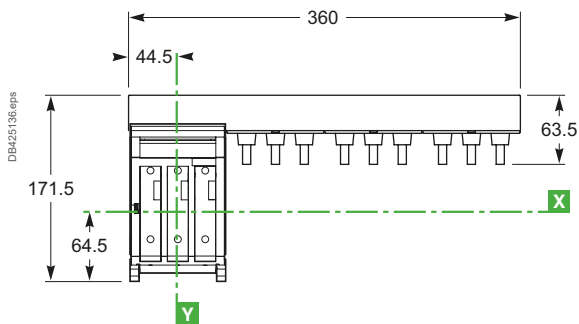
Feeding busbar for 2 ISFT100 devices



Feeding busbar for 3 ISFT100 devices



Feeding busbar for 4 ISFT100 devices



Dimensions and connection

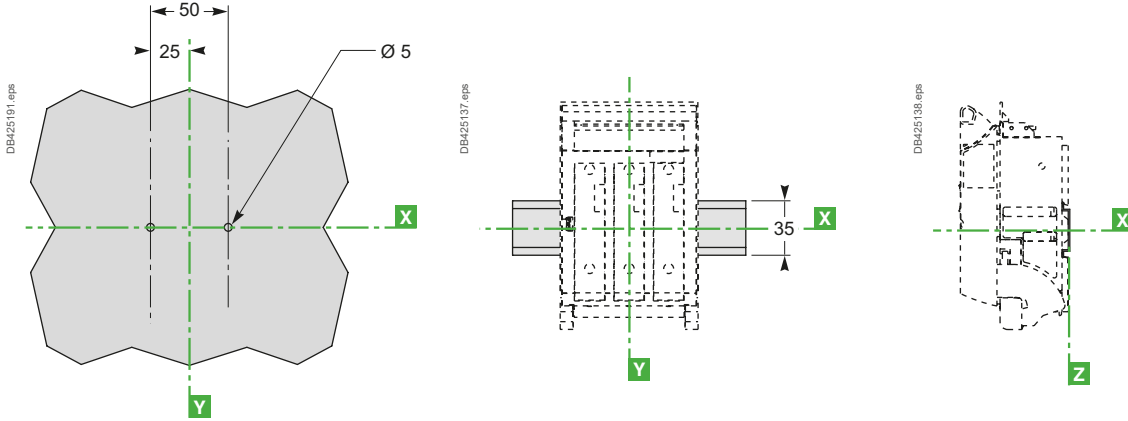
Fupact ISFT100

Mounting and front panel cut-outs

Mounting

On backplate

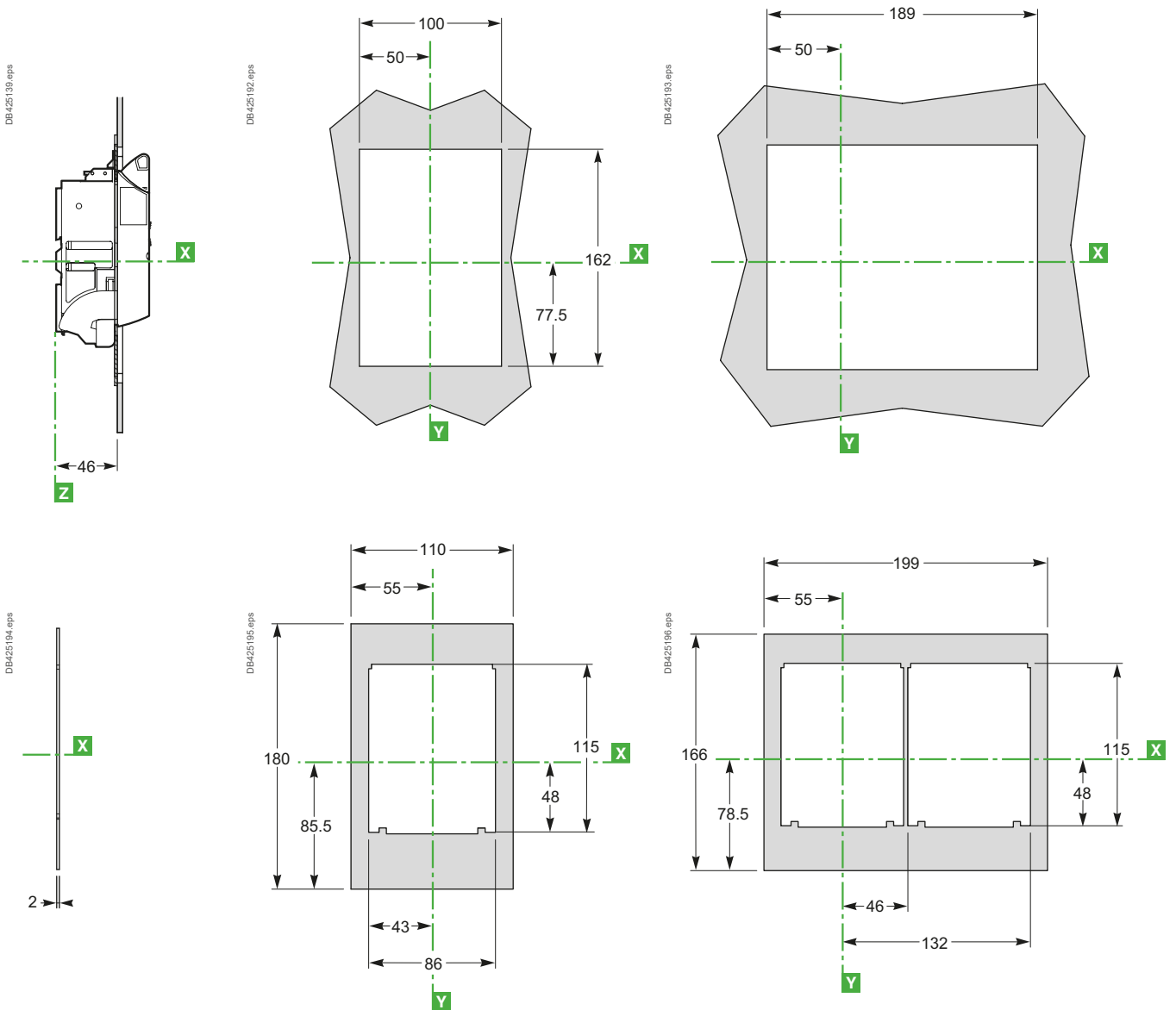
On a symmetrical DIN rail



Front panel cut-outs

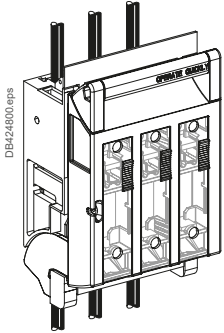
Cut-out for 1 device

Cut-out for 2 devices

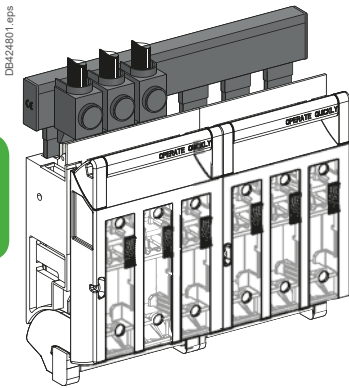


Fupact ISFT100

Connection and accessories



Connection via bare cable connectors.



Connection via feeding busbars.

Front connection via bare cable connectors

Fupact ISFT100 devices are equipped as standard with connectors for bare copper or aluminium cables from 1.5 to 50 mm² for mounting on backplates.

Standard device

	Fupact connectors	L (mm)	18
		S (mm ²)	1.5 to 50 rigid
		Cu/Al	1.5 to 35 flexible ^[1]
		Torque (Nm)	3

3 x 10 mm² distribution connector

	Fupact connectors	L (mm)	18
		S (mm ²)	1.5 to 10 rigid
		Cu/Al	1.5 to 6 flexible ^[1]
		Torque (Nm)	2 (cables) 3 (connectors)

[1] Connection of 2.5 to 4 mm² flexible cables requires crimped or auto-crimping ferrules.

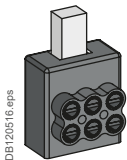
Front connection via feeding busbars

This accessory simplifies connection of cables and can be used to supply two to four Fupact ISFT100 devices.

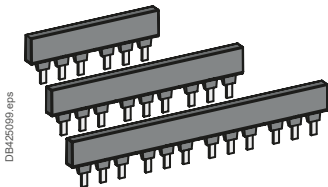
- Tightening torque 3 Nm.

Incoming connector for feeding busbars

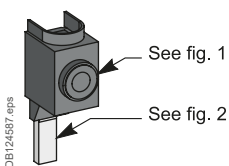
	Fupact connectors	L (mm)	18
		S (mm ²)	25 to 95 rigid
		Cu/Al	25 to 70 flexible
		Torque (Nm)	10 (cables) 3 (connectors)



Distribution connector.



Feeding busbars.



Incoming connector for feeding busbars.

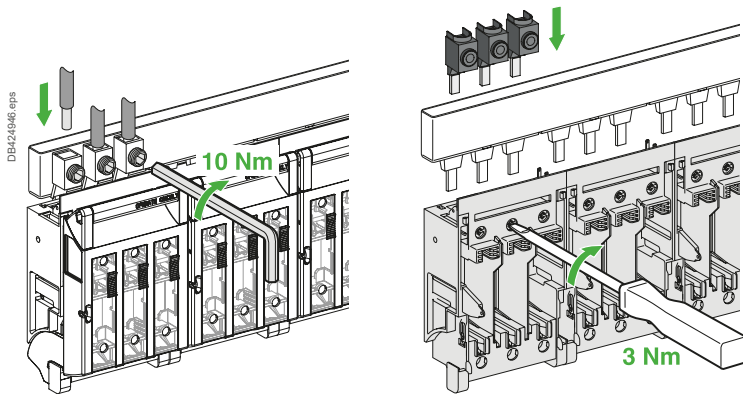


Figure 1.

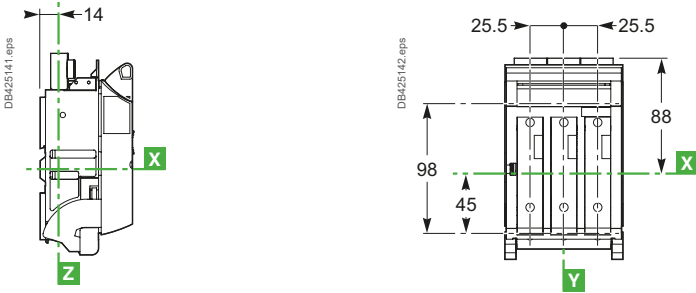
Figure 2.

Dimensions and connection

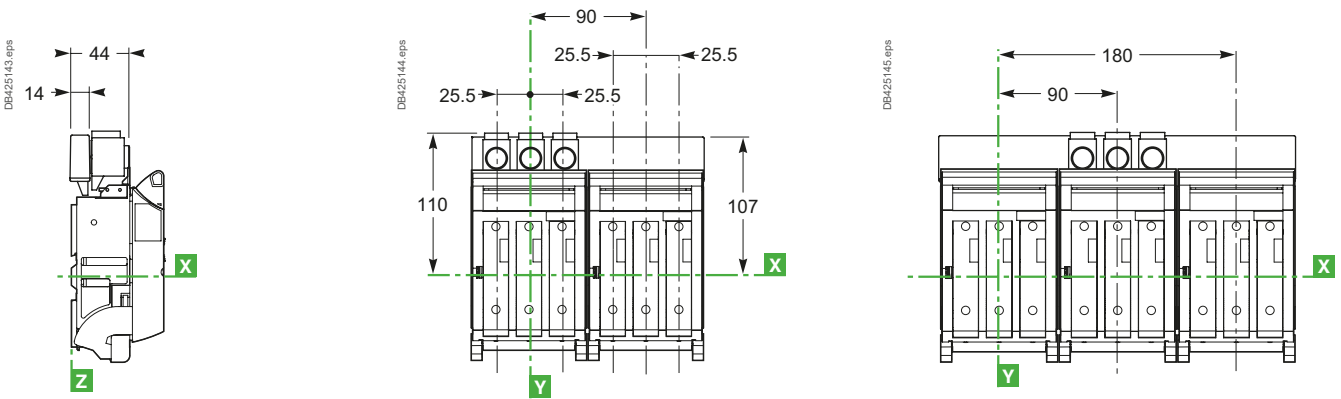
Fupact ISFT100

Connection and accessories

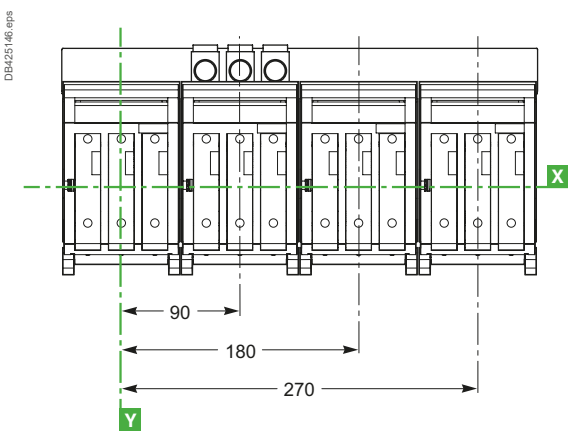
Basic device with distribution connector option



Feeding busbars for two or three ISFT100 devices (with 25 to 95 mm² incoming connector)



Feeding busbars for four ISFT100 devices (with 25 to 95 mm² incoming connector)

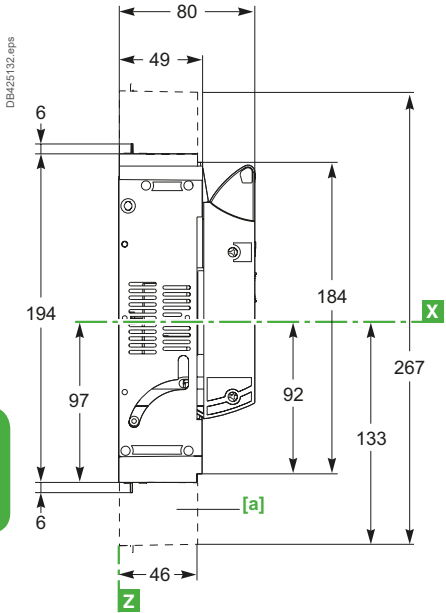


Fupact ISFT160

Dimensions

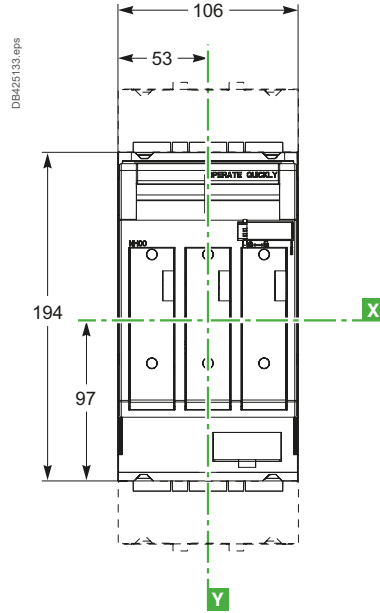
Dimensions

Fuse-carrier closed

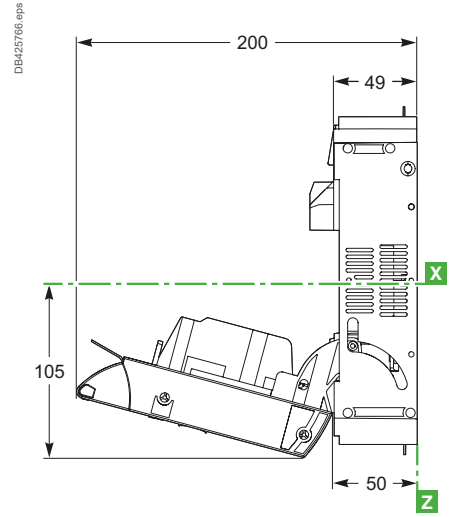


[a] Terminal shields.

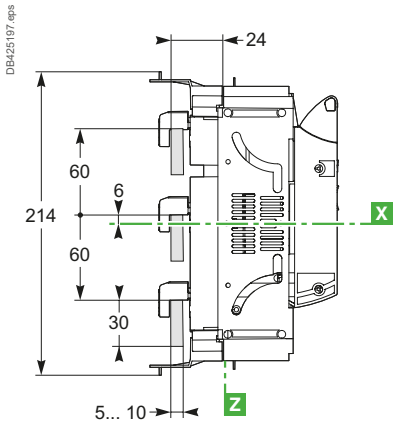
Front



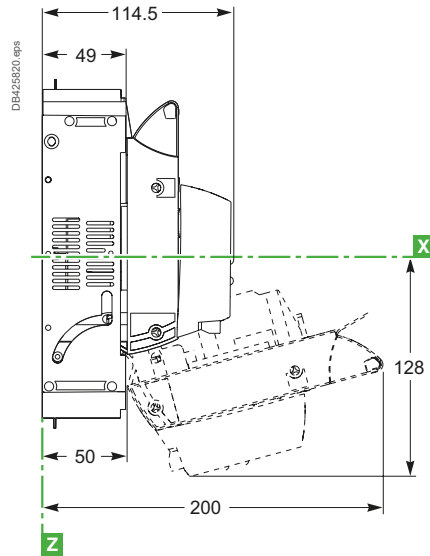
Fuse-carrier open



With hook-on



With fuse monitor



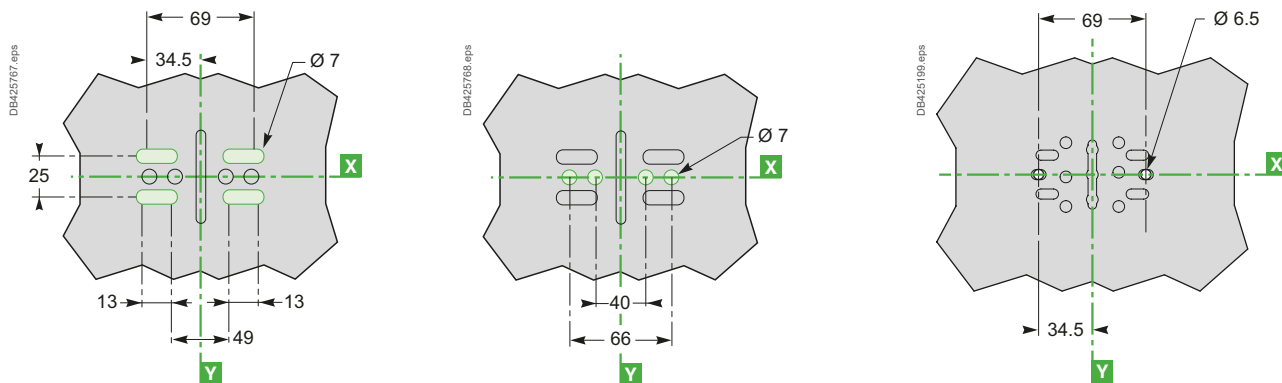
Dimensions and connection

Fupact ISFT160

Mounting and front panel cut-outs

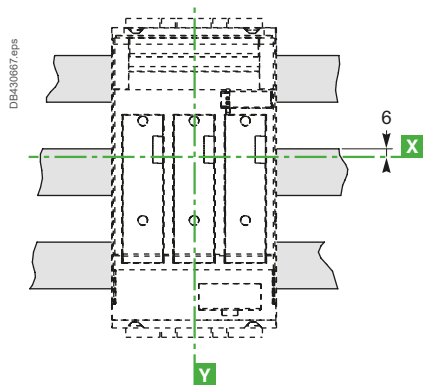
Mounting

On backplate

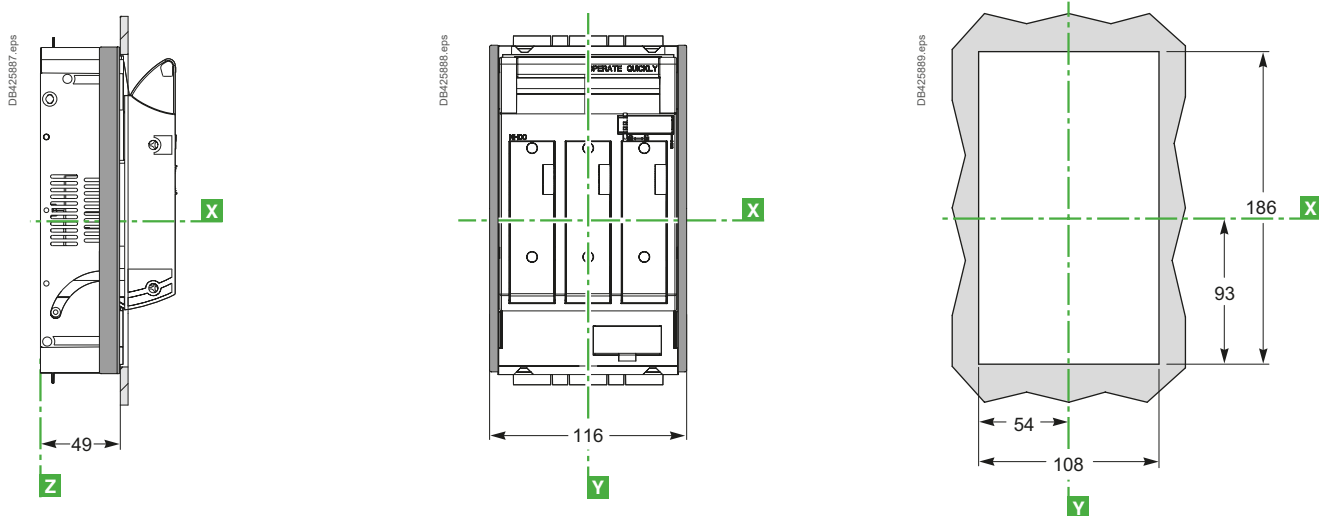


On 60 mm busbars

With hook-on

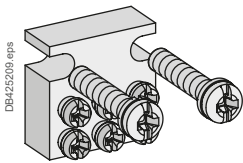
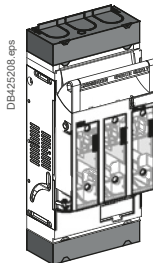
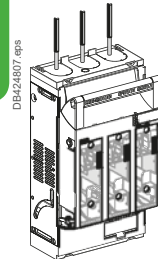
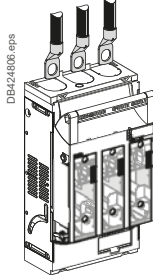
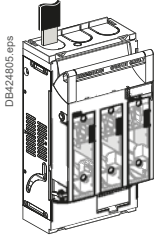
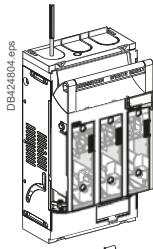
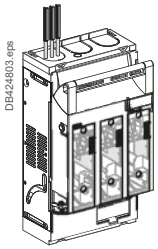


Front panel cut-outs

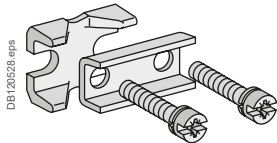


Fupact ISFT160

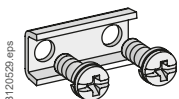
Connection and accessories



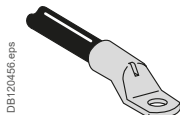
Distribution connector.



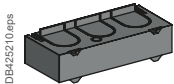
V-type connector for bare Cu/Al cables.



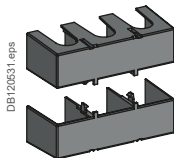
Connector for flexible bars.



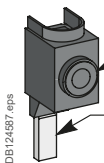
Lug for copper cables.



Short terminal shield.



Long terminal shields.



See fig. 1

See fig. 2

Incoming connector for feeding busbars.

Front connection to standard M8 terminals

Fupact ISFT160 devices are also equipped with 12 mm wide terminals with holes for M8 screws for the connection methods presented below.

3 x 16 mm² distribution connector



L (mm)	25
S (mm ²)	1.5 to 16 rigid
Cu/Al	1.5 to 10 flexible ^[1]
Torque (Nm)	2 (cables) 4 (connectors)

Used with long terminal shields

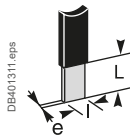
V-type connector for bare Cu/Al cables



L (mm)	25
S (mm ²)	1.5 to 95 rigid
Cu/Al	1.5 to 70 flexible ^[1]
Torque (Nm)	4

Used with short terminal shields

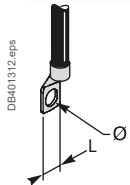
Connector for flexible bars



L (mm)	20
l (mm)	12
e (Nm)	6
Torque (mm)	4

Used with short terminal shields

Lug for 95 to 185 mm² copper cables



L (mm)	< 12
Ø (mm)	8.2
Torque (Nm)	14

Used with long terminal shields

^[1] Connection of 2.5 to 4 mm² flexible cables requires crimped or auto-crimping ferrules.

Direct front connection to connectors

Fupact ISFT160 devices are equipped as standard with connectors for bare copper or aluminium cables from 1.5 to 50 mm² for mounting on backplates.

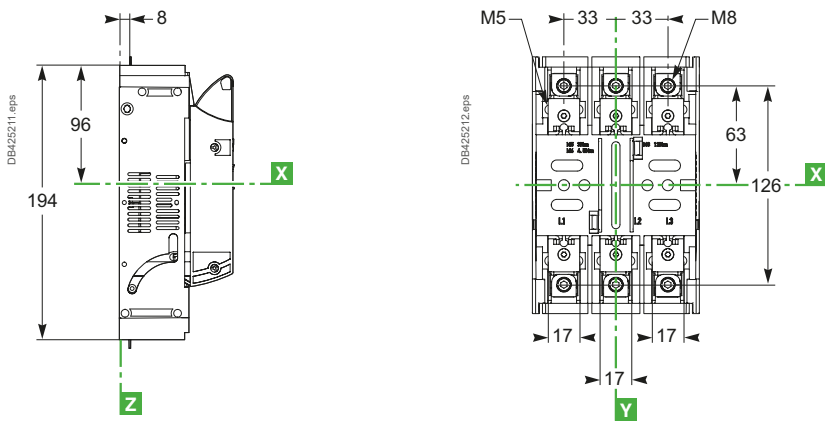
Standard device



Fupact connectors	L (mm)	25
	S (mm ²)	1.5 to 95 rigid
	Cu/Al	1.5 to 70 flexible
	Torque (Nm)	4

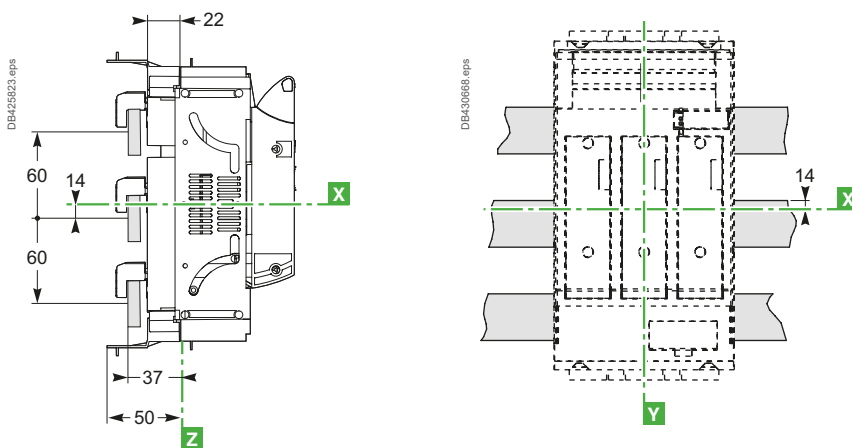
Used with short terminal shields

Connections for mounting on a backplate



Connections for mounting on 60 mm busbars

Hook-on connection



Dimensions and connection

Fupact ISFT250 to 630

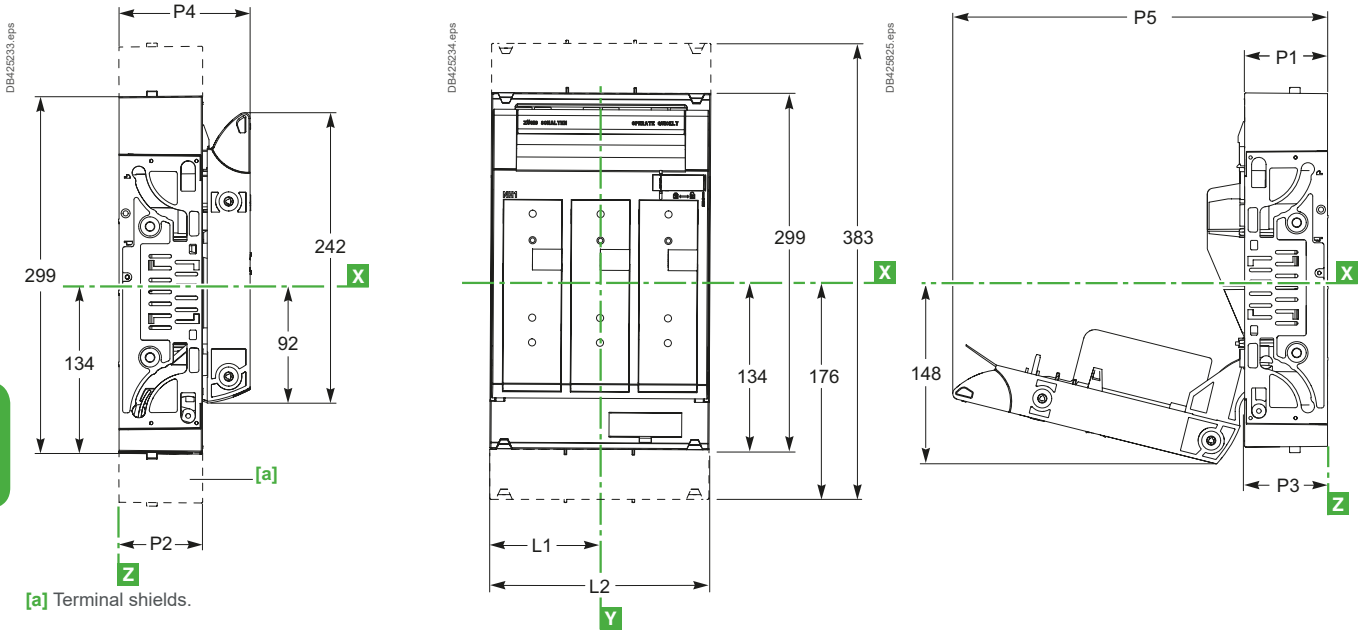
Dimensions and mounting

Dimensions

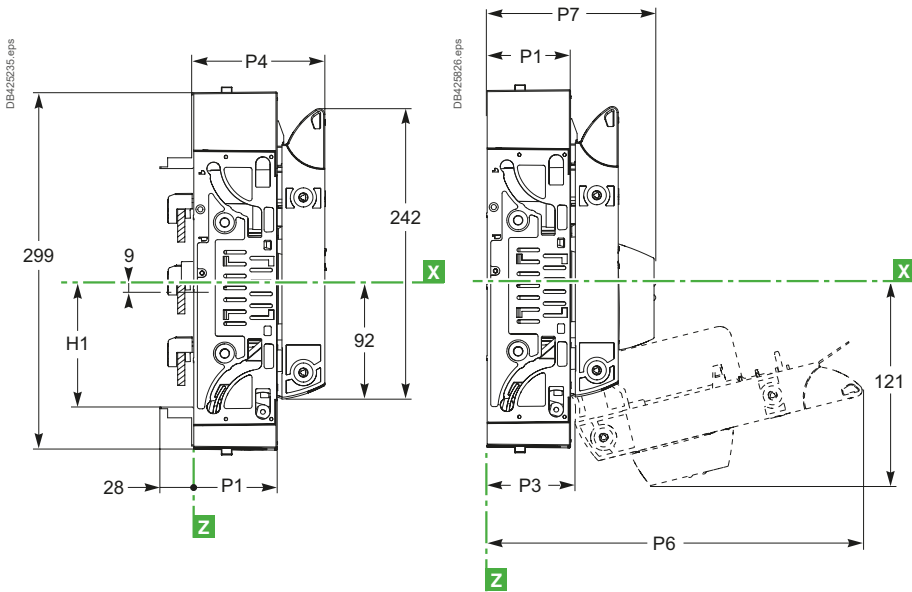
Fuse-carrier closed

Front

Fuse-carrier open



With hook-on for ISFT250/400/630 With fuse monitor for ISFT250/400/630



Type	L1	L2	P1	P2	P3	P4	P5	P6	P7
ISFT250	92	184	70	70	74	112	293	316	142
ISFT400	105	210	90	90	94	131	331	319	162
ISFT630	125	250	90	90	94	131	332	319	162

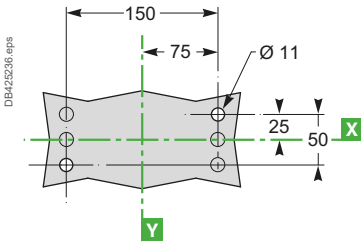
Dimensions and connection

Fupact ISFT250 to 630

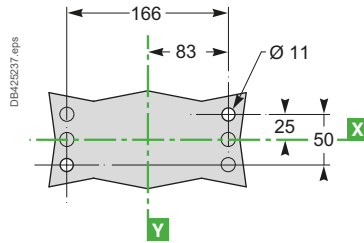
Mounting and front panel cut-outs

Mounting

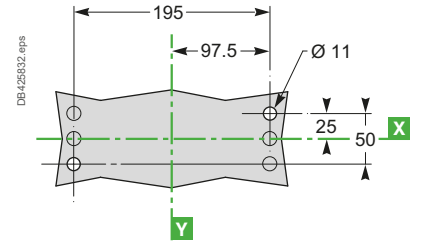
On a backplate for ISFT250



On a backplate for ISFT400

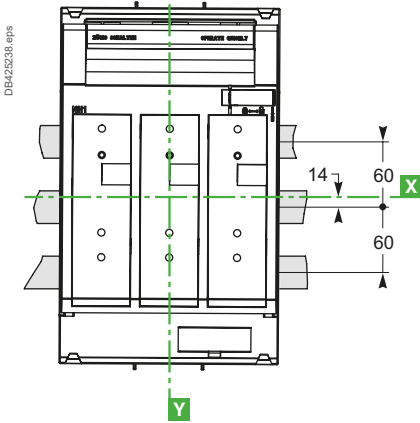


On a backplate for ISFT630

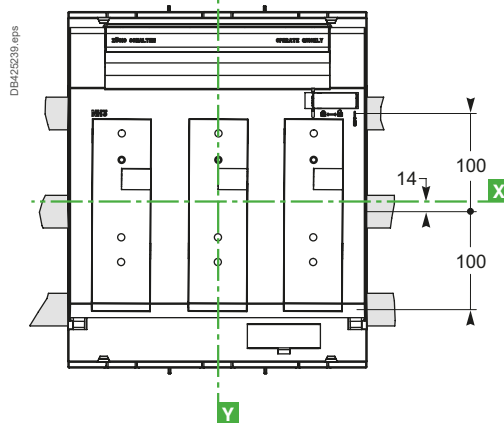


On busbars

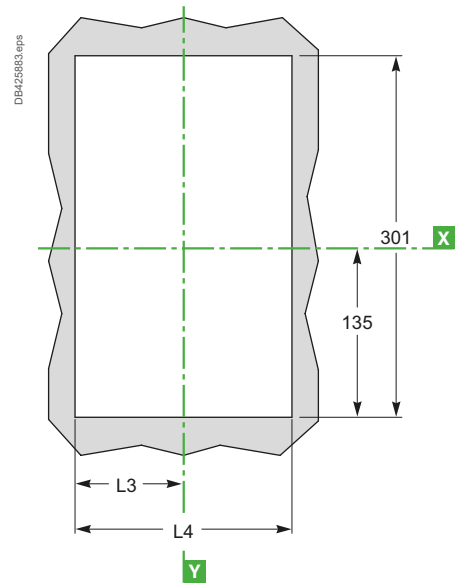
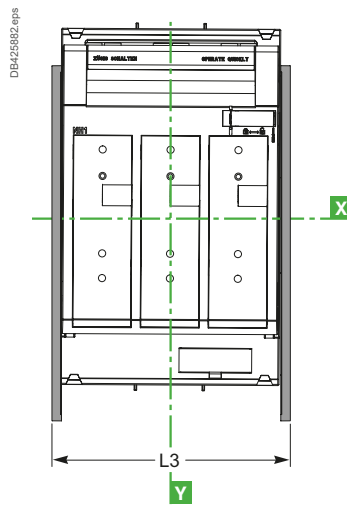
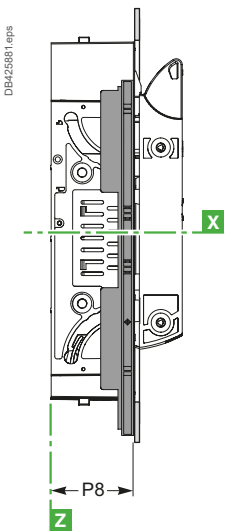
With hook-on for ISFT250



With hook-on for ISFT400/630



Front panel cut-outs

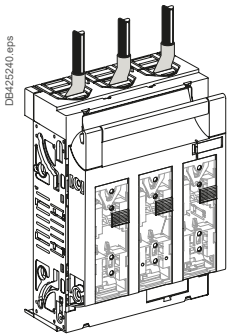


Type	L4	L5	P8
ISFT250	93	186	70
ISFT400	106	212	90
ISFT630	126	252	90



Fupact ISFT250 to 630

Connection and accessories



Front connection to standard M10 terminals

Fupact ISFT250 to 630 devices are equipped as standard with terminals comprising holes for M10 screws for the connection methods presented below.

V-type connector for bare Cu/Al cables

		ISFT250	ISFT400/630
<p>DB401307 eps</p>	L (mm)	20	25
	S (mm ²)	6 to 150	6 to 240
	Cu/Al		
	Torque (Nm)	14	14

Connector for flexible bars

		ISFT250	ISFT400/630
<p>DB401311 eps</p>	L (mm)	20	30
	l (mm ²)	16	21
	e (mm)	15	15
	Torque (Nm)	14	14

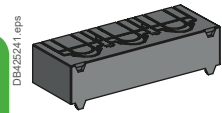
Lug for 100 to 185 mm² copper cables

	ISFT250 to 630	
<p>DB401312 eps</p>	L (mm)	≤ 16
	Ø (mm)	10.2
	Torque (Nm)	32

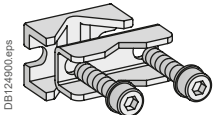
Lug for 240 to 300 mm² copper cables

	ISFT400/630	
<p>DB401312 eps</p>	L (mm)	≤ 21
	Ø (mm)	10.2
	Torque (Nm)	32

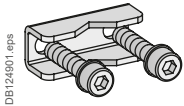
C



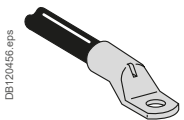
Terminal shields.



V-type connector.

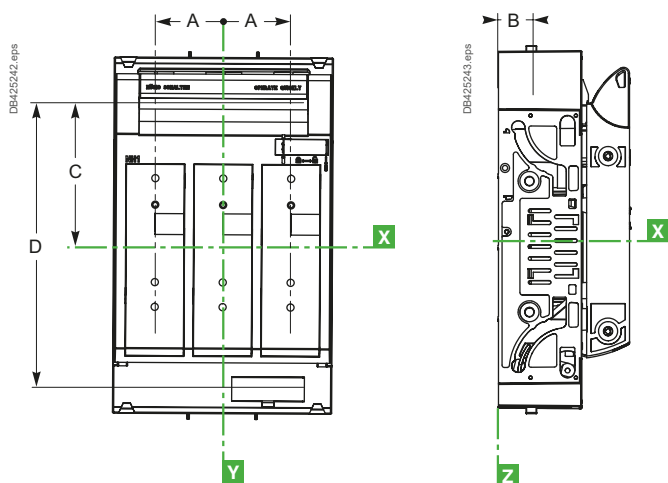


Connector for flexible bars.



Lug for copper cables.

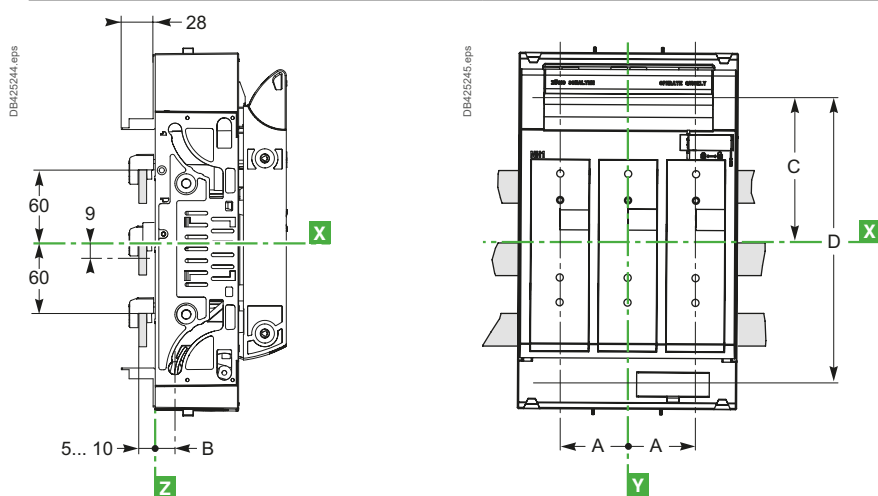
Connections for mounting on a backplate



Type	A	B	C	D
ISFT250	57	33	93	186
ISFT400	65	36.5	104.5	209
ISFT630	80	36.5	104.5	209

Connections for mounting on 60 mm busbars

Hook-on connection for ISFT250/400



Dimensions and connection

Fupact ISFL160 3 x 1P

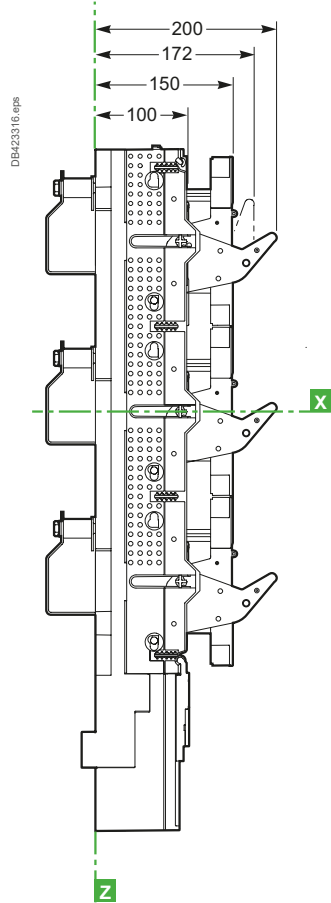
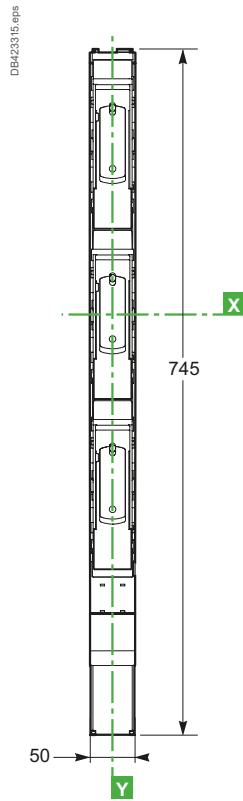
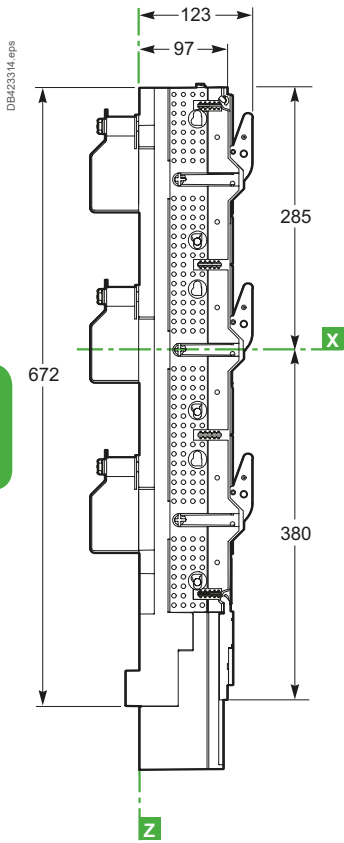
Dimensions and mounting

Dimensions

Fuse-carrier closed

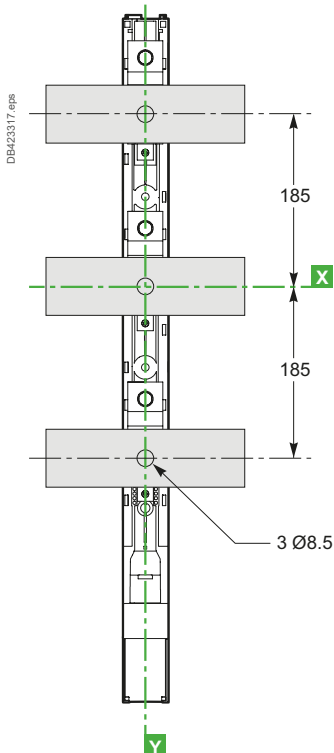
Front

Open and locked



Mounting

For 185 mm busbars

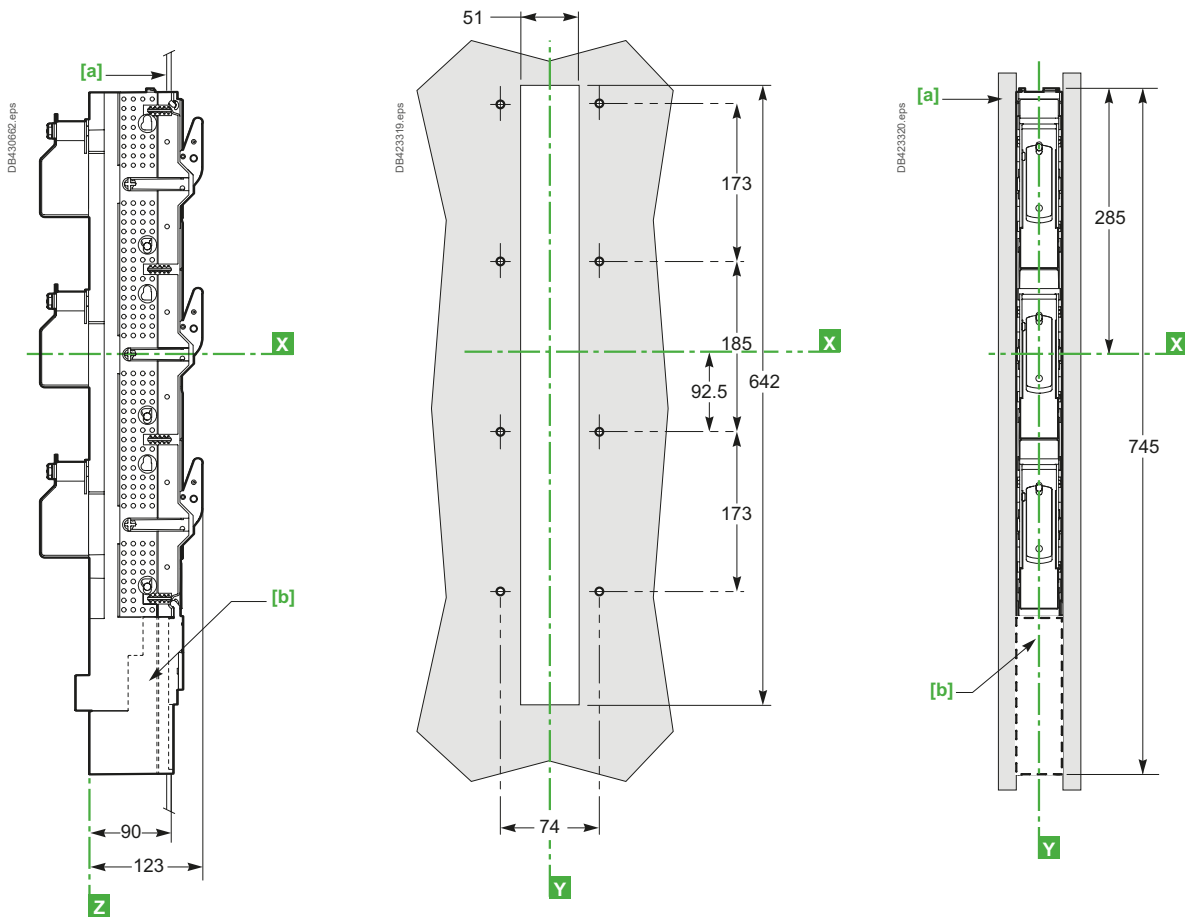


Dimensions and connection

Fupact ISFL160 3 x 1P

Dimensions and mounting

For 1 device with side cover and/or 1 free slot



[a] Side cover for front panel cut-out.
 [b] Terminal shields.



Fupact ISFL160 1 x 3P

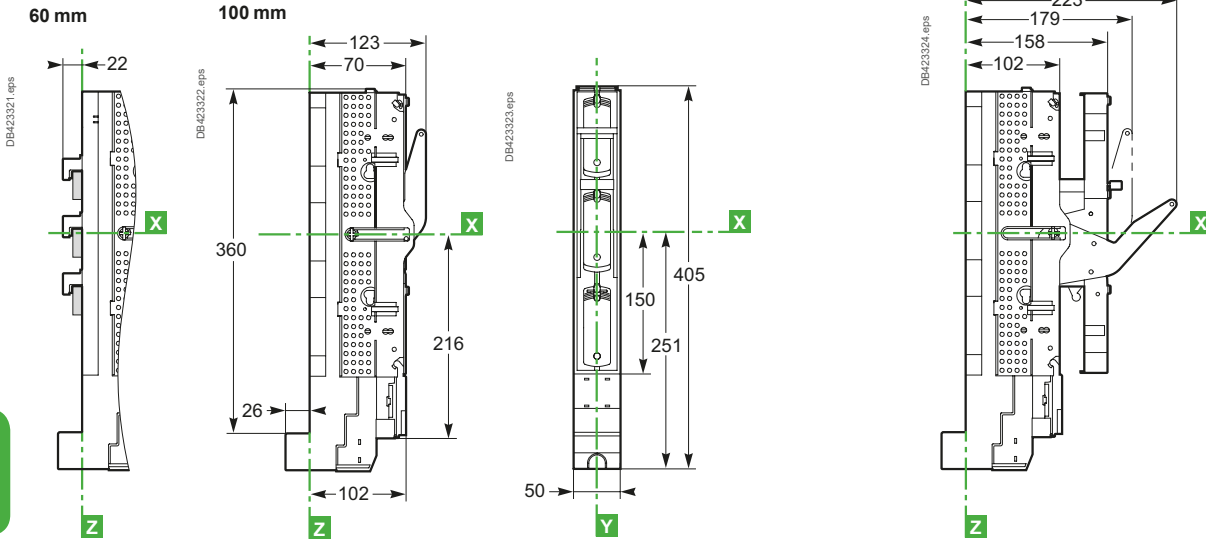
Dimensions and mounting

Dimensions

Fuse-carrier closed

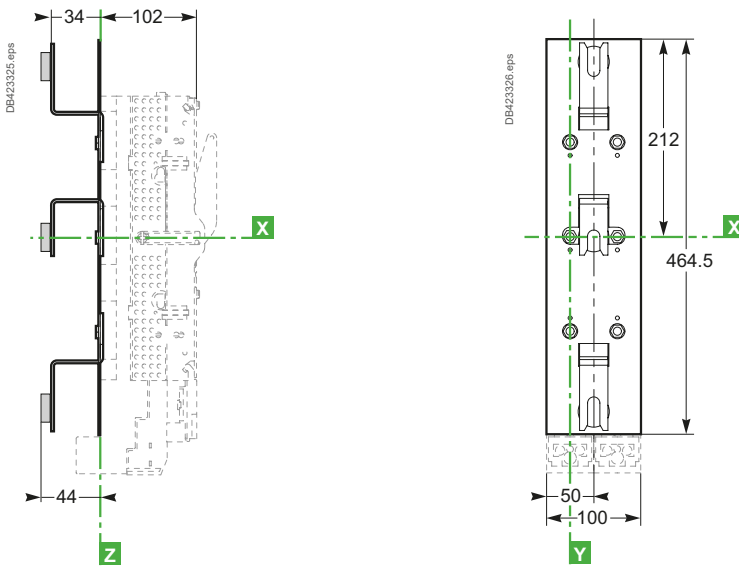
Front

Open and locked



With 185 mm connection kit

With 185 mm connection kit for 2 ISFL devices

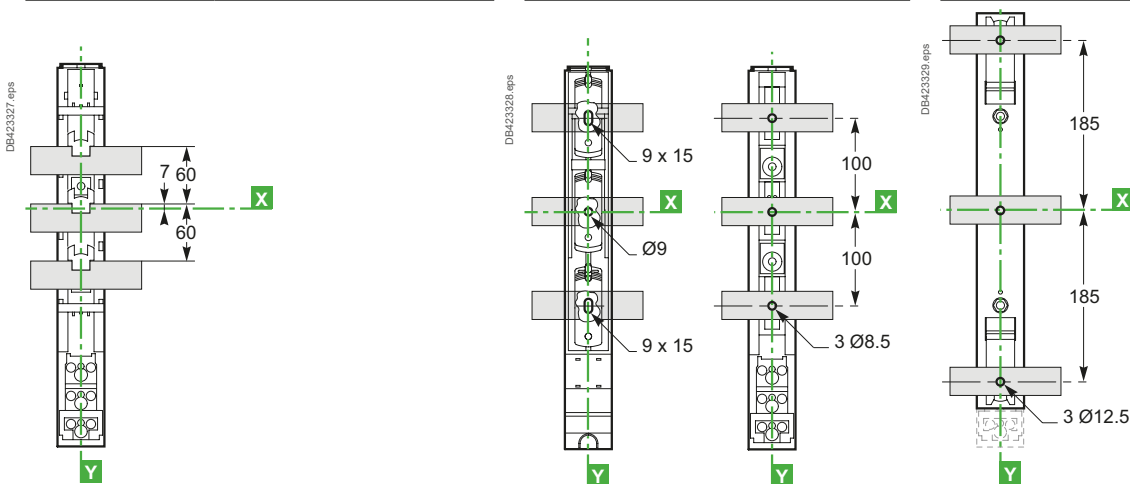


Mounting

For 60 mm busbars

For 100 mm busbars

With connection kit for 185 mm busbars

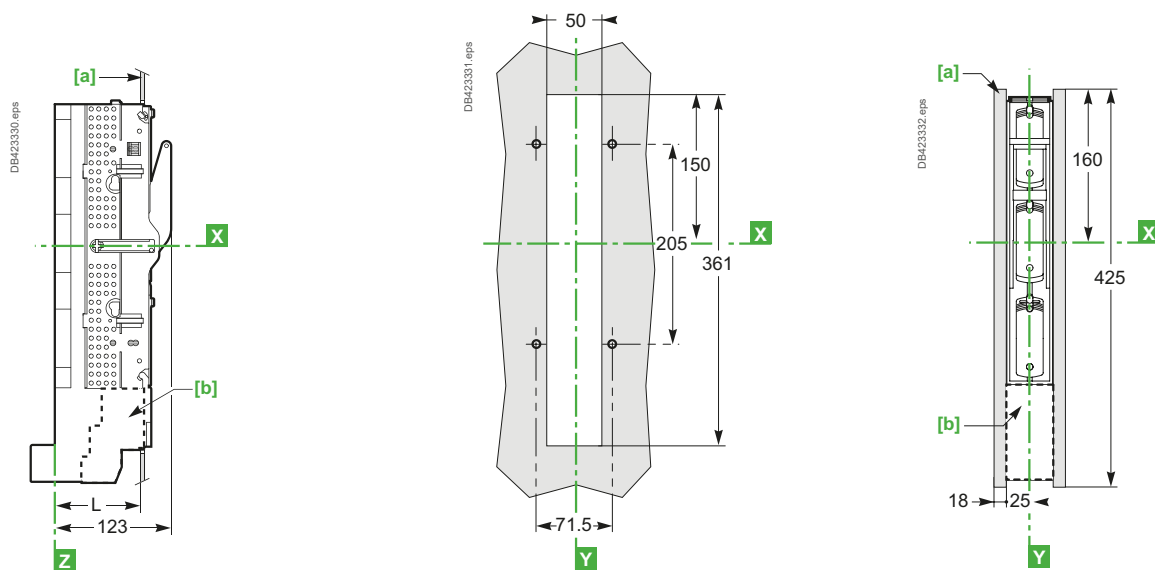


Dimensions and connection

Fupact ISFL160 1 x 3P

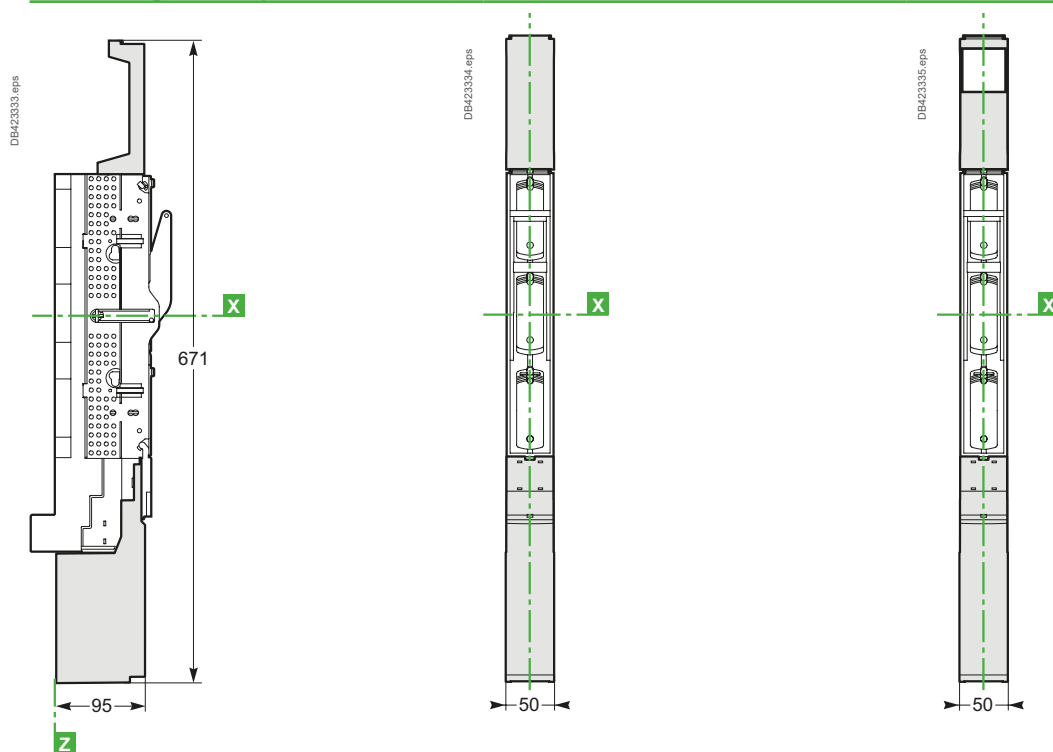
Dimensions and mounting

For 1 device with side cover and/or 1 free slot



[a] Side cover for front panel cut-out.
[b] Terminal shields.

With length adapter



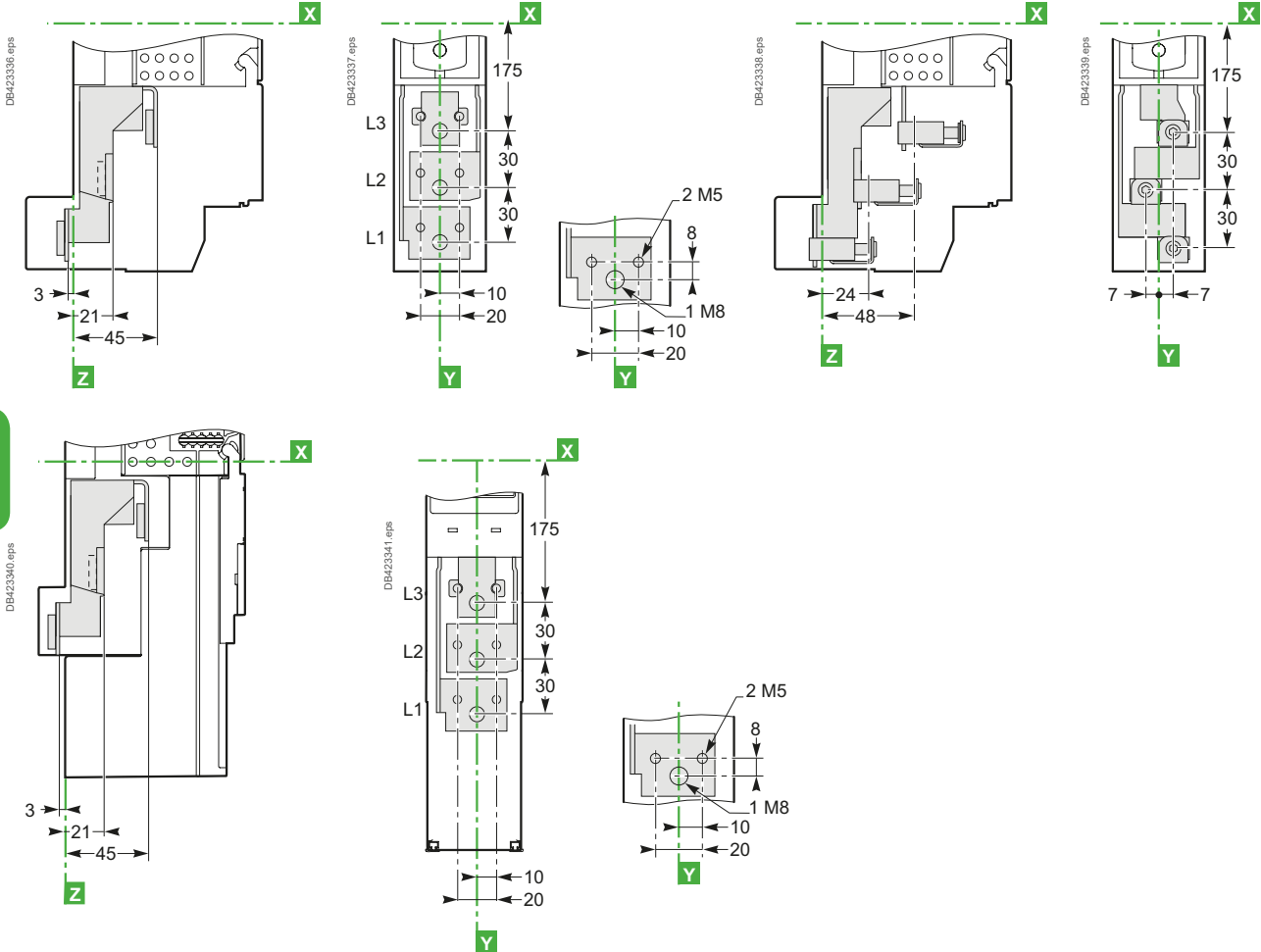
Fupact ISFL160 1 x 3P

Connection and accessories

Connection

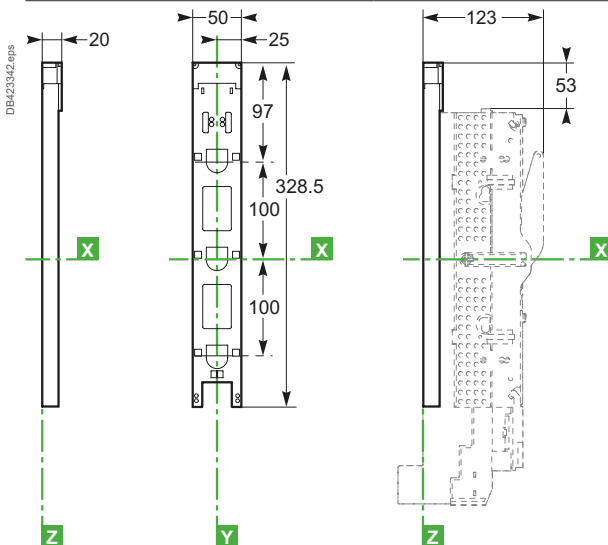
Connection via lugs/flexible bars

Connection via connectors



Current transformer

Direct connection to 100 mm busbars



Dimensions and connection

Fupact ISFL250 to 630 1 x 3P

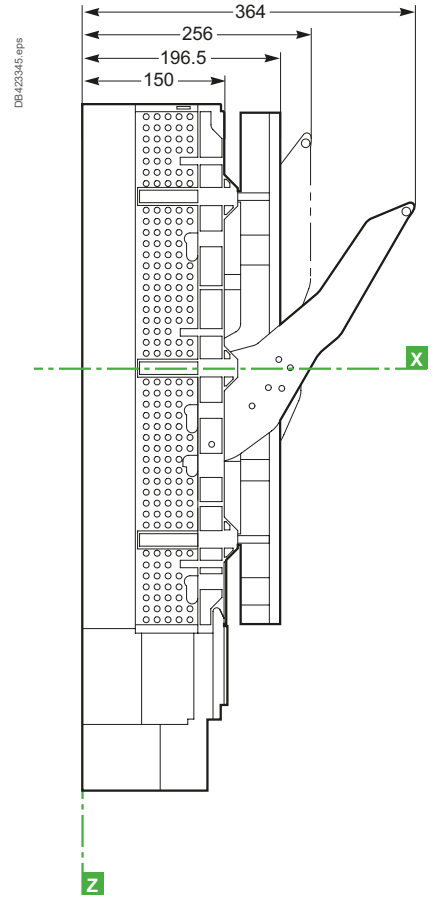
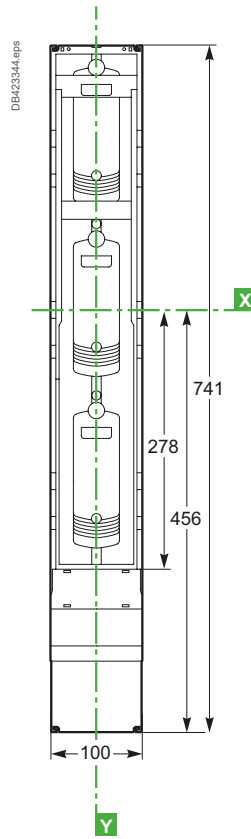
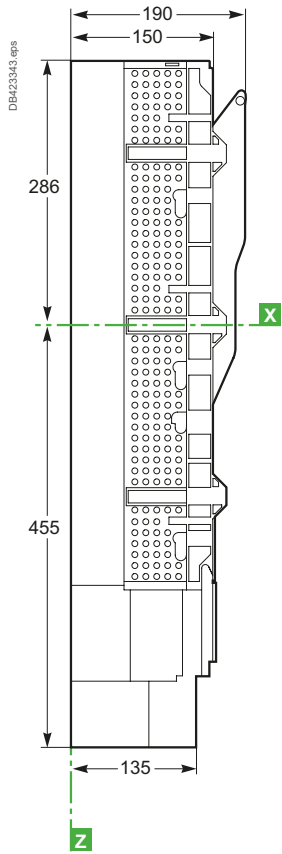
Dimensions and mounting

Dimensions

Fuse-carrier closed

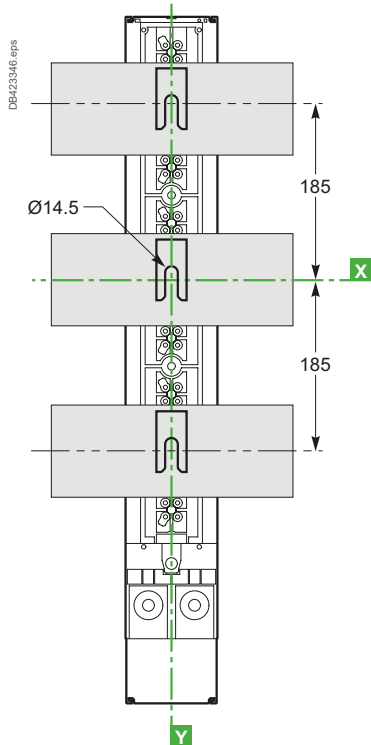
Front

Open and locked



Mounting

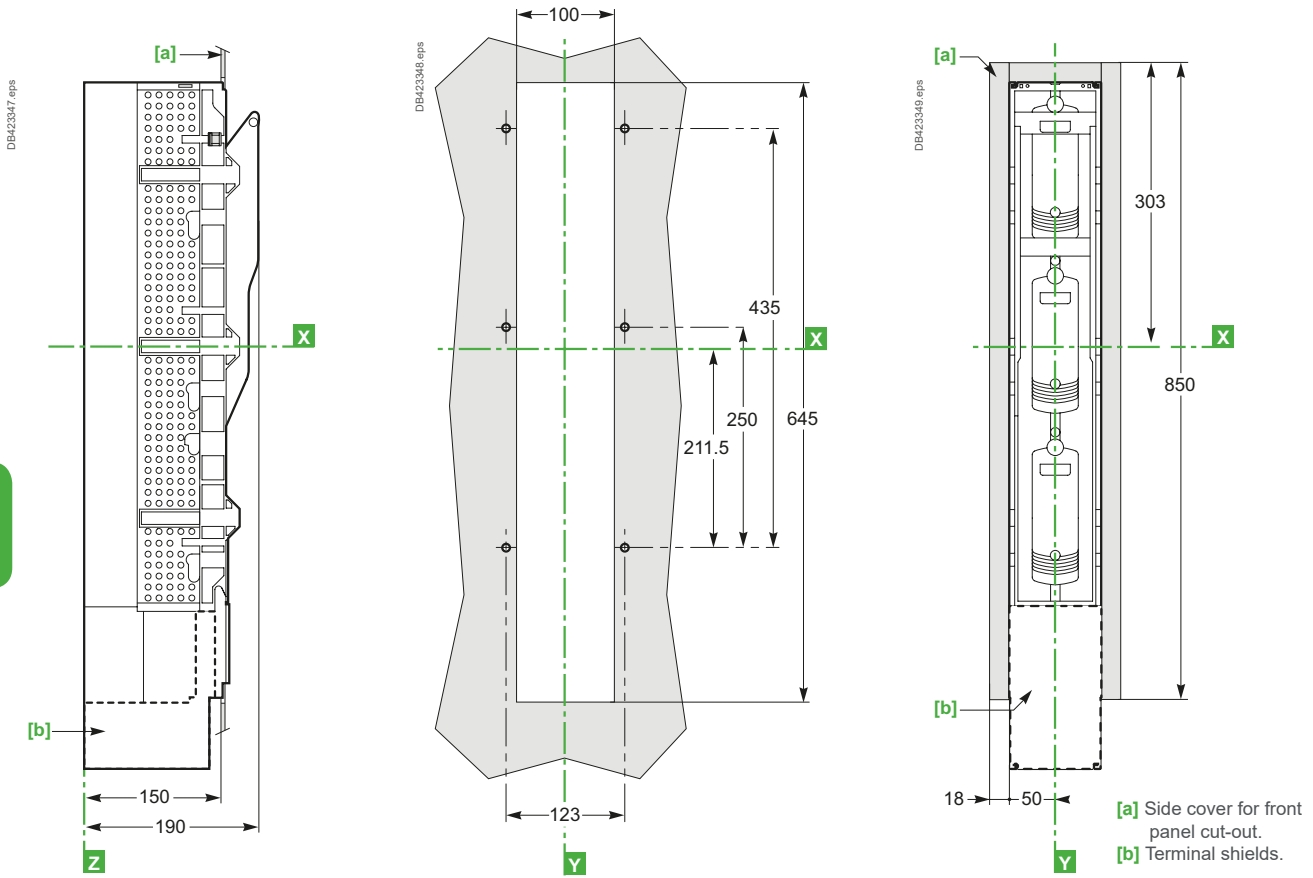
For 185 mm busbars



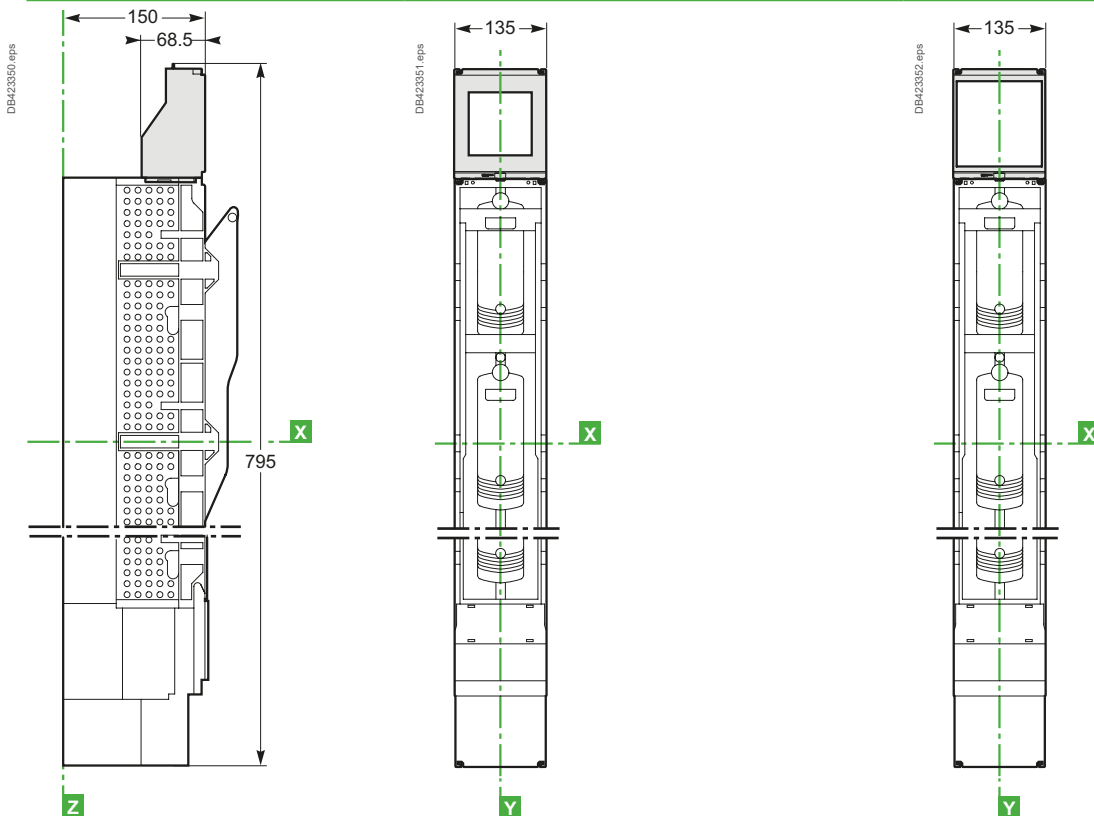
Fupact ISFL250 to 630

Dimensions and mounting

Device with side cover



With measurement device



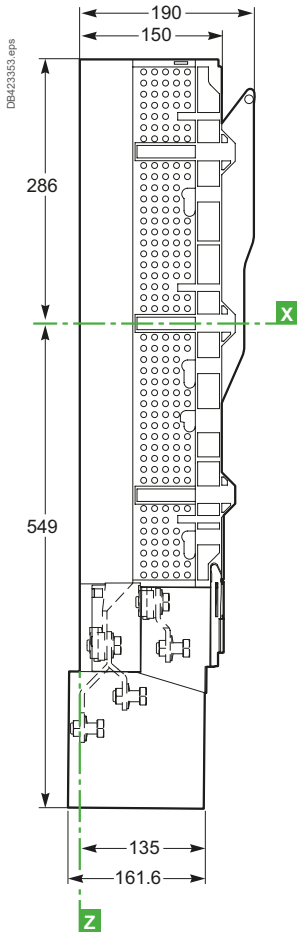
Dimensions and connection

Fupact ISFL1250

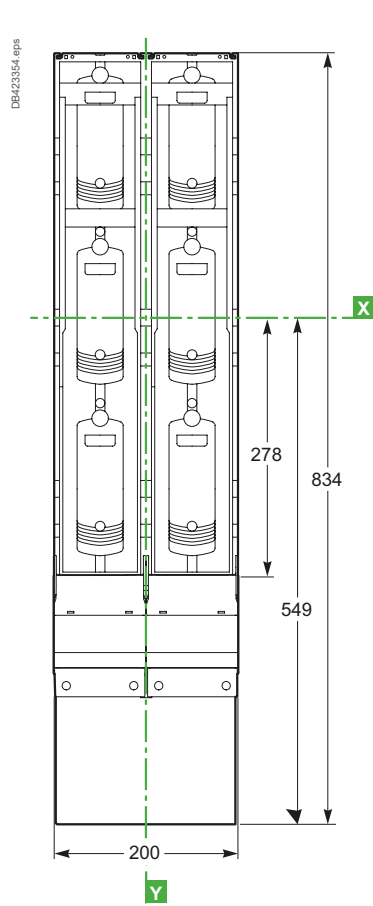
Dimensions and mounting

Dimensions

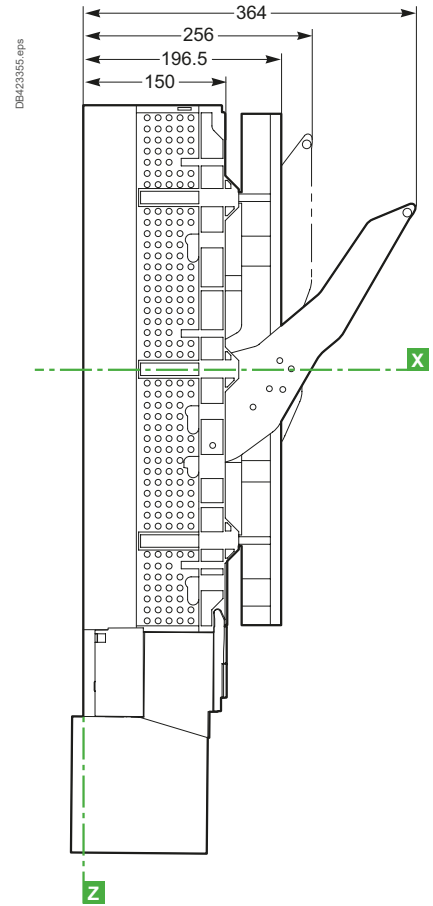
Fuse-carrier closed



Front

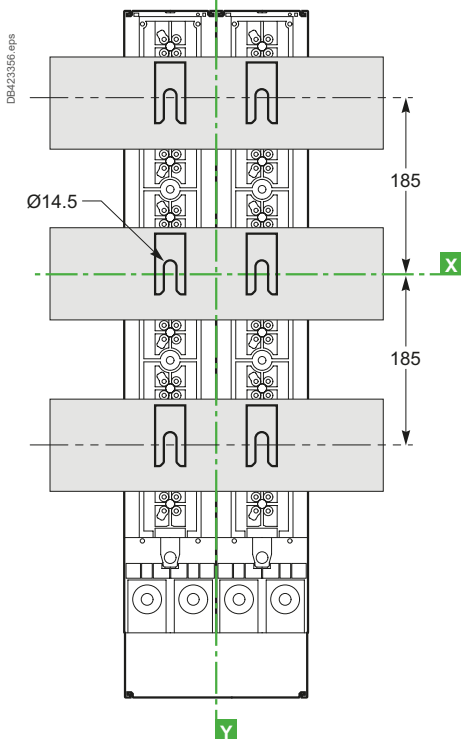


Open and locked



Mounting

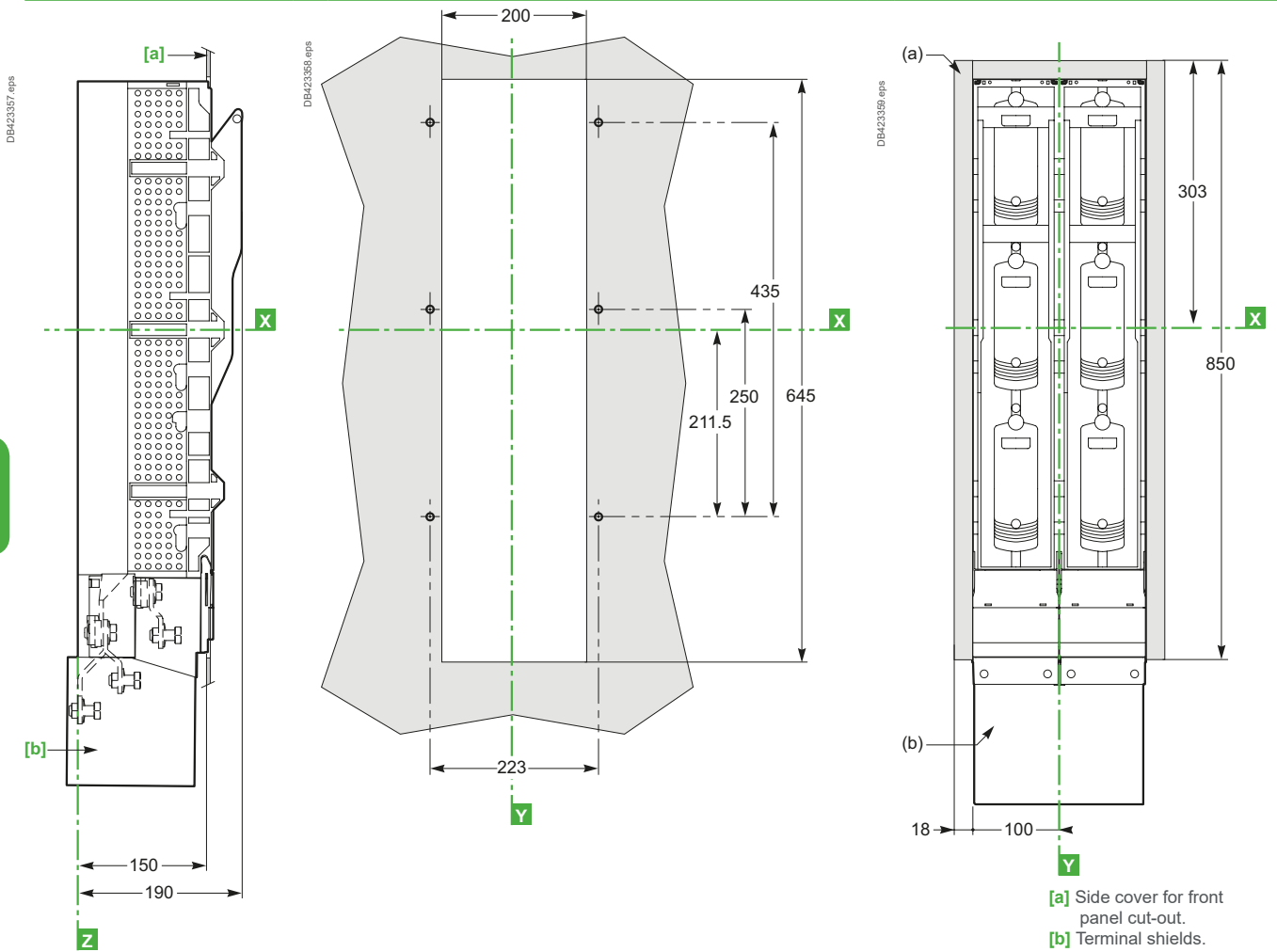
For 185 mm busbars



Fupact ISFL1250

Dimensions and mounting

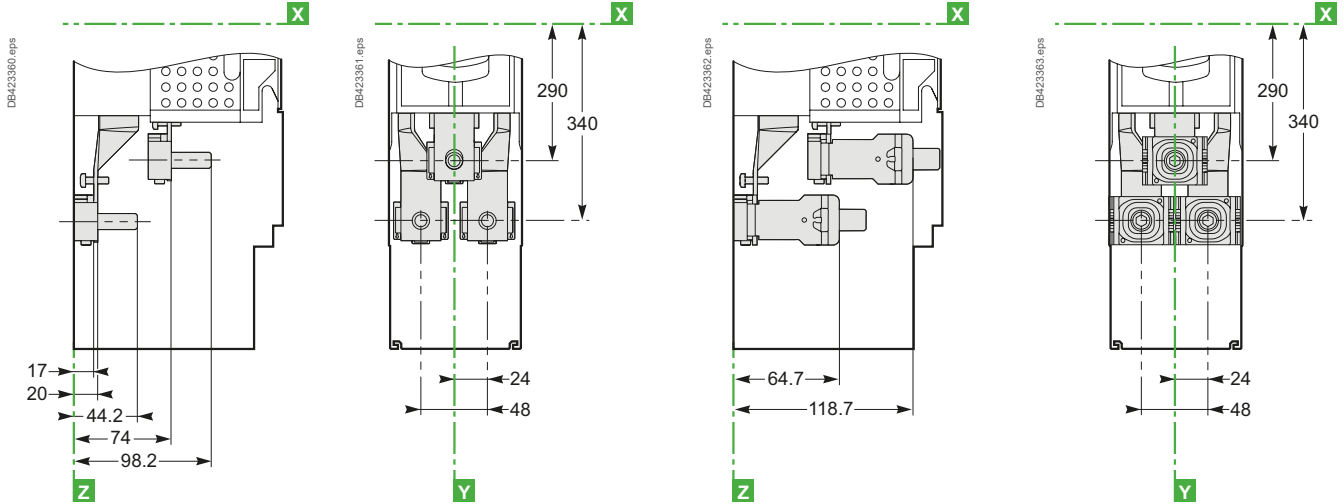
Device with side cover



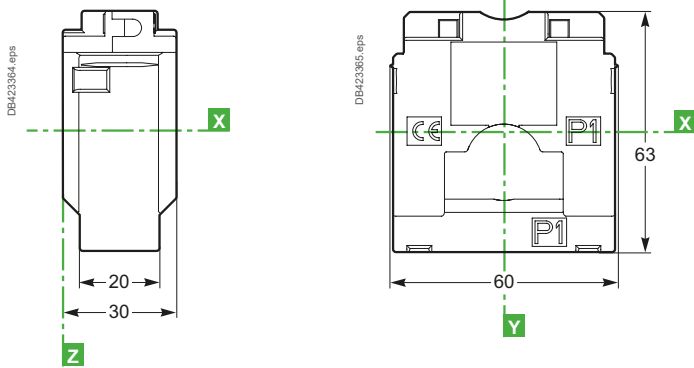
Connection

Connection via lugs/flexible bars

Connection via connectors



Current transformer

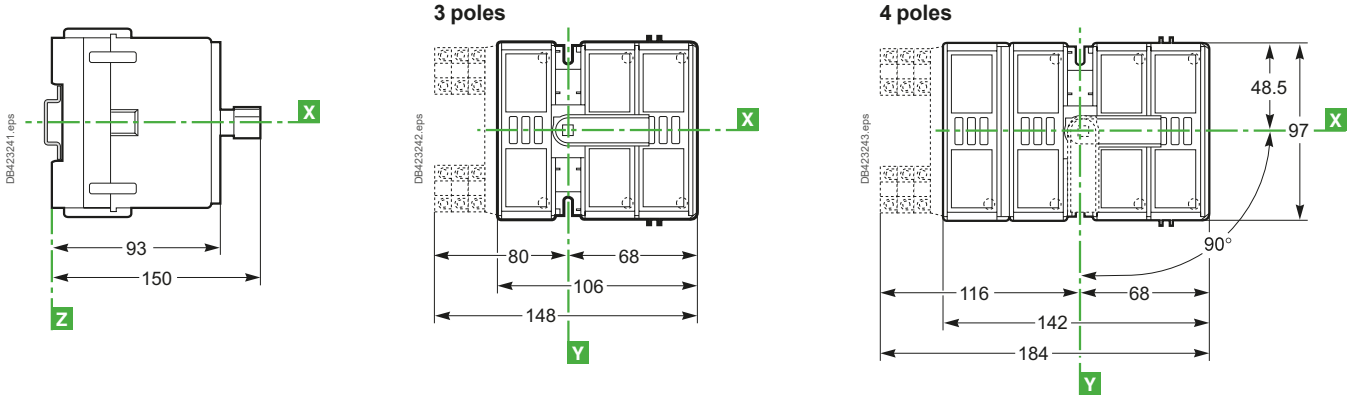


Fupact INF●32

Dimensions

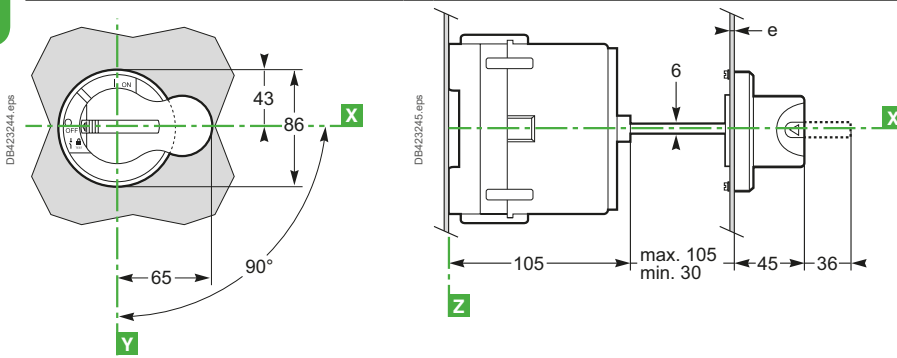
Dimensions

INFC32 and INFB32 with direct front handle

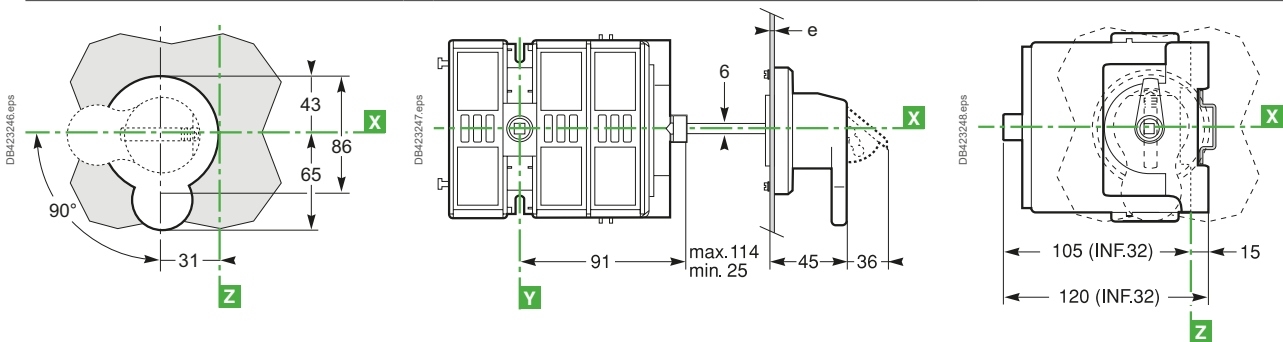


C

Extended front handle

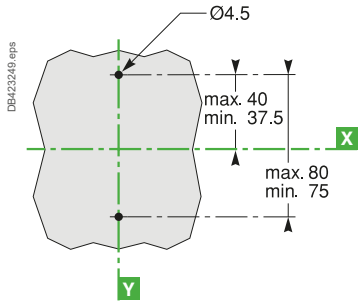


Extended lateral handle

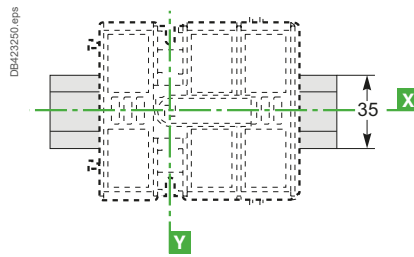


Mounting

On the backplate

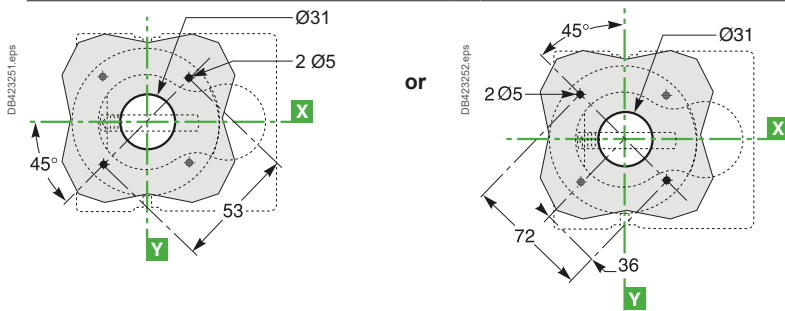


On DIN rail

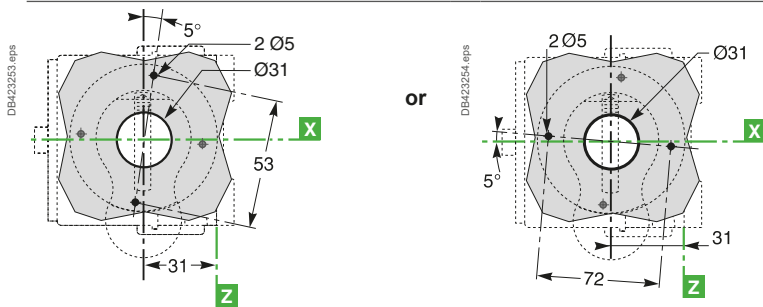


Front panel cut-outs

Extended front handle

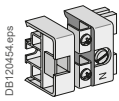
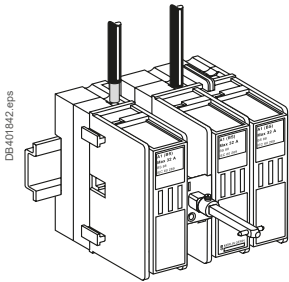


Extended lateral handle



Fupact INF●32

Connection and accessories



External neutral link.

Front connection of cables

Fupact INF●32 devices are equipped as standard with connectors for bare copper and aluminium cables.

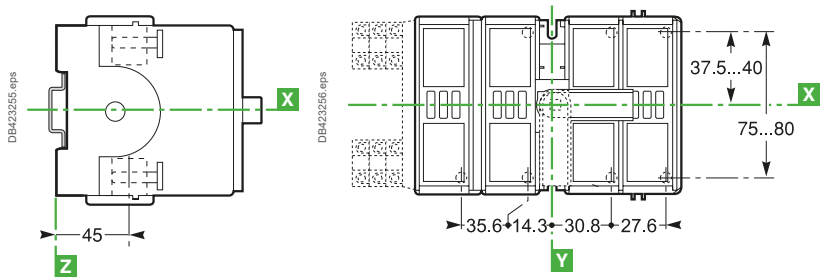
Neutral link: In the form of a terminal block to be secured directly to the DIN rail on the left-hand side of the Fupact.

Standard device

	Fupact connectors	L (mm)	≤ 14
		S (mm ²)	0.5 to 10 rigid
		Cu/Al	0.5 to 10 flexible ^[1]
		Torque (Nm)	2
	External neutral link	L (mm)	≤ 16
		S (mm ²)	2.5 to 35 rigid
		Cu/Al	2.5 to 35 flexible ^[1]
		Torque (Nm)	2

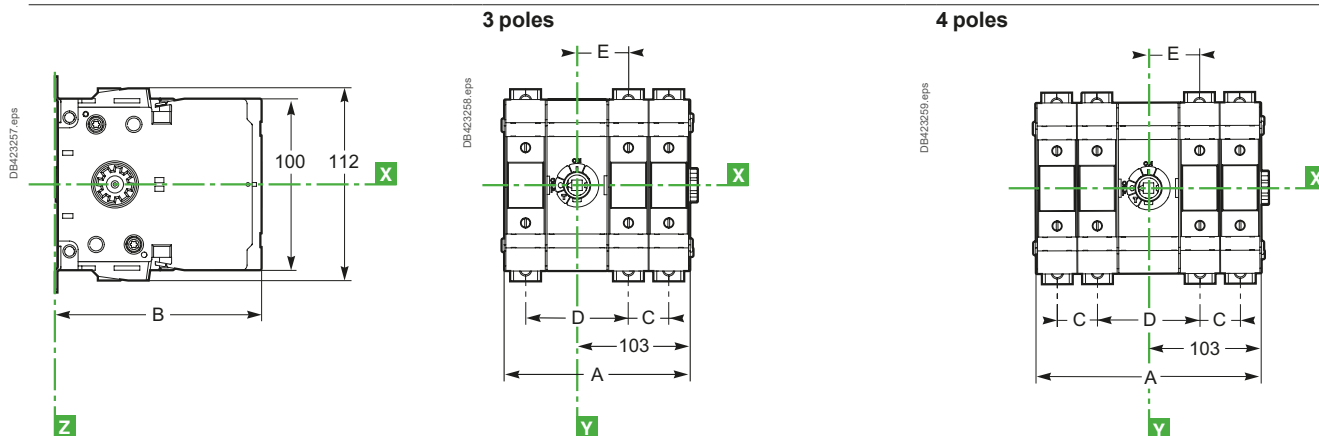
[1] Connection of 0.5 to 4 mm² flexible cables requires crimped or auto-crimping ferrules.

Switch-disconnector fuse with front handle

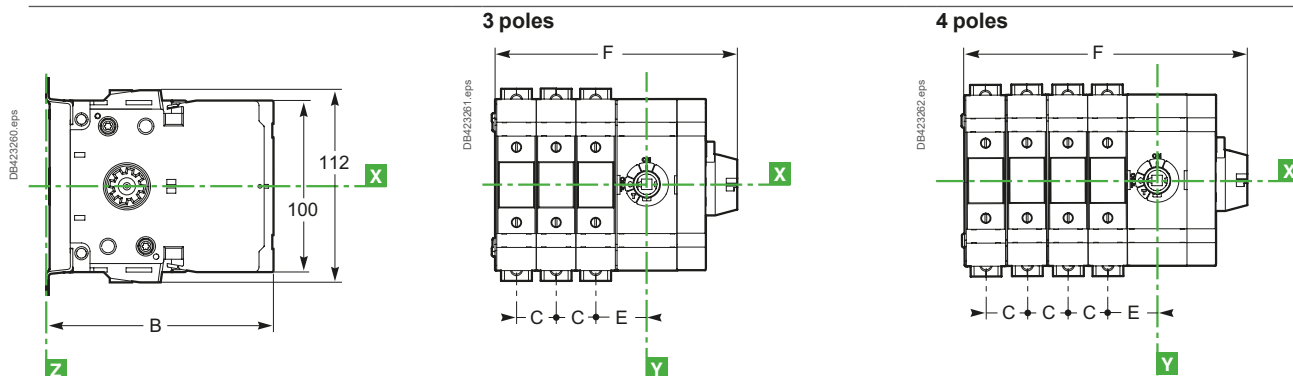


Dimensions

Front handle



Lateral handle



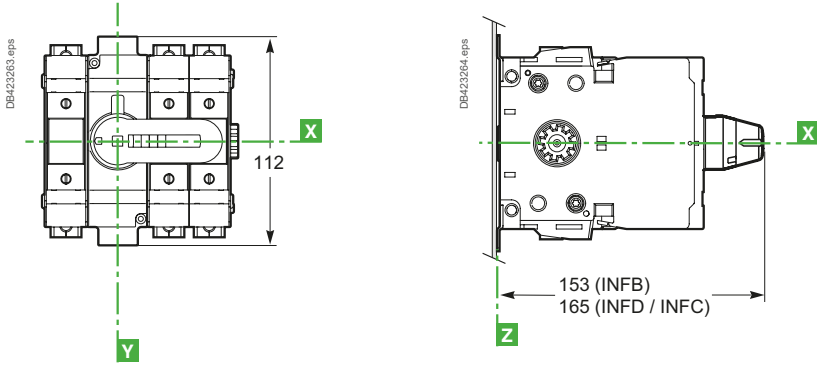
Type		A	B	C	D	E	F
INFB63	3P	114.5	108.5	23.5	60	30	146.5
INFC50	4P	138	108.5	23.5	60	30	170
INFC63	3P	148	130	35	71.5	36	181.5
	4P	183	130	35	71.5	36	216.5
INFD40	3P	114.5	120.5	23.5	60	30	146.5
INFD63	4P	138	120.5	23.5	60	30	170



Fupact INFD40 and INF●63 Dimensions

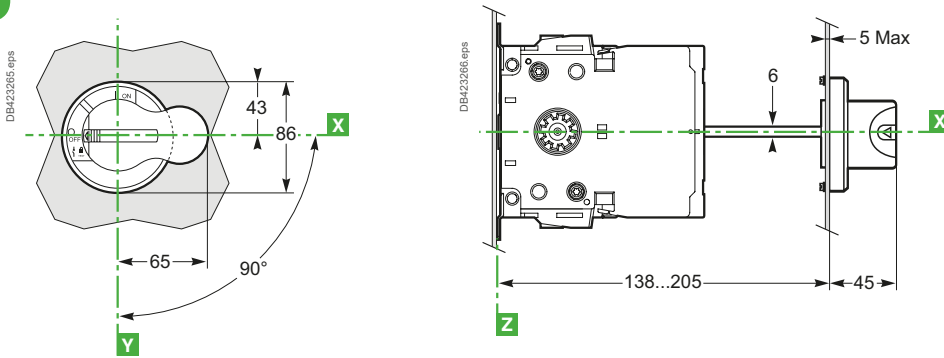
Dimensions

Direct front handle

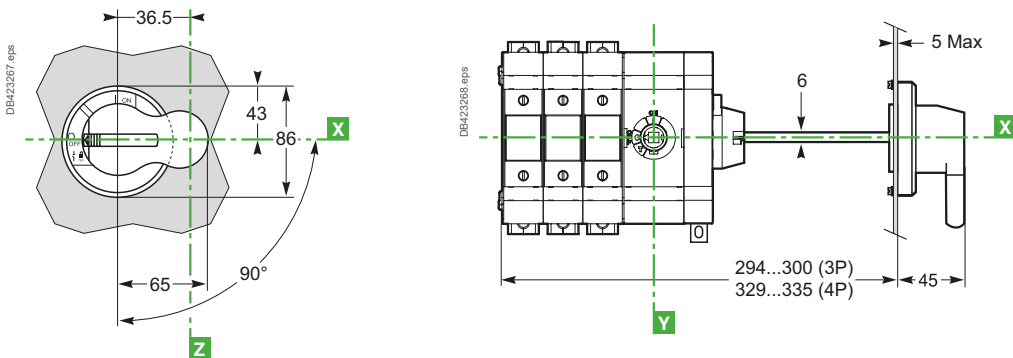


C

Extended front handle



Extended lateral handle



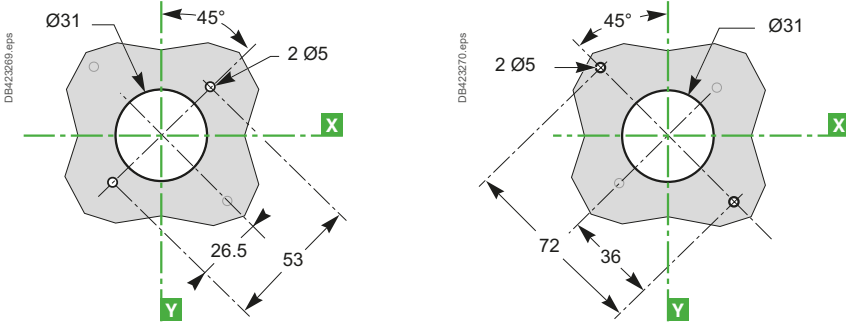
Dimensions and connection

Fupact INFD40 and INF●63

Mounting and front panel cut-outs

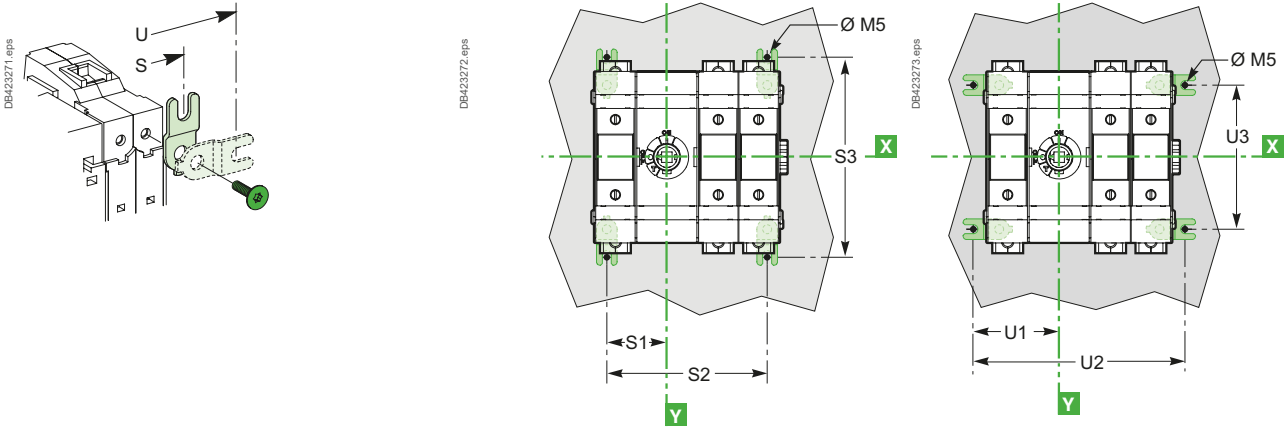
Front panel cut-outs

Extended front handle



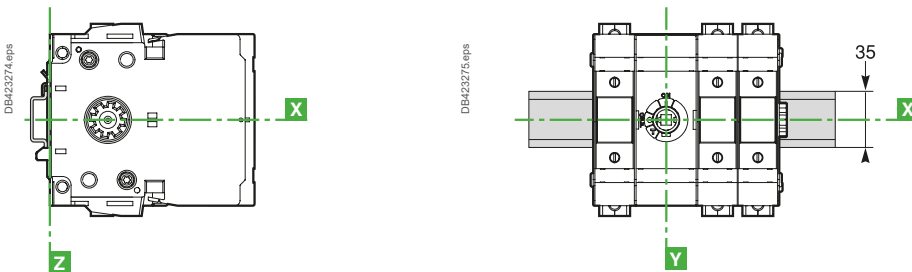
Mounting

On a backplate



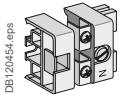
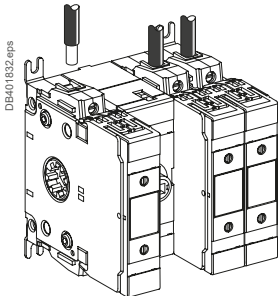
Type		S1	S2	S3	U1	U2	U3
INFB63	3 Poles	35	93.5	114	50	123.5	84
INFC50	4 Poles	58.5	117	114	50	147	84
INFD40	3 Poles	35	93.5	114	50	123.5	84
INFD63	4 Poles	58.5	117	114	50	147	84

On DIN rail



Fupact INFD40 and INF●63

Connection and accessories



External neutral link.

Front connection of cables

Fupact INFD40 and INF●63 devices are equipped as standard with connectors for bare copper and aluminium cables.

Neutral link: In the form of a terminal block to be secured directly to the DIN rail on the left-hand side of the Fupact.

Standard device

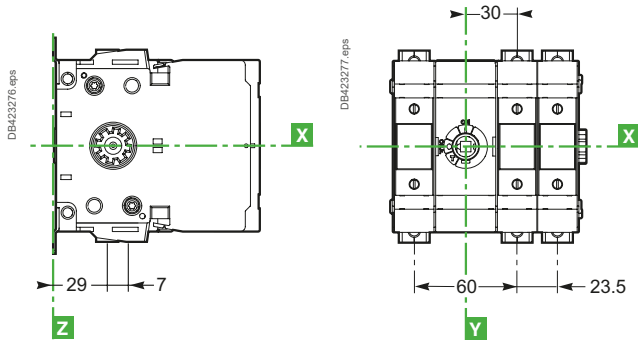


○ S

Fupact connectors	L (mm)	≤ 12
	S (mm ²)	2.5 to 25 rigid
	Cu/Al	2.5 to 25 flexible ^[1]
	Torque (Nm)	3 Nm (2.5 to 6 mm ²) 4 Nm (10 to 25 mm ²)
External neutral link	L (mm)	≤ 18
	S (mm ²)	2.5 to 35 rigid
	Cu/Al	2.5 to 35 flexible ^[1]
	Torque (Nm)	3.5

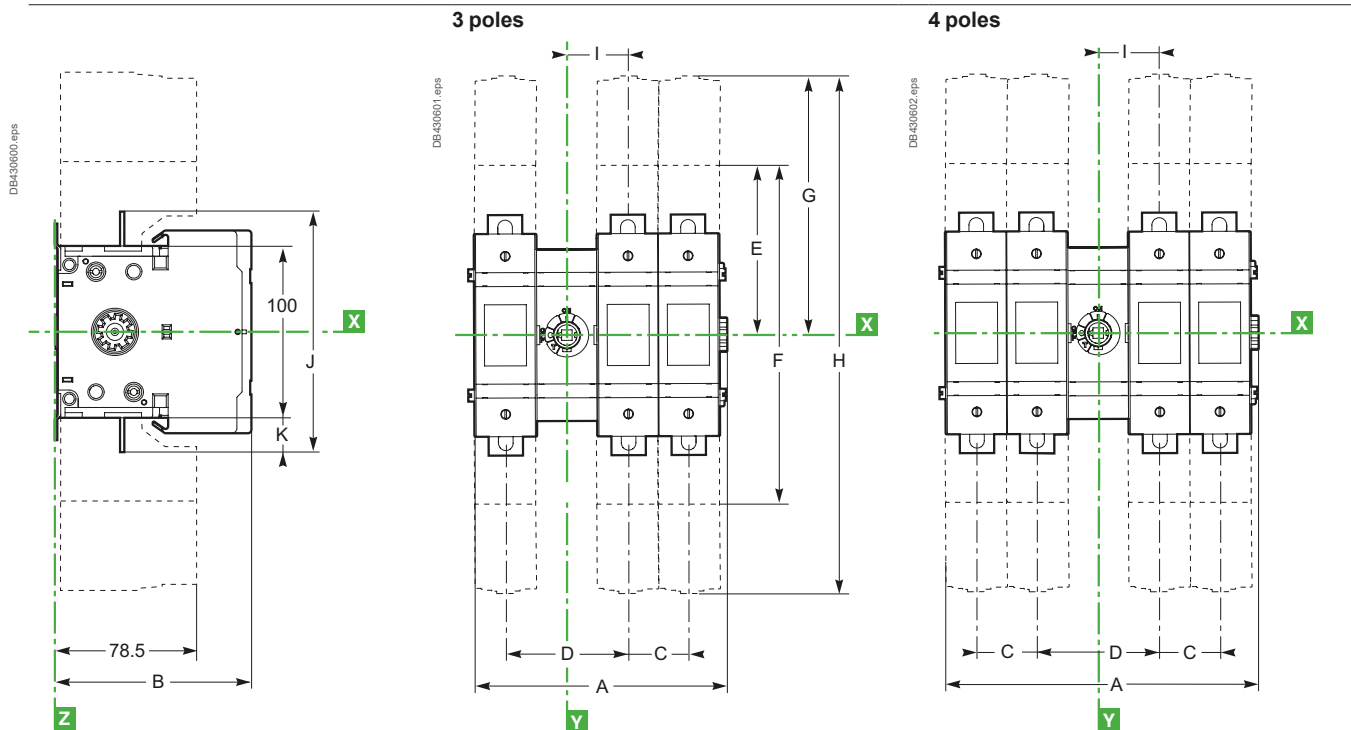
[1] Connection of 2.5 to 4 mm² flexible cables requires crimped or auto-crimping ferrules.

Switch-disconnector fuse with front or lateral handle

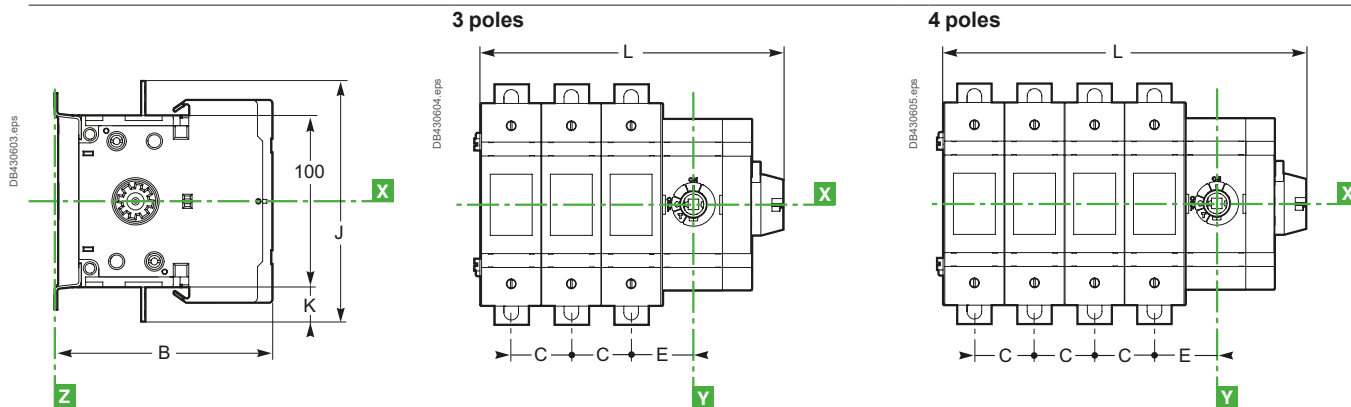


Dimensions

Front handle



Lateral handle



Type	A	B	C	D	E	F	G	H	I	J	K	L
INFB100 3 Poles	148	114.5	35	71.5	94	188	144	288	36	140	20	178
INFB160 4 Poles	183	114.5	35	71.5	94	188	144	288	36	140	20	213
INFC125 3 Poles	148	130	35	71.5	94	188	144	288	36	140	20	178
INFD160 4 Poles	183	130	35	71.5	94	188	144	288	36	140	20	213

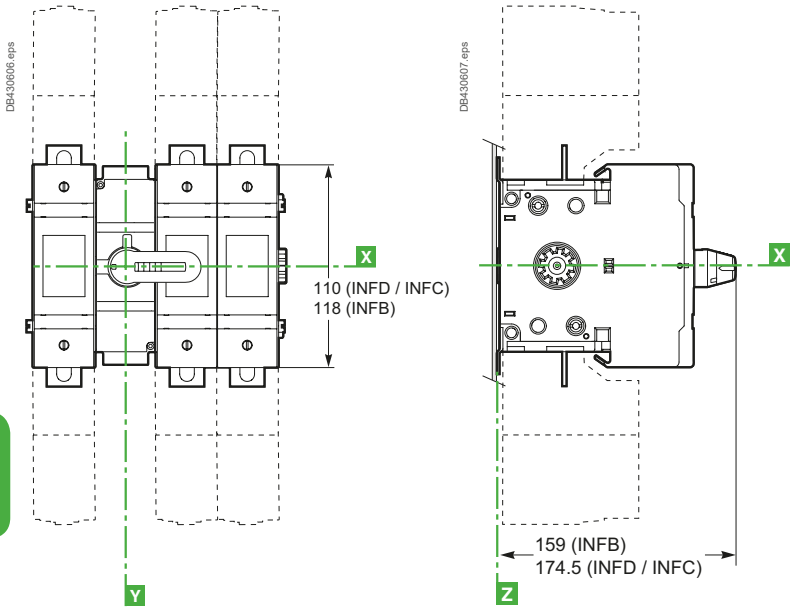


Fupact INFB100 to INF●160

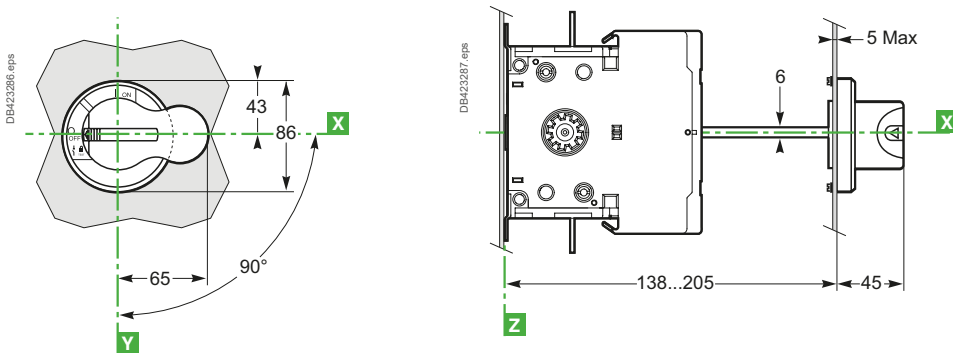
Dimensions

Dimensions

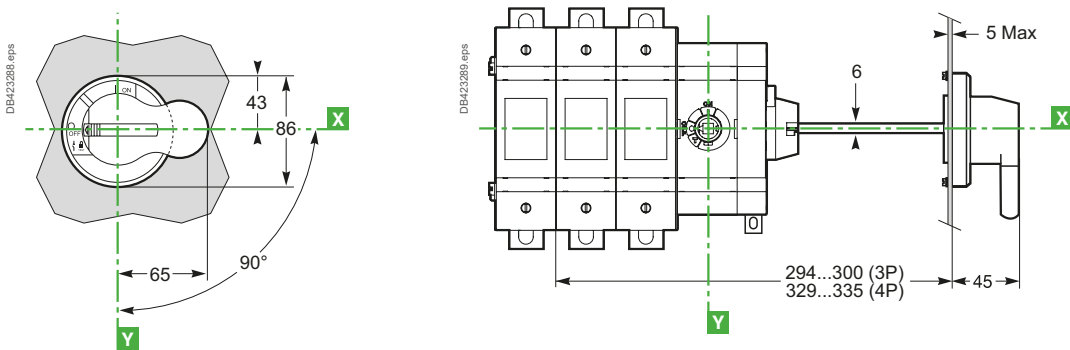
Direct front handle



Extended front handle



Extended lateral handle



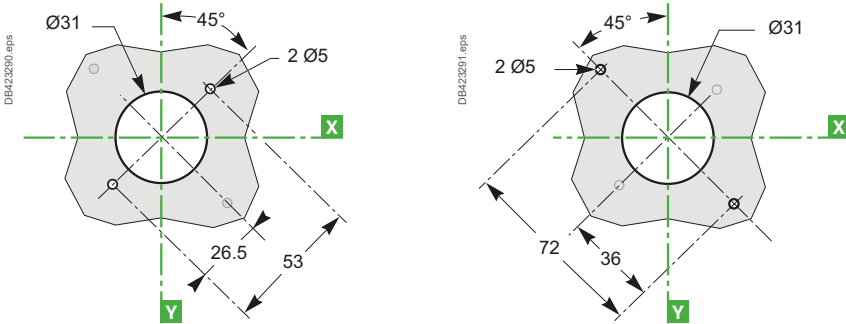
Dimensions and connection

Fupact INFB100 to INF●160

Mounting and front panel cut-outs

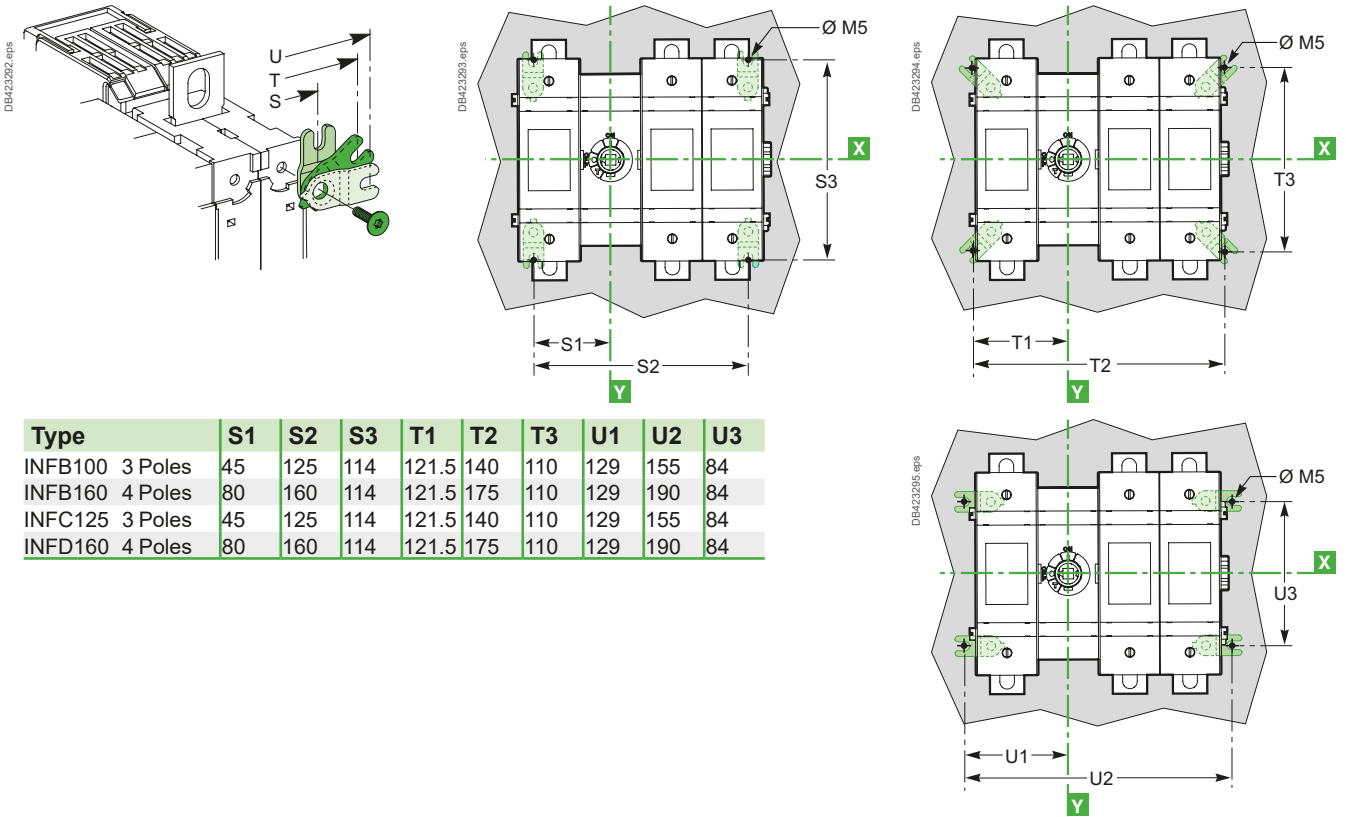
Front panel cut-outs

Extended front handle

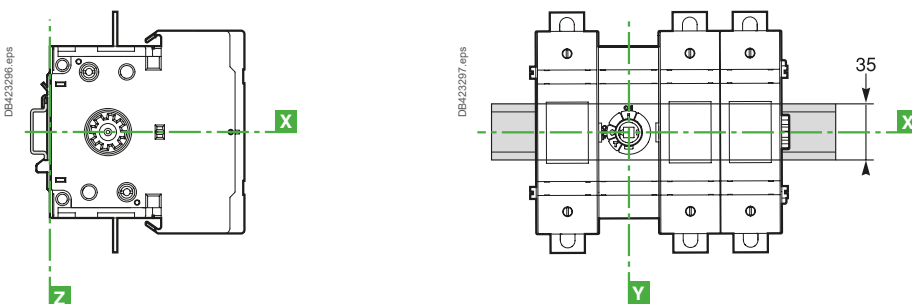


Mounting

On a backplate

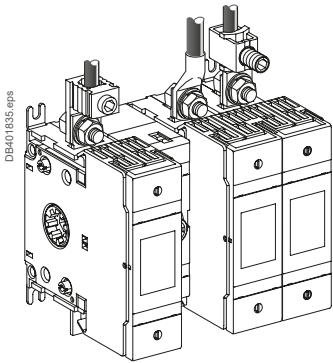


On DIN rail



Fupact INFB100 to INF●160

Connection and accessories



If 500 V ≤ U ≤ 690 V, terminal shields are mandatory.

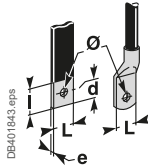
Front connection of bars or cables

Fupact INFB100 to INF●160 devices are equipped as standard with 20 mm wide terminals with holes for M8 screws, for direct connection of insulated bars and cables with crimped lugs.

Lugs

The small lugs for copper or aluminium cables may be used for cables with cross-sectional areas up to 185 mm². Crimping by hexagonal barrels or punching. Lugs are compatible with the terminal shields.

Standard device



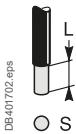
d (mm)	≤ 10
l (mm)	≤ 27
e (mm)	2...6.4
L (mm)	≤ 20
Ø (mm)	10
Torque (Nm)	15 to 22
Bars, lugs	

Front connection with accessories

Fupact INFB100 to INF●160 switch-disconnector fuses are equipped as standard with 20 mm wide terminals that can be fitted with connectors for bare copper or aluminium cables with cross-sectional areas from 25 to 120 mm².

Removable neutral link: in the form of a terminal block to be secured directly to the DIN rail on the left-hand side of the Fupact.

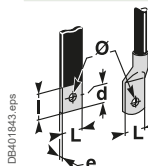
Standard device



Fupact connectors LV480442	L (mm)	27
	S (mm ²) Cu/Al	25 to 95
	Torque (Nm)	20
Fupact connectors LV480443	L (mm)	27
	S (mm ²) Cu/Al	6 to 95
	Torque (Nm)	12 to 22
External neutral link	L (mm)	≤ 18
	S (mm ²)	2.5 to 35 rigid
	Cu/Al	2.5 to 35 flexible
	Torque (Nm)	2

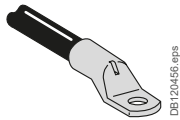
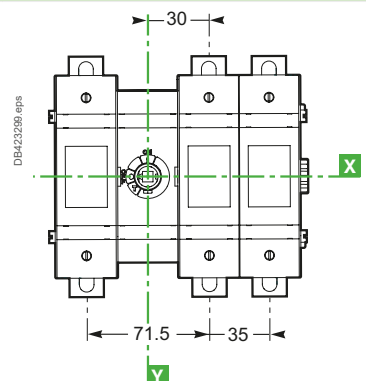
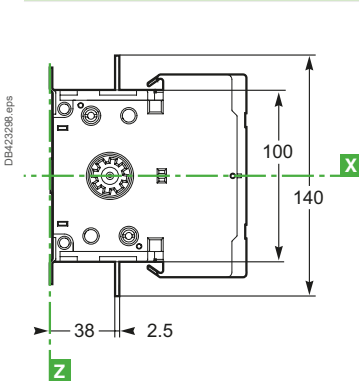
Removable neutral link

INF●100
INF●160

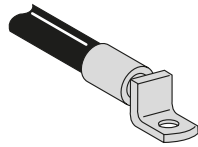


d (mm)	≤ 15
l (mm)	≤ 58
e (mm)	≤ 6
L (mm)	≤ 25
Ø (mm)	≥ 12
Torque (Nm)	30

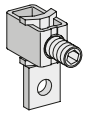
Switch-disconnector fuse with front handle



Lug for copper cable.



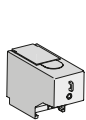
Lug for aluminium cable.



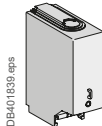
Cable connector
25 to 95 mm² Cu.



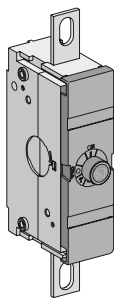
Cable connector
6 to 95 mm² Al.



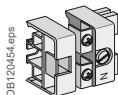
Short terminal shield.



Long terminal shield.



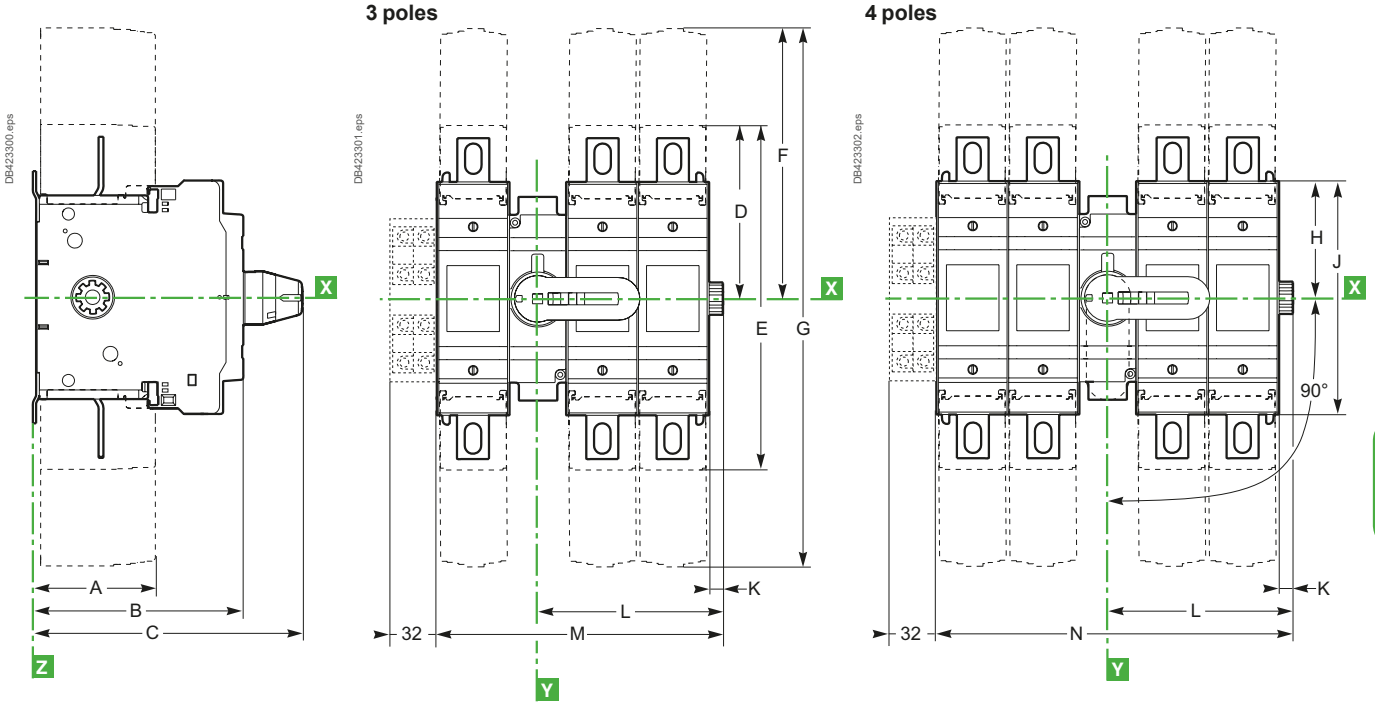
Removable neutral link.



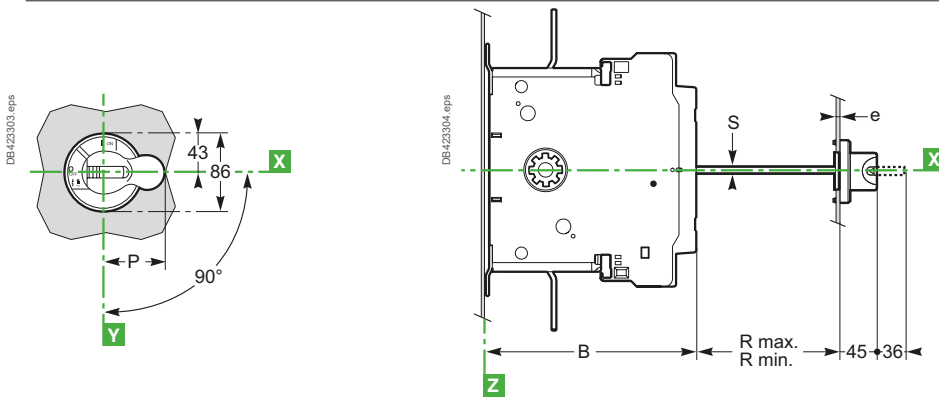
External neutral link.

Dimensions

Direct front handle



Extended front handle

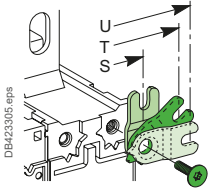


Type	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R min	R max	S
INFD200	78	149	191	103.5	207	167.5	335	72.5	145	6.8	111.5	175.5	219	65	40	105	6
INFB200	78	130	167	103.5	207	167.5	335	72.5	145	6.8	111.5	175.5	219	65	59	124	6
INFD250	78	154	191	103.5	207	173.5	347	74.5	149	6.8	131.5	206	260	65	35	100	6
INFB250	78	154	167	103.5	207	173.5	347	74.5	149	6.8	131.5	206	260	65	35	100	6
INFD400	84	193	236	125.8	251.6	209	401.8	83	166	6.8	161.5	254	318	95	37	132	12
INFB400	84	176	219	125.8	251.6	209	401.8	97	194	6.8	161.5	254	318	95	54	149	12
INF●630	98	233	276	165	330	240	480	115	230	7.8	218.5	341	429	145	23	146	12
INF●800	135	233	276	165	330	240	480	115	230	7.8	218.5	341	429	145	23	146	12

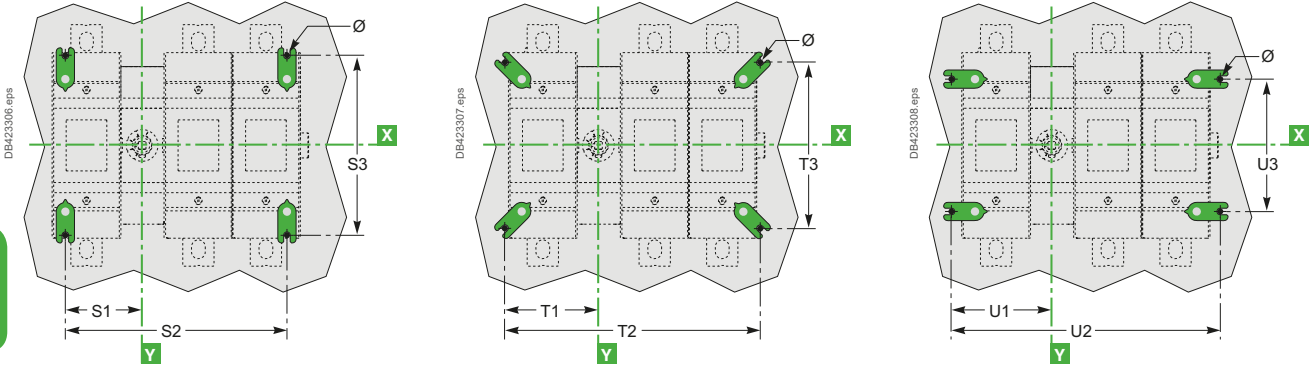
Fupact INF●200 to INF●800

Mounting and front panel cut-outs

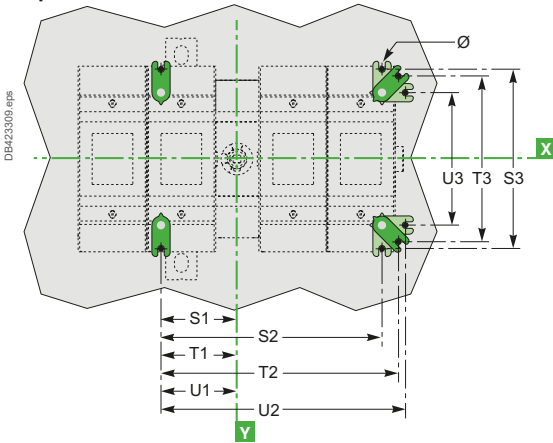
Mounting



3 poles

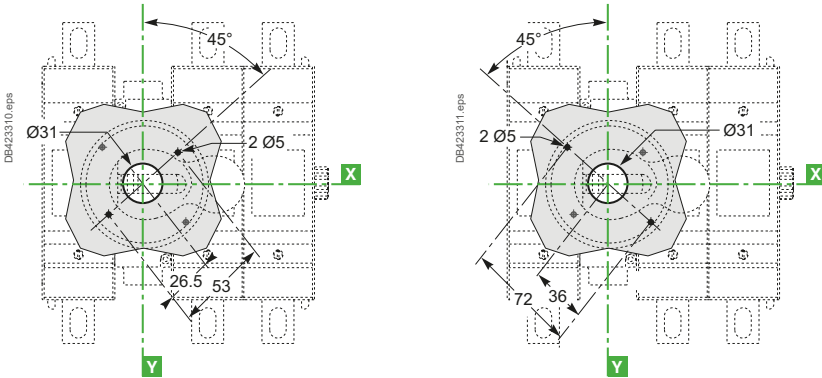


4 poles



Front panel cut-outs

Extended front handle

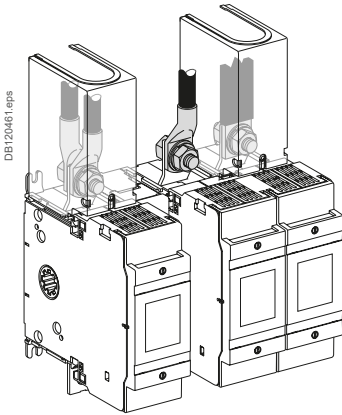


Type	S1	S2	S3	T1	T2	T3	U1	U2	U3	Ø	
INF●200	3P	52	147.5	144	61.5	166.5	138.5	70	183.5	108	5.2
	4P	52	147.5	144	52	157	138.5	52	165.5	108	5.2
INF●250	3P	67.5	178	144	71.5	197	138.5	80	214	108	5.2
	4P	67.5	178	144	67.5	187.5	138.5	67.5	196	108	5.2
INF●400	3P	81.5	227	164	90.5	245	159	101	263	128	5.2
	4P	81.5	227	164	81.5	236	159	81.5	245	128	5.2
INF●630	3P	102.5	293	232	117.5	323	223.3	130.5	349	176	8.2
INF●800	4P	102.5	293	232	102.5	308	223.3	102.5	321	176	8.2

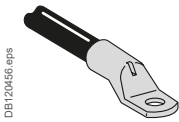
Dimensions and connection

Fupact INF●200 to INF●800

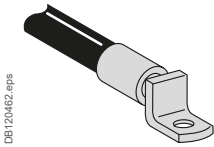
Connection and accessories



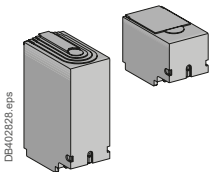
If 500 V ≤ U ≤ 690 V, terminal shields are mandatory.



Lug for copper cable.



Lug for aluminium cable.



Terminal shields.

Front connection of bars or cables

Fupact INF●250 to INF●400 and INF●630 to INF●800 devices are equipped as standard with terminals with holes for screws, for direct connection of insulated bars and cables with crimped lugs.

Terminals

- 25 mm wide with M10 screws (INF●200 to INF●400)
- 40 mm wide with M12 screws (INF●630 to INF●800).

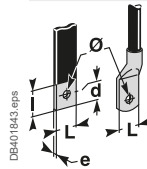
Lugs

The lugs are different for copper and aluminium cables and are compatible with the terminal shields.

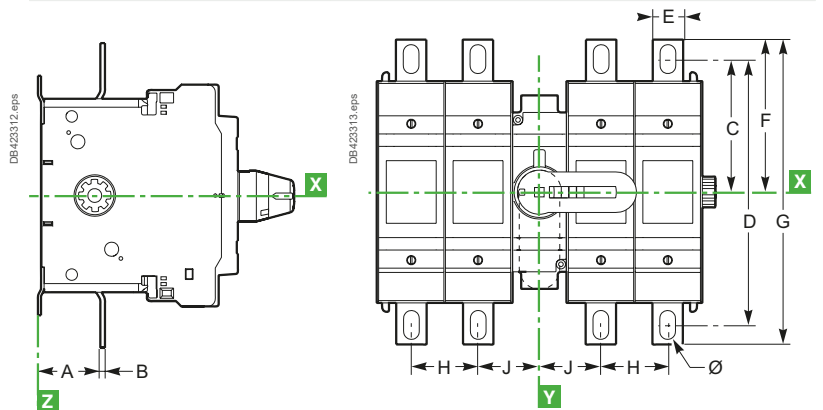
The small lugs for copper or aluminium cables may be used for cables with 240 or 300 mm² cross-sectional areas (INF●630 to INF●800).

Crimping by hexagonal barrels (Cu or Al lugs) or punching (Cu lugs).

Standard device	INF●200	INF●250 INF●400	INF●630 INF●800
d (mm)	≤ 15	≤ 15	≤ 20
l (mm)	≤ 58	≤ 58	≤ 58
e (mm)	≤ 6	≤ 6	3 ≤ e ≤ 10
L (mm)	≤ 25	≤ 25	≤ 40
Ø (mm)	≥ 12	≥ 12	≥ 14
Torque (Nm)	15 to 22	30 to 44	50 to 75



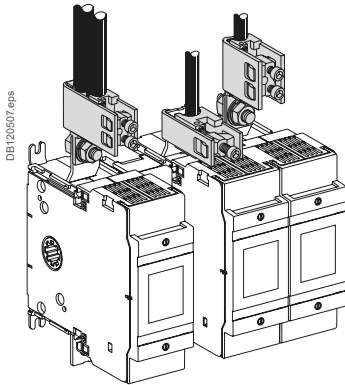
Switch-disconnector fuse with front handle



	A	B	C	D	E	F	G	H	J	Ø
INF●200	40.5	3	86.8	173.6	20	99.5	199	43.5	40	10.5
INF●250	40.5	3	83	166	25	96.5	193	54	45	10.5
INF●400	43.5	5	100	200	25	115	230	64	58.5	11.5
INF●630	48.4	6	130	260	39	153	306	88	77.5	13.5
INF●800	48.4	6	130	260	39	153	306	88	77.5	13.5

Fupact INF●200 to INF●800

Connection and accessories



If $500\text{ V} \leq U \leq 690\text{ V}$, terminal shields are mandatory.



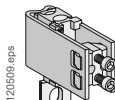
6 to 95 mm² bare cable connector, LV480443.



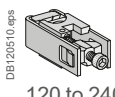
25 to 95 mm² bare cable connector, LV480442.



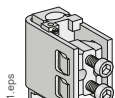
95 to 185 mm² bare cable connector, 49651.



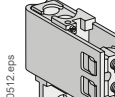
2 x (95 to 185 mm²) bare cable connector, 49652.



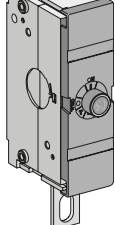
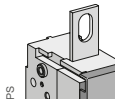
120 to 240 mm² bare cable connector, 49653.



120 to 300 mm² bare cable connector, 49654.



2 x (120 to 300 mm²) bare cable connector, 49655.



Removable neutral link.

Front connection with accessories

Fupact INF●200 to INF●400 devices are equipped as standard with 25 mm wide terminals and Fupact INF●630 to INF●800 devices are equipped as standard with 40 mm wide terminals that can be fitted with connectors for bare copper or aluminium cables with cross-sectional areas from 70 to 300 mm².

Removable neutral link: In the form of a terminal block to be secured directly to the side of the device.

Standard device		INF●200 INF●250	INF●400	INF●630 INF●800
1-cable connector LV480442 Steel profile	L (mm)	27	-	-
	S (mm ²) Cu/Al	25 to 95 ^[1]	-	-
(only for INF●200)	Torque (Nm)			
	Cable	20	-	-
1-cable connector LV480443 Al profile	L (mm)	27	-	-
	S (mm ²) Cu/Al	6 to 95 ^[1]	-	-
(only for INF●200)	Torque (Nm)			
	Cable	12 to 22	-	-
1-cable connector 49651	L (mm)	58	-	-
	S (mm ²) Cu/Al	95 to 185 ^[1]	-	-
(only for INF●400)	Torque (Nm)			
	Cable	22	-	-
	Terminal	30 to 44	-	-
2-cable connector 49652	L (mm)	70	70	-
	S (mm ²) Cu/Al	2x(95 to 185) ^[1]	2x(95 to 185) ^[1]	-
	Torque (Nm)			
Cable		22	22	-
	Terminal	30 to 44	50 to 75	-
	1-cable connector 49653	L (mm)	-	58
S (mm ²) Cu/Al		-	120 to 240	-
(only for INF●400)	Torque (Nm)			
	Cable	-	35	-
	Terminal	-	30 to 44	-
1-cable connector 49654	L (mm)	-	58	-
	S (mm ²) Cu/Al	-	120 to 300 ^[1]	-
	Torque (Nm)			
Cable		-	44	-
	Terminal	-	30 to 44	-
	2-cable connector 49655	L (mm)	-	-
S (mm ²) Cu/Al		-	-	2x(120 to 300) ^[1]
Torque (Nm)				
Cable		-	-	44
	Terminal	-	-	50 to 75

Removable neutral link	INF●200 INF●250	INF●400	INF●630 INF●800
d (mm)	≤ 15	≤ 15	≤ 20
l (mm)	≤ 58	≤ 58	≤ 58
e (mm)	≤ 6	≤ 6	3 ≤ e ≤ 10
L (mm)	≤ 25	≤ 25	≤ 40
Ø (mm)	≥ 12	≥ 12	≥ 12
Torque (Nm)	30	40	50

[1] Flexible or rigid cables.

Wiring diagrams

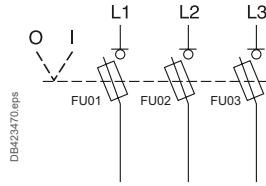
Fupact ISFT	D-2
Fupact ISFL	D-3
Fupact INF●32 to INF●800.....	D-4

D

Other chapters

Presentation	2
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Power

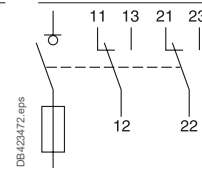


Auxiliary contacts

ISFT100N



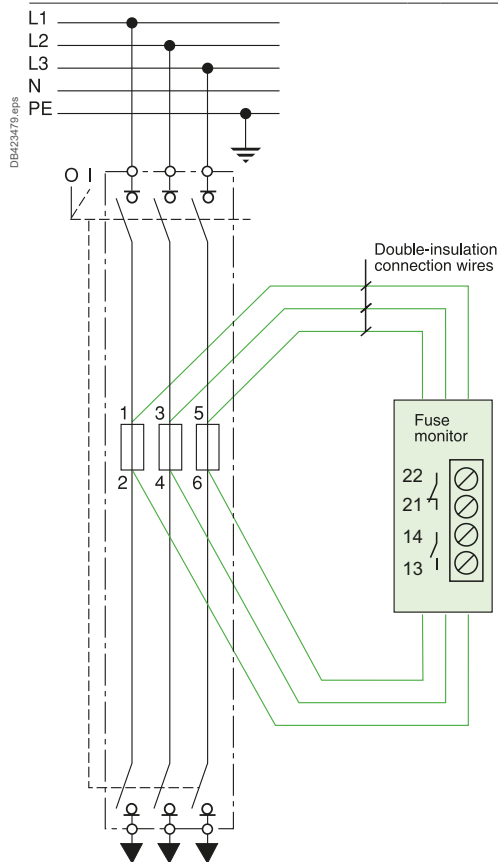
ISFT100 to 630



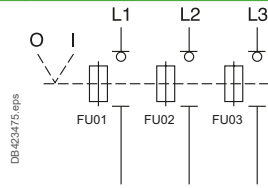
Blown fuse

D

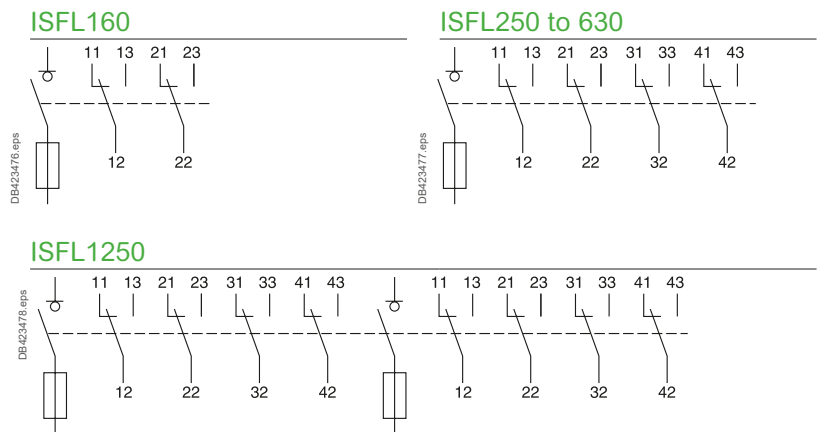
ISFT160 to 630 Electronic fuse Monitor



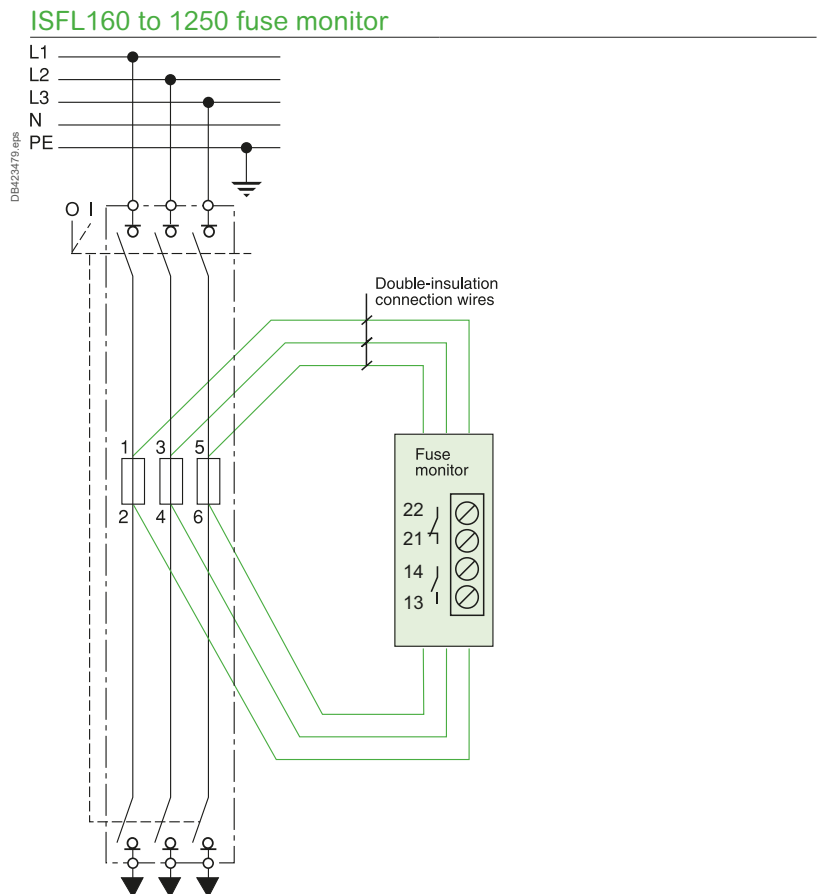
Power



Auxiliary contacts



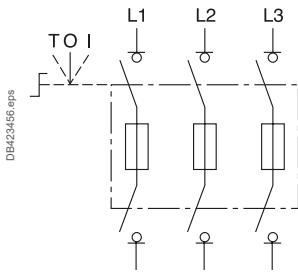
Blown fuse



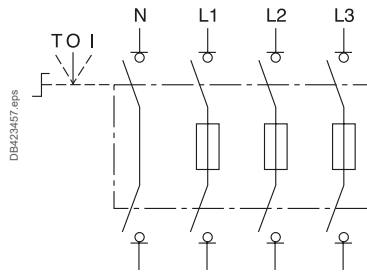
Fupact INF●32 to INF●800

Power

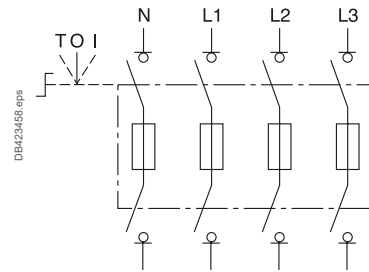
3 poles, 3 fuse-links



4 poles, 3 fuse-links

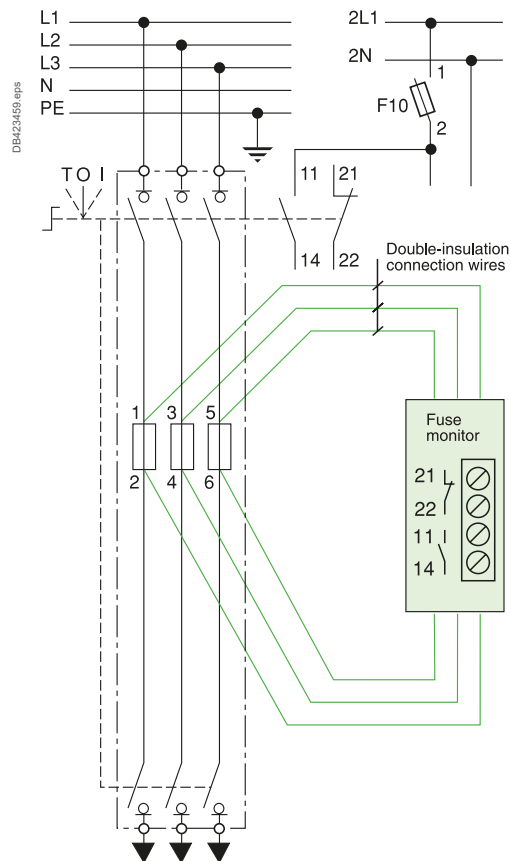


4 poles, 4 fuse-links



Fuse monitor

INF●32 to INF●800

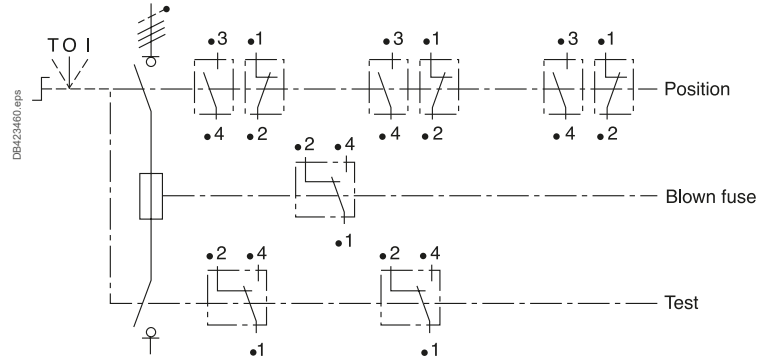


Note: for a switch-disconnector fuse supplied via the downstream terminals (reverse supply), reverse the connection of the fuse monitor. The double insulation connection wires of the fuse monitor must be connected on the side to which the incoming power is connected.

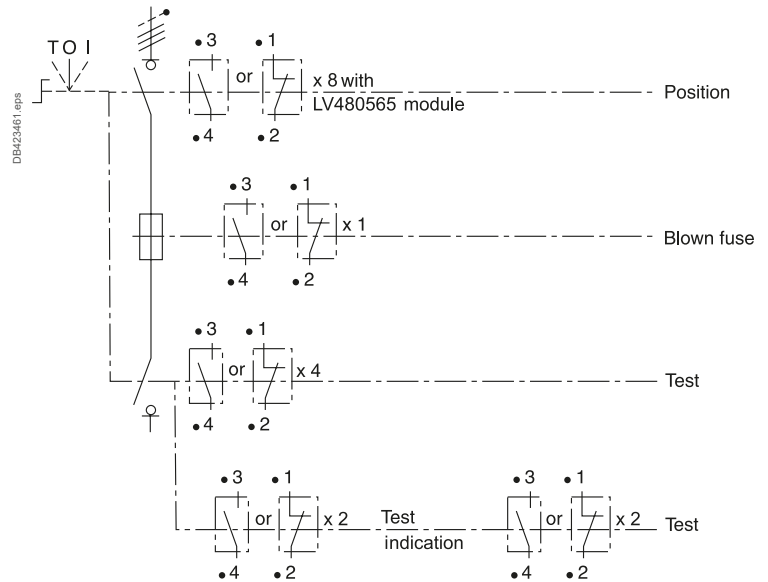
T : Test
I : On
O : Off.

Auxiliary contacts

INF●32



INFD40 to INF●160



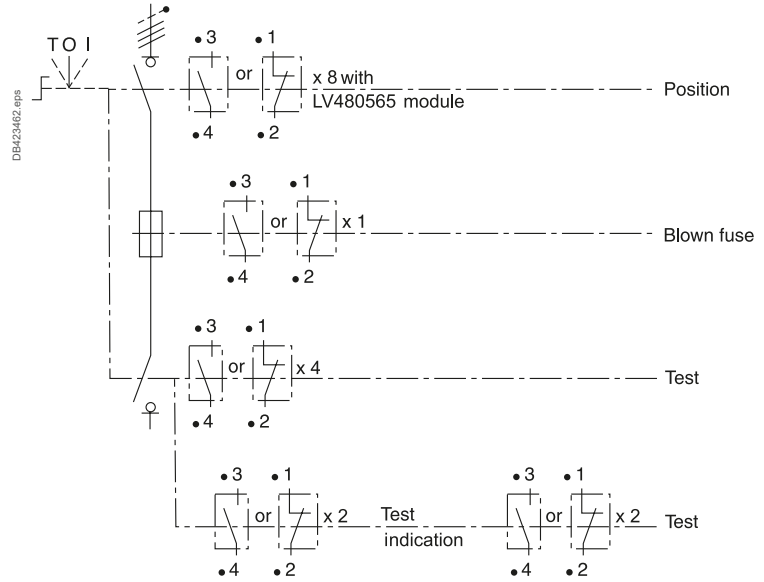
Note: for possible combinations, see pages A-81 to A-83 (chapter A).



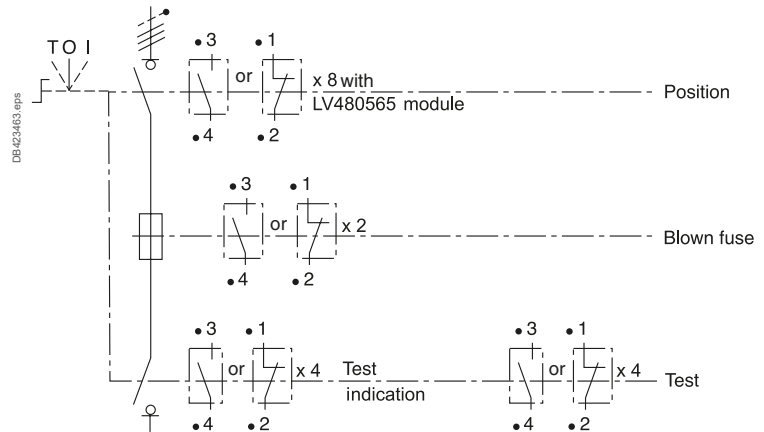
Fupact INF●32 to INF●800

Auxiliary contacts

INF●200 and INF●250



INF●400 to INF●800

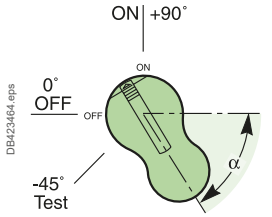


Note: for possible combinations, see pages A-81 to A-83 (chapter A).

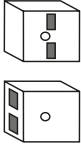


Auxiliary contact functions with front handle

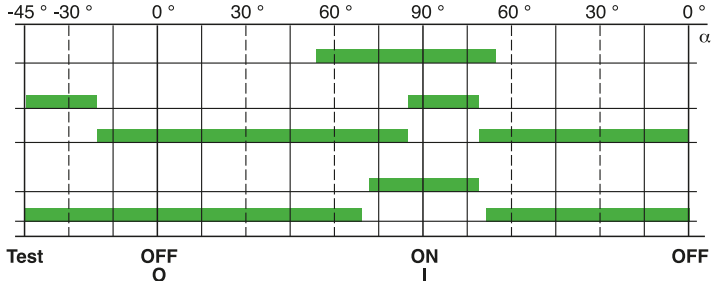
INF●32



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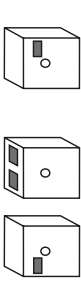


- Main contacts**
- 49605 Test NO
 - 49605 Test NC
 - 49609 Auxiliary contact NO
 - 49610 Auxiliary contact NC

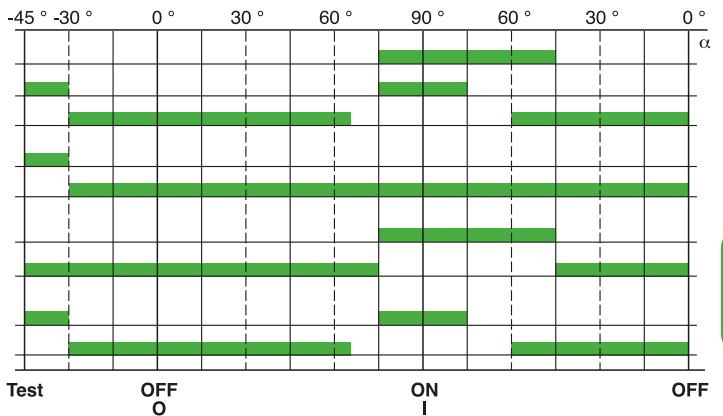


INF40 to INF●250

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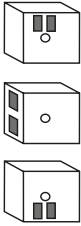


- Main contacts**
- 46609 Test NO
 - 49610 Test NC
 - or
 - 46609 Test indication NO
 - 49610 Test indication NC
 - 46609 Auxiliary contact NO
 - 49610 Auxiliary contact NC
 - 46609 Test NO
 - 49610 Test NC

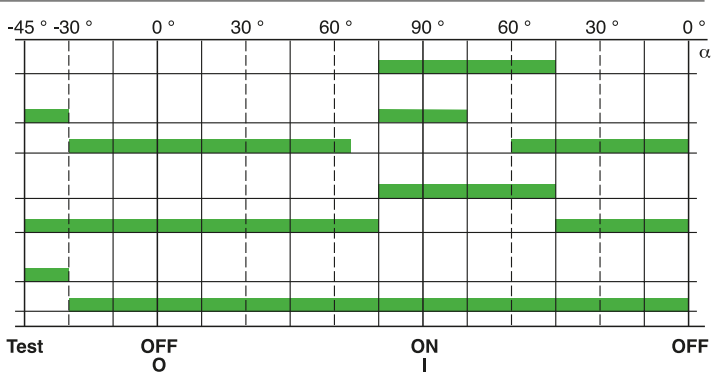


INF●400 to INF●800

DB423467.eps



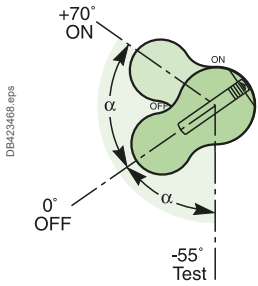
- Main contacts**
- 46609 Test NO
 - 49610 Test NC
 - 46609 Auxiliary contact NO
 - 49610 Auxiliary contact NC
 - 46609 Test indication NO
 - 49610 Test indication NC



Fupact INF●32 to INF●160

Auxiliary contact functions with lateral handle

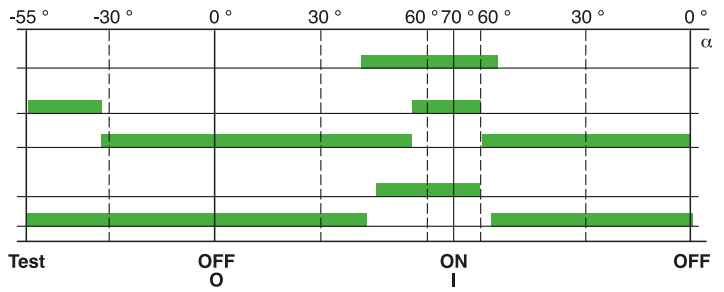
INF●32



DB4223468.eps



- Main contacts**
- 49605 Test NO
 - 49605 Test NC
 - 49609 Auxiliary contact NO
 - 49610 Auxiliary contact NC

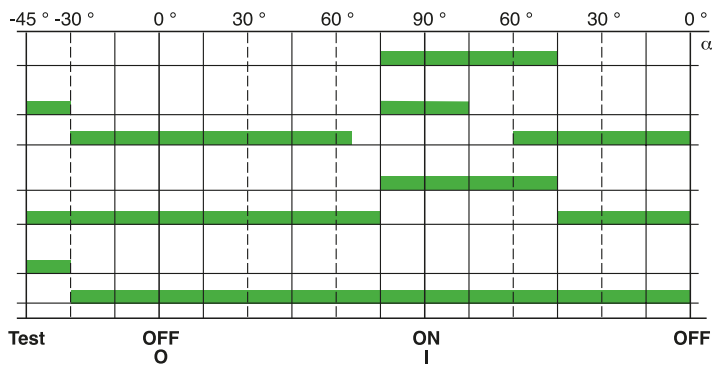


INFD40 to INF●160

DB422487.eps



- Main contacts**
- 46609 Test NO
 - 49610 Test NC
 - 46609 Auxiliary contact NO
 - 49610 Auxiliary contact NC
 - 46609 Test indication NO
 - 49610 Test indication NC



Technical characteristics

- Functions and applications E-2
- Standards**
 - Fusegear E-4
 - Fuse-links E-6
 - Installation E-9
- Discrimination**..... E-13
- Discrimination tables**
 - Upstream: Fupact (gG fuse-link)
 - Downstream: Fupact (gG or aM fuse-link) E-17
 - Upstream: Masterpact MTZ
 - Downstream: Fupact (gG or aM fuse-link) E-18
 - Upstream: Compact NS630b to 3200
 - Downstream: Fupact (gG fuse-link) E-19
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 - Upstream: Compact NSX100 to 630
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- Protection of motor circuits with fuses: general E-23
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- Type 2 coordination (IEC 60947-4-1) 380/415 V E-29
- Type 2 coordination (IEC 60947-4-1) 440 V E-31
- Type 2 coordination (IEC 60947-4-1) 500 V E-33
- Type 2 coordination (IEC 60947-4-1) 500 V E-34
- Type 2 coordination (IEC 60947-4-1) 525/550 V E-35
- Type 2 coordination (IEC 60947-4-1) 525/550 V E-36
- Type 2 coordination (IEC 60947-4-1) 660/690 V E-37
- Type 2 coordination (IEC 60947-4-1) 660/690 V E-38

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Functions and applications

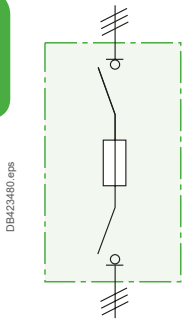
Fusegear:

- is a control device, generally manually operated
 - can make and break circuits on load
 - is suitable for isolation of circuits. This optional characteristic for switches is very important to ensure the safety of life and property on circuits downstream of fusegear in the open (OFF) position.
- A fuse-link is an element designed to protect against:
- overloads (except for aM type fuse-links)
 - short-circuits.

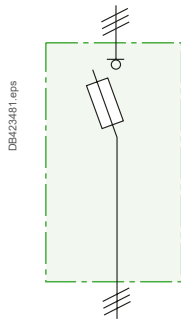
The Fupact fusegear range is made up of self-protected devices.



NFC, DIN and BS fuse-links.



INF● diagram.



ISF● diagram.

Functions

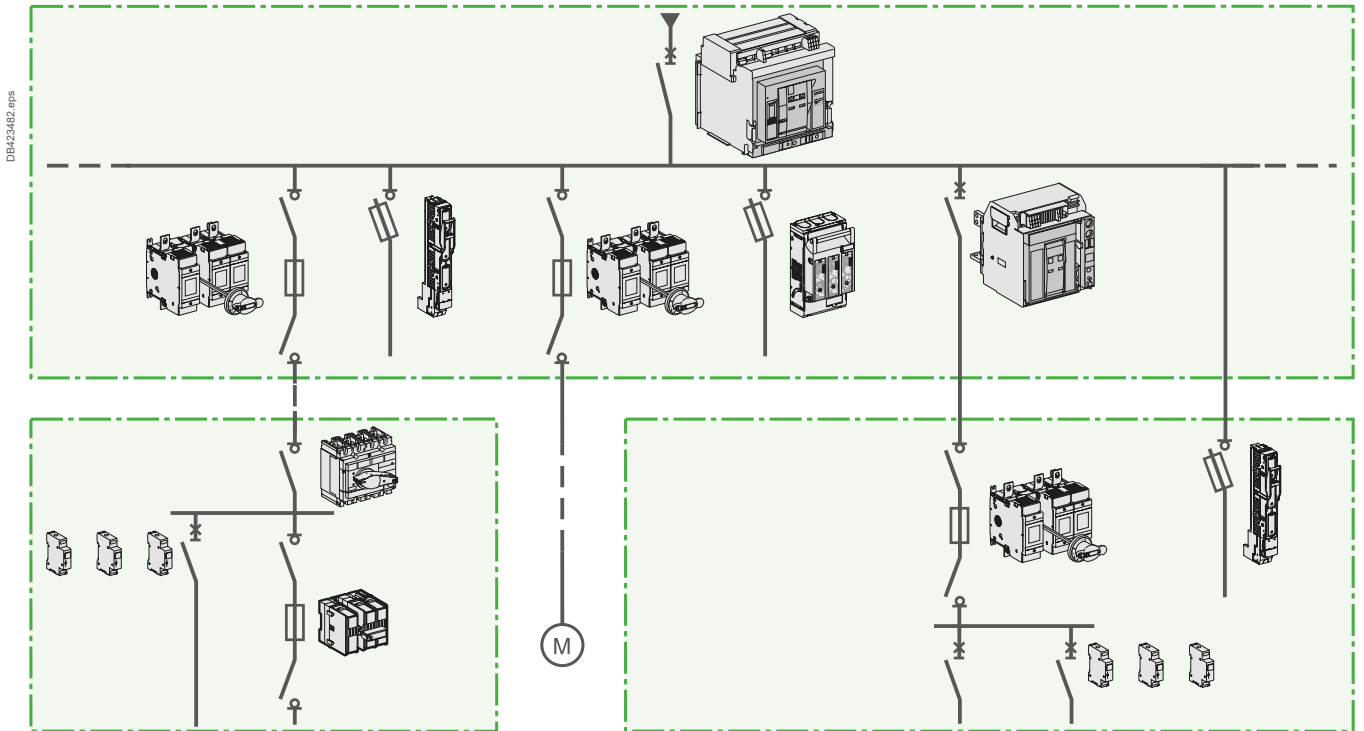
Fusegear range

- INF●: switch-disconnector fuses.
- ISF●: fuse-switch disconnectors.

The Fupact fuse-combination unit includes:

- a switch that is suitable for isolation, fulfilling the switch-disconnector function as defined by standard IEC 60947-1/3
- a fuse device for industrial fuse-links in compliance with standards:
 - IEC 60269-1 to 4
 - EN 60269-1 to 4
 - NF C63200, NF C63211
 - DIN 43620 / VDE 0636
 - BS 88.

Applications



Simplified LV distribution system diagram.

Fupact devices are used for the applications presented below:

Incomer for sub-distribution switchboards and enclosures

Local protection and isolation functions.

The protection function is ensured by gG distribution fuse-links.

Isolation, a mandatory safety function, is ensured by the switch-disconnector.

Feeders between main and sub-distribution LV switchboards or between secondary and final switchboards

Line protection function.

The protection function is ensured primarily by gG distribution fuse-links.

Motor feeders

Local protection and isolation functions for motor feeders.

The on-load breaking and isolation functions are mandatory.

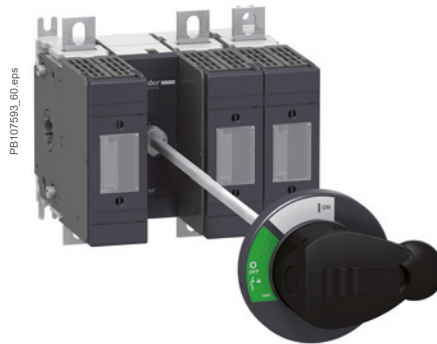
The protection function is ensured by aM / gM or gG fuse-links.



ISFL160 - 3P



ISFL160 - 3 x 1P



INF160.



ISFT160.

Standards

Fusegear



DE423483 eps

Switch.



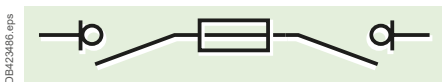
DE423484 eps

Disconnector.



DE423485 eps

Switch-disconnector.



DE423486 eps

Switch-disconnector fuses.



DE423487 eps

Fuse-switch disconnector.

E

Standard IEC 60947-3

All requirements and test specifications are laid out in standard IEC 60947-1 (general stipulations) and in standard IEC 60947-3 (specific stipulations).

Definitions

■ **A switch is a mechanical switching device:**

- capable of making, carrying and breaking currents under normal circuit conditions including specific overload conditions
- capable of carrying currents under abnormal circuit conditions such as short-circuits for a specified time

■ **A disconnector is a mechanical switching device:**

- capable of opening a circuit exclusively under no-load conditions (no load downstream)
- which, in the open position, complies with the requirements specified for the isolating function
- capable of carrying currents under normal circuit conditions and of carrying currents under abnormal conditions such as short-circuits for a specified time

■ **A switch-disconnector is a switch which**

In the open position, satisfies the isolating requirements specified for a disconnector

■ **Switch-disconnector fuses and fuse-switch disconnectors**

A switch-disconnector in which one or more poles have a fuse in series in a combined unit (for fuse-switch disconnectors, the fuse-link forms the moving contact).

Standardised current values for fusegear

■ **Conventional thermal current I_{th} (A)**

This is the maximum current that a switch can carry continuously without excessive temperature rise. This value is provided with an operating temperature indicated by the manufacturer.

- E.g. $I_{th} = 400\text{ A}$, $I_{th} = 25\text{ A}$ at 40 °C .

Generally speaking, $I_{th} = I_u$ (rated uninterrupted current). I_{th} is in fact the rating for the switch.

■ **Rated operational current I_e (A)**

This is the current for which the switch is generally used. It depends on the application (resistive or inductive current).

Utilisation categories

The standard IEC 60947-3 distinguishes between three types of utilisation category:

- AC21: resistive loads
- AC22: mixed (resistive and inductive) loads
- AC23: inductive loads.

A specific category is defined in the Appendix:

- AC3: direct switching of individual motors.

For DC loads, the respective categories are DC21, DC22, etc.

The designation (e.g. ACxy) of utilisation categories is completed by the suffix A or B according to whether the intended applications require frequent or infrequent operations:

- the letter "A" indicates frequent operations, from 2000 to 10,000 (mechanical and electrical), depending on the rating
- the letter "B" indicates infrequent operations, from 400 to 2000.

Utilisation categories		Characteristics	Applications
Frequent operation	Infrequent operation		
AC21A	AC21B	Switching of resistive loads including moderate overloads ($\cos \varphi = 0.95$)	Power distribution Final distribution (except motor feeders)
AC22A	AC22B	Switching of mixed resistive and inductive loads, including moderate overloads ($\cos \varphi = 0.65$)	Medium and high power industrial distribution with motor feeders
AC23A	AC23B	Switching of motor loads or other highly inductive loads ($\cos \varphi = 0.45$ for $I_o > 100\text{ A}$) ($\cos \varphi = 0.35$ for $I_o \leq 100\text{ A}$)	Motor feeders Occasional motor control ^[1]
AC3		Switching of motor loads or other highly inductive loads ($\cos \varphi = 0.45$ for $I_o > 100\text{ A}$) ($\cos \varphi = 0.35$ for $I_o \leq 100\text{ A}$)	Main, indirect control of an individual motor

[1] For this type of application, a contactor is used to control the motor.

Example:

A 125 A switch in the AC23 utilisation category must be capable of:

- making a 10 I_n current (1250 A) with a $\cos \varphi = 0.45$
- breaking a 8 I_n current (1000 A) with a $\cos \varphi = 0.45$.

Suitability for isolation

Standard IEC 60947-1 clearly defines the general rules governing suitability for isolation.

Standard IEC 60947-3 stipulates the requirements for the isolation function of switches.

These standards are based on:

- construction rules
- the required tests.

Construction rules

The construction rules stipulate, among other features:

- the isolation clearances and distances between open contacts (> 1 mm/kV, see Table 13 in standard IEC 60947-1) or, if that is not the case, sampling tests (impulse withstand voltage) for verification of clearances
- the presence of a device indicating the true position of the contacts (the actuator if its position is indicative of that of all the contacts). When means are provided to lock the equipment in the open position, locking in that position shall only be possible when the main contacts are in the open position.

Additional requirements for equipment suitable for isolation

Three specific tests must be carried out:

■ impulse withstand voltage (Uimp) test

Test conditions are those defined in standard IEC 60947-1.

The impulse withstand voltage tests (impulse voltage 1.2/50 μs) for value Uimp (variable depending on the place of installation) are representative of atmospheric and switching overvoltages. They are carried out by the manufacturer when the manufacturer indicates a Uimp value

Voltage applied between:	Impulse withstand voltage (kV) at 2000 meters	Impulse withstand voltage (kV) at sea level
Phases	8	9.8
Upstream / downstream	10	12.3 ^[1]
Phases / exposed conductive parts	8	9.8

[1] 14.7 kV if the device was previously declared class II.

■ measurement of leakage current with the contacts in the open position

The test voltage is equal to 1.1 times the rated operational voltage.

The value of leakage current must not exceed:

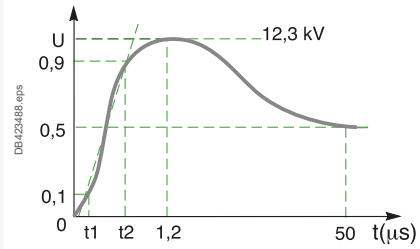
- 0.5 mA per pole for equipment in new condition
- 2 mA per pole for equipment having been subjected to tests related to:
 - general operating characteristics
 - operational performance capability (mechanical and electrical endurance)
 - making and breaking capacity.

■ mechanical test

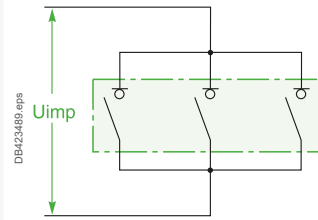
“Verification of the strength of actuator mechanism and position indicating device” or “welded contact test”.

The contacts are maintained closed and the actuator is submitted to a force F equal to three times that required for normal operation (with a minimum of 150 N and a maximum of 400 N) for ten seconds.

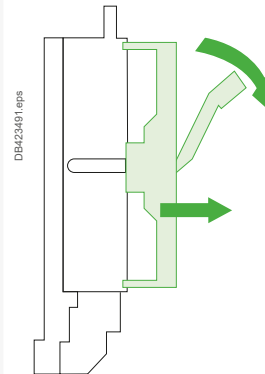
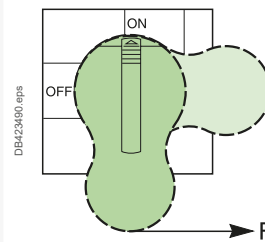
- during application of the force, it must not be possible to lock the actuator mechanism
- following the test and once the actuator has been released, the indication that the main contacts are in the open position must not be false.



1.2-50 μs impulse voltage.

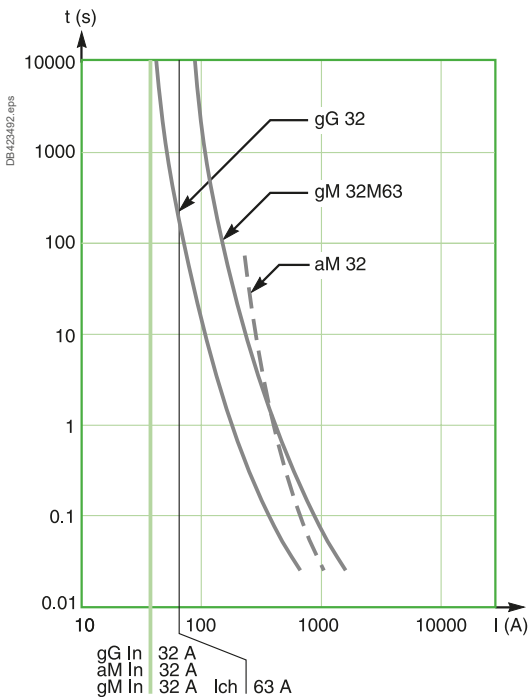


Impulse withstand voltage between switch input and output.



Strength testing of actuator mechanism.





The three curves represent the three types of 32 A fuse-links.

Standard IEC 60269

Standard IEC 60269 applies to low-voltage industrial fuses:

- with a breaking capacity greater than or equal to 6 kA
- intended for the protection of circuits with voltages up to 1000 V AC or 1500 V DC.

Definitions

■ Fuse-link ratings

□ a **gG fuse-link** is defined by its rated current I_n (e.g. fuse-link gG 63 A)

□ a **gM fuse-link** is characterised by two current values separated by an "M" (e.g. I_n M I_{ch})

- the first value I_n corresponds to the maximum continuous current

- the second value I_{ch} corresponds to the "G" characteristic of the fuse-link having the same time-current characteristic.

For example, a fuse-link rated 32M63 is intended to protect motors with a maximum continuous current less than 32 A and having the time-current characteristic of a 63 A "G" fuse-link.

Important: When comparing gM and gG fuse-links, the I_{ch} value of the gM fuse-link must be taken into account.

□ an **aM fuse-link** is defined by a fictive rated current I_n , i.e. it may be used to break currents only starting at four times I_n . Below this value, it must be protected against overloads. For example, a 32 A aM fuse-link must not be used for thermal protection below approximately 130 A.

■ Fuse-link codes

Standard IEC 60269 (section 5.7.1) defines a two-letter code to characterise industrial fuse-links.

First letter: type of fuse-link (breaking range)	Second letter: type of protection	Distribution	Motor
g = general use (full-range breaking capacity up to rated breaking capacity)	gG	■	
	gM		■
a = back-up use (partial-range breaking capacity starting at 4 I_n)	aM		■

■ Conventional non-fusing current I_{nf}

Value of current specified as that which the fuse-link is capable of carrying for a specified time (conventional time) without melting, expressed as a multiple of I_n (e.g. $I_{nf} = 1.25 I_n$).

■ Conventional fusing current I_f

Value of current specified as that which causes operation of the fuse-link within a specified time (conventional time), expressed as a multiple of I_n (e.g. $I_f = 1.6 I_n$).

■ Time-current characteristic

Curve giving the pre-arcing time or operating time as a function of the prospective current under stated conditions of operation.

■ Gates

Standard IEC 60269 defines limiting values within which the characteristics must lie (see gate table on following page), notably for:

- time-current characteristics
- pre-arcing energies.

Characteristics $I = f(t)$

The manufacturer provides a curve for the pre-arcing or total fusing time that is a function of the fault current, with a tolerance of $\pm 30\%$ (compared to 15% for circuit breakers). This curve must respect the following standardised rules.

gG / gM fuse-links

■ Asymptotes

They are determined by the conventional non-fusing current and the conventional fusing current.

Conventional currents and times for "gG" and "gM" fuse-links

Rated current I_n for gG Characteristic current I_{ch} for gM (A)	Conventional time (h)	Conventional current (I_{nr})	Conventional current (I_f)
$16 \leq I_n \leq 63$	1	$1.25 I_n$	$1.6 I_n$
$63 < I_n \leq 160$	2		
$160 < I_n \leq 400$	3		
$400 < I_n$	4		

■ Gates

The time-current characteristics for the fuse-link must lie within the zone determined by the gates.

The table below indicates the gates for specified pre-arcing times of gG and gM fuse-links.

I_n for gG I_{ch} for gM (A)	I_{min} (10 s) [1] (A)	I_{max} (5 s) [2] (A)	I_{min} (0.1 s) (A)	I_{max} (0.1 s) (A)
16	33	65	85	150
20	42	85	110	200
25	52	110	150	260
32	75	150	200	350
40	95	190	260	450
50	125	250	350	610
63	160	320	450	820
80	215	425	610	1100
100	290	580	820	1450
125	355	715	1100	1910
160	460	950	1450	2590
200	610	1250	1910	3420
250	750	1650	2590	4500
315	1050	2200	3420	6000
400	1420	2840	4500	8060
500	1780	3800	6000	10600
630	2200	5100	8060	14140
800	3060	7000	10600	19000
1000	4000	9500	14140	24000
1250	5000	13000	19000	35000

[1] I_{min} (10 s) is the minimum value of current for which the pre-arcing time is not less than ten seconds.

[2] I_{max} (5 s) is the maximum value of current for which the operating time is not more than five seconds.

aM fuse-links

■ Asymptotes

aM fuse-links do not have an asymptote because they must not be used for protection purposes under $4 I_n$.

The table below indicates the gates for specified pre-arcing times of aM fuse-links. The gates are expressed as a percentage of the "fictive" rated current I_n (called k_0)

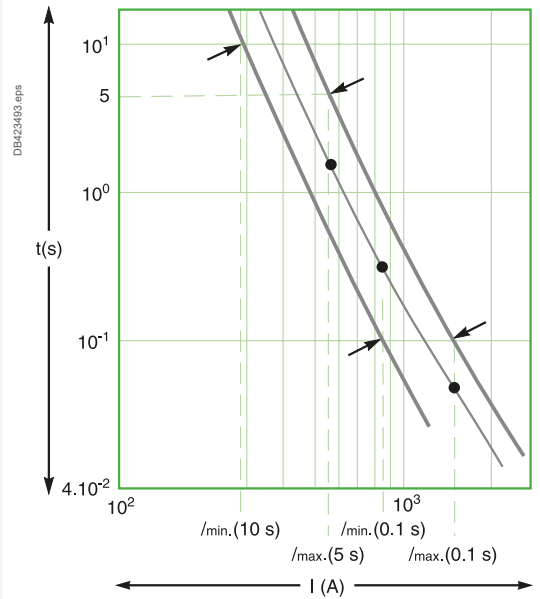
■ aM gates

t (s)	I_p/I_n	I_f/I_n
60	4	6.3
0.5	8	12
0.2	10	
0.1		19

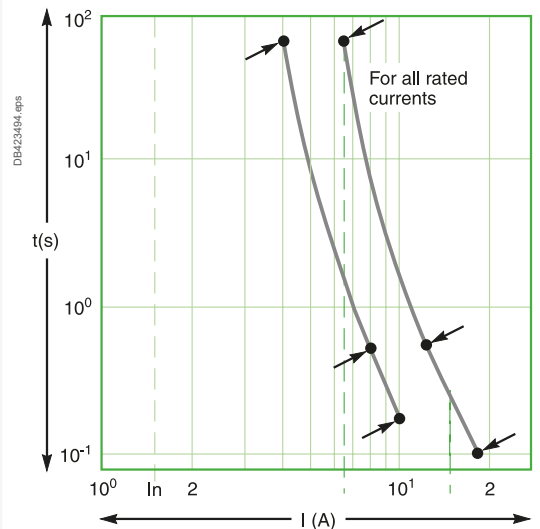
I_n : "fictive" rated current I_n (called k_0).

I_p : pre-arcing threshold.

I_f : fusing threshold.



63 A fuse-link, $\swarrow \searrow$: gates and test on gate currents. Curve $\hat{I} = f(t)$ for gG/gM.

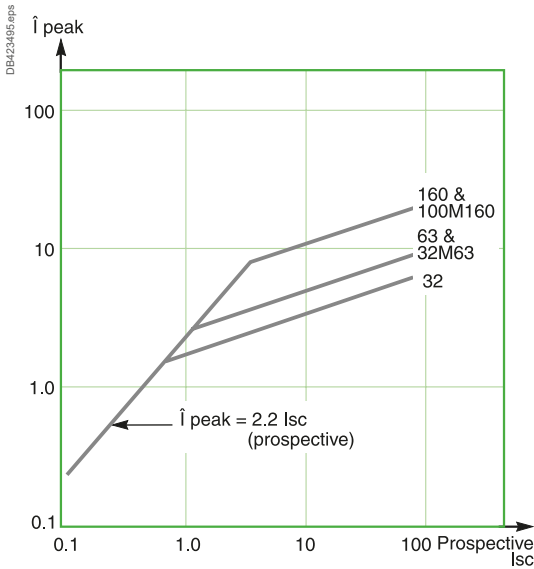


$\swarrow \searrow$: aM gates for an aM fuse-link. Curve $\hat{I} = f(t)$ for aM.

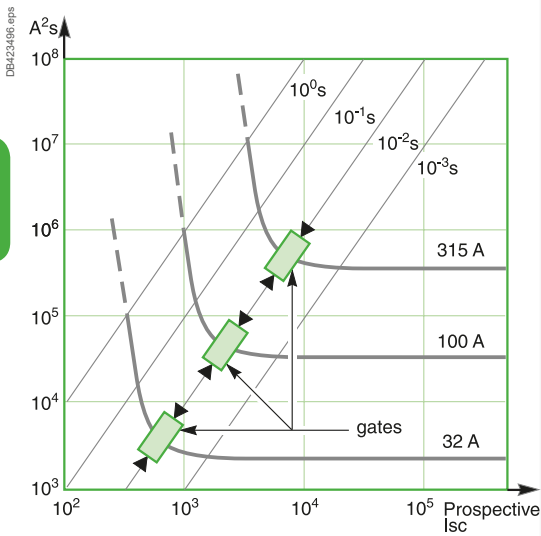


Standards

Fuse-links



$\hat{I} = f(I)$ curve.



Typical $I^2t = f(I)$ curves for gG fuse-links.

Limiting

Current limiting

Limiting of the prospective fault current I_p occurs as soon as the pre-arcing time T_p is less than 10 ms (I_p of approximately $30 I_n$).

Energy limiting $I^2t = f(I)$

The peak fault current is limited to a lesser value and the thermal stresses caused by the flowing energy (I^2t) are correspondingly reduced.

■ gG fuse-links

Standard IEC 60239 indicates minimum and maximum gate values in energy (I^2t) for each standardised fuse-link value where $t = 0.01$ seconds.

Pre-arcing I^2t values at 0.01 s for “gG” and “gM” fuse-links

I_n for gG I_{ch} for gM (A)	I^2t_{min} $10^3 \times (A^2s)$	I^2t_{max} $10^3 \times (A^2s)$
16	0.3	1.0
20	0.5	1.8
25	1.0	3.0
32	1.8	5.0
40	3.0	9.0
50	5.0	16
63	9.0	27
80	16	46
100	27	86
125	46	140
160	86	250
200	140	400
250	250	760
315	400	1300
400	760	2250
500	1300	3800
630	2250	7500
800	3800	13600
1000	7840	25000
1250	13700	47000

■ aM fuse-links

Standard IEC 60239 indicates maximum energy (I^2t) values for operation depending on:

- the rated voltage U_n
- the “fictive” rated current I_n for the fuse-link for operating times less than or equal to 0.01 seconds.

Maximum pre-arcing I^2t values for aM fuse-links

Voltage U_n (V)	I^2t_{max} (A ² s)
$U_n \leq 400$ V	$18 I_n^2$
$400 < U_n \leq 500$ V	$24 I_n^2$
$500 < U_n \leq 660$ V	$35 I_n^2$

Standard IEC 60364

The international installation standard IEC 60364 and the derived national standards stipulate the main rules to be observed to ensure the safety of installations.

Protection against overloads

Section 364-52 covers this type of protection.

Calculations

A wiring system rated I_z supplies a load or set of loads with a rated current I_b and is protected by a fuse with a rated current I_n . The I_z rating is determined as indicated below:

current I_b depends on the load, hence:

- fuse sizing where $I_n > I_b$
- fusing current $I_2 \leq 1.6 I_n$
- overload protection for the wiring system is ensured if $I_2 \leq 1.45 I_z$
- the wiring system must therefore be sized to $I_z > 1.1 I_n$.

Determination of the rated current for a wiring system depends on the cross-sections in a given environment. Standard IEC 60364 precisely defines the environment. For example, the "reference method" defines the method of installation, whether the cables are single or multicore, etc. Depending on the environment, correction factors are applied to determine the cross-section of the cable to be installed.

Calculation of the correction factors

Reference method

Type of conductor	Method of installation	Reference method
Multicore cables and conductors	<ul style="list-style-type: none"> ■ in conduits, cable ducting, cable trunking, surface mounted or embedded ■ in building voids, ceiling voids ■ in cable channels, mouldings, skirting trunking, architraves 	B
	<ul style="list-style-type: none"> ■ surface mounted on walls or ceilings ■ on unperforated trays 	C
Multicore cables	<ul style="list-style-type: none"> ■ on ladders, brackets, perforated trays ■ surface mounted, spaced from wall ■ suspended cables 	E
Single-core cables	<ul style="list-style-type: none"> ■ on ladders, brackets, perforated trays ■ surface mounted, spaced from wall ■ suspended cables 	F

Correction factors K1, K2, K3

The installation standards specify in the tables the values of the correction factors to be applied. The main effects of the environment are presented below:

- K1 varies from 0.7 to 1, depending on:
 - the reference method of installation
 - particular installation criteria (cables in ceiling voids, cable channels, in a conduit in a thermally insulated wall)
- K2 varies from 0.38 to 1, depending on:
 - primarily the number of multicore cables and conductors positioned side by side
 - the number of layers (one or more) ^[1]
 - the method of installation
- K3 varies from 0.115 to 1.29, depending on:
 - the ambient temperature
 - the type of cable insulation (EPR, PVC, XPLE, etc.).

[1] An additional factor < 1 must be applied in this case.

Example

A three-phase XPLE cable is run on a perforated tray, touching three other circuits, namely:

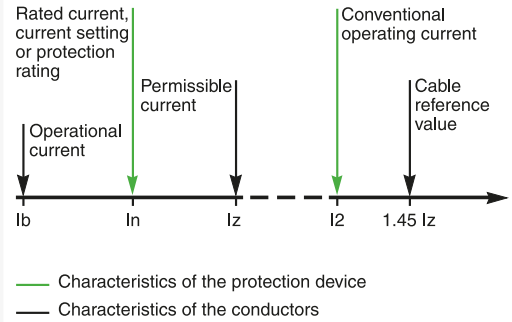
- a three-phase cable (circuit 1)
- three single-phase cables (circuit 2)
- six single-phase cables (circuit 3). This circuit is made up of two conductors per phase.

There are therefore five three-phase groups. The ambient temperature is 40° C.

The XLPE cable carries 23 amperes per phase.

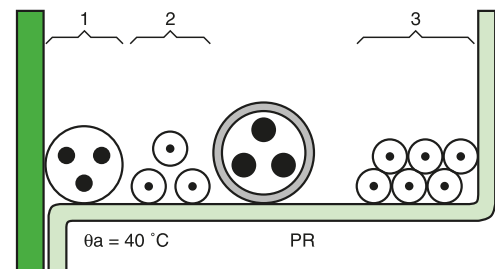
The reference method is indicated in the table above. The correction factors K1, K2 and K3 are indicated in the tables in the standard. For this example, the correction factors are K1 = 1, K2 = 0.75, K3 = 0.91.

The resulting K factor (equal to K1 x K2 x K3, i.e. 1 x 0.75 x 0.91), is therefore 0.68.



Wiring system protection fuse.

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DB423488.eps

Standards Installation

Depending on the cable size and the environment, the table below indicates the rating Iz and, in the next column (F), the rating of the corresponding protection fuse-link.

Permissible current (Iz) and the corresponding protection fuse-link (F)

		Insulation and number of loaded conductors																	
Reference method	B	PVC3		PVC2				PR3				PR2							
	C			PVC3				PVC2		PR3				PR2					
	E					PVC3				PVC2		PR3				PR2			
	F							PVC3				PVC2				PR3		PR2	
Copper, cross-sectional area (mm²)	Iz	F	Iz	F	Iz	F	Iz	F	Iz	F	Iz	F	Iz	F	Iz	F	Iz	F	
	1.5	15.5	10	17.5	10	18.5	10	19.5	16	22	16	23	16	24	20	26	20		
2.5	21	16	24	20	25	20	27	20	30	25	31	25	33	25	36	32			
4	28	20	32	25	34	25	36	32	40	32	42	32	45	40	49	40			
6	36	32	41	32	43	40	46	40	51	40	54	50	58	50	63	50			
10	50	40	57	50	60	50	63	50	70	63	75	63	80	63	86	63			
16	68	50	76	63	80	63	85	63	94	80	100	80	107	80	115	100			
25	89	80	96	80	101	80	112	100	119	100	127	100	138	125	149	125	161	125	
35	110	100	119	100	126	100	138	125	147	125	158	125	171	125	185	160	200	160	
50	134	100	144	125	153	125	168	125	179	160	192	160	207	160	225	200	242	200	
70	171	125	184	160	196	160	213	160	229	200	246	200	269	160	289	250	310	250	
95	207	160	223	200	238	200	258	200	278	250	298	250	328	250	352	315	377	315	
120	239	200	259	200	276	250	299	250	322	250	346	315	382	315	410	315	437	400	
150			299	250	319	250	344	315	371	315	399	315	441	400	473	400	504	400	
185			341	250	364	315	392	315	424	315	456	400	506	400	542	500	575	500	
240			403	315	430	315	461	400	500	400	538	400	599	500	641	500	679	500	
300			464	400	497	400	530	400	576	500	621	500	693	630	741	630	783	630	
400									656	500	754	630	825	630			840	800	
500									749	630	868	800	946	800			1083	1000	
630									855	630	1005	800	1088	800			1254	1000	
Aluminium cross-sectional area (mm²)	Iz	F	Iz	F	Iz	F	Iz	F	Iz	F	Iz	F	Iz	F	Iz	F	Iz	F	
	2.5	16.5	10	18.5	10	19.5	16	21	16	23	16	24	20	26	20	28	20		
4	22	16	25	20	26	20	28	20	31	25	32	25	35	32	38	32			
6	28	20	32	25	33	25	36	32	39	32	42	40	45	40	49	40			
10	39	32	44	40	46	40	49	40	54	50	58	50	62	50	67	50			
16	53	40	59	50	61	50	66	50	73	63	77	63	84	63	91	80			
25	70	63	73	63	78	63	83	63	90	80	97	80	101	80	108	100	121	100	
35	86	80	90	80	96	80	103	80	112	100	120	100	126	100	135	125	150	125	
50	104	80	110	100	117	100	125	100	136	125	146	125	154	125	164	125	184	160	
70	133	100	140	125	150	125	160	125	174	160	187	160	198	160	211	160	237	200	
95	161	125	170	125	183	160	195	160	211	160	227	200	241	200	257	200	289	250	
120	188	160	197	160	212	160	226	200	245	200	263	250	280	250	300	250	337	250	
150			227	200	245	200	261	200	283	250	304	250	324	250	346	315	389	315	
185			259	200	280	250	298	250	323	250	347	315	371	315	397	315	447	400	
240			305	250	330	250	352	315	382	315	409	315	439	400	470	400	530	400	
300			351	315	381	315	406	315	440	400	471	400	508	400	543	500	613	500	
400									526	400	600	500	663	500			740	630	
500									610	500	694	630	770	630			856	630	
630									711	630	808	630	899	800			996	800	

E

Example 1:

■ Three copper conductors in PVC insulation (PVC3) in embedded conduits are intended to carry a 58 A current (Ib). The method of installation corresponds to reference method B. The study of the environment shows that it is not necessary to apply correction factors.
A direct reading in the table (B, PVC3) indicates:
□ fuse-link rating $I_n \geq I_b = 58 \text{ A} \Rightarrow I_n = 80 \text{ A}$
□ cross-sectional area of the conductors = 25 mm².

Example 2:

■ Consider the three-phase PR cable used in the example (page E-9). The method of installation corresponds to reference method E and the study of the environment shows that it is necessary to apply a correction factor of 0.68.
A direct reading in the table (E, PR3) indicates:
□ fuse-link rating $I_n \geq I_b = 23 \text{ A} \Rightarrow I_n = 25 \text{ A}$ and I_z (not corrected) = 31
□ the corrected I_z is $31 / 0.68 = 40.5 \Rightarrow I_z = 42 \text{ A}$ and the corresponding cross sectional area of the conductors = 4 mm².

Protection of life and property

Standard IEC 60364-4x deals with the protection of life and property against indirect contacts. If a dangerous fault occurs (> U_L maximum safety voltage), the duration of contact must be less than 0.4 seconds (for TN systems or for second fault on IT systems). The impedance of the downstream fault must be such that the fuse reacts within the time limit.

TN system

The table below indicates the length of wiring systems depending on the cross sectional areas and the fuse rating, with the following system characteristics:

- 230 V / 400 V distribution system
- maximum safety voltage U_L = 50 V
- copper conductors

$$m = \frac{S_{Phase}}{S_{PE}} = 1$$

Cable lengths

Rated copper conductor cross sectional areas (mm ²)	Rated currents of the disconnectors using gG fuse-links (A)																	
	16	20	25	32	40	50	63	90	100	125	160	200	250	315	400	500	630	800
1.5	35	31	23	18	15	11	9	7	5.5	4	3							
2.5	59	51	39	30	25	19	15	12	9	7	5.5	4	3					
4	95	82	62	49	40	30	25	19	15	11	9	7	5	4	3			
6	142	123	94	73	60	45	37	29	22	17	13	10	8	6	4.5	3		
10	237	206	156	122	100	75	62	49	37	29	22	17	13	9.5	8	5.5	4	
16	379	329	250	195	160	120	99	78	59	46	36	27	21	15	12	9	6	5
25	592	515	391	305	250	188	155	122	93	72	56	42	32	24	19	13	10	8
35	830	720	547	428	350	263	217	171	130	101	78	59	46	34	27	19	13	11
50	1185	1029	782	611	501	376	310	244	186	145	112	85	65	48	39	27	19	15
70	1660	1440	1095	855	702	526	434	342	260	203	156	119	91	67	55	38	27	22
95	2250	1955	1486	1191	953	714	590	464	354	245	212	161	124	62	74	52	37	20
120	2845	2470	1877	1466	1203	902	745	586	447	348	268	204	156	116	94	65	29	37
150			2127	1662	1364	1023	844	665	506	394	304	231	177	131	106	74	53	42
185				1809	1484	1113	919	723	551	429	331	251	193	143	116	80	57	46
240					1805	1354	1117	880	870	521	402	306	235	174	140	98	70	56
300						1579	1303	1027	782	608	469	357	274	203	164	114	82	66
400																		



Correction factors for cable lengths

$m = \frac{S_{Phase}}{S_{PE}}$		1	2	3	4
400 V systems ^[1]	copper cable	1	0.67	0.50	0.40
(phase-to-phase)	aluminium cable	0.62	0.41	0.31	0.25

[1] For 237 V phase-to-phase systems, apply the additional factor of 0.62.

For 237 V single-phase systems (237 V phase-to-neutral), do not apply the additional correction factor.

IT system

Additional correction factors

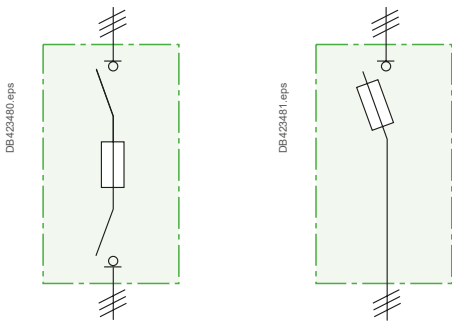
After applying the correction factors in the table above (where applicable) to the cable lengths, the correction factors specific to the IT system must be applied.

400 V systems ^[1]	IT with non-distributed neutral	0.86
(phase-to-phase)	IT with distributed neutral	0.60

[1] For 237 V phase-to-phase systems, apply the additional factor of 0.62. For 237 V single-phase systems (237 V phase-to-neutral), use the 400 V table with the distributed-neutral correction factor.

TT system

The protection of life and property is ensured by residual-current devices (RCD), which may be easily combined with circuit breakers.



INF diagram.

ISF diagram.

Isolation and installation rules**■ Lock-out of a circuit**

The device disconnecting the circuit in question must be "suitable for isolation" and have a locking system to maintain the contacts in the OFF position.

■ Position of the isolating function in the installation

A disconnection device must be installed at the head of each circuit-distribution point to ensure optimum continuity of service (incomer in an enclosure or sub-distribution switchboard).

■ Implementation in the installation

A device "suitable for isolation" must:

- ensure breaking of all poles
- have a locking system to maintain the contacts in the OFF position
- meet overvoltage withstand conditions.

Isolation of an outgoing circuit

It is necessary to be able to de-energise an electrical installation in part or in whole for maintenance or servicing purposes, or to make modifications on the installation. Standard IEC 60364-5x deals with isolation and lock-out of outgoing circuits.

Fupact and the isolation function

Fupact is suitable for isolation with positive contact indication.

The Fupact handle cannot indicate the OFF position unless the main contacts are actually open.

The isolation function is consequently guaranteed by the manufacturer.

Fupact and the safety of maintenance operations

The Fupact front face offers IP20 protection.

Fupact uses replaceable fuse-links, so it is mandatory to ensure that replacement operations may be carried out without any risk.

Safety is ensured because:

- the fuse-contacts are totally protected during normal operation
- the fuse covers or fuse-carriers cannot be removed unless the handle is turned to the OFF position
- Fupact ensures double isolation, upstream and downstream of the fuse-link
- the innovative fuse-carrier system on the small ratings makes it possible to replace the fuse-links outside of the switchboard.



Safe replacement of fuse-links on a Fupact ISFL.

Principle

Schneider Electric offers a coordinated protection system

In an electrical installation, protection fuses are never used alone and must always be integrated in a system comprising circuit breakers.

Coordination is required between:

- upstream and downstream fuses
- upstream circuit breakers and downstream fuses
- upstream fuses and downstream circuit breakers.

Upstream fuse / Downstream fuse

Discrimination is ensured when

Total energy of downstream fuse (E_{tav}) < Pre-arcing energy of upstream fuse (E_{pm})

Note: If E_{tav} is higher than 80 % of E_{pm}, the upstream fuse may be derated.

■ Upstream gG fuse-link / downstream gG fuse-link

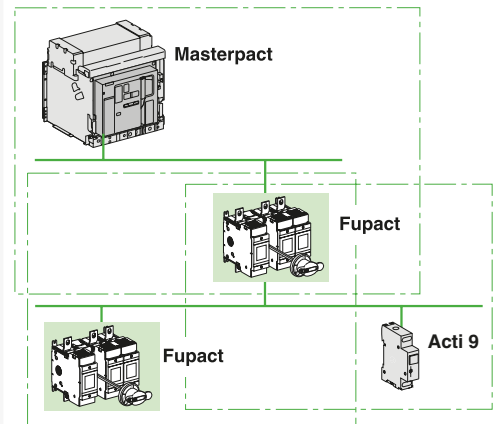
Standard IEC 60269-2-1 indicates limit values for pre-arcing and total energies for operation of gG and gM fuse-links, where the operating current is approximately 30 I_n.

I²t limit and test currents for verification of discrimination

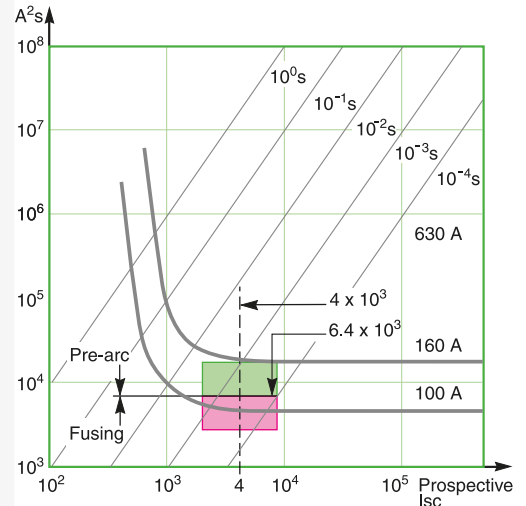
I _n (A)	Minimum values of pre-arcing I ² t		Maximum values of operating I ² t	
	Rms values of I prospective (kA)	I ² t (A ² s)	Rms values of I prospective (kA)	I ² t (A ² s)
16	0.27	291	0.55	1 210
20	0.40	640	0.79	2 500
25	0.55	1 210	1.00	4 000
32	0.79	2 500	1.20	5 750
40	1.00	4 000	1.50	9 000
50	1.20	5 750	1.85	13 700
63	1.50	9 000	2.30	21 200
80	1.85	13 700	3.00	36 000
100	2.30	21 200	4.00	64 000
125	3.00	36 000	5.10	104 000
160	4.00	64 000	6.80	185 000
200	5.10	104 000	8.70	302 000
250	6.80	185 000	11.80	557 000
315	8.70	302 000	15.00	900 000
400	11.80	557 000	20.00	1 600 000
500	15.00	900 000	26.00	2 700 000
630	20.00	1 600 000	37.00	5 470 000
800	26.00	2 700 000	50.00	10 000 000
1 000	37.00	5 470 000	66.00	17 400 000
1 250	50.00	10 000 000	90.00	33 100 000

■ Upstream gG fuse-link / downstream aM fuse-link

The I = f(t) curve for an aM fuse-link is steeper. aM fuse-links are just as fast as gG fuse-links for short-circuit currents, but slower for low overloads. That is why the discrimination ratio between gG and aM fuse-links is approximately 2.5 to 4.

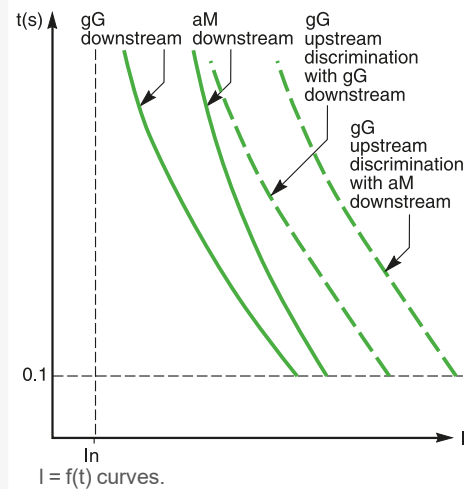


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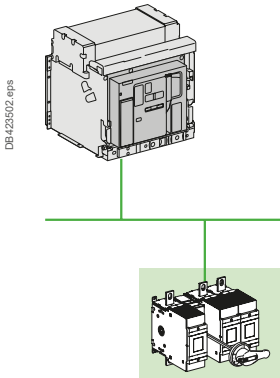
Curves E = f (I) superimposed.

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I = f(t) curves.

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Upstream circuit breaker / Downstream fuse

Upstream circuit breaker with delayed ST (short time) protection function

This is the situation for a MLVS (main low-voltage switchboard) or sub-distribution switchboard protected by an incoming circuit breaker.

The upstream circuit breaker has an electrodynamic withstand capacity I_{cw} and ensures time discrimination.

Rule

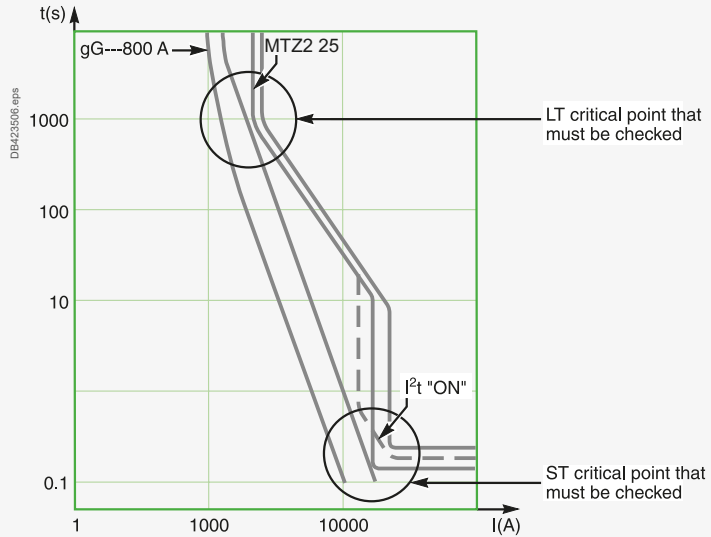
Examination of discrimination at the critical points on the LT (long time) and ST (short time) curves results in a discrimination table.

Analysis of the LT critical point indicates whether discrimination between the protection devices is possible or not.

Analysis of the ST (or I_{cw}) critical point indicates whether the discrimination limit is greater than or equal to the ST (or I_{cw}) value.

Note:

- the LT critical point is the most restrictive
- for circuit breakers with a I_{cw} value that is high and/or equal to I_{cu} , the ST critical point is almost never a problem, i.e. discrimination is total.

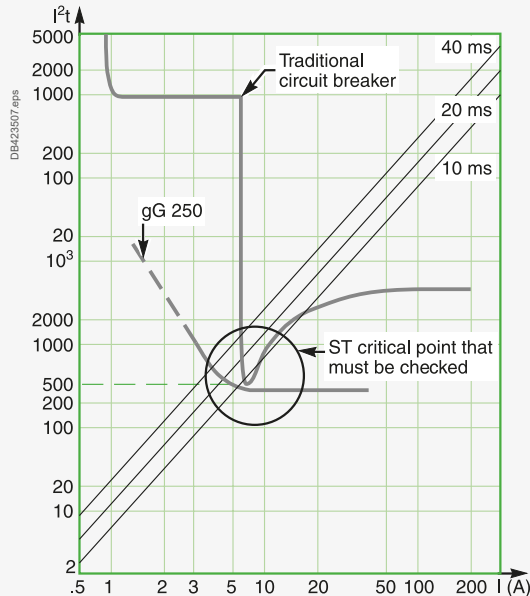


Time-current curves and critical points that must be checked.

Upstream circuit breaker with non-delayed ST (short time) protection and/or current-limiting function

To make sure the ST critical point is OK, it is necessary to compare:

- the energy curves of the protection devices
- the non-tripping curves of the upstream circuit breaker and the fusing curves of the downstream fuse, and to run tests for the critical values.

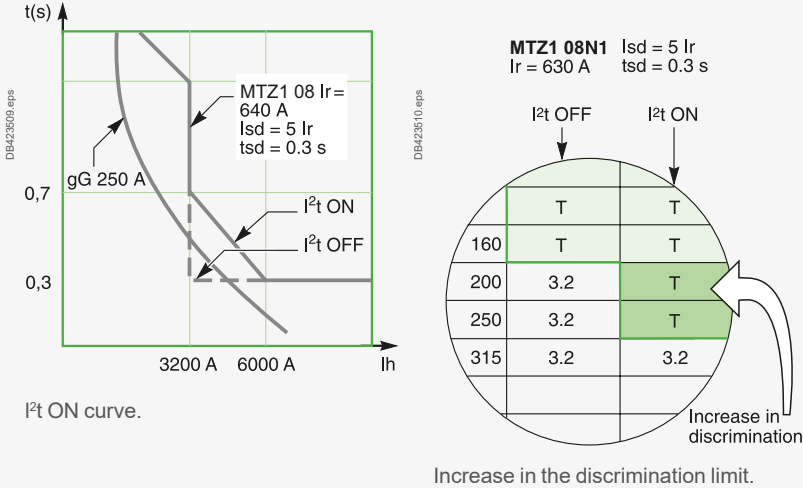


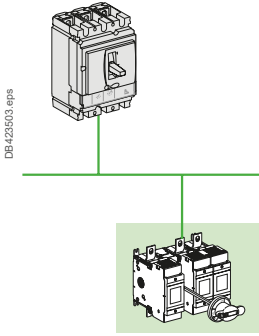
Energy curves and critical points that must be checked.

I²t ON setting

To significantly limit the stresses exerted on the installation (cables installed on trays, power supplied by an engine generator set, etc.), it may be necessary to set the ST protection function to a low value.

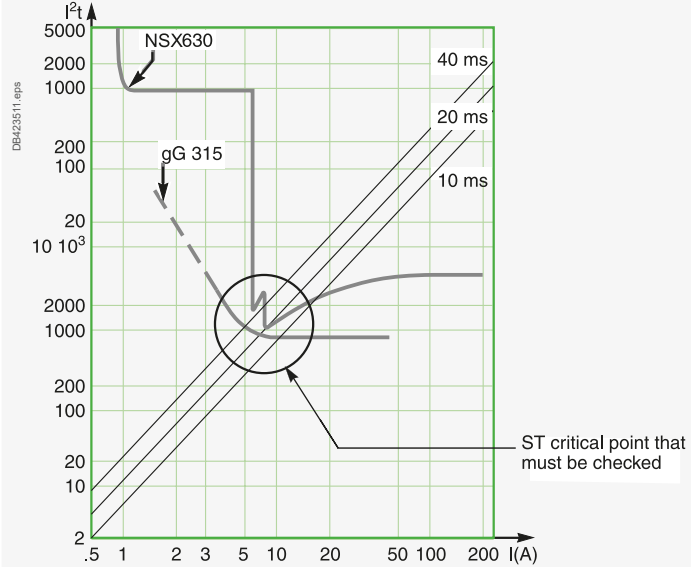
The I²t ON function, a constant-energy tripping curve, maintains the level of discrimination performance and facilitates total discrimination.





Compact NSX upstream of gG or aM fuse-links

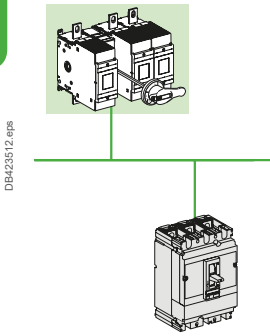
Compact NSX is a current-limiting circuit breaker. Even without an ST (short time) delay setting, discrimination at the ST critical point is significantly improved because Compact NSX has a mini-delay that considerably increases curve values at the ST critical point.



I²t curve for Compact NSX and a fuse.

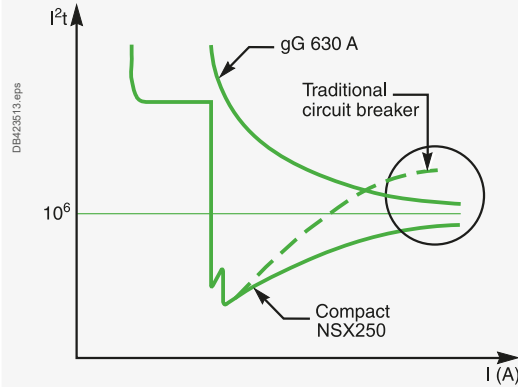
See pages E-23 to E-25 for the discrimination tables.

E



Compact NSX downstream of gG or aM fuse-links

Compact NSX offers an extremely high level of current-limiting performance due to the piston-based reflex tripping system. Again, discrimination is significantly improved with an upstream fuse.

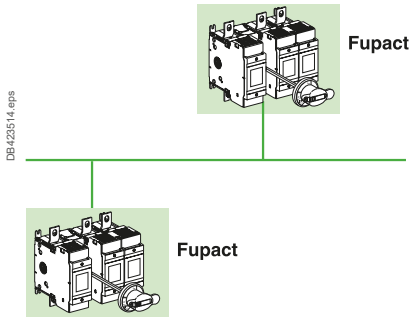


See page E-26 for the discrimination tables.

Discrimination tables

Upstream: Fupact (gG fuse-link)

Downstream: Fupact (gG or aM fuse-link)



The tables below indicate the necessary ratings for the upstream and downstream fuse-links to achieve **total discrimination**. They take into account the standardised values stipulated in IEC 60269-1 and IEC 60269-2-1 for:

- the pre-arcing energies of the upstream fuse-links
- the total fusing energies of the downstream fuse-links.

Upstream fuse-link gG (In) / gM (Ich)	Downstream fuse-link gG (In) / gM (Ich)	aM (In)
Rating (A)		
16	6	4
20	10	6
25	16	8
32	20	10
40	25	12
50	32	16
63	40	20
80	50	25
100	63	32
125	80	40
160	100	63
200	125	80
250	160	125
315	200	125
400	250	160
500	315	200
630	400	250
800	500	315
1000	630	400
1250	800	500

Examples:

- an upstream 125 A gG fuse-link ensures total discrimination with an 80 A gG fuse-link and/or a 40 A aM fuse-link situated downstream
- an upstream 125 A gG fuse-link ensures total discrimination with a 63 A gG 63M80 fuse-link (with an 80 A characteristic) situated downstream.



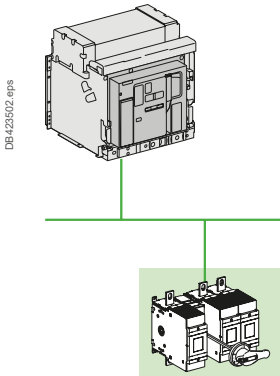
Technical characteristics

Discrimination tables

Upstream: Masterpact MTZ

Downstream: Fupact (gG or aM fuse-link)

$U_e \leq 440 \text{ V AC}$



The Masterpact circuit breaker is equipped with a Micrologic 5.0 - 6.0 - 7.0 X control unit with the following settings:

- LT setting: $T_r = 24$ seconds
- ST setting: instantaneous OFF / $I_{sd} = 10I_r$ $T_{sd} = 0.4$ seconds.

Upstream		Masterpact MTZ Micrologic 5.0-6.0-7.0 X																
		MTZ1 08 H1	MTZ1 08 H1	MTZ1 08 H1	MTZ1 08 H1	MTZ1 08 H1	MTZ1 08 H1	MTZ1 08 H1	MTZ1 08 H1	MTZ1 10 H1	MTZ1 12 H1	MTZ1 16 H1						
Down- stream	Rating (A) Ir setting	MTZ2 08 N1 H1/H2	MTZ2 08 N1 H1/H2	MTZ2 08 N1 H1/H2	MTZ2 08 N1 H1/H2	MTZ2 08 N1 H1/H2	MTZ2 08 N1 H1/H2	MTZ2 08 N1 H1/H2	MTZ2 10 N1 H1/H2	MTZ2 12 N1 H1/H2	MTZ2 16 N1 H1/H2	MTZ2 20 H3	MTZ2 25 H3	MTZ2 32 H3	MTZ2 40 H3	MTZ3 50 H1/H2	MTZ3 63 H1/H2	
				400	400	400	630	800	800	800	800	1000	1200	1600	2000	2500	3200	4000
		160	200	240	315	400	480	630	800	1000	1200	1600	2000	2500	3200	4000	5000	6300
gG/aM Fuse-link	32	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	40	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	50	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	63	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	80		T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	100			T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	125				T	T	T	T	T	T	T	T	T	T	T	T	T	T
	160					T	T	T	T	T	T	T	T	T	T	T	T	T
	200						T	T	T	T	T	T	T	T	T	T	T	T
	250							T	T	T	T	T	T	T	T	T	T	T
	315								T	T	T	T	T	T	T	T	T	T
	355									T	T	T	T	T	T	T	T	T
	400									T	T	T	T	T	T	T	T	T
	500										T	T	T	T	T	T	T	T
	630											T	T	T	T	T	T	T
800												T	T	T	T	T	T	
1000													T	T	T	T	T	
1250														T	T	T	T	

Table key

T	Total discrimination
16	Discrimination limit in kA
	No discrimination

Discrimination tables

Upstream: Compact NS630b to 3200

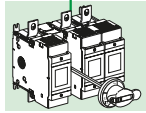
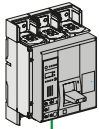
Downstream: Fupact (gG fuse-link)

$U_e \leq 440 \text{ V AC}$

The Compact NS630b to 3200 circuit breaker is equipped with a Micrologic 5.0-6.0-7.0 control unit with the following settings:

- LT setting: $T_r = 24$ seconds
- ST setting: instantaneous OFF / $T_{sd} = 0.4$ seconds.

DE125650.eps



Upstream: Compact NS L

Micrologic 5.0-6.0-7.0

NS630b NS630b NS630b NS630b NS630b NS630b NS630b NS630b NS800 NS1000

Downstream: Fupact gG fuse-link

Rating (A)	400	400	400	630	630	630	630	800	1000
I _r setting	160	200	240	315	400	500	630	800	1000
32	T	T	T	T	T	T	T	T	T
40	T	T	T	T	T	T	T	T	T
50	T	T	T	T	T	T	T	T	T
63	T	T	T	T	T	T	T	T	T
80	T	T	T	T	T	T	T	T	T
100		74	74	74	74	74	74	74	74
125			41	41	41	41	41	41	41
160				16	16	16	16	16	16
200					10	10	10	10	10
250						10	10	10	10
315								10	10
355								10	10
400									10
500									
630									
800									
1000									
1250									

Upstream: Compact NS N/H

Micrologic 5.0-6.0-7.0

NS630b NS630b NS630b NS630b NS630b NS630b NS630b NS630b NS800 NS1000 NS1250 NS1600 NS1600b NS2000 NS2500 NS3200

Downstream: Fupact gG fuse-link

Rat. (A)	400	400	400	630	630	630	630	800	1000	1200	1600	1600	2000	2500	3200
I _r setting	160	200	240	315	400	500	630	800	1000	1200	1600	1600	2000	2500	3200
32	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
40	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
50	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
63	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
80	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
100		T	T	T	T	T	T	T	T	T	T	T	T	T	T
125			T	T	T	T	T	T	T	T	T	T	T	T	T
160				T	T	T	T	T	T	T	T	T	T	T	T
200					T	T	T	T	T	T	T	T	T	T	T
250						T	T	T	T	T	T	T	T	T	T
315								T	T	T	T	T	T	T	T
355								44	44	44	44	T	T	T	T
400									35	35	35	T	T	T	T
500										25	25	T	T	T	T
630											25	40	40	40	40
800												40	40	40	40
1000													40	40	40
1250														40	40

Table key

T	Total discrimination
41	Discrimination limit in kA
	No discrimination

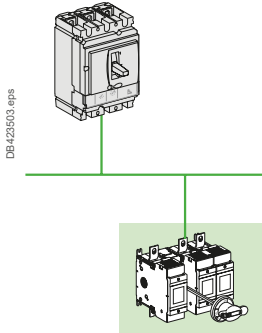


Discrimination tables

Upstream: Compact NSX100 to 630

Downstream: Fupact (gG fuse-link)

$U_e \leq 440 \text{ V AC}$



The Compact NSX100 to 630 circuit breaker is equipped with a thermal-magnetic or electronic trip unit without a delayed short-time setting.

Note: the discrimination rules are the same for a Compact NSX with a delayed short-time setting.

Upstream: Compact NSX

TM-D

NSX100B/F/N/H/S/L

NSX160B/F/N/H/S/L

NSX250B/F/N/H/S/L

Downstream: Fupact gG fuse-link

Rating (A)	16	25	32	40	50	63	80	100	80	100	125	160	160	200	250	
I_m (kA)	0.19	0.3	0.4	0.5	0.5	0.5	0.63	0.8	1	1	1	1	1	2	2.5	
2	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
4	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
6	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
10	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
16				T	T	T	T	T	T	T	T	T	T	T	T	T
20					T	T	T	T	T	T	T	T	T	T	T	T
25						T	T	T	T	T	T	T	T	T	T	T
32							T	T	T	T	T	T	T	T	T	T
35											T	T	T	T	T	T
40												T	T	T	T	T
50													T	T	T	T
63														T	T	T
80															T	T
100																T
125																
160																

Upstream: Compact NSX

Micrologic 2, 5, 6 $I_{sd} = 10 I_r$

NSX100B/F/N/H/S/L

NSX160B/F/N/H/S/L

NSX250B/F/N/H/S/L

NSX400F/N/H/S/L

NSX630F/N/H/S/L

Downstream: Fupact gG fuse-link

Rating (A)	40			100				160			250			400			630		
I_r Setting	18	25	40	40	63	80	100	100	125	160	160	200	250	250	320	400	400	500	630
I_m (kA)		0.25	0.4	0.4	0.63	0.8	1	1	1.25	1.6	1.6	2	2.5	2.5	3.2	4	4	5	6.3
2	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
4	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
6	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
10		T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
16			T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
20					T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
25						T	T	T	T	T	T	T	T	T	T	T	T	T	T
32							T	T	T	T	T	T	T	T	T	T	T	T	T
35								T	T	T	T	T	T	T	T	T	T	T	T
40									T	T	T	T	T	T	T	T	T	T	T
50										T	T	T	T	T	T	T	T	T	T
63											T	T	T	T	T	T	T	T	T
80												T	T	T	T	T	T	T	T
100													T	T	T	T	T	T	T
125															T	T	T	T	T
160																T	T	T	T
200																		T	T
250																			T

Discrimination tables

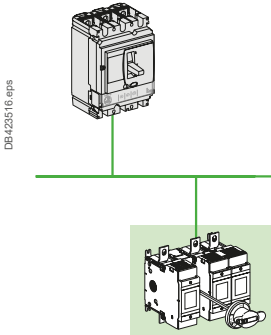
Upstream: Compact NSX100 to 630

Downstream: Fupact (aM fuse-link)

$U_e \leq 440 \text{ V AC}$

The Compact NSX100 to 630 circuit breaker is equipped with a thermal-magnetic or electronic trip unit without a delayed short-time setting.

Note: the discrimination rules are the same for a Compact NSX with a delayed short-time setting.



Upstream: Compact NSX

TM-D

NSX100B/F/N/H/S/L

NSX160B/F/N/H/S/L

NSX250B/F/N/H/S/L

Downstream: Fupact aM fuse-link

Rating (A)	16	25	32	40	50	63	80	100	80	100	125	160	160	200	250
Im (kA)	0.19	0.3	0.4	0.5	0.5	0.5	0.63	0.8	1	1	1	1	1	2	2.5
2	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
4	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
6	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
10				T	T	T	T	T	T	T	T	T	T	T	T
16						T	T	T	T	T	T	T	T	T	T
20							T	T	T	T	T	T	T	T	T
32											T	T	T	T	T
35														T	T
40														T	T
50														T	T
63														T	T

Upstream: Compact NSX

Micrologic 2.0/5.0/6.0 I_{sd}: 10 Ir

NSX100B/F/N/H/S/L

NSX160B/F/N/H/S/L

NSX250B/F/N/H/S/L

Downstream: Fupact aM fuse-link

Rating (A)	40				100				160				250				
	18	25	40	40	63	80	100	63	80	100	125	160	100	125	160	200	250
Im (kA)		0.25	0.4	0.4	0.63	0.8	1	0.63	0.8	1	1.25	1.6	1	1.25	1.6	2	2.5
2	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
4	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
6		T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
10			T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
16					T	T	T	T	T	T	T	T	T	T	T	T	T
20						T	T		T	T	T	T	T	T	T	T	T
32											T	T		T	T	T	T
35															T	T	T
40															T	T	T
50																T	T
63																T	T

Upstream: Compact NSX

Micrologic 2.0/5.0/6.0 I_{sd}: 10 Ir

NSX400F/N/H/S/L

NSX630F/N/H/S/L

Downstream: Fupact aM fuse-link

Rating (A)	400				630					
	160	200	250	320	400	250	320	400	500	630
Im (kA)	1.6	2	2.5	3.2	4	2.5	3.2	4	5	6.3
2	T	T	T	T	T	T	T	T	T	T
4	T	T	T	T	T	T	T	T	T	T
6	T	T	T	T	T	T	T	T	T	T
10	T	T	T	T	T	T	T	T	T	T
16	T	T	T	T	T	T	T	T	T	T
20	T	T	T	T	T	T	T	T	T	T
32	T	T	T	T	T	T	T	T	T	T
35	T	T	T	T	T	T	T	T	T	T
40	T	T	T	T	T	T	T	T	T	T
50		T	T	T	T	T	T	T	T	T
63			T	T	T	T	T	T	T	T
80				T	T		T	T	T	T
100					T			T	T	T

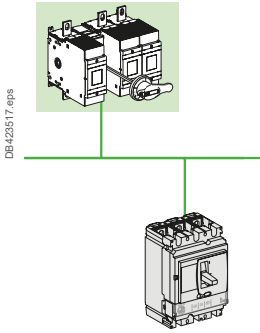


Discrimination tables

Upstream: Fupact (gG fuse-link)

Downstream: Compact NSX100 to 630

$U_e \leq 440 \text{ V AC}$



The Compact NSX100 to 630 circuit breaker is equipped with a thermal-magnetic or electronic trip unit without a delayed short-time setting.

Upstream: Fupact gG fuse-link

Downstream	Rating (A)	160	200	250	315	355	400	450	500	560	630	670	710	750	800	1000	1250
NSX100 TM-D	16	2.5	4	7	15	T	T	T	T	T	T	T	T	T	T	T	T
	25	2.5	4	7	15	T	T	T	T	T	T	T	T	T	T	T	T
	32	2.5	4	7	15	T	T	T	T	T	T	T	T	T	T	T	T
	40	2.5	4	7	15	T	T	T	T	T	T	T	T	T	T	T	T
	50	2.5	4	7	15	T	T	T	T	T	T	T	T	T	T	T	T
	63	2.5	4	7	15	T	T	T	T	T	T	T	T	T	T	T	T
	80		4	7	15	T	T	T	T	T	T	T	T	T	T	T	T
	100			7	15	T	T	T	T	T	T	T	T	T	T	T	T
	≤ 63			7	15	T	T	T	T	T	T	T	T	T	T	T	T
	NSX160 TM-D	80			7	15	T	T	T	T	T	T	T	T	T	T	T
100						T	T	T	T	T	T	T	T	T	T	T	
125							T	T	T	T	T	T	T	T	T	T	
160							T	T	T	T	T	T	T	T	T	T	
NSX250 TM-D	≤ 100						T	T	T	T	T	T	T	T	T	T	
	125						T	T	T	T	T	T	T	T	T	T	
	160						T	T	T	T	T	T	T	T	T	T	
	200						T	T	T	T	T	T	T	T	T	T	
NSX100 Micrologic 2.0/5.0/6.0	40			4	10	T	T	T	T	T	T	T	T	T	T	T	
	100			4	10	T	T	T	T	T	T	T	T	T	T	T	
	NSX160 Micrologic 2.0/5.0/6.0	40			7	8	T	T	T	T	T	T	T	T	T	T	
	100				7	8	T	T	T	T	T	T	T	T	T	T	
NSX250 Micrologic 2.0/5.0/6.0	160				7	8	T	T	T	T	T	T	T	T	T	T	
	100						10	T	T	T	T	T	T	T	T	T	
	160						10	T	T	T	T	T	T	T	T	T	
NSX400 Micrologic 2.0/5.0/6.0	250							T	T	T	T	T	T	T	T	T	
	160							6	7	9	10	T	T	T	T		
	200							6	7	9	10	T	T	T	T		
	250							6	7	9	10	T	T	T	T		
	320							6	7	9	10	T	T	T	T		
NSX630 Micrologic 2.0/5.0/6.0	400							6	7	9	10	T	T	T	T		
	400											12	15	30	T		
	630											12	15	30	T		

Table key

T	Total discrimination
16	Discrimination limit in kA
	No discrimination

Protection of motor circuits with fuses: general

Example:

An INF●160 can receive BS fuse-links in sizes A2, A3 or A4, which correspond to the following ratings:

- A2 size:
 - 2 to 32 A for gG fuse-links
 - 32M35 to 32M63 for gM fuse-links
- A3 size:
 - 35 to 63 A for gG fuse-links
 - 63M80 to 63M100 for gM fuse-links
- A4 size:
 - 80 to 100 A for gG fuse-links
 - 100M125 to 100M200 for gM fuse-links.

The tables on pages E-24 to E-33 directly indicate the correct selection of fuse-links and Fupact switches depending on the distribution circuit rating and the motor rating (for direct-on-line starting).

Fuse size table

The table below indicates the minimum and maximum fuse sizes depending on the rating of the switch and the applicable reference standard.

	BS		DIN		NFC	
	min.	max.	min.	max.	min.	max.
INF●32	A1	A2			10 x 38	14 x 51
INFD40			000	000		
INFC50					14 x 51	14 x 51
INF●63	A2	A3	000	000	22 x 58	22 x 58
INF●100	A2	A4				
INFC125					22 x 58	22 x 58
INF●160	A2	A4	000	00		
INF●200	B1	B2	0	0		
INF●250	B1	B3	0	1		
INF●400	B1	B4	0	2		
INF●630	C1	C3	3	3		
INF●800	C1	C3	3	3		
ISFT100N			000	000		
ISFT100			000	000		
ISF●160			000	00		
ISF●250			1	1		
ISF●400			2	2		
ISF●630			3	3		

Protection of motor feeders

A motor feeder is generally made up of:

- a control contactor
- a thermal relay for overcurrent protection
- a short-circuit protection device
- a disconnection device capable of interrupting load currents.

Fupact switch-disconnector fuses are ideally suited to perform the last two functions in the list. What is more, Fupact devices are totally compatible with the IEC 60204 machine directive.

Additional specific protection:

- fault limiting protection (while the motor is running)
- fault prevention (monitoring of motor insulation with motor off).

Fupact characteristics

The local emergency-off switch must have the AC23 characteristic for the rated motor current.

Motor starting characteristics are the following:

- peak current: 8 to 10 I_n
- duration of peak current: 20 to 30 ms
- starting current I_d: 4 to 8 I_n
- starting time t_d: 2 to 4 seconds.

Short-circuit protection of motors is ensured by aM or gM^[1] fuse-links that are sized to take into account the above characteristics.

Fupact offers a wide range of fuse utilisations, whatever the applicable reference standard.

[1] A gM fuse-link is in fact simply a derated gG fuse-link.

Coordination of devices on the motor feeder

■ Thermal protection of:

- motor
- conductors
- switch
- fuse

is ensured by the thermal relay on the contactor.

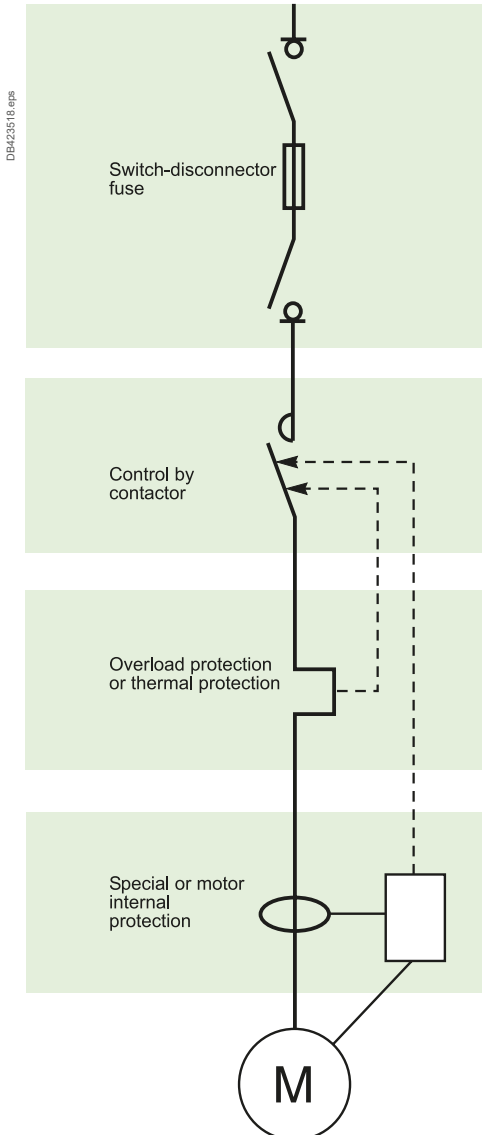
■ Overload (or short-circuit) protection of:

- motor
- conductors
- switch
- thermal relay

is ensured by the fuse.

To ensure a high level of operational quality, it is important to ensure **coordination of the devices** on the motor feeder in compliance with standard IEC 60947-4.

The equipment manufacturers provide type-1 and type-2 coordination tables between fuse-links, contactors and thermal relays.



Note: Proposed fuses are based on 4 poles 50 Hz induction motors direct on line start I_d/I_n ≤ 7 for 10 sec. The choice of fuses and overload relay shall be checked according to the actual motor's characteristic.



Protection of motor circuits with BS fuses

Selection tables for Fupact devices and associated BS fuse-links

Example:

A 37 kW motor supplied at 415 V is protected by 160 A gM fuse-links.

This type of fuse-link may be mounted on a Fupact INFB100 or higher.

See the grey section in the table opposite.

230/240 V				
P(kW)	(HP)	In (A)	Fupact	gG/gM
0.37	0.5	1.9	INFB32	gG 6
1	0.7	2.7	INFB32	gG 10
0.8	1	3.6	INFB32	gG 16
1.1	1.5	4.5	INFB32	gG 16
1.5	2	6.3	INFB32	gG 20
2.2	2.9	9	INFB32	20M25
3	4	11.7	INFB32	20M32
4	5.3	15.2	INFB32	32M40
5.5	7.3	19.8	INFB32	32M50
7.5	10	26	INFB32	32M50
10	13	34	INFB32	63M80
11	15	38	INFB63	63M80
15	20	51	INFB63	63M100
18.5	25	63	INFB100	100M160
22	29	74	INFB100	100M160
30	40	99	INFB200	gG 200
37	49	125	INFB200	200M250
45	60	144	INFB200	200M250
55	73	177	INFB250	315M400
75	100	245	INFB250	315M400
90	120	296	INFB400	400M450
110	147	354	INFB630	gG 630
132	176	408	INFB800	gG 800
150	200	484	INFB800	gG 800
160	213	496	INFB800	gG 800

415V				
P(kW)	(HP)	In (A)	Fupact	gG/gM
0.37	0.5	1.1	INFB32	gG 4
1	0.7	1.5	INFB32	gG 6
0.8	1	2	INFB32	gG 10
1.1	1.5	2.5	INFB32	gG 10
1.5	2	3.5	INFB32	gG 16
2.2	2.9	5	INFB32	gG 16
3	4	6.5	INFB32	gG 20
4	5.3	8.4	INFB32	20M25
5.5	7.3	11	INFB32	20M32
7.5	10	14.4	INFB32	32M40
10	13.3	19.1	INFB32	32M50
11	15	21	INFB32	32M50
15	20	28	INFB32	32M63
18.5	25	35	INFB63	63M80
22	29	41	INFB63	63M80
30	40	55	INFB63	63M100
37	49	69	INFB100	100M160
45	60	80	INFB100	100M160
55	73	98	INFB200	gG 200
75	100	136	INFB200	200M250
90	120	164	INFB200	200M315
110	147	196	INFB250	315M400
132	176	226	INFB250	315M400
150	200	268	INFB400	400M500
160	213	275	INFB400	400M500
200	267	358	INFB630	gG 630
240	320	428	INFB800	gG 800
280	373	488	INFB800	gG 800



Protection of motor circuits with NFC fuses

Selection tables for Fupact devices and associated NFC fuse-links

Example:

A 30 kW motor supplied at 690 V is protected by:

- 80 A gG fuse-links
- 32 A aM fuse-links.

Both types of fuse-links may be mounted on a Fupact INFC63^[1] or higher.

See the grey section in the table on following page.

[1] Fupact is designed to allow overrated protection.

230/240 V						
P(kW)	(HP)	In (A)	Fupact	gG	Fupact	aM
0.37	0.49	1.9	INFC32	6	INFC32	2
0.55	0.73	2.7	INFC32	10	INFC32	4
0.75	1	3.6	INFC32	16	INFC32	4
1.1	1.5	4.5	INFC32	16	INFC32	6
1.5	2	6.3	INFC32	20	INFC32	8
2.2	2.9	9	INFC32	25	INFC32	10
3	4	11.7	INFC32	32	INFC32	12
4	5.3	15.2	INFC32	40	INFC32	16
5.5	7.3	19.8	INFC32	50	INFC32	20
7.5	10	26	INFC50	50	INFC32	32
10	13	34	INFC63	80	INFC50	40
11	15	38	INFC63	80	INFC50	40
15	20	51	INFC63	100	INFC63	63
18.5	25	63	-	160	INFC125	80
22	29	74	-	160	INFC125	80
30	40	99	-	200	INFC125	100
37	49	125	-	250	INFC125	125

380/400V						
P(kW)	(HP)	In (A)	Fupact	gG	Fupact	aM
0.37	0.49	1.1	INFC32	4	INFC32	2
0.55	0.73	1.6	INFC32	6	INFC32	2
0.75	1	2.2	INFC32	10	INFC32	4
1.1	1.5	2.7	INFC32	10	INFC32	4
1.5	2	3.8	INFC32	16	INFC32	4
2.2	2.9	5.5	INFC32	16	INFC32	6
3	4	7.1	INFC32	20	INFC32	8
4	5.3	9.2	INFC32	25	INFC32	10
5.5	7.3	12	INFC32	32	INFC32	12
7.5	10	16	INFC32	40	INFC32	16
10	13	21	INFC32	50	INFC32	25
11	15	23	INFC32	50	INFC32	25
15	20	31	INFC63	80	INFC32	32
18.5	25	38	INFC63	80	INFC50	40
22	29	45	INFC63	100	INFC50	50
30	40	60	INFC63	125	INFC63	63
37	49	75	-	160	INFC125	80
45	60	87	-	200	INFC125	100
55	73	107	-	200	INFC125	125

415 V						
P(kW)	(HP)	In (A)	Fupact	gG	Fupact	aM
0.37	0.49	1.1	INFC32	4	INFC32	2
0.55	0.73	1.5	INFC32	6	INFC32	2
0.75	1	2	INFC32	6	INFC32	2
1.1	1.5	2.5	INFC32	10	INFC32	4
1.5	2	3.5	INFC32	16	INFC32	4
2.2	2.9	5	INFC32	16	INFC32	6
3	4	6.5	INFC32	20	INFC32	8
4	5.3	8.4	INFC32	25	INFC32	10
5.5	7.3	11	INFC32	32	INFC32	12
7.5	10	14	INFC32	40	INFC32	16
10	13	19	INFC32	50	INFC32	25
11	15	21	INFC32	50	INFC32	25
15	20	28	INFC63	63	INFC32	32
18.5	25	35	INFC63	80	INFC50	40
22	29	41	INFC63	80	INFC50	50
30	40	55	INFC63	100	INFC63	63
37	49	69	-	160	INFC125	80
45	60	80	-	160	INFC125	80
55	73	98	-	200	INFC125	100

440 V						
P(kW)	(HP)	In (A)	Fupact	gG	Fupact	aM
0.37	0.49	1	INFC32	4	INFC32	2
0.55	0.73	1.4	INFC32	6	INFC32	2
0.75	1	1.9	INFC32	6	INFC32	2
1.1	1.5	2.4	INFC32	10	INFC32	4
1.5	2	3.3	INFC32	10	INFC32	4
2.2	2.9	4.7	INFC32	16	INFC32	6
3	4	6.1	INFC32	16	INFC32	6
4	5.3	7.9	INFC32	20	INFC32	8
5.5	7.3	10.4	INFC32	25	INFC32	10
7.5	10	14	INFC32	40	INFC32	16
10	13	18	INFC50	50	INFC32	20
11	15	20	INFC50	50	INFC32	20
15	20	26	INFC63	63	INFC32	32
18.5	25	33	INFC63	80	INFC50	40
22	29	39	INFC63	80	INFC50	40
30	40	52	INFC63	100	INFC50	50
37	49	65	-	160	INFC125	80
45	60	75	-	160	INFC125	80
55	73	92	-	200	INFC125	100



Protection of motor circuits with NFC fuses

500 V						
P(kW)	(HP)	In (A)	Fupact	gG	Fupact	aM
0.37	0.49	0.9	INFC32	4	INFC32	2
0.55	0.73	1.2	INFC32	4	INFC32	2
0.75	1	1.5	INFC32	6	INFC32	2
1.1	1.5	2.2	INFC32	6	INFC32	2
1.5	2	2.9	INFC32	10	INFC32	4
2.2	2.9	3.9	INFC32	10	INFC32	4
3	4	5.2	INFC32	16	INFC32	6
4	5.3	6.8	INFC32	20	INFC32	8
5.5	7.3	9.2	INFC32	25	INFC32	10
7.5	10	12	INFC32	32	INFC32	12
10	13	16	INFC32	32	INFC32	16
11	15	18	INFC32	40	INFC32	20
15	20	23	INFC63	50	INFC32	25
18.5	25	28	INFC63	63	INFC50	32
22	29	33	INFC63	80	INFC50	40
30	40	45	INFC63	100	INFC63	50
37	49	53	INFC63	100	INFC63	63
45	60	64	-	160	INFC125	80
55	73	78	-	160	INFC125	80

525/550 V						
P(kW)	(HP)	In (A)	Fupact	gG	Fupact	aM
0.37	0.49	0.8	INFC63	4	INFC32	2
0.55	0.73	1.1	INFC63	4	INFC32	2
0.75	1	1.4	INFC63	6	INFC32	2
1.1	1.5	2.1	INFC63	6	INFC32	2
1.5	2.0	2.8	INFC63	10	INFC32	4
2.2	2.9	3.7	INFC63	10	INFC32	4
3	4	4.9	INFC63	16	INFC32	6
4	5.3	6.5	INFC63	20	INFC32	8
5.5	7.3	8.7	INFC63	25	INFC32	10
7.5	10	12	INFC63	32	INFC32	12
10	13	15	INFC63	32	INFC32	16
11	15	17	INFC63	40	INFC32	20
15	20	22	INFC63	50	INFC32	25
18.5	25	27	INFC63	63	INFC63	32
22	29	31	INFC63	80	INFC63	40
30	40	43	-	100	INFC63	50
37	49	50	-	100	INFC63	63
45	60	61	-	125	INFC63	63
55	73	74	-	160	INFC125	80

660/690V						
P(kW)	(HP)	In (A)	Fupact	gG	Fupact	aM
0.37	0.49	0.7	INFC63	2	INFC32	2
0.55	0.73	0.9	INFC63	4	INFC32	2
0.75	1	1.1	INFC63	4	INFC32	2
1.1	1.5	1.6	INFC63	6	INFC32	2
1.5	2	2.2	INFC63	6	INFC32	4
2.2	2.9	2.8	INFC63	10	INFC32	4
3	4	3.8	INFC63	10	INFC32	6
4	5.3	4.9	INFC63	16	INFC32	6
5.5	7.3	6.7	INFC63	20	INFC32	8
7.5	10	9	INFC63	25	INFC32	10
10	13	12	INFC63	32	INFC32	12
11	15	13	INFC63	32	INFC32	16
15	20	17	INFC63	40	INFC32	20
18.5	25	22	INFC63	50	INFC32	25
22	29	24	INFC63	50	INFC63	25
30	40	32	INFC63	80	INFC63	32
37	49	39	INFC63	80	INFC63	40
45	60	47	-	100	INFC63	50
55	73	57	-	125	INFC63	63
75	100	77	-	160	INFC125	80



Protection of motor circuits with DIN fuses

Selection tables for Fupact devices and associated DIN fuse-links

Example:

A 75 kW motor supplied at 500 V is protected by:

- 200 A gG fuse-links
- 125 A aM fuse-links.

Both types of fuse-links may be mounted on a Fupact INFD200 or higher.

See the grey section in the table below.

230/240 V							380/400V						
P(kW)	(HP)	In (A)	Fupact	gG	Fupact	aM	P(kW)	(HP)	In (A)	Fupact	gG	Fupact	aM
0.37	0.49	1.9	INFD40	6	INFD40	2	0.37	0.49	1.1	INFD40	4	INFD40	2
0.55	0.73	2.7	INFD40	10	INFD40	4	0.55	0.73	1.6	INFD40	6	INFD40	2
0.75	1	3.6	INFD40	16	INFD40	4	0.75	1	2.2	INFD40	10	INFD40	4
1.1	1.5	4.5	INFD40	16	INFD40	6	1.1	1.5	2.7	INFD40	10	INFD40	4
1.5	2	6.3	INFD40	20	INFD40	8	1.5	2	3.8	INFD40	16	INFD40	4
2.2	2.9	9.0	INFD40	25	INFD40	10	2.2	2.9	5.5	INFD40	16	INFD40	6
3	4	11.7	INFD40	32	INFD40	12	3	4	7.1	INFD40	20	INFD40	8
4	5.3	15.2	INFD40	40	INFD40	16	4	5.3	9.2	INFD40	25	INFD40	10
5.5	7.3	19.8	INFD40	50	INFD40	20	5.5	7.3	12	INFD40	32	INFD40	12
7.5	10	26	INFD40	50	INFD40	32	7.5	10	16	INFD40	40	INFD40	16
10	13	34	INFD40	80	INFD40	40	10	13	21	INFD40	50	INFD40	25
11	15	38	INFD40	80	INFD40	40	11	15	23	INFD40	50	INFD40	25
15	20	51	INFD63	100	INFD63	63	15	20	31	INFD40	80	INFD40	32
18.5	25	63	INFD160	160	INFD160	80	18.5	25	38	INFD40	80	INFD40	40
22	29	74	INFD160	160	INFD160	80	22	29	45	INFD63	100	INFD63	50
30	40	99	INFD200	200	INFD160	100	30	40	60	INFD63	125	INFD63	63
37	49	125	INFD200	250	INFD160	125	37	49	75	INFD160	160	INFD160	80
45	60	144	INFD200	250	INFD160	160	45	60	87	INFD200	200	INFD160	100
55	73	177	INFD250	355	INFD200	200	55	73	107	INFD200	200	INFD160	125
75	100	245	INFD400	400	INFD400	250	75	100	149	INFD200	250	INFD160	160
90	120	296	INFD400	450	INFD400	315	90	120	179	INFD250	355	INFD200	200
110	147	354	INFD630	630	INFD400	355	110	147	214	INFD400	400	INFD250	250
132	176	408	INFD630	800	INFD630	450	132	176	247	INFD400	450	INFD250	250
150	200	484	INFD630	800	INFD630	500	150	200	293	INFD400	500	INFD400	315
160	213	496	INFD630	800	INFD630	500	160	213	300	INFD630	630	INFD400	315
200	267	646	-	-	INFD800	800	200	267	391	INFD630	800	INFD400	400
							240	320	467	INFD630	800	INFD630	500
							280	373	533	-	-	INFD630	630
							300	400	573	-	-	INFD630	630
							320	427	588	-	-	INFD630	630

415 V						
P(kW)	(HP)	In (A)	Fupact	gG	Fupact	aM
0.37	0.49	1.1	INFD40	4	INFD40	2
0.55	0.73	1.5	INFD40	6	INFD40	2
0.75	1	2	INFD40	10	INFD40	2
1.1	1.5	2.5	INFD40	10	INFD40	4
1.5	2	3.5	INFD40	16	INFD40	4
2.2	2.9	5	INFD40	16	INFD40	6
3	4	6.5	INFD40	20	INFD40	8
4	5.3	8.4	INFD40	25	INFD40	10
5.5	7.3	11	INFD40	32	INFD40	12
7.5	10	14	INFD40	40	INFD40	16
10	13	19	INFD40	50	INFD40	25
11	15	21	INFD40	50	INFD40	25
15	20	28	INFD40	63	INFD40	32
18.5	25	35	INFD40	80	INFD40	40
22	29	41	INFD63	80	INFD63	50
30	40	55	INFD63	100	INFD63	63
37	49	69	INFD160	160	INFD160	80
45	60	80	INFD160	160	INFD160	80
55	73	98	INFD200	200	INFD160	100
75	100	136	INFD200	250	INFD160	160
90	120	164	INFD250	315	INFD200	200
110	147	196	INFD250	355	INFD200	200
132	176	226	INFD400	400	INFD250	250
150	200	268	INFD400	450	INFD400	315
160	213	275	INFD400	500	INFD400	315
200	267	358	INFD630	630	INFD400	400
240	320	428	INFD630	800	INFD630	450
280	373	488	INFD630	800	INFD630	500
300	400	525	-	-	INFD630	630
320	427	538	-	-	INFD630	630
355	473	605	-	-	INFD630	630
375	500	610	-	-	INFD630	630

440 V						
P(kW)	(HP)	In (A)	Fupact	gG	Fupact	aM
0.37	0.49	1	INFD40	4	INFD40	2
0.55	0.73	1.4	INFD40	6	INFD40	2
0.75	1	1.9	INFD40	6	INFD40	2
1.1	1.5	2.4	INFD40	10	INFD40	4
1.5	2	3.3	INFD40	10	INFD40	4
2.2	2.9	4.7	INFD40	16	INFD40	6
3	4	6.1	INFD40	16	INFD40	6
4	5.3	7.9	INFD40	20	INFD40	8
5.5	7.3	10.4	INFD40	25	INFD40	10
7.5	10	14	INFD40	40	INFD40	16
10	13	18	INFD40	50	INFD40	20
11	15	20	INFD40	50	INFD40	20
15	20	26	INFD40	63	INFD40	32
18.5	25	33	INFD40	80	INFD40	40
22	29	39	INFD40	80	INFD40	40
30	40	52	INFD63	100	INFD63	50
37	49	65	INFD160	160	INFD160	80
45	60	75	INFD160	160	INFD160	80
55	73	92	INFD160	200	INFD160	100
75	100	128	INFD200	250	INFD160	125
90	120	155	INFD250	315	INFD160	160
110	147	185	INFD250	355	INFD200	200
132	176	213	INFD400	400	INFD250	250
150	200	253	INFD400	450	INFD400	250
160	213	259	INFD400	500	INFD400	315
200	267	338	INFD630	630	INFD400	355
240	320	404	INFD630	800	INFD630	400
280	373	460	INFD630	800	INFD630	450
300	400	495	INFD630	800	INFD630	500
320	427	507	-	-	INFD630	500
355	473	560	-	-	INFD630	630
375	500	575	-	-	INFD630	630
400	533	611	-	-	INFD630	630

500 V						
P(kW)	(HP)	In (A)	Fupact	gG	Fupact	aM
0.37	0.49	0.9	INFD40	4	INFD40	2
0.55	0.73	1.2	INFD40	4	INFD40	2
0.75	1	1.5	INFD40	6	INFD40	2
1.1	1.5	2.2	INFD40	6	INFD40	2
1.5	2	2.9	INFD40	10	INFD40	4
2.2	2.9	3.9	INFD40	10	INFD40	4
3	4	5.2	INFD40	16	INFD40	6
4	5.3	6.8	INFD40	20	INFD40	8
5.5	7.3	9.2	INFD40	25	INFD40	10
7.5	10	12	INFD40	32	INFD40	12
10	13	16	INFD40	32	INFD40	16
11	15	18	INFD40	40	INFD40	20
15	20	23	INFD40	50	INFD40	25
18.5	25	28	INFD40	63	INFD40	32
22	29	33	INFD40	80	INFD40	40
30	40	45	INFD63	100	INFD63	50
37	49	53	INFD63	100	INFD160	63
45	60	64	INFD160	160	INFD160	80
55	73	78	INFD160	160	INFD160	80
75	100	106	INFD200	200	INFD160	125
90	120	130	INFD200	250	INFD160	160
110	147	155	INFD250	315	INFD200	160
132	176	187	INFD250	355	INFD250	200
150	200	211	INFD400	400	INFD400	250
160	213	225	INFD400	400	INFD400	250
200	267	280	INFD400	450	INFD400	315
240	320	338	INFD630	630	INFD630	355
280	373	386	INFD630	800	INFD630	400
300	400	415	INFD630	800	INFD630	450
320	427	435	INFD630	800	INFD630	450
355	473	488	INFD630	800	INFD630	500
375	500	515	-	-	INFD630	500
400	533	552	-	-	INFD630	630
450	600	630	-	-	INFD630	630



Protection of motor circuits with DIN fuses

525/550 V							660/690V						
P(kW)	(HP)	In (A)	Fupact	gG	Fupact	aM	P(kW)	(HP)	In (A)	Fupact	gG	Fupact	aM
0.37	0.49	0.8	INFD40	4	INFD40	2	0.37	0.49	0.7	INFD40	2	INFD40	2
0.55	0.73	1.1	INFD40	4	INFD40	2	0.55	0.73	0.9	INFD40	4	INFD40	2
0.75	1	1.4	INFD40	6	INFD40	2	0.75	1	1.1	INFD40	4	INFD40	2
1.1	1.5	2.1	INFD40	6	INFD40	2	1.1	1.5	1.6	INFD40	6	INFD40	2
1.5	2	2.8	INFD40	10	INFD40	4	1.5	2	2.2	INFD40	6	INFD40	4
2.2	2.9	3.7	INFD40	10	INFD40	4	2.2	2.9	2.8	INFD40	10	INFD40	4
3	4	4.9	INFD40	16	INFD40	6	3	4	3.8	INFD40	10	INFD40	6
4	5.3	6.5	INFD40	20	INFD40	8	4	5.3	4.9	INFD40	16	INFD40	6
5.5	7.3	8.7	INFD40	25	INFD40	10	5.5	7.3	6.7	INFD40	20	INFD40	8
7.5	10	12	INFD40	32	INFD40	12	7.5	10	9	INFD40	25	INFD40	10
10	13	15	INFD40	32	INFD40	16	10	13	12	INFD40	32	INFD40	12
11	15	17	INFD40	40	INFD40	20	11	15	13	INFD40	32	INFD40	16
15	20	22	INFD40	50	INFD40	25	15	20	17	INFD40	40	INFD40	20
18.5	25	27	INFD40	63	INFD40	32	18.5	25	22	INFD40	50	INFD40	25
22	29	31	INFD63	80	INFD40	40	22	29	24	INFD40	50	INFD40	25
30	40	43	INFD160	100	INFD63	50	30	40	32	INFD63	80	INFD40	32
37	49	50	INFD160	100	INFD63	63	37	49	39	INFD63	80	INFD63	40
45	60	61	INFD160	125	INFD63	63	45	60	47	INFD160	100	INFD63	50
55	73	74	INFD200	160	INFD160	80	55	73	57	INFD160	125	INFD63	63
75	100	101	INFD250	200	INFD160	100	75	100	77	INFD200	160	INFD160	80
90	120	123	INFD400	250	INFD160	125	90	120	93	INFD250	200	INFD160	100
110	147	147	INFD400	250	INFD250	160	110	147	113	INFD250	250	INFD160	125
132	176	178	INFD630	355	INFD250	200	132	176	134	INFD250	250	INFD250	160
150	200	200	INFD630	400	INFD250	200	150	200	152	INFD400	315	INFD250	160
160	213	214	INFD630	400	INFD250	250	160	213	162	INFD400	315	INFD250	160
200	267	266	INFD630	450	INFD400	315	200	267	203	INFD630	400	INFD250	200
240	320	321	-	-	INFD400	355	240	320	244	INFD630	450	INFD250	250
280	373	366	-	-	INFD400	400	280	373	284	INFD630	500	INFD400	315
300	400	394	-	-	INFD400	400	300	400	305	INFD630	500	INFD400	315
320	427	413	-	-	INFD630	450	320	427	325	-	-	INFD630	355
355	473	464	-	-	INFD630	500	355	473	354	-	-	INFD630	355
375	500	490	-	-	INFD630	500	375	500	374	-	-	INFD630	400
							400	533	400	-	-	INFD630	400
							450	600	455	-	-	INFD630	450



Type 2 coordination (IEC 60947-4-1) 380/415 V

Schneider Electric switch-disconnector fuses and contactors

Performance: Ue = 380/415 V - "Iq" 100 kA

Starting

Class 10 A/10

Motors				Switch-fuse ^[1]	Fuse-link type		Contactors ^[2]	Thermal relays	
P (kW)	I (A) 380 V	I (A) 415 V	Ie Max (A)		Type	gG rating (A)		aM rating (A)	Type
0.37	1.2	1.1	1.6	INFC32 or INFD40	4	2	LC1-D09	LRD 06	1/1.6
0.55	1.6	1.5	1.6	INFC32 or INFD40	6	2	LC1-D09	LRD 06	1/1.6
0.75	2	1.8	2.5	INFC32 or INFD40	10	4	LC1-D09	LRD 07	1.6/2.5
1.1	2.8	2.6	2.5	INFC32 or INFD40	10	4	LC1-D09	LRD 07	1.6/2.5
1.5	3.7	3.4	4	INFC32 or INFD40	16	4	LC1-D09	LRD 08	2.5/4
2.2	5.3	4.8	6	INFC32 or INFD40	16	6	LC1-D09	LRD 10	4/6
3	7	6.5	8	INFC32 or INFD40	20	8	LC1-D09	LRD 12	5.5/8
4	9	8.2	10	INFC32 or INFD40	25	10	LC1-D12	LRD 14	7/10
5.5	12	11	12	INFC32 or INFD40	32	12	LC1-D12	LRD 16	9/13
7.5	16	14	16	INFC32 or INFD40	40	16	LC1-D18	LRD 21	12/18
10	21	19	24	INFC32 or INFD40	50	25	LC1-D25	LRD 22	16/24
11	23	21	24	INFC32 or INFD40	50	25	LC1-D25	LRD 22	16/24
15	30	28	32	INFC32 or INFD40	-	32	LC1-D32	LRD 32	23/32
				INFC63 or INFD40	63	-			
18.5	37	34	40	INFC50 or INFD40	-	40	LC1-D40A	LRD 340	30/40
				INFC63 or INFD40	80	-			
22	43	40	50	INFC50 or INFD63	-	50	LC1-D50A	LRD 350	37/50
				INFC63 or INFD63	100	-			
30	59	55	63	INFC63 or INFD63	125	63	LC1-D65A	LRD 365	48/65
37	72	66	80	INFC125 or INFD160	160	80	LC1-D80	LRD 3363	63/80
45	85	80	100	INFC125 or INFD160	-	100	LC1-D115	LR9-D53 67	60/100
				INFD200	200	-			
55	105	100	115	INFC125 or INFD160	-	125	LC1-D115	LR9-D53 69	90/150
				INFD200	200	-			
75	140	135	150	INFD160	-	160	LC1-D150	LR9-D53 69	90/150
				INFD200	250	-			
90	170	160	185	INFD200	-	200	LC1-F265	LR9-F53 71	132/220
				INFD250	355	-			
110	210	200	220	INFD250	-	250	LC1-F330	LR9-F53 71	132/220
				INFD400	400	-			
132	250	230	250	INFD250	-	250	LC1-F330	LR9-F73 75	200/330
				INFD400	450	-			
160	300	270	265	INFD400	-	315	LC1-F400	LR9-F73 75	200/330
				INFD630	630	-			
200	380	361	400	INFD400	-	400	LC1-F500	LR9-F73 79	300/500
				INFD630	800	-			
250	460	430	500	INFD630	800	500	LC1-F500	LR9-F73 79	300/500
280	520	475	630	INFD630	800	630	LC1-F630	LR9-F73 81	380/630
300	565	500	630	INFD630	-	630	LC1-F630	LR9-F73 81	380/630
335	610	560	630	INFD630	-	630	LC1-F630	LR9-F73 81	380/630
355	630	590	630	INFD630	-	800	LC1-F630	LR9-F73 81	380/630

[1] INFC for NFC cylindrical ferrule / INFD for NH DIN type fuse-link.

[2] Reversers: replace LC1 with LC2; star-delta starter: replace LC1 with LC3.

E

Type 2 coordination (IEC 60947-4-1) 380/415 V

Schneider Electric switch-disconnector fuses and contactors

Performance: Ue = 380/415 V - "Iq" 100 kA

Starting

Adjustable class 10 A to 30 A ^[4]

Motors P (kW)				Switch-fuse ^[1]	Fuse-link type		Contactors ^[2]	Thermal relays	
	I (A) 380 V	I (A) 415 V	Ie Max (A)	Type	gG rating (A)	aM rating (A)	Type	Type	I _{rt} h (A)
0.37	1.2	1.1	2	INFC32 or INFD40	4	2	LC1-D09	LTM R08	0.4/8 ^[3]
0.55	1.6	1.5	2	INFC32 or INFD40	6	2	LC1-D09	LTM R08	0.4/8 ^[3]
0.75	2	1.8	4	INFC32 or INFD40	10	4	LC1-D09	LTM R08	0.4/8 ^[3]
1.1	2.8	2.6	4	INFC32 or INFD40	10	4	LC1-D09	LTM R08	0.4/8 ^[3]
1.5	3.7	3.4	4	INFC32 or INFD40	16	4	LC1-D09	LTM R08	0.4/8 ^[3]
2.2	5.3	4.8	6	INFC32 or INFD40	16	6	LC1-D09	LTM R08	0.4/8 ^[3]
3	7	6.5	8	INFC32 or INFD40	20	8	LC1-D09	LTM R08	0.4/8 ^[3]
4	9	8.2	10	INFC32 or INFD40	25	10	LC1-D12	LTM R27	1.35/27 ^[3]
5.5	12	11	12	INFC32 or INFD40	32	12	LC1-D18	LTM R27	1.35/27 ^[3]
7.5	16	14	16	INFC32 or INFD40	40	16	LC1-D25	LTM R27	1.35/27 ^[3]
10	21	19	25	INFC32 or INFD40	50	25	LC1-D32	LTM R27	1.35/27 ^[3]
11	23	21	25	INFC32 or INFD40	50	25	LC1-D32	LTM R27	1.35/27 ^[3]
15	30	28	32	INFC32 or INFD40	-	32	LC1-D40A	LTM R100	5/100 ^[3]
				INFC63 or INFD40	80	-			
18.5	37	34	40	INFC50 or INFD40	-	40	LC1-D40A	LTM R100	5/100 ^[3]
				INFC63 or INFD40	80	-			
22	43	40	50	INFC50 or INFD63	-	50	LC1-D50A	LTM R100	5/100 ^[3]
				INFC63 or INFD63	100	-			
30	59	55	63	INFC63 or INFD63	125	63	LC1-D65A	LTM R100	5/100 ^[3]
37	72	66	80	INFC125 or INFD160	160	80	LC1-D80	LTM R100	5/100 ^[3]
45	85	80	80	INFC125 or INFD160	-	100	LC1-D115	LTM R100	5/100 ^[3]
				INFD200	200	-			
55	105	100	115	INFC125 or INFD160	-	125	LC1-D115	LTM R08	On CT
				INFD200	200	-			
75	140	135	150	INFD160	-	160	LC1-D150	LTM R08	On CT
				INFD200	250	-			
90	170	160	185	INFD200	-	200	LC1-D265	LTM R08	On CT
				INFD250	355	-			
110	210	200	225	INFD250	-	250	LC1-F330	LTM R08	On CT
				INFD400	400	-			
132	250	230	250	INFD250	-	250	LC1-F330	LTM R08	On CT
				INFD400	450	-			
160	300	270	315	INFD400	-	315	LC1-F400	LTM R08	On CT
				INFD630	630	-			
200	380	361	400	INFD400	-	400	LC1-F500	LTM R08	On CT
				INFD630	800	-			
250	460	430	500	INFD630	800	500	LC1-F500	LTM R08	On CT
280	520	475	630	INFD630	800	630	LC1-F630	LTM R08	On CT
300	565	500	630	INFD630	-	630	LC1-F630	LTM R08	On CT
335	610	560	630	INFD630	-	630	LC1-F630	LTM R08	On CT
355	630	590	630	INFD630	-	800	LC1-F630	LTM R08	On CT

(1) INFC for NFC cylindric ferrule / INFD for NH DIN type fuse-link.

(2) Reversers: replace LC1 with LC2; star-delta starter: replace LC1 with LC3.

(3) Currents transformers built-in electronic relays.

(4) For use with overload relay setted in class 20 and 30, apply respectively a derating of 20 % and 37 %.

Type 2 coordination (IEC 60947-4-1) 440 V

Schneider Electric switch-disconnector fuses and contactors

Performance: U_e = 440 V^[3] - "Iq" 100 kA

Starting

Class 10 A/10

Motors P (kW)	I (A) 440 V	I _e Max (A)	Switch-fuse ^[1]	Fuse-link type		Contactors ^[2]	Thermal relays	
			Type	gG rating (A)	aM rating (A)	Type	Type	I _{rt} h (A)
0.37	1	1.6	INFC32 or INFD40	4	2	LC1-D09	LRD 06	1/1.6
0.55	1.4	1.6	INFC32 or INFD40	6	2	LC1-D09	LRD 06	1/1.6
0.75	1.9	2.5	INFC32 or INFD40	6	2	LC1-D09	LRD 07	1.6/2.5
1.1	2.4	2.5	INFC32 or INFD40	10	4	LC1-D09	LRD 07	1.6/2.5
1.5	3.3	4	INFC32 or INFD40	10	4	LC1-D09	LRD 08	2.5/4
2.2	4.7	6	INFC32 or INFD40	16	6	LC1-D09	LRD 10	4/6
3	6.1	6	INFC32 or INFD40	16	6	LC1-D09	LRD 10	4/6
4	7.9	8	INFC32 or INFD40	20	8	LC1-D09	LRD 12	5.5/8
5.5	10.4	10	INFC32 or INFD40	25	10	LC1-D12	LRD 16	9/13
7.5	14	16	INFC32 or INFD40	40	16	LC1-D18	LRD 21	12/18
11	20	20	INFC32 or INFD40	-	20	LC1-D25	LRD 22	16/24
			INFC50 or INFD40	50	-			
15	26	32	INFC32 or INFD40	-	32	LC1-D32	LRD 32	23/32
			INFC63 or INFD40	63	-			
18.5	33	40	INFC50 or INFD40	-	40	LC1-D40A	LRD 340	30/40
			INFC63 or INFD40	80	-			
22	39	50	INFC50 or INFD63	-	50	LC1-D50A	LRD 340	30/40
			INFC63 or INFD63	100	-			
30	52	63	INFC50 or INFD63	-	63	LC1-D65A	LRD 365	48/65
			INFC63 or INFD63	125	-			
37	65	65	INFC125 or INFD160	-	80	LC1-D80	LRD 3359	48/65
			INFD160	160	-			
45	75	80	INFC125 or INFD160	-	80	LC1-D80	LRD 3363	63/80
			INFD160	160	-			
55	92	100	INFC125 or INFD160	-	100	LC1-D115	LR9-D53 67	60/100
			INFD160	200	-			
75	128	125	INFD160	-	125	LC1-D150	LR9-D53 69	90/150
			INFD200	250	-			
90	155	150	INFD160	-	160	LC1-D185	LR9-D53 69	90/150
			INFD250	315	-			
110	185	200	INFD200	-	200	LC1-F265	LR9-F53 71	132/220
			INFD250	355	-			
132	213	220	INFD250	-	250	LC1-F265	LR9-F53 71	132/220
			INFD400	400	-			
160	259	315	INFD400	500	315	LC1-F330	LR9-F73 75	200/330
200	338	330	INFD400	-	355	LC1-F400	LR9-F73 75	200/330
			INFD630	630	-			
250	423	400	INFD630	800	400	LC1-F500	LR9-F73 79	300/500
280	460	450	INFD630	800	450	LC1-F500	LR9-F73 79	300/500
300	495	500	INFD630	800	500	LC1-F500	LR9-F73 79	300/500
355	560	630	INFD630	-	630	LC1-F630	LR9-F73 81	380/630
375	575	630	INFD630	-	630	LC1-F630	LR9-F73 81	380/630
400	611	630	INFD630	-	800	LC1-F630	LR9-F73 81	380/630

[1] INFC for NFC cylindrical ferrule / INFD for NH DIN type fuse-link.

[2] Reversers: replace LC1 with LC2; star-delta starter: replace LC1 with LC3.

[3] Valid for 480 V NEMA network.

E

Type 2 coordination (IEC 60947-4-1) 440 V

Schneider Electric switch-disconnector fuses and contactors

Performance: $U_e = 440\text{ V}$ [5] - "Iq" 100 kA

Starting

Adjustable class 10 A to 30 [4]

Motors P (kW)	I (A) 440 V	Ie Max (A)	Switch-fuse [1]	Fuse-link type		Contactors [2]	Thermal relays	
			Type	gG rating (A)	aM rating (A)	Type	Type	Irth (A)
0.37	1	2	INFC32 or INFD40	4	2	LC1-D09	LTM R08	0.4/8 [3]
0.55	1.4	2	INFC32 or INFD40	6	2	LC1-D09	LTM R08	0.4/8 [3]
0.75	1.8	2	INFC32 or INFD40	6	2	LC1-D09	LTM R08	0.4/8 [3]
1.1	2.4	4	INFC32 or INFD40	10	4	LC1-D09	LTM R08	0.4/8 [3]
1.5	3.3	4	INFC32 or INFD40	10	4	LC1-D09	LTM R08	0.4/8 [3]
2.2	4.7	6	INFC32 or INFD40	16	6	LC1-D09	LTM R08	0.4/8 [3]
3	6.1	6	INFC32 or INFD40	16	6	LC1-D09	LTM R08	0.4/8 [3]
4	7.9	8	INFC32 or INFD40	20	8	LC1-D09	LTM R08	0.4/8 [3]
5.5	10.4	10	INFC32 or INFD40	25	10	LC1-D12	LTM R27	1.35/27 [3]
7.5	14	16	INFC32 or INFD40	40	16	LC1-D18	LTM R27	1.35/27 [3]
11	20	20	INFC32 or INFD40 INFC50 or INFD40	- 50	20 -	LC1-D25	LTM R27	1.35/27 [3]
15	26	27	INFC32 or INFD40 INFC63 or INFD40	- 63	32 -	LC1-D32	LTM R27	1.35/27 [3]
18.5	33	40	INFC50 or INFD40 INFC63 or INFD40	- 80	40 -	LC1-D40A	LTM R100	5/100 [3]
22	39	50	INFC50 or INFD63 INFC63 or INFD63	- 100	50 -	LC1-D50A	LTM R100	5/100 [3]
30	52	63	INFC50 or INFD63 INFC63 or INFD63	- 125	63 -	LC1-D63A	LTM R100	5/100 [3]
37	65	80	INFC125 or INFD160 INFD160	- 160	80 -	LC1-D80	LTM R100	5/100 [3]
45	75	80	INFC125 or INFD160 INFD160	- 160	80 -	LC1-D80	LTM R100	5/100 [3]
55	92	100	INFC125 or INFD160 INFD160	- 200	100 -	LC1-D115	LTM R100	5/100 [3]
75	128	125	INFD160 INFD200	- 250	125 -	LC1-D150	LTM R08	On CT
90	155	160	INFD160 INFD250	- 315	160 -	LC1-F185	LTM R08	On CT
110	185	200	INFD200 INFD250	- 355	200 -	LC1-F265	LTM R08	On CT
132	213	250	INFD250 INFD400	- 400	250 -	LC1-F265	LTM R08	On CT
160	259	315	INFD400	500	315	LC1-F330	LTM R08	On CT
200	338	355	INFD400 INFD630	- 630	355 -	LC1-F400	LTM R08	On CT
250	423	400	INFD630	800	400	LC1-F500	LTM R08	On CT
280	460	450	INFD630	800	450	LC1-F500	LTM R08	On CT
300	495	500	INFD630	800	500	LC1-F500	LTM R08	On CT
355	560	630	INFD630	-	630	LC1-F630	LTM R08	On CT
375	575	630	INFD630	-	630	LC1-F630	LTM R08	On CT
400	611	630	INFD630	-	800	LC1-F630	LTM R08	On CT

[1] INFC for NFC cylindrical ferrule / INFD for NH DIN type fuse-link.

[2] Reversers: replace LC1 with LC2; star-delta starter: replace LC1 with LC3.

[3] Currents transformers built-in electronic relays.

[4] For use with overload relay set in class 20 and 30, apply respectively a derating of 20 % and 37 %.

[5] Valid for 480 V NEMA network.

Type 2 coordination (IEC 60947-4-1) 500 V

Schneider Electric switch-disconnector fuses and contactors

Performance: $U_e = 500\text{ V} - "I_q" 100\text{ kA}$

Starting

Class 10 A/10

Motors			Switch-fuse ^[1] Type	Fuse-link type		Contactors ^[2] Type	Thermal relays	
P (kW)	I (A) 500 V	I _e Max (A)		gG rating (A)	aM rating (A)		Type	I _{rt} h (A)
0.37	0.8	1	INFC32 or INFD40	4	2	LC1-D09	LRD 05	0.63/1
0.55	1.2	1.6	INFC32 or INFD40	4	2	LC1-D09	LRD 06	1/1.6
0.75	1.5	1.6	INFC32 or INFD40	6	2	LC1-D09	LRD 06	1/1.6
1.1	2	2	INFC32 or INFD40	6	2	LC1-D09	LRD 07	1.6/2.5
1.5	2.8	4	INFC32 or INFD40	10	4	LC1-D09	LRD 08	2.5/4
2.2	3.8	4	INFC32 or INFD40	10	4	LC1-D09	LRD 08	2.5/4
3	5	6	INFC32 or INFD40	16	6	LC1-D09	LRD 10	4/6
4	6.5	8	INFC32 or INFD40	20	8	LC1-D09	LRD 12	5.5/8
5.5	9	10	INFC32 or INFD40	25	10	LC1-D12	LRD 16	9/13
7.5	12	12	INFC32 or INFD40	32	12	LC1-D18	LRD 16	9/13
10	15	16	INFC32 or INFD40	32	16	LC1-D25	LRD 21	12/18
11	18.4	20	INFC32 or INFD40	40	20	LC1-D25	LRD 22	16/24
15	23	24	INFC32 or INFD40	-	25	LC1-D32	LRD 22	16/24
			INFC63 or INFD40	50	-			
18.5	28.5	32	INFC50 or INFD40	-	32	LC1-D32	LRD 32	23/32
			INFC63 or INFD40	63	-			
22	33	40	INFC50 or INFD40	-	40	LC1-D40A	LRD 340	30/40
			INFC63 or INFD40	80	-			
30	45	50	INFC63 or INFD63	100	50	LC1-D50A	LRD 350	37/50
37	55	63	INFC63 or INFD63	100	63	LC1-D65A	LRD 365	48/65
45	65	70	INFC125 or INFD160	-	80	LC1-D80	LRD 3361	55/70
			INFD160	160	-			
55	75	80	INFC125 or INFD160	-	80	LC1-D115	LRD 3363	63/80
			INFD160	160	-			
75	105	115	INFD160	-	125	LC1-D115	LR9-D53 69	90/150
			INFD200	200	-			
90	130	150	INFD160	-	160	LC1-D150	LR9-D53 69	90/150
			INFD200	250	-			
110	156	160	INFD200	-	160	LC1-F185	LR9-F53 71	132/220
			INFD250	315	-			
132	187	200	INFD250	355	200	LC1-F265	LR9-F53 71	132/220
160	230	250	INFD400	400	250	LC1-F265	LR9-F73 75	200/330
200	280	315	INFD400	450	315	LC1-F400	LR9-F73 75	200/330
240	338	355	INFD630	630	355	LC1-F400	LR9-F73 79	300/500
280	386	400	INFD630	800	400	LC1-F500	LR9-F73 79	300/500
300	415	450	INFD630	800	450	LC1-F500	LR9-F73 79	300/500
320	425	450	INFD630	800	450	LC1-F500	LR9-F73 79	300/500
355	478	500	INFD630	800	500	LC1-F500	LR9-F73 79	300/500
375	482	500	INFD630	-	500	LC1-F630	LR9-F73 81	380/630
400	534	500	INFD630	-	630	LC1-F630	LR9-F73 81	380/630
450	630	630	INFD630	-	630	LC1-F630	LR9-F73 81	380/630

[1] INFC for NFC cylindric ferrule / INFD for NH DIN type fuse-link.

[2] Reversers: replace LC1 with LC2 ; start-delta starter: replace LC1 with LC3.

Note: Proposed fuses are based on 4 poles 50 Hz induction motors direct on line start $I_d/I_n \leq 7$ for 10 sec. The choice of fuses and overload relay shall be checked according to the actual motor's characteristic.

E

Type 2 coordination (IEC 60947-4-1) 500 V

Schneider Electric switch-disconnector fuses and contactors

Performance: Ue = 500 V - "Iq" 100 kA

Starting

Adjustable class 10 A to 30^[4]

Motors			Switch-fuse ^[1]	Fuse-link type		Contactors ^[2]	Thermal relays	
P (kW)	I (A) 500 V	Ie Max (A)		Type	gG rating (A)		aM rating (A)	Type
0.37	0.8	1	INFC32 or INFD40	4	2	LC1-D09	LTM R08	0.4/8 ^[3]
0.55	1.2	1.6	INFC32 or INFD40	4	2	LC1-D09	LTM R08	0.4/8 ^[3]
0.75	1.5	1.6	INFC32 or INFD40	6	2	LC1-D09	LTM R08	0.4/8 ^[3]
1.1	2	2	INFC32 or INFD40	6	2	LC1-D09	LTM R08	0.4/8 ^[3]
1.5	2.8	4	INFC32 or INFD40	10	4	LC1-D09	LTM R08	0.4/8 ^[3]
2.2	3.8	4	INFC32 or INFD40	10	4	LC1-D09	LTM R08	0.4/8 ^[3]
3	5	6	INFC32 or INFD40	16	6	LC1-D09	LTM R08	0.4/8 ^[3]
4	6.5	8	INFC32 or INFD40	20	8	LC1-D09	LTM R08	0.4/8 ^[3]
5.5	9	10	INFC32 or INFD40	25	10	LC1-D25	LTM R27	1.35/27 ^[3]
7.5	12	12	INFC32 or INFD40	32	12	LC1-D25	LTM R27	1.35/27 ^[3]
10	15	16	INFC32 or INFD40	32	16	LC1-D25	LTM R27	1.35/27 ^[3]
11	18.4	20	INFC32 or INFD40	40	20	LC1-D25	LTM R27	1.35/27 ^[3]
15	23	24	INFC32 or INFD40	-	25	LC1-D32	LTM R27	1.35/27 ^[3]
			INFC63 or INFD40	50	-			
18.5	28.5	32	INFC50 or INFD40	-	32	LC1-D32	LTM R100	5/100 ^[3]
			INFC63 or INFD40	63	-			
22	33	40	INFC50 or INFD40	-	40	LC1-D40A	LTM R100	5/100 ^[3]
			INFC63 or INFD40	80	-			
30	45	50	INFC63 or INFD63	100	50	LC1-D50A	LTM R100	5/100 ^[3]
37	55	63	INFC63 or INFD63	100	63	LC1-D65A	LTM R100	5/100 ^[3]
45	65	70	INFC125 or INFD160	-	80	LC1-D80	LTM R100	5/100 ^[3]
			INFD160	160	-			
55	75	80	INFC125 or INFD160	-	80	LC1-D115	LTM R100	5/100 ^[3]
			INFD160	160	-			
75	105	115	INFD160	-	125	LC1-D115	LTM R08	On CT
			INFD200	200	-			
90	130	150	INFD160	-	160	LC1-D150	LTM R08	On CT
			INFD200	250	-			
110	156	160	INFD200	-	160	LC1-F185	LTM R08	On CT
			INFD250	315	-			
132	187	200	INFD250	355	200	LC1-F265	LTM R08	On CT
160	230	250	INFD400	400	250	LC1-F265	LTM R08	On CT
200	280	315	INFD400	450	315	LC1-F400	LTM R08	On CT
240	338	355	INFD630	630	355	LC1-F400	LTM R08	On CT
280	386	400	INFD630	800	400	LC1-F500	LTM R08	On CT
300	415	450	INFD630	800	450	LC1-F500	LTM R08	On CT
320	425	450	INFD630	800	450	LC1-F500	LTM R08	On CT
355	478	500	INFD630	800	500	LC1-F500	LTM R08	On CT
375	482	500	INFD630	-	500	LC1-F630	LTM R08	On CT
400	534	500	INFD630	-	630	LC1-F630	LTM R08	On CT
450	630	630	INFD630	-	630	LC1-F630	LTM R08	On CT

[1] INFC for NFC cylindric ferrule / INFD for NH DIN type fuse-link.

[2] Reversers: replace LC1 with LC2; star-delta starter: replace LC1 with LC3.

[3] Currents transformers built-in electronic relays.

[4] For use with overload relay setted in class 20 and 30, apply respectively a derating of 20 % and 37 %.

Type 2 coordination (IEC 60947-4-1) 525/550 V

Schneider Electric switch-disconnector fuses and contactors

Performance: Ue = 525/550 V - "Iq" 80/100 kA^[1]

Starting

Class 10 A/10

Motors P (kW)				Switch-fuse ^[2] Type	Fuse-link type		Contactors ^[3] Type	Thermal relays	
	I (A) 525 V	I (A) 550 V	Ie Max (A)		gG rating (A)	aM rating (A)		Type	I _{rt} h (A)
0.37	0.8	0.8	1	INFC32 or INFD40 INFC63 or INFD40	- 4	2 -	LC1-D09	LRD 05	0.63/1
0.55	1.2	1.1	1.6	INFC32 or INFD40 INFC63 or INFD40	- 4	2 -	LC1-D09	LRD 06	1/1.6
0.75	1.5	1.4	1.6	INFC32 or INFD40 INFC63 or INFD40	- 6	2 -	LC1-D09	LRD 06	1/1.6
1.1	2	2.1	2.5	INFC32 or INFD40 INFC63 or INFD40	- 6	2 -	LC1-D09	LRD 07	1.6/2.5
1.5	2.8	2.8	4	INFC32 or INFD40 INFC63 or INFD40	- 10	4 -	LC1-D09	LRD 08	2.5/4
2.2	3.8	3.7	4	INFC32 or INFD40 INFC63 or INFD40	- 10	4 -	LC1-D09	LRD 08	2.5/4
3	5	4.9	6	INFC32 or INFD40 INFC63 or INFD40	- 16	6 -	LC1-D09	LRD 10	4/6
4	6.5	6.5	8	INFC32 or INFD40 INFC63 or INFD40	- 20	8 -	LC1-D09	LRD 12	5.5/8
5.5	9	8.7	10	INFC32 or INFD40 INFC63 or INFD40	- 25	10 -	LC1-D25	LRD 16	9/13
7.5	12	11.8	12	INFC32 or INFD40 INFC63 or INFD40	- 32	12 -	LC1-D25	LRD 16	9/13
10	15	15.2	16	INFC32 or INFD40 INFC63 or INFD40	- 32	16 -	LC1-D25	LRD 21	12/18
11	18.4	16.7	24	INFC32 or INFD40 INFC63 or INFD40	- 40	20 -	LC1-D25	LRD 22	16/24
15	23	21.9	24	INFC32 or INFD40 INFC63 or INFD40	- 50	25 -	LC1-D32	LRD 22	16/24
18.5	28.5	26.6	32	INFC63 or INFD40	63	32	LC1-D32	LRD 32	23/32
22	33	31	40	INFC63 or INFD40 INFC63 or INFD63	- 80	40 -	LC1-D40A	LRD 340	30/40
30	45	43	50	INFC63 or INFD63 INFD160	- 100	50 -	LC1-D50A	LRD 350	37/50
37	55	50	63	INFC63 or INFD63 INFD160	- 100	63 -	LC1-D65A	LRD 365	48/65
45	65	61	70	INFC63 or INFD63 INFD160	- 125	63 -	LC1-D80	LRD 3361	55/70
55	75	74	80	INFC63 or INFD160 INFD200	- 160	80 -	LC1-D115	LRD 3363	63/80
75	105	101	115	INFD160 INFD250	- 200	100 -	LC1-D115	LR9-D53 69	90/150
90	130	123	125	INFD160 INFD400	- 250	125 -	LC1-D150	LR9-D53 69	90/150
110	156	147	160	INFD250 INFD400	- 250	160 -	LC1-F185	LR9-F53 71	132/220
132	187	178	200	INFD250 INFD630	- 355	200 -	LC1-F265	LR9-F53 71	132/220
160	214	204	250	INFD250 INFD630	- 400	250 -	LC1-F265	LR9-F73 75	200/330
200	266	254	315	INFD400 INFD630	- 450	315 -	LC1-F400	LR9-F73 75	200/330
240	321	307	355	INFD400	-	355	LC1-F400	LR9-F73 79	300/500
280	366	350	400	INFD400	-	400	LC1-F500	LR9-F73 79	300/500
300	394	376	400	INFD400	-	400	LC1-F500	LR9-F73 79	300/500
320	413	394	450	INFD630	-	450	LC1-F500	LR9-F73 79	300/500
355	464	443	500	INFD630	-	500	LC1-F500	LR9-F73 79	300/500
375	490	467	500	INFD630	-	500	LC1-F630	LR9-F73 81	380/630

^[1] Coordination chart built with 690 V fuse-links (80 kA for NFC fuse-links, 100 kA for DIN fuse-link).^[2] INFC for NFC cylindrical ferrule / INFD for NH DIN type fuse-link.^[3] Reversers: replace LC1 with LC2; star-delta starter: replace LC1 with LC3.

E

Type 2 coordination (IEC 60947-4-1) 525/550 V

Schneider Electric switch-disconnector fuses and contactors

Performance: Ue = 525/550 V - "Iq" 80/100 kA^[1]

Starting

Adjustable class 10 A to 30^[4]

Motors		Switch-fuse ^[2]			Fuse-link type		Contactors ^[3]	Thermal relays	
P (kW)	I (A) 525 V	I (A) 550 V	Ie Max (A)	Type	gG rating (A)	aM rating (A)	Type	Type	I _{rt} h (A)
0.37	0.8	0.8	2	INFC32 or INFD40 INFC63 or INFD40	- 4	2 -	LC1-D09	LTM R08	0.4/8 ^[5]
0.55	1.2	1.1	2	INFC32 or INFD40 INFC63 or INFD40	- 4	2 -	LC1-D09	LTM R08	0.4/8 ^[5]
0.75	1.5	1.4	2	INFC32 or INFD40 INFC63 or INFD40	- 6	2 -	LC1-D09	LTM R08	0.4/8 ^[5]
1.1	2	2.1	2	INFC32 or INFD40 INFC63 or INFD40	- 6	2 -	LC1-D09	LTM R08	0.4/8 ^[5]
1.5	2.8	2.8	4	INFC32 or INFD40 INFC63 or INFD40	- 10	4 -	LC1-D09	LTM R08	0.4/8 ^[5]
2.2	3.8	3.7	4	INFC32 or INFD40 INFC63 or INFD40	- 10	4 -	LC1-D09	LTM R08	0.4/8 ^[5]
3	5	4.9	6	INFC32 or INFD40 INFC63 or INFD40	- 16	6 -	LC1-D09	LTM R08	0.4/8 ^[5]
4	6.5	6.5	8	INFC32 or INFD40 INFC63 or INFD40	- 20	8 -	LC1-D09	LTM R08	0.4/8 ^[5]
5.5	9	8.7	10	INFC32 or INFD40 INFC63 or INFD40	- 25	10 -	LC1-D25	LTM R27	1.35/27 ^[5]
7.5	12	11.8	12	INFC32 or INFD40 INFC63 or INFD40	- 32	12 -	LC1-D25	LTM R27	1.35/27 ^[5]
10	15	15.2	16	INFC32 or INFD40 INFC63 or INFD40	- 32	16 -	LC1-D25	LTM R27	1.35/27 ^[5]
11	18.4	16.7	20	INFC32 or INFD40 INFC63 or INFD40	- 40	20 -	LC1-D25	LTM R27	1.35/27 ^[5]
15	23	21.9	25	INFC32 or INFD40 INFC63 or INFD40	- 50	25 -	LC1-D32	LTM R27	1.35/27 ^[5]
18.5	28.5	26.6	32	INFC63 or INFD40	63	32	LC1-D32	LTM R100	5/100 ^[5]
22	33	31	40	INFC63 or INFD40 INFC63 or INFD63	- 80	40 -	LC1-D40A	LTM R100	5/100 ^[5]
30	45	43	50	INFC63 or INFD63 INFD160	- 100	50 -	LC1-D50A	LTM R100	5/100 ^[5]
37	55	50	63	INFC63 or INFD63 INFD160	- 100	63 -	LC1-D65A	LTM R100	5/100 ^[5]
45	65	61	63	INFC63 or INFD63 INFD160	- 125	63 -	LC1-D80	LTM R100	5/100 ^[5]
55	75	74	80	INFC63 or INFD160 INFD200	- 160	80 -	LC1-D115	LTM R100	5/100 ^[5]
75	105	101	100	INFD160 INFD250	- 200	100 -	LC1-D115	LTM R08	On CT
90	130	123	125	INFD160 INFD400	- 250	125 -	LC1-D150	LTM R08	On CT
110	156	147	160	INFD250 INFD400	- 250	160 -	LC1-F185	LTM R08	On CT
132	187	178	200	INFD250 INFD630	- 355	200 -	LC1-F265	LTM R08	On CT
160	214	204	250	INFD250 INFD630	- 400	250 -	LC1-F265	LTM R08	On CT
200	266	254	315	INFD400 INFD630	- 450	315 -	LC1-F400	LTM R08	On CT
240	321	307	355	INFD400	-	355	LC1-F400	LTM R08	On CT
280	366	350	400	INFD400	-	400	LC1-F500	LTM R08	On CT
300	394	376	400	INFD400	-	400	LC1-F500	LTM R08	On CT
320	413	394	450	INFD630	-	450	LC1-F500	LTM R08	On CT
355	464	443	500	INFD630	-	500	LC1-F500	LTM R08	On CT
375	490	467	500	INFD630	-	500	LC1-F630	LTM R08	On CT

[1] Coordination chart built with 690 V fuse-links (80 kA for NFC fuse-links, 100 kA for DIN fuse-link).

[2] INFC for NFC cylindrical ferrule / INFD for NH DIN type fuse-link.

[3] Reversers: replace LC1 with LC2; star-delta starter: replace LC1 with LC3.

[4] For use with overload relay set in class 20 and 30, apply respectively a derating of 20 % and 37 %.

[5] Currents transformers built-in electronic relays.

Type 2 coordination (IEC 60947-4-1) 660/690 V

Schneider Electric switch-disconnector fuses and contactors

Performance: Ue = 660/690 V - "Iq" 80/100 kA^[1]

Starting

Class 10 A/10

Motors P (kW)	I (A) 690 V	Ie Max (A)	Switch-fuse ⁽²⁾		Fuse-link type		Contactors ⁽³⁾ Type	Thermal relays	
			Type		gG rating (A)	aM rating (A)		Type	I _{rt} h (A)
0.75	1.1	1.6	INFC32 or INFD40 INFC63 or INFD40	- 4	2 -	LC1-D09	LRD 06	1/1.6	
1	1.6	1.6	INFC32 or INFD40 INFC63 or INFD40	- 6	2 -	LC1-D09	LRD 06	1/1.6	
1.5	2.2	2.5	INFC32 or INFD40 INFC63 or INFD40	- 6	4 -	LC1-D09	LRD 07	1.6/2.5	
2.2	2.8	4	INFC32 or INFD40 INFC63 or INFD40	- 10	4 -	LC1-D09	LRD 08	2.5/4	
3	3.8	4	INFC32 or INFD40 INFC63 or INFD40	- 10	6 -	LC1-D09	LRD 08	2.5/4	
4	4.9	6	INFC32 or INFD40 INFC63 or INFD40	- 16	6 -	LC1-D09	LRD 10	4/6	
5.5	6.7	8	INFC32 or INFD40 INFC63 or INFD40	- 20	8 -	LC1-D09	LRD 12	5.5/8	
7.5	8.9	10	INFC32 or INFD40 INFC63 or INFD40	- 25	10 -	LC1-D25	LRD 16	9/13	
11	12.8	13	INFC32 or INFD40 INFC63 or INFD40	- 32	16 -	LC1-D25	LRD 16	9/13	
15	17	20	INFC32 or INFD40 INFC63 or INFD40	- 40	20 -	LC1-D25	LRD 22	16/24	
18.5	22	24	INFC32 or INFD40 INFC63 or INFD40	- 50	25 -	LC1-D32	LRD 22	16/24	
22	24	32	INFC32 or INFD40 INFC63 or INFD40	- 50	25 -	LC1-D40A	LRD 332	23/32	
30	32	32	INFC63 or INFD40 INFC63 or INFD63	- 80	32 -	LC1-D40A	LRD 340	30/40	
37	39	40	INFC63 or INFD63	80	40	LC1-D65A	LRD 365	37/50	
45	47	50	INFC63 or INFD63 INFD160	- 100	50 -	LC1-D80	LRD 3357	37/50	
55	57	63	INFC63 or INFD63 INFD160	- 125	63 -	LC1-D115	LRD 3359	48/65	
75	77	80	INFC125 or INFD160 INFD200	- 160	80 -	LC1-D115	LRD 3363	63/80	
90	93	100	INFD160 INFD250	- 200	100 -	LC1-D150	LR9-D53 69	90/150	
110	113	125	INFD160 INFD250	- 250	125 -	LC1-F185	LR9-D53 69	90/150	
132	134	160	INFD250	250	160	LC1-F265	LR9-F53 71	132/220	
160	162	160	INFD250 INFD400	- 315	160 -	LC1-F265	LR9-F53 71	132/220	
200	203	200	INFD250 INFD630	- 400	200 -	LC1-F400	LR9-F73 75	200/330	
220	223	250	INFD250 INFD630	- 450	250 -	LC1-F400	LR9-F73 75	200/330	
250	253	315	INFD400 INFD630	- 500	315 -	LC1-F400	LR9-F73 75	200/330	
315	320	355	INFD630	-	355	LC1-F500	LR9-F73 79	300/500	
355	354	400	INFD630	-	400	LC1-F630	LR9-F73 79	300/500	
400	400	450	INFD630	-	450	LC1-F630	LR9-F73 79	300/500	
450	455	500	INFD630	-	500	LC1-F630	LR9-F73 79	300/500	

^[1] Coordination chart built with 690 V fuse-links (80 kA for NFC fuse-links, 100 kA for DIN fuse-link).^[2] INFC for NFC cylindrical ferrule / INFD for NH DIN type fuse-link.^[3] Reversers: replace LC1 with LC2; star-delta starter: replace LC1 with LC3.

E

Type 2 coordination (IEC 60947-4-1) 660/690 V

Schneider Electric switch-disconnector fuses and contactors

Performance: Ue = 660/690 V - "Iq" 80/100 kA^[1]

Starting

Adjustable class 10 A to 30^[4]

Motors P (kW)	I (A) 690 V	Ie Max (A)	Switch-fuse ^[2]	Switch-fuse type		Contactors ^[3]	Thermal relays	
			Type	gG rating (A)	aM rating (A)	Type	Type	I _{rt} h (A)
0.75	1.1	2	INFC32 or INFD40 INFC63 or INFD40	- 4	2 -	LC1-D09	LTM R08	0.4/8 ^[5]
1	1.6	2	INFC32 or INFD40 INFC63 or INFD40	- 6	2 -	LC1-D09	LTM R08	0.4/8 ^[5]
1.5	2.2	4	INFC32 or INFD40 INFC63 or INFD40	- 6	4 -	LC1-D09	LTM R08	0.4/8 ^[5]
2.2	2.8	4	INFC32 or INFD40 INFC63 or INFD40	- 10	4 -	LC1-D09	LTM R08	0.4/8 ^[5]
3	3.8	6	INFC32 or INFD40 INFC63 or INFD40	- 10	6 -	LC1-D09	LTM R08	0.4/8 ^[5]
4	4.9	6	INFC32 or INFD40 INFC63 or INFD40	- 16	6 -	LC1-D09	LTM R08	0.4/8 ^[5]
5.5	6.7	8	INFC32 or INFD40 INFC63 or INFD40	- 20	8 -	LC1-D09	LTM R08	0.4/8 ^[5]
7.5	8.9	10	INFC32 or INFD40 INFC63 or INFD40	- 25	10 -	LC1-D25	LTM R27	1.35/27 ^[5]
11	12.8	16	INFC32 or INFD40 INFC63 or INFD40	- 32	16 -	LC1-D25	LTM R27	1.35/27 ^[5]
15	17	20	INFC32 or INFD40 INFC63 or INFD40	- 40	20 -	LC1-D25	LTM R27	1.35/27 ^[5]
18.5	22	25	INFC32 or INFD40 INFC63 or INFD40	- 50	25 -	LC1-D32	LTM R27	1.35/27 ^[5]
22	24	25	INFC32 or INFD40 INFC63 or INFD40	- 50	25 -	LC1-D40A	LTM R27	1.35/27 ^[5]
30	32	32	INFC63 or INFD40 INFC63 or INFD63	- 80	32 -	LC1-D40A	LTM R100	5/100 ^[5]
37	39	40	INFC63 or INFD63	80	40	LC1-D65A	LTM R100	5/100 ^[5]
45	47	50	INFC63 or INFD63 INFD160	- 100	50 -	LC1-D80	LTM R100	5/100 ^[5]
55	57	63	INFC63 or INFD63 INFD160	- 125	63 -	LC1-D115	LTM R100	5/100 ^[5]
75	77	80	INFC125 or INFD160 INFD200	- 160	80 -	LC1-D115	LTM R100	5/100 ^[5]
90	93	100	INFD160 INFD250	- 200	100 -	LC1-D150	LTM R100	5/100 ^[5]
110	113	125	INFD160 INFD250	- 250	125 -	LC1-F185	LTM R08	On CT
132	134	160	INFD200 INFD250	- 250	160 -	LC1-F265	LTM R08	On CT
160	162	160	INFD200 INFD400	- 315	160 -	LC1-F265	LTM R08	On CT
200	203	200	INFD200 INFD630	- 400	200 -	LC1-F400	LTM R08	On CT
220	223	250	INFD250 INFD630	- 450	250 -	LC1-F400	LTM R08	On CT
250	253	315	INFD400 INFD630	- 500	315 -	LC1-F400	LTM R08	On CT
315	320	355	INFD400	-	355	LC1-F500	LTM R08	On CT
355	354	400	INFD400	-	400	LC1-F630	LTM R08	On CT
400	400	450	INFD630	-	450	LC1-F630	LTM R08	On CT
450	455	500	INFD630	-	500	LC1-F630	LTM R08	On CT

[1] Coordination chart built with 690 V fuse-links (80 kA for NFC fuse-links, 100 kA for DIN fuse-link).

[2] INFC for NFC cylindrical ferrule / INFD for NH DIN type fuse-link.

[3] Reversers: replace LC1 with LC2; star-delta starter: replace LC1 with LC3.

[4] For use with overload relay setted in class 20 and 30, apply respectively a derating of 20 % and 37 %.

[5] Currents transformers built-in electronic relays.

Catalogue numbers

ISFT100N	
Devices and accessories	F-2
ISFT100	
Devices and accessories	F-3
ISFT160	
Devices and accessories	F-4
ISFT250 to ISFT630	
Devices and accessories	F-5
ISFL160	
Devices and accessories	F-6
ISFL250 to ISFL1250	
Devices and accessories	F-8
INF●32	
Devices	F-10
Accessories	F-11
INFD40 and INF●63	
Devices	F-12
Accessories	F-13
INFB100 to INF●160	
Devices and accessories	F-14
INF●200 to INF●800	
Devices and accessories	F-16
Fupact protection components	
Cartridge fuses type aM	F-18
Cartridge fuses type gG	F-19

F

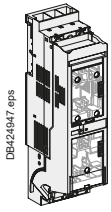
Other chapters	
Presentation	2
Functions and characteristics	A-1
Installation recommendation	B-1
Dimensions and connection	C-1
Wiring diagrams	D-1
Technical characteristics	E-1

ISFT100N

Devices and accessories

ISFT100N 3P fixed front-connected

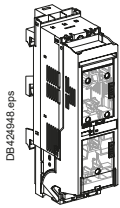
Basic device for mounting on a backplate



Connection via 2.5 to 50 mm² cable connectors

LV480750

Basic device for mounting on busbars



Hook-on connection to 60 mm busbars

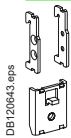
Upstream distribution

LV480751

Downstream distribution

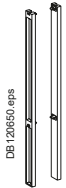
LV480752

Accessories



DIN rail fixing kit

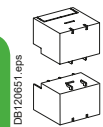
LV480753



Support profile laterally attachable

Set of 2

LV480754

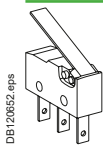


Terminal shield

Set of 2

LV480756

Electrical auxiliaries

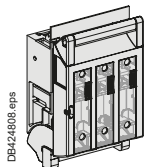


Auxiliary changeover contact NO + NC

LV480755

ISFT100 3P fixed front-connected

Basic device for mounting on a backplate

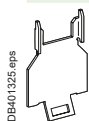


DB424808.eps

Connection via 1.5 to 50 mm ² cable connectors	LV480800
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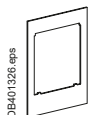
Accessories

Mounting accessories



DB401325.eps

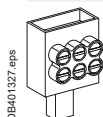
Accessory for mounting on a DIN rail	49877
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DB401326.eps

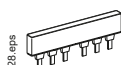
Escutcheon (not compatible with feeding busbars)	For 1 device	49878
	For 2 devices	49879

Connection accessories



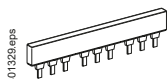
DB401327.eps

Distribution connector 3 x 16 mm ²	Set of 3	49860
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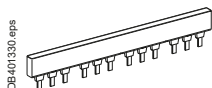
DB401328.eps

Feeding busbar to supply 2 devices	49861
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DB401329.eps

Feeding busbar to supply 3 devices	49862
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DB401330.eps

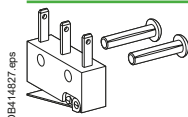
Feeding busbar to supply 4 devices	49863
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DB401331.eps

Incoming connector (25 to 95 mm ²) for feeding busbars	Set of 3	49865
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Electrical auxiliaries



DB414827.eps

Auxiliary changeover contact NO + NC	49885
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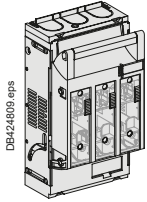


ISFT160

Devices and accessories

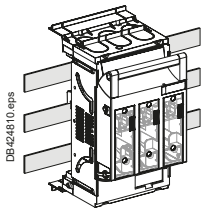
ISFT160 3P fixed front-connected

Basic device for mounting on a backplate



M8 terminals	LV480801
2,5 to 95 mm ² cable connectors (box clamp)	LV480802

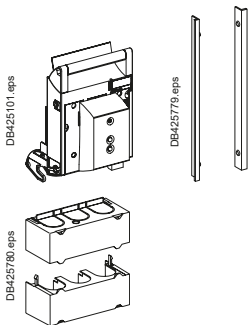
Basic device for mounting on busbars with turnable hooks



ISFT160	LV480803
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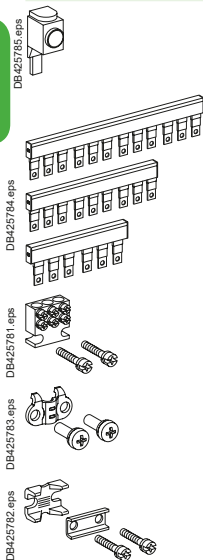
Accessories

Mounting accessories



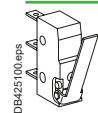
Handle with electronic fuse monitor	LV480810
Support profile laterally attachable	LV480817
Terminal shields	LV480819

Connection accessories



Incoming connector	LV480818	
Feeding busbars	for 2 devices	LV480811
	for 3 devices	LV480812
	for 4 devices	LV480813
Distribution connector 3 x 16 mm ² for 1,5 to 50 mm ² cable connectors	LV480814	
Pressure plate for multiple-use terminal from 6 to 50mm ²	LV480815	
Pressure plate with contact prism for multiple-use terminal with Cu/Alu conductors from 6 to 70 mm ²	LV480816	

Electrical auxiliaries

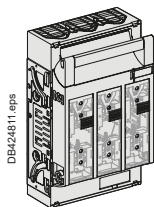


Auxiliary changeover contact NO+NC	LV480755
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F

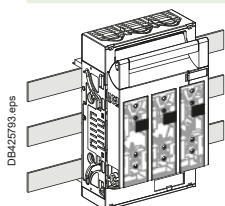
ISFT250 to ISFT630 3P fixed front-connected

Basic device for mounting on a backplate



ISFT250	LV480804
ISFT400	LV480806
ISFT630	LV480808

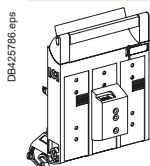
Basic device for mounting on busbars with turnable hooks



ISFT250	LV480805
ISFT400	LV480807

Accessories

Mounting accessories

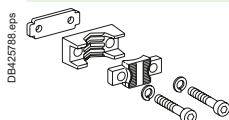


Handle with electronic fuse monitor	ISFT250	LV480821
	ISFT400	LV480825
	ISFT630	LV480828

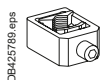


Support profile laterally attachable	LV480832
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Connection accessories



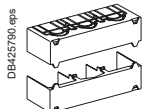
Pressure plate with contact prism for multiple-use terminal with Cu/Al conductors	from 70 to 150 mm ²	ISFT250	LV480822
	from 120 to 240 mm ²	ISFT400	LV480826
	from 150 to 300 mm ²	ISFT630	LV480829



ISFT250 box clamp from 35 to 150 mm ² 35...150 mm ² re/rm 50 to 150 mm ² se/sm	LV480823
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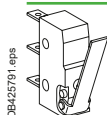


ISFT400 and ISFT 630 box clamp 95...300 mm ² re/rm 120 to 300 mm ² se/sm	LV480830
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Terminal shields	ISFT250	LV480824
	ISFT400	LV480827
	ISFT630	LV480831

Electrical auxiliaries



Auxiliary changeover contact NO + NC	LV480833
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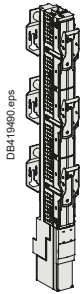


ISFL160

Devices and accessories

ISFL160 1-pole switchable fixed front-connected

Basic device for mounting on busbars

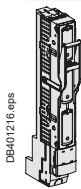


Direct connection to 185mm busbars (M12)

LV480900

ISFL160 3-pole switchable fixed front-connected

Basic device for mounting on busbars



Direct hook-on connection to 60 mm busbars

Screws M8

LV480850

Terminals 95 mm²

LV480851

Direct connection to 100 mm busbars

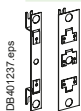
Screws M8

LV480852

Terminals 95 mm²

LV480853

Conversion kit for connection to busbars (for ISFL160 direct connection)



Direct connection to 185 mm busbars

LV480854

Direct connection to 185 mm busbars for 2 ISFL160 devices

LV480855

Accessories

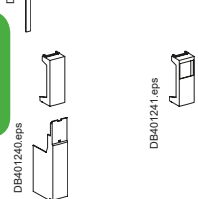


Sideframe door cut out - 850 mm

LV480868

Sidewise angle bracket for side frame (x4)

LV480869

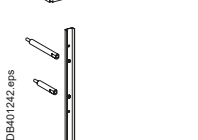


Length adaptor

LV480870

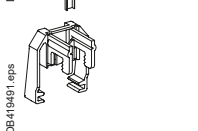
Empty plastic box (46 x 46 mm)

LV480878



Bank panel cover

LV480871

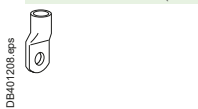


Contact hooks for ISFL 1-pole switchable

Set of 3

LV480905

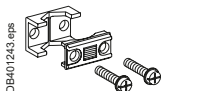
Connection (accessories for standard M8 terminals)



Lugs for 95 mm² copper cables

Set of 3

28951



Connectors for Cu/Al bare cables 1.5 x 95 mm²

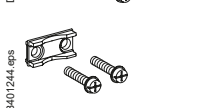
Set of 3

LV480861

for flexible bars 12 x 6 mm

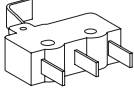

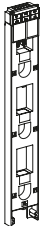
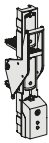
Set of 3

LV480862



F

Electrical auxiliaries

 <p>DB401245.eps</p>	Auxiliary changeover contact NO + NC	LV480873
 <p>DB419492.eps</p>	1 current transformer for ISFL 1-pole switchable	150/5 A class 1 5 VA Set of 1 LV480904
 <p>DB401246.eps</p>	Single block with 3 current transformer for ISFL 3-pole switchable	150/5 A class 1 1.5 VA 150/1 A class 1 2.5 VA Set of 1 Set of 1 LV480881 LV480882
 <p>DB401217.eps</p>	Fuse monitor for ISFL 3-pole switchable	LV480883 LV480884 LV480877

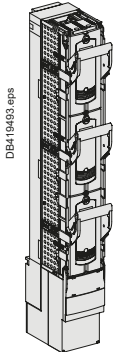


ISFL250 to ISFL1250

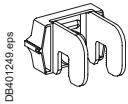
Devices and accessories

ISFL250 to ISFL630 1-pole switchable

Basic device for mounting on busbars



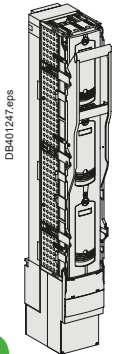
Direct connection to 185 mm busbars (screw M12)	ISFL250	LV480901
	ISFL400	LV480902
	ISFL630	LV480903



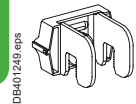
Hooks for mounting without drilling	LV480859
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ISFL250 to ISFL630 3-pole switchable

Basic device for mounting on busbars



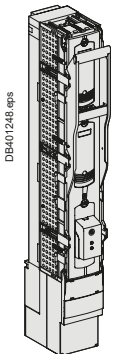
Direct connection to 185 mm busbars	ISFL250	LV480856
	ISFL400	LV480857
	ISFL630	LV480858
	ISFL1250	LV480875



Hooks for mounting without drilling	LV480859
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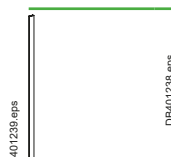
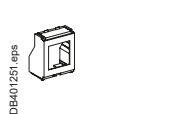

F

With fuse monitor


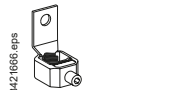
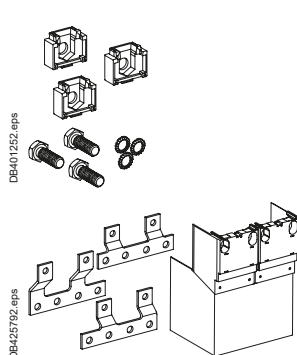


Fuse monitor (direct connection to 185 mm busbars)	ISFL250	LV480863
	ISFL400	LV480864
	ISFL630	LV480865
	ISFL1250	LV480876

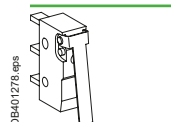
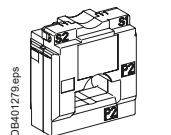
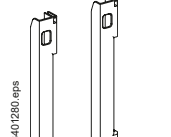
Accessories

	Sideframe door cut out - 850 mm			LV480868
	Sidewise angle bracket for side frame	Set of 4		LV480869
	Empty plastic box (72 x 72 mm)			LV480879 ^[1]
	Empty plastic box (96 x 96 mm)			LV480880 ^[1]
	Blank panel cover			LV480872

Connection (accessories for standard M12 terminals)

	Connectors	For Cu/Al bare cable 1 x 35 to 300 mm ²	Set of 3	LV480867 ^[1]
		For Cu/Al bare cable 2 x 50 to 185 mm ²	Set of 3	49895 ^[1]
		For Cu/Al cable 4 x 240 mm ²	Set of 3	LV480890 ^[2]
	Screws with plastic support		Set of 3	LV480866 ^[1]
	Coupling kit ISFL250-630			LV480891 ^[1]

Electrical auxiliaries

	Auxiliary changeover contact NO + NC			LV480874
	Current transformer	150/5 class 1 2.5 VA	Set of 1	LV480885
		250/5 class 1 5 VA	Set of 1	LV480886
		400/5 class 1 5 VA	Set of 1	LV480887
		600/5 class 1 5 VA	Set of 1	LV480888
	Click-lock cable transformers		Set of 1	LV480889

[1] Except for ISFL1250.

[2] Only for ISFL1250.

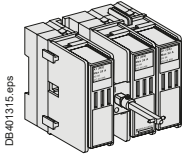


INF●32

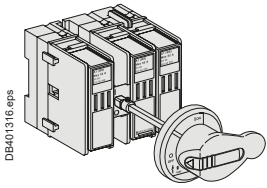
Devices

INF●32 fixed, front-connected

Basic device supplied with 150 mm operating shaft (without handle)

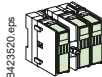
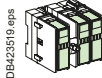


Front control



Basic device for front control

Switch/Type of fuse	3P/3F	4P/3F	4P/4F
INFC32 / NFC (10 x 38), 32 A	LV480650	LV480651	LV480652
INFC32 / NFC (14 x 51), 32 A	LV480656	LV480657	LV480658
INFB32 / BS (A1), 32 A	LV480680	LV480681	
INFB32 / BS (A2), 32 A	LV480682	LV480683	



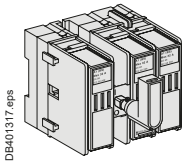
Rotary handle for basic front-control device



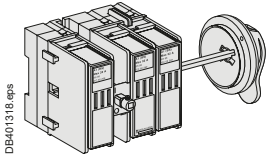
Direct rotary handle			49613
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Black extended rotary handle			49619
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Red/yellow extended rotary handle			49616
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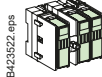
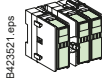


Lateral control



Basic device for lateral control

Switch/Type of fuse	3P/3F	4P/3F	4P/4F
INFC32 / NFC (10 x 38), 32 A	LV480653	LV480654	LV480655
INFC32 / NFC (14 x 51), 32 A	LV480659	LV480660	LV480661
INFB32 / BS (A1), 32 A	LV480686	LV480687	
INFB32 / BS (A2), 32 A	LV480688	LV480689	



Rotary handle for basic lateral-control device



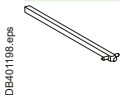
Direct rotary handle			49614
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Black extended rotary handle			49619
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Red/yellow extended rotary handle			49616
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Accessories

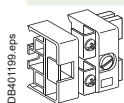
Shaft



430 mm shaft (6 x 6)			49626
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Accessories

Connection



External neutral link	35 mm ²	LV480450
	16 mm ²	LV480451

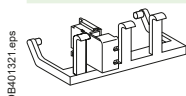
Electrical auxiliaries

Auxiliary contacts



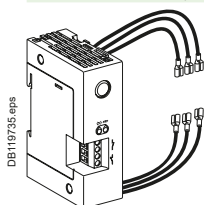
For mounting between poles	1 NO + NC contact (changeover)	49605
For mounting on left-hand side	Contact support required	49608
	1 NO contact	49609
	1 NC contact	49610

Blown fuse indicator (only for NFC type fuse-links)



3P (supplied with 1 NO contact + 1 NC contact)	49630
4P (supplied with 1 NO contact + 1 NC contact)	49631

Fuse monitor (for NFC, DIN and BS fuses)



100 to 260 V AC 50/60 Hz	LV480560
380 to 690 V AC 50/60 Hz	LV480561



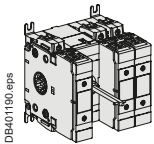
Catalogue numbers

INFD40 and INF●63

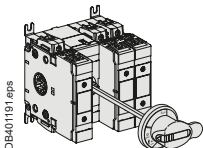
Devices

INFD40 and INF●63 fixed, front-connected




Basic device supplied with 161 mm operating shaft (without handle)

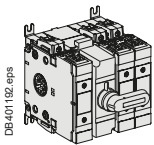


Front control

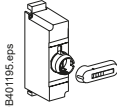



Basic device for front control

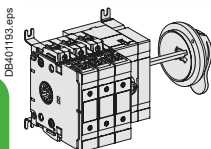
Switch/Type of fuse	3P/3F	4P/3F	4P/4F
 DB401194.eps INFC63 / NFC (14 x 51), 50 A	LV480402	LV480403	LV480404
INFC63 / NFC (22 x 58), 63 A	LV480410	LV480411	LV480412
 DB401194.eps INFD40 DIN (000), 40 A	LV480400	LV480401	
INFD63 / DIN (000), 63 A	LV480405	LV480406	LV480407
 DB401194.eps INFB63 / BS (A2/A3), 63 A	LV480408	LV480409	






Rotary handle for basic front-control device

 DB401195.eps Black rotary handle		LV480530
Red/yellow rotary handle		LV480531
 DB401196.eps Black extended rotary handle		49619
Red/yellow extended rotary handle		49616


Lateral control



Basic device for lateral control

Switch/Type of fuse	3P/3F	4P/3F	4P/4F
 DB401202.eps INFC63 / NFC (14 x 51), 50 A	LV480424	LV480425	LV480426
INFC63 / NFC (22 x 58), 63 A	LV480431	LV480432	LV480433
 DB401202.eps INFD40 DIN (000), 40 A	LV480423		
INFD63 / DIN (000), 63 A	LV480427	LV480428	LV480429
 DB401202.eps INFB63 / BS (A2/A3), 63 A	LV480430		

Rotary handle for basic lateral-control device

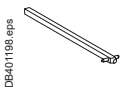
 DB401197.eps Black extended rotary handle		49619
Red/yellow extended rotary handle		49616

Accessories

Shaft

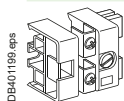
430 mm shaft (6 x 6)

49626



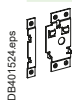
Accessories

Connection

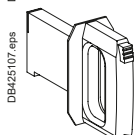


External neutral link	35 mm ²	LV480450
	16 mm ²	LV480451

Mounting accessories



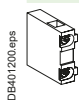
Din rail mounting kit	LV480455
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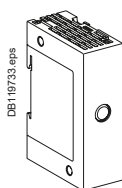
Fuse replacement handle	LV480575
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Electrical auxiliaries

Auxiliary contacts



1 NO contact	49609
1 NC contact	49610



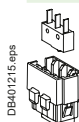
Module auxiliary contacts	LV480565
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Blown fuse indicator (only for NFC type fuse-links 14 x 51)



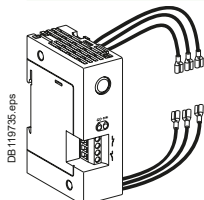
3P (supplied with 1 NO contact + 1 NC contact)	LV480446
4P (supplied with 1 NO contact + 1 NC contact)	LV480447

Blown fuse indicator (only for NFC type fuse-links 22 x 58)



3P (supplied with 1 NO contact + 1 NC contact)	LV480448
4P (supplied with 1 NO contact + 1 NC contact)	LV480449

Fuse monitor (for NFC, DIN and BS fuses)



100 to 260 V AC 50/60 Hz	LV480560
380 to 690 V AC 50/60 Hz	LV480561



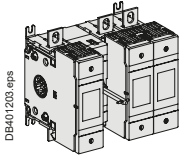
Catalogue numbers

INFB100 to INF●160

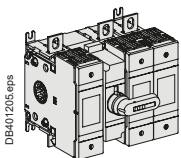
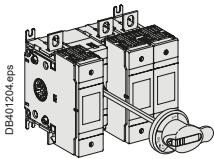
Devices and accessories

INFB100 to INF●160 fixed, front-connected

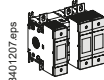



Basic device supplied with 161 mm operating shaft (without handle)



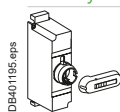
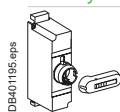


Front control



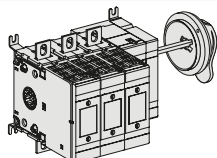
Basic device for front control

Switch/Type of fuse	3P/3F	4P/3F	4P/4F
 INFC125 / NFC (22 x 58)	LV480413	LV480414	LV480415
 INFD160 / DIN (000/00)	LV480416	LV480417	LV480418
 INFB100 / BS (A2/A3/A4)	LV480419	LV480420	
 INFB160 / BS (A2/A3/A4)	LV480421	LV480422	


Rotary handle for basic front-control device

 Black rotary handle	LV480530
 Red/yellow rotary handle	LV480531
 Black extended rotary handle	49619
 Red/yellow extended rotary handle	49616



Lateral control



Basic device for lateral control

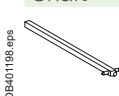
Switch/Type of fuse	3P/3F	4P/3F	4P/4F
 INFC125 / NFC (22 x 58)	LV480434	LV480435	LV480436
 INFD160 / DIN (000/00)	LV480437	LV480438	LV480439
 INFB160 / BS (A2/A3/A4)	LV480440	LV480441	

Rotary handle for basic lateral-control device

 Black extended rotary handle	49619
 Red/yellow extended rotary handle	49616

Accessories

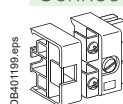
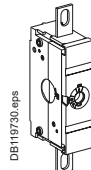






Shaft



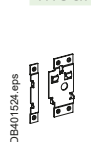
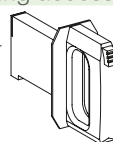
430 mm shaft (6 x 6)	49626
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Accessories

Connection


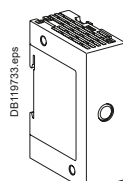
	External neutral link	35 mm ²		LV480450
		16 mm ²		LV480451
	Removable neutral link	100 to 250 A (lth 250 A)		LV480562
		Crimp lugs for copper cables	For 120 mm ² cables	Set of 3
			Set of 4	LV429256
For 150 mm ² cables		Set of 3	LV429253	
		Set of 4	LV429257	
For 185 mm ² cables		Set of 3	LV429254	
		Set of 4	LV429258	
	Crimp lugs for aluminium cables	For 150 mm ² cables	Set of 3	LV429504
			Set of 4	LV429505
	For 185 mm ² cables	Set of 3	LV429506	
		Set of 4	LV429507	
 	Cable connectors	25 to 95 mm ² Al/Cu (steel connector)	(1 part)	LV480442
		6 to 95 mm ² Al/Cu (Al connector)	(1 part)	LV480443
 	Short terminal shield for bars or cables with lugs		(1 part)	LV480444
	Long terminal shield for bars or cables with lugs		(1 part)	LV480445

Mounting accessories

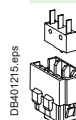
 	Din rail mounting kit			LV480455
	Fuse replacement handle			LV480575

Electrical auxiliaries

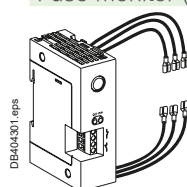
Auxiliary contacts

	1 NO contact			49609
	1 NC contact			49610
	Module auxiliary contacts			LV480565

Blown fuse indicator (only for NFC type fuse-links)

	3P (supplied with 1 NO contact + 1 NC contact)			LV480448
	4P (supplied with 1 NO contact + 1 NC contact)			LV480449

Fuse monitor (for NFC, DIN and BS fuses)

	100 to 260 V AC 50/60 Hz			LV480560
	380 to 690 V AC 50/60 Hz			LV480561



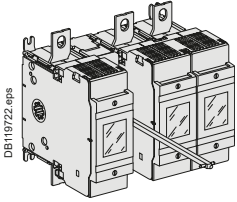
Catalogue numbers

INF●200 to INF●800

Devices and accessories

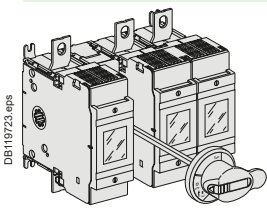
INF●200 to INF●800 fixed, front-connected

Basic device supplied with 210 mm operating shaft (without handle)



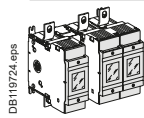
DB119722.eps

Front control



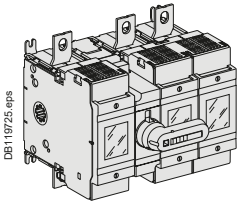
DB119723.eps

Switch/Type of fuse

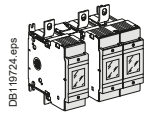


DB119724.eps

Switch/Type of fuse	3P/3F	4P/3F	4P/4F
INFD200 / DIN (0)	LV480500	LV480501	LV480502
INFD250 / DIN (0/1)	LV480503	LV480504	LV480505
INFD400 / DIN (0/1/2)	LV480506	LV480507	LV480508
INFD630 / DIN (3)	LV480509	LV480510	LV480511
INFD800 / DIN (3)	LV480512	LV480513	LV480514



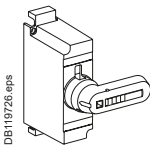
DB119725.eps



DB119724.eps

INFB200 / BS (B1/B2/B3)	LV480515	LV480516	
INFB250 / BS (B1/B2/B3)	LV480517	LV480518	
INFB400 / BS (B1/B2/B3/B4)	LV480519	LV480520	
INFB630 / BS (C1/C2/C3)	LV480521	LV480522	
INFB800 / BS (C1/C2/C3)	LV480523	LV480524	

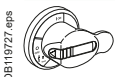
Direct front-control rotary handle



DB119726.eps

For INFB200		
Black rotary handle		LV480530
Red/yellow rotary handle		LV480531
For INFD200 and INF●250		
Black rotary handle		LV480532
Red/yellow rotary handle		LV480533
For INFD400		
Black rotary handle		LV480534
Red/yellow rotary handle		LV480535
For INFB400		
Black rotary handle		LV480536
Red/yellow rotary handle		LV480537
For INF●630/800		
Black rotary handle		LV480538
Red/yellow rotary handle		LV480539

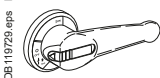
Extended front-control rotary handle



DB119727.eps



DB119728.eps

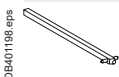


DB119729.eps

For INF●200/250		
Black rotary handle		49619
Red/yellow rotary handle		49616
For INF●400		
Black rotary handle		LV480540
Red/yellow rotary handle		LV480541
For INF●630/800		
Black rotary handle		49620
Red/yellow rotary handle		49617

Accessories

Shaft, locking

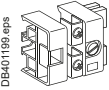
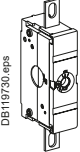


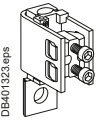



DB401198.eps

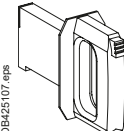
430 mm shaft (6 x 6) for INF●200/250	49626
465 mm shaft (12 x 12) for INF●400 to 800	49627
Handle locking accessory for Ronis EL11AP keylock (not supplied) for INF●400 to 800	49053

Accessories

Connection


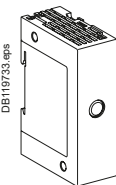
	External neutral link	35 mm ²		LV480450
		16 mm ²		LV480451
	Removable neutral link	100 to 250 A (lth 250 A)		LV480562
		400 A (lth 400 A)		LV480563
		630 to 800 A (lth 800 A)		LV480564
	Crimp lugs for copper cables	For 240 mm ² cable	Set of 3	LV432500
			Set of 4	LV432501
	Crimp lugs for aluminium cables	For 240 mm ² cable	Set of 3	LV432502
			Set of 4	LV432503
		For 300 mm ² cable	Set of 3	LV432504
Set of 4	LV432505			
	Cable connectors	25 to 95 mm ² Al/Cu (steel connector)	(1 part)	LV480442
		6 to 95 mm ² Al/Cu (Al connector)	(1 part)	LV480443
		95 to 185 mm ² Al/Cu	(1 part)	49651
		2 x (95 to 185 mm ²) Al/Cu	(1 part)	49652
		120 to 240 mm ² Al/Cu	(1 part)	49653
		120 to 300 mm ² Al/Cu	(1 part)	49654
	Terminal shields for crimp lugs and bars	Short for 200 A	(1 part)	LV480550
		Long for 200 A	(1 part)	LV480551
		Short for 250 A	(1 part)	LV480552
		Long for 250 A	(1 part)	LV480553
		Short for 400 A	(1 part)	LV480554
		Long for 400 A	(1 part)	LV480555
		Short for 630 and 800 A	(1 part)	LV480556
		Long for 630 and 800 A	(1 part)	LV480557

Mounting accessories

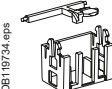
	Fuse replacement handle			LV480575
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Electrical auxiliaries

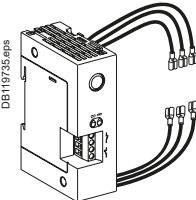
Auxiliary contacts

	1 NO contact	(1 part)	49609
	1 NC contact	(1 part)	49610
	Module for auxiliary contacts (8 max.)		LV480565

Blown fuse indicator (only for DIN type fuse-links)

	3P (supplied with 3 NO and 3 NC contacts)		LV480558
	4P (supplied with 4 NO and 4 NC contacts)		LV480559

Fuse monitor (for DIN and BS fuses)

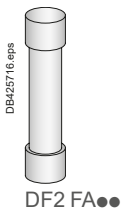
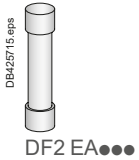
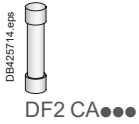
	100 to 260 V AC 50/60 Hz		LV480560
	380 to 690 V AC 50/60 Hz		LV480561

Catalogue numbers

Fupact protection components

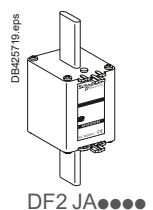
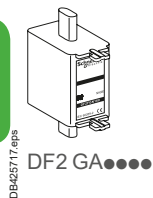
Cartridge fuses type aM

For protection of equipment with current peaks



Fuse type	Maximum rated voltage		Rating	Set of	Fuses without striker		Maximum rated voltage		Rating	Set of	Fuses with striker				
	V	A			Unit reference	Weight	V	A			Unit reference	Weight			
Cylindrical 10 x 38	~ 500	20	10	DF2 CA20	0.010	-	20	-	-	-	-	-			
	~ 400	25	10	DF2 CA25	0.010	-	25	-	-	-	-	-			
		32	10	DF2 CA32	0.010	-	32	-	-	-	-	-			
Cylindrical 14 x 51	~ 690	20	10	DF2 EA20	0.020	~ 500	20	10	DF3 EA20	0.020	~ 690	20	10	DF3 FA20	0.045
		25	10	DF2 EA25	0.020		25	10	DF3 EA25	0.020		25	10	DF3 FA25	0.045
	~ 500	32	10	DF2 EA32	0.020		32	10	DF3 EA32	0.020		32	10	DF3 FA32	0.045
		40	10	DF2 EA40	0.020		40	10	DF3 EA40	0.020		40	10	DF3 FA40	0.045
		50	10	DF2 EA50	0.020		50	10	DF3 EA50	0.020		50	10	DF3 FA50	0.045
Cylindrical 22 x 58	~ 690	20	10	DF2 FA20	0.045	~ 500	20	10	DF3 FA20	0.045	~ 500	20	10	DF3 FA20	0.045
		25	10	DF2 FA25	0.045		25	10	DF3 FA25	0.045		25	10	DF3 FA25	0.045
	~ 500	32	10	DF2 FA32	0.045		32	10	DF3 FA32	0.045		32	10	DF3 FA32	0.045
		40	10	DF2 FA40	0.045		40	10	DF3 FA40	0.045		40	10	DF3 FA40	0.045
		50	10	DF2 FA50	0.045		50	10	DF3 FA50	0.045		50	10	DF3 FA50	0.045
	~ 500	63	10	DF2 FA63	0.045		63	10	DF3 FA63	0.045		63	10	DF3 FA63	0.045
		80	10	DF2 FA80	0.045		80	10	DF3 FA80	0.045		80	10	DF3 FA80	0.045
100	10	DF2 FA100	0.045	100	10	DF3 FA100	0.045	100	10	DF3 FA100	0.045				
125	10	DF2 FA125	0.045	125	10	DF3 FA125	0.045	125	10	DF3 FA125	0.045				

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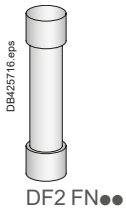
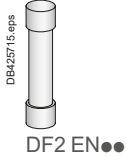
Fuse type	Maximum rated voltage		Rating	Set of	Fuses without striker		Fuses with striker	
	V	A			Unit reference	Weight	Unit reference	Weight
Blade NH 000	~ 690	25	3	DF2 FGA25	0.160	-	-	
		32	3	DF2 FGA32	0.160	-	-	
		40	3	DF2 FGA40	0.160	-	-	
		50	3	DF2 FGA50	0.160	-	-	
		63	3	DF2 FGA63	0.160	-	-	
Blade NH 00	~ 690	80	3	DF2 FGA80	0.160	-	-	
		100	3	DF2 FGA100	0.160	-	-	
		125	3	DF2 FGA125	0.160	-	-	
		50	3	DF2 GA1051	0.230	-	-	
Blade NH 0	~ 690	63	3	DF2 GA1061	0.230	-	-	
		80	3	DF2 GA1081	0.230	-	-	
		100	3	DF2 GA1101	0.230	-	-	
		125	3	DF2 GA1121	0.230	DF4 GA1121	0.230	
		160	3	DF2 GA1161	0.230	DF4 GA1161	0.230	
		200	3	DF2 GA1201	0.230	DF4 GA1201	0.230	
		160	3	DF2 HA1161	0.400	-	-	
Blade NH 1	~ 690	200	3	DF2 HA1201	0.400	DF4 HA1201	0.400	
		250	3	DF2 HA1251	0.400	DF4 HA1251	0.400	
		315	3	DF2 HA1311	0.400	DF4 HA1311	0.400	
		250	3	DF2 JA1251	0.560	-	-	
Blade NH 2	~ 690	315	3	DF2 JA1311	0.560	DF4 JA1311	0.560	
		400	3	DF2 JA1401	0.560	DF4 JA1401	0.560	
		500	3	DF2 JA1501	0.560	DF4 JA1501	0.560	
Blade NH 3	~ 690	400	1	DF2 KA1401	0.850	-	-	
		500	1	DF2 KA1501	0.850	DF4 KA1501 [1]	0.850	
		630	1	DF2 KA1631	0.850	DF4 KA1631	0.850	

[1] Set of 3.

Fupact protection components

Cartridge fuses type gG

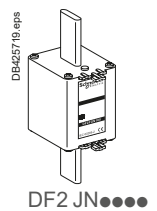
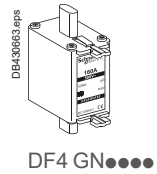
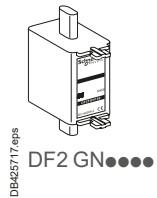
For protection of circuits without significant current peaks



Fuse type	Maximum rated voltage	Rating	Set of	Fuses without striker		Maximum rated voltage	Rating	Set of	Fuses with striker	
				Unit reference	Weight				Unit reference	Weight
	V	A			kg	V	A			kg
Cylindrical 10 x 38	~ 500	20	10	DF2 CN20	0.010	-	20	-	-	-
	~ 400	25	10	DF2 CN25	0.010	-	25	-	-	-
		32	10	DF2 CN32	0.010	-	32	-	-	-
Cylindrical 14 x 51	~ 690	20	10	DF2 EN20	0.020	~ 500	20	10	DF3 EN20	0.020
		25	10	DF2 EN25	0.020		25	10	DF3 EN25	0.020
	32	10	DF2 EN32	0.020	32		10	DF3 EN32	0.020	
	40	10	DF2 EN40	0.020	40		10	DF3 EN40	0.020	
	50	10	DF2 EN50	0.020	-		50	10	-	-
Cylindrical 22 x 58	~ 690	20	10	DF2 FN20	0.045	~ 690	20	10	DF3 FN20	0.045
		25	10	DF2 FN25	0.045		25	10	DF3 FN25	0.045
		32	10	DF2 FN32	0.045		32	10	DF3 FN32	0.045
		40	10	DF2 FN40	0.045		40	10	DF3 FN40	0.045
	~ 500	50	10	DF2 FN50	0.045	~ 500	50	10	DF3 FN50	0.045
		63	10	DF2 FN63	0.045		63	10	DF3 FN63	0.045
		80	10	DF2 FN80	0.045		80	10	DF3 FN80	0.045
		100	10	DF2 FN100	0.045		100	10	DF3 FN100	0.045

Fuse type	Maximum rated voltage	Rating	Set of	Fuses without striker		Fuses with striker	
				Unit reference	Weight	Unit reference	Weight
	V	A			kg		kg
Blade NH 000	~ 690	25	3	DF2 FGN25	0.160	-	-
		32	3	DF2 FGN32	0.160	-	-
		40	3	DF2 FGN40	0.160	-	-
		50	3	DF2 FGN50	0.160	-	-
		63	3	DF2 FGN63	0.160	-	-
		80	3	DF2 FGN80	0.160	-	-
		> 500	100	9	DF2 FGN100	0.160	-
Blade NH 00	~ 690	125	3	DF2 FGN125	0.160	-	-
	~ 500	160	3	DF2 FGN160	0.160	-	-
Blade NH 0	~ 690	50	3	DF2 GN1051	0.230	-	-
		63	3	DF2 GN1061	0.230	-	-
		80	3	DF2 GN1081	0.230	-	-
		100	3	DF2 GN1101	0.230	-	-
	~ 500	125	3	DF2 GN1121	0.230	-	-
		160	3	DF2 GN1161	0.230	-	-
		125	3	-	-	DF4 GN1121	0.230
		160	3	-	-	DF4 GN1161	0.230
Blade NH 1	~ 690	160	1	DF2 HN1161	0.400	-	-
	~ 500	200	1	DF2 HN1201	0.400	DF4 HN1201 [1]	0.400
		250	3	DF2 HN1251	0.400	DF4 HN1251	0.400
Blade NH 2	~ 690	250	3	DF2 JN1251	0.560	-	-
	~ 500	315	3	DF2 JN1311	0.560	DF4 JN1311	0.560
		400	3	DF2 JN1401	0.560	DF4 JN1401	0.560
Blade NH 3	~ 690	500	3	-	-	DF4 KN1501	0.850
	~ 500	500	1	DF2 KN1501	0.850	-	-
		630	1	DF2 KN1631	0.850	DF4 KN1631 [1]	0.850

[1] Set of 3.



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Schneider Electric Industries SAS

35, rue Joseph Monier
CS 30323
92506 Rueil Malmaison Cedex
France

RCS Nanterre 954 503 439
Capital social 896 313 776 €
www.schneider-electric.com

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