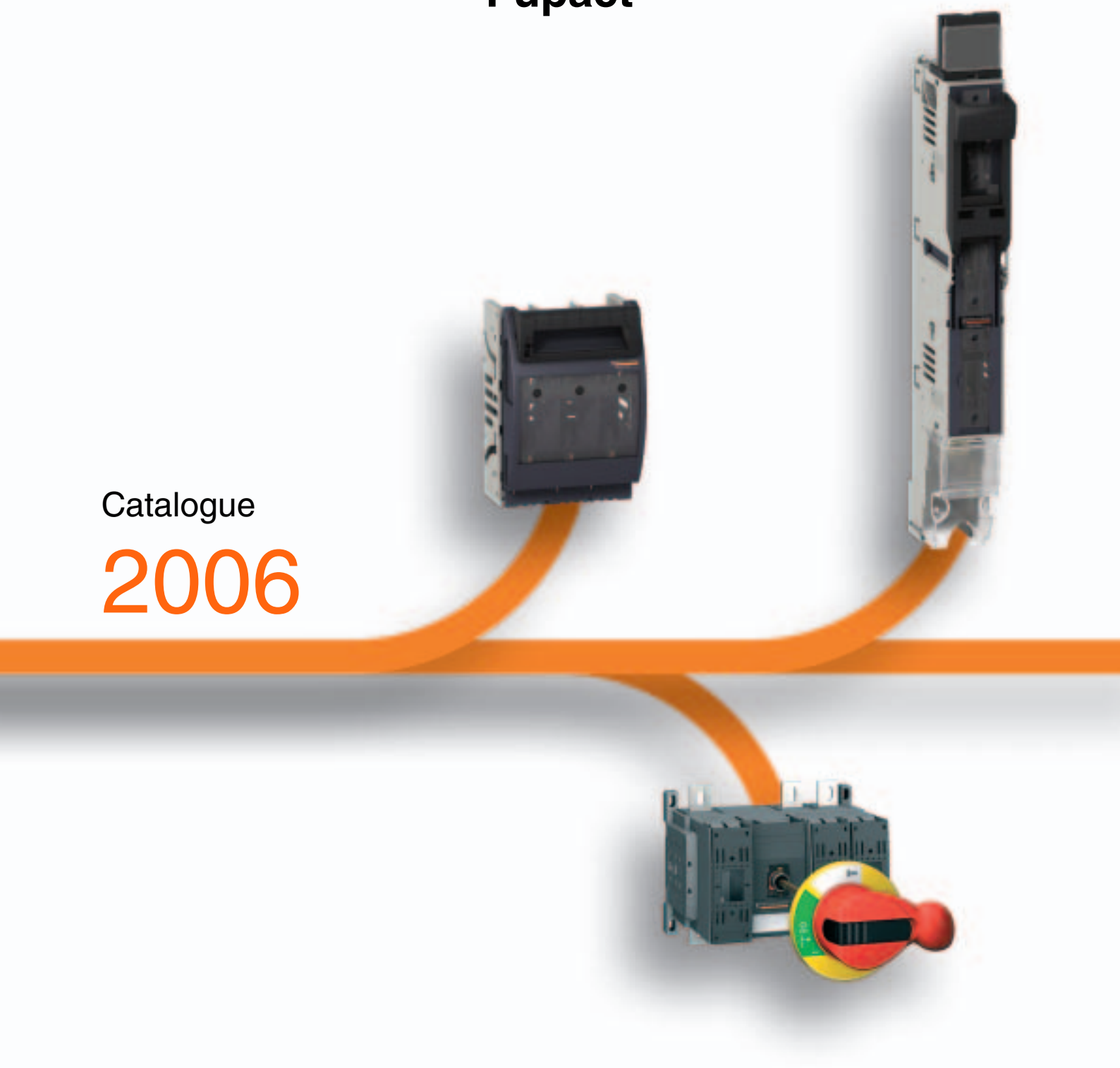
Fusegear range from 32 to 800 A

Fupact



Catalogue

2006

a brand of Schneider Electric

Merlin Gerin

General contents

The Guiding System, the new way to create your electrical installations

A comprehensive offer of products with consistent design

The Guiding System is first and foremost a Merlin Gerin product offer covering all electrical distribution needs. However, what makes all the difference is that these products have been designed to operate togheter: mechanical and electrical compatibility, interoperability, modularity, communication.
Thus the electrical installation is both optimised and more efficient: better continuity of supply, enhanced safety for people and equipment, guaranteed upgradeability, effective monitoring and control.

Tools to simplify design and implementation

With the Guiding System, you have a comprehensive range of tools - the Guiding Tools - that will help you increase your product knowledge and product utilisation. Of course this is in compliance with current standards and procedures.
These tools include technical booklets and guides, design aid software, training courses, etc. and are regularly updated.

The Guiding System, combined with the know-how and creativity, allows optimised, reliable, open-ended and standard compliant installations

For a genuine partnership with you

Because each electrical installation is unique, there is no standard solution. With the Guiding System, the variety of combinations allows for genuine customisation solutions. You can create and implement electrical installations to meet your creative requirements and design knowledge.
You and Merlin Gerin's Guiding System form a genuine partnership.

For more details on the Guiding System, consult www.merlin-gerin.com

A consistent design of offers from Medium Voltage to Low Voltage

All Merlin Gerin offers are designed according to electrical, mechanical and communication consistency rules.
The products express this consistency by their overall design and shared ergonomics.

Discrimination guarantees co-ordination between the operating characteristics of serial-connected circuit-breakers. Should a fault occurs downstream, only the circuit-breaker placed immediately upstream from the fault will trip.

Electrical consistency:

Each product complies with or enhances system performance at co-ordination level: breaking capacity, Isc, temperature rise, etc. for more safety, continuity of supply (discrimination) or economic optimisation (cascading).
The leading edge technologies employed in Merlin Gerin's Guiding System ensure high performance levels in discrimination and cascading of protection devices, electrodynamic withstand of switches and current distributors, heat loss of devices, distribution blocks and enclosures.
Likewise, inter-product ElectroMagnetic Compatibilty (EMC) is guaranteed.

Direct connection of the Canalis KT busbar trunking on the Masterpact 3200 A circuit breaker.

Mechanical consistency:

Each product adopts dimensional standards simplifying and optimising its use within the system.
It shares the same accessories and auxiliaries and complies with global ergonomic choices (utilisation mode, operating mode, setting and configuration devices, tools, etc.) making its installation and operation within the system a simpler process.

Transparent Ready

Thanks to the use of standard Web technologies, you can offer your customers intelligent Merlin Gerin switchboards allowing easy access to information: follow-up of currents, voltages, powers, consumption history, etc.

Communication consistency:

Each product complies with global choices in terms of communication protocols (Modbus, Ethernet, etc.) for simplified integration in the management, supervision and monitoring systems.

Guiding Tools for more efficient design and implementation of your installations.

SM6

Medium voltage switchboard system from 1 to 36 kV

Sepam

Protection relays

Masterpact

Protection switchgear from 100 to 6300 A

Trihal

MV/LV dry cast resin transformer from 160 to 5000 kVA

Evolis

MV vacuum switchgear and components from 1 to 24 kV.

The Technical guide

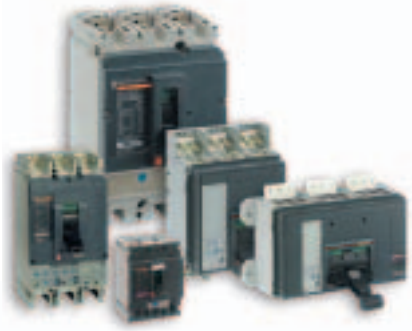
These technical guides help you comply with installation standards and rules i.e.:
The electrical installation guide, the protection guide, the switchboard implementation guide, the technical booklets and the co-ordination tables all form genuine reference tools for the design of high-performance electrical installations.
For example, the LV protection co-ordination guide - discrimination and cascading - optimises choice of protection and connection devices while also increasing markedly continuity of supply in the installations.

CAD software and tools

The CAD software and tools enhance productivity and safety.
They help you create your installations by simplifying product choice through easy browsing in the Guiding System offers.
Last but not least, they optimise use of our products while also complying with standards and proper procedures.

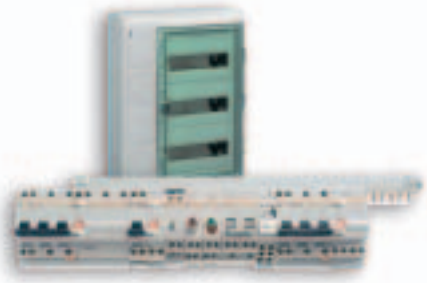
Compact

Protection switchgear system from 100 to 630 A



Multi 9

Modular protection switchgear system up to 125 A



Prisma Plus

Functional system for electrical distribution switchboards up to 3200 A

Pragma
Enclosures for distribution switchboards up to 160 A

Canalis
Prefabricated Busbar Trunking from 25 to 4000 A

PowerLogic
Power management

Training

Training allows you to acquire the Merlin Gerin expertise (installation design, work with power on, etc.) for increased efficiency and a guarantee of improved customer service.
The training catalogue includes beginner's courses in electrical distribution, knowledge of MV and LV switchgear, operation and maintenance of installations, design of LV installations to give but a few examples.

merlin-gerin.com

This international site allows you to access all the Merlin Gerin products in just 2 clicks via comprehensive range data-sheets, with direct links to:
- complete library: technical documents, catalogs, FAQs, brochures…
- selection guides from the e-catalog
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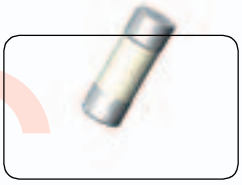
Fupact INF

from 32 to 800 A

C

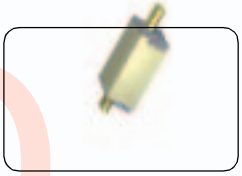


INFC32

INFC63

INFC125

D



INFD40

INFD63

INFD160

B

INFB32

INFB63

INFB100/160

Fupact INF switch-disconnector fuses are designed for fuse-links complying with the three main European standards: BS, DIN and NFC.

INFD250/400

INFD630/800

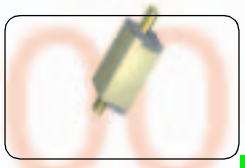
INFB250/400

INFB630/800

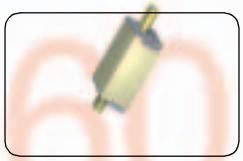
Fupact ISF

from 100 to 630

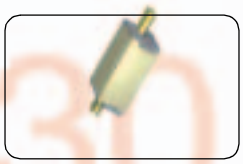
Fupact ISFT fuse-switch disconnectors are particularly suited to sub-distribution applications.



ISFT100



ISFT160



ISFT250/400/630

Fupact ISFL vertical fuse-switch disconnectors are mainly intended for power distribution applications.

ISFL160

ISFL250/400/630

Fupact

INF	INFC32	INFB32	INFD40	INFC63	INFB63	INFD63	INFB100	INFC125
Version	NFC	BS	DIN(NH)	NFC	BS	DIN(NH)	DIN	NFC
Number of poles	3P/4P							
Type of fuse-link	10x38/14x51	A1/A2/F1	000	14x51/22x58	A1/A2	000/00	A2/A3/A4	22x58
Performance								
Insulation voltage	800 V							
Operational voltage	690 V							
Impulse voltage	8 kV							
Thermal current	32 A		40 A	63 A			100 A	
Utilisation category								
At 500/525V	AC23A							
At 690V	AC23A			AC23B			AC23B	

ISFT	ISFT100
Version	DIN (NH)
Number of poles	3P
Type of fuse-link	NH000
Performance	
Insulation voltage	690 V
Operational voltage	690 V
Impulse voltage	6 kV
Thermal current	160 A
Utilisation category	
At 380/415V	AC22B

ISFL	
Version	
Number of poles	
Type of fuse-link	
Performance	
Insulation voltage	
Operational voltage	
Impulse voltage	
Thermal current	
Catégorie d'emploi	
At 380/415V	

Exceptional electrical performance

	INFD160	INFB160	INFD250	INFB250	INFD400	INFB400	INFD630	INFB630	INFD800	INFB800
	DIN(NH)	BS	DIN(NH)	BS	DIN(NH)	BS	DIN(NH)	BS	DIN(NH)	BS
	000/00	A2/A3/A4	0/1/2	B1/2/3/4	0/1/2	B1/2/3/4	3	C1/2/3	3	C1/2/3
	160 A		250 A		400 A		630 A		800 A	
			AC23A						AC23B	

	ISFT160	ISFT250	ISFT400	ISFT630
	NH000/NH00	NH1	NH2	NH3
	800 V			
	8 kV			
	160 A	250 A	400 A	630 A

	ISFL160	ISFL250	ISFL400	ISFL630
	DIN (NH)			
	3P			
	NH000/NH00	NH1	NH2	NH3
	800 V			
	690 V			
	8 kV			
	160 A	250 A	400 A	630 A
	AC22B			

Fupact INF.

Standards and certifications

The Fupact INF range complies withEuropean and International standards:

IEC 60947-1, -3, -5
EN 60947-1, -3, -5
The Fupact range has been designed for use with all fuse-links complying with the following European and International standards:
IEC 60269-1 to -4
EN 60269-1 to -4, BS 88-1 to -4, DIN 43620,
NFEN 60269-1 to -4, NFC 63220
The Fupact range has been officially certified by an independent organisation.

Test position, for greater flexibility and ease of use

Lets you test auxiliary circuits without closing the main contacts.
Standard for Fupact INF.32 to INF.160.
Optional for Fupact INF.250 to INF.800.

Fuse monitor for safe and reliable indications

- compatible with all standard fuses: BS, DIN and NFC
- indicates blown fuse remotely
- protects motors against single-phasing
- reduces costs by eliminating the need for striker-type fuses
- wide range of operating voltages: 110 to 260 V and 380 to 690 V
- automatic reset after replacement of a blown fuse
- an alarm contact and a contact to trip a remote device
- suitable for all types of electrical installations, even highly unbalanced.

A high level of safety

Contact position

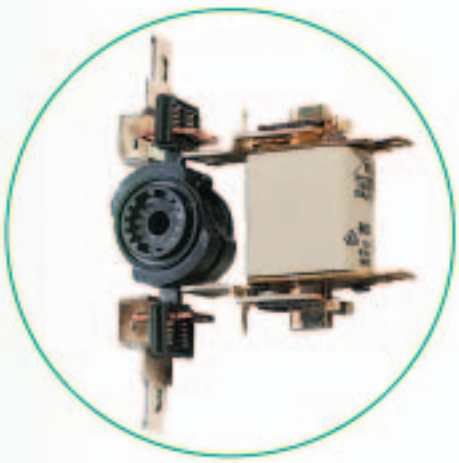
Positive contact indication
for the entire range,
together with visible break
for models INF•250 to INF•800.

Safety

Fuse compartment protected
by IP20 insulating covers as standard.

Interlocking

Interlock to prevent access to fuses
when the switch is ON.



Isolation

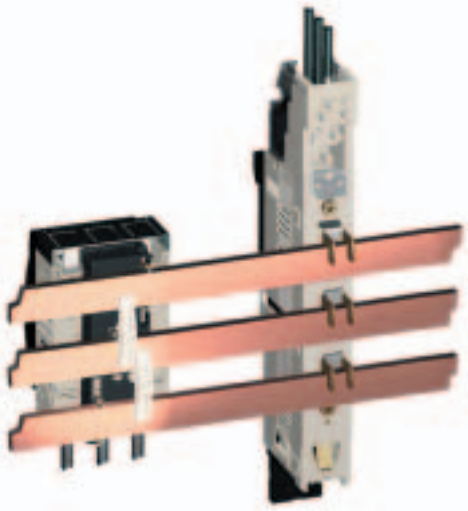
Double isolation, upstream and downstream
of the fuse-link, when the switch is OFF.

Fupact ISF.

Fupact ISF fusegear offers a wide variety of installation systems, all offering full safety.

Direct connection: simple and effective

ISFL fusegear connects directly to busbars in vertical position.
Electrical contact is made by bolted, push-on or hook-on connections.



A complete installation system

ISFT fusegear is designed for installation on mounting plates, busbars or DIN rails, depending on the rating. The devices are connected by cables or directly to the busbars by push-on or hook-on connections.

Reverse distribution

A simple change in mounting is required to supply distribution circuits via the top terminals of the fuse-switch disconnectors.

Many connection possibilities

For the lower ratings, comb busbars and couplers can combine up to five outgoing fuse-switch disconnectors for connection to single incoming circuit.

Perfect adaptation to different busbar spacings

ISFL160 fusegear has three mounting kits for connection to busbars with 100 mm (standard), 60 or 185 mm spacing.

All the benefits of simplicity

Dual-purpose fuse-carriers

The fuse-carriers hold the fuse-links
and provide the actuating means
to control power circuits.

Protected access to fuse-links

For ISFT fusegear, lead seals protect access to fuse-links
in ON position.
For ISFL fusegear, padlocks provide the same protection
in ON or OFF position.

Fuse-link test points

A sliding window provides IP20 degree
of protection and access to fuse-link test points.

Clearly visible fuse-links

Fuse-link technical characteristics are clearly visible
from the front through large view-ports.

Fuse-link replacement

The fuse-links are held inside the fuse-carriers by clips.
This system lets the operator remove blown fuse-links
without touching them.

Fupact

Easy implementation

Fupact fusegear can be installed on mounting plates or mounted directly on the busbars. Installation is made easy by special components for each type of mounting and clear instructions in accordance with standard working practices.

Maximum safety

Whatever the switchboard configuration, Prisma offers tested solutions guaranteeing the safety of personnel and applications. 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 planned, tested and certified.

All types of mounting

Depending on the model, fusegear can be installed:
- vertically or horizontally
- in the device compartment or in a lateral duct
- with other models of different ratings while ensuring maximum fill.

Functional installation in Prisma

Multiple combinations

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.

Simplified distribution

ISFT100 devices can be supplied via comb busbars connected to the main busbars.
ISFT160 to 630 devices can be supplied directly by busbars via a connection kit and prefabricated connections.

Full functional-unit performance

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

Guiding TOOLS

merlin-gerin.com

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The technical guide

These technical guides help you comply with installation standards and rules i.e.:
the electrical installation guide, the protection guide, the switchboard implementation guide, the technical booklets and the co-ordination tables all form genuine reference tools for the design of high performance electrical installations.
For example, the LV protection co-ordination guide - discrimination and cascading - optimises choice of protection and connection devices while also increasing markedly continuity of supply in the installations.

Functions and characteristics

The symbol ● stands for:
the type of fuse-link associated with INF switch-disconnector fuses
- *INF● + BS fuse-link = INFB*
- *INF● + NFC fuse-link = INFC*
- *INF● + DIN fuse-link = INFD*

the type of fuse-link arrangement for ISF fuse-switch disconnectors:
- *ISF● + side-by-side fuse-link arrangement (DIN) = ISFT*
- *ISF● + vertical fuse-link arrangement (DIN) = ISFL.*

General description of Fupact fusegear

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.

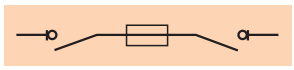
056503

INF. switch-disconnector fuses.

Fupact INF.

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 generally independent of the action of the operator (fast opening and closing)
- isolation with positive contact indication and/or visible break when the fusegear is in the open position (OFF). The fuse-link is completely isolated from the power circuit
- protection against short-circuits and overloads on distribution circuits. This function is provided by industrial fuses-links (DIN, NFC, BS) used in conjunction with the switch-disconnector fuse.

DB103985



INF. switch-disconnector fuse

62196

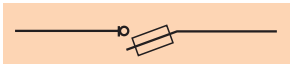
62194

ISF. fuse-switch disconnectors.

Fupact ISF.

ISF. fuse-switch disconnectors provide 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 fusegear
- the fuse-links are mounted in a fuse-carrier assembly
- via the handle, the fuse-carriers operate the main moving contacts
- isolation with positive contact indication 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 fuses-links (NH).

DB103986



ISF. fuse-switch disconnectors

Solutions combining separate components

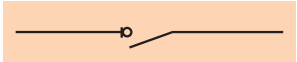
It is also possible to protect distribution circuits and/or motors by combining switch-disconnectors with fuse-links mounted on separate fuse-carriers.
- The functions provided by each component are:
  - on-load switching of circuits (opening and closing) and isolation (switch-disconnector)
  - protection against overloads and short-circuits (fuse).

The combination can implement Interpact INS or ISV switch-disconnectors from 40 to 2500 A (see page 188).

056648

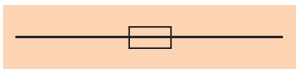
INS switch-disconnectors.

DB103987



Control.

DB103988



Protection.

056518

Fuse-link.

General description of Fupact fusegear (cont.)

E79145

Fupact	INFB/INFD 160		
Ui 750V	Uimp 8kV		
Ith	160A / 40°C		
	Max (A) 160		Max (W) 12
Ue(V) / Ie (A)	AC22A	AC23A	AC23B
500/525V	160	160	-
690V	160	-	160
	DC22A	DC23A	
250V / Nb poles	160/2	160/2	
500V / Nb poles	100/4	100/4	

Fuse suivant / according to: IEC 60 269-1 /BS88

Schneider Electric

Made in France
IEC 60 947-3 /CEI-UTE-UNE-VDE-BS

INF• label.

E94870

Fupact	ISFL 160	
Ui 800V	Uimp 8kV	50/60 Hz
Ith	160A	40°C
	Max(A) 160	Max(W) 12
Ue (V) / Ie (A)	AC21B	AC22B
380/415V	160	160
690V	100	-
	DC21B	DC22B
220V / nb pole	-	-
440V / nb pole	-	-

Schneider Electric

IEC 60 947-3 /CEI - UTE - UNE - VDE - BS
IEC 60 269-1 DIN 43 620-1
made in Germany

ISFL label.

E94871

Fupact	ISFT 630	
Ui 800V	Uimp 8kV	50/60 Hz
Ith	630A	40°C
	Max(A) 630	Max(W) 48
Ue (V) / Ie (A)	AC21B	AC22B
380/415V	630	630
690V	630	
	DC21B	DC22B
220V / nb pole	630/1	-
440V / nb pole	630/2	-

Schneider Electric

IEC 60 947-3 /CEI - UTE - UNE - VDE - BS
IEC 60 269-1 DIN 43 620-1
made in Germany

ISFT label.

059028

62354

Fusegear with terminal shields.
IP20 and IK07

058987

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

Compliance with standards

Fupact fusegear complies with international standards and recommendations:
- IEC 60947-1: general rules
- IEC 60947-3: switches, disconnectors, switch-disconnectors and fuse-combination units
- IEC 60947-5.1 and following: control-circuit devices and switching elements; automatic-control.

These recommendations are applied in most countries. Fupact fusegear and auxiliaries comply with European (EN 60947-1 and EN 60947-3) and the corresponding national standards:
- Australia AS
- France NF
- Germany VDE
- Italy CEI
- United Kingdom BS.

Fupact INF• switch-disconnector fuses and auxiliaries are:
- designed for use with industrial fuse-links complying with the following standards:
  - IEC 60269
  - BS 88
  - 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.

Fupact ISF• fuse-switch disconnectors and auxiliaries are:
- designed for use with industrial fuse-links complying with the following standards:
  - IEC 60269
  - DIN 43620 / VDE 0636.

Climatic environment

Fupact fusegear meets climatic requirements as defined in the following standards:
- IEC/EN 60068-2-30: damp-heat tests under off-load conditions, 95 % relative humidity at 55 °C (hot and humid climate conditions)
- IEC/EN 60068-2-52: salt-mist tests, KB severity 2 tests
- IEC/EN 60068-2-56: damp-heat tests under on-load conditions for 48 hours, environment category C2.

The fusegear can therefore be used in all climates.

Degree of pollution

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

Ambient temperature

Fupact fusegear can be used at temperatures ranging from -25 °C to +70 °C. Above 40 °C, the derating coefficients indicated in the documentation must be applied.

Fusegear should be put into service at the normal ambient operating temperature indicated above, however this can nonetheless be done at temperatures as low as -35 °C.

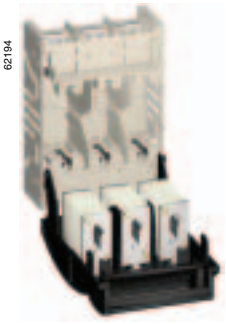
Fupact fusegear in the original packing can be stored at temperatures ranging from -50 °C to +85 °C.

Degree of protection

For Fupact fusegear, the degree of protection against direct contact complies with standard IEC 60529 (IP index of protection) and EN 50102 (IK code for protection against external mechanical impact).

General description of Fupact fusegear (cont.)

Positive contact indication.



Visible break.

Positive contact indication

IEC standard 60947-3 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 actually open
- 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 of Fupact fusegear.

Visible break

The physical separation of the main contacts is directly visible through a transparent cover.
For INF**.**250 to INF**.**800 fusegear, the visible-break function is provided in addition to positive contact indication.
INF**.**250 to INF**.**800 switch-disconnector fuses and ISF**.**100 to ISF**.**630 fuse-switch disconnectors all provide isolation with visible break.

The isolation with visible-break function is certified by tests guaranteeing:
- the absence of leakage currents
- overvoltage withstand capacity between upstream and downstream connections of Fupact fusegear.

Guiding TOOLS

merlin-gerin.com

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- product discovery sites and their Flash animations.

You will also find illustrated overviews, news to which you can subscribe, the list of country contacts…

CAD software and tools

The CAD software and tools enhance productivity and safety. They help you create your installations by simplifying product choice through easy browsing in the Guiding System offers.
Last but not least, they optimise use of our products while also complying with standards and proper procedures.

General characteristics Fupact INF.

The symbol . stands for:
the type of fuse-link associated with INF switch-disconnector fuses
- *INF. + BS fuse-link = INFB*
- *INF. + NFC fuse-link = INFC*
- *INF. + DIN fuse-link = INFD*

the type of fuse-link arrangement for ISF fuse-switch disconnectors:
- *ISF. + side-by-side fuse-link arrangement (DIN) = ISFT*
- *ISF. + vertical fuse-link arrangement (DIN) = ISFL.*

General characteristics: INF.
Fupact INF.32 to INF.800

Emergency-off switch-disconnector fuse.

Fuse carrier.

Emergency-off (safety) switch-disconnector fuses

The Fupact switch-disconnector fuse can be used as an emergency-off device. 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 fuse uses 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 following emergency-off switch-disconnector fuses are available:
- ■ in extended handle versions as follows:
- □ for all control models
- □ for lateral control models up to and including the 250 A rating
- ■ for direct front control models from INF.250 to INF.800.

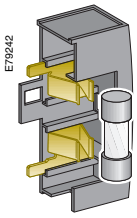
Compatible fuse-links

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

Switch-disconnector fuse	Type of fuse-link		
	NFC	BS	DIN
INF.32/40	■	■	■
INF.63	■	■	■
INF.100 to 160	■ (1)	■	■
INF.250 to 800	-	■	■

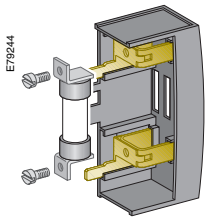
(1) Up to 125 A.

NFC



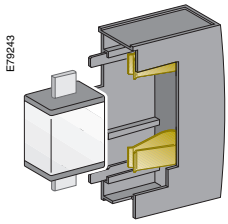
Fuse-carrier for INFC32 and INFC63.

BS

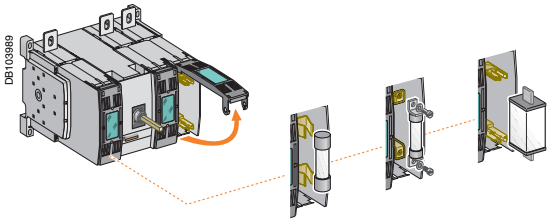


Fuse-carrier for INFB32 and INFB63.

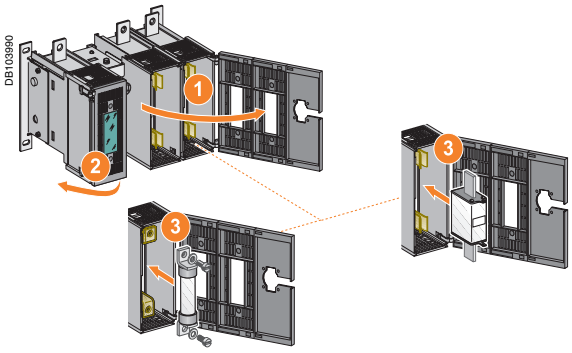
DIN



Fuse-carrier for INFD40 and INFD63.



INF.100 to 160.



INF.250 to 800.

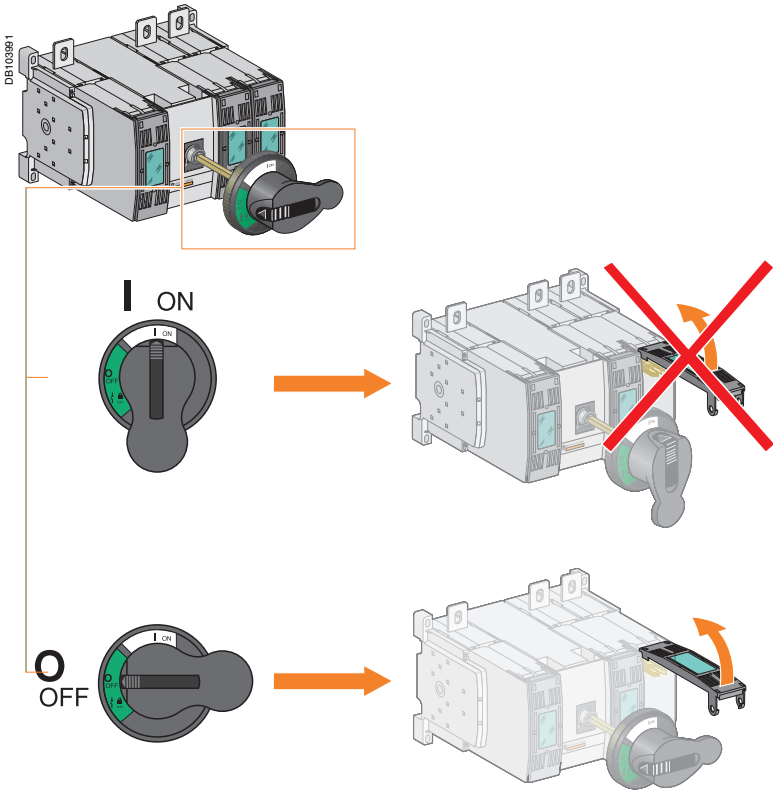
***Note:** for ratings ⩽ 63 A, the fuse-carriers are different for each type of fuse-link.*
For ratings ⩾ 100 A, the switch-disconnector fuses are different for each type of fuse-link.

General characteristics
Fupact INF.32 to INF.800 (cont.)

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 800 switch-disconnector fuses are in the ON position (the fuse-carrier on the INF.32 to 63 and the fuse-covers on the INF.100 to 800 are locked)
- possible only when the handle is in the OFF.

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 28). The operating mechanism (opening and closing) features independent manual operation (speed and force independent of operator action).



Protection against access to live fuses.

Switch-disconnector fuse selection
Fupact INF.32 to INF.800


059000

INFB32.


056502

INFC63.


056603

INFD160.


056504

INFD400.

Fupact INF. switch-disconnector fuses

Number of poles / type of fuse-link	3 poles / 3 fuse-links			
	4 poles / 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	**Ith**	at 40 °C	
	Maximum fuse power dissipation (W)			
	In enclosure	**Ithe**	at 40 °C	
	Maximum fuse power dissipation (W)			
Rated insulation voltage (V)		**Ui**	AC 50/60 Hz / DC	
Rated impulse-withstand voltage (kV)		**Uimp**		
Rated operational voltage (AC20 and DC20) (V)		**Ue**		
Rated operational voltage (V)		**Ue**	AC 50/60 Hz	
			DC	
Rated operational current (A)		**Ie**	AC 50/60 Hz	
				220/240 V
				380/415 V
				440/480 V (1)
				500/525 V
				660/690 V
			DC	
				125 V/nbr of poles in series
				250 V/nbr of poles in series
				500 V/nbr of poles in series
				750 V/nbr of poles in series
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)		**Icm**		415 V
				500 V
				690 V
Rated short-circuit breaking capacity (kA rms) / Rated short-circuit making capacity (kA peak) (4)		**Icn / Icm**		415 V (BS)
				500 V (DIN)
				690 V (DIN)
Rated short-time withstand current (A rms)		**Icw**	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 poles 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.
(5) Only for NFC fuse-links.
(6) Only for DIN fuse-links.

Switch-disconnector fuse selection
Fupact INF•32 to INF•800 (cont.)

	INF•32		INFD40		INF•63		INFB100		INFC125		INF•160		INF•250		INF•400		INF•630		INF•800	
	NFC-BS		DIN		NFC-DIN-BS		BS		NFC		DIN-BS		DIN-BS		DIN-BS		DIN-BS		DIN-BS	
	NFC-BS		DIN		NFC-DIN-BS		BS		NFC		DIN-BS		DIN-BS		DIN-BS		DIN-BS		DIN-BS	
	NFC		-		NFC-DIN		-		NFC		DIN		DIN		DIN		DIN		DIN	
	32		40		63		100		125		160		250		400		630		800	
	3.5		4.5		7.5		12		12		12		32		45		60		65	
	32		40		63		100		125		160	135	250	230	400	360	600	570	720	
	3.5		4.5		7.5		12		12		10	12	23	27	34	37	45	50	55	
	750		750		750		750		750		750		750		750		750		750	
	8		8		8		8		8		8		8		8		8		8	
	690		690		690		690		690		690		690		690		690		690	
	750		750		750		750		750		750		750		750		750		750	
	750		750		750		750		750		750		750		750		750		750	
	AC22A	**AC23A**	**AC22A**	**AC23A**	**AC22A**	**AC23A**	**AC22A**	**AC23A**	**AC22A**	**AC23A**	**AC22A**	**AC23A**	**AC22A**	**AC23A**	**AC22A**	**AC23A**	**AC22A**	**AC23A**	**AC22A**	**AC23A**
	32	32	40	40	63	63	100	100	125	125	160	160	250	250	400	400	630	630	800	720
	32	32	40	40	63	63	100	100	125	125	160	160	250	250	400	400	630	630	800	720
	32	32	40	40	63	63	100	100	125	125	160	160	250	250	400	400	630	630	800	720
	32	32	40	40	63	63	100	100	125	125	160	160	250	250	400	400	630	630	800	720
	32	32	40	40	63	63 [2]	100	100 [2]	125	125 [2]	160	160 [2]	250	250	400	400	630	630	800	720
	DC22A	**DC23A**	**DC22A**	**DC23A**	**DC22A**	**DC23A**	**DC22A**	**DC23A**	**DC22A**	**DC23A**	**DC22A**	**DC23A**	**DC22A**	**DC23A**	**DC22A**	**DC23A**	**DC22A**	**DC23A**	**DC22A**	**DC23A**
	32/2	32/2	40/2	40/2	63/3	63/3	100/2	100/2	125/2	125/2	160/2	160/2	250/2	250/2	400/2	400/2	630/2	630/2	800/2	800/2
	32/4	32/4	40/4	40/4	63/3	63/3	100/2	100/2	125/2	125/2	160/2	160/2	250/2	250/2	400/2	400/2	630/2	630/2	800/2	800/2
	-	-	-	-	-	-	100/4	100/4	100/4	100/4	100/4	100/4	250/3	250/3	400/3	400/3	630/3	630/3	800/3	800/3
	-	-	-	-	-	-	-	-	-	-	-	-	250/3	250/3	400/3	400/3	630/3	630/3	800/3	800/3
	8		11		18.5		30		37		45		70		110		180		200	
	14		18.5		30		45		60		80		132		210		315		350	
	15		18.5		30		55		60		90		140		230		340		380	
	18		22		37		60		80		110		170		280		400		470	
	25		30		60		90		110		132		230		330		540		600	
	■		■		■		■		■		■		■		■		■		■	
	class 120-60 %		class 120-60 %		class 120-60 %		class 120-60 %		class 120-60 %		class 120-60 %		class 120-60 %		class 120-60 %		class 120-60 %		class 120-60 %	
	9		9		17		22		22		22		40		40		75		75	
	7.5		7.5		17		22		22		22		40		40		75		75	
	6		6		13		15		15		15		35		35		60		60	
	80/176		80/176		80/176		80/176		80/176		80/176		80/176		80/176		80/176		80/176	
	100/220		100/220		100/220		100/220		100/220		100/220		100/220		100/220		100/220		100/220	
	50/105		50/105		50/105		50/105		50/105		50/105		50/105		50/105		50/105		50/105	
	1000		1000		2500		5000		5000		5000		8000		10000		16000		16000	
	570		570		1440		2900		2900		2900		4650		5800		9250		9250	
	220		220		560		1150		1150		1150		1800		2250		3600		3600	
	180		180		460		950		950		950		1500		1850		2950		2950	
	10000		10000		10000		10000		10000		10000		8000		8000		5000		5000	
	1500		1500		1500		1500		1500		1500		1000		1000		1000		1000	
	1500		1500		1500		1500		1500		1500		1000		1000		1000		1000	
	1500		1500		1500		1500		1500		1500		1000		1000		1000		1000	
	1500		1500		1500		1500		1500		1500		1000		1000		1000		1000	
	■		■		■		■		■		■		■		■		■		■	
	yes		yes		yes		yes		yes		yes		yes		yes		yes		yes	
	III		III		III		III		III		III		III		III		III		III	
	■		■		■		■		■		■		■		■		■		■	
	■		■		■		■		■		■		■		■		■		■	
	■		■		■		■		■		■		■		-		-		-	
	■		■		■		■		■		■		■		■		■		■	
	3		3		4		8		8		8		22		22		28		28	
	■		■		■		■		■		■		■		■		■		■	
	■ [5]		-		■ [5]		-		■		-		■ [6]		■ [6]		■ [6]		■ [6]	
	■		■		■		■		■		■		■		■		■		■	
	■ (standard)		■ (standard)		■ (standard)		■ (standard)		■ (standard)		■ (standard)		■ (optional)		■ (optional)		■ (optional)		■ (optional)	

Switch-disconnector fuse selection
Fupact INF.32 to INF.800 (cont.)

Fupact INF. switch-disconnector fuses

Type of fuse-link		
NFC	10 x 38	
	14 x 51	
	22 x 58	
DIN (NH)	NH000	
	NH00	
	NH0,1	
	NH0,1,2	
	NH3	
BS (fixing centres in mm) (3)	A1 (44,5)	
	F1	
	A2 (73,0)	
	A3 (73,0)	
	A4 (93,7)	
	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 bolts 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	
	4P	
Approximate weight without fuses (kg)	3P	
	4P	
Enclosure dimensions for Ithe		
	H x W x D (mm)	
Temperature derating (4) (5)		
"Vertical mounting" fuse-links in vertical position	**Ith (A)**	40
		45
		50
		55
		60
		65
		70
"Horizontal mounting" fuse-links in horizontal position	**Ith (A)**	35
		40
		45
		50
		55
		60
		65
		70

(1) Maximum fuse body diameter : Ø32 mm.
(2) Maximum fuse body diameter : Ø55 mm.
(3) A: fuse-link with centre bolted tags.
B: fuse-link with offset bolted tags.
(4) Derating data is based on:
- the maximum rating for fuse-links intended for the device,
- maximum heat loss.
(5) For installation on a ceiling, derate an additional 10 %.

Switch-disconnector fuse selection
Fupact INF•32 to INF•800 (cont.)

	INF•32	INFD40	INF•63	INFB100	INFC125	INF•160	INF•250	INF•400	INF•630	INF•800
	■	-	-	-	-	-	-	-	-	-
	■	-	■	-	-	-	-	-	-	-
	-	-	■	-	■	■	-	-	-	-
	-	■	■	-	-	■	-	-	-	-
	-	-	■	-	-	■	-	-	-	-
	-	-	-	-	-	-	■	-	-	-
	-	-	-	-	-	-	-	■	-	-
	-	-	-	-	-	-	-	-	■	■
	■	-	-	-	-	-	-	-	-	-
	■	-	-	-	-	-	-	-	-	-
	■	-	■	■	-	■	-	-	-	-
	-	-	■	■	-	■	-	-	-	-
	-	-	-	■ (1)	-	■ (1)	-	-	-	-
	-	-	-	-	-	-	■	■	-	-
	-	-	-	-	-	-	■	■	-	-
	-	-	-	-	-	-	■ (2)	■	-	-
	-	-	-	-	-	-	-	■	-	-
	-	-	-	-	-	-	-	-	■	■
	-	-	-	-	-	-	-	-	■	■
	-	-	-	-	-	-	-	-	-	■
	■	■	■	■	■	■	■	■	■	■
	2	2	3.5	15-22	15-22	15-22	30-44	30-44	50-75	50-75
	2	2	2	M5: 3.5 M8: 5	-	M5: 3.5 M8: 5	15	15	40	40
	■ (standard)	■ (standard)	■ (standard)	■ (optional)	■ (optional)	■ (optional)	■ (optional)	■ (optional)	■ (optional)	■ (optional)
	-	-	-	■	■	■	■	■	■	■
	■	■	■	■	■	■	■	■	■	■
	-	■	■	■	■	■	■	■	■	■
	97 x 106 x 105	97 x 106 x 133	100 x 143 x 128	140 x 180 x 130	140 x 180 x 130	140 x 180 x 130	162 x 278 x 199	180 x 302 x 206	232 x 378 x 234	232 x 408 x 234
	97 x 142 x 105	97 x 142 x 133	100 x 188 x 128	140 x 215 x 130	140 x 215 x 130	140 x 215 x 130	162 x 340 x 199	180 x 372 x 206	232 x 458 x 234	232 x 498 x 234
	0.7	0.7	1.3	1.5	1.5	1.5	6.9	7.8	15.5	17
	0.9	0.9	1.6	1.8	1.8	1.8	7.9	8.8	19	21
	300x350x200						600 x 350 x 300 / 500 x 400 x 250		600 x 700 x 300 / 800 x 600 x 270	
	NFC-BS	**DIN**	**NFC-DIN-BS**	**BS**	**NFC**	**DIN-BS**	**DIN-BS**	**DIN-BS**	**DIN-BS**	**DIN-BS**
	32	40	63	100	125	160	250	400	630	800
	30.4	38	60	95	119	152	237	380	600	760
	28.8	36	56.7	90	113	144	225	360	567	720
	27.2	34	53.6	85	106	136	212	340	536	680
	25.6	32	50.4	80	100	128	200	320	504	640
	25	30	47.2	75	94	120	187	300	474	600
	24.4	28	44	70	88	112	175	280	441	560
	31	38	61	96	121	156	242	386	610	772
	29.5	36	58	92	115	148	230	368	580	736
	28	34	55	87	109	140	218	350	550	700
	26.5	32	52.2	83	103	133	207	331	522	662
	25	30	49.3	78	97	126	195	313	493	625
	23.5	28	46.4	74	92	118	184	295	464	588
	22	26	43	69	86	111	172	277	434	552
	20.5	24	40	65	81	103	161	268	406	514

Connection and connection accessories
Fupact INF.32, INFD40 and INF.63

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.

056501

INF.32.

056522

Neutral link.

Fupact INF.32 and INFD40

Connection of bare cables

Fupact INF.32 and INFD40 devices are equipped with built-in connectors for bare copper or aluminium cables of the following types:
- 0.5 to 10 mm^2 flexible cables
- 0.5 to 10 mm^2 rigid cables.

Neutral link

Three-pole devices may be optionally equipped with a removable neutral link that is mounted either on the side of the switch-disconnector fuse, or on the back plate or the DIN rail. Copper cables ⩽ 16 mm^2 may be connected.

056502

INF.63.

058995

Terminal shields.

056522

Neutral link.

Fupact INF.63

Connection of bare cables

Fupact INF.63 devices are equipped with built-in connectors for bare copper or aluminium cables of the following types:
- 2.5 to 25 mm^2 flexible cables
- 2.5 to 25 mm^2 rigid cables.

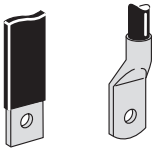
Terminal shields
- mandatory to maintain IP20 protection when cables smaller than 10 mm^2 are used
- clip-on
- one shield per connection.

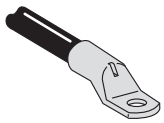
Neutral link

Three-pole devices may be optionally equipped with the same removable neutral link as that for INF.100/125/160 devices. The neutral link is mounted either on the side of the switch-disconnector fuse, or on the back plate or the DIN rail.
Copper cables ⩽ 16 mm^2 may be connected.

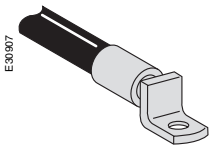
Connection and connection accessories
Fupact INFB100 to INF•160

INF•160.





Narrow lug for copper cable.



Narrow lug for aluminium cable.

Terminal shield for bars and cables with lugs.

Bare-cable connector.

Terminal shield for bare-cable connectors.

Neutral link.

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 mm^2.

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 mm^2.

Crimping by hexagonal barrels.

Terminal shields for bars or cables with lugs

- maintain IP20 protection
- clip-on and transparent with knock-outs
- one shield per connection.

Front connection of bare cables

The optional connectors may be used for both copper and aluminium cables with cross-sectional areas of 25 to 120 mm^2.

1-cable connectors

These connectors facilitate auxiliary connections with a special connection point for cables with cross-sectional areas of 1.5 to 4 mm^2. They snap directly onto the device terminals.

Terminal shields for devices equipped with connectors

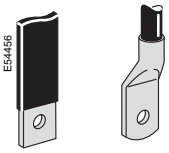
Terminal shields ensure IP20 protection.

Neutral link

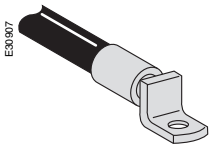
Three-pole devices may be optionally equipped with a removable neutral link mounted on the back plate or the DIN rail. Copper cables ⩽ 35 mm^2 with lugs or bars may be connected.

Connection and connection accessories
Fupact INF•250 to INF•800

INF•800.

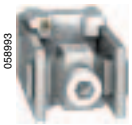


Narrow lug for copper cable.

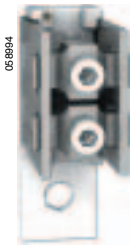


Narrow lug for aluminium cable.

Terminal shield.



1-cable snap-on connector.



2-cable screw-on connector.

Neutral link.

Front connection of bars or cables with lugs

Fupact INF•250 to 800 devices are equipped as standard with terminals and screws and nuts for direct connection of bars or cables with lugs:
- 250 and 400 models have 25 mm terminals with M10 screws and nuts
- 630 and 800 models have 40 mm 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 mm^2.

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 mm^2.

Crimping by hexagonal barrels.

Terminal shields for lug connections

Two models:
- one for the 250 and 400 A ratings
- the second for the 630 and 800 A ratings.

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•250 to INF•400

The connectors snap directly onto the device terminals:
- cross-sectional areas of 120 to 240 mm^2.

1-cable and 2-cable connectors for Fupact INF•250 to INF•800

The connectors are screwed to the device terminals:
- 250/400 A ratings: cross-sectional areas of 70 to 185 mm^2
- 400/630 A ratings: cross-sectional areas of 120 to 300 mm^2
- 400/630 A ratings: cross-sectional areas of 2 x (70 to 185) mm^2
- 630/800 A ratings: cross-sectional areas of 2 x (120 to 300) mm^2.

Neutral link

Three-pole devices may be optionally equipped with a removable neutral link mounted on the side of the switch-disconnector fuse.
Two models:
- one with 400 A thermal current Ith for the 250 and 400 A ratings
- another with 800 A thermal current Ith for the 630 and 800 A ratings.

Auxiliary contacts and indications
Fupact INF.32 to INF.800

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.

OF auxiliary contact.

NO and NC auxiliary contacts.

Support for NO and NC blocks.

Auxiliary contacts
Auxiliary contacts can be used to remote switch-disconnector fuse status information for indications and 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 close before the main contacts)
- testing of the control/monitoring circuit with power off. Simulates the closed position of the switch-disconnector fuse 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 fuse.

Blown-fuse indicator
Fuses with strikers must be used with this device which remotes the fuse-status information. It serves 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 remotes status information for standard fuses (without strikers).
It serves to:
- signal a blown fuse
- protect motors from overloads caused by single-phase operation
- prevent the risks of abnormal voltages on the neutral.

Auxiliary contacts and indications
Fupact INF.32 and INFD40

OF contacts.

NO and NC contacts.

Possible combinations.

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 and NC auxiliary contacts indicating the device ON/OFF positions

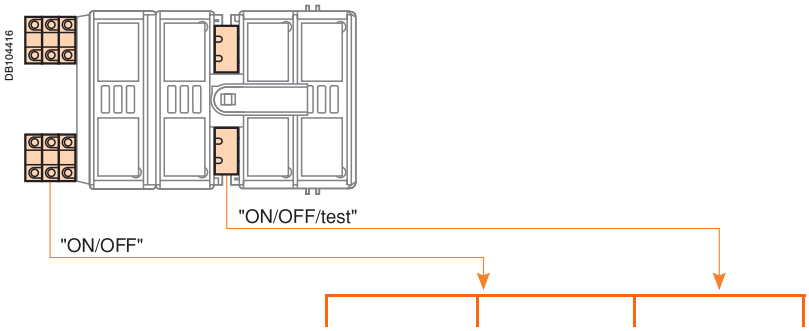
- mounting:
  - left-hand side
  - snap-in
  - requires the contact support (ordered separately)
- possible configuration: one to six contact blocks.

If the fuse monitor is used, only three contact blocks may be mounted because the remaining space is taken up by the fuse monitor.

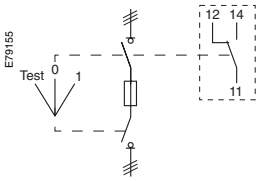
Description :

- 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 mm^2.

Functional table of contact status



Position of operating handle	Status of poles	Status of auxiliary contacts NO	Status of auxiliary contacts NC	Status of OF auxiliary contact
I				14 12 11
O				14 12 11
Test				14 12 11
Function		ON / OFF		ON / OFF / Test



Possible combinations

Front or lateral handle

Maximum block configuration	OF	NO or NC
Switch-disconnector fuse alone	2	6
With blown-fuse indicator	1	6
With fuse monitor	2	3

Auxiliary contacts and indications
Fupact INF.32 and INFD40 (cont.)

059009

Contact OF.

Electrical characteristics of OF contacts

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

Mounting between poles

Electrical characteristics					
Conventional thermal current Ith (A)		10			
Rated insulation level (V)		690			
Minimum load		100 mA at 24 V			
		AC		**DC**	
Utilisation category (IEC 60947-5-1)		AC12	AC15	DC12	DC13
Operational current (A)	24 V	-	6	6	-
	48 V	-	4	2	-
	110 V	-	3	0.5	-
	220/240 V	-	3	0.1	-
	250 V	-	3	0.1	-
	380/415 V	-	2	-	-
	440 V	-	2	-	-
	660/690 V	-	-	-	-

059014

Contact NO or NC.

Electrical characteristics of NO and NC auxiliary contacts

ON / OFF position

Mounting on side

Electrical characteristics					
Conventional thermal current Ith (A)		16			
Rated insulation level (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	6	-
	48 V	-	6	2	-
	110 V	-	6	1.1	-
	220/240 V	-	6	0.4	-
	250 V	-	6	0.4	-
	380/415 V	-	4	0.1	-
	440 V	-	3	0.1	-
	660/690 V	-	2	-	-

059027

Blown-fuse indicator.

Blown-fuse indicator

Fuses with strikers must be used with this device which remotes the fuse-status information. It serves 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.32 and INF.40 switch-disconnector fuses
- four-pole (4P) INF.32 and INF.40 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).

Mounting possibilities	
INFC32	Yes
INFD40	No
INFB32	No

Fuse monitor

See page 44.

Auxiliary contacts and indications
Fupact INF.63

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

059001

Position for the ON / OFF / Test function.

059004

Position for the ON / OFF function.

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 mm^2.

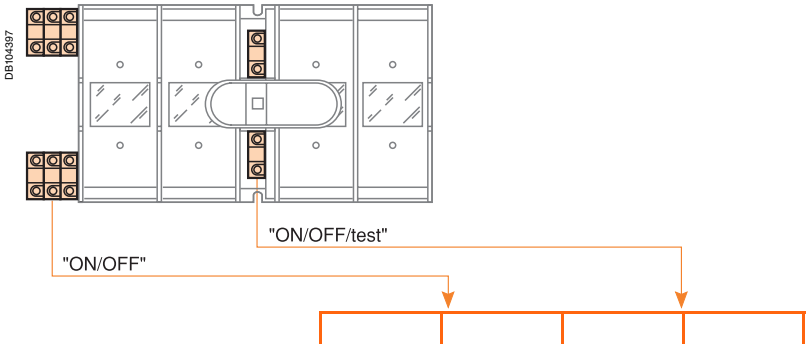
Auxiliary contacts indicating the device ON/OFF/test positions
- mounted between the device poles
- possible configuration: one or two NO or NC blocks.

NO and NC auxiliary
indicating the device ON/OFF positions
- mounting on the left-hand side
- snap-in
- possible configuration: one to six contact blocks.

All six contact blocks may be mounted even if the fuse monitor is used.
The monitor is mounted on the right-hand side.

Functional table of contact status

DB104397



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

Handle	Front		Lateral	
Maximum block configuration	ON / OFF / Test	ON / OFF	ON / OFF / Test	ON / OFF
Switch-disconnector fuse alone	2	6	2	6
With blown-fuse indicator	2	6	2	6
With fuse monitor	2	6	2	6

Auxiliary contacts and indications
Fupact INF•63 (cont.)

059014

NO or NC contact.

Electrical characteristics of NO or NC contacts

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

Electrical characteristics					
Conventional thermal current Ith (A)		16			
Rated insulation level (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	6	-
	48 V	-	6	2	-
	110 V	-	6	1.1	-
	220/240 V	-	6	0.4	-
	250 V	-	6	0.4	-
	380/415 V	-	4	0.1	-
	440 V	-	3	0.1	-
	660/690 V	-	2	-	-

058988

Blown-fuse indicator.

Blown-fuse indicator

Fuses with strikers must be used with this device which remotes the fuse-status information. It serves 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•63 switch-disconnector fuses
- four-pole (4P) INF•63 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 38 (a mounting adapter is supplied).

Mounting possibilities	
INFC63	Yes
INFD63	No
INFB63	No

Fuse monitor

See page 44.

Auxiliary contacts and indications
Fupact INFB100 to INF•160

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

059002

Position for the "test indication" and ON / OFF / Test functions.

059003

Position for the ON / OFF function.

Description:
- consists of one contact per block
- NO contacts (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.

Auxiliary contacts indicating the device ON/OFF/test positions
- mounted on between the device poles the right
- possible configuration: one or two NO or NC blocks.

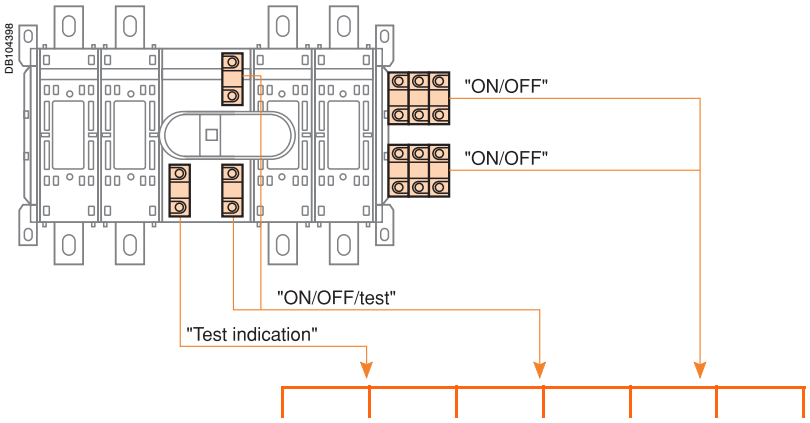
"Test indication" auxiliary contacts
- mounted between the device poles on the left
- possible configuration: one NO or NC block.

NO and NC auxiliary contacts indicating the device ON/OFF positions
- mounting on the left-hand or right-hand side
- snap-in
- possible configuration: one to twelve contact blocks

Up to six contact blocks may be mounted if a fuse monitor is also installed. They are mounted on the side opposite the fuse monitor.

Functional table of contact status

DB104398



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		Test indication		ON / OFF / Test		ON / OFF / Test	

Possible combinations

Handle	Front		
Maximum block configuration	**ON / OFF / Test**	**Test indication**	**ON / OFF**
Switch-disconnector fuse alone	2	1	12
With blown-fuse indicator	2	1	12
With fuse monitor	2	1	6

Handle	Lateral		
Maximum block configuration	**ON / OFF / Test**	**Test indication**	**ON / OFF**
Switch-disconnector fuse alone	2	1	6
With blown-fuse indicator	2	1	6
With fuse monitor	2	1	0

Auxiliary contacts and indications
Fupact INFB100 to INF.160 (cont.)

059014

NO or NC contact.

Electrical characteristics of NO or NC contacts

ON / OFF / Test positions, "Test indication" and ON / OFF position

Electrical characteristics					
Conventional thermal current Ith (A)		16			
Rated insulation level (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	6	-
	48 V	-	6	2	-
	110 V	-	6	1.1	-
	220/240 V	-	6	0.4	-
	250 V	-	6	0.4	-
	380/415 V	-	4	0.1	-
	440 V	-	3	0.1	-
	660/690 V	-	2	-	-

059017

Blown-fuse indicator.

Blown-fuse indicator

Fuses with strikers must be used with this device which remotes the fuse-status information. It serves to:
- signal a blown fuse
- protect motors from overloads caused by single-phase operation
- prevent the risks of abnormal voltages on the neutral.

Description

one model for three-pole (3P) or four-pole (4P) INF.100/160 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 40 (a mounting adapter is supplied).

Mounting possibilities	
INFC125	Yes
INFD160	No
INFB100	No
INFB160	No

Fuse monitor

See page 44.

Auxiliary contacts and indications
Fupact INF.250 to INF.800

The same auxiliary contact is used for the ON / OFF, ON / OFF / Test and "early-make or early-break" (CAM) functions. The function is determined by where the contact is installed in the switch-disconnector fuse.

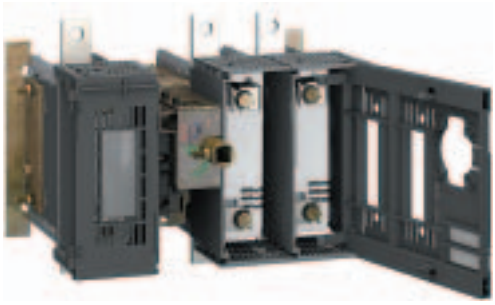
059032

NO and NC auxiliary contacts.

059018

Early-make or early-break (CAM) auxiliary contacts.

059007



Position for the ON / OFF /Test function.

Description :

- consists of one NO contact (positive opening) or one NC contact per block
- IP20 degree of protection
- connection terminals for cables with cross-sectional areas between 0.5 and 2 x 2.5 mm^2.

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

INF.250 and INF.400 :

- mounting above the operating mechanism
- snap-in
- possible configurations:
  - when combining different functions, refer to the table of possible combinations below
  - used alone: one or two contact blocks.

Early-make or early-break NO and NC auxiliary contacts

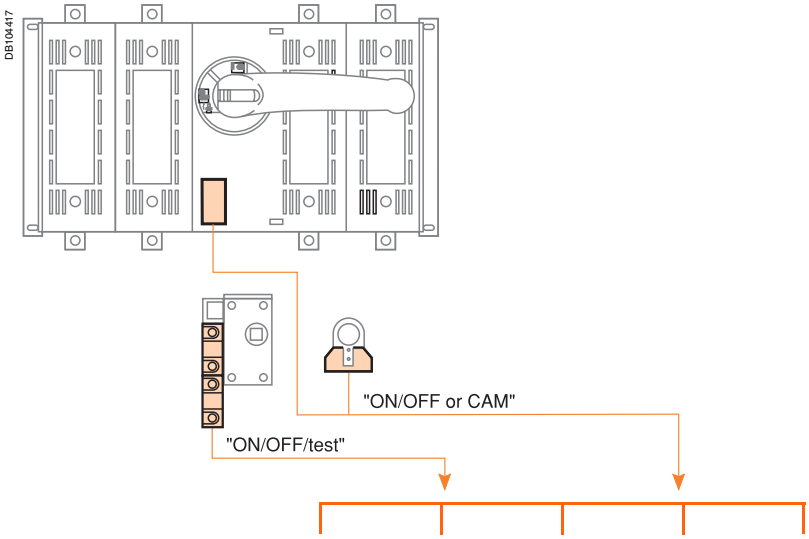
- mounting: driven by the operating shaft
- snap-in
- possible configurations:
  - when combining different functions, refer to the table of possible combinations below
  - used alone: one or two contact blocks for INF.250 and INF.400.
  - used alone: one or eight contact blocks for INF.630 and INF.800.

Auxiliary contacts indicating the device ON/OFF/test positions

- parts to be ordered:
  - one test position mechanism
  - one to four blocks with one contact each
- mounting: on the test position mechanism
  - possible configuration: one to four NO or NC blocks.

Functional table of contact status

DB104417



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/test		ON/OFF or CAM	

Auxiliary contacts and indications
Fupact INF•250 to INF•800 (cont.)

Possible combinations

Front handle

Product	INF•250 and INF•400			INF•630 and INF•800		
Maximum block configuration	ON / OFF / Test	ON / OFF	CAM	ON / OFF / Test	ON / OFF	CAM
	0	2	0	-	-	-
	0	0	2	0	0	8
	4	0	0	4	0	0

Lateral handle

Product	INF•250	
Maximum block configuration	ON / OFF	CAM
	2	0

In addition to the above combinations of auxiliary contacts, one NO or NC fuse contact can be mounted per pole.

NO and NC contact.

Electrical characteristics of NO and NC contacts

ON / OFF position and early-make/early-break functions

Electrical characteristics					
Conventional thermal current Ith (A)		16			
Rated insulation level (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	8	6	5	-
	48 V	8	6	2	-
	110 V	8	6	1.1	-
	220/240 V	6	5	0.55	-
	250 V	6	5	0.55	-
	380/415 V	4	3	0.3	-
	440 V	3	3	0.3	-
	660/690 V	2	1	-	-

NO or NC contact.

Electrical characteristics of NO or NC contacts

Position ON / OFF / test positions or blown-fuse indication

Electrical characteristics					
Conventional thermal current Ith (A)		10			
Rated insulation level (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	-	8	5	-
	48 V	-	8	2	-
	110 V	-	8	1.1	-
	220/240 V	-	6	0.55	-
	250 V	-	6	0.55	-
	380/415 V	-	4	0.3	-
	440 V	-	3	0.3	-
	660/690 V	-	2	-	-

Blown-fuse indicator.

Blown-fuse indicator

Fuses with strikers must be used with this device which remotes the fuse-status information. It serves 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•250/800 to switch-disconnector fuses:
- three-pole (3P)
- four-pole (4P).

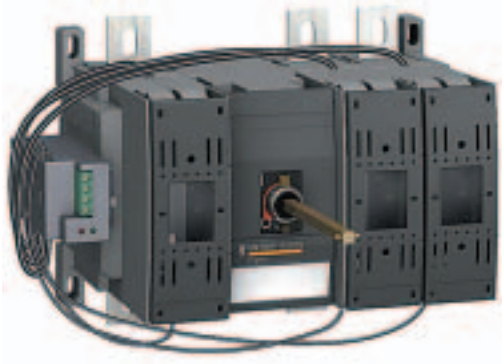
The indicator is made up of:
- a mechanical transmission system and mounting adapter for the contact blocks
- NO auxiliary-contact blocks.

Fuse monitor

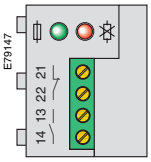
See page 44.

Fuse monitor
Fupact INF.32 to INF.800

Fuse monitor.



Mounting example.



Indications.

Fuse monitor

Functions
This device remotes status information on standard fuses (without strikers).
It serves 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
- 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
- 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:
  - the device clips onto INF.32 to INF.160 switch-disconnector fuses. For the INF.32 and INF.40, the auxiliary-contact block support must be ordered separately (see the NO and NC auxiliary contacts for INF.32 and INF.40)
  - mounting brackets are supplied for the INF.200 to INF.800
- characteristics:
  - IP20 degree of protection
  - weight 140 grams.
- the package consists of:
  - the fuse monitor equipped with one NO contact and one NC contact
  - mounting brackets for the INF.200 to INF.800.

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 (cont.)

Electrical characteristics

Power circuit

Rated operational voltage		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 mm² Cu, length 60 cm			
Downstream connection (2, 4, 6)		Standard Cu conductor 0.75 mm² Cu, length 60 cm			
Consumption		< 3 VA			
Rated frequency		50/60 Hz			
Measurement impedance		> 1000 ¾/V			
Rated impulse withstand voltage (1,2 / 50 µs)	Phase / phase	8 kV			
	Upstream / downstream	12 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)		8			
Rated insulation voltage (V)		440			
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	8	3	-	2
	48 V	8	3	-	-
	110 V	8	3	-	-
	220/240 V	8	3	-	-
	250 V	8	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…+60
Storage and transport temperature range (°C)	-40…+70
Operating time (s)	< 2
Overvoltage category / degree of pollution	IEC 60947-1 III/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	EN 61000-4-3 category A level 3
Conducted low energy susceptibility	EN 61000-4-4 category B level 3
Conducted high energy susceptibility	EN 61000-4-6 category A level 3
Radio-frequency interference (GSM)	ENV 50204 category A

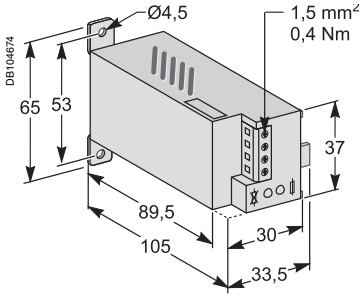
Magnetic field immunity

Continuous	EN 61000-4-8 level 5
1.2 / 50 µs pulse	EN 61000-4-9 level 5

Mechanical characteristics

Degree of protection	IP20
Weight (kg)	0.14

Dimensions

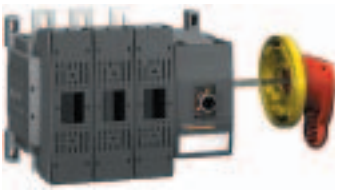


Rotary handles
Fupact INF.32 to INF.800

056503

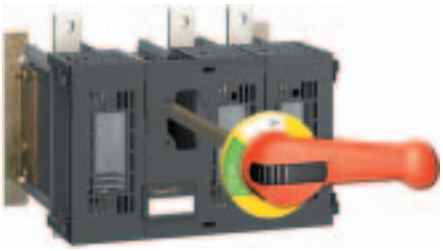
Switch-disconnector fuse with extended front rotary handle.

056509

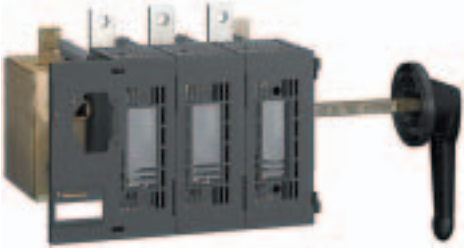


Switch-disconnector fuse with extended lateral rotary handle.

Direct rotary handle.



Switch-disconnector fuse emergency-off version with extended front rotary handle.



Switch-disconnector fuse with extended lateral rotary handle.

	INF.32/40	INF.63	INF.100/125/160	INF.250/400/800
Rotary control with black handle				
Direct front	Optional	Optional	Optional	Standard
Direct lateral	No	No	No	No
Extended front	Optional	Optional	Optional	Standard (1)
Extended lateral	Optional	Optional	Optional	Standard (1) (2)
Rotary control with red and yellow handle for emergency-off switch-disconnector fuses				
Direct front	No	No	No	Optional
Direct lateral	No	No	No	No
Extended front	Optional	Optional	Optional	Optional (1)
Extended lateral	Optional	Optional	Optional	Optional (1) (2)

(1) The handle is the same as for front control.
(2) For INF.250 only; lateral control is not available for higher ratings.

Direct rotary control

Direct rotary control is available only for front handles.
Degree of protection: IP20.
■ INF.32/40 to INF.160:
□ switch locking in OFF position for:
- INF.32/40 using 1 or 2 padlocks (not supplied) with 5 to 6 mm shackle diameter
- INF.63 to 160 using 1 to 3 padlocks (not supplied) with 5 to 6 mm shackle diameter
□ "Test O I" indication plate
□ black handle
■ INF.250 to INF.800:
□ secured to the switch-disconnector fuse cover
- secured to the switch-disconnector fuse cover
- test function can be added
□ locking by 3 padlocks (not supplied) with 5 to 10 mm shackle diameter
□ versions:
- standard with black handle
- emergency-off version with red and yellow handle.

Extended rotary handle

Makes it possible to operate a switch-disconnector fuse installed in the back of a switchboard from the front or side of the switchboard.
The extended rotary handle may be installed on the front or the side of the switch-disconnector fuse.
Degree of protection: IP65.

Operation

■ suitability for isolation is maintained
■ door opening is prevented when the switch-disconnector fuse is in the ON position (for front handle only); this interlock can be defeated by authorised personnel for servicing
■ the switch-disconnector fuse 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 and yellow handle.
■ "Test O I" indication plate
□ test function:
- standard for basic INF.32 to INF.160 switch-disconnector fuses
- optional for basic INF.250 to INF.800 switch-disconnector fuses
□ the test function makes it possible to test the control circuits with the power circuit off (see page 35); putting the handle in test position operates the auxiliary test contacts and simulates the closing of the power circuit.

Installation

The extended rotary handle is made up of:
■ an extension shaft that can be cut to the right length (a 400 to 465 mm shaft is available as an option)
■ a handle 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 this requirement whether the device is mounted horizontally or vertically.

Locking
Fupact INF.32 to INF.800

Padlocking.

Locking to prevent fuse access

The Fupact range includes a system designed to lock the fuse carriers or fuse compartment covers when the switch-disconnector fuse is in the ON (I) position:
- standard for INF.32 to INF.160
- optional fuse cover locking accessory for INF.250 to INF.800.

Padlocking

To lock a Fupact INF. switch-disconnector fuse in ON or OFF position, the standard handles can be fitted with 2 or 3 padlocks (not supplied).
Locking in the OFF 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 fuse padlocked	OFF (O)		■ (3)	

(1) After a simple modification.
(2) Using a special tool.
(3) Cannot be defeated.

Guiding TOOLS

merlin-gerin.com

This international site allows you to access all the Merlin Gerin products in just 2 clicks via comprehensive range data-sheets, with direct links to:

- complete library: technical documents, catalogs, FAQs, brochures…
- selection guides from the e-catalog.
- product discovery sites and their Flash animations.

You will also find illustrated overviews, news to which you can subscribe, the list of country contacts…

Training

Training allows you to acquire the Merlin Gerin expertise (installation design, work with power on, etc.) for increased efficiency and a guarantee of improved customer service.
The training catalogue includes beginner's courses in electrical distribution, knowledge of MV and LV switchgear, operation and maintenance of installations, design of LV installations to give but a few examples.

General characteristics Fupact ISF●

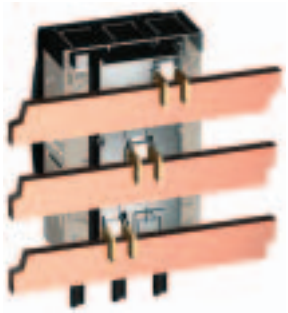
The symbol . stands for:
the type of fuse-link associated with INF switch-disconnector fuses
- *INF. + BS fuse-link = INFB*
- *INF. + NFC fuse-link = INFC*
- *INF. + DIN fuse-link = INFD*

the type of fuse-link arrangement for ISF fuse-switch disconnectors:
- *ISF. + side-by-side fuse-link arrangement (DIN) = ISFT*
- *ISF. + vertical fuse-link arrangement (DIN) = ISFL.*

General characteristics: ISF.
Installation
Fupact ISFT100 to ISFT630

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

62336

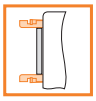


ISFT160 (hook-on connection).

DB103996

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.

DB103997



Push-on connection to 30 mm busbars:
the device slides on to the busbars via three spring contacts that press against each busbar.
An insulated nut positioned between the bars and connected to a bolt provides mechanical support for the device on the busbars.

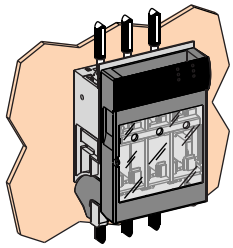
These two systems ensure direct contact of the power circuit to the busbars (no cables, bars, drilling, etc.) and traditional connections for downstream distribution (bare-cable connectors, lugs, bars, distribution connectors, etc.).

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

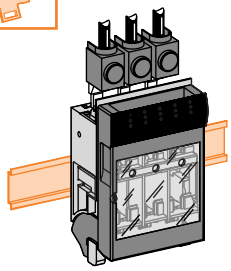
ISFT100 fusegear

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

DB103998



DB103999

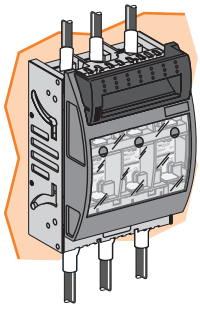


ISFT160 fusegear

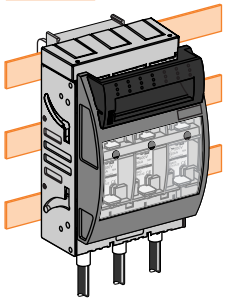
Installation on a mounting plate or on busbars.
Upstream connection of power circuits use:
- cables or flexible bars
- hook-on connection to 60 mm busbars
- push-on connection to 60 mm busbars.

Downstream connection of distribution circuits use cables or flexible bars.

DB104000



DB104001



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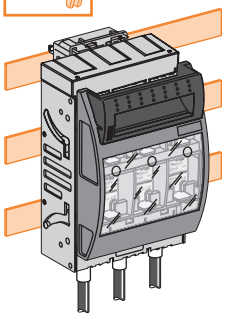
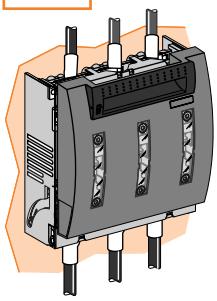


ISFT250/400/630 fusegear

Installation on a mounting plate or on busbars.
Upstream connection of power circuits use:
- cables or flexible bars
- hook-on connection to 60 or 100 mm busbars
- push-on connection (only for the ISFT250) to 60 mm busbars.

Downstream connection of distribution circuits use cables or flexible bars.

DB104003



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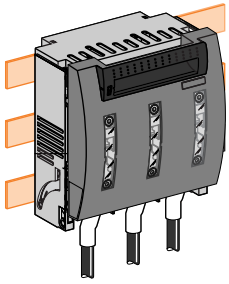

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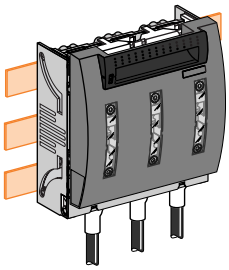


General characteristics: ISF.
Installation
Fupact ISFL160 to ISFL630

ISFL fusegear is installed vertically and connects directly to the busbars.
The connection is bolted or, for the ISFL160, can also use the hook-on connection technique.

62337

ISFL160 (direct connection to the busbars).

DB104006

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.

DB103986

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.).

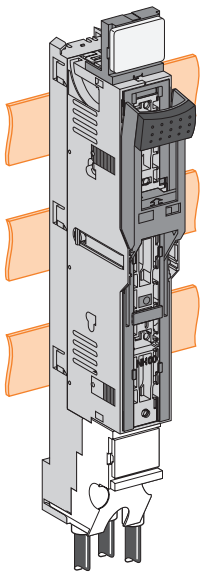
The two connection systems can also be reversed to supply distribution circuits via the top terminals.

ISFL160 fusegear

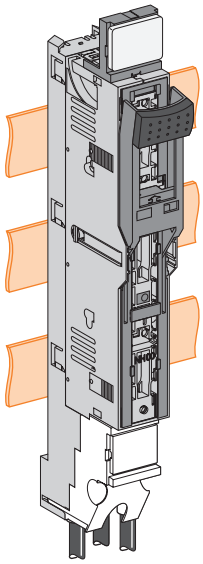
Connection to busbars.
The power circuit is connected:
- directly to the 100 mm busbars
- hook-on connection to 60 mm busbars
- via a conversion kit equipped with hooks for connection to 60 mm busbars
- via a conversion kit equipped with hooks for connection to 185 mm busbars
- via a conversion kit for two devices and for connection to 185 mm busbars.

Downstream connection of distribution circuits use cables.

DB104007



DB104008

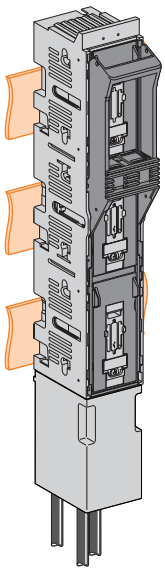


ISFL250/400/630 fusegear

Connection to busbars.
The power circuit is connected:
- directly to the 185 mm busbars.

Downstream connection of distribution circuits use cables.

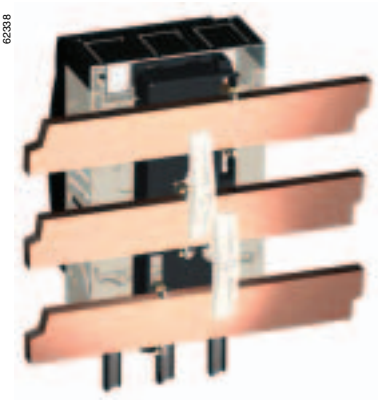
DB104009



General characteristics: ISF.
Reverse distribution
Fupact ISFT100 to ISFT630

The fuse-switch disconnectors designed for connection to busbars can also supply distribution circuits via the top terminals. A simple change in mounting is required to supply distribution circuits via the top terminals of the fuse-switch disconnectors.

62338



ISFT160 (push-on connection).

To reverse supply, depending on the model, simply turn 180° either:
- the base with its connection kit
- 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 top or bottom terminals.

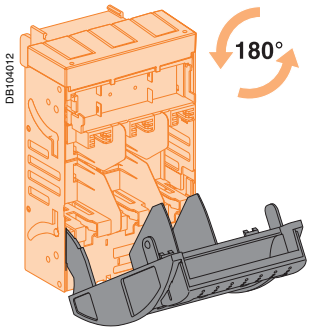
Operation to reverse supply (top/bottom terminals)

		180° rotation				Change
		Base	Connection kit	Hooks	Shields for power circuits	Fuse-monitor cover
	ISFT160	■	□	■	□	■
	ISFT250 to 630	-	■	■	-	■
	ISFT160	■	□	-	□	■
	ISFT250	■	□	-	□	■

Fusegear with hook-on connection

ISFT160/250

DB104012



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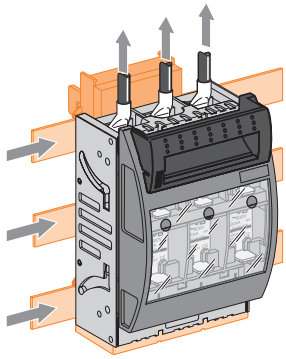
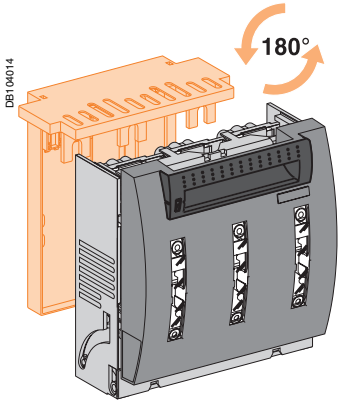
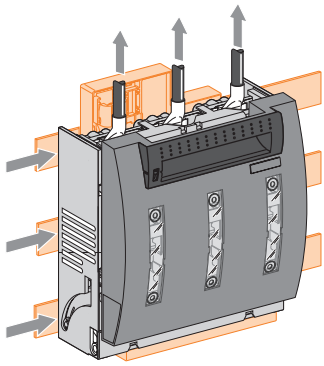


ISFT400/630

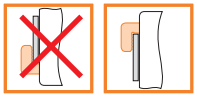
DB104014



DB104015



DB104010



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

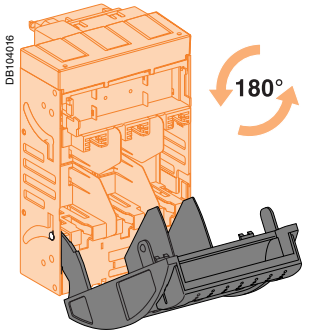
DB104011

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

Fusegear with press-on connection

ISFT160/250

DB104016



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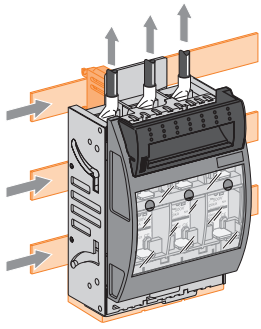
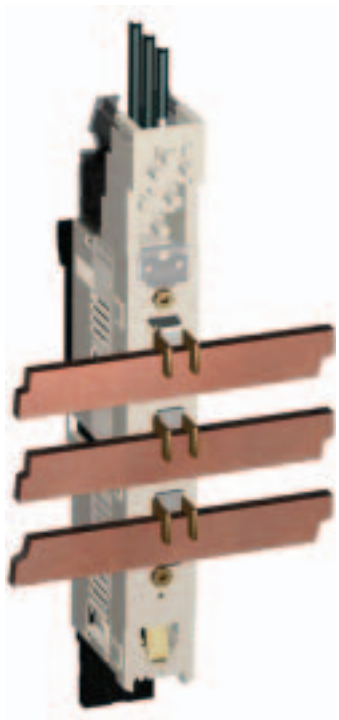


General characteristics: ISF.
Reverse distribution
Fupact ISFL160 to ISFL630

62339



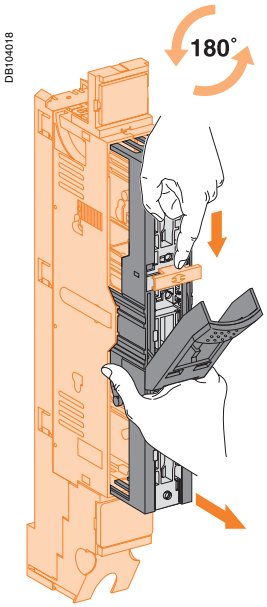
ISFL160 (hook-on connection).

ISFL160 fusegear devices with hook-on connection to 60 mm bars are available in two versions:
- distribution via the bottom terminals
- distribution via the top terminals.

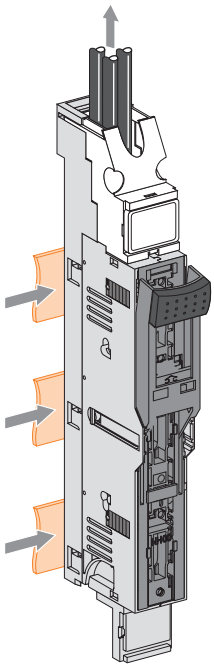
For all other versions, a release tab on the fuse-carrier assembly is used to remove the assembly from the base to reverse distribution. Rotate the base 180° to reverse supply to distribution circuits (connection to top terminals). The fuse-carrier assembly does not change position. All the various connection modes remain possible (direct, mounting plates, etc.).

ISFL160 fusegear

DB104018

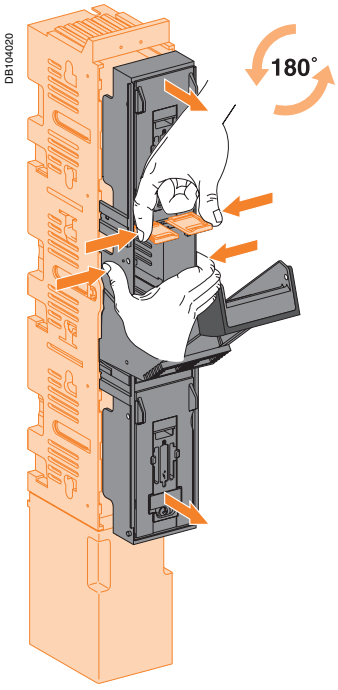


DB104019

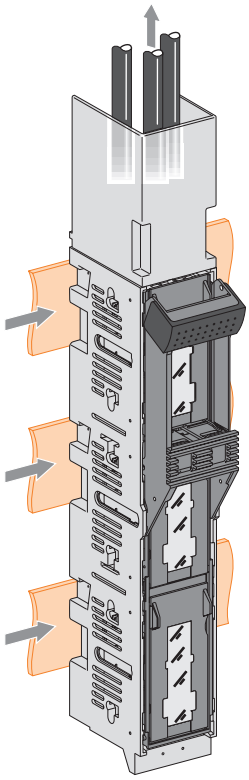


ISFL250/400/630 fusegear

DB104020



DB104021



DB104022

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:*
  - *to lock the device in open (OFF) position.*

DB104349

Release tab for the ISFL250/400/630:
with the device in open position, press the two release tabs together:
- *to remove the fuse-carrier assembly from the base or install it on the base*
- *to lock the device in open (OFF) position.*

General characteristics: ISF.
Connection, coupling
Fupact ISFT100 to ISFT630

ISFT100 fusegear with insulated comb busbar couplers makes it possible to supply a number of devices via a single incomer.

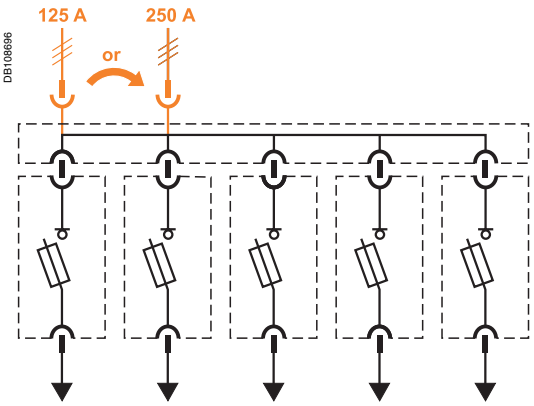
62340

ISFT100 (comb + insulated cover).

Combinations:
- *2 devices:*
  - *1 incomer for 2 outgoers*
- *3 devices (1):*
  - *1 incomer for 3 outgoers*
- *4 devices (1):*
  - *1 incomer for 4 outgoers*
- *5 devices (1):*
  - *1 incomer for 5 outgoers.*

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

DB108696

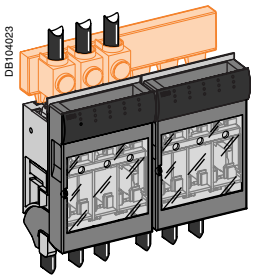


Supplying a number of devices via comb busbars

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

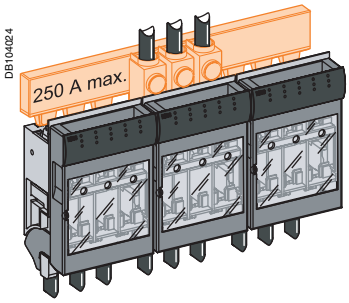
2 devices

DB104023



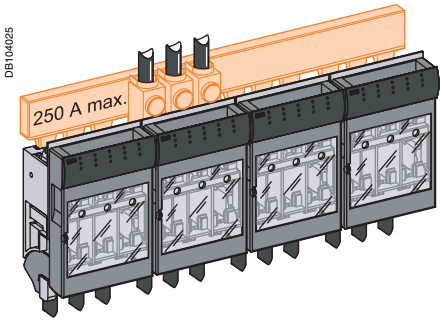
3 devices

DB104024



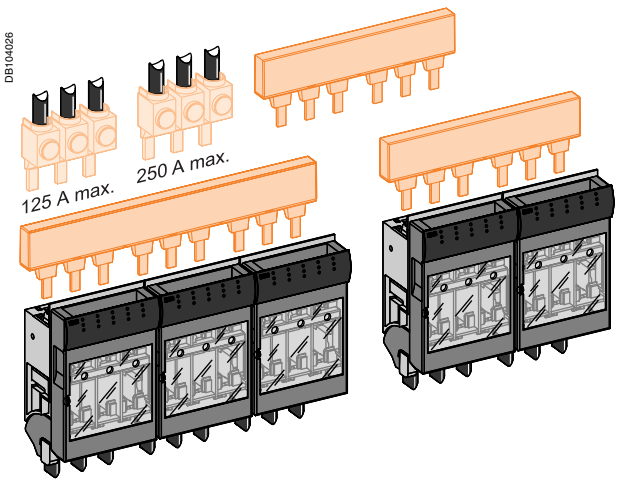
4 devices

DB104025



5 devices (3 + 2 + coupler)

DB104026



General characteristics: ISF.
Connection, coupling
Fupact ISFL160 to ISFL630

Three conversion kits are available for ISFL160 fusegear to adapt the 100 mm standard fixing centres to 60 or 185 mm.

These conversion kits may be used to connect fuse-switch disconnectors with different sizes and ratings to a given set of busbars:

- *for the 100/60 mm kit:*
  - *ISFL160/ISFT160/250/400/630*
- *for the 100/185 mm kit:*
  - *ISFL160/ISFL250/400/630*
  - *ISFL160/ISFL/250/400/630.*

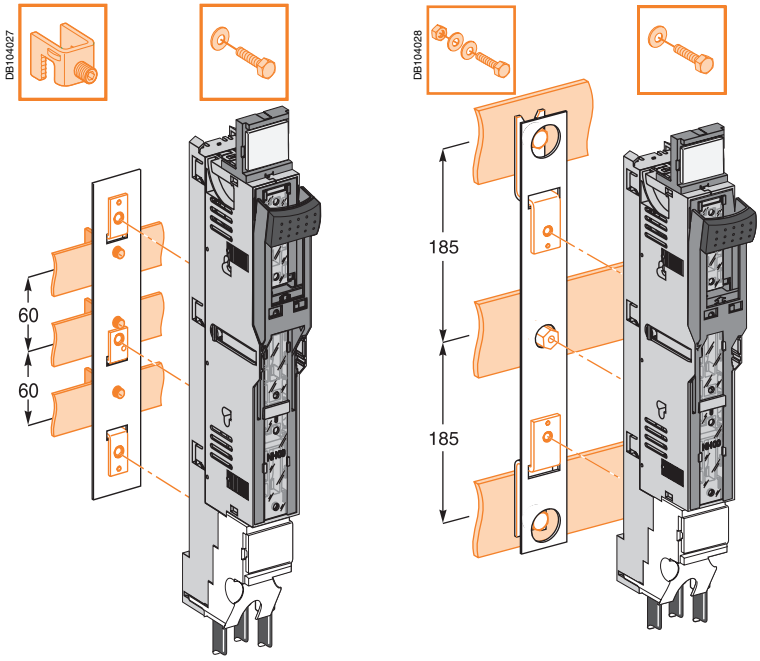
62341

ISFL160 (185 mm kit).

Conversion from 100 to 60 mm or 100 to 185 mm for a single device

Conversion kit for 60 mm busbars:
- the kit connects to the busbars via hook-on connection.

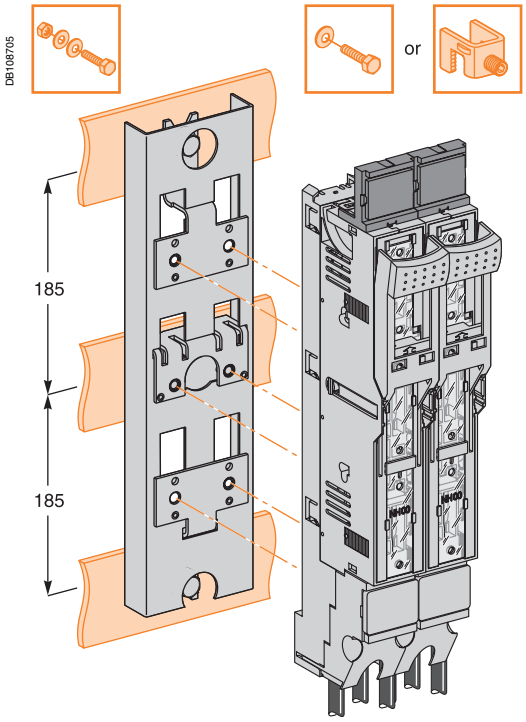
Conversion kit for 185 mm busbars:
- both electrical and mechanical connection to the busbars is ensured by a set of nuts and bolts,
- electrical and mechanical connection of the device to the 100/60 mm or 100/185 mm conversion kit is ensured by three screws.



Conversion from 100 to 185 mm for two devices

Conversion kit for 185 mm busbars:
- both electrical and mechanical connection to the busbars is ensured by a set of nuts and bolts.

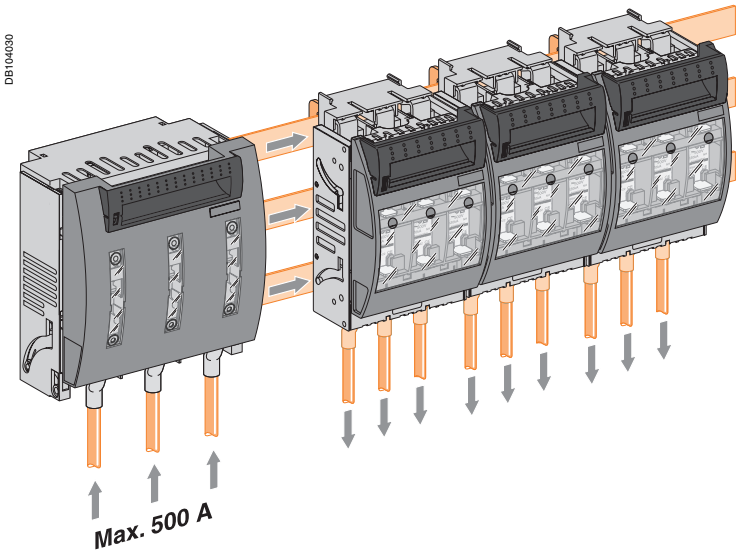
Electrical and mechanical connection of the device to the conversion kit is ensured by three screws or by hook-on connection.



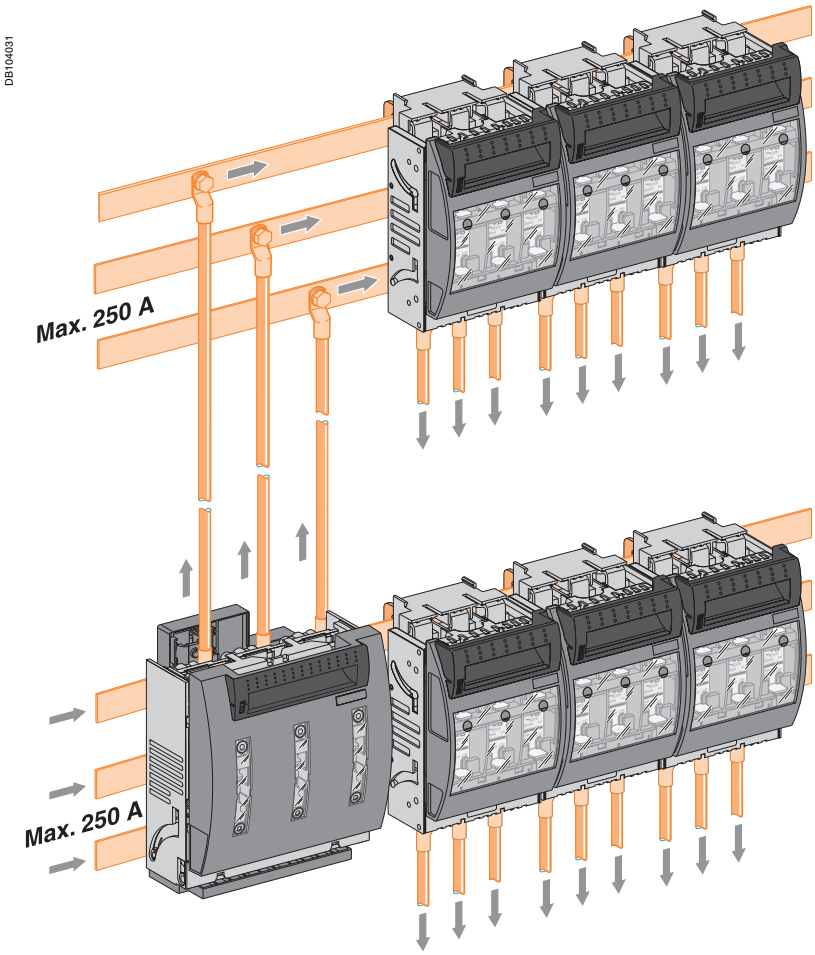
General characteristics: ISF.
Variations in installation systems
Fupact ISFT100 to ISFT630

Many connection and supply possibilities

Supplying a set of busbars from an incoming device.

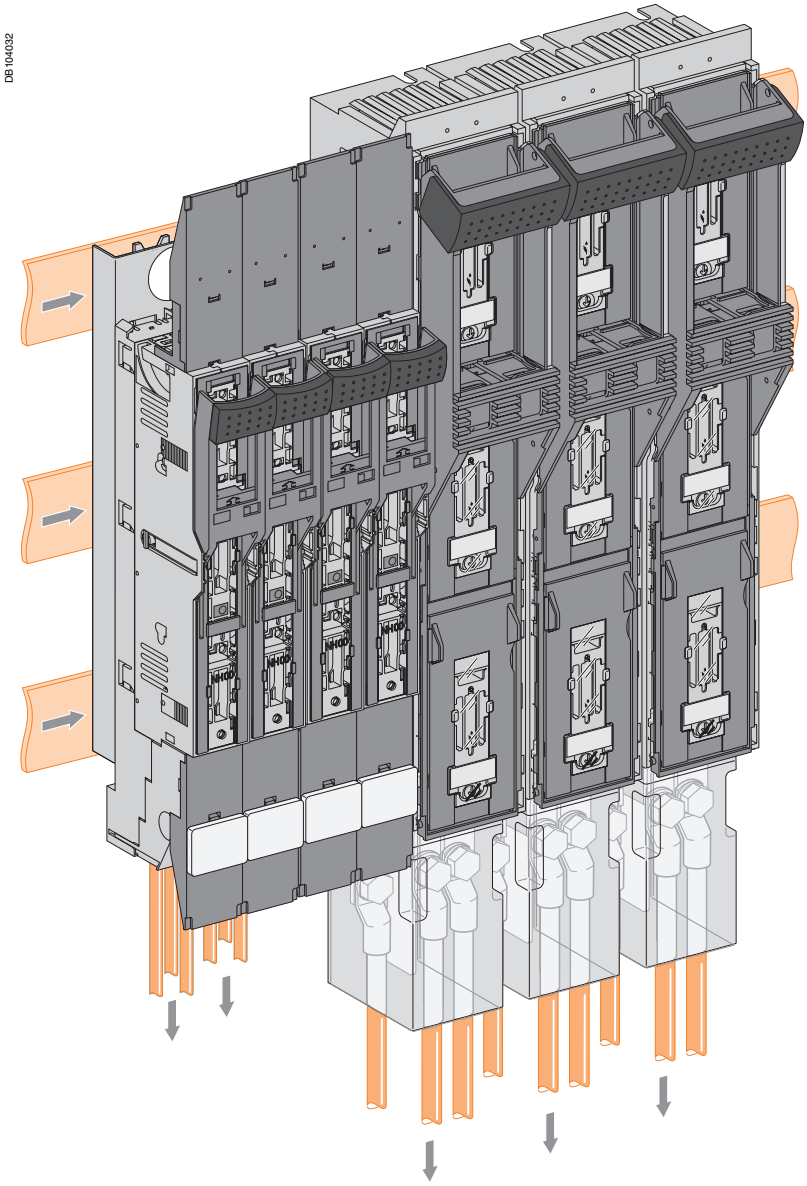


Supplying two sets of busbars from an incoming device.



General characteristics: ISF.
Variations in installation systems
Fupact ISFL160 to ISFL630

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



Selection of fuse-switch disconnectors
Fupact ISFT100 to ISFT630

62193

ISFT100.

62194

ISFT160.

62195

ISFT630.

Fupact ISFT 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	Ith		at 40 °C
	Maximum fuse power dissipation (W)			
	In enclosure	Ithe		at 40 °C
	Maximum fuse power dissipation (W)			
Rated insulation voltage (V)		Ui	AC 50/60 Hz / DC	
Rated impulse-withstand voltage (kV)		Uimp		
Rated operational voltage (V)		Ue	AC 50/60 Hz	
			DC	
Rated operational voltage (AC20 and DC20) (V)		Ue		
Rated operational current (A)		Ie	AC 50/60 Hz	
				220/240 V
				380/415 V
				440/480 V (2)
				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)/ In fuse-link (A) (3)		Icn/Icm/In fuse-link		415 V
				500 V
				690 V
Endurance (category B) (CO cycles)			Mechanical	
			Electrical AC	AC22B 415 V
				AC21B 690 V
Suitability for isolation				
Visible break				
Pollution degree				
Control				
Direct front rotary handle (operator-dependent opening and closing)				
Locking	Padlocks			
	Lead seal			
Indication auxiliary				
Auxiliary contacts				
Fuse monitor				
Blown-fuse indicator				
Installation and connection accessories				
Mounting position	Horizontal			
	Vertical			
Bare-cable connectors				
Other connectors	For bare Cu/Al cables			
	For flexible bars			
Distribution connector				
Lugs for copper cables				
Comb busbars				
Insulated comb covers				
Incoming connector for comb busbars				
Terminal shields				
Dimensions and weight				
Overall dimensions H x W x D (mm)		3P		
Approximate weight without fuse-links (kg)		3P		

(1) With 95 mm² connector.
(2) Suitable for 480 V NEMA.
(3) Fuse-switch disconnector with fuse-links.

Selection of fuse-switch disconnectors
Fupact ISFT100 to ISFT630 (cont.)

ISFT100		ISFT160		ISFT250		ISFT400		ISFT630	
3P/DIN (NH)		3P/DIN (NH)		3P/DIN (NH)		3P/DIN (NH)		3P/DIN (NH)	
160 (1)		160		250		400		630	
9		12		23		34		48	
160 (1)		160		250		400		630	
9		12		23		34		48	
690		800		800		800		800	
6		8		8		8		8	
690		690		690		690		690	
440		440		440		440		440	
690		800		800		800		800	
AC21B	**AC22B**	**AC21B**	**AC22B**	**AC21B**	**AC22B**	**AC21B**	**AC22B**	**AC21B**	**AC22B**
160	160	160	160	250	250	400	400	630	630
160	160	160	160	250	250	400	400	630	630
100	-	160	-	250	-	400	-	630	-
100	-	160	-	250	-	400	-	630	-
100	-	100	-	250	-	400	-	630	-
DC21B	**DC22B**	**DC21B**	**DC22B**	**DC21B**	**DC22B**	**DC21B**	**DC22B**	**DC21B**	**DC22B**
100/1	-	160/1	-	250/1	-	400/1	-	630/1	-
100/1	-	160/1	-	250/1	-	400/1	-	630/1	-
100/1	-	160/2	-	250/2	-	400/2	-	630/2	-
■		■		■		■		■	
80 / 176 / 100		50 / 105 / 160		50 / 105 / 250		50 / 105 / 400		50 / 105 / 630	
50 / 105 / 100		50 / 105 / 160		50 / 105 / 250		50 / 105 / 400		50 / 105 / 630	
50 / 105 / 100		50 / 105 / 100		50 / 105 / 200		50 / 105 / 315		50 / 105 / 500	
2000		1600		1600		1000		1000	
300		200		200		200		200	
300		200		200		200		200	
■		■		■		■		■	
■		■		■		■		■	
III		III		III		III		III	
■		■		■		■		■	
-		-		-		-		-	
■		■		■		■		■	
■		■		■		■		■	
-		■		■		■		■	
-		■		-		-		-	
■		■		■		■		■	
■		■		■		■		■	
■		■		-		-		-	
-		■		■		■		■	
-		■		■		■		■	
■		■		-		-		-	
		■		■		■		■	
■		-		-		-		-	
■		-		-		-		-	
■		-		-		-		-	
-		■		■		■		■	
141 x 89 x 71		163 x 107 x 80		246 x 186 x 110		271 x 210 x 127		271 x 250 x 132	
0.46		0.64		2.06		2.96		4.00	

Selection of fuse-switch disconnectors
Fupact ISFT100 to ISFT630 (cont.)

Fupact ISFT fuse-switch disconnectors

Type of fuse-link		
	DIN NH000	
	DIN NH00	
	DIN NH1	
	DIN NH2	
	DIN NH3	
Installation and connection		
Symmetrical rail		
Direct connection on backplate		
Push-on connection to 60 mm busbars		
Hook-on connection to 60 mm busbars		
Hook-on connection to 100 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

(1) Derating data is based on:
- the maximum rating for fuse-links intended for the device,
- maximum heat loss.
(2) For installation on a ceiling, derate an additional 10 %.
(3) With 100/160 A fuse-link

Selection of fuse-switch disconnectors
Fupact ISFT100 to ISFT630 (cont.)

	ISFT100	ISFT160	ISFT250	ISFT400	ISFT630
	■	■	-	-	-
	-	■	-	-	-
	-	-	■	-	-
	-	-	-	■	-
	-	-	-	-	■
	■	-	-	-	-
	■	■	■	■	■
	-	■	■	-	-
	-	■	■	■	■
	-	-	■	■	■
	see page 90				
	100/160 (3)	160	250	400	630
	100/160	160	250	400	630
	95/152	152	238	380	599
	90/144	144	225	360	567
	85/136	136	213	340	536
	80/128	128	200	320	504
	75/120	120	188	300	473
	70/112	112	175	280	441
	100/160	160	250	400	630
	95/152	152	238	380	599
	90/144	144	225	360	567
	85/136	136	213	340	536
	80/128	128	200	320	504
	75/120	120	188	300	473
	70/112	112	175	280	441

Selection of fuse-switch disconnectors
Fupact ISFL160 to ISFL630

62196

ISFL160.

62197

ISFL250.

Fupact ISFL 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	Ith		at 40 °C
	Maximum fuse power dissipation (W)			
	In enclosure	Ithe		at 40 °C
	Maximum fuse power dissipation (W)			
Rated insulation voltage (V)		Ui	AC 50/60 Hz / DC	
Rated impulse-withstand voltage (kV)		Uimp		
Rated operational voltage (V)		Ue	AC 50/60 Hz	
			DC	
Rated operational voltage (AC20 and DC20) (V)		Ue		
Rated operational current (A)		Ie	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)/ In fuse-link (A) (2)		Icn/Icm/In fuse-link		415 V
				500 V
				690 V
Endurance (category B) (CO cycles)			Mechanical	
			Electrical AC	AC22B 415 V
				AC21B 690 V
Suitability for isolation				
Visible break				
Pollution degree				
Control				
Direct front rotary handle (operator-dependent opening and closing)				
Locking	Padlocks			
	Lead seal			
Indication auxiliary				
Auxiliary contacts				
Blown-fuse indicator				
Current transformer				
Installation and connection accessories				
Mounting position	Horizontal			
	Vertical			
Connector	For bare Cu/Al cables			
	For flexible bars			
Lugs for Cu/Al cables				
Terminal shields				
Coupling accessories				
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 disconnector with fuse-links.
(3) Only for ISF160 with direct connection to the busbars.

Selection of fuse-switch disconnectors
Fupact ISFL160 to ISFL630 (cont.)

ISFL160		ISFL250		ISFL400		ISFL630	
3P/DIN (NH)		3P/DIN (NH)		3P/DIN (NH)		3P/DIN (NH)	
160		250		400		630	
12		23		34		48	
160		250		400		630	
12		23		34		48	
800		800		800		800	
8		8		8		8	
690		690		690		690	
440		440		440		440	
800		800		800		800	
AC21B	**AC22B**	**AC21B**	**AC22B**	**AC21B**	**AC22B**	**AC21B**	**AC22B**
160	160	250	250	400	400	630	630
160	160	250	250	400	400	630	630
160	-	250	-	400	-	630	-
160	-	250	-	400	-	630	-
100	-	250	-	400	-	630	-
DC21B	**DC22B**	**DC21B**	**DC22B**	**DC22B**	**DC21B**	**DC22B**	**DC21B**
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
■		■		■		■	
50 / 105 / 160		100 / 220 / 250		100 / 220 / 400		100 / 220 / 630	
50 / 105 / 160		50 / 105 / 250		50 / 105 / 400		50 / 105 / 630	
50 / 105 / 100		50 / 105 / 200		50 / 105 / 315		50 / 105 / 500	
1600		1600		1000		1000	
200		200		200		200	
200		200		200		200	
■		■		■		■	
■		■		■		■	
III		III		III		III	
■		■		■		■	
■		■		■		■	
-		-		-		-	
■		■		■		■	
-		-		-		-	
■ (3)		■		■		■	
■		-		-		-	
■		■		■		■	
■		■		■		■	
■		-		-		-	
■		-		-		-	
■		■		■		■	
■		■		■		■	
456 x 50 x 159		755 x 100 x 192		755 x 100 x 192		755 x 100 x 192	
1.35		6.35		6.35		6.35	

Selection of fuse-switch disconnectors
Fupact ISFL160 to ISFL630 (cont.)

Fupact ISFL fuse-switch disconnectors

Type of fuse-link		
	DIN NH000	
	DIN NH00	
	DIN NH1	
	DIN NH2	
	DIN NH3	
Installation and connection		
Hook-on connection to 60 mm busbars		
Direct connection to 100 mm busbars		
Direct connection to 185 mm busbars		
To 60 mm busbars using single-device conversion kit		
To 185 mm busbars using single or double device conversion kit		
Tightening torque (Nm)		
Temperature derating (with gG fuse-link) (1)		
"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

(1) Derating data is based on:
- the maximum rating for fuse-links intended for the device
- maximum heat loss.

Selection of fuse-switch disconnectors
Fupact ISFL160 to ISFL630 (cont.)

	ISFL160	ISFL250	ISFL400	ISFL630
	■	-	-	-
	■	-	-	-
	-	■	-	-
	-	-	■	-
	-	-	-	■
	■	-	-	-
	■	-	-	-
	-	■	■	■
	■	-	-	-
	■	-	-	-
	see page 90	-	-	-
	160	250	400	630
	152	238	380	599
	144	225	360	567
	136	213	340	536
	128	200	320	504
	120	188	300	473
	112	175	280	441
	160	-	-	-
	152	-	-	-
	144	-	-	-
	136	-	-	-
	128	-	-	-
	120	-	-	-
	112	-	-	-

Insulation
Fupact ISFT100 to ISFT630

Insulation accessories used to protect against direct contact with the power circuits.
The escutcheons (single and double with one free slot) for ISFT160-250-400 devices can be used to install 2, 3 or 4 devices on a single switchboard row (or more if the switchboard is wide enough).
These escutcheons require a single cutout format in the switchboard front panel.
For the ISFT100, escutcheons are not compatible with comb busbars.
In this case, the switchboard manufacturer must take the necessary measures to ensure the degree of protection (IP) of the switchboard. All ISFT devices are equipped with shields that extend beyond the top and bottom of the device to help maintain the degree of protection when an escutcheon is not used.

62305

Insulated comb cover for unused teeth.

62306

Escutcheon.

62307

Terminal shields.

62308

Escutcheon.

62309

Terminal shields.

62310

Escutcheon.

Insulation of live parts

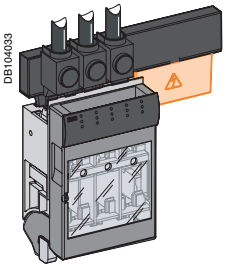
Escutcheon

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

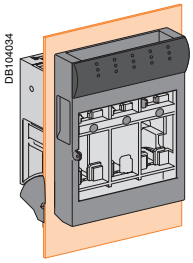
Type	Escutcheon type		
			
ISFT100	■	■	-
ISFT160	■	-	■
ISFT250	■	-	■
ISFT400	■	-	■
ISFT630	■	-	-

ISFT100 fusegear

DB104033

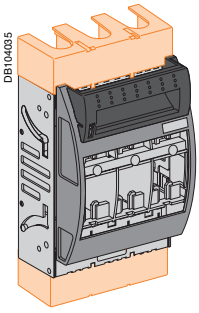


DB104034

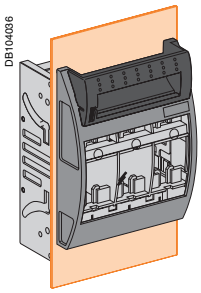


ISFT160 fusegear

DB104035

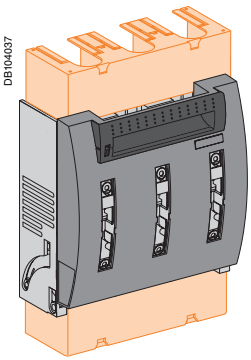


DB104036

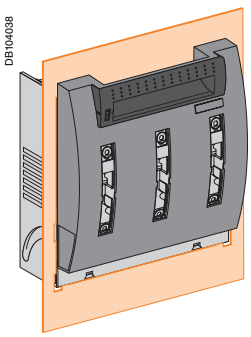


ISFT250/400/630 fusegear

DB104037



DB104038



Insulation
Fupact ISFL160 to ISFL630

62311

Length adapter.

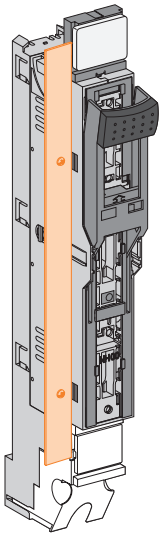
Side cover for front panel cutout.

62312

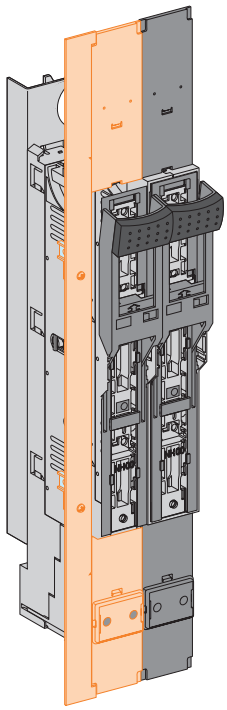
Cover for free slot.

ISFL160 fusegear

DB104039



DB104040



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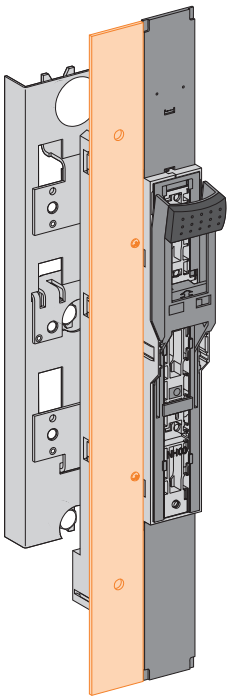
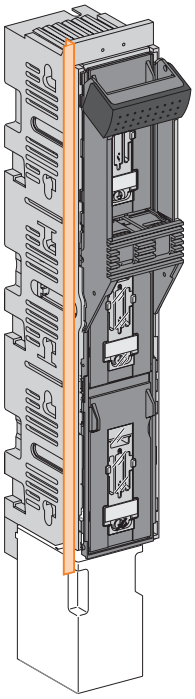


ISFL250/400/630 fusegear

62313

Side cover for front panel cutout.

DB104042



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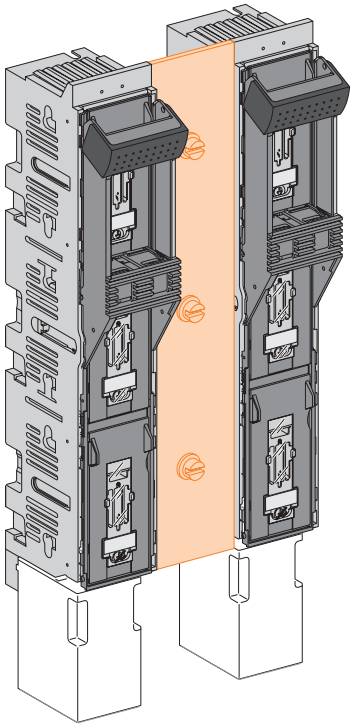


62314

Cover for free slot.

PB101086-20

CB (ISFL630).

Connection and connection accessories
Fupact ISFT100 to ISFT630

Fupact fuse-switch disconnectors can supply distribution circuits via either the top or bottom terminals.

Devices intended for connection to busbars are configured as standard for distribution via the bottom terminals.

ISFT fusegear is equipped as standard with connectors or terminals for front connection of:
- bare cables for the ISFT100 and ISFT160
- cables with lugs for the ISFT160 to 630
- flexible bars for the ISFT160 to 630.

	ISFT100	ISFT160	ISFT250	ISFT400	ISFT630
Cables					
Connector (standard)	1.5 to 50 mm^2		-		
Lug to terminal	-	95 mm^2	100 to 300 mm^2		
Connector to terminal	-	1.5 to 95 mm^2	6 to 150 mm^2	6 to 240 mm^2	
Flexible bars					
Connector	-	12 x 6 mm	16 x 15 mm	21 x 15 mm	

DB104406

62315

Distribution connector.

62316

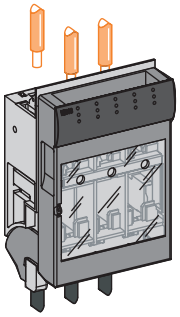
Incoming connector for comb busbars.

62317

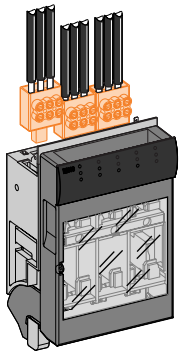
Comb busbar.

ISFT100 fusegear

DB104414



DB104396



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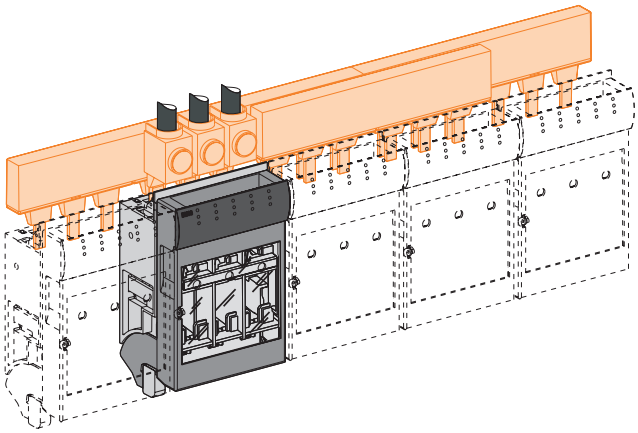
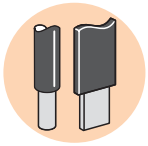


Connection and connection accessories
Fupact ISFT100 to ISFT630 (cont.)

DB104407



62330

Lug for copper cables.

62318

Distribution connector.

62319

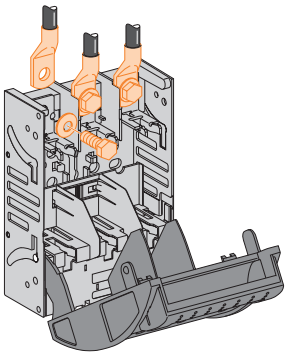
Connector for bare Cu/Al cables.

62320

Connector for flexible bars.

ISFT160 fusegear

DB104399



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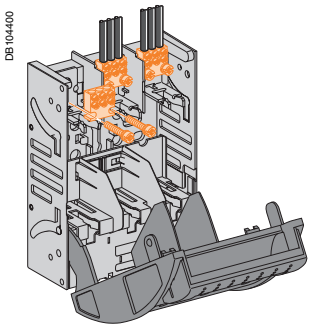

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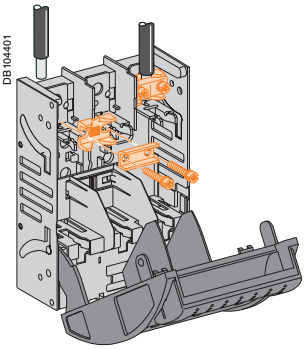

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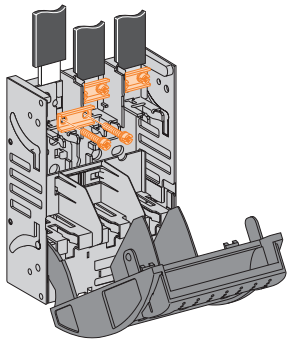

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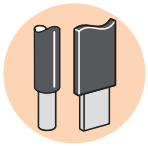


62330

Lug for copper cables.

62321

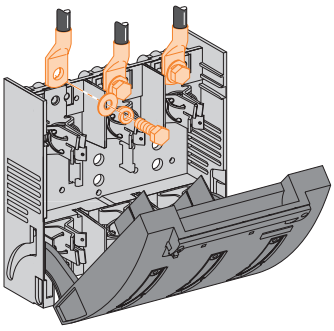
Connector for bare Cu/Al cables.

62322

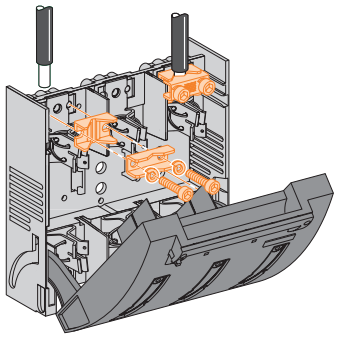
Connector for flexible bars.

ISFT250/400/630 fusegear

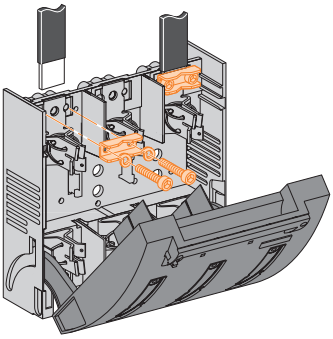
DB104403



DB104404



DB104405



Connection and connection accessories
Fupact ISFL160 to ISFL630

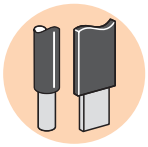
Fupact fuse-switch disconnectors can supply distribution circuits via either the top or bottom terminals.

Devices intended for connection to busbars are configured as standard for distribution via the bottom terminals.

ISFT fusegear is equipped as standard with connectors or terminals for front connection of:
- cables with lugs for the ISFL160
- flexible bars for the ISFL160
- bare cables for the ISFL160 to 630.

	ISFL160	ISFL250	ISFL400	ISFL630
Cables				
Lug to terminal	95 mm²	-	-	-
1-cable connector to terminal	1.5 to 95 mm²	25 to 240 mm²		
2-cable connector to terminal	-	25 to 185 mm²		
Flexible bars				
Connector	12 x 6 mm	-	-	-

DB104407



62330

Lug for copper cables.

62323

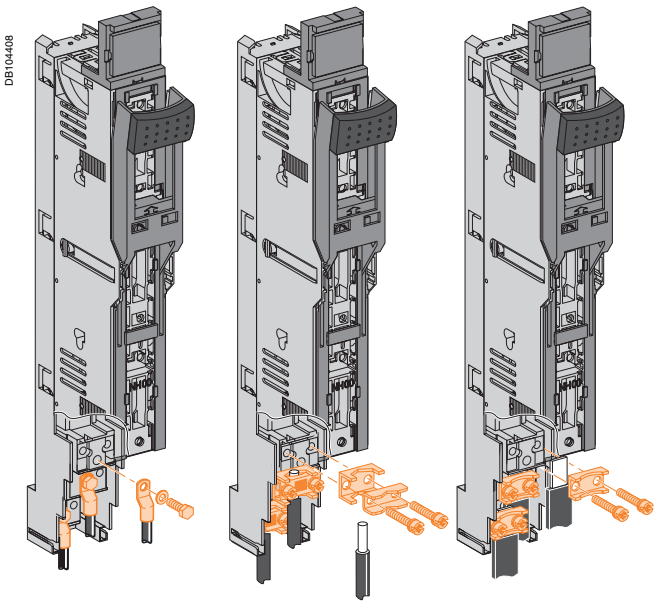
Connector for bare Cu/Al cables.

62324

Connector for flexible bars.

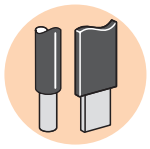
ISFL160 fusegear

DB104408



Connection and connection accessories
Fupact ISFL160 to ISFL630 (cont.)

DB104407



PB101085-18

1-cable connector.

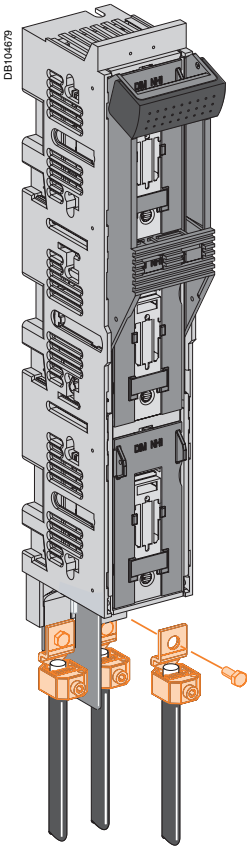
PB101086-22

2-cable connector.

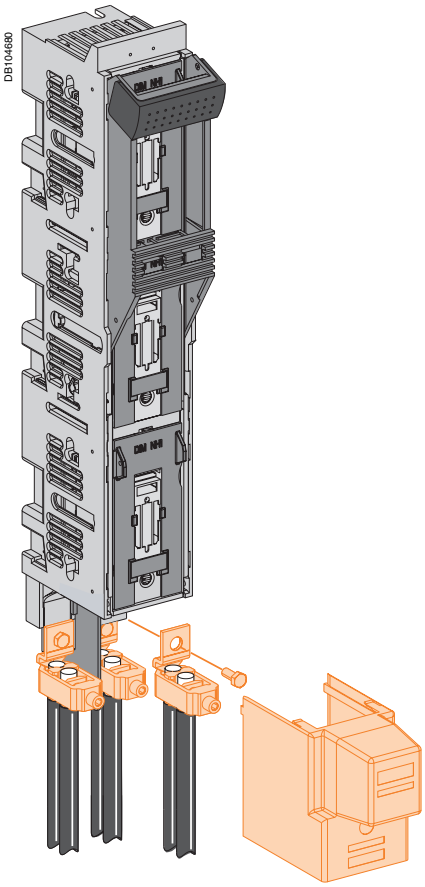
PB101801-23

ISFL250/400/630 fusegear

DB104679



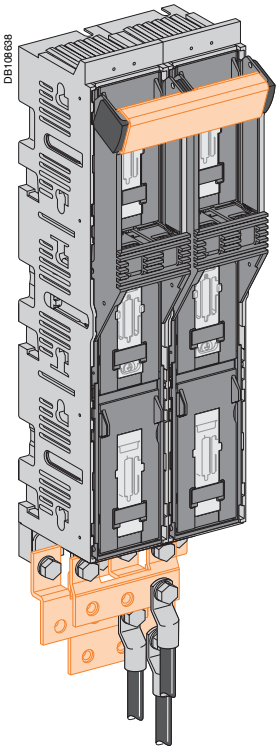
DB104680



Coupling of two ISFL250/400/630 devices

An assembly including a handle-coupling kit and a connection-coupling kit can be used to connect two ISFL250/400/630 devices in parallel.

DB108638



Control, locking and operation
Fupact ISF.100 to ISF.630

The main moving contacts are controlled by:
- *the pivoting fuse-carrier assembly forming the cover for the ISFT*
- *the drawout fuse-carrier assembly for the ISFL.*

when in open position, the fuse-switch disconnector fuse-carrier assembly guarantees isolation with visible break.

62342

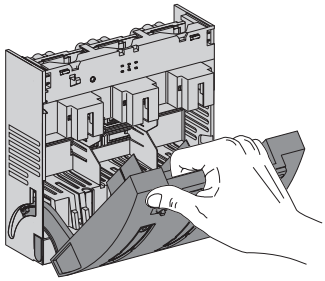
ISFT630.

Access to the fuse-links:
- *may be protected by lead seals on the ISFT*
- *is automatically blocked on the ISFL when the fusegear is closed*
- *may be protected using padlocks on the ISFL or lead seals on the ISFT.*

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

Control

E94852



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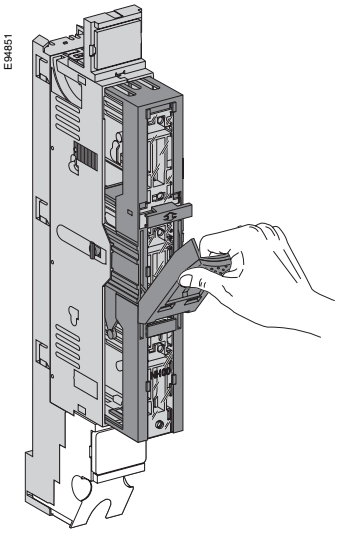
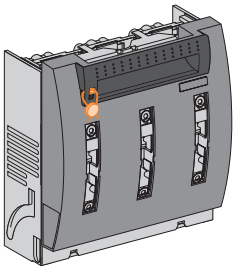


Locking

DB104044

On

DB104061

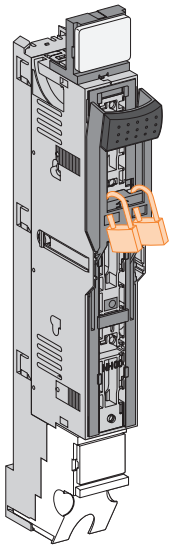


Lead-seal locking for the ISFT100 to ISFT630.

DB104045

On

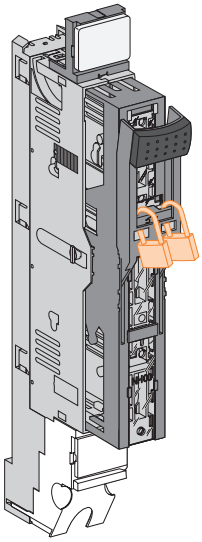
DB104062



DB104045

Off

DB104063



Padlocking for the ISFL160 to ISFL630.

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

Type	Function	Means	Accessory
ISFT100 ISFT160 ISFT250 to ISFT630	Device locking in closed (ON) position	Lead seal	Built-in
ISFL160	Device locking in closed (ON) or open (OFF) position	Padlocks max. 2 Ø6	Built-in
ISFL250 to ISFL630		max. 4 Ø8	

Control, locking and operation
Fupact ISF•100 to ISF•630 (cont.)

For ISF• fusegear, the fuse-carrier assembly serves both to control the device and house the fuse-links.

For fuse-switch disconnectors ISFT100 and ISFT630, the fuse-carrier assembly forming the cover contains the three fuse-links side by side, for the ISFL160, the three fuse-links are installed vertically in a drawout fuse-carrier assembly and finally, for the ISFL250/400/630, the drawout fuse-carrier assembly includes three removable fuse compartments.

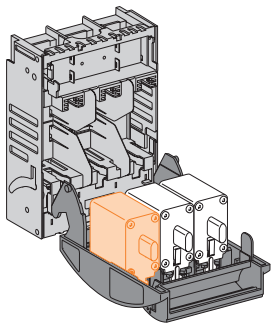
62343a

ISFL630.

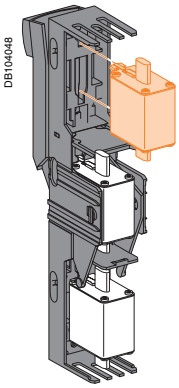
Fuse-carriers

Compatibility between ISF• fuse-switch disconnectors and fuse-links (NH)

DB104047

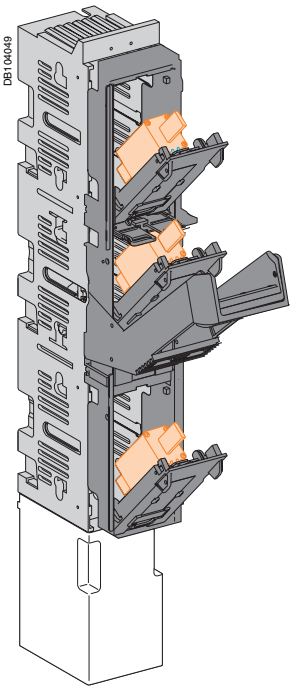


DB104048



Fuse-carrier assembly in cover for the ISFT100 to ISFT630

DB104049



Drawout fuse-carrier assembly for the ISFL160 to 630

Type of DIN fuse-link	NH000	NH00	NH1	NH2	NH3
ISFT100	■	-	-	-	-
ISFT160	■	■	-	-	-
ISFT250	-	-	■	-	-
ISFT400	-	-	-	■	-
ISFT630	-	-	-	-	■
ISFL160	■	■	-	-	-
ISFL250	-	-	■	-	-
ISFL400	-	-	-	■	-
ISFL630	-	-	-	-	■

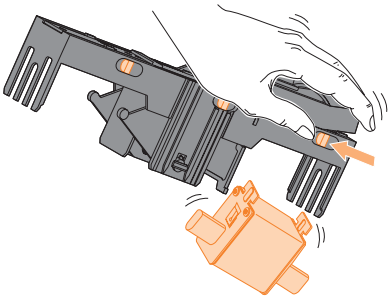
Insertion and removal of fuse-links

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

DB104064

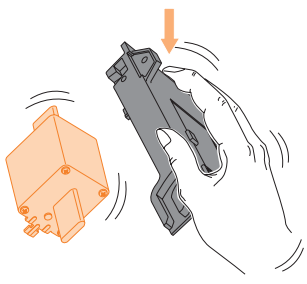
ISFT100 to ISFT630.

DB104050



ISFL160.

DB104051



ISFL250 to ISFL630.

Auxiliary contacts and indications
Fupact ISF.100 to ISF.630

Auxiliary contact NO + NC.

The optional auxiliary contacts carry out indication functions.
They can remote fuse-switch disconnector status information. 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	
	1 2 4	**Maximum number**
ISFT100	■	2
ISFT160	■	2
ISFT250	■	2
ISFT400	■	2
ISFT630	■	2
ISFL160	■	2
ISFL250	■	6
ISFL400	■	6
ISFL630	■	6

Auxiliary changeover contact					
Conventional thermal current Ith (A)		2			
Rated insulation voltage (V)		250			
Minimum load		100 mA at 24 V			
		AC		**DC**	
Load		Resistive	Inductive	Resistive	Inductive
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 ISF•100 to ISF•630 (cont.)

62325

Auxiliary contact for:
ISFT100-250-400-630
ISFL160-250-400-630.

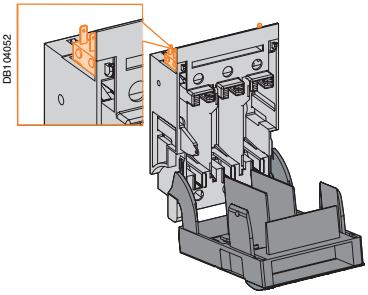
62327

Auxiliary contact for the ISFT160.

Positions of auxiliary contacts

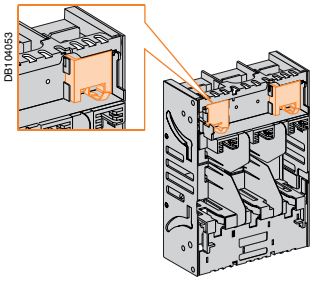
For the ISFT100

DB104052



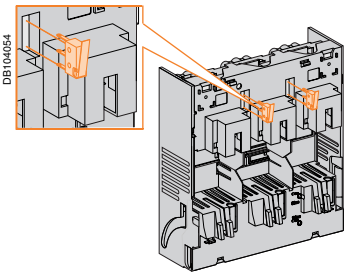
For the ISFT160

DB104053



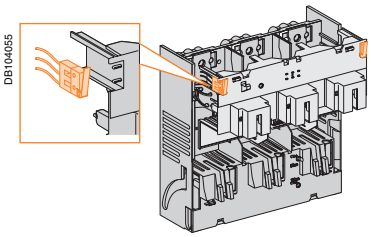
For the ISFT250

DB104054



For the ISFT400/630

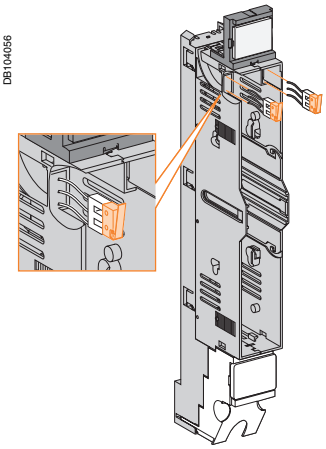
DB104055



Positions of auxiliary contacts

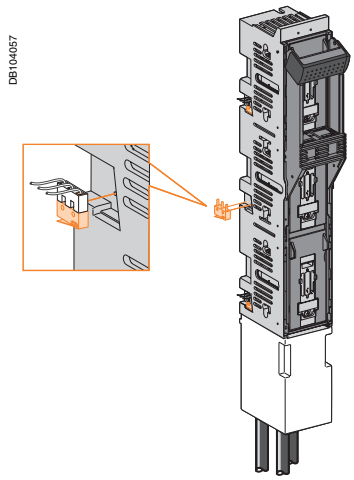
For the ISFL160

DB104056



For the ISFL250/400/630

DB104057



Fuse monitor
Fupact ISFT160/250/400/630

PB101794-36

ISFT160 fuse monitor.

PB101799-36

ISFT400 equipped with a fuse monitor (supply via top terminals).

Functions
This device remotes status information on 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
- operation with standard fuses: DIN
- 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: 380…690 V AC, ±10 %, 50/60 Hz
- tested for electromagnetic compatibility (EMC)
- mounting:
  - connected to the fuse-carrier assembly forming the cover
  - one version for fusegear supplied via the bottom terminals
  - one version for fusegear supplied via the top terminals.
- the fuse monitor is equipped with one NO contact and one NC contact.

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:

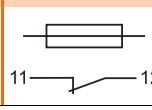
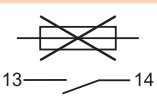
- the NO contact is for remote fault indication
- the NC contact may be used, for example, to control an undervoltage device in order to shut down equipment that may be sensitive to single-phasing.

Fuse monitor
Fupact ISFT160/250/400/630 (cont.)

Electrical characteristics					
Power circuit					
Supply voltage		380 to 690 V AC 50/60 Hz ±10 %			
Power consumption		< 3 VA			
Rated frequency		50/60 Hz			
Measurement impedance		> 1000 Ω/V			
Impulse withstand voltage Uimp (1.2/50 µs)	Phase to phase	6 kV			
	Upstream / downstream	6 kV			
Auxiliary contact output terminals					
Terminals	NO	13 - 14			
	NC	21 - 22			
Wire size	Flexible	⩽ 1.5 mm² Cu			
	Rigid	⩽ 2.5 mm² Cu			
Output contact characteristics (1NO + 1NC)					
Rated thermal current Ith (A)		2			
Rated insulation voltage (V)		230			
Minimum load		3 mA at 24 V			
characteristics		**AC**		**DC**	
Utilisation category (IEC 60947-5-1)		**AC12**	**AC15**	**DC12**	**DC13**
Operational current (A)	24 V	-	-	-	2
	48 V	2	2	-	-
	110 V	2	2	-	-
	220/240 V	2	2	-	-
	250 V	2	2	-	-
	380/415 V	-	-	-	-
	440 V	-	-	-	-
	660/690 V	-	-	-	-
Rated voltage / max. breaking voltage (V AC)		230			
Rated breaking capacity (VA)		2000			
General characteristics					
Ambient operating temperature range (°C)		-25…+55			
Transport and storage temperature range (°C)		-40…+70			
Operating time (s)		< 0.5			
Overvoltage category / pollution degree		IEC 60947-1 III/3			
Dielectric test voltage (between power circuit and output terminals)		5 kV rms / 1 min 50 Hz			
Electromagnetic compatibility - emission					
Conducted disturbances		EN 55022 Class B			
Radiated		EN 55022 Class B			
Electromagnetic compatibility - immunity					
Electrostatic discharge (ESD)		EN 61000-4-2 category B level 2/3			
RF radiated field		EN 61000-4-3 category A level 3			
Electrical fast transient (EFT)		EN 61000-4-4 category B level 2			
Surge immunity test		EN 61000-4-5 level 4			
RF electromagnetic conducted		EN 61000-4-6 category A level 3			
RF electromagnetic field (GSM)		ENV 50204 category A			
Mechanical characteristics					
Degree of protection		IP20			
Weight (kg) / Rating		0.36/160 - 0.86/250 - 1.32/400 - 1.20/630			

PB101796-60

Functional table of contact status

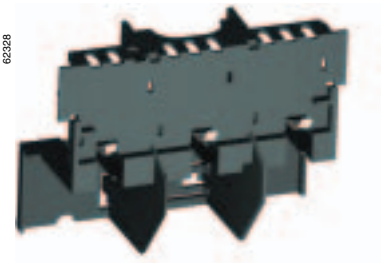
	Blown-fuse contact	
		

Blown-fuse indication contact					
Conventional thermal current Ith (A)		3			
Rated insulation voltage (V)		250			
Minimum load		10 mA at 24 V			
		AC		**DC**	
Load		Resistive	Inductive	Resistive	Inductive
Operational current (A)	24 V	2	-	2	-
	48 V	2	-	2	-
	110 V	2	-	2	-
	220/240 V	2	-	2	-
S (mm²) Cu		⩽ 1.5			

Blown-fuse indicator
Fupact ISFT160

Only the ISFT160 integrates the blown-fuse indication contacts in a separate adde-on unit.

62328



Blown-fuse indication contact unit.

Blown-fuse indicator

This system requires the use of striker fuse-links. It remotes the fuse-status information:

- it signals blown fuses
- it protects motors from overloads caused by operation on a single phase
- it avoids the risk of abnormal voltages on the neutral
- it must be used with DIN 00 blade type fuse-links as defined by standard IEC 60269-2-1, Annex A, section 1A, table B.

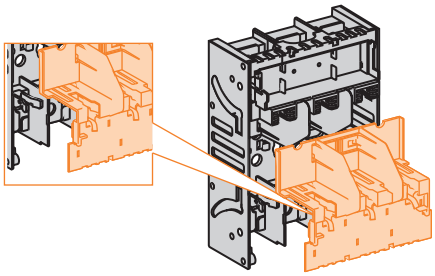
Functional table of contact status

	Blown-fuse changeover contact	
	1 2 4	**Maximum number**
ISFT160	■	1 set of 3

Blown-fuse changeover contact					
Conventional thermal current Ith (A)		6			
Rated insulation voltage (V)		250			
Minimum load		100 mA at 24 V			
		AC		**DC**	
Load		Resistive	Inductive	Resistive	Inductive
Operational current (A)	24 V	6	-	3	-
	48 V	6	-	1	-
	110 V	6	-	0.5	-
	220/240 V	6	-	0.25	-

Blown-fuse indication contact unit

DB104058



Checks and tests on fuse-links
Fupact ISF.100 to ISF.630

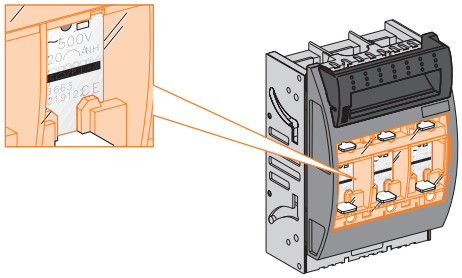
62194

ISFT160.

Checks

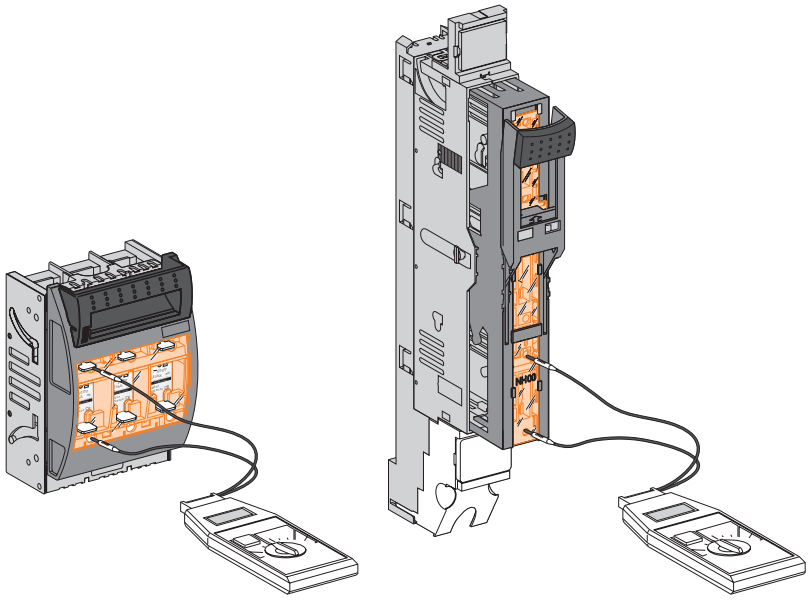
ISF. fuse-switch disconnectors are equipped with large windows so that the fuse-link technical characteristics are clearly visible.

DB104059



Tests

DB104060



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

Measurement accessory
Fupact ISFL160 to ISFL630

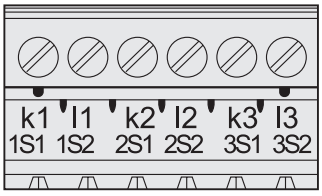
The current transformers (CTs) produce a current (0 - 5 A) on the secondary winding that is proportional to the current measured on the primary winding. They can therefore be used in conjunction with measurement devices (ammeters, energy meters), load-shedding devices, control relays, etc.

PB101797-18

62329

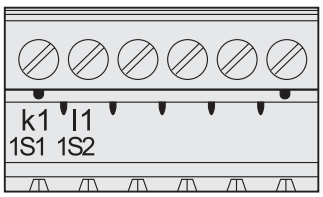
Current transformer (CTs).

DB108641



Terminal block of 3-pole 3-CT module for ISFL160.

DB108642



Terminal block of 3-pole 1-CT module for ISFL160.

Operation and implementation

ISFL160 to 630 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:
  - 4 ratings from 60 to 160 A
- single-pole module with one CT for ISFL250/400/630 fusegear:
  - 7 ratings from 150 to 600 A
- for ISFL160/250/400/630 fusegear, dummy CT modules (3-pole and single-pole versions) are available for depth compensation between the fusegear and the busbars (for outgoers not equipped for current measurement or equipped for current measurement on one phase only).
- the CT modules clip onto the back of the fusegear
- connections are made:
  - via terminal blocks for the 3-pole modules (ISFL160)
- via connectors and lugs for the single-pole modules (ISFL250/400/630).

Environment

Compliance with standards: IEC 600 44-1, NFC 42502, VDE 0414, BS 7626 and IEC 600 38-1.
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 technical characteristics:
- maximum operational voltage (V): 800 V
- secondary current: 5 A
- frequency: 50 to 60 Hz
- continuous overload current: 1.2 In
- safety factor: Fs ⩽ 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.

Selection table

ISFL160				ISFL250 to 630			
Ip/5	Accuracy class Power (VA)			Ip/5	Accuracy class Power (VA)		
	0.5	1	3		0.5	1	3
60/5	0	1.5	2.5	150/5	2.5	2.5	2.5
100/5	2.5	2.5	2.5	200/5	2.5	5	5
125/5	2.5	2.5	2.5	250/5	2.5	5	5
160/5	2.5	2.5	2.5	300/5	2.5	5	5
				400/5	2.5	5	5
				500/5	5	10	10
				600/5	5	10	10

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.

Measurement accessory
Fupact ISFL160 to ISFL630 (cont.)

ISFL250/400/630 (with CTs).

ISFL160 (with CTs).

CT accuracy class:

Measurement system

Merlin Gerin device	Consumption in VA
72 x 72 mm ammeter	0.75
Analogue ammeter	1.25
Digipact IM100 ammeter	0.5
Digital ammeter	0.3
PM Power Meter	0.25
CDS	0.25
RCI	0.5
Three-phase CE	1
Three-phase CEr	1
Varlogic regulator	0.7
PM500	0.1
CM3000	0.15

Primary copper cross-section in mm²	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 the temperature, the power drawn by the cables increases 4 %.

Example of measurement-system consumption at 40 °C:

4 m of 2.5 mm² double wire	1.7 VA
PM500	+ 0.1 VA
Total consumption	= 1.8 VA

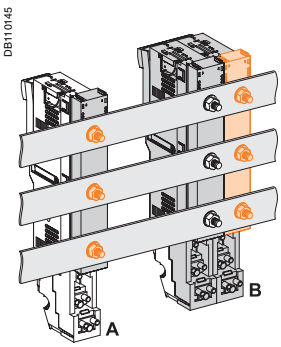
The accuracy class of the CT is determined:

- 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.

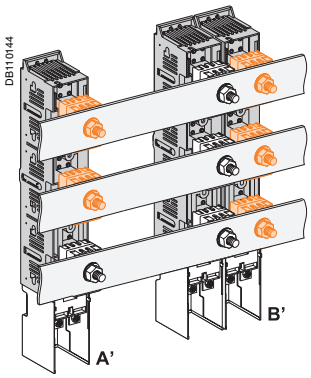
Dummy transformers

Measurements can be carried out on one or three phases. A dummy transformer serves as a spacer and also ensures electrical continuity.



Configuration A
Measurement on 1 phase:
- 1 ISFL250/630 fuse-switch disconnector
- 1 three-pole 1-CT transformer module.

Configuration B
Measurement on 3 phases:
- 2 ISFL250/630 fuse-switch disconnectors
- 1 three-pole 3-CT transformer module
- 1 three-pole dummy transformer module for depth compensation.



Configuration A'
Measurement on 1 phase:
- 1 ISFL250/630 fuse-switch disconnector
- 1 single-pole measurement CT
- 2 dummy single-pole CT modules for depth compensation.

Configuration B'
Measurement on 3 phases:
- 2 ISFL250/630 fuse-switch disconnectors
- 3 single-pole measurement CTs
- 3 dummy single-pole CT modules for depth compensation.

Installation in Prisma Plus

Prisma Plus is the Schneider Electric installation system for distribution switchboards in commercial and industrial buildings.
Whatever the switchboard configuration, Prisma Plus 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.

Prisma Plus functional system

- Mounting of Merlin Gerin and Telemecanique devices guarantees correct operation of installations.
- The supplied configuration complies with standard IEC 60439-1 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 Plus includes two ranges

System 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 another	Can be combined side by side and one on top of another

System 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*

PD391148

Fupact in Prisma Plus

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

PD391150

Installation in Prisma Plus
Fupact INF.
Direct front rotary handle

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

059000


056503


056502


056504


PD391151


Fusegear concerned

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

Types of Prisma Plus enclosures

Prisma Plus System G wall-mount and floor-standing enclosures and Prisma Plus System P cubicles

Fusegear installation

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

Vertical or horizontal mounting.
Depending on the rating, one to four devices can be installed per row.

	Vertical		No. of	Horizontal		No. of
Rating	3P	4P	modules	3P	4P	modules
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 in the rear of enclosures.
Connections are made by the panel builder.

Installation in System P cubicles

Vertical or horizontal mounting.
Depending on the rating, one to four devices can be installed per row.

	Vertical		No. of	Horizontal		No. of
Rating	3P	4P	modules	3P	4P	modules
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
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.

Installation in Prisma Plus
Fupact ISFT

ISFT100 fusegear can be supplied by comb busbars connected to the main busbars. ISFT160 to 630 devices can be supplied directly by busbars using a connection kit, itself connected to the main busbars by prefabricated connections.

Fusegear concerned

ISFT100 and 250 for System G wall-mount and floor-standing enclosures
ISFT100 to 630 for System P cubicles

Types of Prisma Plus enclosures

Prisma Plus System G wall-mount and floor-standing enclosures and Prisma Plus System P cubicles

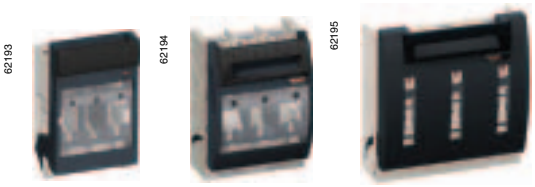
Fusegear installation

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

Vertical or horizontal mounting (incomer)

- ■ Horizontal mounting (ISFT160, ISFT250):
  - □ 1 device per row, three 50 mm modules (150 mm), for ISFT160
  - □ 1 device per row, five 50 mm modules (150 mm), for ISFT250
  - □ mounting plates secured in the rear of wall-mount enclosures
  - □ upstream connections via cables
  - □ downstream connections are made by the panel builder.
- ■ Vertical mounting:
  - □ depending on the rating, one to five devices can be installed per row.

Rating	Number of devices	Number of modules
100 A (on mounting plate)	5	7
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:
  - □ ISFT100, on mounting plates secured in the rear of wall-mount enclosures
  - □ ISFT160 equipped with terminal shields, on mounting plates secured in the rear of wall-mount enclosures or ducts, or on lateral cross-members with direct connection to busbars (60 mm fixing centres).

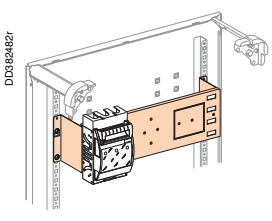
ISFT100 devices can be supplied by comb busbars.
Connections are made by the panel builder.
Front plates with cut-outs can be used to maintain the degree of protection IP xxB.

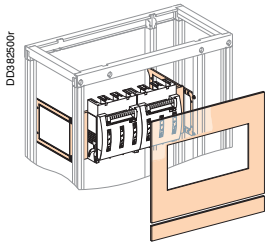
Installation in System P cubicles

- ■ Vertical mounting:
  - □ depending on the rating, one to five devices can be installed per row.

Rating	Number of devices	Number of modules
100 A (on mounting plate)	5	5
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 comb 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 Plus
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.

Fusegear concerned

ISFL160 to 630 for System P cubicles

Types of enclosures

Prisma Plus System P cubicles only

62197

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Fusegear installation

Installation in System P cubicles

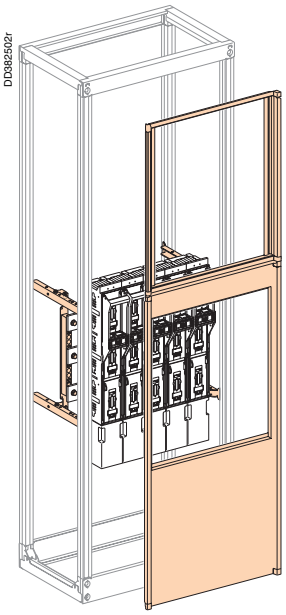
■ Vertical mounting only

Rating	Number of devices	Number of modules	
	Front-plate with cut-out	Standard front plate	2/3 front plate
160 A	9	11	24
250 A	-	-	24
400 A	-	-	24
630 A	-	-	24

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 ISFL630 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 xxB.

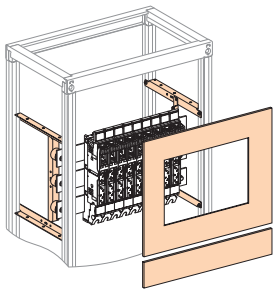
PD390946r

DD382502r



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

DD382503r



Mounting through front plate with cut-out.

Guiding TOOLS

merlin-gerin.com

This international site allows you to access all the Merlin Gerin products in just 2 clicks via comprehensive range data-sheets, with direct links to:
- complete library: technical documents, catalogs, FAQs, brochures…
- selection guides from the e-catalog.
- product discovery sites and their Flash animations.

You will also find illustrated overviews, news to which you can subscribe, the list of country contacts…

The electrical installation guide

According to IEC 60364
This guide, part of the Guiding System, is the essential tool to "guide" you any time in your business:
- design office, consultant
- contractor, panelbuilder
- teacher, trainer.

Comprehensive and concrete information on:
- all the new technical solutions
- all the components of an installation from a global point of view
- all the IEC standards modifications
- all the fundamental electrotechnical knowledge
- all the design stages, from medium to low voltage.

Installation and connection

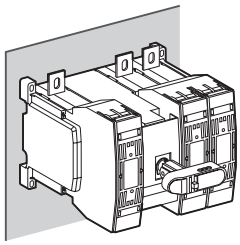
The symbol . stands for:
the type of fuse-link associated with INF switch-disconnector fuses
- *INF. + BS fuse-link = INFB*
- *INF. + NFC fuse-link = INFC*
- *INF. + DIN fuse-link = INFD*

the type of fuse-link arrangement for ISF fuse-switch disconnectors:
- *ISF. + side-by-side fuse-link arrangement (DIN) = ISFT*
- *ISF. + vertical fuse-link arrangement (DIN) = ISFL.*

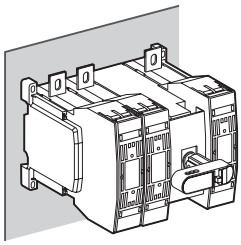
Possible installation positions and mounting techniques
Fupact INF.32 to INF.800

Possible installation positions

E79197



E79198



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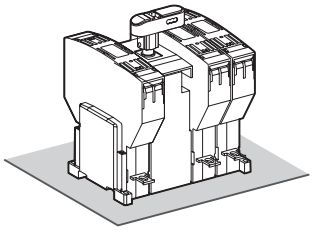

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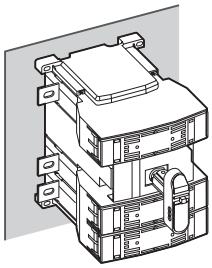

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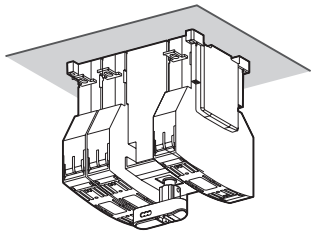
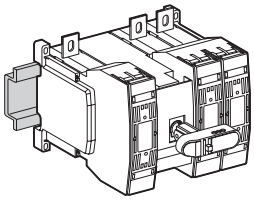


Possible mounting techniques

INF.32 to INF.160

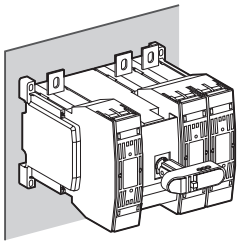
E72591



DIN rail.

INF.32 to INF.800

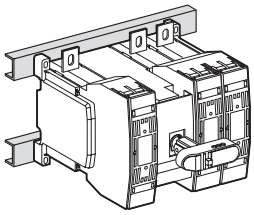
E79197



Plain mounting plate.

INF.32 to INF.800

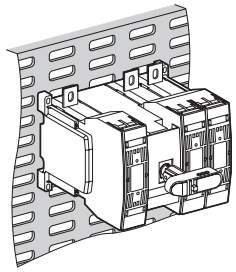
E72592



Rails.

INF.32 to INF.800

E94685

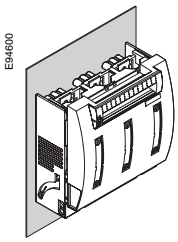


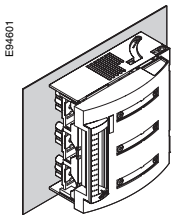
Slotted mounting plate.

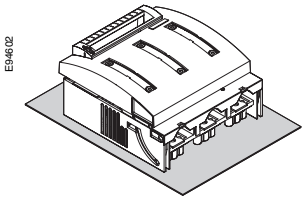
Possible installation positions and mounting techniques
Fupact ISF.100 to ISF.630

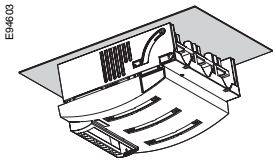
Possible installation positions

ISFT100 to 630

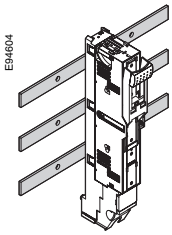




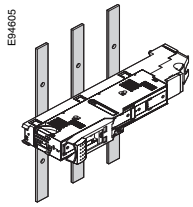




ISFL160 to 630

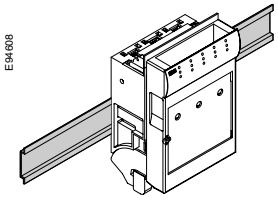


ISFL160



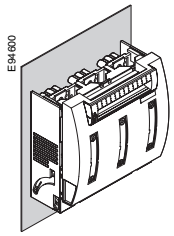
Possible mounting techniques

ISFT100



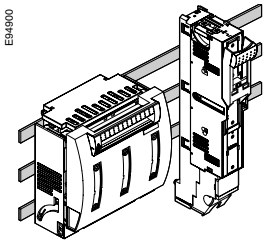
DIN rail.

ISFT100 to 630



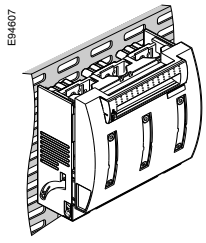
Plain mounting plate.

ISFT160 to 630 / ISFL160 to 630



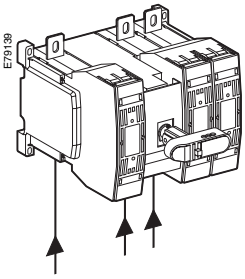
Secured to busbars.

ISFT100 to 630



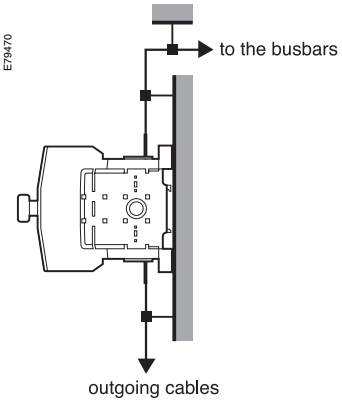
Slotted mounting plate.

Implementation and power dissipation
Fupact INF• and ISF•



Reverse supply
Fupact fusegear may be supplied indifferently via the top or bottom terminals, without any reduction in performance.

Neutral pole position for INF• fusegear
On Merlin Gerin fusegear ranges, the neutral pole is traditionally located on the left-hand side. On the INF•32 to INF•800 ranges, the four poles are identical and the neutral pole can therefore be located on the right-hand side simply by adding an appropriate label.



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.

Cables 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 Width: 4.5 mm Max. load: 22 kg Colour: white**			**"Sarel" type Width: 9 mm Max. load: 90 kg 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 ⩾ 50 mm², 9 mm wide ties must be used.*

Tightening torque for connections (ISF•)

	Type	**Torque (Nm)**
ISFT	ISFT100 mounted on backplate with connection terminals	3
	ISFT160 mounted on backplate with connection terminals	4
	ISFT160 with push-on connection to 60 mm busbars	6
	ISFT160 with hook-on connection to 60 mm busbars	6
	ISFT250 mounted on backplate with connection terminals	14
	ISFT250 with push-on connection to 60 mm busbars	2
	ISFT250 with hook-on connection to 60 mm busbars	6
	ISFT250 with hook-on connection to 100 mm busbars	6
	ISFT400 mounted on backplate with connection terminals	14
	ISFT400 with hook-on connection to 60 mm busbars	6
	ISFT400 with hook-on connection to 100 mm busbars	6
	ISFT630 mounted on backplate with connection terminals	14
	ISFT630 with hook-on connection to 60 mm busbars	6
	ISFT630 with hook-on connection to 100 mm busbars	6
ISFL	ISFL160 with direct connection to 100 mm busbars	14
	ISFL250 with direct connection to 185 mm busbars	40
	ISFL400 with direct connection to 185 mm busbars	40
	ISFL630 with direct connection to 185 mm busbars	40
	ISFL160 with kit for hook-on connection to 60 mm busbars	6
	ISFL160 with connectors for flexible bars (set of 3)	4
	ISFL160 with connectors for Cu/Al bare cables (set of 3)	4

Implementation and power dissipation
Fupact INF• and ISF• (cont.)

Power dissipated by INF• switch-disconnector fuses

Power dissipated per pole

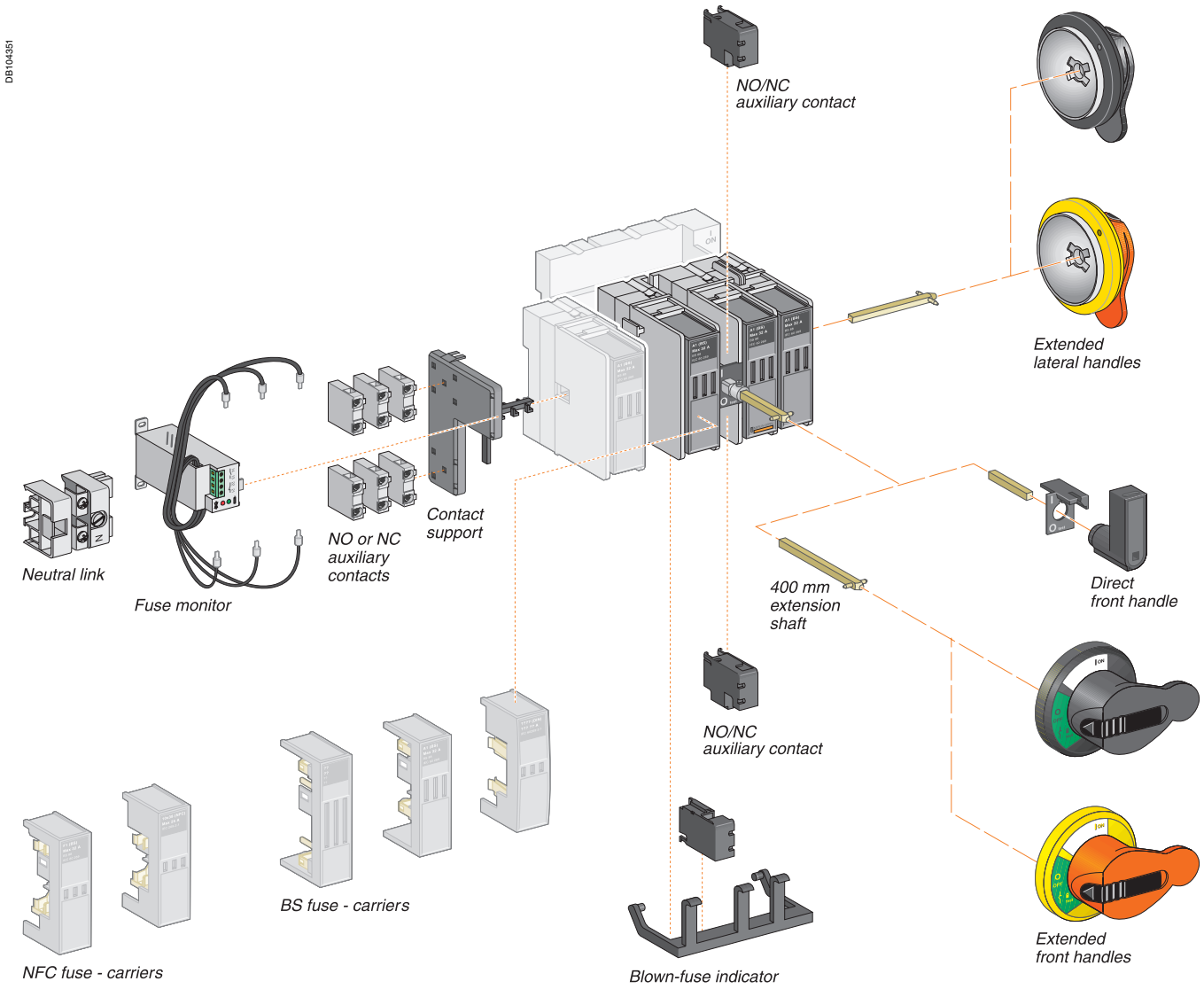
	Switchgear			Fuse-link		Total
Rating	Model	Resistance per pole	Power dissipated per pole	Max. power dissipated		Total power dissipated per pole
(A)		(mΩ)	(W)	Rat. (A)	P (W)	(W)
16	INFC / INFB32 /INFD40	2.03	0.5	16	3.5	4
20	INFC / INFB32 /INFD40	2.03	0.8	20	3.5	4.3
25	INFC / INFB32 /INFD40	2.03	1.3	25	3.5	4.8
32	INFC / INFB32 /INFD40	2.03	2.1	32	3.5	5.6
40	INFD40	2.03	3.3	40	3.5	6.8
50	INFC / INFB / INFD63	1.00	2.5	50	7.5	10
63	INFC / INFB / INFD63	1.00	4.0	63	7.5	11.5
100	INFB100	0.35	3.5	100	12	15.5
125	INFC125	0.35	5.5	125	12	17.5
160	INFB / INFD160	0.35	9	160	12	21
250	INFB / INFD250	0.19	12	250	32	44
400	INFB / INFD400	0.19	30	400	45	75
630	INFB / INFD630	0.14	56	630	60	116
800	INFB / INFD800	0.12	77	800	65	142

Power dissipated by ISF• fuse-switch disconnectors

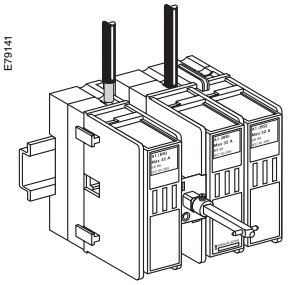
Power dissipated per pole

			Switchgear			Fuse-link		Total
		Rating	Model	Resistance per pole	Power dissipated per pole	Max. power dissipated		Total power dissipated per pole
		(A)		(mΩ)	(W)	Rat. (A)	P (W)	(W)
Fixed front-connected device (without conversion kit)		100	ISFT100	0.150	1.5	100	7.5	9
		160	ISFT100	0.151	3.8	160	8.2	12
		160	ISFT160	0.117	3.0	160	12	15
		250	ISFT 250	0.056	3.5	250	23	27
		400	ISFT400	0.046	7.3	400	34	41
		630	ISFT630	0.045	18.0	630	48	66
With conversion kit	60 mm push-on connection	160	ISFT160	0.234	6.0	160	12	18
	60 mm hook-on connection	160	ISFT160	0.220	5.6	160	12	18
	60 mm push-on connection	250	ISFT250	0.107	6.7	250	23	30
	60 mm hook-on connection	250	ISFT250	0.086	5.5	250	23	29
	100 mm hook-on connection	250	ISFT250	0.088	5.5	250	23	29
	60 mm hook-on connection	400	ISFT400	0.075	12.0	400	34	46
	100 mm hook-on connection	400	ISFT400	0.075	12.0	400	34	46
	60 mm hook-on connection	630	ISFT630	0.057	22.5	630	48	71
	100 mm hook-on connection	630	ISFT630	0.057	22.5	630	48	71
Device bolted directly to busbars (without conversion kit)		160	ISFL160	0.210	5.4	160	12	17
		250	ISFL250	0.123	7.7	250	32	40
		400	ISFL400	0.120	19.2	400	45	64
		630	ISFL630	0.110	44	630	48	92
With conversion kit		160	ISFL160	0.230	5.9	160	12	18

Fupact INF.32 and INFD40
Device and accessories

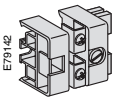


Fupact INF.32 and INFD40
Connection and connection accessories



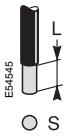
Front connection of bare copper and aluminium cables

Fupact INF.32 and INFD40 device are equipped as standard with connectors for bare copper and aluminium cables.
Neutral link: In the form of a terminal block to be secured to the DIN rail on the left-hand side of the Fupact.



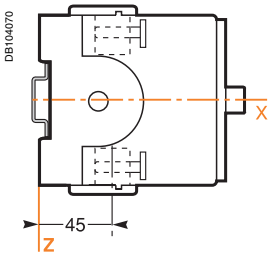
Neutral link.

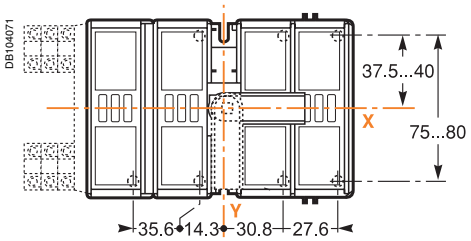
Standard device	
Fupact connectors	
L (mm)	⩽ 14
S (mm²) Cu/Al	0.5 to 10 rigid
	0.5 to 10 flexible (1)
Torque	2 Nm
Neutral link	
L (mm)	⩽ 16
S (mm²) Cu/Al	2.5 to 16 rigid
	2.5 to 16 flexible (1)
Torque	2 Nm



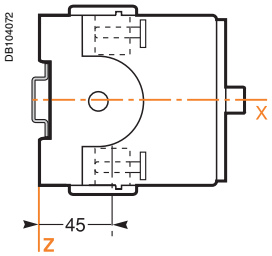
(1) Connection of 0.5 to 4 mm² flexible cables requires crimped or auto-crimping ferrules.

Switch-disconnector fuse with front handle





Switch-disconnector fuse with lateral handle

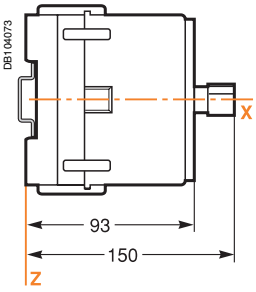


X: represents the centre of the device.
Y: represents the operating shaft.
Z: represents rear face of the device.

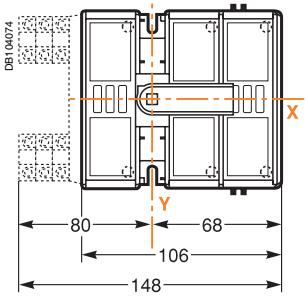
Fupact INF.32 and INFD40
Installation

Dimensions

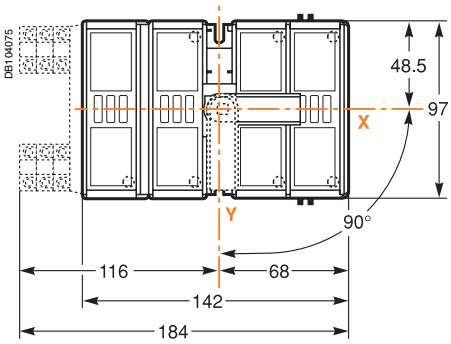
INFC32 and INFB32 with direct front handle



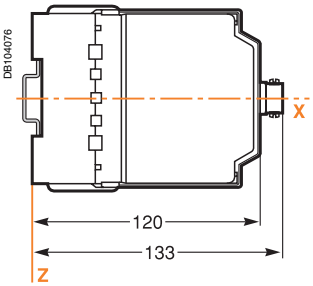
3 poles



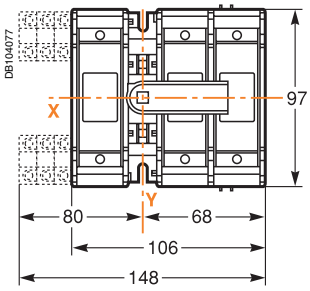
4 poles



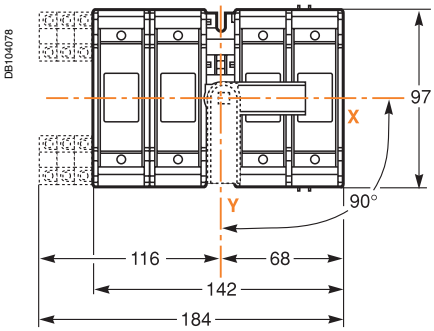
INFD40 with direct front handle



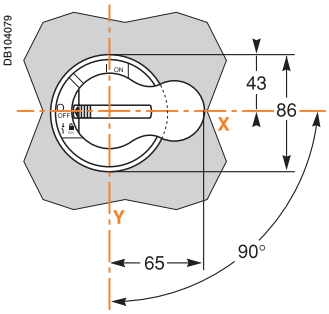
3 poles

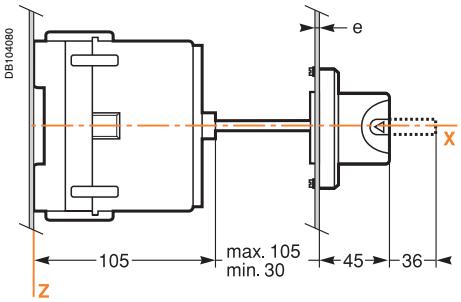


4 poles

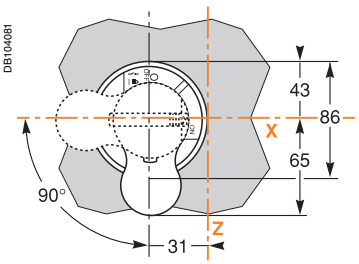


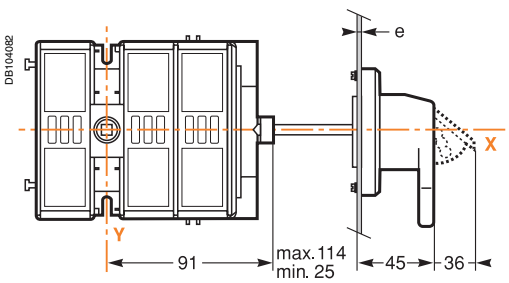
Extended front handle

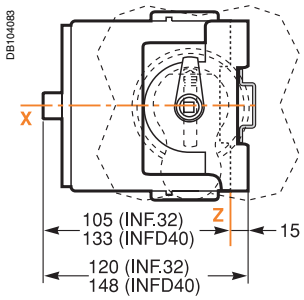




Extended lateral handle

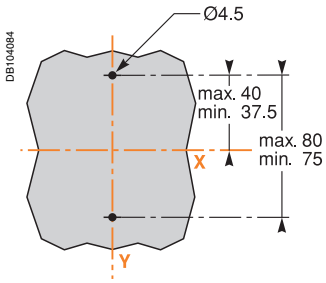




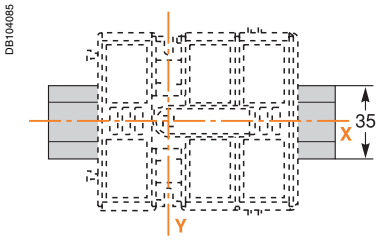


Fupact INF.32 and INFD40
Installation (cont.)

Installation on a backplate

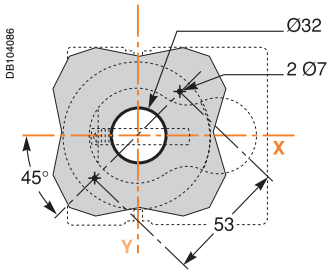


Installation on a rail



Front panel cutout

Extended front handle



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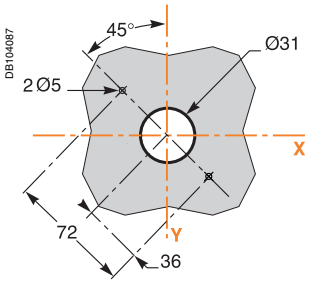
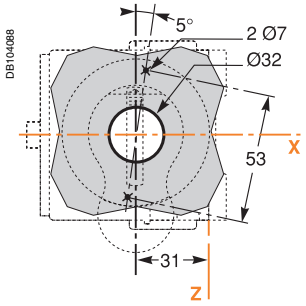
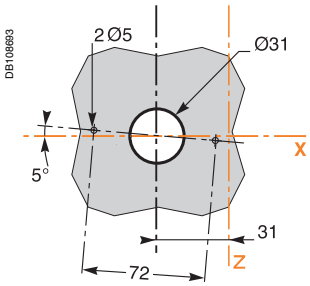


Extended lateral handle

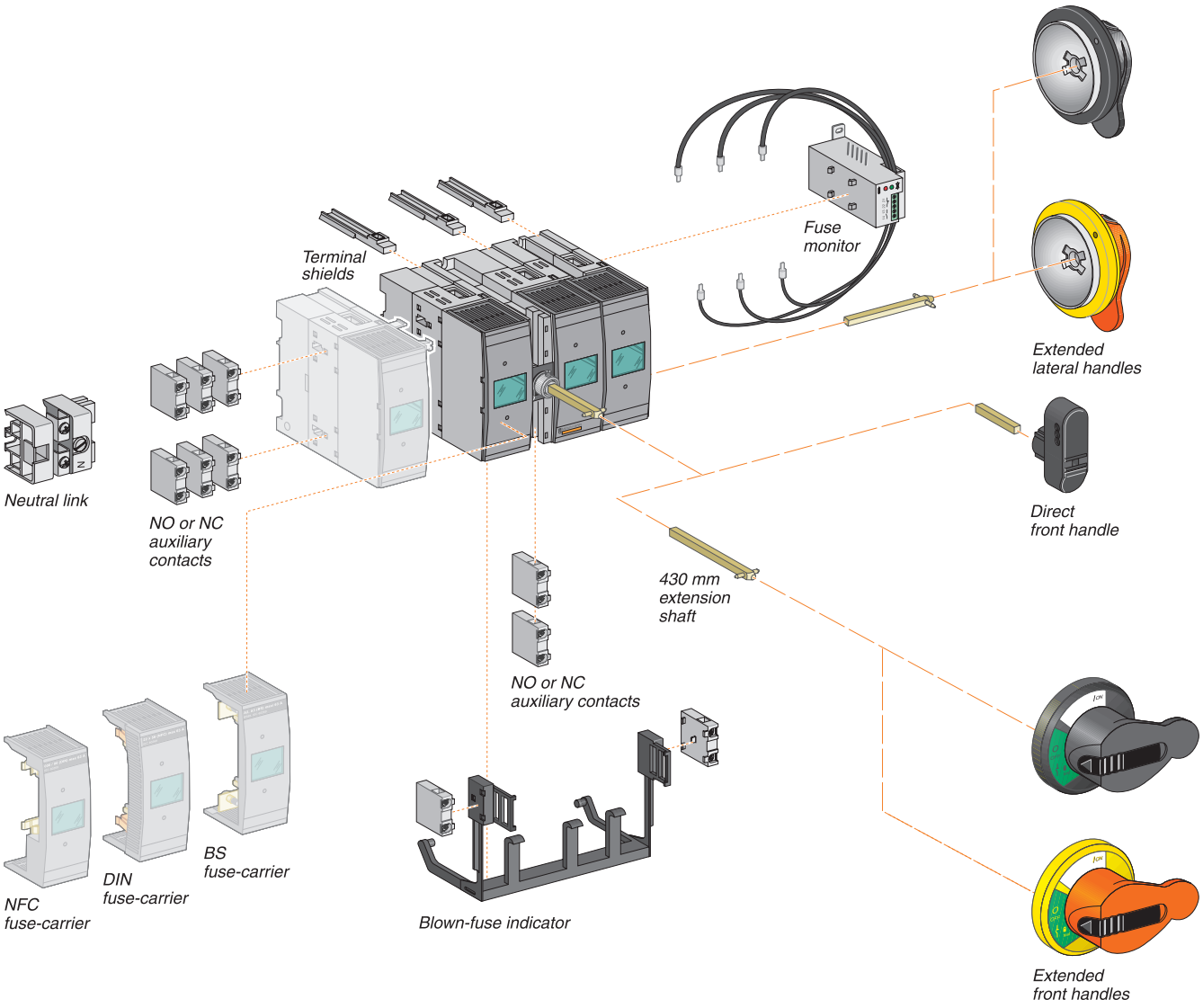


or

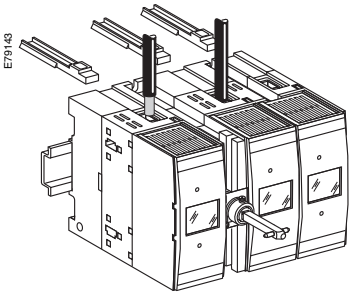


Fupact INF.63
Device and accessories

DB104352

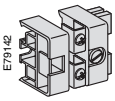


Fupact INF.63
Connection and connection accessories

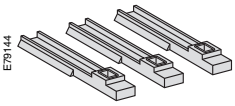


Front connection of bare copper and aluminium cables

Fupact INF.63 device are equipped as standard with connectors for bare copper and aluminium cables.
Neutral link: In the form of a terminal block to be secured to the DIN rail on the left-hand side of the Fupact.

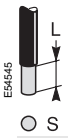


Neutral link.



Terminal shields.

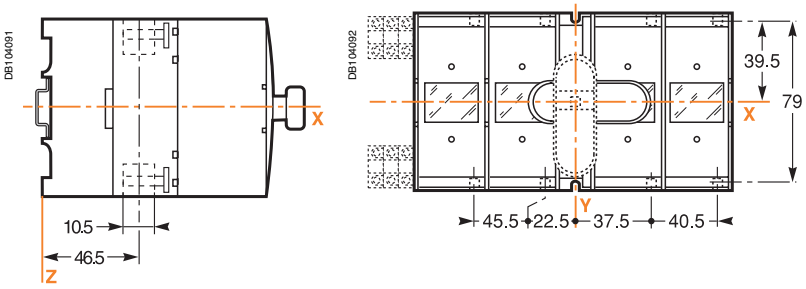
Standard device



Fupact connectors		
L (mm)		⩽ 14
S (mm²) Cu/Al		2.5 to 25 rigid
		2.5 to 25 flexible (1)
Torque		2 Nm
Neutral link		
L (mm)		⩽ 18
S (mm²) Cu/Al		2.5 to 35 rigid
		2.5 to 35 flexible (1)
Torque		3.5 Nm

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

Switch-disconnector fuse with front or lateral handle



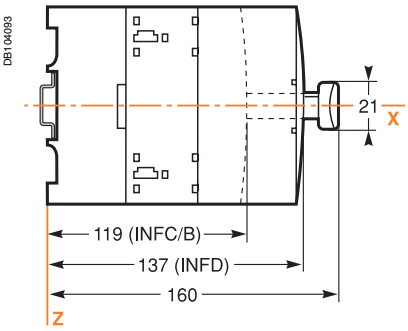
X: represents the centre of the device.
Y: represents the operating shaft.
Z: represents rear face of the device.

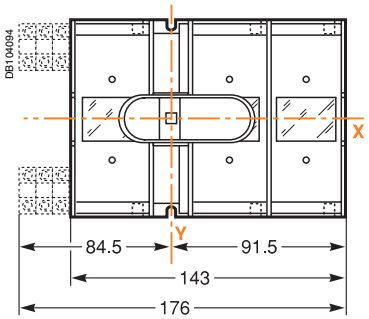
Fupact INF.63
Installation

Dimensions

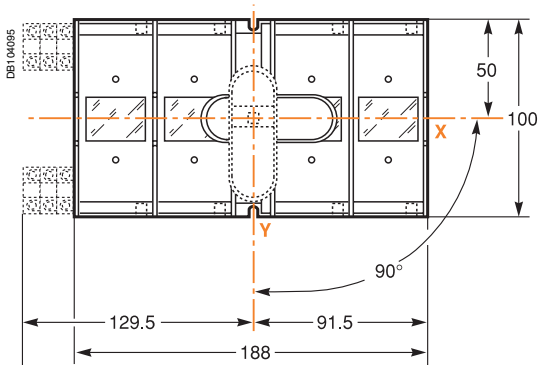
Direct front handle

3 poles

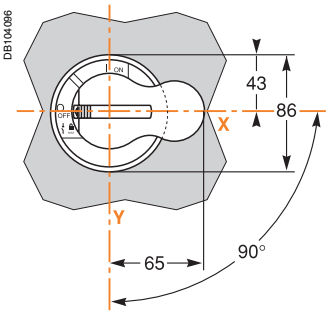


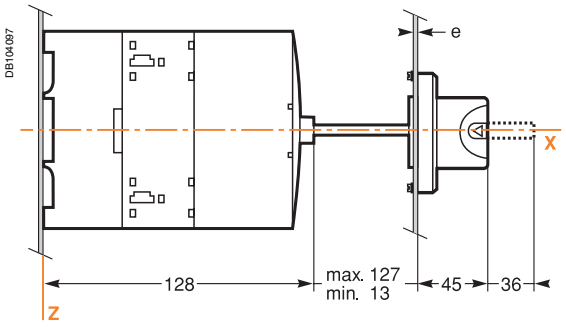


4 poles

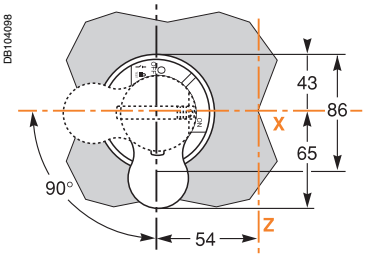


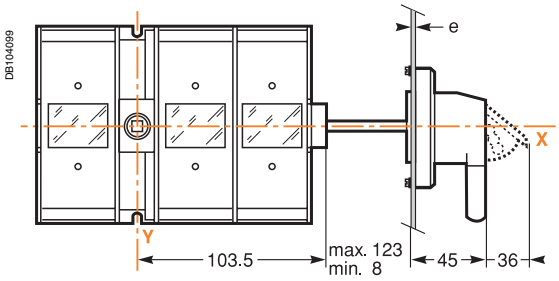
Extended front handle





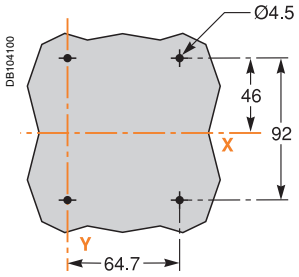
Extended lateral handle



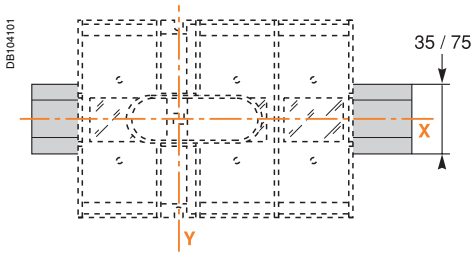


Fupact INF.63
Installation (cont.)

Installation on a backplate

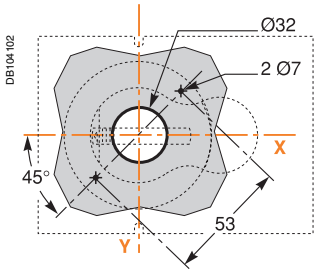


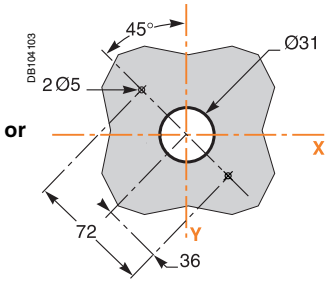
Installation on a rail



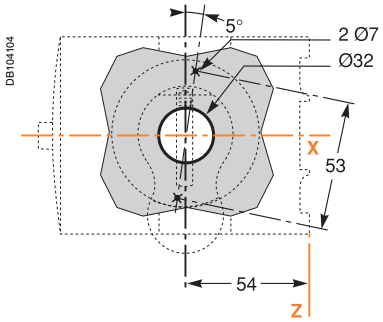
Front panel cutout

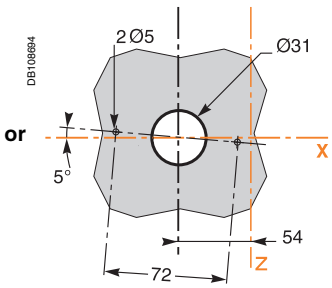
Extended front handle





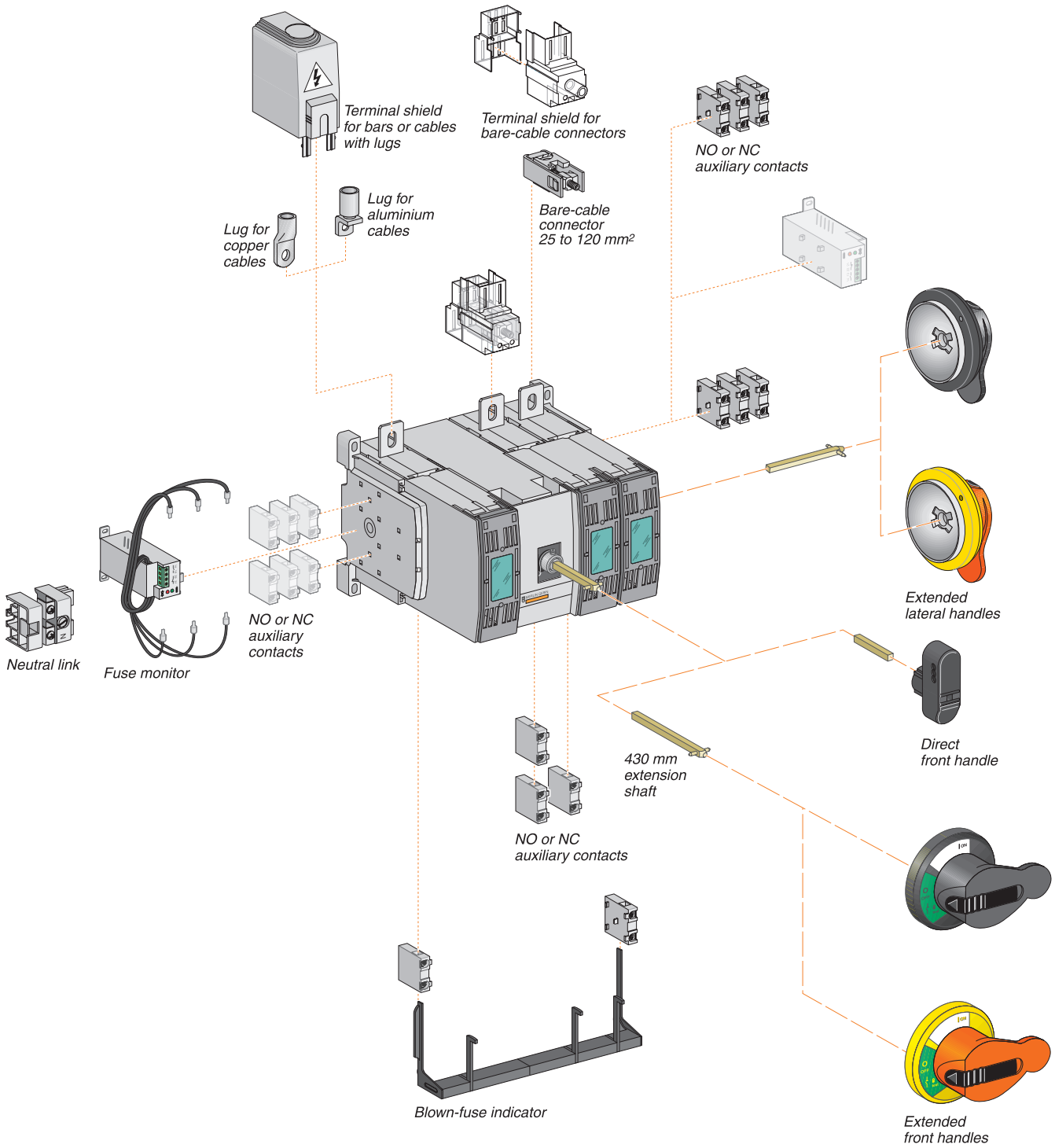
Extended lateral handle



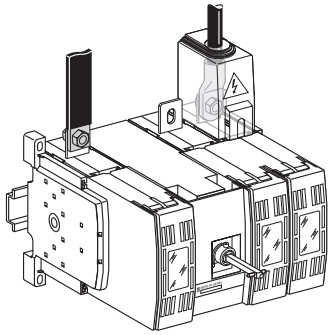


Fupact INFB100 to INF.160
Device and accessories

DB104353



Fupact INFB100 to INF.160
Connection and connection accessories



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

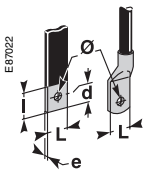
Front connection of insulated bars and cables with crimped lugs

Fupact INFB100 to INF.160 device 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.

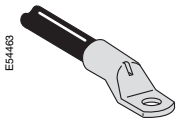
Lugs

The small lugs for copper 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.

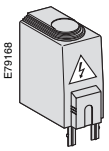
Standard device



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

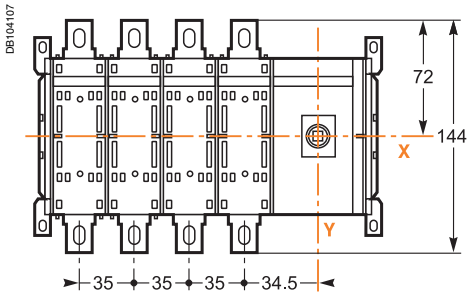


Lug for copper cable.

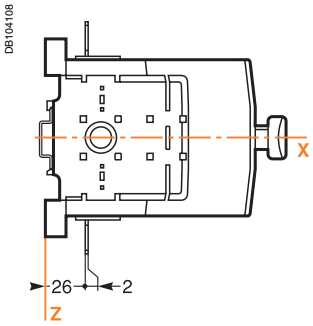


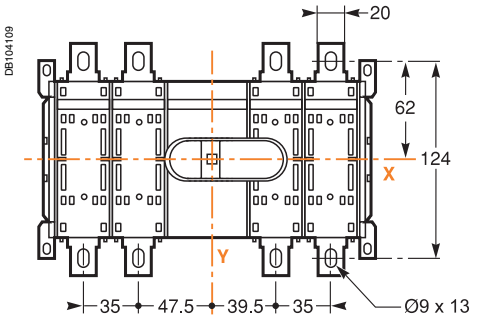
Terminal shield.

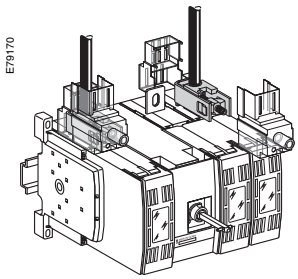
Switch-disconnector fuse with lateral handle



Switch-disconnector fuse with front handle







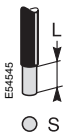
If 500 V ⩽ U ⩽ 690 V, terminal shields are mandatory.

Front connection with accessories

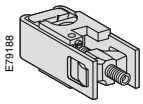
Fupact INF.100 to INF.160 switch-disconnector fuses are equipped as standard with 20 mm wide terminals that can be fitted with connectors for copper or aluminium bare cables with cross-sectional areas from 25 to 120 mm².

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

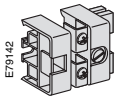
Standard device



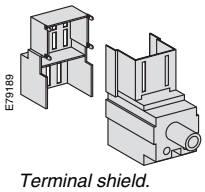
Fupact connectors	
L (mm)	27
S (mm²)	25 to 120 rigid
Cu/Al	25 to 120 flexible
Couple (Nm)	15 to 22
Neutral link	
L (mm)	⩽ 18
S (mm²)	2.5 to 35 rigid
Cu/Al	2.5 to 35 flexible
Torque (Nm)	2



Bare-cable connector.



Neutral link.



Terminal shield.

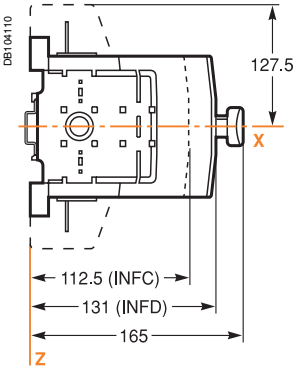
X: represents the centre of the device.
Y: represents the operating shaft.
Z: represents rear face of the device.

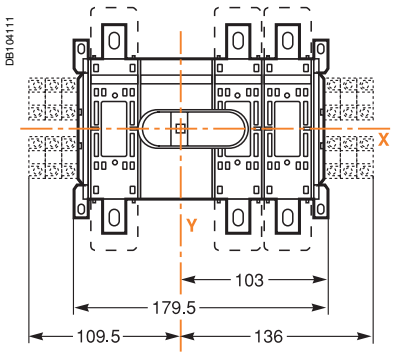
Fupact INFB100 to INF.160
Installation

Dimensions

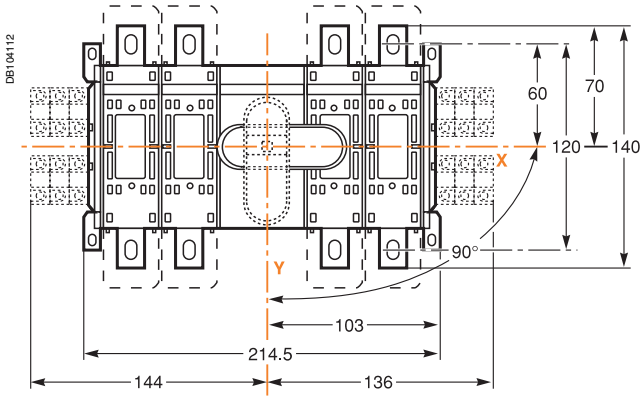
INFC125 - INFD160 with direct front handle

3 poles



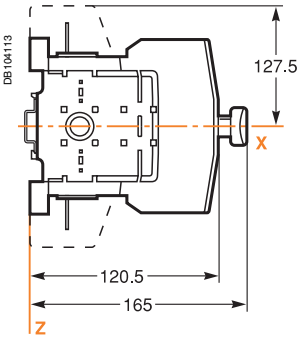


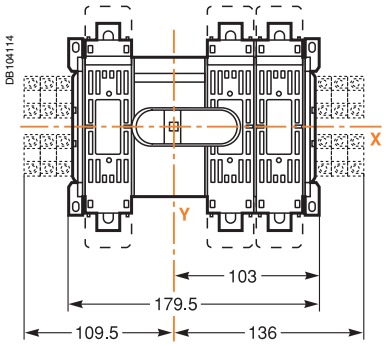
4 poles



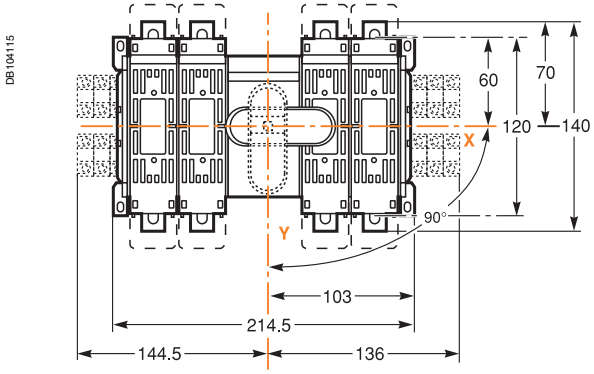
INFB100 - INFB160 with direct front handle

3 poles

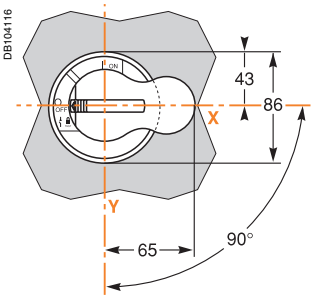


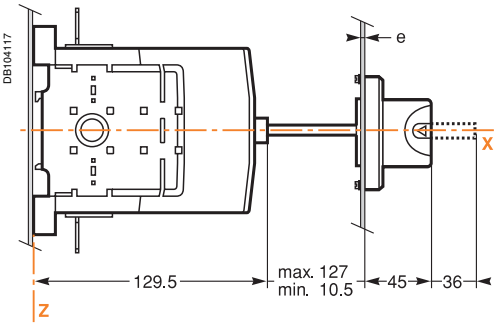


4 poles

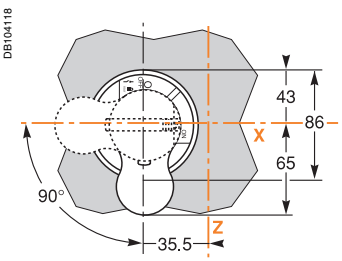


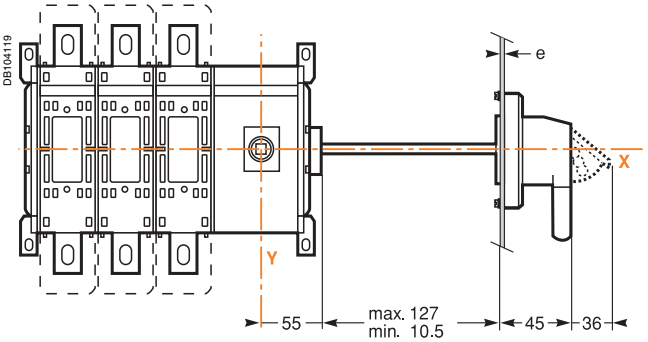
Extended front handle





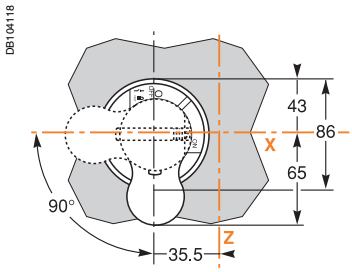
INFC125 - INFD160 with extended lateral handle

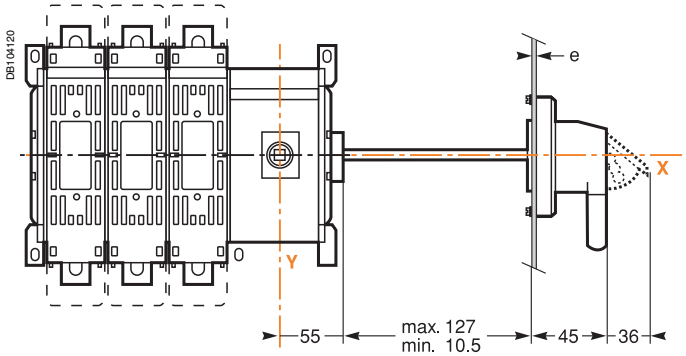




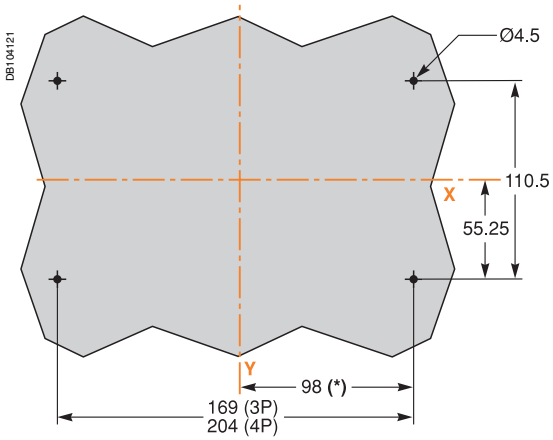
Fupact INFB100 to INF.160
Installation (cont.)

INFB100 - INFB160 with extended lateral handle



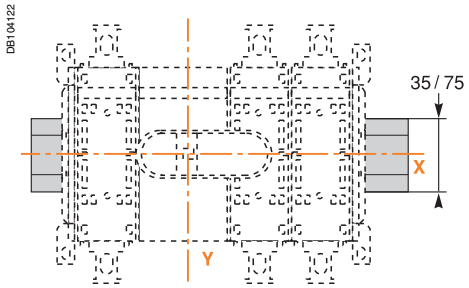


Installation on a backplate



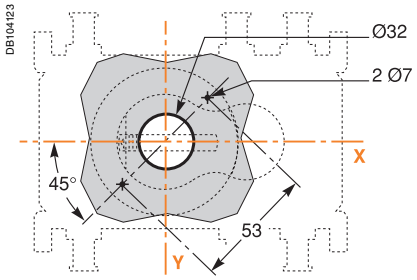
(*) 98 for front handle or 36 for lateral handle.

Installation on a rail

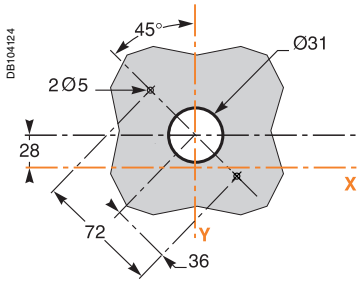


Front panel cutout

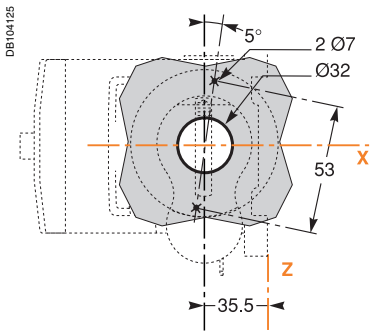
Extended front handle



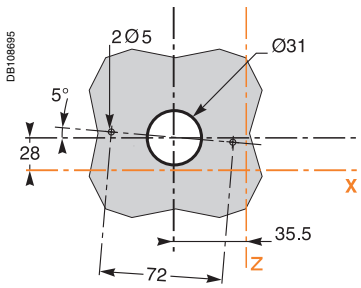
or



Extended lateral handle

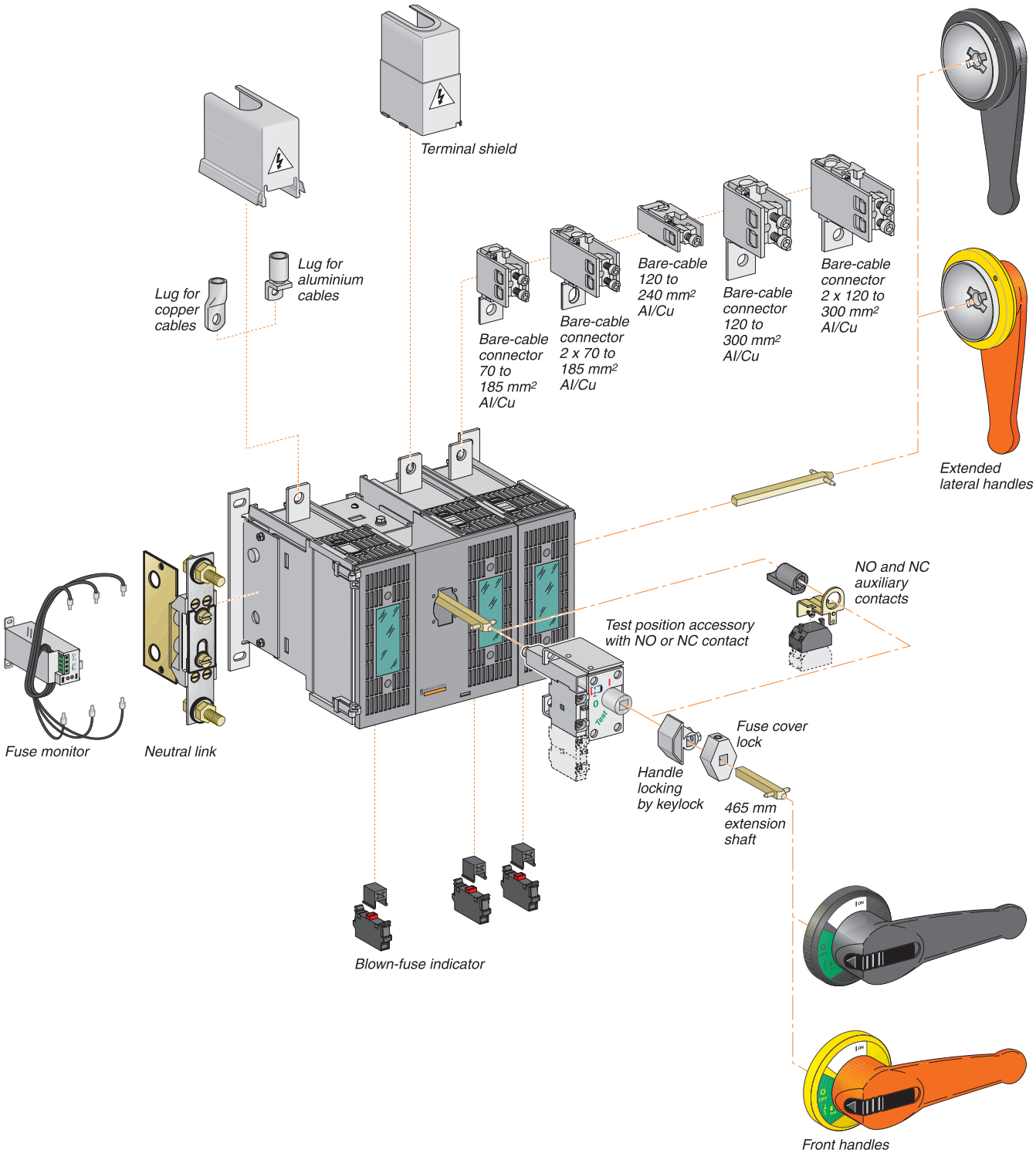


or

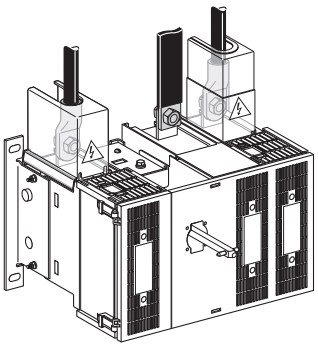


Fupact INF.250 to INF.800
Device and accessories

DB104354



Fupact INF.250 to INF.800
Connection and connection accessories



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

Front connection of insulated bars and cables with crimped lugs

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

Terminals

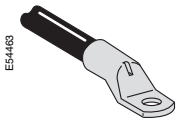
- 25 mm wide with M10 screws (INF.250 to INF.400)
- 40 mm wide with M12 screws (INF.630 to INF.800).

Lugs

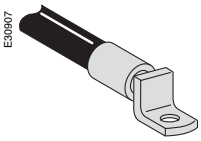
The lugs are different for copper and aluminium cables and are compatible with the terminal shields.

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

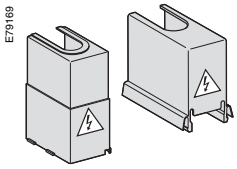
Crimping by hexagonal barrels (Cu or Al lugs) or punching (Cu lugs).



Lug for copper cable.

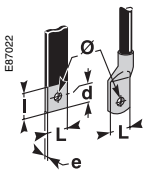


Lug for aluminium cable.

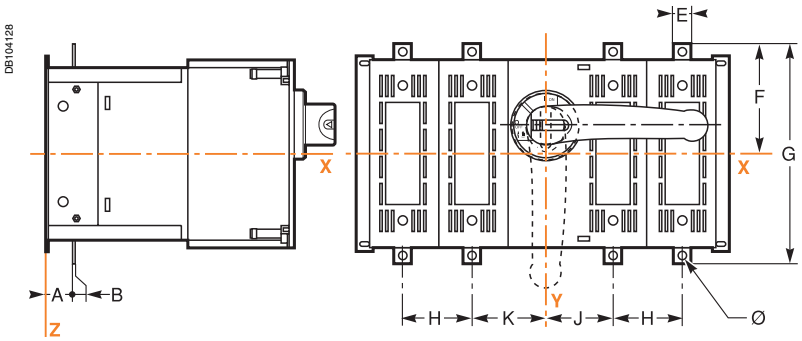


Terminal shields.

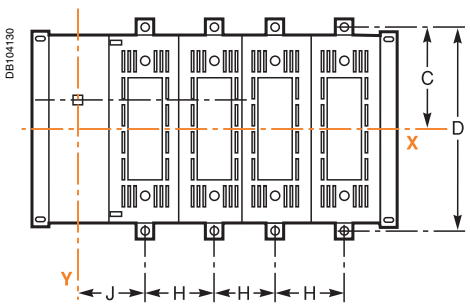
Standard device	INF.250 INF.400	INF.630 INF.800
d (mm)	⩽ 15	⩽ 20
l (mm)	⩽ 58	⩽ 58
e (mm)	⩽ 6	3 ⩽ e ⩽ 10
L (mm)	⩽ 25	⩽ 40
Ø (mm)	⩾ 12	⩾ 14
Torque (Nm)	30 to 44	50 to 75



Switch-disconnector fuse with front handle



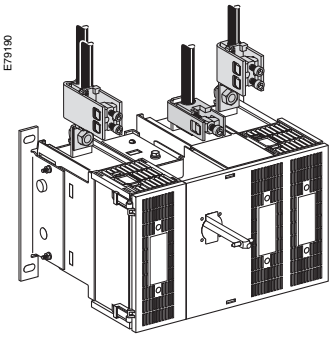
Switch-disconnector fuse with lateral handle



	A	B	C	D	E	F	G	H	J	K	Ø
250 A	45	5	87.5	175	25	100	200	62	44	76	11
400 A	45	5	87.5	175	25	100	200	70	48	80	11
630 A	40	6	125	250	40	145	290	80	83	72	13
800 A	40	6	125	250	40	145	290	90	88	77	13

X: represents the centre of the device.
Y: represents the operating shaft.
Z: represents rear face of the device.

Fupact INF.250 to INF.800
Connection and connection accessories (cont.)

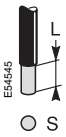


If 500 V ⩽ U ⩽ 690 V, terminal shields are mandatory.

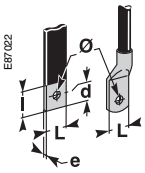
Front connection

Fupact INF.250 to INF.400 device are equipped as standard with 25 mm wide terminals and Fupact INF.630 to INF.800 device are equipped as standard with 40 mm wide terminals that can be fitted with connectors for copper or aluminium bare cables with cross-sectional areas from 70 to 300 mm².

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

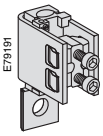


Standard device	INF.250 INF.400	INF.630 INF.800
1-cable connector 49651		
L (mm)	58	58
S (mm²) Cu/Al	70 to 185 (1)	70 to 185 (1)
Torque (Nm)		
Cable	22	22
Terminal	30 to 44	50 to 75
2-cable connector 49652		
L (mm)	70	70
S (mm²) Cu/Al	2x(70 to 185) (1)	2x(70 to 185) (1)
Torque (Nm)		
Cable	22	22
Terminal	30 to 44	50 to 75
1-cable connector 49653		
L (mm)	58	58
S (mm²) Cu/Al	120 to 240 (1)	120 to 240 (1)
Torque (Nm)		
Cable	35	35
Terminal	30 to 44	50 to 75
1-cable connector 49654		
L (mm)	58	58
S (mm²) Cu/Al	120 to 300 (1)	120 to 300 (1)
Torque (Nm)		
Cable	44	44
Terminal	30 to 44	50 to 75
2-cable connector 49655		
L (mm)	70	70
S (mm²) Cu/Al	2x(120 to 300) (1)	2x(120 to 300) (1)
Torque (Nm)		
Cable	44	44
Terminal	30 to 44	50 to 75

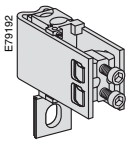


Neutral link	INF.250 INF.400	INF.630 INF.800
d (mm)	⩽ 15	⩽ 20
l (mm)	⩽ 58	⩽ 58
e (mm)	⩽ 6	3 ⩽ e ⩽ 10
L (mm)	⩽ 25	⩽ 40
Ø (mm)	⩾ 12	⩾ 12
Torque (Nm)	40	40

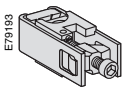
(1) Flexible or rigid cables.



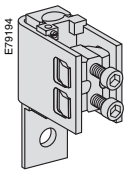
70 to 185 mm² bare-cable connector.



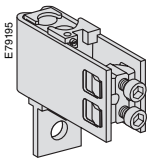
2 x (70 to 185 mm²) bare-cable connector.



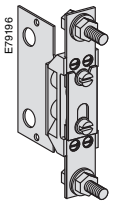
120 to 240 mm² bare-cable connector.



120 to 300 mm² bare-cable connector.



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



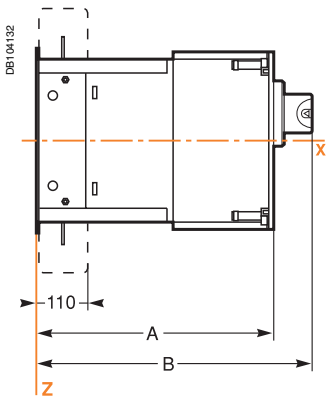
Neutral link.

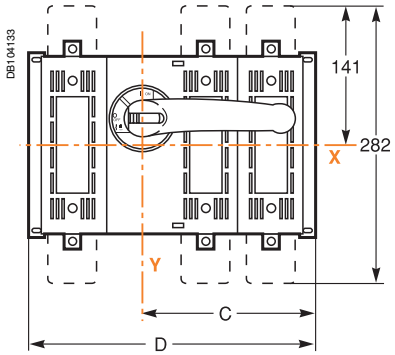
Fupact INF.250 to INF.800
Installation (ratings 250 and 400)

Dimensions

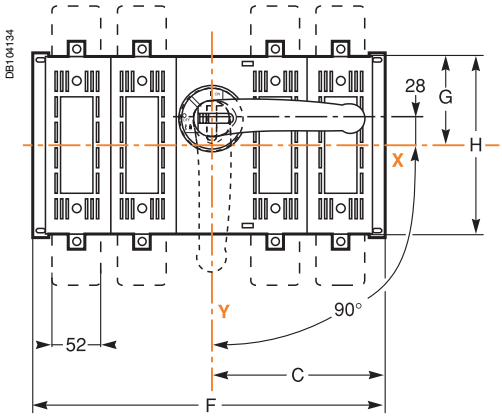
Direct front handle

3 poles

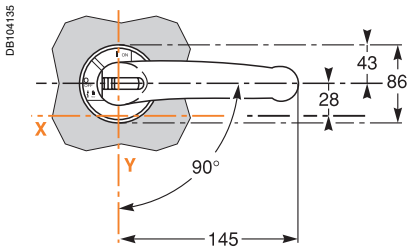


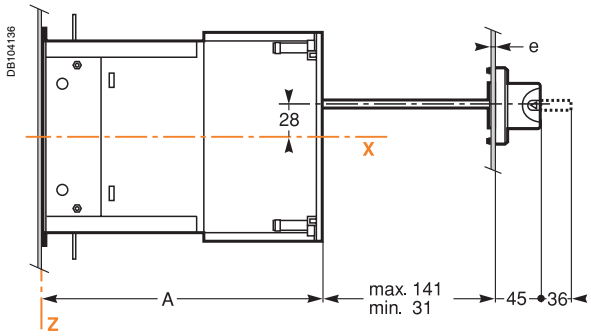


4 poles

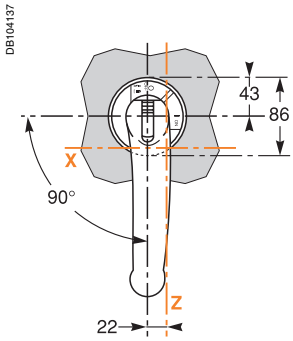


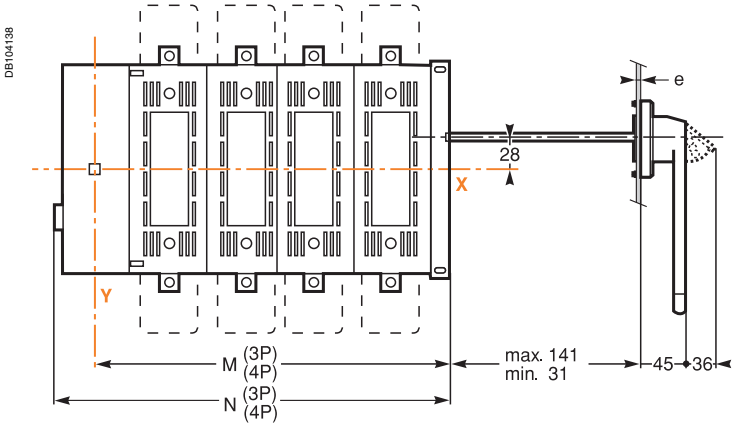
Extended front handle





INF.250 with extended lateral handle



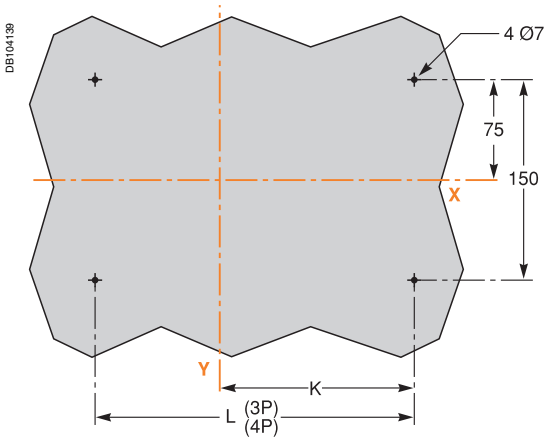


	A	B	C	D	e	F	G	H	J (3P)	J (4P)	K	L (3P)	L (4P)	M (3P)	M (4P)	N (3P)	N (4P)
INF.250	199	244	154	278	1…3	340	81	162	198	260	143	256	318	217	262	279	324
INF.400	206	251	170	302	1…3	372	90	180	-	-	159	280	350	-	-	-	-

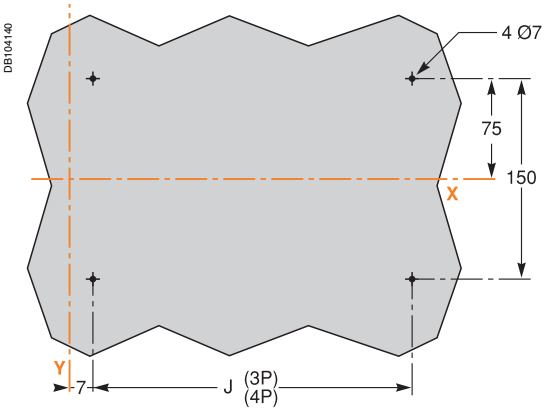
Fupact INF.250 to INF.800
Installation (ratings 250 and 400) (cont.)

Installation on a backplate

Front handle

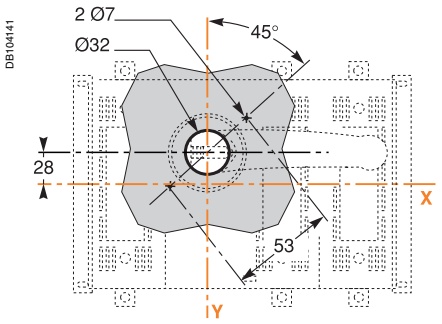


INF.250 with lateral handle

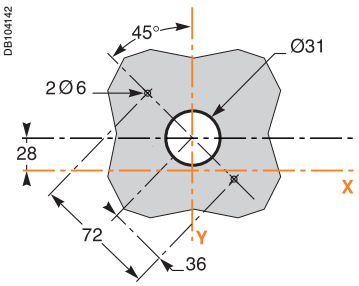


Front panel cutout

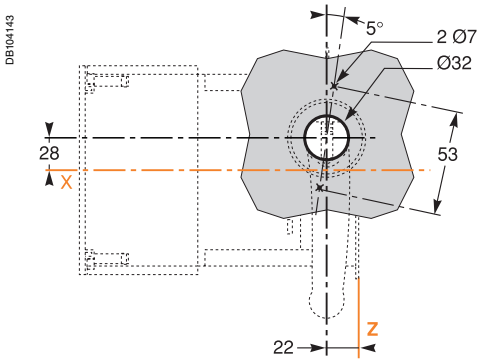
Extended front handle



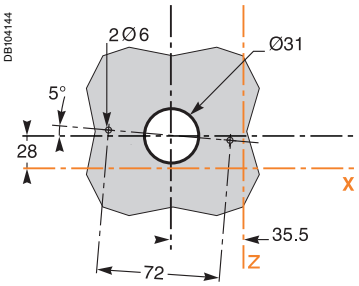
or



Extended lateral handle



or

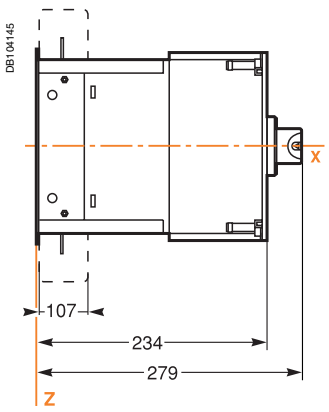


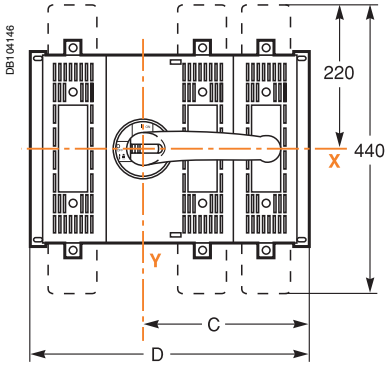
Fupact INF.250 to INF.800
Installation (ratings 630 and 800)

Dimensions

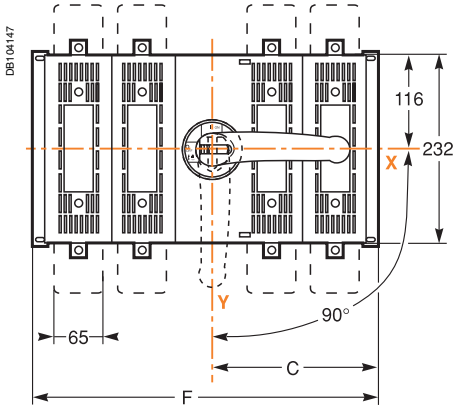
Direct front handle

3 poles

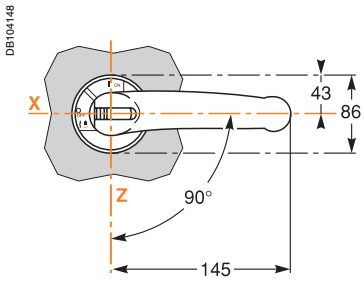


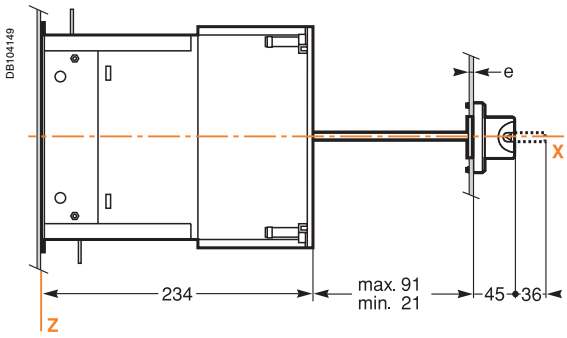


4 poles

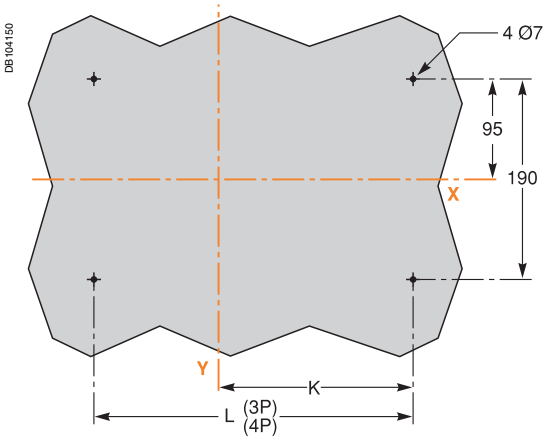


Extended front handle



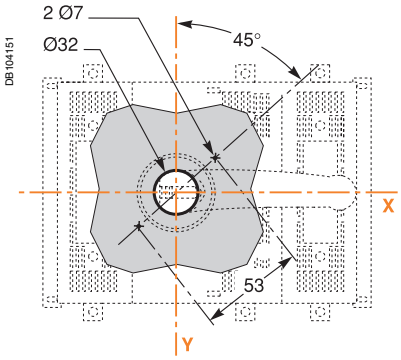


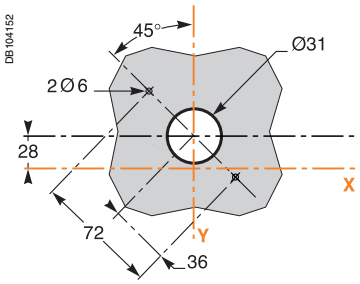
Installation on a backplate



Front panel cutout

Extended front handle

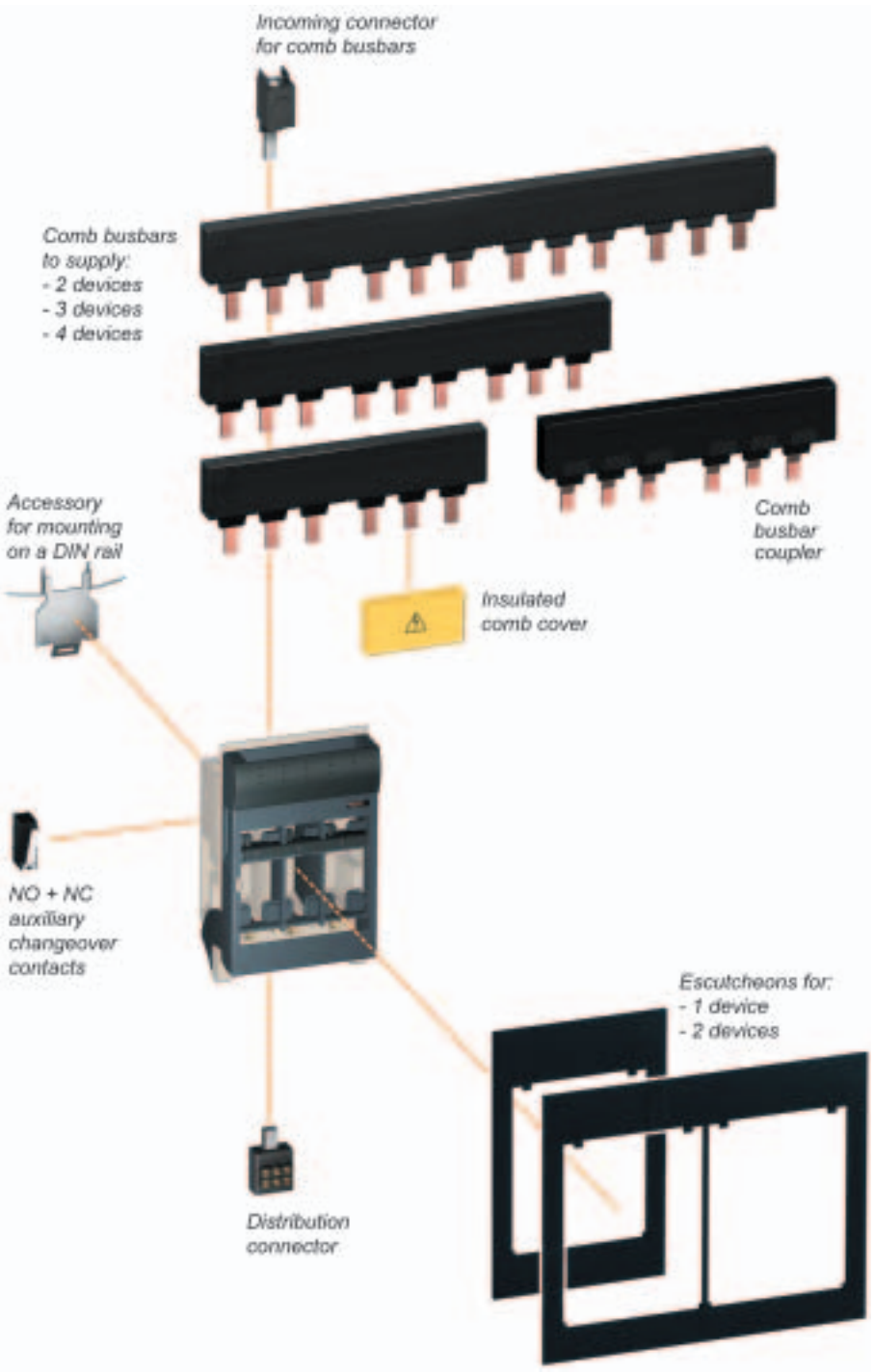




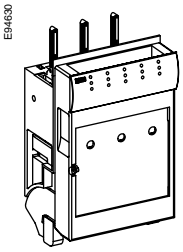
	C	D	e	F	K	L (3P)	L (4P)
INF.630	234.5	378	1…3	458	222	353	433
INF.800	254.5	408	1…3	498	242	383	473

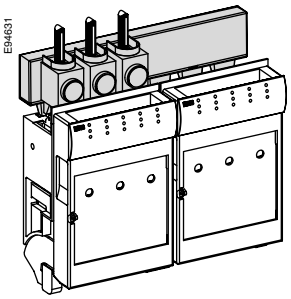
Fupact ISFT100
Device and accessories

DB104355-120



Fupact ISFT100
Connection and connection accessories

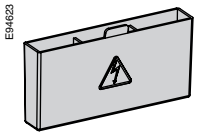




Front connection

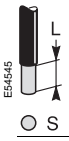
Connection via bare-cable connectors

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



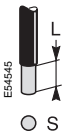
Insulated comb cover.

Standard device

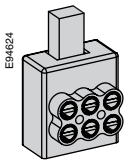


Fupact connector	
L (mm)	18
S (mm²)	1.5 to 50 rigid
Cu/Al	1.5 to 35 flexible
Torque (Nm)	3

3 x 10 mm² distribution connector



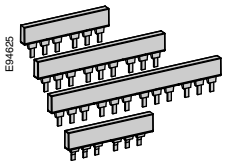
Fupact connector	
L (mm)	18
S (mm²)	1.5 to 10 rigid
Cu/Al	1.5 to 6 flexible
Torque (Nm)	2 (cables)
	3 (connectors)



Distribution connector.

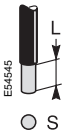
Connection via comb busbars

This accessory simplifies connection of cables and can be used to supply two to five Fupact ISFT100 devices.
- a comb-busbar coupler is used to connect five Fupact ISFT100 devices by joining a 2-device and a 3-device comb busbar
- tightening torque 3 Nm.

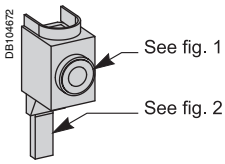


Comb busbars.

Incoming connector for comb busbars



Fupact connector	
L (mm)	18
S (mm²)	25 to 95 rigid
Cu/Al	25 to 70 flexible
Torque (Nm)	10 (cables)
	3 (connectors)



Incoming connector for comb busbars.

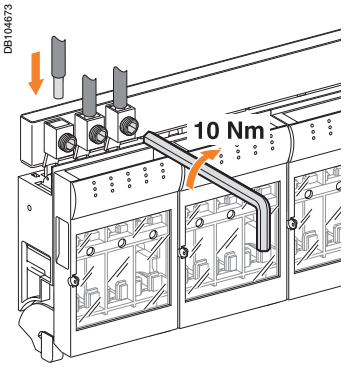


Figure 1.

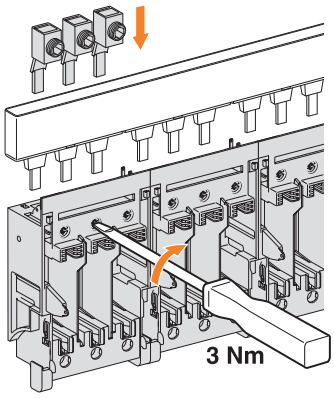
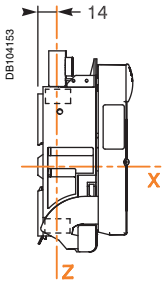


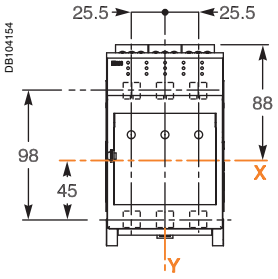
Figure 2.

X: represents the centre of the device.
Y: represents the operating shaft.
Z: represents rear face of the device.

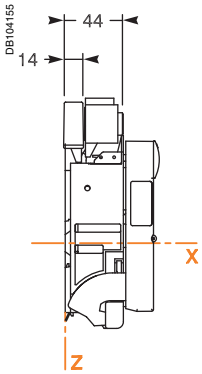
Fupact ISFT100
Connection and connection accessories (cont.)

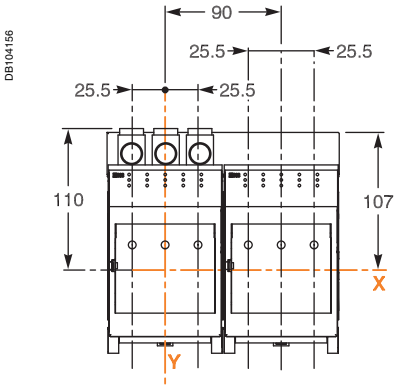
Basic device with distribution-connector option

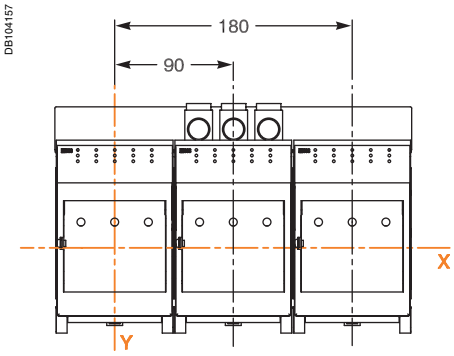




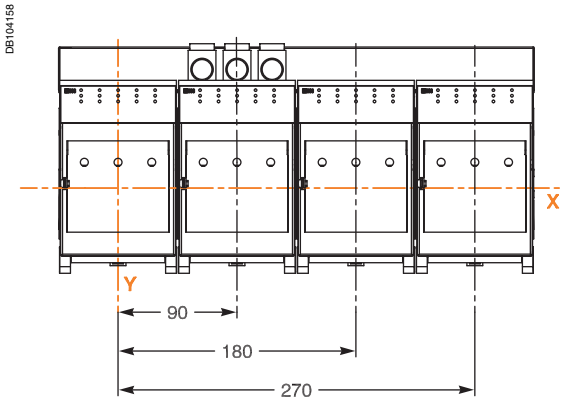
Comb busbars for two or three ISFT100 devices (with 25 to 95 mm² incoming connector)

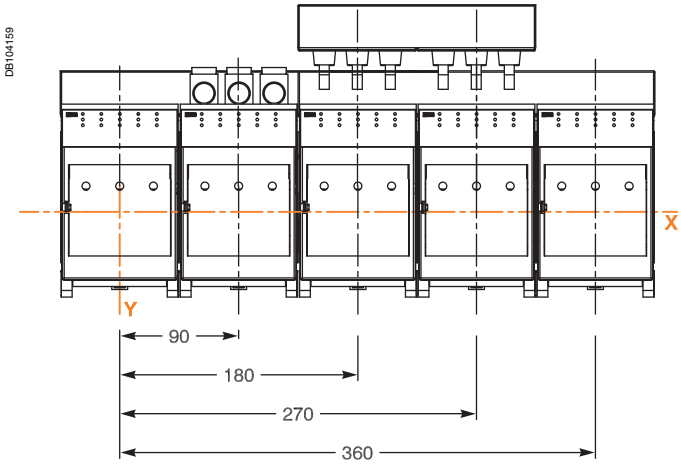






Comb busbars for four or five ISFT100 devices

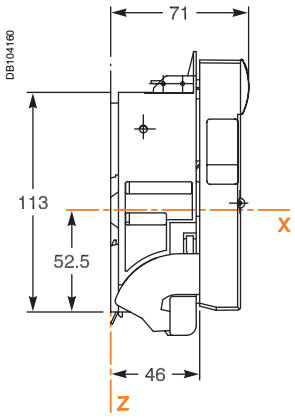




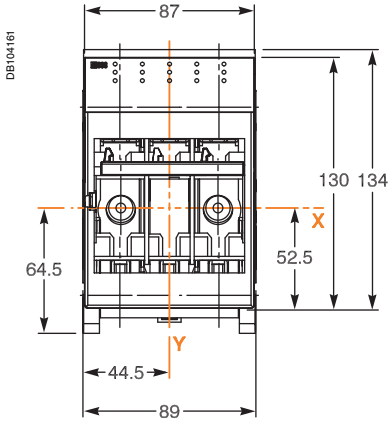
Fupact ISFT100
Installation

Dimensions

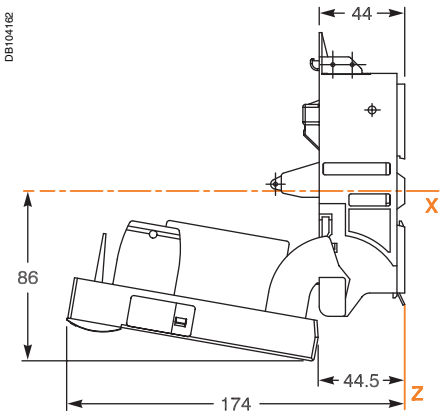
Fuse-carrier closed



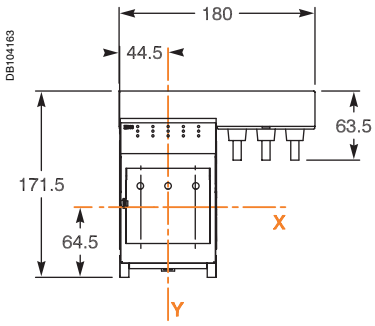
Front



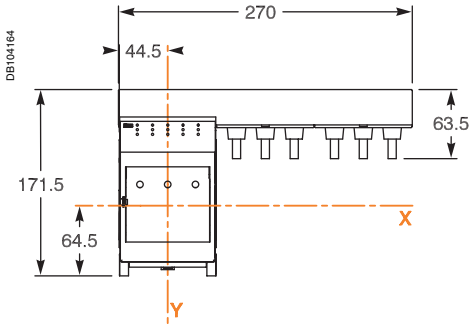
Fuse-carrier open



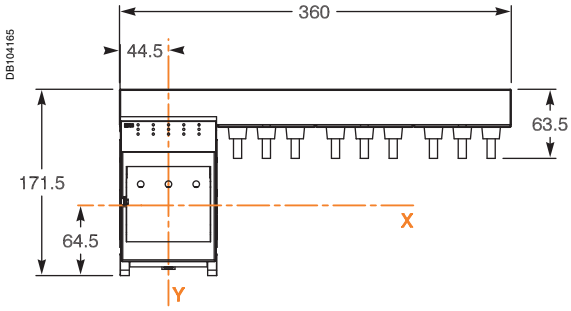
Comb busbar for 2 ISFT100 devices



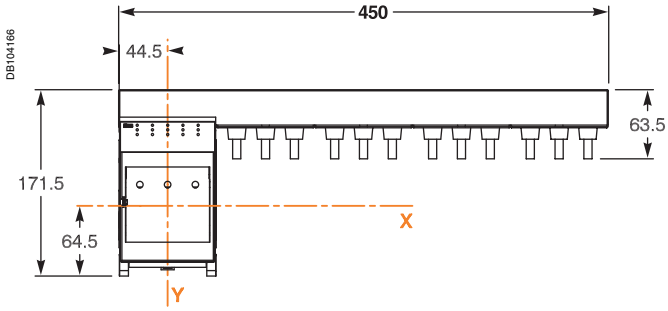
Comb busbar for 3 ISFT100 devices



Comb busbar for 4 ISFT100 devices

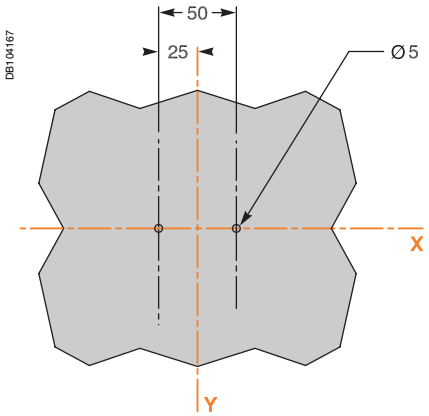


Comb busbar 3 + 2 + coupler for 5 ISFT100 devices

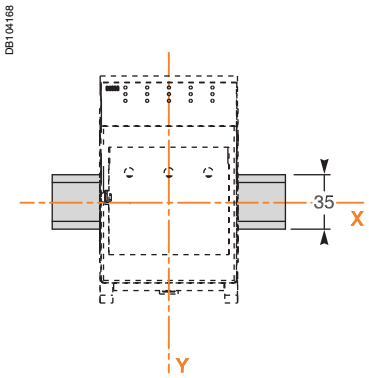


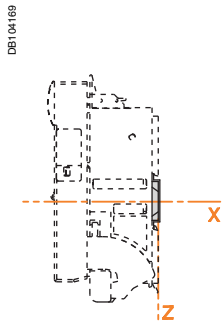
Fupact ISFT100
Installation (cont.)

Installation on a backplate



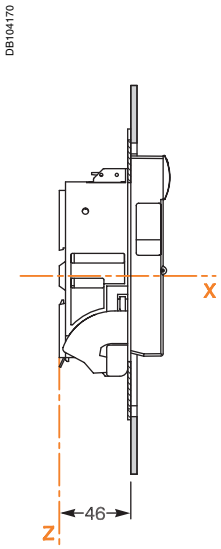
Installation on a symmetrical DIN rail

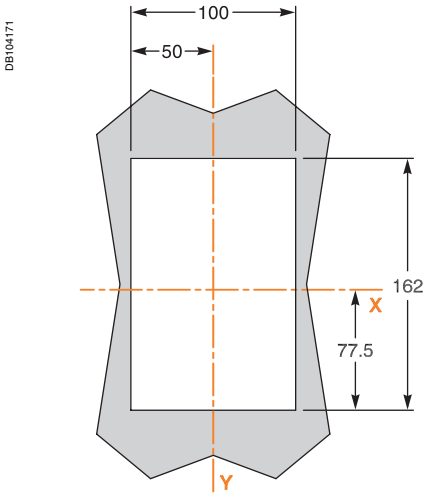


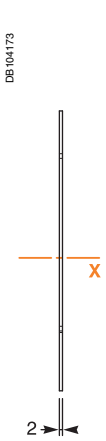


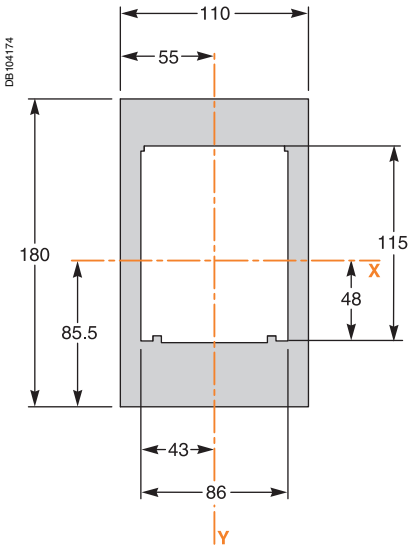
Front panel cutout

Cutout for 1 device

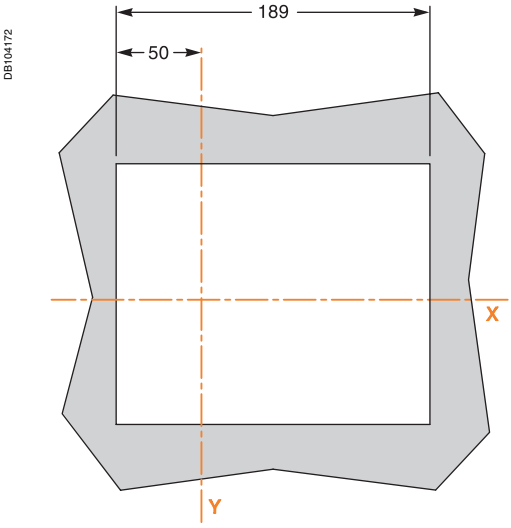


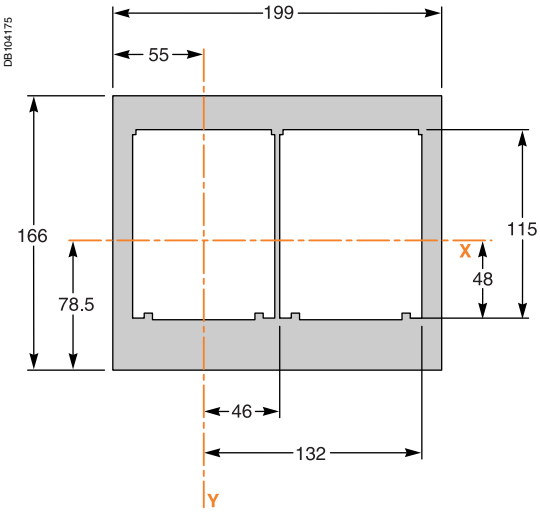






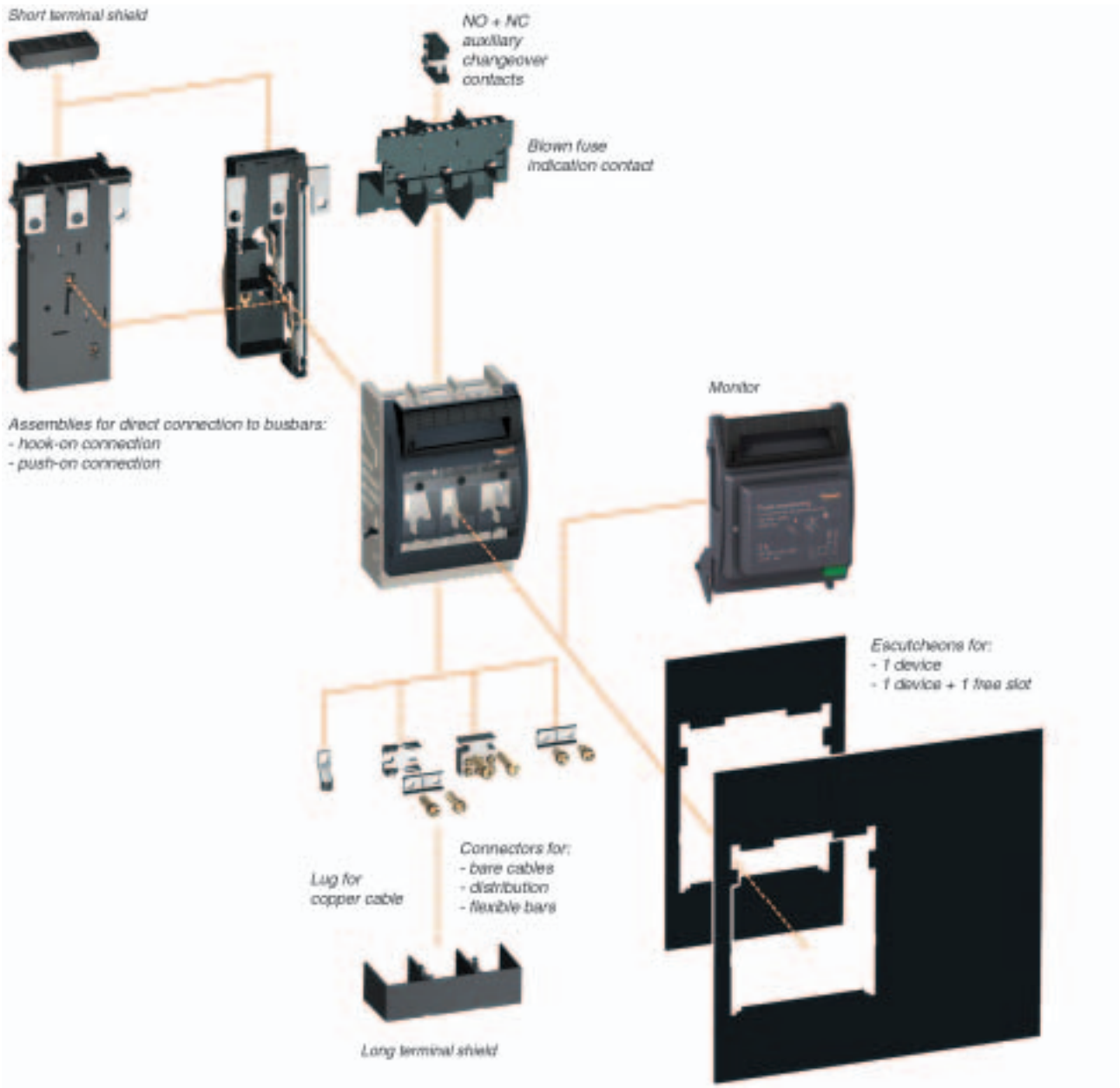
Cutout for 2 devices



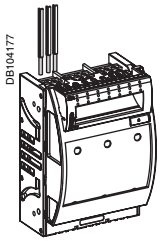


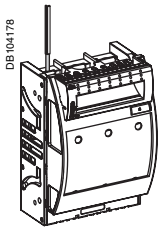
Fupact ISFT160
Device and accessories

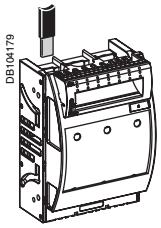
DB108701-159

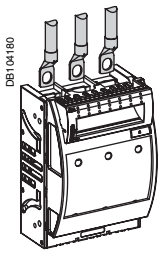


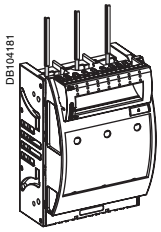
Fupact ISFT160
Connection and connection accessories

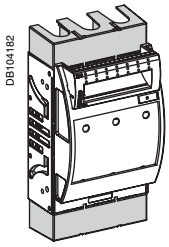










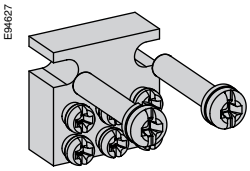


X: represents the centre of the device.
Y: represents the operating shaft.
Z: represents rear face of the device.

Front connection

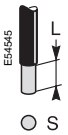
Connection to standard M8 terminals

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



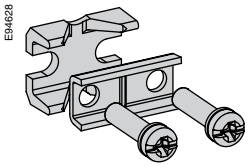
Distribution connector.

3 x 16 mm² distribution connector



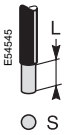
L (mm)	25
S (mm²)	1.5 to 16 rigid
Cu/Al	1.5 to 10 flexible
Torque (Nm)	2 (cables)
	4 (connectors)

Used with long terminal shields



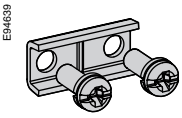
V-type connector for bare Cu/Al cables.

V-type connector for bare Cu/Al cables



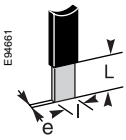
L (mm)	25
S (mm²)	1.5 to 95 rigid
Cu/Al	1.5 to 70 flexible
Torque (Nm)	4

Used with short terminal shields



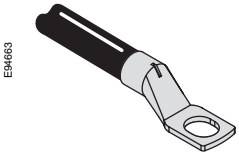
Connector for flexible bars.

Connector for flexible bars



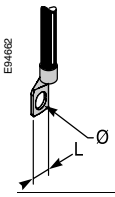
L (mm)	20
l (mm)	12
e (mm)	6
Torque (Nm)	4

Used with short terminal shields



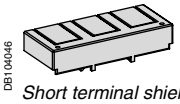
Lug for copper cables.

Lug for 95 to 185 mm² copper cables



L (mm)	< 12
Ø (mm)	8.2
Torque (Nm)	14

Used with long terminal shields

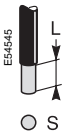


Short terminal shield.

Direct connection to connectors

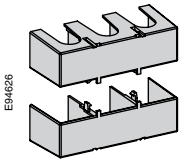
Fupact ISFT160 devices are equipped as standard with connectors for copper or aluminium bare cables from 1.5 to 50 mm² for mounting on backplates

Standard device



Fupact connector	
L (mm)	25
S (mm²)	1.5 to 95 rigid
Cu/Al	1.5 to 70 flexible
Torque (Nm)	4

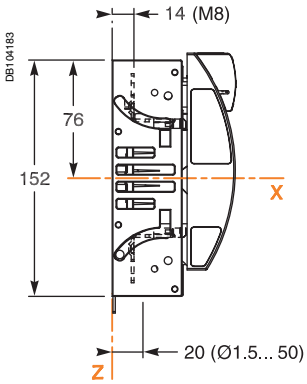
Used with short terminal shields

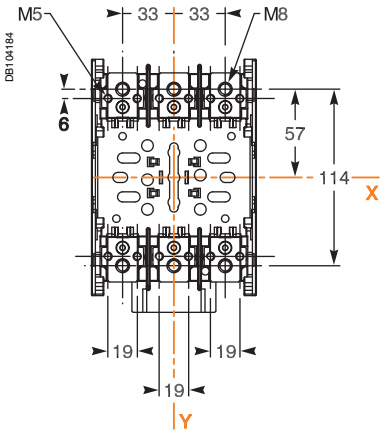


Long terminal shields.

Fupact ISFT160
Connection and connection accessories (cont.)

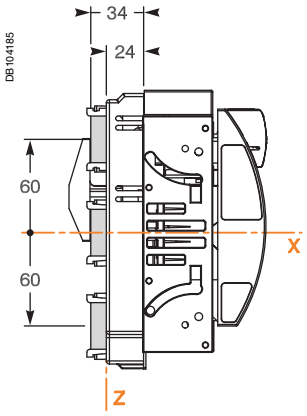
Connections for mounting on a backplate

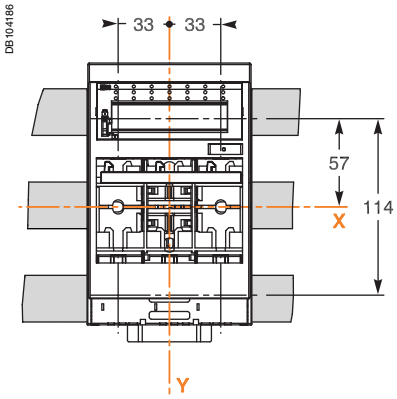




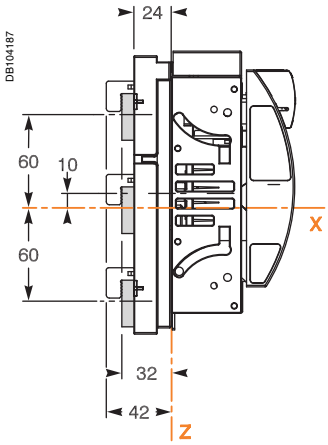
Connections for mounting on 60 mm busbars

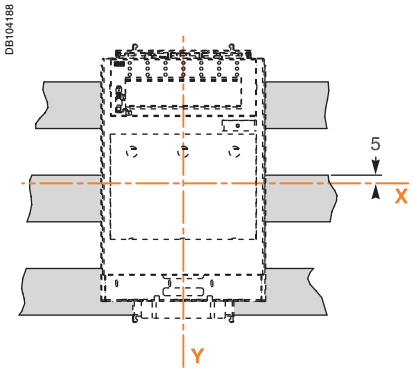
Push-on connection





Hook-on connection

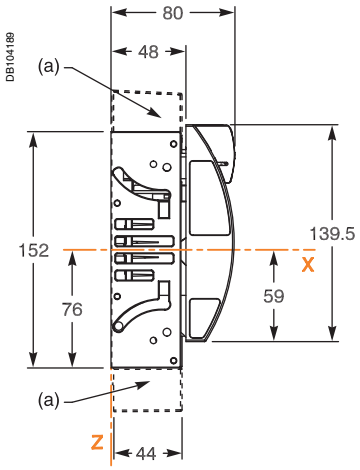




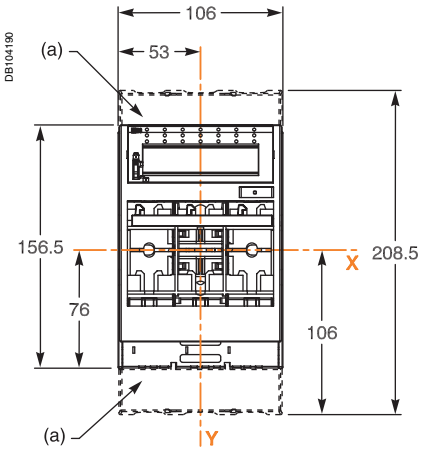
Fupact ISFT160
Installation

Dimensions

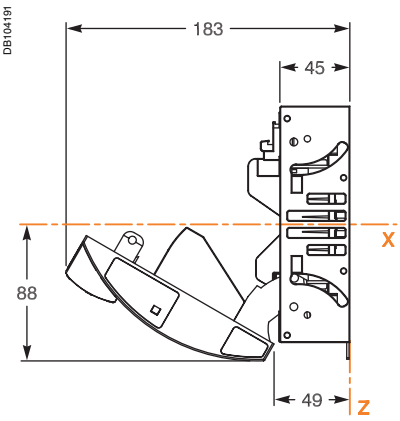
Closed



Front

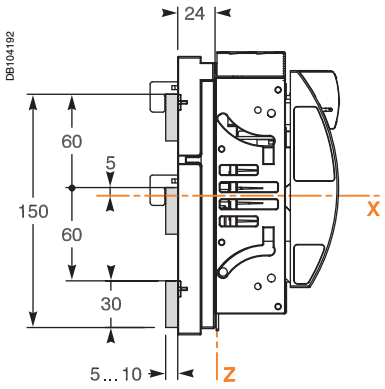


Fuse carrier open

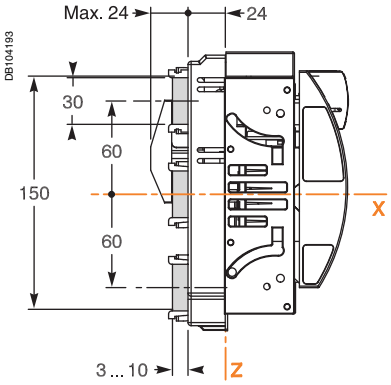


a = terminal shields.
b = fuse controller.

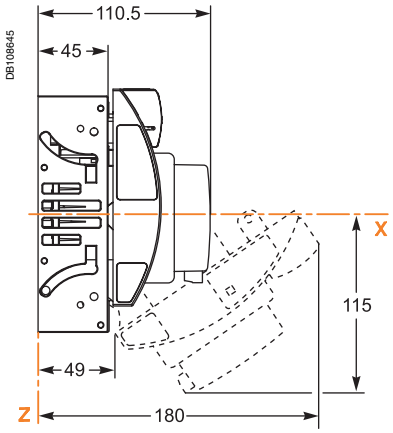
With hook-on kit



With push-on kit

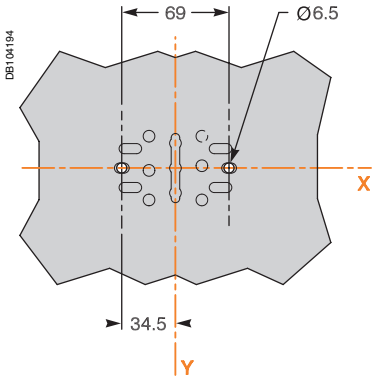


With fuse monitor



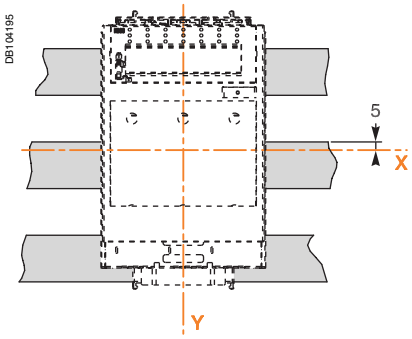
Fupact ISFT160
Installation (cont.)

Installation on a backplate

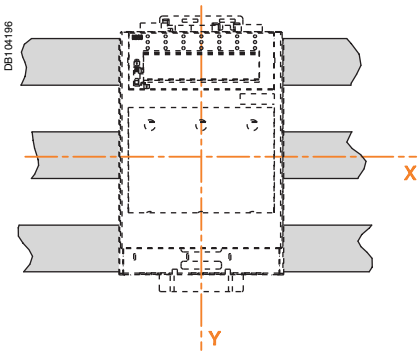


Installation on 60 mm busbars

With hook-on kit

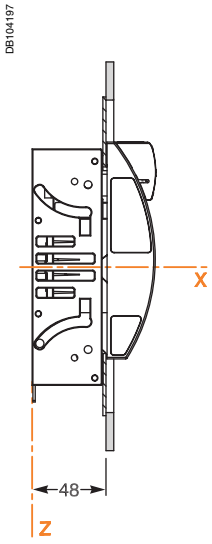


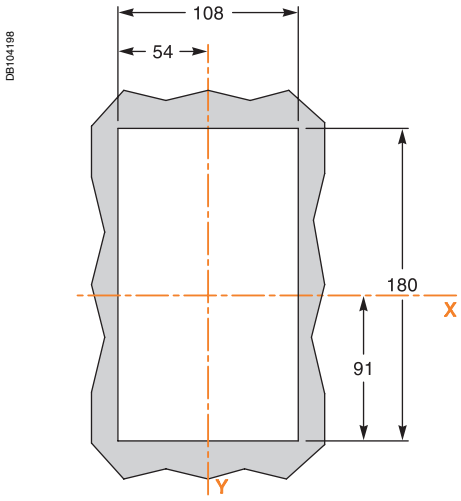
With push-on kit

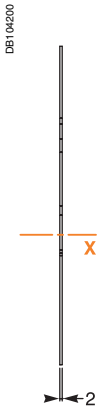


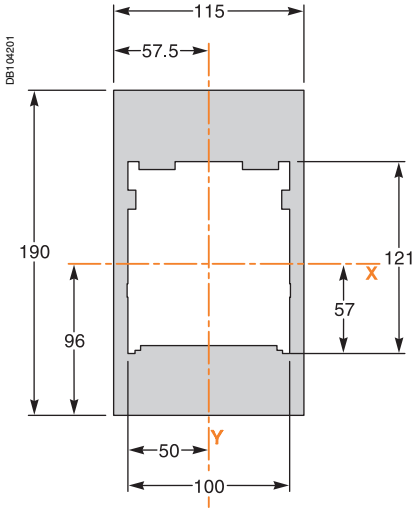
Front panel cutout

Cutout for 1 device

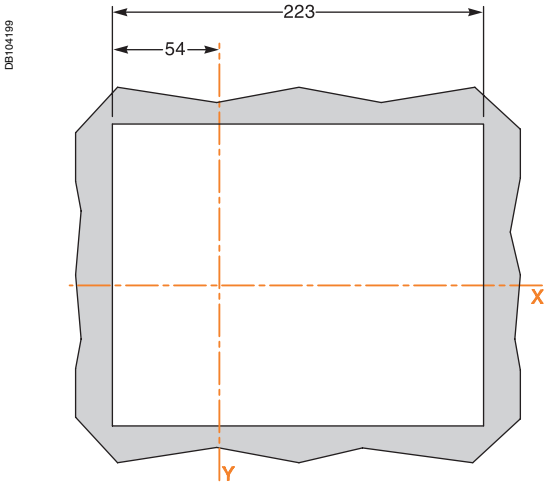


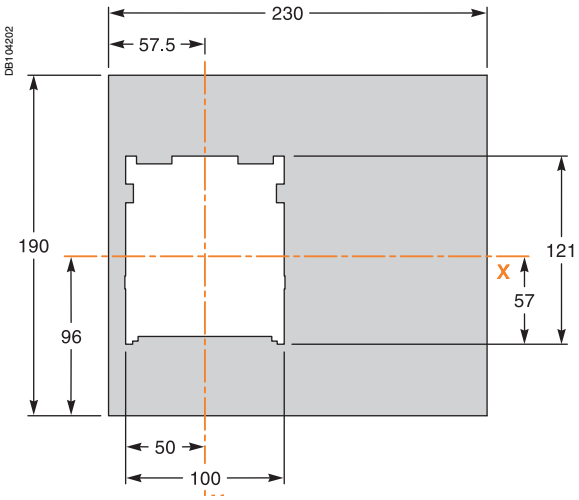






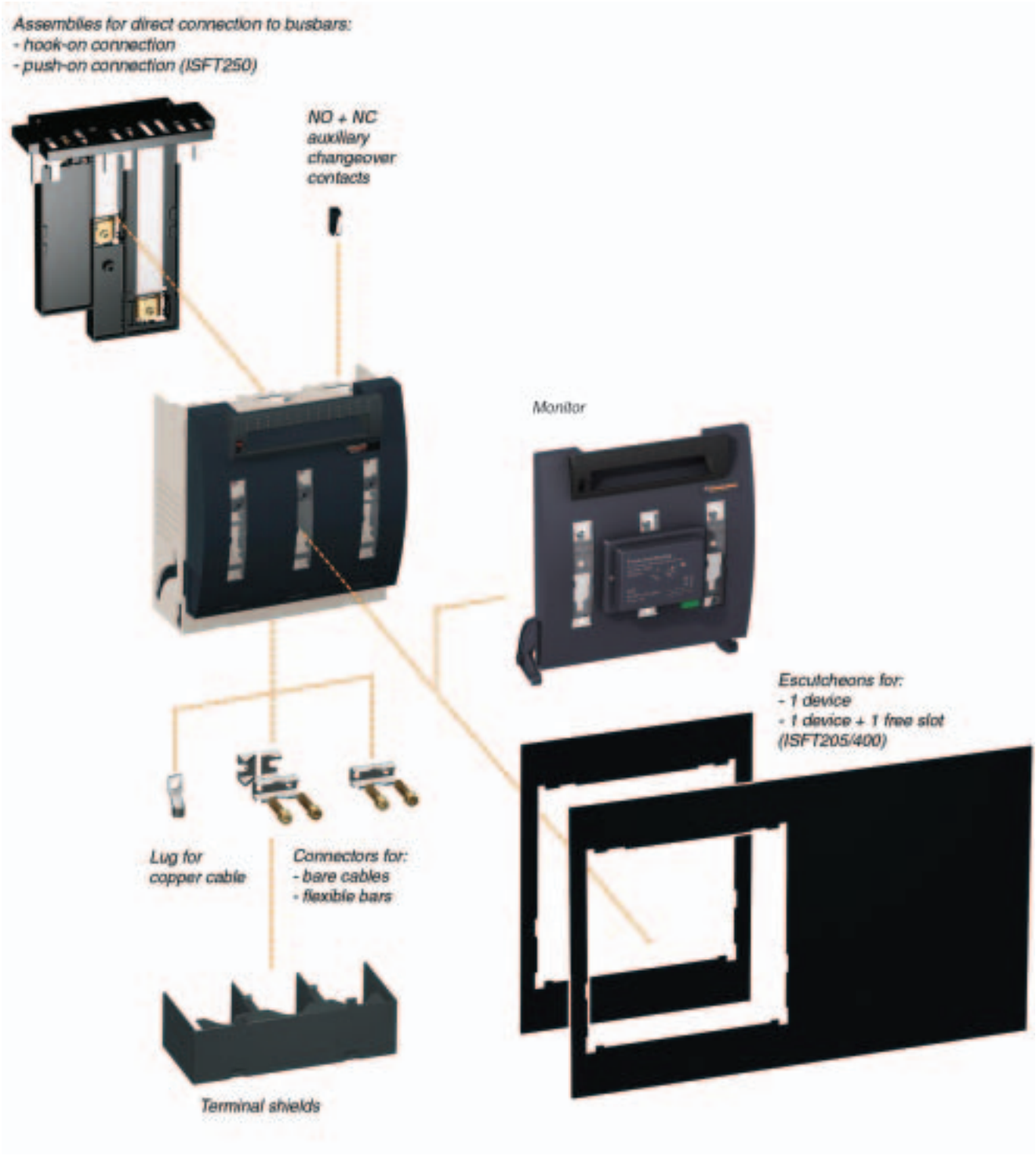
Cutout for 1 device + 1 free slot



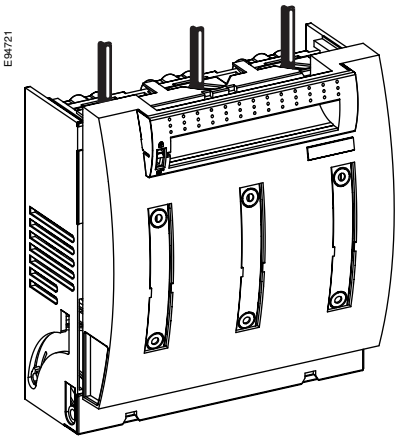


Fupact ISFT250 to 630
Device and accessories

DB108702-180



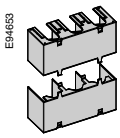
Fupact ISFT250 to 630
Connection and connection accessories



Front connection

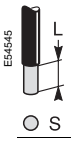
Connection to standard M10 terminals

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

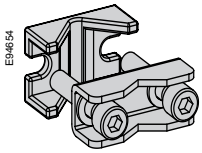


Terminal shields.

V-type connector for bare Cu/Al cables

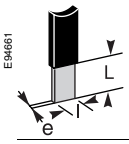


	ISFT250	ISFT400/630
L (mm)	20	25
S (mm^2) Cu/Al	6 to 150	6 to 240
Torque (Nm)	14	14

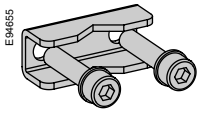


V-type connector for bare Cu/Al cables.

Connector for flexible bars

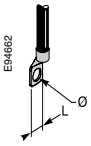


	ISFT250	ISFT400/630
L (mm)	20	30
l (mm^2)	16	21
e (mm)	15	15
Torque (Nm)	14	14

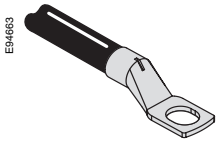


Connector for flexible bars.

Lug for 100 to 185 mm² copper cables

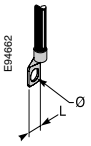


	ISFT250 to 630
L (mm)	⩽ 16
Ø (mm)	10.2
Torque (Nm)	32

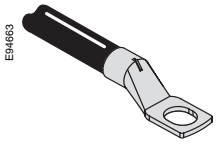


Lug for copper cables.

Lug for 240 to 300 mm² copper cables

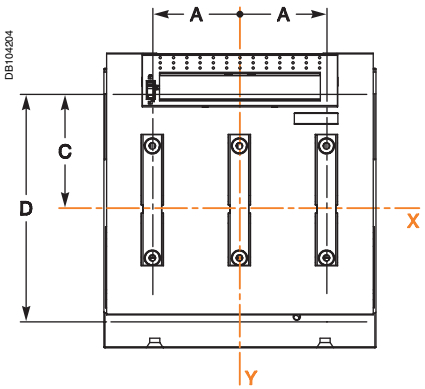


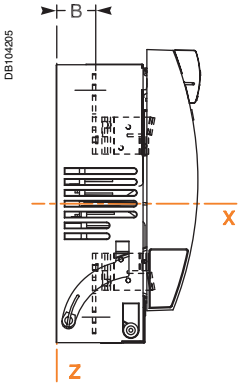
	ISFT400 to 630
L (mm)	⩽ 21
Ø (mm)	10.2
Torque (Nm)	32



Lug for copper cables.

Connections for mounting on a backplate





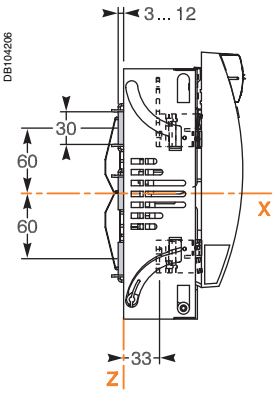
	A	B	C	D
ISFT250	57	33	93	186
ISFT400	65	36.5	104.5	209
ISFT630	80	36.5	104.5	209

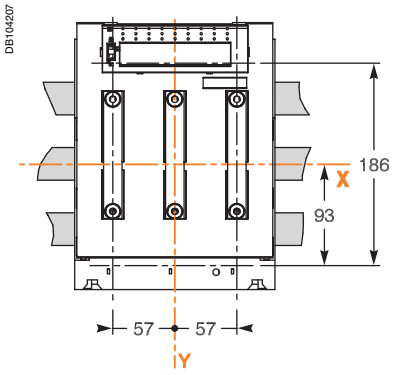
X: represents the centre of the device.
Y: represents the operating shaft.
Z: represents rear face of the device.

Fupact ISFT250 to 630
Connection and connection accessories (cont.)

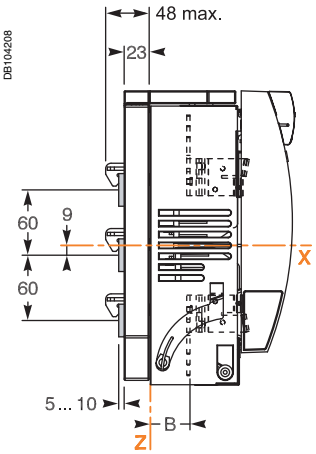
Connections for mounting on 60 mm busbars

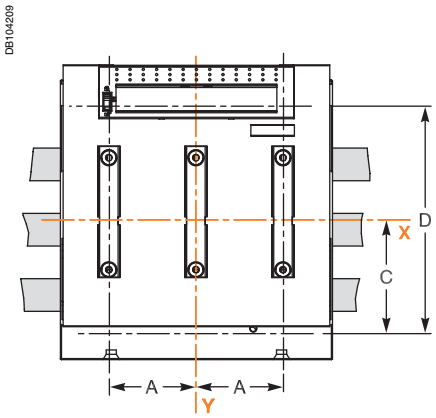
Push-on connection for ISFT250





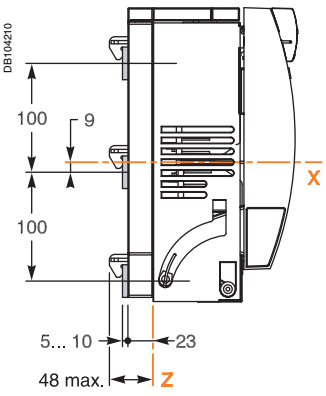
Hook-on connection for ISFT250/400/630

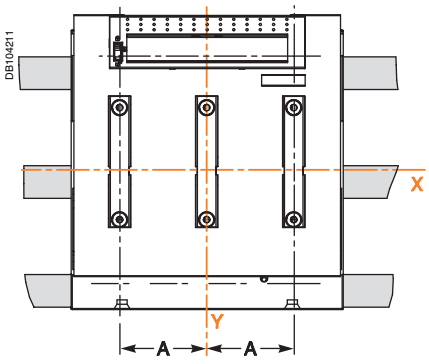




Connections for mounting on 100 mm busbars

Hook-on connection for ISFT250/400/630



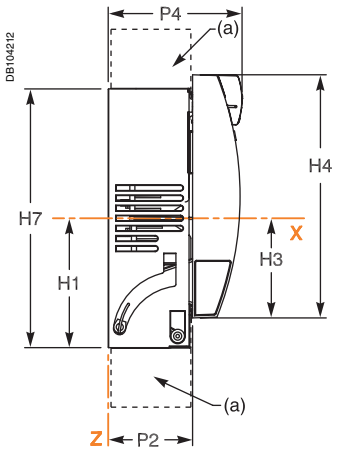


	A	B	C	D
ISFT250	57	33	93	186
ISFT400	65	36.5	104.5	209
ISFT630	80	36.5	104.5	209

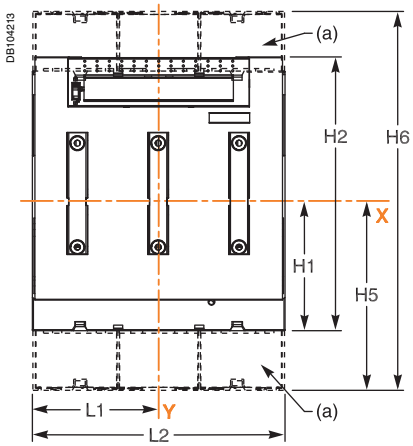
Fupact ISFT250 to 630
Installation

Dimensions

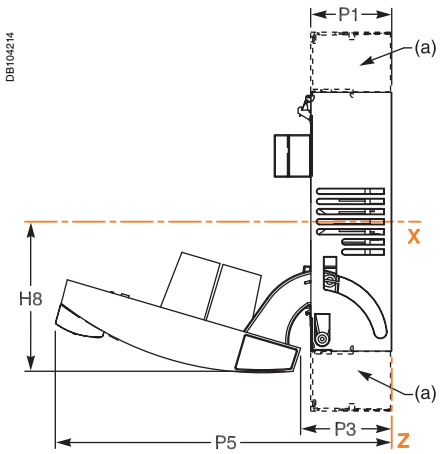
Closed



Front

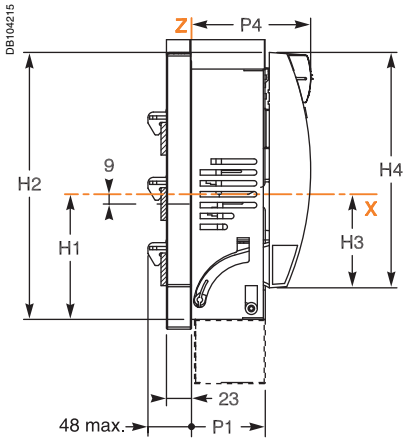


Fuse carrier open

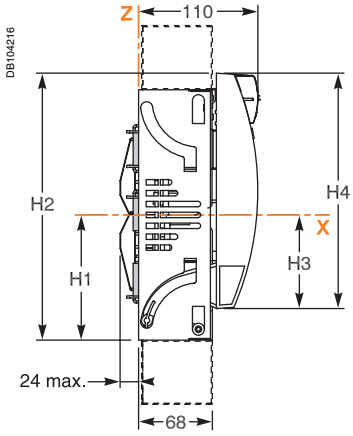


a = terminal shields.
b = fuse controller.

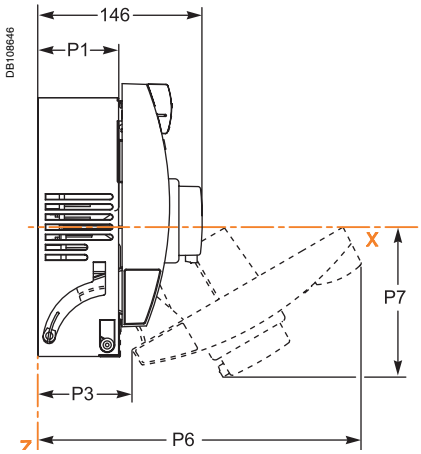
With hook-on kit for ISFT250/400/630



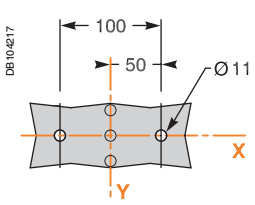
With push-on kit for ISFT250



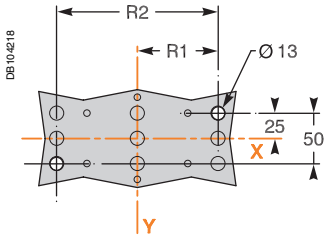
With fuse monitor



Installation on a backplate for ISFT250



Installation on a backplate for ISFT400/630

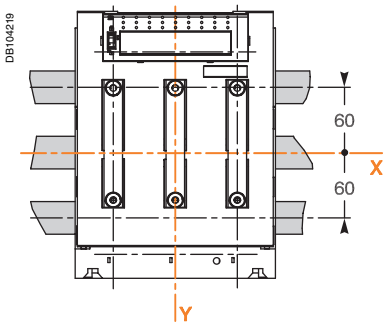


	H1	H2	H3	H4	H5	H6	H7	H8	L1	L2	P1	P2	P3	P4	P5	R1	R2	P6	P7
ISFT250	115	245	86	216	174	348	230	133	92	184	68	72	78	110	293	-	-	316	148
ISFT400	128	270	99	241	187	374	256	144	105	210	82	84	91	127	331	65	130	319	148
ISFT630	128	270	99	241	187	374	256	147	125	250	82	84	91	132	332	80	160	319	148

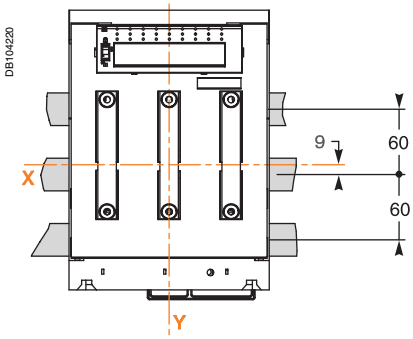
Fupact ISFT250 to 630
Installation (cont.)

Installation on busbars

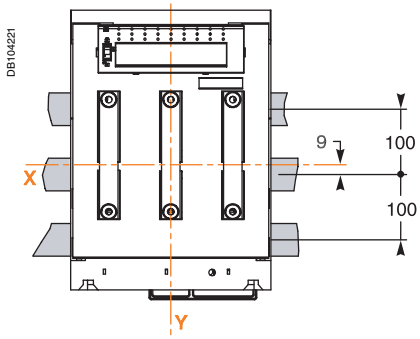
With push-on kit for ISFT250



With hook-on kit for ISFT250

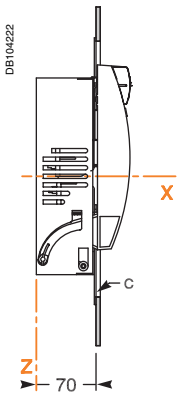


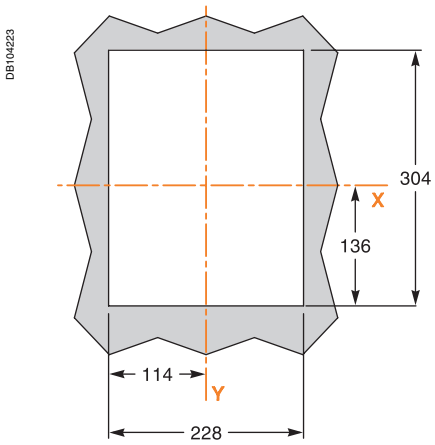
With hook-on kit for ISFT400/630



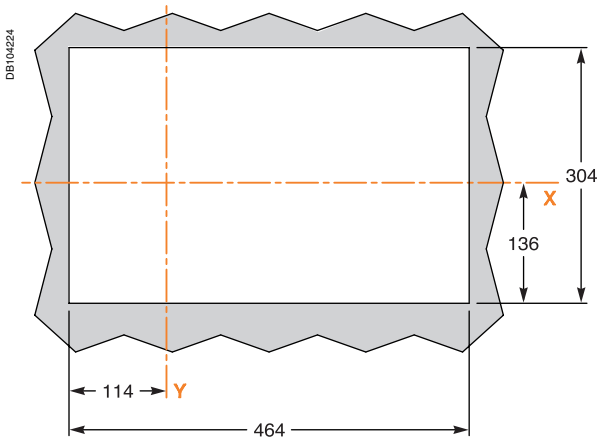
Front panel cutout for ISFT250

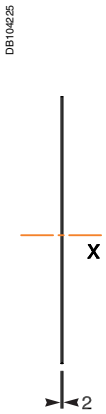
Cutout for 1 device

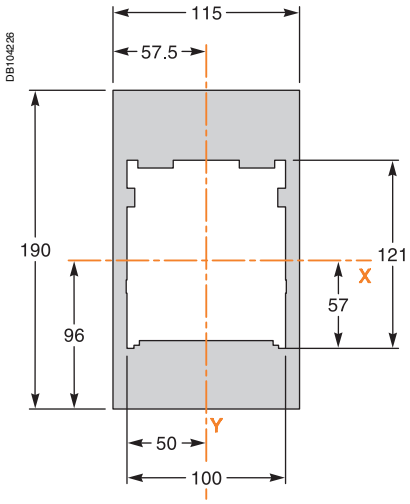


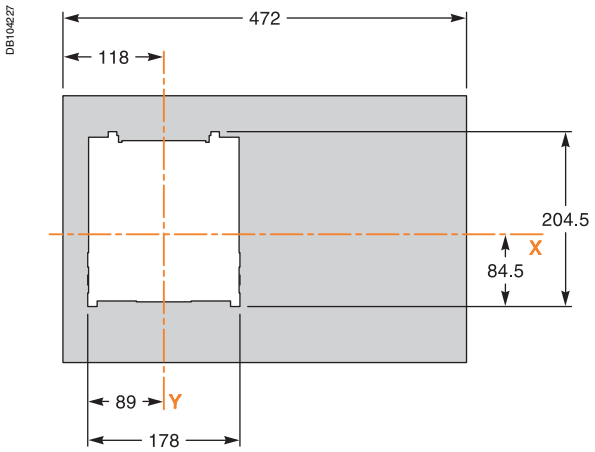


Cutout for 1 device + 1 free slot





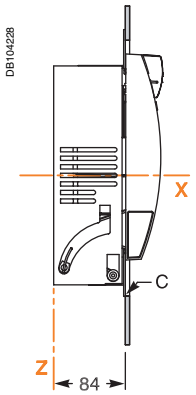


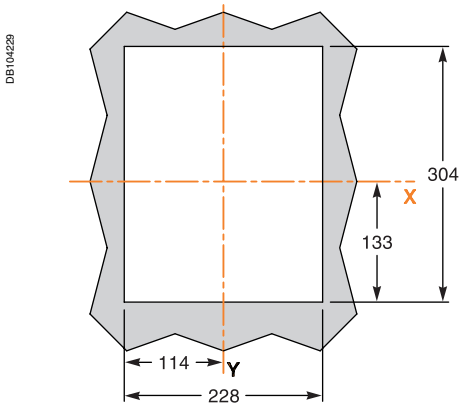


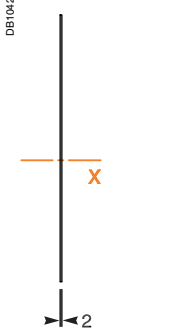
Fupact ISFT250 to 630
Installation (cont.)

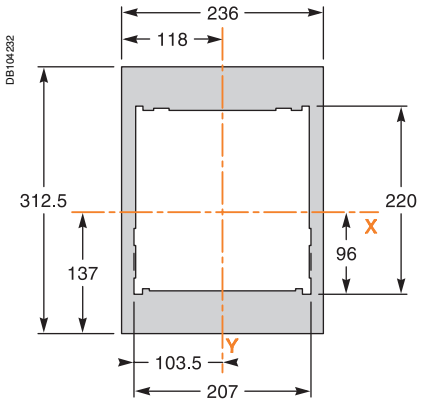
Front panel cutout for ISFT400

Cutout for 1 device

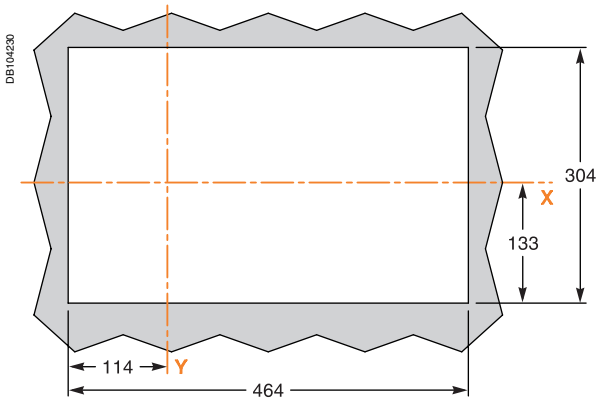


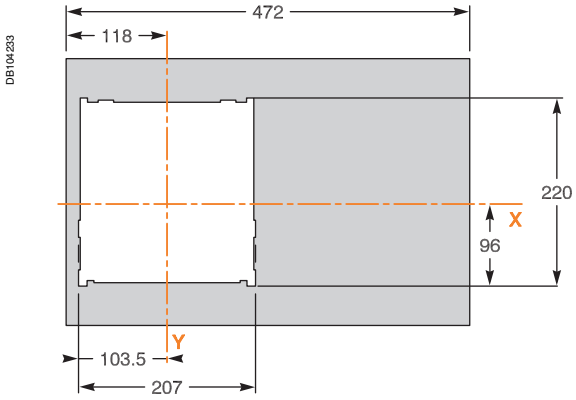






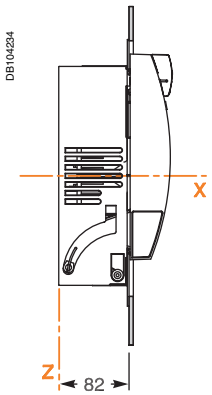
Cutout for 1 device + 1 free slot

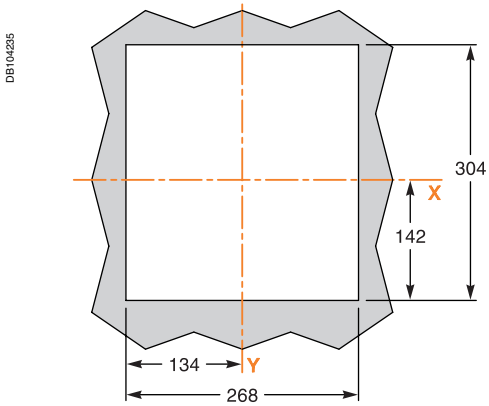


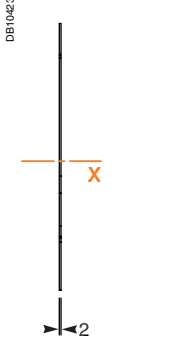


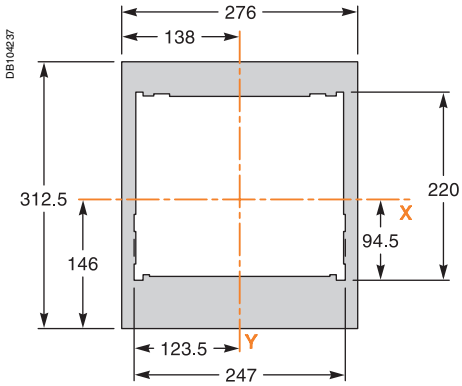
Front panel cutout for ISFT630

Cutout for 1 device



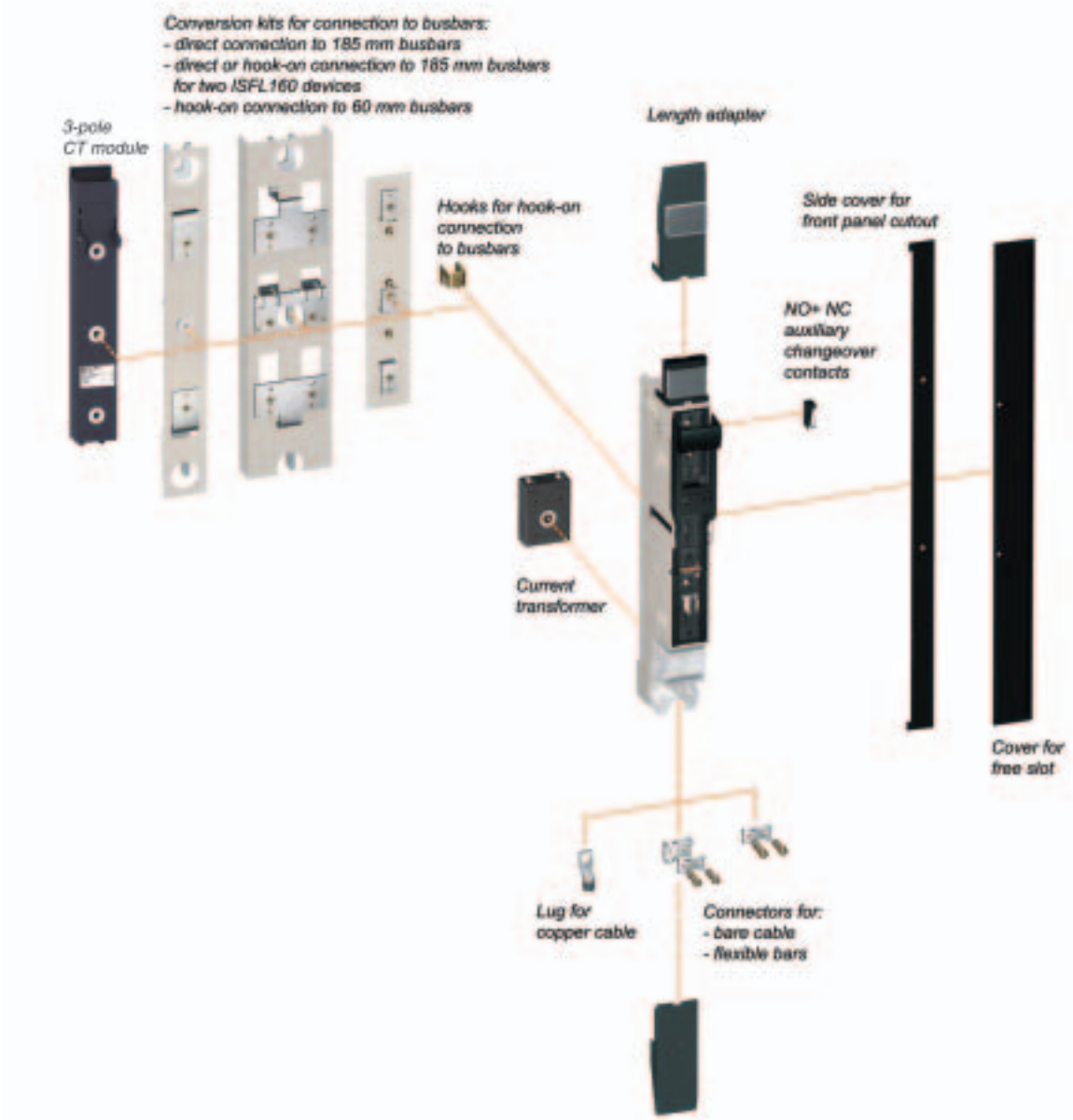




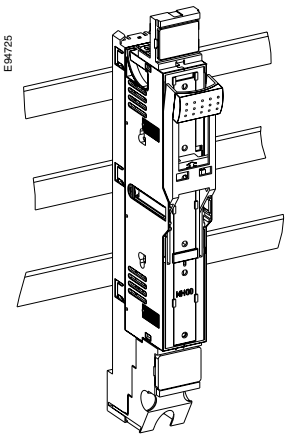


Fupact ISFL160
Device and accessories

DB108703-180



Fupact ISFL160
Connection and connection accessories



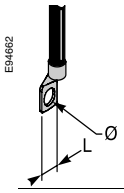
Front connection

Connection to standard M8 terminals

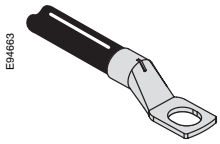
20 mm wide terminals with M8 holes for outgoing connection via lugs or connectors.

Connector for flexible bars.

Connection via lugs for 95 mm² copper cables

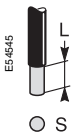


L (mm)	⩽ 20
Ø (mm)	8.2
Torque (Nm)	14

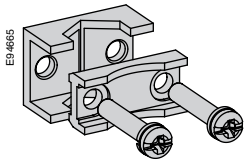


Lug for copper cables.

V-type connector for bare Cu/Al cables

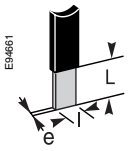


L (mm)	25
S (mm²)	1.5 to 95 rigid
	1.5 to 70 flexible
Torque (Nm)	4

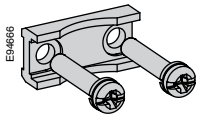


V-type connector for bare Cu/Al cables.

Connector for flexible bars

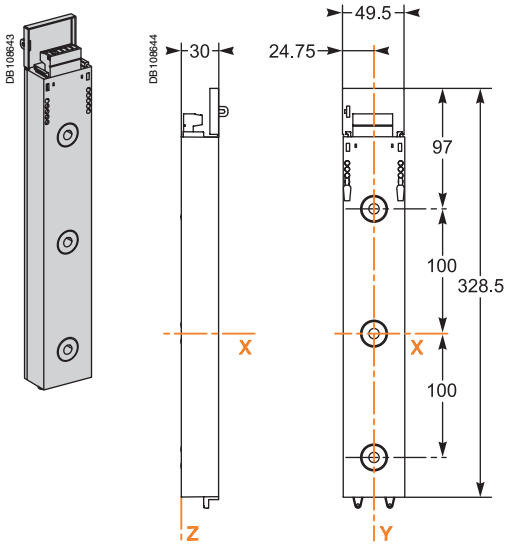


L (mm)	20
l (mm)	12
e (mm)	6
Torque (Nm)	4

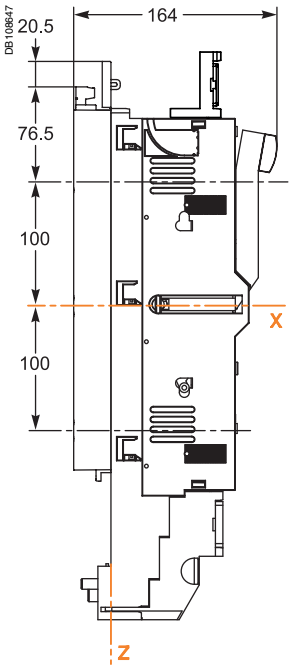


Current transformer

For current measurements, one to three transformers can be inserted between the busbars and the Fupact devices.
M12 connections, torque 40 Nm.



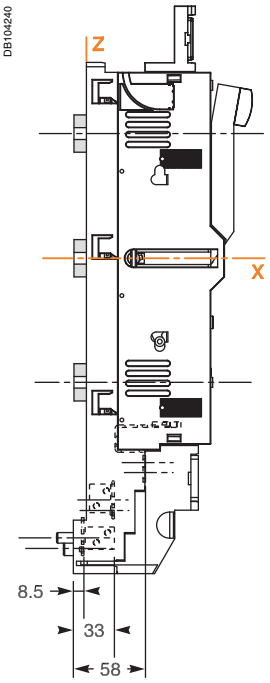
Direct connection to 100 mm busbars

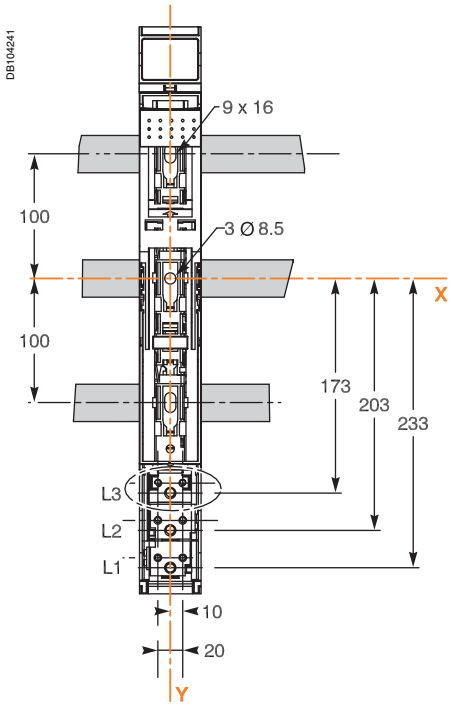


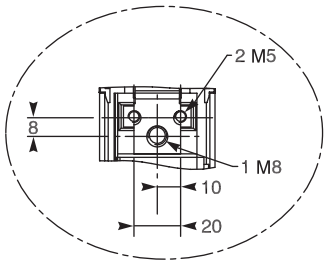
X: represents the centre of the device.
Y: represents the operating shaft.
Z: represents rear face of the device.

Fupact ISFL160
Connection and connection accessories (cont.)

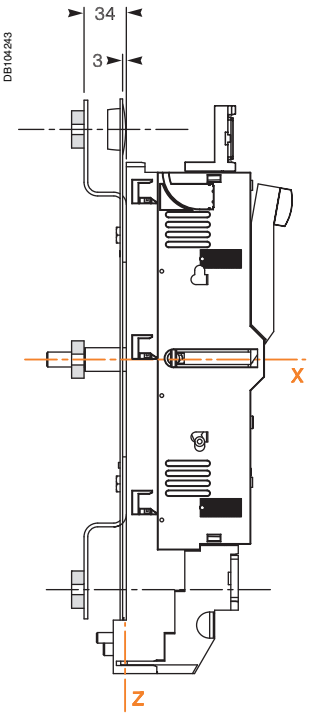
Direct connection to 100 mm busbars

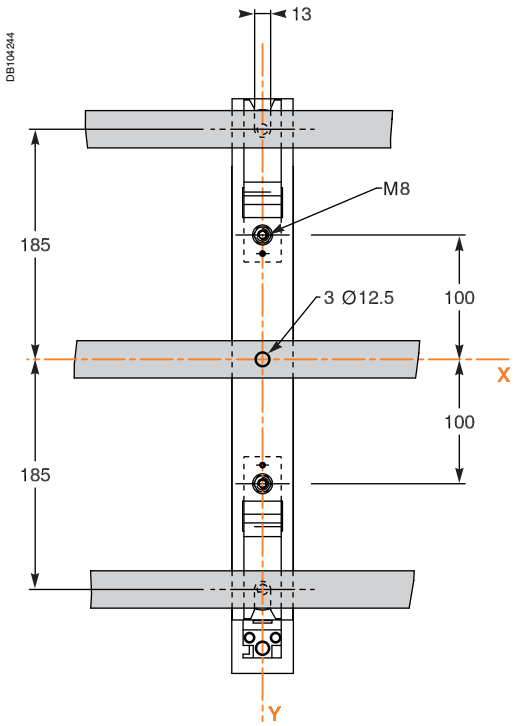






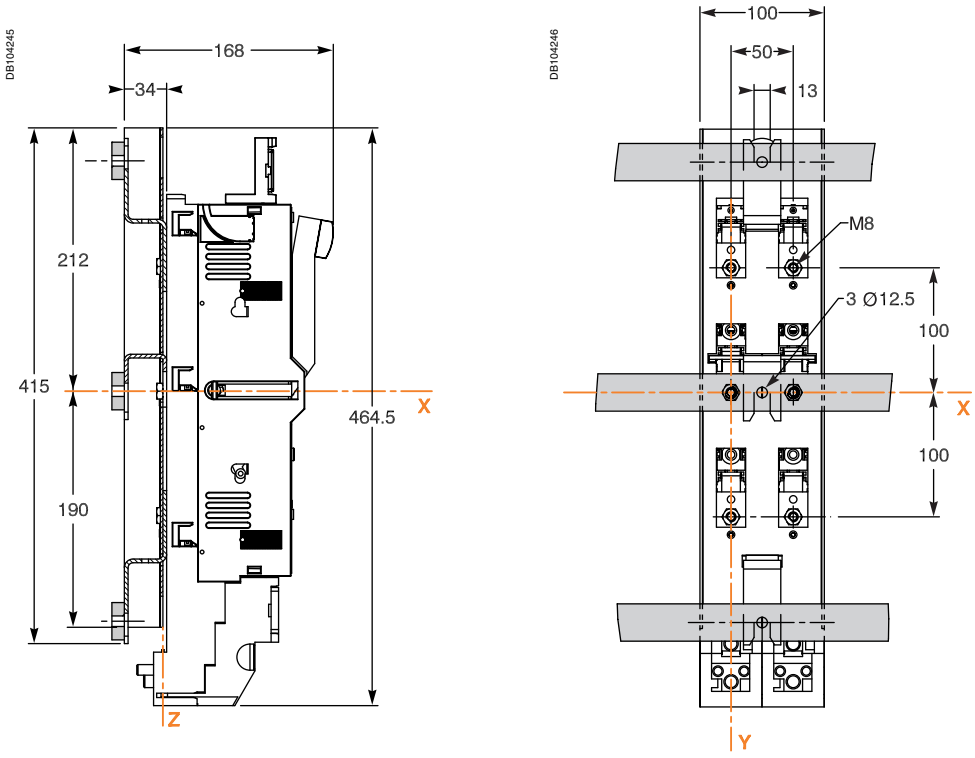
Kit for direct connection to 185 mm busbars





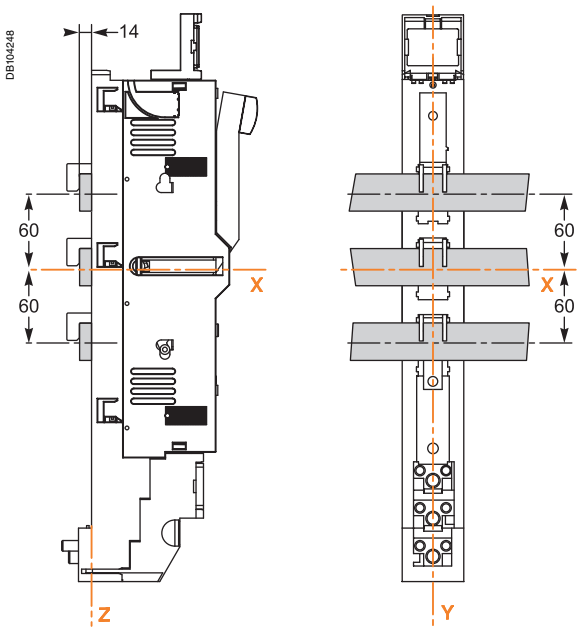
Fupact ISFL160
Connection and connection accessories (cont.)

Kit for direct connection to 185 mm busbars for 2 ISFL160 devices

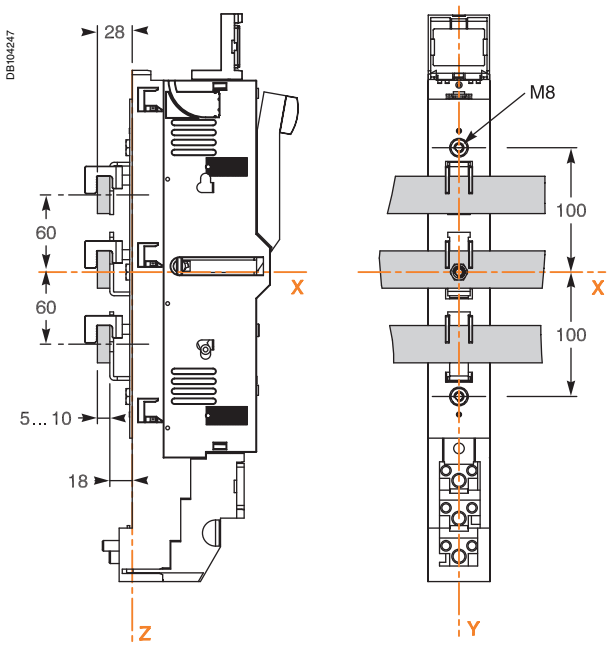


Hook-on connection to 60 mm busbars

Kit for fusegear with 100 mm centres



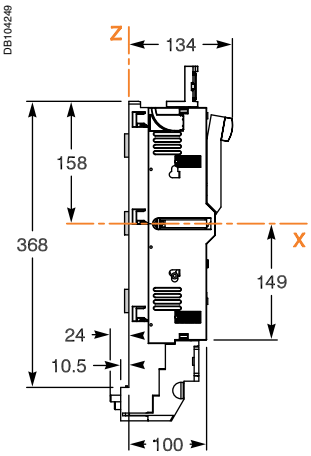
Standard fusegear with 60 mm centres



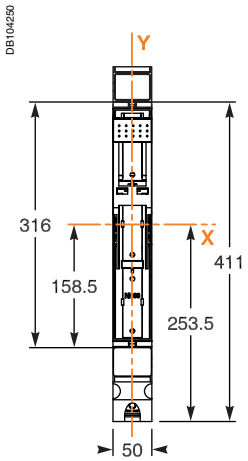
Fupact ISFL160
Installation

Dimensions

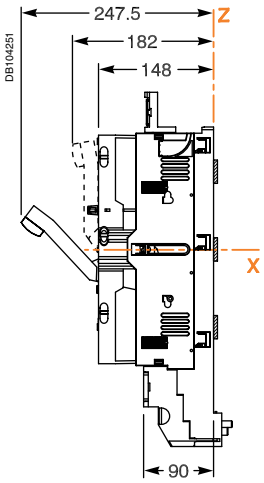
Closed



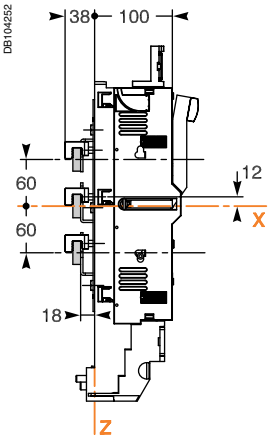
Front



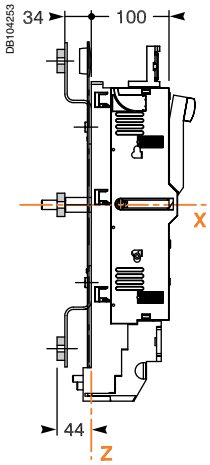
Open and locked



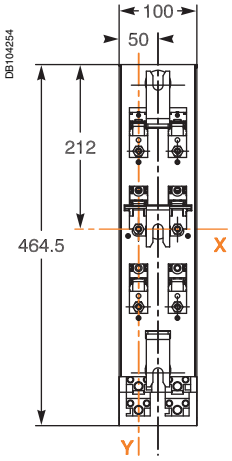
With 60 mm hook-on kit



With 185 mm connection kit

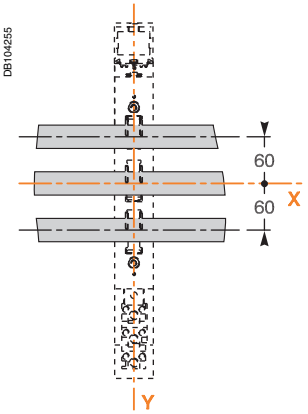


With 185 mm connection kit for 2 ISFL devices

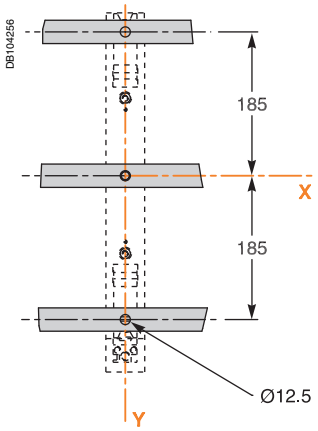


Connection to busbars

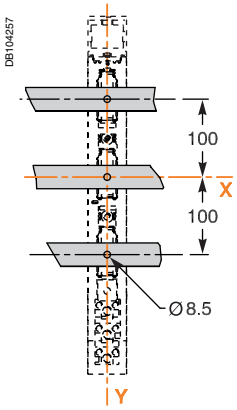
With hook-on kit



With connection kit for 185 mm busbars



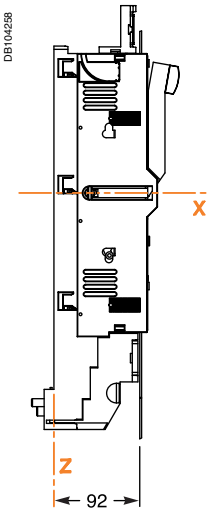
For 100 mm busbars

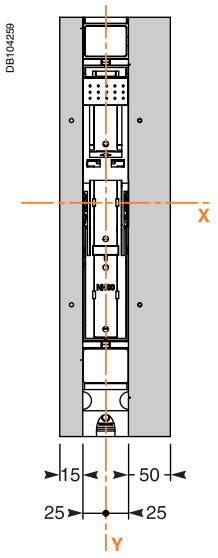


Fupact ISFL160
Installation (cont.)

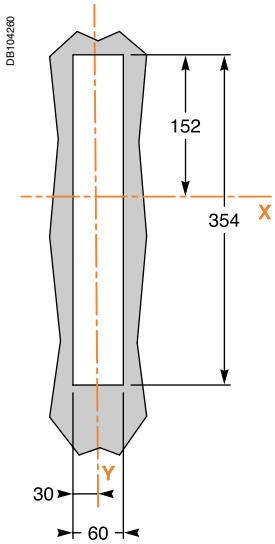
Front panel cutout for 1 device with side cover and/or 1 free slot

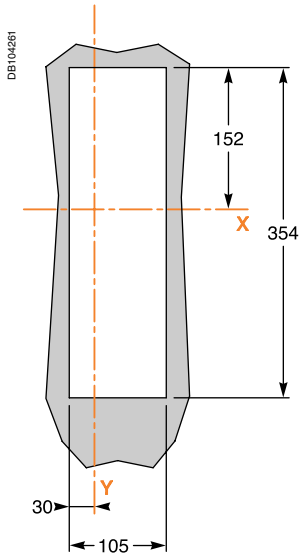
1 device





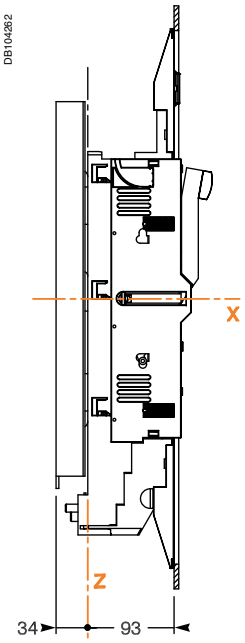
1 device + 1 free slot

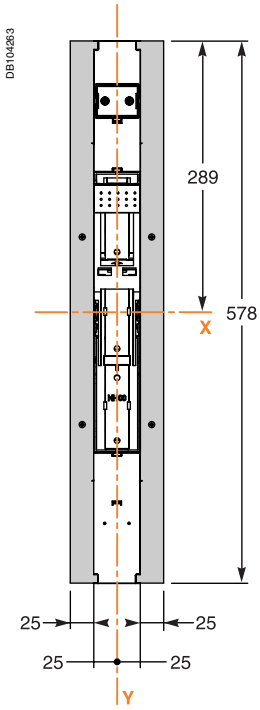




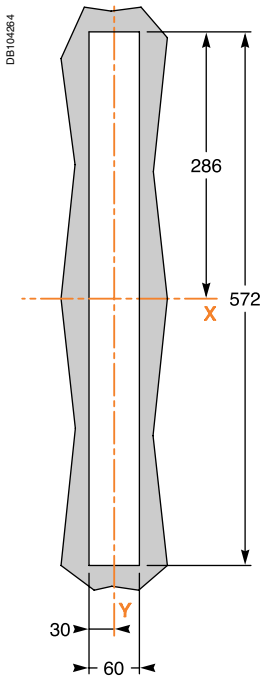
Front panel cutout with length adapter and identification label holder

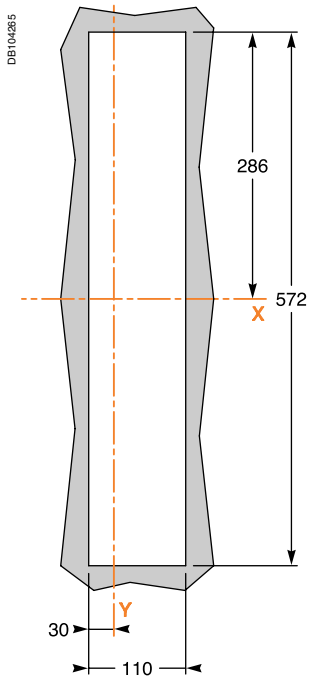
1 device





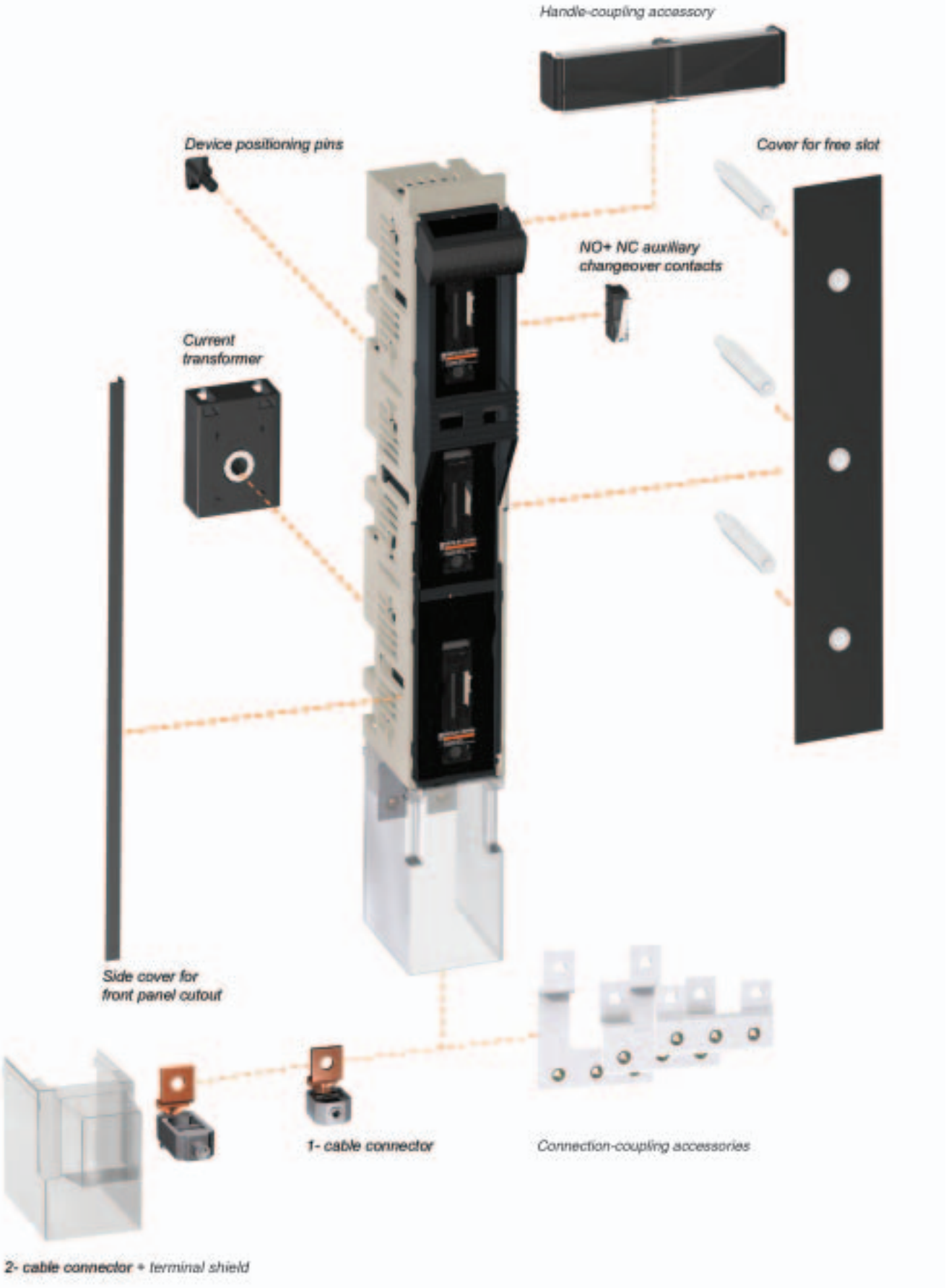
2 devices



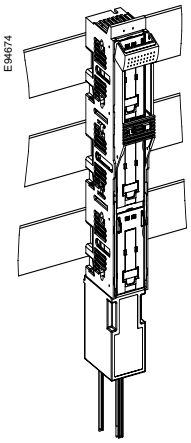


Fupact ISFL250 to 630
Device and accessories

DB108704-180



Fupact ISFL250 to 630
Connection and connection accessories

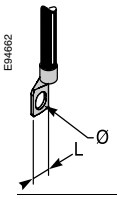


Front connection

Connection to standard M12 terminals

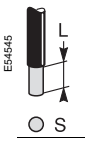
20 mm wide terminals with M12 holes for outgoing connection via lugs.

ISFL250 to ISFL630

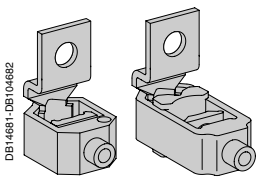


L (mm)	⩽ 30
Ø (mm)	12.2
Torque (Nm)	40

Connector for Cu/Al cables



L (mm)	30
Ø (mm)	35 to 240 for 1-cable connector 2 x 50 to 180 for 2-cable connector
Torque (Nm)	40

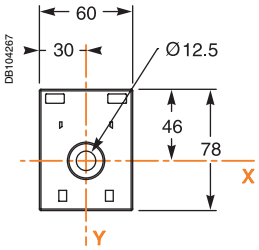


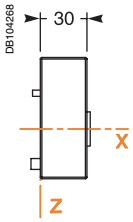
1-cable connector. *2-cable connector.*

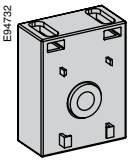
Current transformer

For current measurements, one to three transformers can be inserted between the busbars and the Fupact devices.

M12 connections, torque 40 Nm.



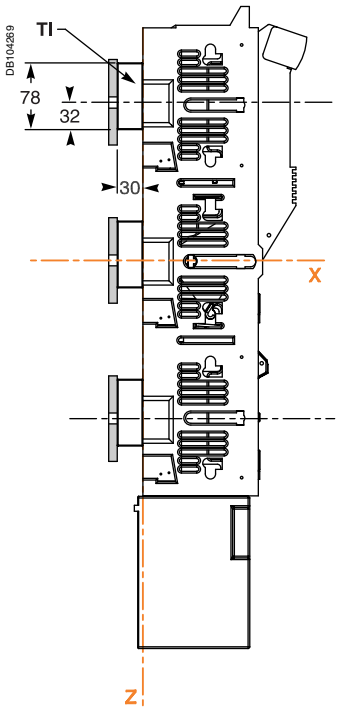


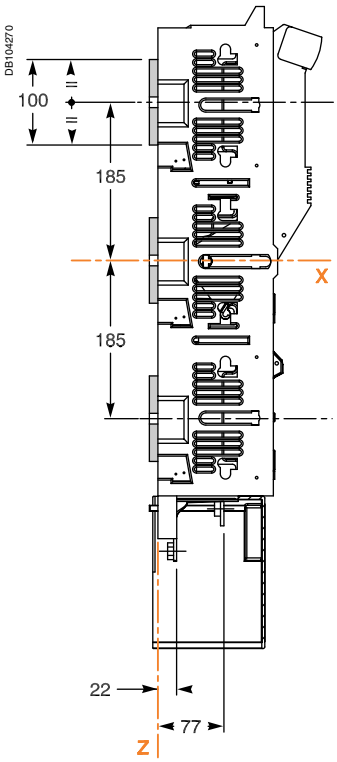


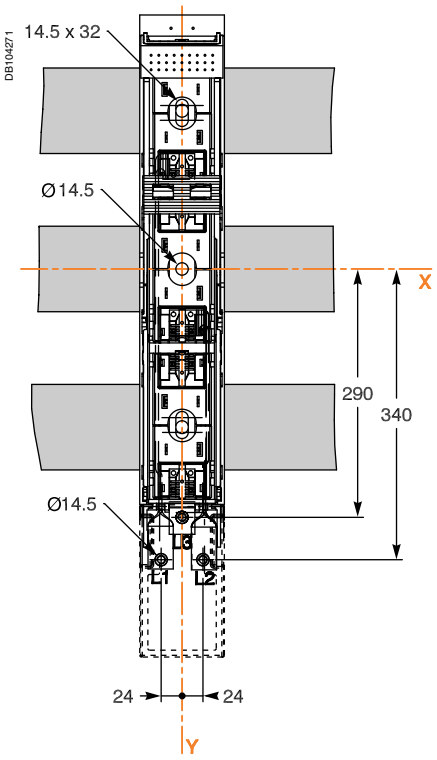
CT.

X: *represents the centre of the device.*
Y: *represents the operating shaft.*
Z: *represents rear face of the device.*

Direct connection to 185 mm busbars



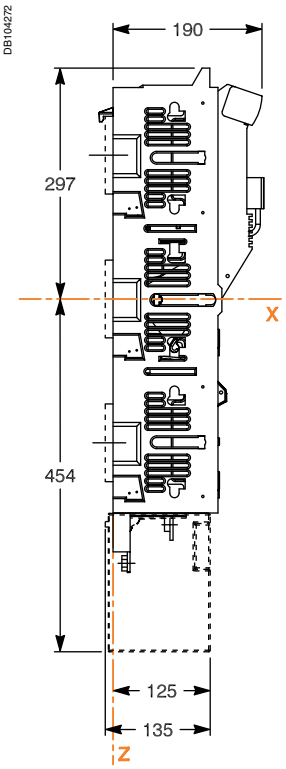




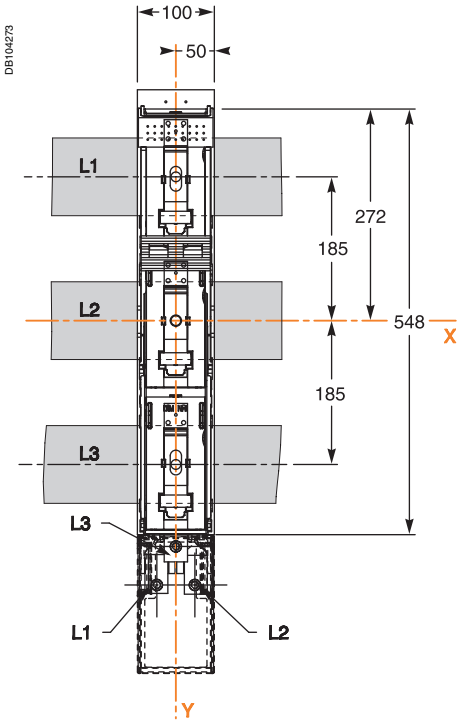
Fupact ISFL250 to 630
Installation

Dimensions

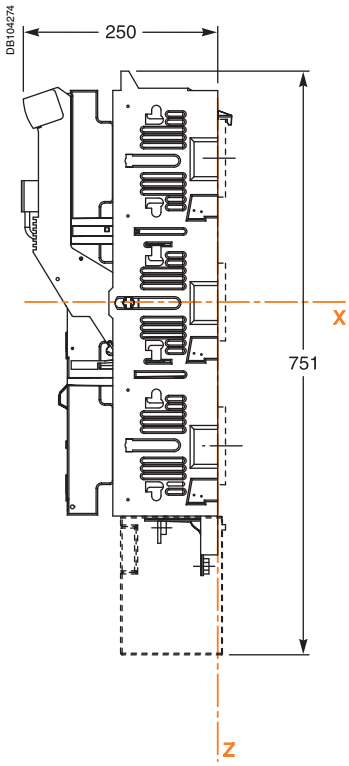
Locked in closed position



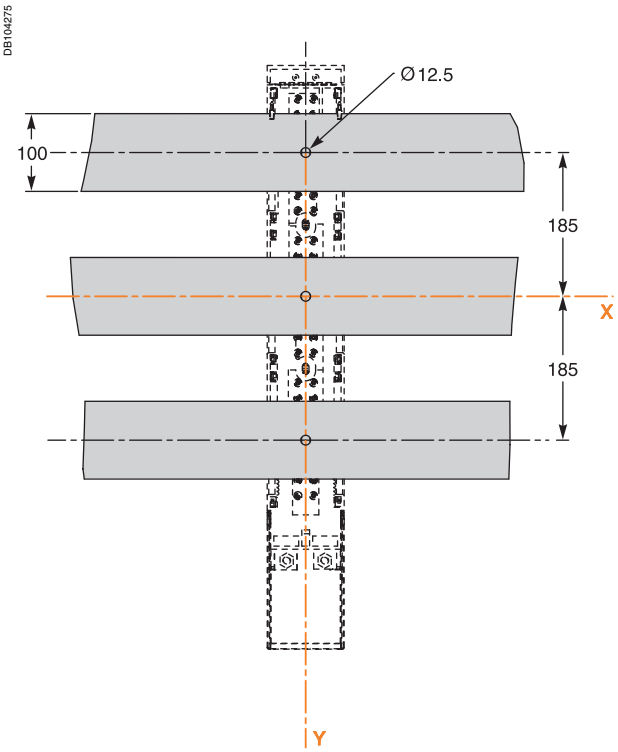
Connection to busbars

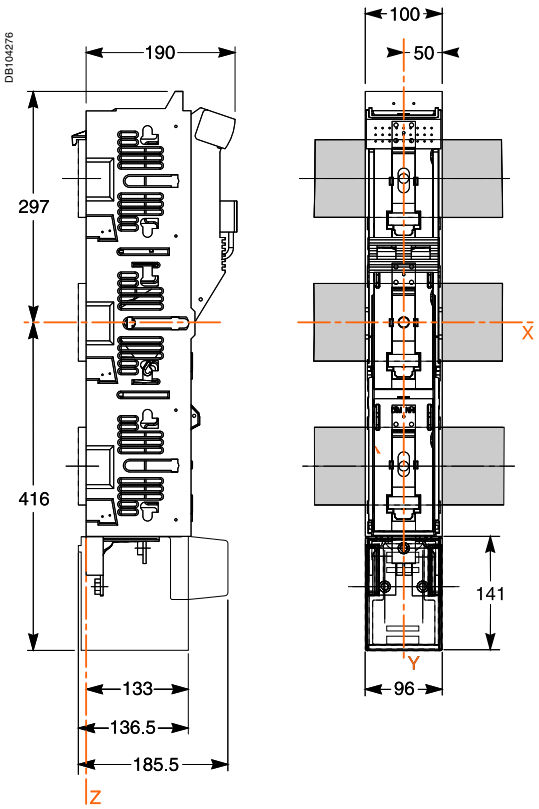


Locked in open position



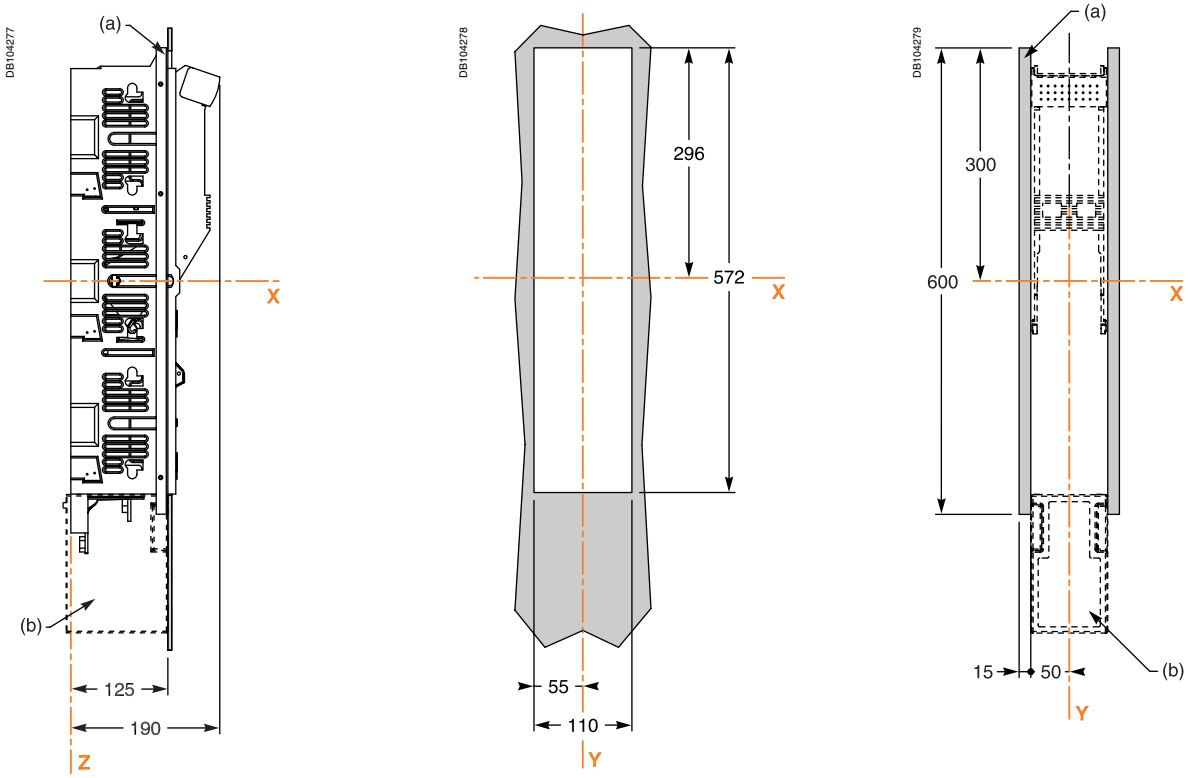
Connection to busbars





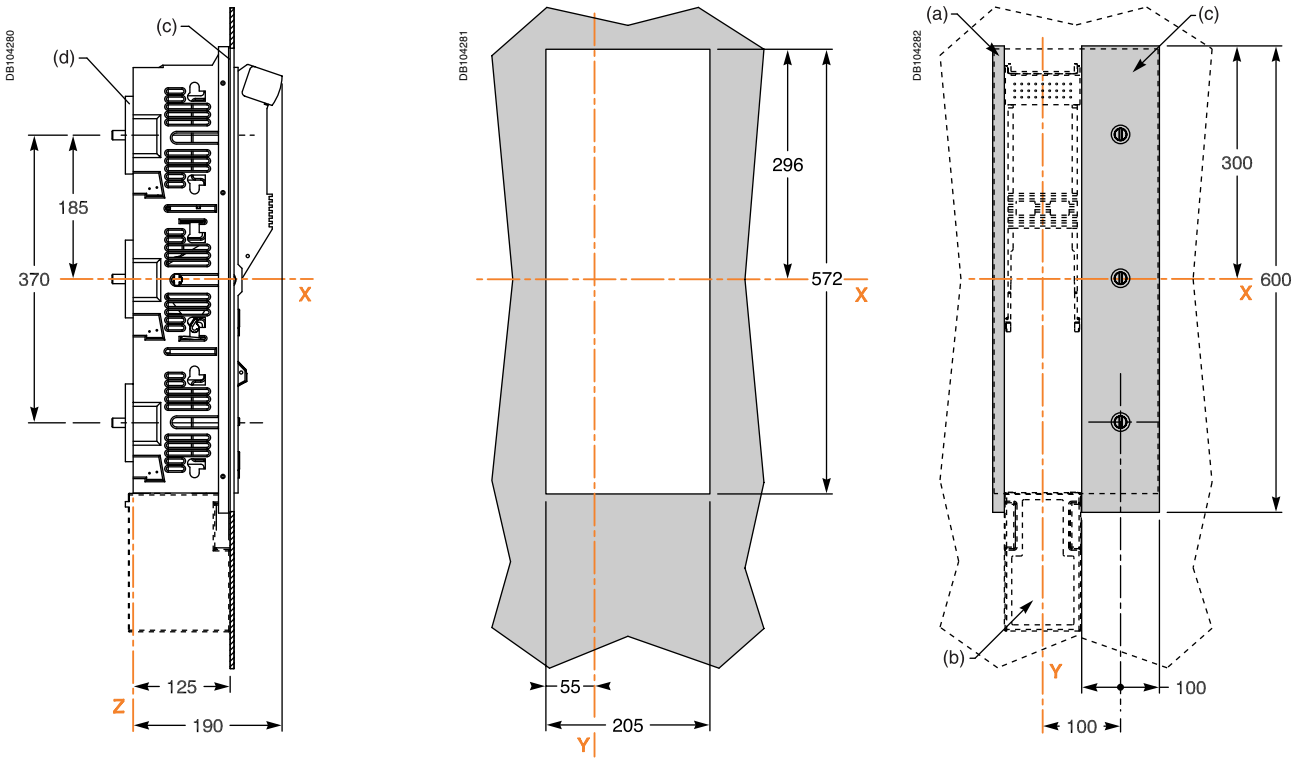
Fupact ISFL250 to 630
Installation (cont.)

Front panel cutout with side cover



a = side cover for front panel cutout.
b = terminal shields.

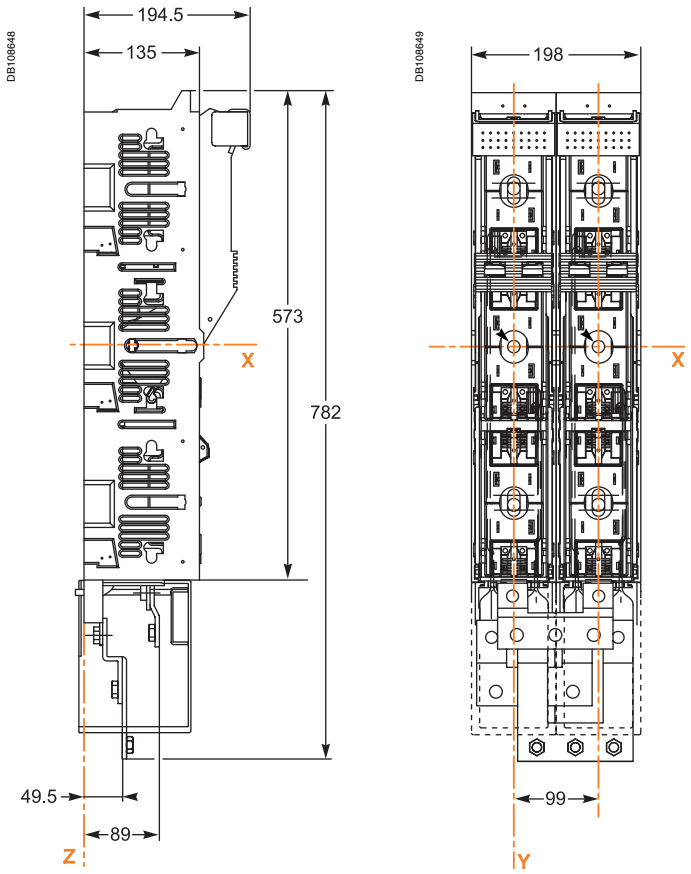
Front panel cutout with cover for free slot



c = cover for free slot.
d = busbars.

Fupact ISFL250 to 630
Installation (cont.)

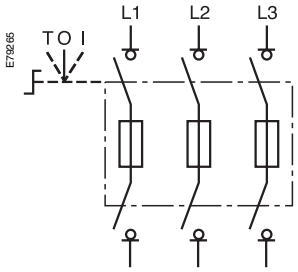
Coupling



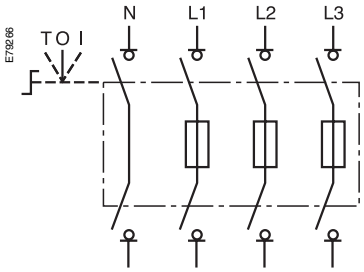
Electrical diagrams
Fupact INF•32 to INF•800

Power connection diagrams

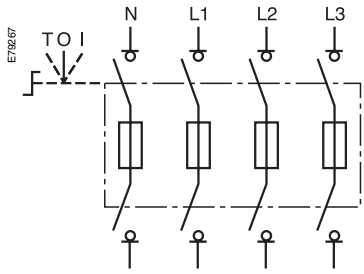
3 poles, 3 fuse-links



4 poles, 3 fuse-links

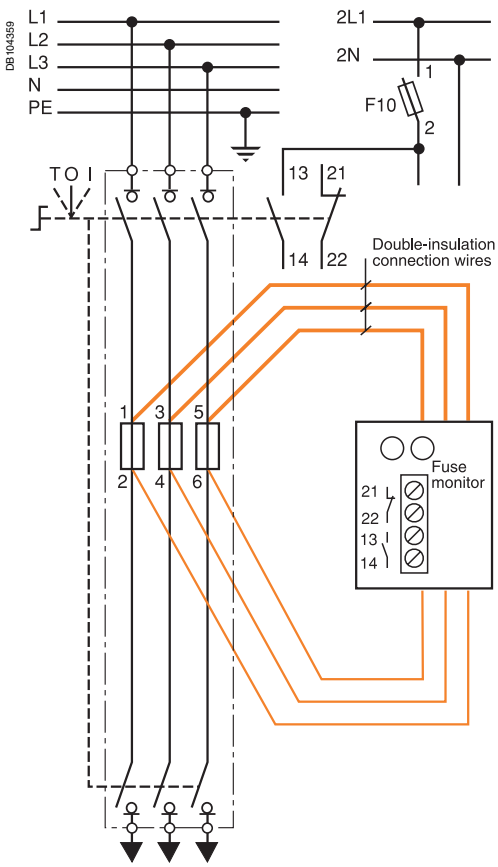


4 poles, 4 fuse-links

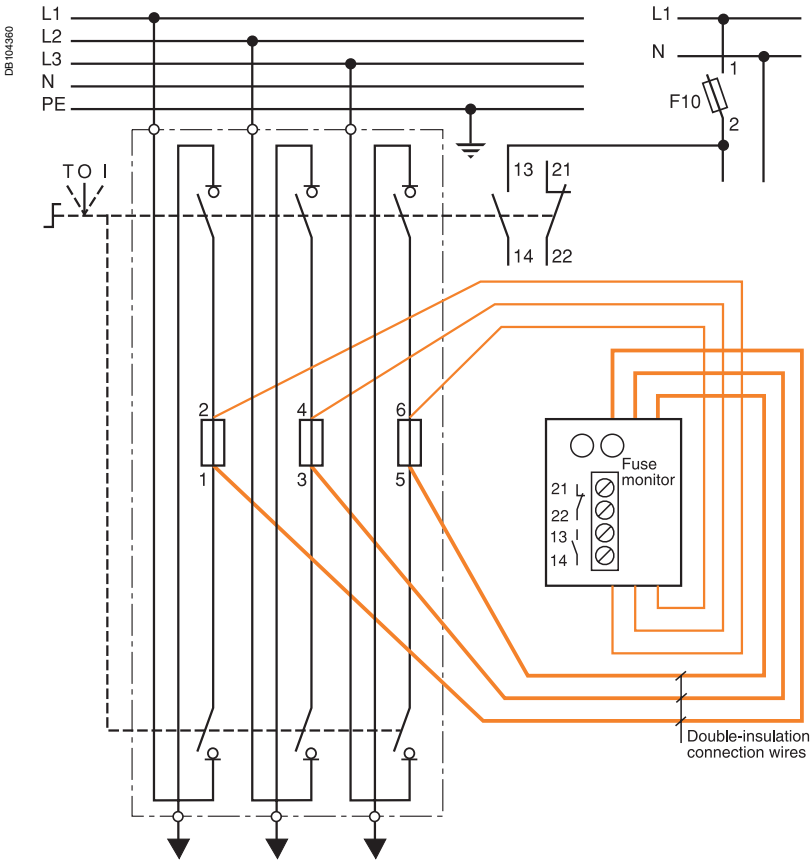


Fuse monitor diagram

INF•32 to INF•160



INF•250 to INF•800



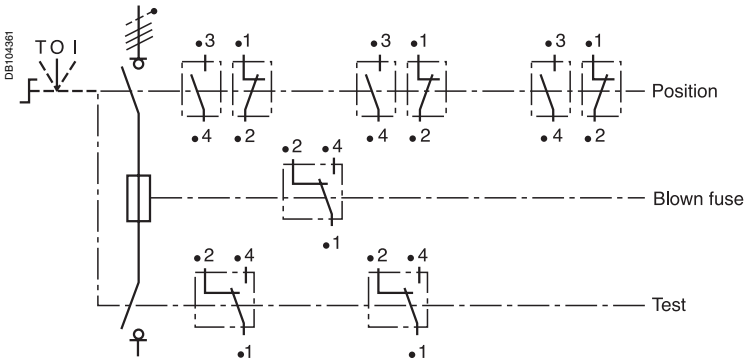
Note : *for a switch-disconnector fuse supplied via the bottom terminals (reverse supply), reverse the connection of the fuse monitor. The double insulation connection wires of the fuse monitor must be connected on the side to which the incoming power is connected.*

T : Test
O : Off
I : On

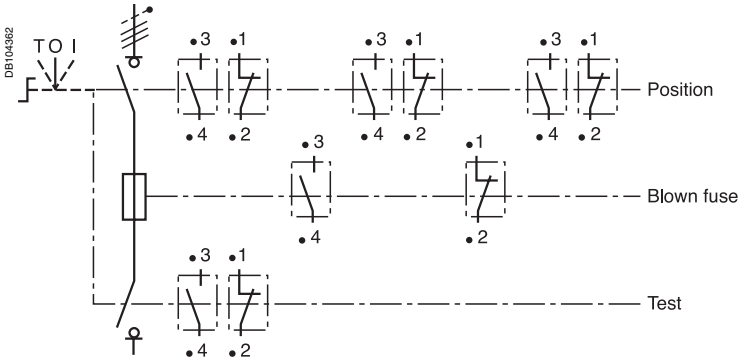
Electrical diagrams
Fupact INF•32 to INF•800 (cont.)

Auxiliary contact wiring diagrams

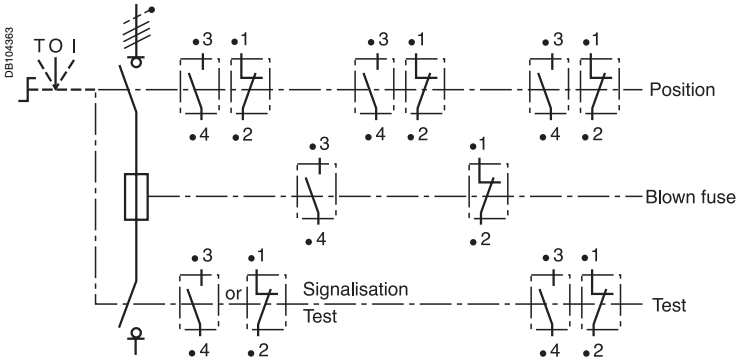
Auxiliary wiring for INF•32 and INFD40



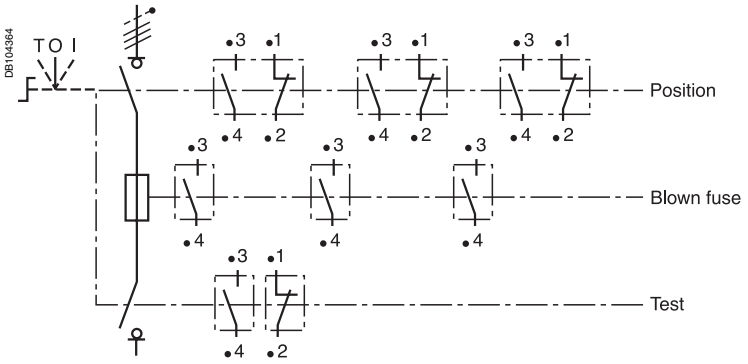
Auxiliary wiring for INF•63



Auxiliary wiring INFB100 to INF•160



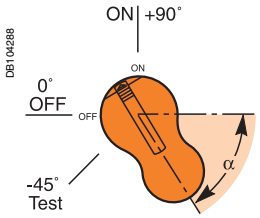
Auxiliary wiring INF•250 to INF•800



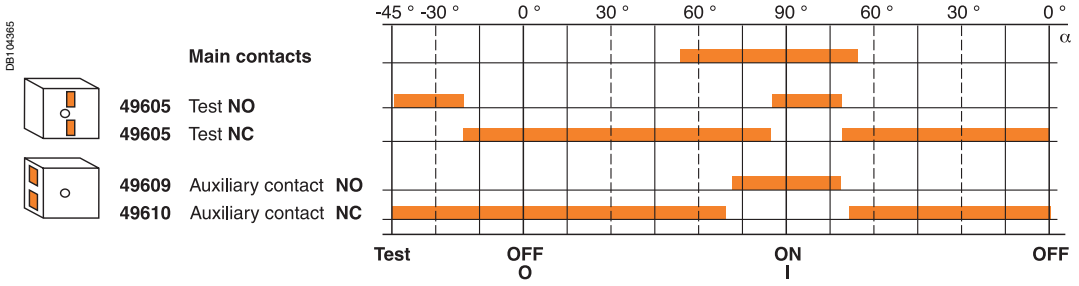
Note : *for possible combinations, see pages: 36, 38, 40 and 42 (chapter 2).*

Electrical diagrams
Fupact INF•32 to INF•800 (cont.)

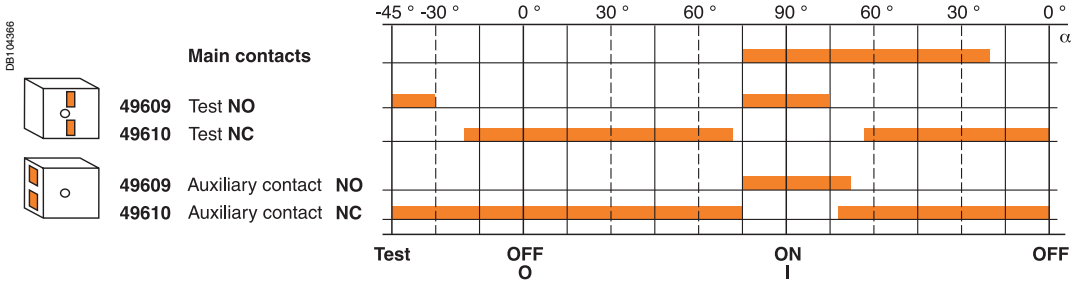
Auxiliary contact functions for Fupact with front handle



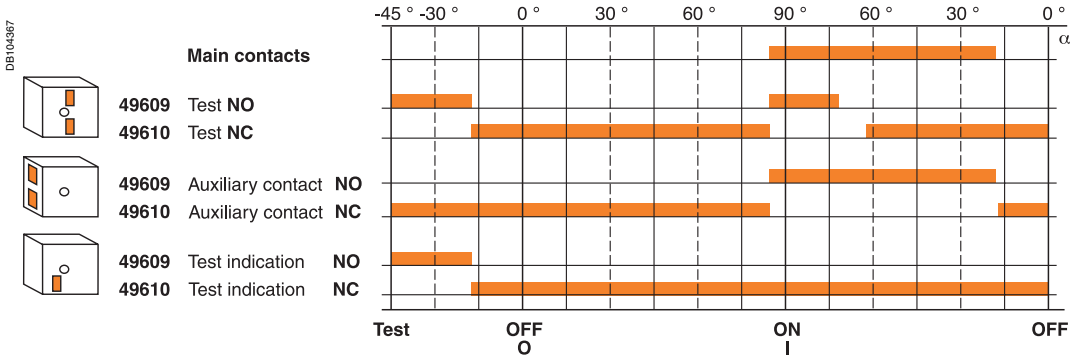
Fupact INF•32 et INFD40



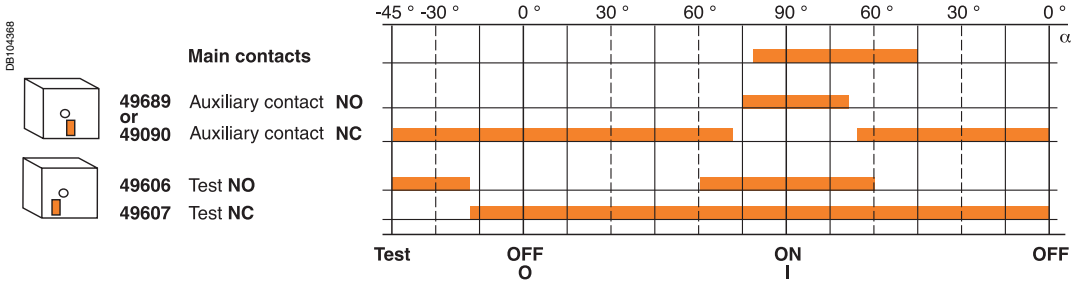
Fupact INF•63



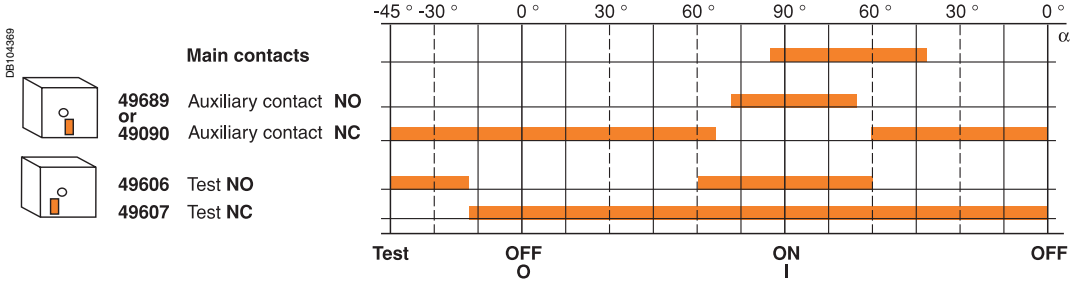
Fupact INFB100 à INF•160



Fupact INF•250 et INF•400



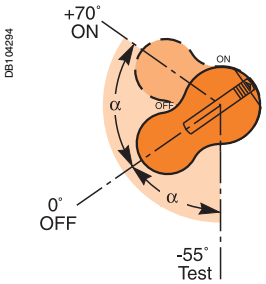
Fupact INF•630 et INF•800

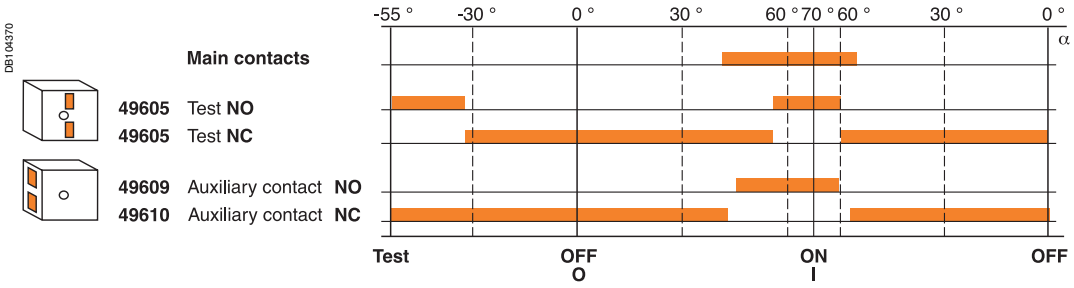


Electrical diagrams
Fupact INF•32 to INF•800 (cont.)

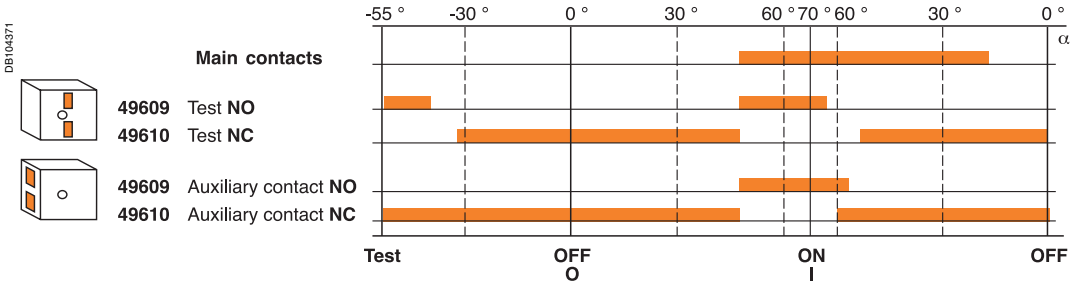
Auxiliary contact functions for Fupact with lateral handle

Fupact INF•32 et INFD40

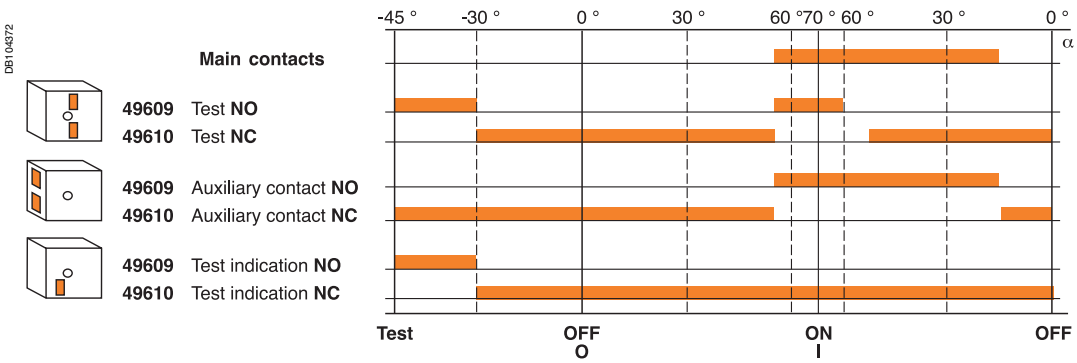




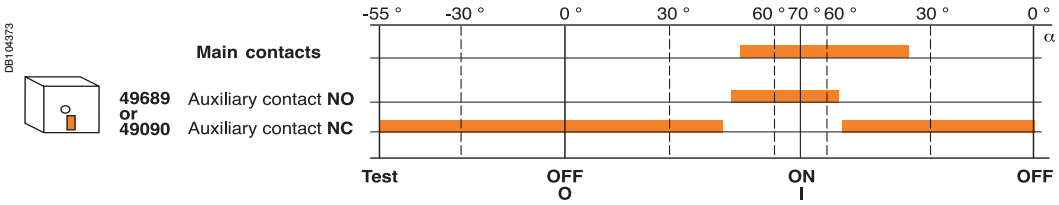
Fupact INF•63



Fupact INFB100 à INF•160

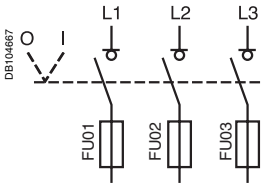


Fupact INF•250



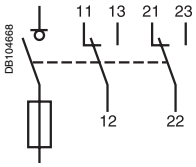
Electrical diagrams
Fupact ISFT. to ISFL.

Power connection diagram

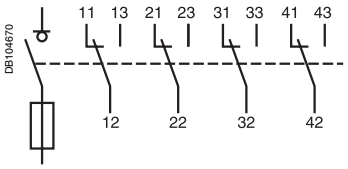


Auxiliary contact wiring diagrams

ISFT100 to 630 and ISFL160

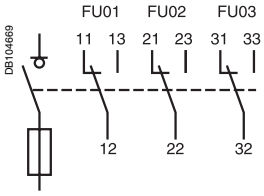


ISFL250 to 630

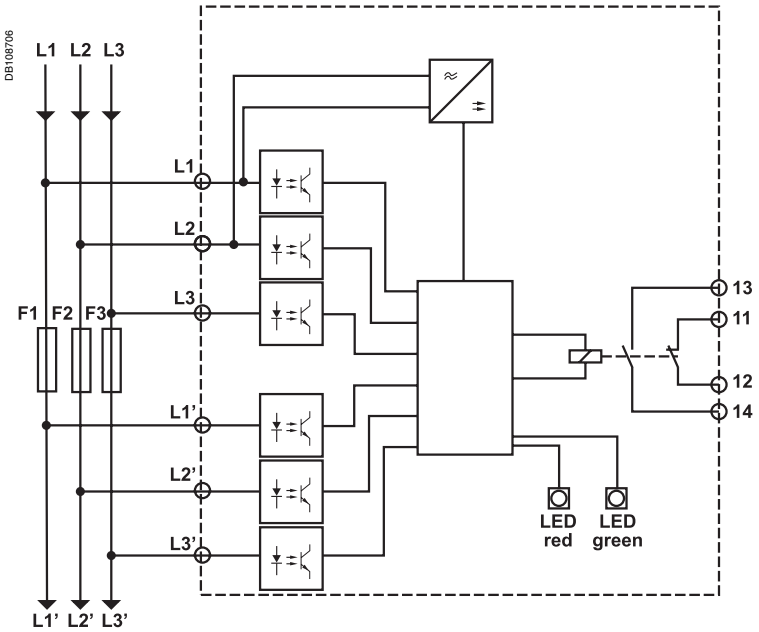


Blown fuse diagrams

Blown-fuse indicator



ISFT160/250/400/630 fuse monitors



Guiding TOOLS

merlin-gerin.com

This international site allows you to access all the Merlin Gerin products in just 2 clicks via comprehensive range data-sheets, with direct links to:

- complete library: technical documents, catalogs, FAQs, brochures…
- selection guides from the e-catalog.
- product discovery sites and their Flash animations.

You will also find illustrated overviews, news to which you can subscribe, the list of country contacts…

The technical guide

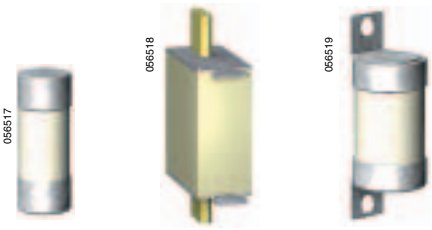
These technical guides help you comply with installation standards and rules i.e.:
the electrical installation guide, the protection guide, the switchboard implementation guide, the technical booklets and the co-ordination tables all form genuine reference tools for the design of high performance electrical installations.
For example, the LV protection co-ordination guide - discrimination and cascading - optimises choice of protection and connection devices while also increasing markedly continuity of supply in the installations.

Technical characteristics

The symbol . stands for:
the type of fuse-link associated with INF switch-disconnector fuses
- *INF. + BS fuse-link = INFB*
- *INF. + NFC fuse-link = INFC*
- *INF. + DIN fuse-link = INFD*

the type of fuse-link arrangement for ISF fuse-switch disconnectors:
- *ISF. + side-by-side fuse-link arrangement (DIN) = ISFT*
- *ISF. + vertical fuse-link arrangement (DIN) = ISFL.*

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.*



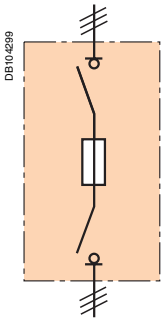
NFC, DIN and BS fuse-links.

Functions

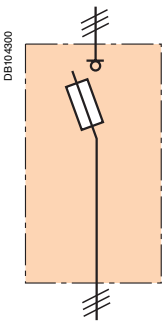
Fusegear range:

The INF.: a switch-disconnector-fuse.
The ISF.: a fuse-switch-disconnector.

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.



INF. diagram.

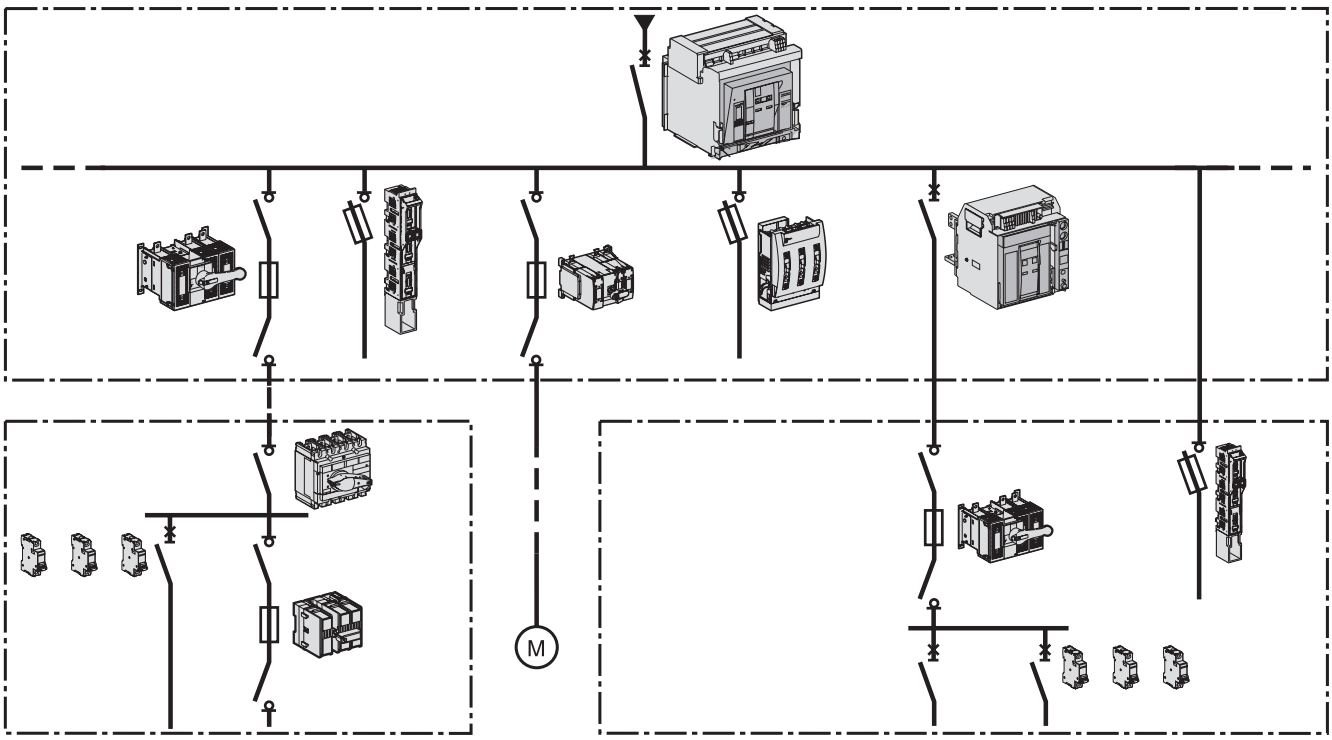


ISF. diagram.

Functions and applications (cont.)

Applications

DB110882



Simplified diagram of a low-voltage distribution system.

Fupact devices are used for the applications presented below:

Incomer for sub-distribution switchboards and enclosures

Local protection and isolation function.
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 function for motor feeders.
The current-breaking and isolation functions are mandatory.
The protection function is ensured by aM / gM or gG fuse-links.

62196

ISFL160.

056503

INFD160.

E94772

ISFT160.

Standards
Fusegear


DB104301

Switch.


DB104302

Disconnector.


DB104303

Switch-disconnector.


DB104304

Switch-disconnector-fuse.


DB104305

Fuse-switch disconnector.

Standard IEC 60947-3 (distinguishes three types of utilisation categories)

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 which may include specified operating overload conditions
□ capable of carrying currents under specified abnormal circuit conditions such as those of 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 carrying for a specified time currents under abnormal conditions such as those of short-circuits
■ **a switch-disconnector** is a switch which:
□ in the open position, satisfies the isolating requirements specified for a disconnector
■ **a switch-disconnector** (and fuse-switch disconnector) in which:
□ one or more poles have a fuse in series in a composite unit (for a fuse-switch disconnector, the fuse-link forms the moving contact).

Standardised current values for fusegear

■ **conventional thermal current Ith (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. Ith = 25 A at 40° C.
Generally speaking, Ith = Iu (rated uninterrupted current). Ith is in fact the rating for the switch.
■ **rated operational current Ie (A)**
This is the current for which the switch is generally used. It depends on the application (resistive or inductive current).

Utilisation categories

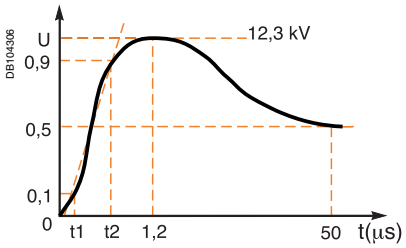
The standard IEC 60947-3 distinguishes three types of utilisation category.
■ AC21: resistive loads
■ AC22: mixed (resistive and inductive) loads
■ AC23: inductive loads
A specific category is defined in the Appendix:
■ AC3: direct switching of individual motors.
For DC loads, the respective categories 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 φ = 0.95)	Power distribution Final distribution (except motor feeders)
AC22A	AC22B	Switching of mixed resistive and inductive loads, including moderate overloads (cos φ = 0.65)	Medium and high power industrial distribution with motor feeders
AC23A	AC23B	Switching of motor loads or other highly inductive loads (cos φ = 0.45 for I_e > 100 A) (cos φ = 0.35 for I_e ⩽ 100 A)	Motor feeders Occasional motor control (1)
AC3		Switching of motor loads or other highly inductive loads (cos φ = 0.45 for I_e > 100 A) (cos φ = 0.35 for I_e ⩽ 100 A)	Main, indirect control of an individual motor

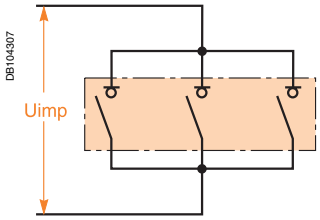
(1) For this type of application, a contactor is used to control the motor.

Example:
A 125 A switch in the AC23 utilisation category must be capable of:
■ making a 10 In current (1250 A) with a cos φ = 0.35
■ breaking a 8 In current (1000 A) with a cos φ = 0.35.

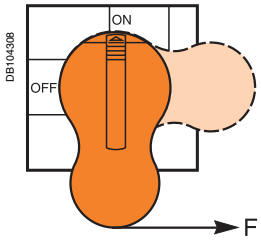
Standards
Fusegear (cont.)

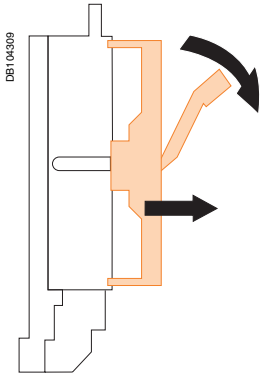


1.2-50 µs impulse voltage.



Impulse withstand voltage between switch input and output.





Test on strength of actuator mechanism.

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 the clearances 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 be possible only 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.

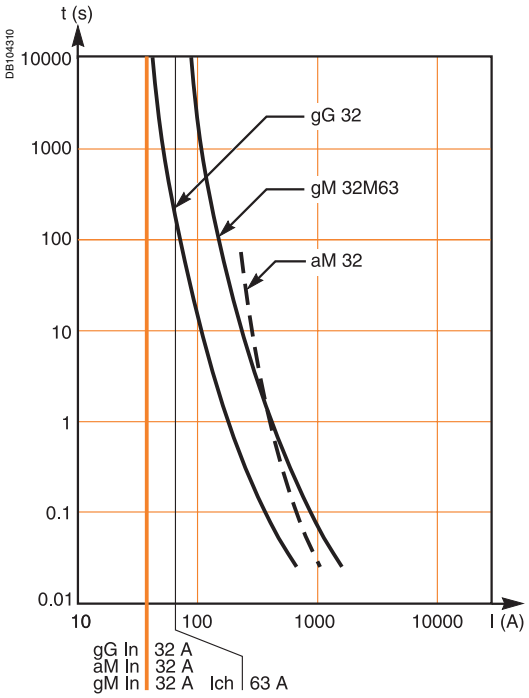
■ measurement of leakage current with the contacts in the open position

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.

Standards
Fuse-links



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 In (e.g. fuse-link gG 63 A)

□ a **gM fuse-link**, is characterised by two current values separated by an "M" (e.g. In M Ich)

- the first value In corresponds to the maximum continuous current
- the second value Ich 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 Ich value of the gM fuse-link must be taken into account

□ an aM fuse-link is defined by a fictive rated current In, i.e. it may be used to break currents only starting at four times In. 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 In)	**aM**		■

■ **conventional non-fusing current Inf**

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 In (e.g. Inf = 1.25 In)

■ **conventional fusing current If**

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

■ **time-current characteristic**

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

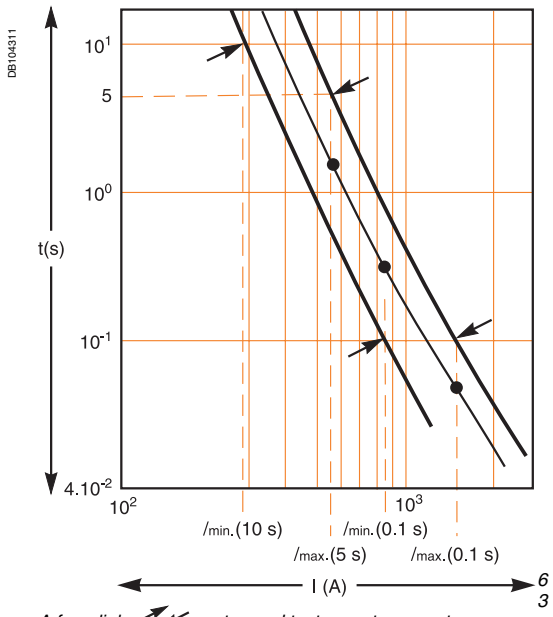
■ **gates**

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.

Standards
Fuse-links (cont.)



A fuse-link, ↗↙ : gates and test on gate currents.
Curve Î = f (t) for gG/gM.

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 ±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_{nf})	(I_f)
$16 \leqslant I_n \leqslant 63$	1	1.25 I_n	1.6 I_n
$63 < I_n \leqslant 160$	2		
$160 < I_n \leqslant 400$	3		
$400 < I_n$	4		

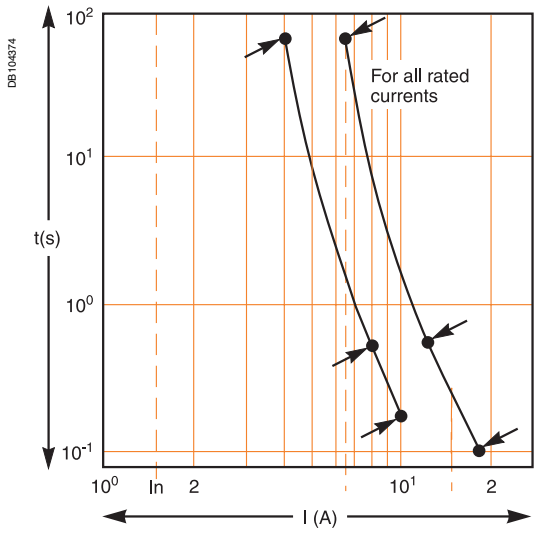
■ **gates**

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	1 100
100	290	580	820	1 450
125	355	715	1 100	1 910
160	460	950	1 450	2 590
200	610	1 250	1 910	3 420
250	750	1 650	2 590	4 500
315	1 050	2 200	3 420	6 000
400	1 420	2 840	4 500	8 060
500	1 780	3 800	6 000	10 600
630	2 200	5 100	8 060	14 140
800	3 060	7 000	10 600	19 000
1 000	4 000	9 500	14 140	24 000
1 250	5 000	13 000	19 000	35 000

(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 gates for an aM fuse-link.
Curve Î = f (t) for aM.

aM fuse-links

■ **asymptotes**

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

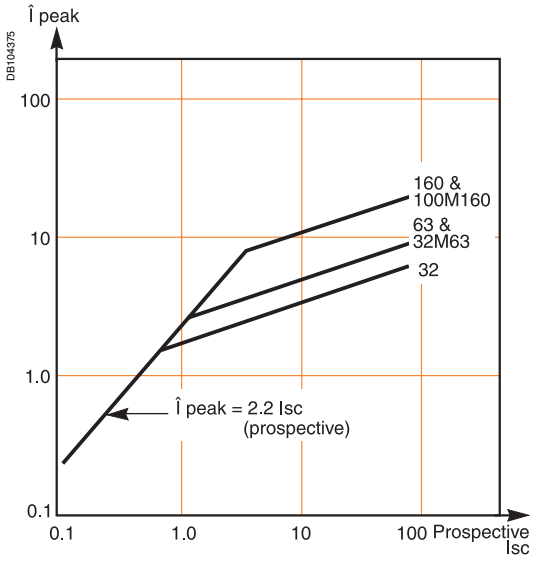
The table below indicates the gates for specified pre-arcing times of aM fuse-links. The gates are expressed as a percentage of the "fictive" rated current In (called ko).

■ **aM gates**

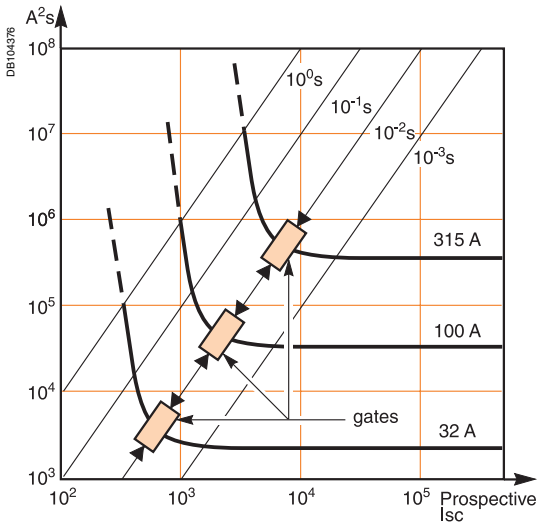
t (s)	Ip/In	If/In
60	4	6.3
0.5	8	12
0.2	10	
0.1		19

In : "fictive" rated current In (called ko).
Ip : pre-arcing threshold.
If : fusing threshold.

Standards
Fuse-links (cont.)



Î = f (I) curve.



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

Limiting

Current limiting

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

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 x (A^2s)	I^2t max 10^3 x (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	1 300
400	760	2 250
500	1 300	3 800
630	2 250	7 500
800	3 800	13 600
1 000	7 840	25 000
1 250	13 700	47 000

■ aM fuse-links

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

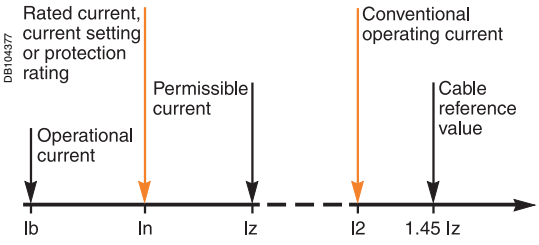
- the rated voltage *Un*
- the "fictive" rated current *In* for the fuse-link

for operating times less than or equal to 0.01 seconds.

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

Voltage *Un* (V)	I^2t max (A^2s)
Un ⩽ 400 V	18 I_n^2
400 < Un ⩽ 500 V	24 I_n^2
500 < Un ⩽ 660 V	35 I_n^2

Standards
Installation



Fuse protection of a wiring system.

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 Iz supplies a load or set of loads with a rated current Ib and is protected by a fuse with a rated current In. The Iz rating is determined as indicated below:

- current Ib depends on the load, hence:
- fuse sizing where

In > Ib

- fusing current

I2 ⩽ 1.6 In

- overload protection for the wiring system is ensured if

I2 ⩽ 1.45 Iz

- the wiring system must therefore be sized to Iz > 1.1 In.

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

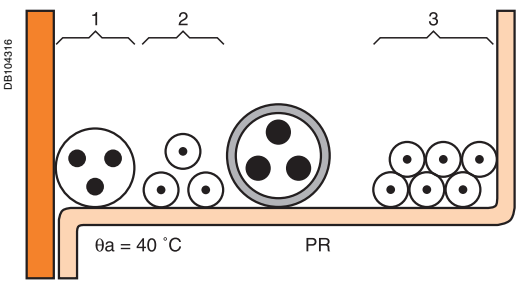
Type of conductor	Method of installation	Reference method
Multicore cables and conductors	■ in conduits, cable ducting, cable trunking, surface mounted or embedded ■ in building voids, ceiling voids ■ in cable channels, mouldings, skirting trunking, architraves	**B**
	■ surface mounted on walls or ceilings ■ on unperforated trays	**C**
Multicore cables	■ on ladders, brackets, perforated trays ■ surface mounted, spaced from wall ■ suspended cables	**E**
Single-core cables	■ 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.

Standards
Installation (cont.)

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				XPLE3				XPLE2							
	C			PVC3				PVC2		XPLE3				XPLE2					
	E					PVC3				PVC2		XPLE3				XPLE2			
	F							PVC3				PVC2		XPLE3				XPLE2	
Copper, cross-sectional area (mm^2)		**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 (mm^2)	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

Examples:

■ 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 In ⩾ Ib = 58 A ➡ In = 80 A

□ cross-sectional area of the conductors = 25 mm^2

■ consider the three-phase XPLE cable used in the example on page 153.

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, XPLE3) indicates:

□ fuse-link rating In ⩾ Ib = 23 A ➡ In = 25 A and Iz (not corrected) = 31

□ the corrected Iz is 31 / 0.68 = 40.5 ➡ Iz = 42 A and the corresponding cross-sectional area of the conductors = 4 mm^2.

Standards
Installation (cont.)

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 (> UL 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 UL = 50 V
- copper conductors
- $m = \frac{S_{Phase}}{S_{PE}} = 1$

Table 9. Cable lengths

Rated copper-conductor cross-sectional areas (mm^2)	Rated currents of the disconnectors using gI 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] (phase-to-phase)	copper cables	1	0.67	0.50	0.40
	aluminium cables	0.62	0.41	0.31	0.25

(1) For systems with 237 V phase-to-phase, apply the additional factor of 0.62.
For 237 V single-phase systems (237 V between 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 indicated in table 9, the correction factors specific to the IT system must be applied

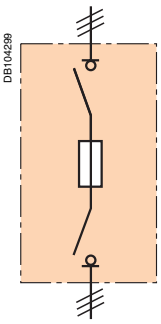
400 V systems [1] (phase-to-phase)	IT with distributed neutral	0.86
	IT with non-distributed neutral	0.60

(1) For systems with 237 V phase-to-phase, 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.

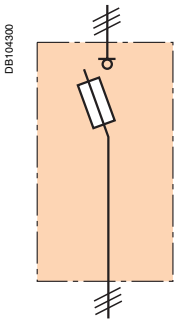
TT system

The protection of life and property is ensured by residual-current devices (RCD), which may be easily combined with circuit breakers.

Standards
Installation (cont.)



INF. diagram.



ISF. diagram.

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.

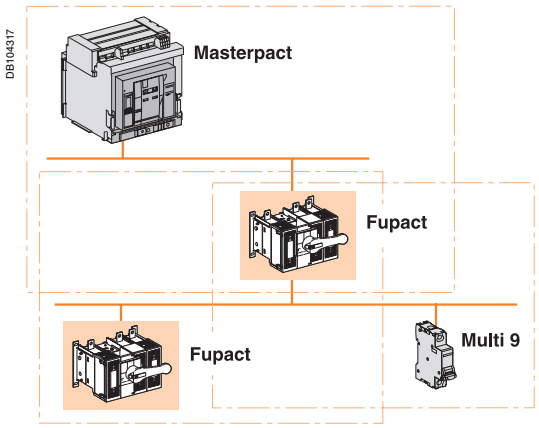
Isolation and installation rules
■ **lock-out of a circuit**
The device disconnecting the circuit in question must be "suitable for isolation" and have a locking system to maintain the contacts in the OFF position.
■ **position of the isolating function** in the installation
A disconnection device must 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.

Safe replacement of fuse-links on a Fupact INF.

Fupact and the safety of maintenance operations

The Fupact front face offers IP 20 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.

Discrimination

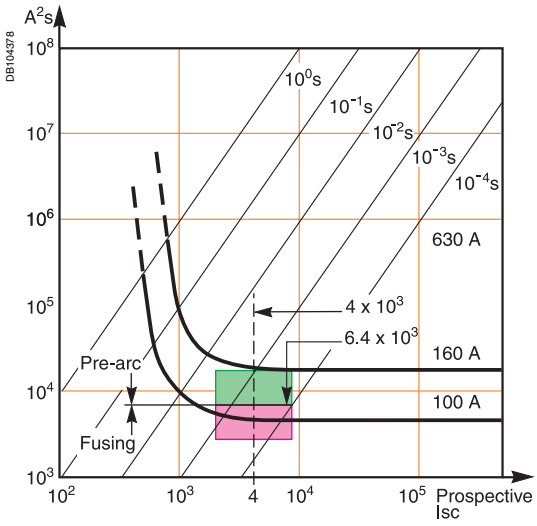


Principle

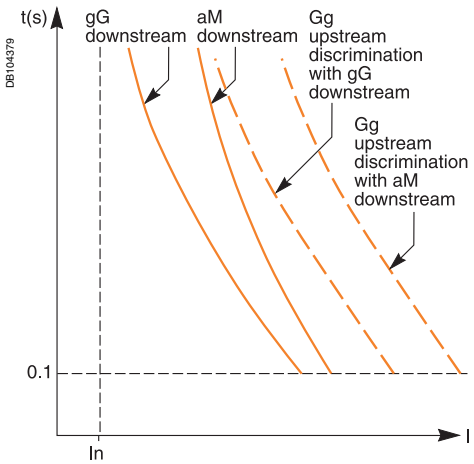
Schneider Electric offers a coordinated protection system

In an electrical installation, fuse protection devices 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.



Curves E = f (I) superimposed.



Fuse upstream / Fuse downstream

Discrimination is ensured when

Total energy of downstream fuse (Etav) < Pre-arcing energy of upstream fuse (Epam)

Note: *If Etav is higher than 80 % of Epam, the upstream fuse may be derated.*

■ gG fuse-link upstream / gG fuse-link downstream

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 In.

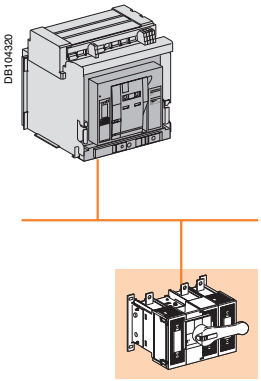
I ²t limit and test currents for verification of discrimination

I_n (A)	Minimum values of pre-arcing I ²t		Minimum values of operating I²t	
	Rms values of Ipprospective (kA)	I ²t (A²s)	Rms values of Ipprospective (kA)	I ²t (A²s)
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

■ gG fuse-link upstream / aM fuse-link downstream

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.

Discrimination (cont.)



Circuit breaker upstream / Fuse downstream

Upstream circuit breaker with delayed ST (short time) protection function

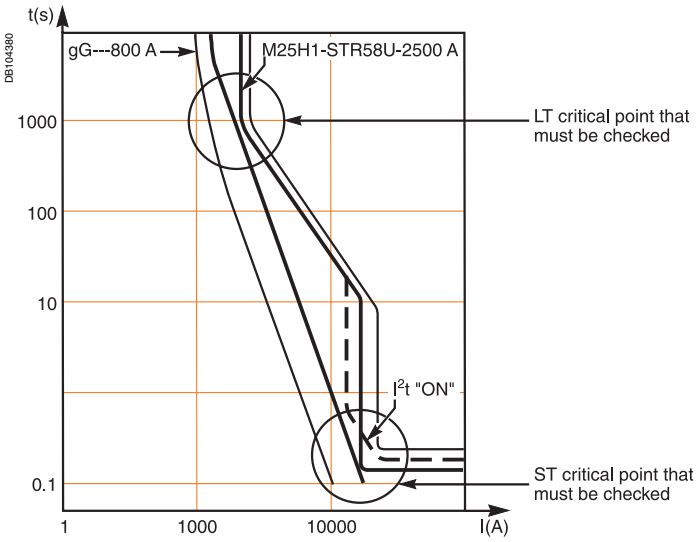
This is the situation for a MLVS (main low-voltage switchboard) or sub-distribution switchboard protected by an incoming circuit breaker.
The upstream circuit breaker has an electrodynamic withstand capacity Icw and ensures time discrimination.

Rule

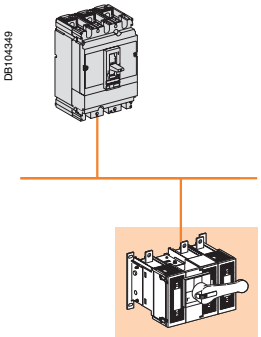
Examination of discrimination at the critical points on the LT (long time) and ST (short time) curves results in a discrimination table.
Analysis of the LT critical point indicates whether discrimination between the protection devices is possible or not.
Analysis of the ST (or Icw) critical point indicates whether the discrimination limit is greater than or equal to the ST (or Icw) value.

Note:

- the LT critical point is the most restrictive
- for circuit breakers with a Icw value that is high and/or equal to Icu, the ST critical point is almost never a problem, i.e. discrimination is total.



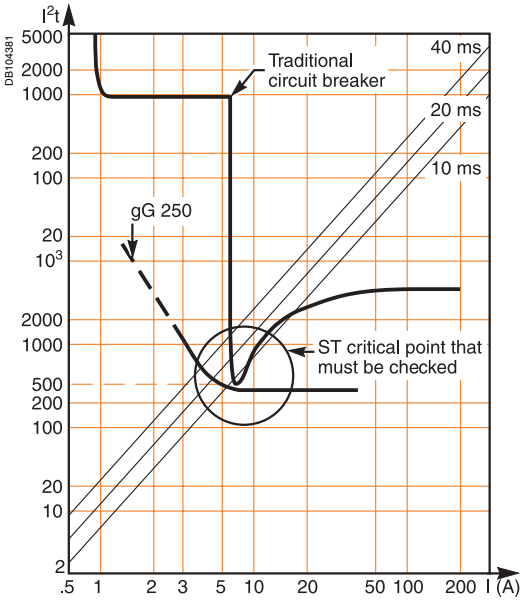
Time-current curves and critical points that must be checked.



Upstream circuit breaker with non-delayed ST (short time) protection and/or current-limiting function

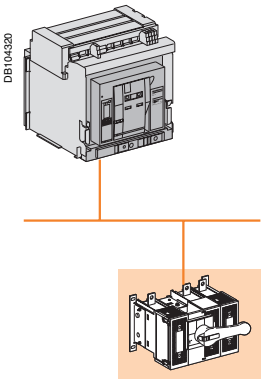
To make sure the ST critical point is OK, it is necessary to compare:

- 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.

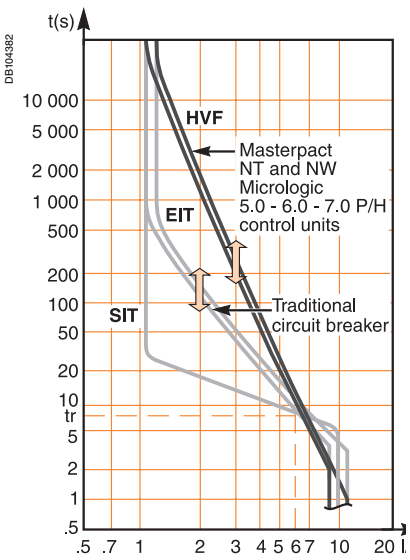
Discrimination (cont.)



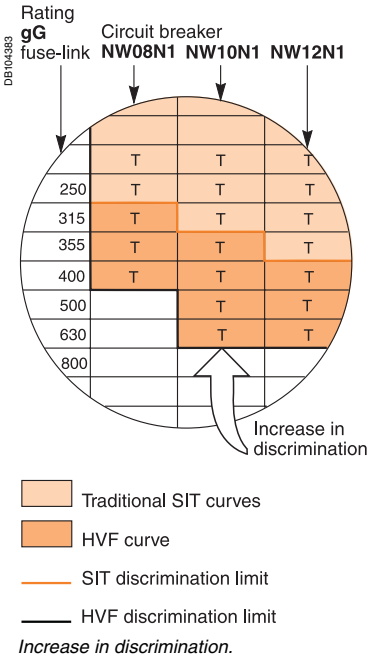
Exclusive Schneider feature

Masterpact NT or NW upstream of a Fupact equipped with a gG fuse-link

The new Micrologic control unit has a special LT delay setting for HVF very inverse-time applications.
This curve is ideal for discrimination when LV distribution fuse-based protection devices are installed downstream or HV devices are installed upstream.



IDMTL curve.



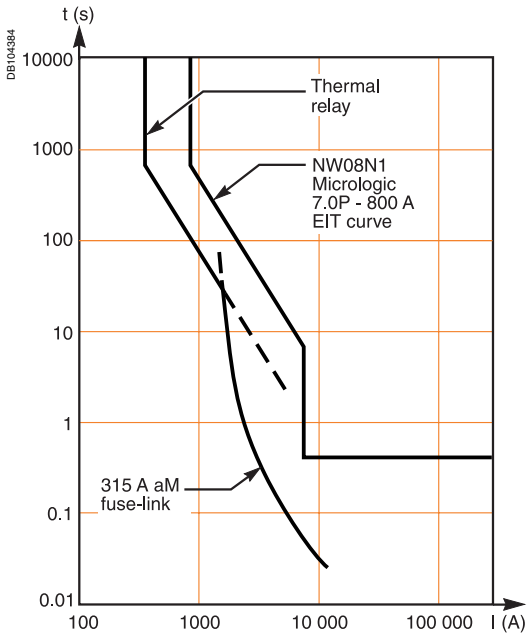
Increase in discrimination.

The new Micrologic 5.0 - 6.0 - 7.0 P / H control units are equipped as standard with four settings for LT inverse-time curves with adjustable slopes.
SIT: standard inverse time.
VIT: very inverse time.
EIT: extremely inverse time.
HVF: high-voltage fuse, inverse-time curve that follows the fuse thermal curve.

Discrimination (cont.)

Masterpact M, NT or NW upstream of an aM fuse-link

The circuit-breaker upstream protection must be coordinated with the thermal relay and the aM fuse-link short-circuit protection.



■ **overload zone - coordination between Masterpact and the thermal relay**
Masterpact offers an EIT long-time setting that is totally coordinated with the curves of the thermal relay. Discrimination is ensured as long as the setting ratio is greater than 1.6.

■ **short-circuit zone - coordination between Masterpact and the aM fuse-link**
Under short-circuit conditions > 10 In, the I = f (t) characteristic of an aM fuse-link is very similar to that of a gG fuse-link with the same rating.

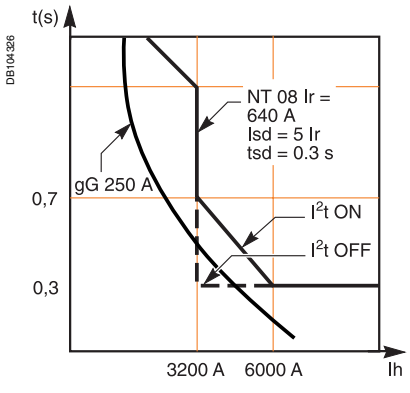
Given the above and using the EIT long-time setting, Masterpact offers the same discrimination ratios for both gG and aM fuse-links downstream. This ratio is very similar to that for gG fuse-links installed upstream of aM fuse-links.

Note: *If there are motor feeders protected by aM fuse-links and distribution lines protected by gG fuse-links downstream of a Masterpact circuit breaker, selection of HVF long-time curves is the means to ensure identical discrimination for both types of circuit.*

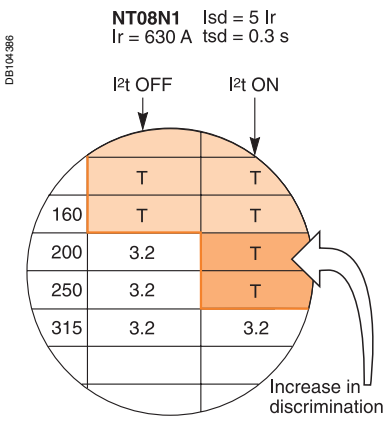
See pages 162 to 169 for the discrimination tables.

I^2t 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 I^2t ON function, a constant-energy tripping curve, maintains the level of discrimination performance and facilitates total discrimination.

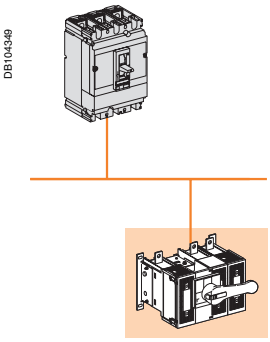


I^2t ON curve.



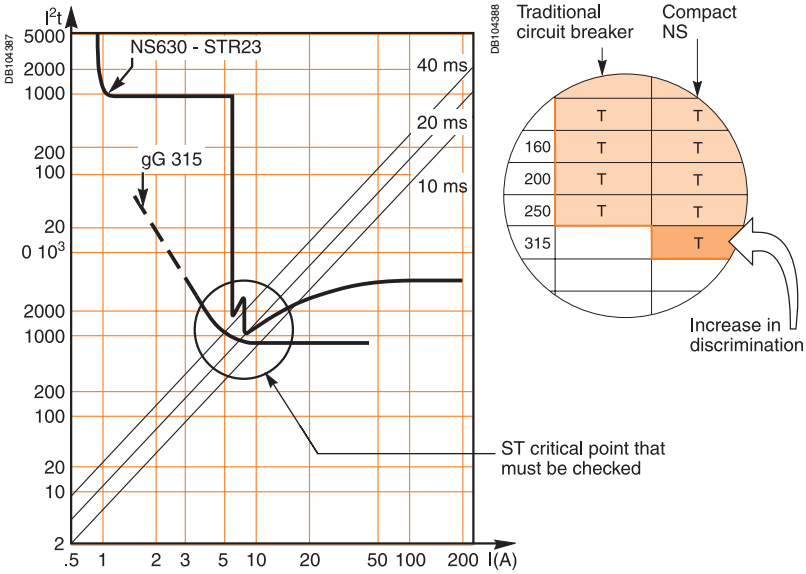
Increase in the discrimination limit.

Discrimination (cont.)



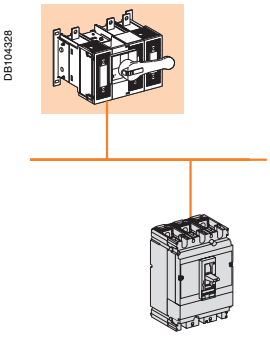
Compact NS upstream of gG or aM fuse-links

Compact NS 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 NS has a mini-delay that considerably increases curve values at the ST critical point.



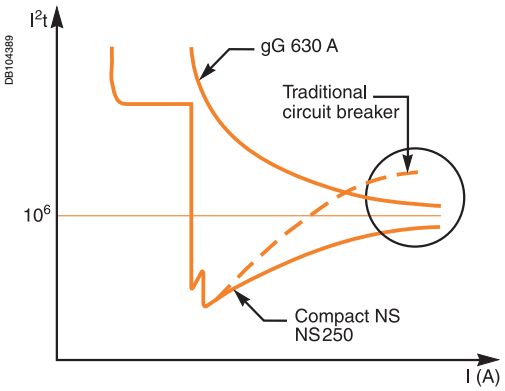
I²t curve for Compact NS and a fuse.

Total discrimination is achieved by a gG fuse-link up to the 315 A rating (instead of 250 A with a traditional circuit breaker).
See 168 for the discrimination tables.



Compact NS downstream of gG or aM fuse-links

Compact NS 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 169 for the discrimination tables.

Discrimination tables

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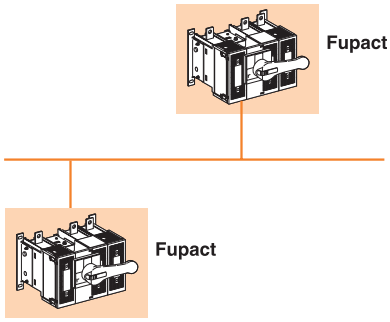


gG fuse-link upstream / gG or aM fuse-link downstream

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:

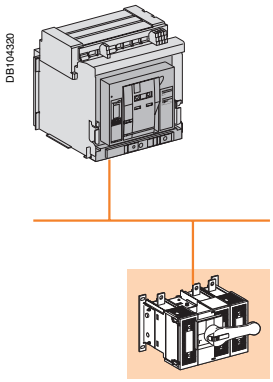
- the pre-arcing energies of the upstream fuse-links
- the total fusing energies of the downstream fuse-links.

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	8000	500

Examples:

- a 125 A gG fuse-link upstream ensures total discrimination with an 80 A gG fuse-link and/or a 40 A aM fuse-link downstream
- a 125 A gG fuse-link upstream ensures total discrimination with a 63 A gG 63M80 fuse-link (with an 80 A characteristic) downstream.

Discrimination tables (cont.)



Masterpact NT/NW (HVF long-time curve) upstream of a Fupact

The Masterpact circuit breaker is equipped with a Micrologic 5.0 - 6.0 - 7.0 P / H control unit with the following settings:

- LT setting: HVF curve with Tld = 24 seconds
- CT setting: instantaneous OFF / Tsd = 0.4 seconds.

Upstream		Masterpact NTH1 / NWH1/H2/H3 Micrologic 5.0-6.0-7.0 P/H																
		NT08	NT08	NT08	NT08	NT08	NT08	NT08	NT08	NT10	NT12	NT16						
		H1	H1	H1	H1	H1	H1	H1	H1	H1	H1	H1						
		NW08	NW08	NW08	NW08	NW08	NW08	NW08	NW08	NW10	NW12	NW16	NW20	NW25	NW32	NW40	NW50	NW63
		N1 H1/H2	N1 H1/H2	N1 H1/H2	N1 H1/H2	N1 H1/H2	N1 H1/H2	N1 H1/H2	N1 H1/H2	N1 H1/H2	N1 H1/H2	N1 H1/H2	H1/H2 H3	H1/H2 H3	H1/H2 H3	H1/H2 H3	H1/H2	H1/H2
	Rating (A)	400	400	400	630	800	800	800	800	1000	1200	1600	2000	2500	3200	4000	5000	6300
	Ir setting	160	200	240	315	400	480	630	800	1000	1200	1600	2000	2500	3200	4000	5000	6300
Down stream 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	T
	100	T	T	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	T	T
	160			T	T	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	T	T
	250					T	T	T	T	T	T	T	T	T	T	T	T	T
	315						5	T	T	T	T	T	T	T	T	T	T	T
	355							T	T	T	T	T	T	T	T	T	T	T
	400							6	T	T	T	T	T	T	T	T	T	T
	500								8	T	T	T	T	T	T	T	T	T
	630									T	T	T	T	T	T	T	T	T
	800										12	T	T	T	T	T	T	T
	1000											16	T	T	T	T	T	T
	1250												20	T	T	T	T	T

Note: *for Masterpacts rated 2500 A and above, with identical settings, discrimination is always total.*

Table key

T	*Total discrimination*
16	*Discrimination limit in kA*
	No discrimination

Circuit breaker characteristics

NT08 to 16
H1 / Icu = Icw = 42 kA
L1 / Icu = 150 kA Icw = 10 kA

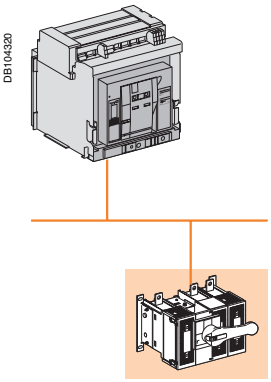
NW08 to NW16
N1 / Icu = Icw = 42 kA
H1 / Icu = Icw = 65 kA
H2 / Icu = 100 Icw = 85 kA

NW08 to NW20
L1 / Icu = 150 kA Icw = 30 kA

NW20 to NW40
H1 / Icu = Icw = 65 kA
H2 / Icu = 100 Icw = 85 kA
H3 / Icu = 150 Icw = 65 kA

NW40b to NW63
H1 / Icu = Icw = 100 kA
H2 / Icu = 150 Icw = 100 kA

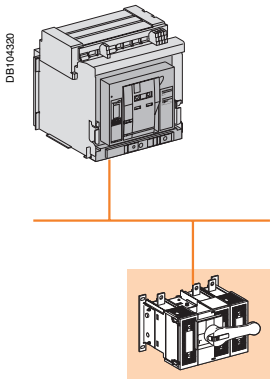
Discrimination tables (cont.)



Upstream		Masterpact NT L1 Micrologic 5.0-6.0-7.0 P/H								
		NT08	NT08	NT08	NT08	NT08	NT08	NT08	NT08	NT10
	Rating (A)	400	400	400	630	630	630	630	800	1000
	Ir setting	160	200	240	315	400	480	630	800	1000
Down stream	32	T	T	T	T	T	T	T	T	T
	40	T	T	T	T	T	T	T	T	T
gG/aM fuse-link	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	T	T	T	T	T	T	T	T	T
	125		T	T	T	T	T	T	T	T
	160			16	16	16	16	16	16	16
	200				10	10	10	10	10	10
	250					10	10	10	10	10
	315						5	10	10	10
	355							10	10	10
	400							6	10	10
	500								8	10
	630									10
	800									
	1000									
	1250									

Upstream		Masterpact NW L1 Micrologic 5.0-6.0-7.0 P/H											
		NW08	NW08	NW08	NW08	NW08	NW08	NW08	NW08	NW10	NW12	NW16	NW20
	Rating (A)	400	400	400	630	630	630	630	800	1000	1200	1600	2000
	Ir setting	160	200	240	315	400	480	630	800	1000	1200	1600	2000
Down stream	32	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
gG/aM fuse-link	50	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
	80	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
	125		T	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
	250					T	T	T	T	T	T	T	T
	315						5	T	T	T	T	T	T
	355							100	100	100	100	100	100
	400							6	83	83	83	83	83
	500								8	43	43	43	43
	630										30	30	30
	800										12	30	30
	1000											16	30
	1250												20

Discrimination tables (cont.)



Masterpact M, NT/NW (EIT long-time curve) upstream of a Fupact

The Masterpact circuit breaker is equipped with a Micrologic 5.0 - 6.0 - 7.0 A / P / H control unit with the following settings:

- LT setting: EIT curve with Tld = 24 seconds
- CT setting: instantaneous OFF / Tsd = 0.4 seconds.

Upstream		Masterpact NT H1 / NW H1/H2/H3 Micrologic 2.0-5.0-6.0-7.0 A/P/H																
		NT08	NT08	NT08	NT08	NT08	NT08	NT08	NT08	NT10	NT12	NT16						
		H1	H1	H1	H1	H1	H1	H1	H1	H1	H1	H1						
		NW08	NW08	NW08	NW08	NW08	NW08	NW08	NW08	NW10	NW12	NW16	NW20	NW25	NW32	NW40	NW50	NW63
		N1 H1/H2	N1 H1/H2	N1 H1/H2	N1 H1/H2	N1 H1/H2	N1 H1/H2	N1 H1/H2	N1 H1/H2	N1 H1/H2	N1 H1/H2	N1 H1/H2	H1/H2 H3	H1/H2 H3	H1/H2 H3	H1/H2 H3	H1/H2	H1/H2
	Rating (A)	400	400	400	630	800	800	800	800	1000	1200	1600	2000	2500	3200	4000	5000	6300
	Ir setting	160	200	240	315	400	480	630	800	1000	1200	1600	2000	2500	3200	4000	5000	6300
Down stream 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

Note: *for Masterpacts rated 2500 A and above, with identical settings, discrimination is always total.*

Table key

T	*Total discrimination*
16	*Discrimination limit in kA*
	No discrimination

Circuit-breaker characteristics

NT08 to 16
H1 / Icu = Icw = 42 kA
L1 / Icu = 150 kA Icw = 10 kA

NW08 to NW16
N1 / Icu = Icw = 42 kA
H1 / Icu = Icw = 65 kA
H2 / Icu = 100 Icw = 85 kA

NW08 to NW20
L1 / Icu = 150 kA Icw = 30 kA

NW20 to NW40
H1 / Icu = Icw = 65 kA
H2 / Icu = 100 Icw = 85 kA
H3 / Icu = 150 Icw = 65 kA

NW40b to NW63
H1 / Icu = Icw = 100 kA
H2 / Icu = 150 Icw = 100 kA

Discrimination tables (cont.)

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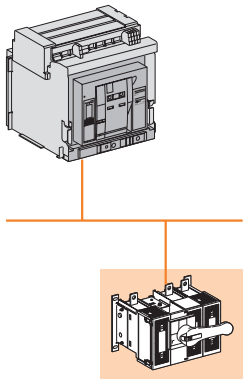

Upstream		Masterpact NT L1 Micrologic 2.0-5.0-6.0-7.0 A								
		NT08	NT08	NT08	NT08	NT08	NT08	NT08	NT08	NT10
	Rating (A)	400	400	400	630	630	630	630	800	1000
	Ir setting	160	200	240	315	400	480	630	800	1000
Downstream gG/aM fuse-link	32	T	T	T	T	T	T	T	T	T
	40	T	T	T	T	T	T	T	T	T
	50	T	T	T	T	T	T	T	T	T
	63	T	T	T	T	T	T	T	T	T
	80		T	T	T	T	T	T	T	T
	100			T	T	T	T	T	T	T
	125				T	T	T	T	T	T
	160					16	16	16	16	16
	200						10	10	10	10
	250							10	10	10
	315								10	10
	355									10
	400									10
	500									
	630									
	800									
	1000									
	1250									

Upstream		Masterpact NW L1 Micrologic 2.0-5.0-6.0-7.0 A/P/H											
		NW08	NW08	NW08	NW08	NW08	NW08	NW08	NW08	NW10	NW12	NW16	NW20
	Rating (A)	400	400	400	630	630	630	630	800	1000	1200	1600	2000
	Ir setting	160	200	240	315	400	480	630	800	1000	1200	1600	2000
Down stream gG/aM fuse-link	32	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
	50	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
	80		T	T	T	T	T	T	T	T	T	T	T
	100			T	T	T	T	T	T	T	T	T	T
	125				T	T	T	T	T	T	T	T	T
	160					T	T	T	T	T	T	T	T
	200						T	T	T	T	T	T	T
	250							T	T	T	T	T	T
	315								T	T	T	T	T
	355									100	100	100	100
	400									83	83	83	83
	500											43	43
	630											30	30
	800												30
	1000												
	1250												

Discrimination tables (cont.)

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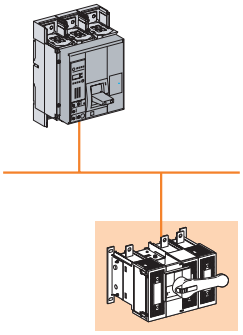


Upstream		Compact NS L Micrologic 5.0-6.0-7.0 A Inst OFF - EIT curve- Tsd = 0.4 TId = 24 s								
		NS630b	NS630b	NS630b	NS630b	NS630b	NS630b	NS630b	NS800	NS1000
	Rating (A)	400	400	400	630	630	630	630	800	1000
	Ir setting	160	200	240	315	400	500	630	800	1000
Down stream gG fuse-link	32	T	T	T	T	T	T	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 A Inst OFF - EIT curve- Tsd = 0.4 TId = 24 s													
		NS630b	NS630b	NS630b	NS630b	NS630b	NS630b	NS630b	NS800	NS1000	NS1250	NS1600	NS1600b	NS2000	NS2500	NS3200
	Rating (A)	400	400	400	630	630	630	630	800	1000	1200	1600	1600	2000	2500	3200
	Ir setting	160	200	240	315	400	500	630	800	1000	1200	1600	1600	2000	2500	3200
Down stream gG fuse-link	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
	1000														40	40
	1250															40

Table key

T	*Total discrimination*
41	*Discrimination limit in kA*
	No discrimination

Circuit-breaker characteristics

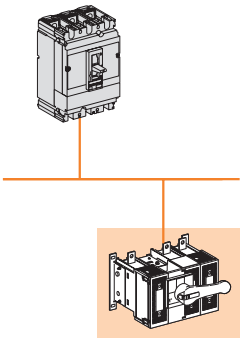
NS630b/400 to 1000
L / Icu = 150 kA Icw = 10kA / 0.5

NS630b to NS1600
N / Icu = 50 KA, Icw = 25 kA
H / Icu = 70 KA, Icw = 25 kA

NS1600b to NS3200
N / Icu = 70 KA, Icw = 40 kA
H / Icu = 85 KA, Icw = 40 kA

Discrimination tables (cont.)

DB104349



Compact NS (non-delayed short-time setting) upstream of a Fupact

The Compact NS100 to 630 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 NS with a delayed short-time setting.*

Discrimination between an upstream Compact NS and downstream gG fuse-links

Upstream		NS100N/H/L						NS160N/H/L				NS250/N/H/L					NS400/630/N/H/L	
	Trip unit	TM-D						TM-D				TM-D			STR22		STR23/53	
	Rating (A)	16	25	40	63	80	100	80	100	125	160	160	200	250	160	250	400	630
	Im (kA)	0.19	0.3	0.5	0.5	0.63	0.8	1	1.25	1.25	1.25	1.25	2	2.5	1.6	2.5	4	6.3
Down stream gG fuse-link	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	T
	10	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
	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	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
	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
	100												T	T		T	T	T
	125												T	T			T	T
	160													T			T	T
	200																	T
	250																	T
	315																	
	355																	

Discrimination between an upstream Compact NS and downstream aM fuse-links

Upstream		NS100N/H/L						NS160N/H/L				NS250/N/H/L					NS400/630/N/H/L	
	Trip unit	TM-D						TM-D				TM-D			STR22		STR23/53	
	Rating (A)	16	25	40	63	80	100	80	100	125	160	160	200	250	160	250	400	630
	Im (kA)	0.19	0.3	0.5	0.5	0.63	0.8	1	1.25	1.25	1.25	1.25	2	2.5	1.6	2.5	4	6.3
Down stream aM fuse-link	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	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	T
	20					T	T	T	T	T	T	T	T	T	T	T	T	T
	32									T	T	T	T	T	T	T	T	T
	40												T	T		T	T	T
	50												T	T		T	T	T
	63												T	T		T	T	T
	80																T	T
	100																T	T
	125																	
	160																	
	200																	

Discrimination tables (cont.)

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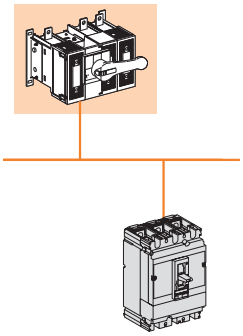

Compact NS (non-delayed short-time setting) downstream of a Fupact

The Compact NS100 to 630 is equipped with a thermal-magnetic or electronic trip unit without a delayed short-time setting.

Discrimination between an upstream gG fuse-link and downstream Compact NS

Upstream	Rating (A)	160	200	250	315	355	400	450	500	560	630	670	710	750	800	1000	1250
Down stream NS100 TM-D trip unit	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
	40	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
NS160 TM-D trip unit	80			7	15	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
	125						T	T	T	T	T	T	T	T	T	T	T
	160						T	T	T	T	T	T	T	T	T	T	T
NS250 TM-D trip unit	160						T	T	T	T	T	T	T	T	T	T	T
	200							T	T	T	T	T	T	T	T	T	T
	250							T	T	T	T	T	T	T	T	T	T
NS100	40	2.5	4	7	15	T	T	T	T	T	T	T	T	T	T	T	T
NS160	100		4	7	15	T	T	T	T	T	T	T	T	T	T	T	T
NS250 STR22	160				7	8	T	T	T	T	T	T	T	T	T	T	T
	200					8	35	T	T	T	T	T	T	T	T	T	T
	250							T	T	T	T	T	T	T	T	T	T
NS630	400								6	7	9	10	T	T	T	T	T
	630												12	15	T	T	T

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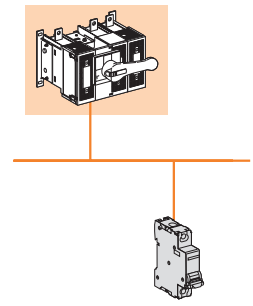


Multi 9 downstream of a Fupact see discrimination tables in Multi 9 catalogue (for all fuse standards)

Table key

T	*Total discrimination*
16	*Discrimination limit in kA*
	No discrimination

Applications

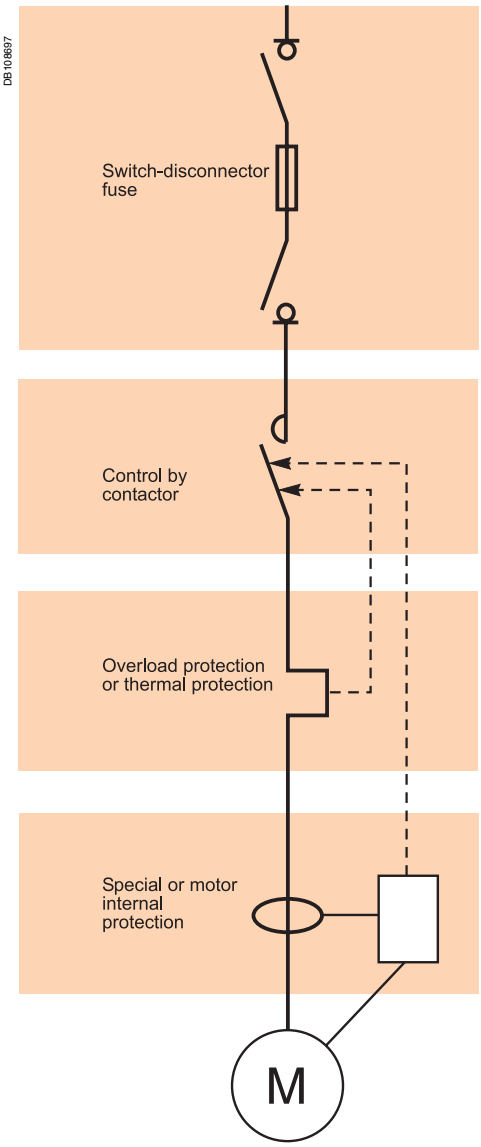
Example:
An INF•160 can receive BS fuse-links in sizes A2, A3 or A4, which correspond to the following ratings:
- ■ A2 size:
  - □ 2 to 32 A for gG fuse-links
  - □ 32M35 to 32M63 for gM fuse-links
- ■ A3 size:
  - □ 35 to 63 A for gG fuse-links
  - □ 63M80 to 63M100 for gM fuse-links
- ■ A4 size:
  - □ 80 to 200 A for gG fuse-links
  - □ 100M125 to 100M200 for gM fuse-links.

The tables on pages 171 to 175 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		
INF•63	A2	A3	000	00	14 x 51	22 X 58
INF•100	A2	A4				
INFC125					22 x 58	22 x 58
INF•160	A2	A4	000	00		
INF•250	B1	B3	0	1		
INF•400	B1	B4	0	2		
INF•630	C1	C3	3	3		
INF•800	C1	C3	3	3		
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 overload protection
- ■ a short-circuit protection device
- ■ an disconnection device capable of interrupting load currents.

The Fupact switch-disconnector-fuse is the ideal device for the last two points in the list. What is more, Fupact is totally compatible with the IEC 60204 machine directive.

Additional specific protection:
- ■ limitative fault protection (while the motor is running)
- ■ preventive fault protection (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 In
- ■ duration of peak current: 20 to 30 ms
- ■ starting current Id: 4 to 8 In
- ■ starting time td: 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 the:
  - □ motor
  - □ conductors
  - □ switch
  - □ fuse

is ensured by the thermal relay on the contactor.
- ■ overload (or short-circuit) protection of the:
  - □ 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.

Applications (cont.)

Selection tables for Fupact and associated NFC fuse-links

Example:
A 55 kW motor supplied with 690 V power is protected by:
- 125 A gG fuse-links
- 63 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 tables opposite.

(1) Fupact is designed to allow over-rated protection.

230/240 V

P(kW)	(HP)	In (A)	Fupact	gG	aM
0.37	0.5	**2.0**	**INFC32**	**10**	**2**
0.55	0.7	**2.8**	**INFC32**	**10**	**4**
0.75	1.0	**3.8**	**INFC32**	**16**	**4**
1.1	1.5	**4.7**	**INFC32**	**16**	**6**
1.5	2.0	**6.6**	**INFC32**	**20**	**8**
2.2	2.9	**9.4**	**INFC32**	**25**	**10**
3	4.0	**12.3**	**INFC32**	**32**	**16**
4	5.3	**15.8**	**INFC32**	**40**	**16**
5.5	7.3	**20.8**	**INFC32**	**50**	**25**
8	10	**27**	**INFC32**		**32**
			INFC63	**63**	
11	15	**40**	**INFC32**		**40**
			INFC63	**80**	
15	20	**53**	**INFC63**	**100**	**63**
18.5	25	**66**	**INFC63**	**125**	**80**
22	29	**77**	**INFC63**	**125**	**80**

380/400V

P(kW)	(HP)	In (A)	Fupact	gG	aM
0.37	0.5	**1.1**	**INFC32**	**4**	**2**
0.55	0.7	**1.6**	**INFC32**	**6**	**2**
0.75	1.0	**2.1**	**INFC32**	**10**	**4**
1.1	1.5	**2.6**	**INFC32**	**10**	**4**
1.5	2.0	**3.6**	**INFC32**	**16**	**4**
2.2	2.9	**5.2**	**INFC32**	**16**	**6**
3	4.0	**6.7**	**INFC32**	**20**	**8**
4	5.3	**8.7**	**INFC32**	**20**	**10**
5.5	7.3	**11.4**	**INFC32**	**32**	**12**
7.5	10	**15**	**INFC32**	**35**	**16**
11	15	**22**	**INFC32**	**50**	**25**
15	20	**29**	**INFC63**	**80**	**32**
18.5	25	**36**	**INFC63**	**80**	**40**
22	29	**43**	**INFC63**	**80**	**50**
30	40	**57**	**INFC125**	**100**	**63**
37	49	**72**	**INFC125**	**125**	**80**

415 V

P(kW)	(HP)	In (A)	Fupact	gG	aM
0.37	0.5	**1.05**	**INFC32**	**4**	**2**
0.55	0.7	**1.5**	**INFC32**	**6**	**2**
0.75	1.0	**2.0**	**INFC32**	**10**	**2**
1.1	1.5	**2.5**	**INFC32**	**10**	**4**
1.5	2.0	**3.5**	**INFC32**	**16**	**4**
2.2	2.9	**5.0**	**INFC32**	**16**	**6**
3	4.0	**6.5**	**INFC32**	**20**	**8**
4	5.3	**8.4**	**INFC32**	**20**	**10**
5.5	7.3	**11**	**INFC32**	**32**	**12**
7.5	10	**14.4**	**INFC32**	**35**	**16**
11	15	**21**	**INFC32**	**50**	**25**
15	20	**28**	**INFC63**	**80**	**32**
18.5	25	**35**	**INFC63**	**80**	**40**
22	29	**41**	**INFC63**	**80**	**50**
30	40	**55**	**INFC125**	**100**	**63**
37	49	**69**	**INFC125**	**125**	**80**

500/525 V

P(kW)	(HP)	In (A)	Fupact	gG	aM
0.37	0.5	**0.8**	**INFC32**	**4**	**2**
0.55	0.7	**1.2**	**INFC32**	**4**	**2**
0.75	1.0	**1.6**	**INFC32**	**6**	**2**
1.1	1.5	**2.0**	**INFC32**	**10**	**2**
1.5	2.0	**2.8**	**INFC32**	**10**	**4**
2.2	2.9	**4.0**	**INFC32**	**16**	**4**
3	4.0	**5.1**	**INFC32**	**16**	**6**
4	5.3	**6.6**	**INFC32**	**20**	**8**
5.5	7.3	**8.7**	**INFC32**	**20**	**10**
7.5	10	**11**	**INFC32**	**32**	**12**
11	15	**17**	**INFC32**	**40**	**20**
15	20	**22**	**INFC32**		**25**
			INFC63	**63**	
18.5	25	**28**	**INFC32**		**32**
			INFC63	**63**	
22	29	**32**	**INFC63**	**80**	**40**
30	40	**43**	**INFC63**	**80**	**50**
37	49	**55**	**INFC125**	**100**	**63**
45	60	**63**	**INFC125**	**125**	**80**
55	73	**77**	**INFC125**	**125**	**80**

690 V

P(kW)	(HP)	In (A)	Fupact	gG	aM
0.37	0.5	**0.7**	**INFC32**	**2**	**2**
0.55	0.7	**0.9**	**INFC32**	**4**	**2**
0.75	1.0	**1.3**	**INFC32**	**4**	**2**
1.1	1.5	**1.6**	**INFC32**	**6**	**2**
1.5	2.0	**2.2**	**INFC32**	**10**	**4**
2.2	2.9	**3.1**	**INFC32**	**16**	**4**
3	4.0	**4.1**	**INFC32**	**16**	**6**
4	5.3	**5.3**	**INFC32**	**16**	**6**
5.5	7.3	**6.9**	**INFC32**	**20**	**8**
7.5	10	**9.1**	**INFC32**	**20**	**10**
11	15	**13**	**INFC32**	**32**	**16**
15	20	**18**	**INFC32**	**40**	**20**
18.5	25	**22**	**INFC32**		**25**
			INFC63	**63**	
22	29	**26**	**INFC32**		**32**
			INFC63	**63**	
30	40	**35**	**INFC63**	**80**	**40**
37	49	**43**	**INFC63**	**80**	**50**
45	60	**50**	**INFC63**	**100**	**63**
55	73	**62**	**INFC63**	**125**	**63**

Applications (cont.)

Selection tables for Fupact and associated BS fuse-links

Example

A 37 kW motor supplied with 400 V power is protected by a:

- 125 A gG fuse-link

This type of fuse-link may be mounted on a Fupact INFB250 or higher.

- 100M125 gM fuse-link.

This type of fuse-link may be mounted on a Fupact INFB100 or higher.

See the grey section in the tables opposite.

230/240 V

P(kW)	(HP)	In (A)	Fupact	gG	gM
0.37	0.5	**1.9**	**INFB32**	**6**	
0.55	0.7	**2.7**	**INFB32**	**10**	
0.75	1.0	**3.6**	**INFB32**	**16**	
1.1	1.5	**4.5**	**INFB32**	**16**	
1.5	2.0	**6.3**	**INFB32**	**20**	
2.2	2.9	**9.0**	**INFB32**	**20**	
3	4.0	**11.7**	**INFB32**	**32**	**20M32**
4	5.3	**15.2**	**INFB32**		**32M40**
			INFB63	**40**	
5.5	7.3	**19.8**	**INFB32**		**32M50**
			INFB63	**50**	
7.5	10	**26.0**	**INFB32**		**32M63**
			INFB63	**63**	
11	15	**38**	**INFB63**		**63M80**
			INFB100	**80**	
15	20	**51**	**INFB63**		**63M100**
			INFB100	**100**	
18.5	25	**63**	**INFB100**		**100M125**
			INFB250	**125**	
22	29	**74**	**INFB100**		**100M125**
			INFB250	**125**	
30	40	**99**	**INFB250**	**200**	
37	49	**125**	**INFB250**	**200**	
45	60	**144**	**INFB250**	**250**	**200M250**
55	73	**177**	**INFB250**	**250**	**200M250**
75	100	**245**	**INFB400**	**355**	**315M355**
90	120	**296**	**INFB400**	**400**	
110	147	**354**	**INFB630**	**450**	**400M450**
132	176	**408**	**INFB630**	**500**	
150	200	**484**	**INFB630**	**560**	
160	213	**496**	**INFB630**	**560**	
200	267	**646**	**INFB800**	**670**	**630M670**

380/400V

P(kW)	(HP)	In (A)	Fupact	gG	gM
0.37	0.5	**1.1**	**INFB32**	**4**	
0.55	0.7	**1.6**	**INFB32**	**6**	
0.75	1.0	**2.1**	**INFB32**	**10**	
1.1	1.5	**2.6**	**INFB32**	**10**	
1.5	2.0	**3.6**	**INFB32**	**16**	
2.2	2.9	**5.2**	**INFB32**	**16**	
3	4.0	**6.7**	**INFB32**	**20**	
4	5.3	**8.7**	**INFB32**	**20**	
5.5	7.3	**11.4**	**INFB32**	**32**	**20M32**
7.5	10	**15**	**INFB32**	**35**	**32M35**
11	15	**22**	**INFB32**		**32M50**
			INFB63	**50**	
15	20	**29**	**INFB63**	**80**	**63M80**
18.5	25	**36**	**INFB63**	**80**	**63M80**
22	29	**43**	**INFB63**	**80**	**63M80**
30	40	**57**	**INFB100**	**100**	**63M100**
37	49	**72**	**INFB100**		**100M125**
			INFB250	**125**	
45	60	**83**	**INFB100**		**100M160**
			INFB250	**160**	
55	73	**102**	**INFB100**	**200**	
75	100	**141**	**INFB250**	**250**	**200M250**
90	120	**170**	**INFB250**	**250**	**200M250**
110	147	**203**	**INFB250**	**315**	**200M315**
132	176	**234**	**INFB400**	**355**	**315M355**
150	200	**278**	**INFB400**	**400**	
160	213	**285**	**INFB400**	**400**	
200	267	**371**	**INFB400**		**400M450**
			INFB630	**450**	
240	320	**444**	**INFB630**	**560**	
280	373	**506**	**INFB630**	**630**	
300	**400**	**545**	**INFB630**	**630**	
320	**427**	**558**	**INFB800**	**630**	

Applications (cont.)

415 V P(kW)	(HP)	In (A)	Fupact	gG	gM
0.37	0.5	**1.05**	**INFB32**	**4**	
0.55	0.7	**1.5**	**INFB32**	**6**	
0.75	1.0	**2.0**	**INFB32**	**10**	
1.1	1.5	**2.5**	**INFB32**	**10**	
1.5	2.0	**3.5**	**INFB32**	**16**	
2.2	2.9	**5.0**	**INFB32**	**16**	
3	4.0	**6.5**	**INFB32**	**20**	
4	5.3	**8.4**	**INFB32**	**20**	
5.5	7.3	**11**	**INFB32**	**32**	**20M32**
7.5	10	**14.4**	**INFB32**	**35**	**32M35**
11	15	**21**	**INFB32**	**50**	**32M50**
15	20	**28**	**INFB63**		**63M80**
			INFB100	**80**	
18.5	25	**35**	**INFB63**		**63M80**
			INFB100	**80**	
22	29	**41**	**INFB63**		**63M80**
			INFB100	**80**	
30	40	**55**	**INFB100**	**100**	**63M100**
37			**INFB100**		**100M125**
			INFB250	**125**	
45			**INFB100**		**100M160**
			INFB250	**160**	
55			**INFB160**		**100M160**
			INFB250	**160**	
75	100	**136**	**INFB100**	**250**	**200M250**
90	120	**164**	**INFB250**	**250**	**200M250**
110	147	**196**	**INFB250**	**315**	**200M315**
132	176	**226**	**INFB250**	**355**	**315M355**
150	200	**268**	**INFB400**	**355**	**315M355**
160	213	**275**	**INFB400**	**400**	
200	267	**358**	**INFB400**		**400M450**
			INFB630	**450**	
240	320	**428**	**INFB630**	**500**	
280	373	**488**	**INFB630**	**560**	
300	400	**525**	**INFB630**	**630**	
320	427	**538**	**INFB630**	**630**	

500/525 V P(kW)	(HP)	In (A)	Fupact	gG	gM
0.37	0.5	**0.8**	**INFB32**	**4**	
0.55	0.7	**1.2**	**INFB32**	**4**	
0.75	1.0	**1.6**	**INFB32**	**6**	
1.1	1.5	**2.0**	**INFB32**	**10**	
1.5	2.0	**2.8**	**INFB32**	**10**	
2.2	2.9	**4.0**	**INFB32**	**16**	
3	4.0	**5.1**	**INFB32**	**16**	
4	5.3	**6.6**	**INFB32**	**20**	
5.5	7.3	**8.7**	**INFB32**	**20**	
7.5	10	**11**	**INFB32**	**32**	**20M32**
11	15	**17**	**INFB32**		**32M40**
			INFB63	**40**	
15	20	**22**	**INFB32**		**32M63**
			INFB63	**63**	
18.5	25	**28**	**INFB32**		**32M63**
			INFB63	**63**	
22	29	**32**	**INFB63**	**80**	**63M80**
30	40	**43**	**INFB63**	**80**	**63M80**
37	49	**55**	**INFB100**	**100**	**63M100**
45			**INFB100**		**100M125**
			INFB250	**125**	
55			**INFB100**		**100M125**
			INFB250	**125**	
75			**INFB160**	**200**	
90			**INFB250**	**250**	**200M250**
110	147	**155**	**INFB250**	**250**	**200M250**
132	176	**179**	**INFB250**	**250**	**200M250**
150	200	**212**	**INFB250**	**315**	**200M315**
160	213	**217**	**INFB400**	**355**	**315M355**
200	267	**283**	**INFB400**	**400**	
240	320	**338**	**INFB400**		**400M450**
			INFB630	**450**	
280	373	**386**	**INFB630**	**500**	
300	400	**415**	**INFB630**	**500**	
320	427	**425**	**INFB630**	**500**	
355	473	**478**	**INFB630**	**560**	
375	500	**482**	**INFB630**	**560**	

690 V P(kW)	(HP)	In (A)	Fupact	gG	gM
0.37	0.5	**0.7**	**INFB32**	**2**	
0.55	0.7	**0.9**	**INFB32**	**4**	
0.75	1.0	**1.3**	**INFB32**	**4**	
1.1	1.5	**1.6**	**INFB32**	**6**	
1.5	2.0	**2.2**	**INFB32**	**10**	
2.2	2.9	**3.1**	**INFB32**	**16**	
3	4.0	**4.1**	**INFB32**	**16**	
4	5.3	**5.3**	**INFB32**	**16**	
5.5	7.3	**6.9**	**INFB32**	**20**	
7.5	10	**9.1**	**INFB32**	**20**	
11	15	**13**	**INFB32**	**32**	**20M32**
15	20	**18**	**INFB32**		**32M40**
			INFB63	**40**	
18.5	25	**22**	**INFB32**		**32M63**
			INFB63	**63**	
22	29	**26**	**INFB32**		**32M63**
			INFB63	**63**	
30	40	**35**	**INFB63**		**63M80**
			INFB100	**80**	
37	49	**43**	**INFB63**		**63M80**
			INFB100	**80**	
45	60	**50**	**INFB63**		**63M100**
			INFB100	**100**	
55			**INFB100**		**100M125**
			INFB250	**125**	
75			**INFB100**		**100M160**
			INFB250	**160**	
90			**INFB250**	**200**	
110			**INFB250**	**200**	
132	176	**142**	**INFB250**	**250**	**200M250**
150	200	**169**	**INFB250**	**250**	**200M250**
160	213	**173**	**INFB250**	**250**	**200M250**
200	267	**225**	**INFB400**	**355**	**315M355**
240	320	**269**	**INFB400**	**355**	**315M355**
280	373	**307**	**INFB400**	**400**	
300	400	**330**	**INFB400**		**400M450**
			INFB630	**450**	
320	427	**338**	**INFB400**		**400M450**
			INFB630	**450**	
355	473	**364**	**INFB630**	**450**	**400M450**
375	500	**367**	**INFB630**	**450**	**400M450**
400	533	**406**	**INFB630**	**500**	
425	567	**415**	**INFB630**	**500**	

Applications (cont.)

Selection tables for Fupact and associated DIN fuse-links

Example:
A 75 kW motor supplied with 500 V power is protected by:
■ 200 A gG fuse-links
This type of fuse-link may be mounted on a Fupact INFD250 or higher
■ 125 A aM fuse-link.
This type of fuse-link may be mounted on a Fupact INFD160 or higher.
See the grey sections in the tables opposite.

230/240 V

P(kW)	(HP)	In (A)	Fupact	gG	aM
0.37	0.5	**1.9**	**INFD40**	**6**	**2**
0.55	0.7	**2.7**	**INFD40**	**10**	**4**
0.75	1.0	**3.6**	**INFD40**	**16**	**4**
1.1	1.5	**4.5**	**INFD40**	**16**	**6**
1.5	2.0	**6.3**	**INFD40**	**20**	**8**
2.2	2.9	**9.0**	**INFD40**	**20**	**10**
3	4.0	**11.7**	**INFD40**	**32**	**12**
4	5.3	**15.2**	**INFD40**	**40**	**16**
5.5	7.3	**19.8**	**INFD40**	**50**	**20**
7.5	10	**26**	**INFD40**	**63**	**32**
11	15	**38**	**INFD63**	**80**	**40**
15	20	**51**	**INFD63**	**100**	**63**
18.5	25	**63**	**INFD160**	**125**	**80**
22	29	**74**	**INFD160**	**125**	**80**
30	40	**99**	**INFD160**		**100**
			INFD250	**200**	
37	49	**125**	**INFD160**		**125**
			INFD250	**200**	
45	60	**144**	**INFD250**	**250**	**160**
55	73	**177**	**INFD250**	**250**	**200**
75	100	**245**	**INFD400**	**355**	**250**
90	120	**296**	**INFD400**	**400**	**315**
110	147	**354**	**INFD630**	**450**	**355**
132	176	**408**	**INFD630**	**500**	**450**
150	200	**484**	**INFD630**	**560**	**500**
160	213	**496**	**INFD630**	**560**	**500**
200	267	**646**	**INFD800**	**670**	**800**

380/400V

P(kW)	(HP)	In (A)	Fupact	gG	aM
0.37	0.5	**1.1**	**INFD40**	**4**	**2**
0.55	0.7	**1.6**	**INFD40**	**6**	**2**
0.75	1.0	**2.1**	**INFD40**	**10**	**4**
1.1	1.5	**2.6**	**INFD40**	**10**	**4**
1.5	2.0	**3.6**	**INFD40**	**16**	**4**
2.2	2.9	**5.2**	**INFD40**	**16**	**6**
3	4.0	**6.7**	**INFD40**	**20**	**8**
4	5.3	**8.7**	**INFD40**	**20**	**10**
5.5	7.3	**11.4**	**INFD40**	**32**	**12**
7.5	10	**15**	**INFD40**	**35**	**16**
11	15	**22**	**INFD40**	**50**	**25**
15	20	**29**	**INFD63**	**80**	**32**
18.5	25	**36**	**INFD63**	**80**	**40**
22	29	**43**	**INFD63**	**80**	**50**
30	40	**57**	**INFD160**	**100**	**63**
37	49	**72**	**INFD160**	**125**	**80**
45	60	**83**	**INFD160**	**160**	**100**
55	73	**102**	**INFD160**		**125**
			INFD250	**200**	
75	100	**141**	**INFD160**		**160**
			INFD250	**250**	
90	120	**170**	**INFD250**	**250**	**200**
110	147	**203**	**INFD250**		**250**
			INFD400	**315**	
132	176	**234**	**INFD250**		**250**
			INFD400	**355**	
150	200	**278**	**INFD400**	**400**	**315**
160	213	**285**	**INFD400**	**400**	**315**
200	267	**371**	**INFD400**		**400**
			INFD630	**450**	
240	320	**444**	**INFD630**	**560**	**450**
280	373	**506**	**INFD630**	**630**	**630**
300	400	**545**	**INFD630**	**630**	**630**
320	427	**558**	**INFD800**	**630**	**630**

Applications (cont.)

415 V					
P(kW)	(HP)	In (A)	Fupact	gG	aM
0.37	0.5	**1.05**	**INFD40**	**4**	**2**
0.55	0.7	**1.5**	**INFD40**	**6**	**2**
0.75	1.0	**2.0**	**INFD40**	**10**	**2**
1.1	1.5	**2.5**	**INFD40**	**10**	**4**
1.5	2.0	**3.5**	**INFD40**	**16**	**4**
2.2	2.9	**5.0**	**INFD40**	**16**	**6**
3	4.0	**6.5**	**INFD40**	**20**	**8**
4	5.3	**8.4**	**INFD40**	**20**	**10**
5.5	7.3	**11**	**INFD40**	**32**	**12**
7.5	10	**14.4**	**INFD40**	**35**	**16**
11	15	**21**	**INFD40**	**50**	**25**
15	20	**28**	**INFD63**	**80**	**32**
18.5	25	**35**	**INFD63**	**80**	**40**
22	29	**41**	**INFD63**	**80**	**50**
30	40	**55**	**INFD160**	**100**	**63**
37	49	**69**	**INFD160**	**125**	**80**
45	60	**80**	**INFD160**	**160**	**80**
55	73	**98**	**INFD160**	**160**	**100**
75	100	**136**	**INFD160**		**160**
			INFD250	**250**	
90	120	**164**	**INFD250**	**250**	**200**
110	147	**196**	**INFD250**		**200**
			INFD400	**315**	
132	176	**226**	**INFD250**		**250**
			INFD400	**355**	
150	200	**268**	**INFD400**	**355**	**315**
160	213	**275**	**INFD400**	**400**	**315**
200	267	**358**	**INFD400**		**400**
			INFD630	**450**	
240	320	**428**	**INFD630**	**500**	**450**
280	373	**488**	**INFD630**	**560**	**500**
300	400	**525**	**INFD630**	**630**	**630**
320	427	**538**	**INFD630**	**630**	**630**
355	473	**605**	**INFD800**	**670**	**630**
375	500	**610**	**INFD800**	**670**	**630**

500/525 V					
P(kW)	(HP)	In (A)	Fupact	gG	aM
0.37	0.5	**0.8**	**INFD40**	**4**	**2**
0.55	0.7	**1.2**	**INFD40**	**4**	**2**
0.75	1.0	**1.6**	**INFD40**	**6**	**2**
1.1	1.5	**2.0**	**INFD40**	**10**	**2**
1.5	2.0	**2.8**	**INFD40**	**10**	**4**
2.2	2.9	**4.0**	**INFD40**	**16**	**4**
3	4.0	**5.1**	**INFD40**	**16**	**6**
4	5.3	**6.6**	**INFD40**	**20**	**8**
5.5	7.3	**8.7**	**INFD40**	**20**	**10**
7.5	10	**11**	**INFD40**	**32**	**12**
11	15	**17**	**INFD40**	**40**	**20**
15	20	**22**	**INFD40**	**63**	**25**
18.5	25	**28**	**INFD40**	**63**	**32**
22	29	**32**	**INFD63**	**80**	**40**
30	40	**43**	**INFD63**	**80**	**50**
37	49	**55**	**INFD160**	**100**	**63**
45	60	**63**	**INFD160**	**125**	**80**
55	73	**77**	**INFD160**	**125**	**80**
75	100	**108**	**INFD160**		**125**
			INFD250	**200**	
90	120	**130**	**INFD160**		**160**
			INFD250	**250**	
110	147	**155**	**INFD250**	**250**	**160**
132	176	**179**	**INFD250**	**250**	**200**
150	200	**212**	**INFD250**		**250**
			INFD400	**315**	
160	213	**217**	**INFD250**		**250**
			INFD400	**355**	
200	267	**283**	**INFD400**	**400**	**315**
240	320	**338**	**INFD400**		**355**
			INFD630	**450**	
280	373	**386**	**INFD630**	**500**	**400**
300	400	**415**	**INFD630**	**500**	**450**
320	427	**425**	**INFD630**	**500**	**450**
355	473	**478**	**INFD630**	**560**	**500**
375	500	**482**	**INFD630**	**560**	**500**
400	533	**534**	**INFD630**	**630**	**630**
425	567	**545**	**INFD800**	**630**	**630**

690 V					
P(kW)	(HP)	In (A)	Fupact	gG	aM
0.37	0.5	**0.7**	**INFD40**	**2**	**2**
0.55	0.7	**0.9**	**INFD40**	**4**	**2**
0.75	1.0	**1.3**	**INFD40**	**4**	**2**
1.1	1.5	**1.6**	**INFD40**	**6**	**2**
1.5	2.0	**2.2**	**INFD40**	**10**	**4**
2.2	2.9	**3.1**	**INFD40**	**16**	**4**
3	4.0	**4.1**	**INFD40**	**16**	**6**
4	5.3	**5.3**	**INFD40**	**16**	**6**
5.5	7.3	**6.9**	**INFD40**	**20**	**8**
7.5	10	**9.1**	**INFD40**	**20**	**10**
11	15	**13**	**INFD40**	**32**	**16**
15	20	**18**	**INFD40**	**40**	**20**
18.5	25	**22**	**INFD40**	**63**	**25**
22	29	**26**	**INFD40**	**63**	**32**
30	40	**35**	**INFD63**	**80**	**40**
37	49	**43**	**INFD63**	**80**	**50**
45	60	**50**	**INFD63**	**100**	**63**
55	73	**62**	**INFD63**	**125**	**63**
75	100	**86**	**INFD160**	**160**	**100**
90	120	**103**	**INFD160**		**125**
			INFD250	**200**	
110	147	**123**	**INFD160**		**125**
			INFD250	**200**	
132	176	**142**	**INFD250**	**250**	**160**
150	200	**169**	**INFD250**	**250**	**200**
160	213	**173**	**INFD250**	**250**	**200**
200	267	**225**	**INFD250**		**250**
			INFD400	**355**	
240	320	**269**	**INFD400**	**355**	**315**
280	373	**307**	**INFD400**	**400**	**315**
300	400	**330**	**INFD400**		**355**
			INFD630	**450**	
320	427	**338**	**INFD400**		**355**
			INFD630	**450**	
355	473	**364**	**INFD400**		**400**
			INFD630	**450**	
375	500	**367**	**INFD400**		**400**
			INFD630	**450**	
400	533	**406**	**INFD630**	**500**	**450**
425	567	**415**	**INFD630**	**500**	**450**

Type 2 Coordination (IEC 60947-4-1) 380/415 V

Switch-fuse disconnector Merlin Gerin, contactors Telemecanique

Performance: Ue = 380/415 V - "Iq" 100 kA

Starting Class 10 A/10.

Motors				Switch-Fuse [1]	Fuse-link type		Contactors [2]	Thermal o/l relays	
P (kW)	I (A) 380 V	I (A) 415 V	Ie Max (A)	Type	gG cal(A)	aM cal(A)	Type	Type	
0.37	1.2	1.1	1.6	INFC32 or INFD40	4	2	LC1-D09	LR-D 06	1/1.6
0.55	1.6	1.5	1.6	INFC32 or INFD40	6	2	LC1-D09	LR-D 06	1/1.6
0.75	2	1.8	2.5	INFC32 or INFD40	6	2	LC1-D09	LR-D 07	1.6/2.5
1.1	2.8	2.6	2.5	INFC32 or INFD40	10	4	LC1-D09	LR-D 07	1.6/2.5
1.5	3.7	3.4	4	INFC32 or INFD40	16	4	LC1-D09	LR-D 08	2.5/4
2.2	5.3	4.8	6	INFC32 or INFD40	16	6	LC1-D09	LR-D 10	4/6
3	7	6.5	6	INFC32 or INFD40	20	8	LC1-D09	LR-D 10	4/6
4	9	8.2	8	INFC32 or INFD40	20	10	LC1-D09	LR-D 12	5.5/8
5.5	12	11	12	INFC32 or INFD40	32	12	LC1-D09	LR-D 16	9/13
7.5	16	14	16	INFC32 or INFD40	35	16	LC1-D25	LR-D 21	12/18
10	21	19	20	INFC32 or INFD40	50	20	LC1-D25	LR-D 22	16/24
11	23	21	24	INFC32 or INFD40	50	25	LC1-D25	LR-D 22	16/24
15	30	28	32	INFC32 or INFD40	63	32	LC1-D32	LR-D 32	23/32
18.5	37	34	40	INFC63 or INFD40	80	40	LC1-D40	LR2-D33 55	30/40
22	43	40	50	INFC63 or INFD63	80	50	LC1-D50	LR2-D33 57	37/50
30	59	55	50	INFC63 or INFD63	100	63	LC1-D50	LR2-D33 59	48/65
37	72	66	80	INFC125 or INFD160	125	80	LC1-D80	LR2-D33 63	63/80
45	85	80	80	INFD160	160	100	LC1-D115	LR9-D53 67	60/100
55	105	100	115	INFD160	-	125	LC1-D115	LR9-D53 69	90/150
				INFD250	200	-			
75	140	135	150	INFD250	250	160	LC1-D150	LR9-D53 69	90/150
90	170	160	185	INFD250	250	200	LC1-F185	LR9-F53 71	132/220
110	210	200	220	INFD250	-	250	LC1-F265	LR9-F53 71	132/220
				INFD400	315				
132	250	230	250	INFD250	-	250	LC1-F265	LR9-F73 75	200/330
			265	INFD400	315	-	LC1-F265		
160	300	270	265	INFD400	355	315	LC1-F265	LR9-F73 75	200/330
200	380	361	330	INFD400	400	315	LC1-F400	LR9-F73 79	300/500
250	460	430	500	INFD630	630	500	LC1-F500	LR9-F73 79	300/500
280	520	475	630	INFD630	630	500	LC1-F630	LR9-F73 81	380/630
300	565	500	630	INFD800	800	630	LC1-F630	LR9-F73 81	380/630
335	610	560	630	INFD800	800	630	LC1-F630	LR9-F73 81	380/630
355	630	590	630	INFD800	800	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; star-delta starter: replace LC1 with LC3.

Type 2 coordination (IEC 60947-4-1) 380/415 V

Switch-fuse disconnector Merlin Gerin, contactors Telemecanique

Performance: Ue = 380/415 V - "Iq" 100 kA

Starting Adjustable class 10 A to 30.

Motors				Switch-Fuse (1)	Fuse-link type		Contactors (2)	Thermal o/l relays	
P (kW)	I (A) 380 V	I (A) 415 V	Ie Max (A)	Type	gG cal(A)	aM cal(A)	Type	Type	
0.37	1.2	1.1	5	INFC32 or INFD40	4	2	LC1-D09	LT6-P0M	1/5 (3)
0.55	1.6	1.5	5	INFC32 or INFD40	6	2	LC1-D09	LT6-P0M	1/5 (3)
0.75	2	1.8	5	INFC32 or INFD40	6	2	LC1-D09	LT6-P0M	1/5 (3)
1.1	2.8	2.6	5	INFC32 or INFD40	10	4	LC1-D09	LT6-P0M	1/5 (3)
1.5	3.7	3.4	5	INFC32 or INFD40	16	4	LC1-D09	LT6-P0M	1/5 (3)
2.2	5.3	4.8	5	INFC32 or INFD40	16	6	LC1-D09	LT6-P0M	1/5 (3)
3	7	6.5	6	INFC32 or INFD40	20	8	LC1-D09	LT6-P0M	1/5 (3)
4	9	8.2	9	INFC32 or INFD40	20	10	LC1-D09	LT6-P0M	5/25 (3)
5.5	12	11	9	INFC32 or INFD40	32	12	LC1-D09	LT6-P0M	5/25 (3)
7.5	16	14	25	INFC32 or INFD40	35	16	LC1-D25	LT6-P0M	5/25 (3)
10	21	19	25	INFC32 or INFD40	50	20	LC1-D25	LT6-P0M	5/25 (3)
11	23	21	25	INFC32 or INFD40	50	25	LC1-D25	LT6-P0M	5/25 (3)
15	30	28	25	INFC32 or INFD40	63	32	LC1-D32	LT6-P0M	5/25 (3)
18.5	37	34	40	INFC63 or INFD40	80	40	LC1-D40	LT6-P0M	On CT
22	43	40	40	INFC63 or INFD63	80	50	LC1-D50	LT6-P0M	On CT
30	59	55	50	INFC63 or INFD63	100	63	LC1-D50	LT6-P0M	On CT
37	72	66	65	INFC125 or INFD160	125	80	LC1-D65	LT6-P0M	On CT
45	85	80	80	INFC125 or INFD160	125	80	LC1-D80	LT6-P0M	On CT
55	105	100	100	INFD160	160	100	LC1-D115	LT6-P0M	On CT
75	140	135	125	INFD160	-	125	LC1-D150	LT6-P0M	On CT
			150	INFD250	200	-	LC1-D150		
90	170	160	150	INFD160	-	160	LC1-D150	LT6-P0M	On CT
			250	INFD250	250	-	LC1-D150		
110	210	200	185	INFD250 INFD400	250	200	LC1-F185	LT6-P0M	On CT
132	250	230	250	INFD250	-	250	LC1-F265	LT6-P0M	On CT
			265	INFD400	315	-	LC1-F265		
160	300	270	265	INFD400	400	315	LC1-F400	LT6-P0M	On CT
200	380	361	400	INFD400	400	400	LC1-F400	LT6-P0M	On CT
250	460	430	500	INFD630	630	500	LC1-F500	LT6-P0M	On CT
280	520	475	630	INFD630	630	630	LC1-F630	LT6-P0M	On CT
300	565	500	630	INFD800	800	630	LC1-F630	LT6-P0M	On CT
335	610	560	630	INFD800	800	630	LC1-F630	LT6-P0M	On CT
355	630	590	630	INFD800	800	630	LC1-F630	LT6-P0M	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.

Type 2 coordination (IEC 60947-4-1) 440 V

Switch-fuse disconnector Merlin Gerin, contactors Telemecanique

Performance: Ue = 440 V - "Iq" 100 kA

Starting Class 10 A/10.

Motors			Switch-Fuse (1)	Fuse-link type		Contactors (2)	Thermal o/l relays	
P (kW)	I (A) 440 V	Ie Max (A)	Type	gG cal(A)	aM cal(A)	Type	Type	
0.37	1	1.6	INFC32 or INFD40	4	2	LC1-D09	LR-D 06	1/1.6
0.55	1.4	1.6	INFC32 or INFD40	6	2	LC1-D09	LR-D 06	1/1.6
0.75	1.7	2.5	INFC32 or INFD40	6	2	LC1-D09	LR-D 07	1.6/2.5
1.1	2.4	2.5	INFC32 or INFD40	10	4	LC1-D09	LR-D 07	1.6/2.5
1.5	3.1	4	INFC32 or INFD40	16	4	LC1-D09	LR-D 08	2.5/4
2.2	4.5	6	INFC32 or INFD40	16	6	LC1-D09	LR-D 10	4/6
3	5.8	6	INFC32 or INFD40	20	8	LC1-D09	LR-D 10	4/6
4	8	8	INFC32 or INFD40	20	10	LC1-D09	LR-D 12	5.5/8
5.5	10.5	12	INFC32 or INFD40	32	12	LC1-D09	LR-D 16	9/13
7.5	13.7	16	INFC32 or INFD40	35	16	LC1-D25	LR-D 21	12/18
10	19	20	INFC32 or INFD40	50	20	LC1-D25	LR-D 22	16/24
11	20	20	INFC32 or INFD40	50	20	LC1-D25	LR-D 22	16/24
15	26.5	32	INFC32 or INFD40	63	32	LC1-D32	LR-D 32	23/32
18.5	33	40	INFC32 or INFD40	80	40	LC1-D40	LR2-D33 55	30/40
22	39	40	INFC63 or INFD63	80	40	LC1-D40	LR2-D33 55	30/40
30	52	50	INFC63 or INFD63	100	63	LC1-D50	LR2-D33 59	48/65
37	63	65	INFC125 or INFD160	125	80	LC1-D65	LR2-D33 59	48/65
45	76	80	INFC125 or INFD160	125	80	LC1-D80	LR2-D33 63	63/80
55	90	100	INFC125 or INFD160	160	100	LC1-D115	LR9-D53 67	60/100
75	125	125	INFD160	-	125	LC1-D150	LR9-D53 69	90/150
		150	INFD250	200	-	LC1-D150		
90	140	150	INFD160	-	160	LC1-D150	LR9-D53 69	90/150
		250	INFD250	250	-	LC1-D150		
110	178	185	INFD250	250	200	LC1-F185	LR9-F53 71	132/220
			INFD400					
132	210	250	INFD250	-	250	LC1-F265	LR9-F53 71	132/220
		265	INFD400	315	-	LC1-F265		
160	256	265	INFD400	355	315	LC1-F265	LR9-F73 75	200/330
200	310	330	INFD400	400	315	LC1-F400	LR9-F73 75	200/330
250	400	400	INFD630	500	450	LC1-F400	LR9-F73 79	300/500
280	435	500	INFD630	560	500	LC1-F500	LR9-F73 79	300/500
300	460	500	INFD630	560	500	LC1-F500	LR9-F73 79	300/500
335	540	630	INFD630	630	630	LC1-F500	LR9-F73 81	380/630
355	560	630	INFD630	630	630	LC1-F500	LR9-F73 81	380/630
375	575	630	INFD800	670	630	LC1-F630	LR9-F73 81	380/630
400	611	630	INFD800	670	630	LC1-F630	TC800/5 + LRD-10	630/1000

(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.

Type 2 coordination (IEC 60947-4-1) 440 V

Switch-fuse disconnector Merlin Gerin, contactors Telemecanique

Performance: Ue = 440 V - "Iq" 100 kA

Starting Adjustable class 10 A to 30.

Motors			Switch-Fuse (1)	Fuse-link type		Contactors (2)	Thermal o/l relays	
P (kW)	I (A) 440 V	Ie Max (A)	Type	gG cal(A)	aM cal(A)	Type	Type	
0.37	1	5	INFC32 or INFD40	4	2	LC1-D09	LT6-P0M	1/5 (3)
0.55	1.4	5	INFC32 or INFD40	6	2	LC1-D09	LT6-P0M	1/5 (3)
0.75	1.7	5	INFC32 or INFD40	6	2	LC1-D09	LT6-P0M	1/5 (3)
1.1	2.4	5	INFC32 or INFD40	10	4	LC1-D09	LT6-P0M	1/5 (3)
1.5	3.1	5	INFC32 or INFD40	16	4	LC1-D09	LT6-P0M	1/5 (3)
2.2	4.5	5	INFC32 or INFD40	16	6	LC1-D09	LT6-P0M	1/5 (3)
3	5.8	6	INFC32 or INFD40	20	8	LC1-D09	LT6-P0M	1/5 (3)
4	8	9	INFC32 or INFD40	20	10	LC1-D09	LT6-P0M	5/25 (3)
5.5	10.5	9	INFC32 or INFD40	32	12	LC1-D09	LT6-P0M	5/25 (3)
7.5	13.7	16	INFC32 or INFD40	35	16	LC1-D25	LT6-P0M	5/25 (3)
10	19	20	INFC32 or INFD40	50	20	LC1-D25	LT6-P0M	5/25 (3)
11	20	20	INFC32 or INFD40	50	20	LC1-D25	LT6-P0M	5/25 (3)
15	26.5	25	INFC32 or INFD40	63	32	LC1-D32	LT6-P0M	5/25 (3)
18.5	33	40	INFC63 or INFD40	80	40	LC1-D40	LT6-P0M	On CT
22	39	40	INFC63 or INFD63	80	40	LC1-D40	LT6-P0M	On CT
30	52	50	INFC63 or INFD63	100	63	LC1-D50	LT6-P0M	On CT
37	63	65	INFC125 or INFD160	125	80	LC1-D65	LT6-P0M	On CT
45	76	80	INFC125 or INFD160	125	80	LC1-D80	LT6-P0M	On CT
55	90	100	INFC125 or INFD160	160	100	LC1-D115	LT6-P0M	On CT
75	125	125	INFD160	-	125	LC1-D150	LT6-P0M	On CT
		150	INFD250	200	-	LC1-D150		
90	140	150	INFD160	-	160	LC1-D150	LT6-P0M	On CT
		250	INFD250	250	-	LC1-D150		
110	178	185	INFD250	250	200	LC1-F185	LT6-P0M	On CT
			INFD400					
132	210	250	INFD250	-	250	LC1-F265	LT6-P0M	On CT
		265	INFD400	315	-	LC1-F265		
160	256	265	INFD400	355	315	LC1-F265	LT6-P0M	On CT
200	310	330	INFD400	400	315	LC1-F400	LT6-P0M	On CT
250	400	400	INFD630	500	450	LC1-F400	LT6-P0M	On CT
280	435	500	INFD630	560	500	LC1-F500	LT6-P0M	On CT
300	460	500	INFD630	560	500	LC1-F500	LT6-P0M	On CT
335	540	630	INFD630	630	630	LC1-F500	LT6-P0M	On CT
355	560	630	INFD630	630	630	LC1-F500	LT6-P0M	On CT
375	575	630	INFD800	670	630	LC1-F630	LT6-P0M	On CT
400	611	630	INFD800	670	630	LC1-F630	LT6-P0M	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) Valid for 480 V NEMA network.

Type 2 coordination (IEC 60947-4-1) 500 V

Switch-fuse disconnector Merlin Gerin, contactors Telemecanique

Performance: Ue = 500 V - "Iq" 100 kA

Starting Adjustable class 10 A/10.

Motors			Switch-Fuse (1)	Fuse-link type		Contactors (2)	Thermal o/l relays	
P (kW)	I (A) 500 V	Ie Max (A)	Type	gG cal(A)	aM cal(A)	Type	Type	
0.37	0.8	1	INFC32 or INFD40	4	2	LC1-D09	LR-D 05	0.63/1
0.55	1.2	1.6	INFC32 or INFD40	4	2	LC1-D09	LR-D 06	1/1.6
0.75	1.5	1.6	INFC32 or INFD40	4	2	LC1-D09	LR-D 06	1/1.6
1.1	2	2.5	INFC32 or INFD40	6	4	LC1-D09	LR-D 07	1.6/2.5
1.5	2.8	4	INFC32 or INFD40	10	6	LC1-D09	LR-D 08	2.5/4
2.2	3.8	4	INFC32 or INFD40	10	6	LC1-D09	LR-D 08	2.5/4
3	5	6	INFC32 or INFD40	16	8	LC1-D09	LR-D 10	4/6
4	6.5	8	INFC32 or INFD40	20	12	LC1-D09	LR-D 12	5.5/8
5.5	9	9	INFC32 or INFD40	25	16	LC1-D09	LR-D 16	9/13
7.5	12	13	INFC32 or INFD40	25	16	LC1-D25	LR-D 16	9/13
10	15	18	INFC32 or INFD40	40	20	LC1-D25	LR-D 21	12/18
11	18.4	24	INFC32	-	25	LC1-D25	LR-D 22	16/24
			INFC63 or INFD40	50				
15	23	24	INFC32	-	25	LC1-D32	LR-D 22	16/24
			INFC63 or INFD40	50				
18.5	28.5	32	INFC32	-	40	LC1-D32	LR-D 32	23/32
			INFC63 or INFD40	63				
22	33	40	INFC63 or INFD63	100	40	LC1-D40	LR2-D33 55	30/40
30	45	50	INFC63 or INFD63	100	50	LC1-D50	LR2-D33 57	37/50
37	55	63	INFC63 or INFD63	100	63	LC1-D65	LR2-D33 59	48/65
45	65	70	INFC125	-	80	LC1-D80	LR2-D33 61	55/70
			INFD160	125				
55	75	80	INFC125	-	80	LC1-D115	LR2-D33 63	63/80
			INFD160	125				
75	105	115	INFD160	-	125	LC1-D115	LR9-D53 69	90/150
			INFD250	200	-	LC1-D115		
90	130	150	INFD160	-	160	LC1-D150	LR9-D53 69	90/150
			INFD250	250	-	LC1-D150		
110	156	160	INFD250	250	160	LC1-F185	LR9-F53 71	132/220
132	187	200	INFD250	250	200	LC1-F265	LR9-F53 71	132/220
160	230	250	INFD250	-	250	LC1-F265	LR9-F73 75	200/330
			INFD400	315	-	LC1-F265		
200	280	315	INFD400	400	315	LC1-F400	LR9-F73 75	200/330
240	338	355	INFD400	-	355	LC1-F400	LR9-F73 79	300/500
		400	INFD630	450	-	LC1-F400		
280	386	400	INFD400	-	400	LC1-F500	LR9-F73 79	300/500
		500	INFD630	500				
300	415	450	INFD630	630	450	LC1-F500	LR9-F73 79	300/500
320	425	450	INFD630	630	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
		630	INFD800	800				
400	534	500	INFD630	-	500	LC1-F630	LR9-F73 81	380/630
		630	INFD800	800				

(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.

Type 2 coordination (IEC 60947-4-1) 500 V

Switch-fuse disconnector Merlin Gerin, contactors Telemecanique

Performance: Ue = 500 V - "Iq" 100 kA

Starting Adjustable class 10 A to 30.

Motors			Switch-Fuse (1)	Fuse-link type		Contactors (2)	Thermal o/l relays	
P (kW)	I (A) 500 V	Ie Max (A)	Type	gG cal(A)	aM cal(A)	Type	Type	
0.37	0.8	5	INFC32 or INFD40	4	2	LC1-D09	LT6-P0M	1/5 (3)
0.55	1.2	5	INFC32 or INFD40	4	2	LC1-D09	LT6-P0M	1/5 (3)
0.75	1.5	5	INFC32 or INFD40	6	2	LC1-D09	LT6-P0M	1/5 (3)
1.1	2	5	INFC32 or INFD40	10	2	LC1-D09	LT6-P0M	1/5 (3)
1.5	2.8	5	INFC32 or INFD40	10	2	LC1-D09	LT6-P0M	1/5 (3)
2.2	3.8	5	INFC32 or INFD40	16	4	LC1-D09	LT6-P0M	1/5 (3)
3	5	5	INFC32 or INFD40	16	4	LC1-D09	LT6-P0M	1/5 (3)
4	6.5	8	INFC32 or INFD40	20	8	LC1-D09	LT6-P0M	5/25 (3)
5.5	9	10	INFC32 or INFD40	20	10	LC1-D09	LT6-P0M	5/25 (3)
7.5	12	12	INFC32 or INFD40	32	12	LC1-D25	LT6-P0M	5/25 (3)
10	15	20	INFC32 or INFD40	40	20	LC1-D25	LT6-P0M	5/25 (3)
11	18.4	20	INFC32	-	20	LC1-D25	LT6-P0M	5/25 (3)
		25	INFC63 or INFD40	50				
15	23	25	INFC32	-	25	LC1-D32	LT6-P0M	5/25 (3)
			INFC63 or INFD40	50				
18.5	28.5	32	INFC32	-	32	LC1-D32	LT6-P0M	On CT
			INFC63 or INFD40	63				On CT
22	33	40	INFC63 or INFD63	80	40	LC1-D40	LT6-P0M	On CT
30	45	50	INFC63 or INFD63	80	50	LC1-D50	LT6-P0M	On CT
37	55	63	INFC63 or INFD63	100	63	LC1-D65	LT6-P0M	On CT
45	65	80	INFC125	-	80	LC1-D80	LT6-P0M	On CT
			INFD160	125				
55	75	80	INFC125	-	80	LC1-D115	LT6-P0M	On CT
		115	INFD160	125				
75	105	115	INFD160	-	125	LC1-D115	LT6-P0M	On CT
			INFD250	200	-	LC1-D115		
90	130	150	INFD160	-	160	LC1-D150	LT6-P0M	On CT
			INFD250	250	-	LC1-D150		
110	156	160	INFD250	250	160	LC1-F185	LT6-P0M	On CT
132	187	200	INFD250	250	200	LC1-F265	LT6-P0M	On CT
160	230	250	INFD250	-	250	LC1-F265	LT6-P0M	On CT
		265	INFD400	315	-	LC1-F265		
200	280	315	INFD400	400	315	LC1-F400	LT6-P0M	On CT
240	338	355	INFD400	-	355	LC1-F400	LT6-P0M	On CT
		400	INFD630	450	-	LC1-F400		
280	386	400	INFD400	-	400	LC1-F500	LT6-P0M	On CT
		500	INFD630	500				
300	415	450	INFD630	500	450	LC1-F500	LT6-P0M	On CT
320	425	450	INFD630	500	450	LC1-F500	LT6-P0M	On CT
355	478	500	INFD630	560	500	LC1-F500	LT6-P0M	On CT
375	482	500	INFD630	-	500	LC1-F630	LT6-P0M	On CT
		630	INFD800	800				
400	534	500	INFD630	-	500	LC1-F630	LT6-P0M	On CT
		630	INFD800	800				

(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) Valid for 480 V NEMA network.

Type 2 coordination (IEC 60947-4-1) 525/550 V

Switch-fuse disconnector Merlin Gerin, contactors Telemecanique

Performance: Ue = 525/550 V - "Iq" 80/100 kA (1)

Starting Adjustable class 10 A/10.

Motors				Switch-Fuse (2)	Fuse-link type		Contactors (3)	Thermal o/l relays	
P (kW)	I (A) 525 V	I (A) 550 V	Ie Max (A)	Type	gG cal(A)	aM cal(A)	Type	Type	
0.37	0.8	0.8	1	INFC32 or INFD40	4	2	LC1-D09	LR-D 05	0.63/1
0.55	1.2	1.2	1.6	INFC32 or INFD40	4	2	LC1-D09	LR-D 06	1/1.6
0.75	1.5	1.5	1.6	INFC32 or INFD40	4	2	LC1-D09	LR-D 06	1/1.6
1.1	2	2	2.5	INFC32 or INFD40	6	4	LC1-D09	LR-D 07	1.6/2.5
1.5	2.8	2.8	4	INFC32 or INFD40	10	6	LC1-D09	LR-D 08	2.5/4
2.2	3.8	3.8	4	INFC32 or INFD40	10	6	LC1-D09	LR-D 08	2.5/4
3	5	5	6	INFC32 or INFD40	16	8	LC1-D09	LR-D 10	4/6
4	6.5	6.5	8	INFC32 or INFD40	20	12	LC1-D09	LR-D 12	5.5/8
5.5	9	9	9	INFC32 or INFD40	25	16	LC1-D09	LR-D 16	9/13
7.5	12	12	13	INFC32 or INFD40	25	16	LC1-D25	LR-D 16	9/13
10	15	15	18	INFC32 or INFD40	-	20	LC1-D25	LR-D 21	12/18
				INFC63 or INFD40	40				
11	18.4	18.4	24	INFC32 or INFD40	-	25	LC1-D25	LR-D 22	16/24
				INFC63 or INFD40	50				
15	23	23	24	INFC32 or INFD40	-	25	LC1-D32	LR-D 22	16/24
				INFC63 or INFD40	50				
18.5	28.5	28.5	32	INFC63 or INFD63	63	40	LC1-D32	LR-D 32	23/32
22	33	33	40	INFD63	-	40	LC1-D40	LR2-D33 55	30/40
				INFD160	100				
30	45	45	50	INFD63	-	50	LC1-D50	LR2-D33 57	37/50
				INFD160	100				
37	55	55	63	INFD160	100	63	LC1-D65	LR2-D33 59	48/65
45	65	65	70	INFD160	125	80	LC1-D80	LR2-D33 61	55/70
55	75	75	80	INFD160	125	80	LC1-D115	LR2-D33 63	63/80
75	105	105	115	INFD160	-	125	LC1-D115	LR9-D53 69	90/150
				INFD250	200				
90	130	130	150	INFD250	-	160	LC1-D150	LR9-D53 69	90/150
				INFD400	250				
110	156	156	185	INFD250	-	160	LC1-F185	LR9-F53 71	132/220
				INFD400	250				
132	187	187	200	INFD250	-	200	LC1-F265	LR9-F53 71	132/220
			220	INFD400	250				
160	230	220	250	INFD250	-	250	LC1-F265	LR9-F73 75	200/330
			265	INFD400	315	-			
200	280	280	315	INFD400	-	315	LC1-F400	LR9-F73 75	200/330
			330	INFD630	400				
240	338	338	355	INFD400	-	355	LC1-F400	LR9-F73 79	300/500
			400	INFD630	450	-			
280	386	386	400	INFD400	-	400	LC1-F500	LR9-F73 79	300/500
			500	INFD630	500				
300	415	415	450	INFD630	-	450	LC1-F500	LR9-F73 79	300/500
320	425	425	450	INFD630	-	450	LC1-F500	LR9-F73 79	300/500
355	478	478	500	INFD630	-	500	LC1-F500	LR9-F73 79	300/500
375	482	482	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 cylindric ferrule / INFD for NH DIN type fuse-link.
(3) Reversers: replace LC1 with LC2; star-delta starter: replace LC1 with LC3.

Type 2 coordination (IEC 60947-4-1) 525/550 V

Switch-fuse disconnector Merlin Gerin, contactors Telemecanique

Performance: Ue = 525/550 V - "Iq" 80/100 kA (1)

Starting Adjustable class 10 A to 30.

Motors				Switch-Fuse (2)	Fuse-link type		Contactors (3)	Thermal o/l relays	
P (kW)	I (A) 525 V	I (A) 550 V	Ie Max (A)	Type	gG cal(A)	aM cal(A)	Type	Type	
0.37	0.8	0.8	5	INFC32 or INFD40	4	2	LC1-D09	LT6-P0M	1/5 (4)
0.55	1.2	1.2	5	INFC32 or INFD40	4	2	LC1-D09	LT6-P0M	1/5 (4)
0.75	1.5	1.5	5	INFC32 or INFD40	6	2	LC1-D09	LT6-P0M	1/5 (4)
1.1	2	2	5	INFC32 or INFD40	10	2	LC1-D09	LT6-P0M	1/5 (4)
1.5	2.8	2.8	5	INFC32 or INFD40	10	2	LC1-D09	LT6-P0M	1/5 (4)
2.2	3.8	3.8	5	INFC32 or INFD40	16	4	LC1-D09	LT6-P0M	1/5 (4)
3	5	5	5	INFC32 or INFD40	16	4	LC1-D09	LT6-P0M	1/5 (4)
4	6.5	6.5	8	INFC32 or INFD40	20	8	LC1-D09	LT6-P0M	5/25 (4)
5.5	9	9	10	INFC32 or INFD40	20	10	LC1-D09	LT6-P0M	5/25 (4)
7.5	12	12	12	INFC32 or INFD40	32	12	LC1-D25	LT6-P0M	5/25 (4)
10	15	15	20	INFC32 or INFD40	-	20	LC1-D25	LT6-P0M	5/25 (4)
			25	INFC63 or INFD40	40				
11	18.4	18.4	20	INFC32 or INFD40	-	20	LC1-D25	LT6-P0M	5/25 (4)
			25	INFC63 or INFD40	50				
15	23	23	25	INFC32 or INFD40	-	25	LC1-D32	LT6-P0M	5/25 (4)
				INFC63 or INFD40	50				
18.5	28.5	28.5	32	INFC63 or INFD63	63	32	LC1-D32	LT6-P0M	On CT
22	33	33	40	INFD63	-	40	LC1-D40	LT6-P0M	On CT
				INFD160	80				
30	45	45	50	INFD63	-	50	LC1-D50	LT6-P0M	On CT
				INFD160	80				
37	55	55	63	INFD160	100	63	LC1-D65	LT6-P0M	On CT
45	65	65	80	INFD160	125	80	LC1-D80	LT6-P0M	On CT
55	75	75	80	INFD160	125	80	LC1-D115	LT6-P0M	On CT
75	105	105	115	INFD160	-	125	LC1-D115	LT6-P0M	On CT
				INFD250	200				
90	130	130	150	INFD250	-	160	LC1-D150	LT6-P0M	On CT
				INFD400	250				
110	156	156	160	INFD250	-	160	LC1-F185	LT6-P0M	On CT
			185	INFD400	250				
132	187	187	200	INFD250	-	200	LC1-F265	LT6-P0M	On CT
			250	INFD400	250				
160	230	220	250	INFD250	-	250	LC1-F265	LT6-P0M	On CT
			265	INFD400	315	-			
200	280	280	315	INFD400	-	315	LC1-F400	LT6-P0M	On CT
			400	INFD630	400				
240	338	338	355	INFD400	-	355	LC1-F400	LT6-P0M	On CT
			400	INFD630	450	-			
280	386	386	400	INFD400	-	400	LC1-F500	LT6-P0M	On CT
			500	INFD630	500				
300	415	415	450	INFD630	-	450	LC1-F500	LT6-P0M	On CT
320	425	425	450	INFD630	-	450	LC1-F500	LT6-P0M	On CT
355	478	478	500	INFD630	-	500	LC1-F500	LT6-P0M	On CT
375	482	482	500	INFD630	-	500	LC1-F630	LT6-P0M	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 cylindric ferrule / INFD for NH DIN type fuse-link.
(3) Reversers: replace LC1 with LC2; star-delta starter: replace LC1 with LC3.
(4) Currents transformers built-in electronic relays.

Type 2 coordination (IEC 60947-4-1) 690 V

Switch-fuse disconnector Merlin Gerin, contactors Telemecanique

Performance: Ue = 690 V - "Iq" 80/100 kA (1)

Starting Adjustable class 10 A/10.

Motors			Switch-Fuse (2)	Fuse-link type		Contactors (3)	Thermal o/l relays	
P (kW)	I (A) 690 V	Ie Max (A)	Type	gG cal(A)	aM cal(A)	Type	Type	
0.75	1.2	1.6	INFC32 or INFD40	4	2	LC1-D09	LR-D 06	1/1.6
1	1.5	1.6	INFC32 or INFD40	4	2	LC1-D09	LR-D 06	1/1.6
1.5	2	2.5	INFC32 or INFD40	6	4	LC1-D09	LR-D 07	1.6/2.5
2.2	2.8	4	INFC32 or INFD40	10	6	LC1-D09	LR-D 08	2.5/4
3	3.8	4	INFC32 or INFD40	10	6	LC1-D09	LR-D 08	2.5/4
4	5	6	INFC32 or INFD40	16	8	LC1-D09	LR-D 10	4/6
5.5	6.5	8	INFC32 or INFD40	20	12	LC1-D09	LR-D 12	5.5/8
7.5	9	13	INFC32 or INFD40	25	16	LC1-D25	LR-D 16	9/13
11	12	13	INFC32 or INFD40	25	16	LC1-D25	LR-D 16	9/13
15	17	18	INFC32 or INFD40 INFC63 or INFD40	- 50	20	LC1-D25	LR-D 22	16/24
18.5	20.2	21	INFC32 or INFD40 INFC63 or INFD40	- 50	25	LC1-D32	LR-D 22	16/24
22	24.2	32	INFC63 or INFD63	63	32	LC1-D40	LR-D 32	23/32
30	33	35	INFD63 INFD160	- 100	40	LC1-D40	LR2-D33 55	30/40
37	40	40	INFD63 INFD160	- 100	40	LC1-D65	LR2-D33 57	37/50
45	47	50	INFD63 INFD160	- 100	50	LC1-D80	LR2-D33 57	37/50
55	58	63	INFD160	100	63	LC1-D115	LR2-D33 59	48/65
75	76	80	INFD160	125	80	LC1-D115	LR2-D33 63	63/80
90	94	100	INFD160 INFD250	- 200	100	LC1-D150	LR9-D53 69	90/150
110	113	125	INFD250 INFD400	- 250	125	LC1-F185	LR9-D53 69	90/150
132	135	185	INFD250 INFD400	- 250	160	LC1-F265	LR9-F53 71	132/220
160	165	180 220	INFD250 INFD400	- 250	200	LC1-F265	LR9-F53 71	132/220
200	203	250 265	INFD250 INFD400	- 315	250 -	LC1-F400	LR9-F73 75	200/330
220	224	250 265	INFD250 INFD400	- 315	250 -	LC1-F400	LR9-F73 75	200/330
250	253	315 330	INFD400 INFD630	- 400	315	LC1-F400	LR9-F73 75	200/330
315	321	355 400	INFD400 INFD630	- 450	355 -	LC1-F500	LR9-F73 79	300/500
355	350	400 500	INFD400 INFD630	- 500	400	LC1-F630	LR9-F73 79	300/500
400	390	450	INFD630	-	450	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 cylindric ferrule / INFD for NH DIN type fuse-link.
(3) Reversers: replace LC1 with LC2; star-delta starter: replace LC1 with LC3.

Type 2 coordination (IEC 60947-4-1) 690 V

Switch-fuse disconnector Merlin Gerin, contactors Telemecanique

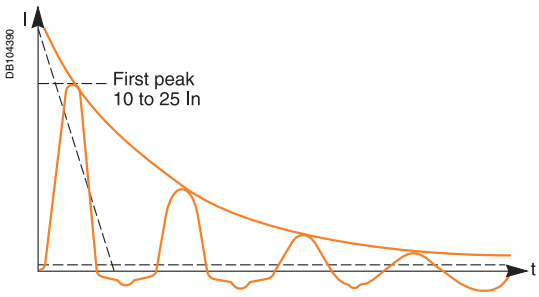
Performance: Ue = 690 V - "Iq" 80/100 kA (1)

Starting Adjustable class 10 A/10.

Motors			Switch-Fuse (1)	Fuse-link type		Contactors (2)	Thermal o/l relays	
P (kW)	I (A) 690 V	Ie Max (A)	Type	gG cal(A)	aM cal(A)	Type	Type	
0.75	1.2	5	INFC32 or INFD40	4	2	LC1-D09	LT6-P0M	1/5 (4)
1	1.5	5	INFC32 or INFD40	6	2	LC1-D09	LT6-P0M	1/5 (4)
1.5	2	5	INFC32 or INFD40	10	2	LC1-D09	LT6-P0M	1/5 (4)
2.2	2.8	5	INFC32 or INFD40	10	2	LC1-D09	LT6-P0M	1/5 (4)
3	3.8	5	INFC32 or INFD40	16	4	LC1-D09	LT6-P0M	1/5 (4)
4	5	5	INFC32 or INFD40	16	4	LC1-D09	LT6-P0M	1/5 (4)
5.5	6.5	8	INFC32 or INFD40	20	8	LC1-D09	LT6-P0M	1/5 (4)
7.5	9	18	INFC32 or INFD40	20	10	LC1-D25	LT6-P0M	5/25 (4)
11	12	18	INFC32 or INFD40	32	12	LC1-D25	LT6-P0M	5/25 (4)
15	17	18	INFC32 or INFD40 INFC63 or INFD40	- 50	20	LC1-D25	LT6-P0M	5/25 (4)
18.5	20.2	21	INFC32 or INFD40 INFC63 or INFD40	- 50	25	LC1-D32	LT6-P0M	5/25 (4)
22	24.2	32	INFC63 or INFD63	63	32	LC1-D40	LT6-P0M	On CT
30	33	35	INFD63 INFD160	- 80	40	LC1-D40	LT6-P0M	On CT
37	40	40	INFD63 INFD160	- 80	40	LC1-D65	LT6-P0M	On CT
45	47	50	INFD63 INFD160	- 80	50	LC1-D80	LT6-P0M	On CT
55	58	63	INFD160	100	63	LC1-D115	LT6-P0M	On CT
75	76	80	INFD160	125	80	LC1-D115	LT6-P0M	On CT
90	94	100	INFD160 INFD250	- 200	100	LC1-D150	LT6-P0M	On CT
110	113	125	INFD250 INFD400	- 250	125	LC1-F185	LT6-P0M	On CT
132	135	185	INFD250 INFD400	- 250	160	LC1-F265	LT6-P0M	On CT
160	165	180 220	INFD250 INFD400	- 250	200	LC1-F265	LT6-P0M	On CT
200	203	250 265	INFD250 INFD400	- 315	250 -	LC1-F400	LT6-P0M	On CT
220	224	250 265	INFD250 INFD400	- 315	250 -	LC1-F400	LT6-P0M	On CT
250	253	315 330	INFD400 INFD630	- 400	315	LC1-F400	LT6-P0M	On CT
315	321	355 400	INFD400 INFD630	- 450	355 -	LC1-F500	LT6-P0M	On CT
355	350	400 500	INFD400 INFD630	- 500	400	LC1-F630	LT6-P0M	On CT
400	390	450	INFD630	-	450	LC1-F630	LT6-P0M	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 cylindric ferrule / INFD for NH DIN type fuse-link.
(3) Reversers: replace LC1 with LC2; star-delta starter: replace LC1 with LC3.
(4) Currents transformers built-in electronic relays.

Applications (cont.)



LV/LV transformer current.

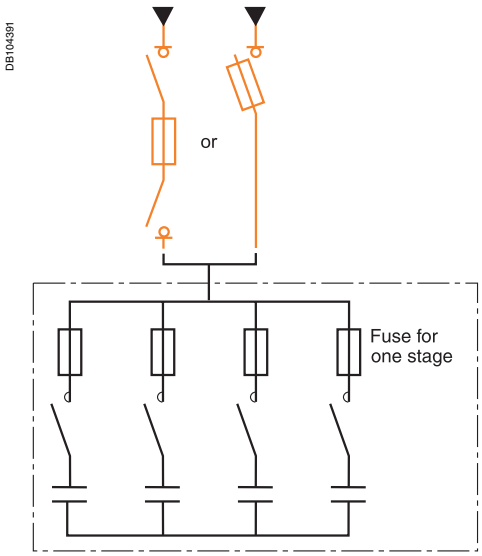
Protection of transformers

On energising low-voltage transformers, there are very high inrush currents (magnetising currents) that must be taken into account when selecting a device for protection against overcurrents.

The table below indicates typical peak values:

LV/LV transformer rating	I magnetising (first peak)
< 50 kVA	20 to 25 In
> 50 kVA	10 to 15 In

The primary winding of the LV/LV transformer must be protected by an aM fuse-link, the best suited to handle overloads.
The secondary winding must be protected by a gG fuse-link or a distribution circuit breaker.



Capacitor-bank protection.

Rectimat 2 capacitor bank.

Protection of capacitors

It is necessary to take into account:
- permissible variations in the fundamental voltage and in harmonic content

The increase in the current rating for the protection device may reach 30 %.
- variations due to capacitor tolerances.

The increase in the current rating for the protection device may reach 15 % (but only 5 % for Rectiphase capacitors).
Given the above, the generally required correction factor ranges from 1.6 to 2.
For Rectiphase capacitor banks, an optimised factor of only 1.4 may be used for standard banks.

Protection table for fixed or automatic capacitor banks

400/415 V Capacitor (kVAR)	gG fuse-link rating	Fupact
10 kVAR	20 A	INF.32 / INFD40
20 kVAR	40 A	INF.63 / INFD40
30 kVAR	63 A	INF.63
50 kVAR	100 A	INF.125
60 kVAR	125 A	INF.125
80 kVAR	160 A	INF.250
105 kVAR	250 A	INF.250
150 kVAR	315 A	INF.400
210 kVAR	450 A	INF.630
315 kVAR	670 A	INF.800

690 V Capacitor (kVAR)	gG fuse-link rating	Fupact
10 kVAR	16 A	INF.32 / INFD40
20 kVAR	32 A	INF.32 / INFD40
30 kVAR	40 A	INF.63 / INFD40
50 kVAR	63 A	INF.63
60 kVAR	80 A	INF.125
80 kVAR	100 A	INF.125
105 kVAR	125 A	INF.160
150 kVAR	200 A	INF.250
210 kVAR	250 A	INF.400
315 kVAR	400 A	INF.400
405 kVAR	500 A	INF.630
450 kVAR	560 A	INF.630
495 kVAR	630 A	INF.800
540 kVAR	670 A	INF.800

Solutions combining separate components
With Interpact INS40 to 2500 and INV100 to 2500

052164-38

INS80.

Interpact INS switch-disconnectors	INS40 to INS160	
Number of poles		
Electrical characteristics as defined by IEC 60947-1/ 60947-3 and EN 60947-1/ 60947-3		
Conventional thermal current (A)	Ith	at 60 °C
Conventional thermal current in enclosure	Ithe	at 60 °C
Rated insulation level (V)	UI	AC 50/60 Hz
Impulse-withstand voltage (kV)	UImp	
Rated operational voltage (V)	Ue	AC 50/60 Hz
		DC
Rated operational voltage AC20 and DC20 (V)		AC 50/60 Hz
Positive contact indication		
Visible break		
Emergency-off switch disconnector		

056648-41

INS250.

Interpact INS switch-disconnectors	INS250 to INS630 INV100 to INV630	
Number of poles		
Electrical characteristics as defined by IEC 60947-1/ 60947-3 and EN 60947-1/ 60947-3		
Conventional thermal current (A)	Ith	at 60 °C
Conventional thermal current in enclosure	Ithe	at 60 °C
Rated insulation level (V)	UI	AC 50/60 Hz
Impulse-withstand voltage (kV)	UImp	
Rated operational voltage (V)	Ue	AC 50/60 Hz
		DC
Rated operational voltage AC20 and DC20 (V)		AC 50/60 Hz
Positive contact indication		
Visible break		
Emergency-off switch disconnector		

(1) Direct current 550 A.

E59503-68

INS800.

Interpact INS switch-disconnectors	INS630b to INS2500 INV630b to INV2500	
Number of poles		
Electrical characteristics as defined by IEC 60947-1/ 60947-3 and EN 60947-1/ 60947-3		
Conventional thermal current (A)	Ith	at 60 °C
Conventional thermal current in enclosure	Ithe	at 60 °C
Rated insulation level (V)	UI	AC 50/60 Hz
Impulse-withstand voltage (kV)	UImp	
Rated operational voltage (V)	Ue	AC 50/60 Hz
		DC
Rated operational voltage AC20 and DC20 (V)		AC 50/60 Hz
Positive contact indication		
Visible break		
Emergency-off switch disconnector		

(2) For vertical connection busbars only; for horizontal busbars, see derating chart in "Installation recommendations".

Solutions combining separate components
With Interpact INS40 to 2500 and INV100 to 2500 (cont.)

	INS40	INS63	INS80	INS100	INS125	INS160
	3-4	3-4	3-4	3-4	3-4	3-4
	40	63	80	100	125	160
	40	63	80	100	125	160
	690	690	690	750	750	750
	8	8	8	8	8	8
	500	500	500	690	690	690
	250	250	250	250	250	250
	690	690	690	750	750	750
	■	■	■	■	■	■
	-	-	-	-	-	-
	■	■	■	■	■	■

	INS250-100 INV100	INS250-160 INV160	INS250-200 INV200	INS250 INV250	INS320 INV320	INS400 INV400	INS500 INV500	INS630 INV630
	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4
	100	160	200	250	320	400	500	630
	100	160	200	250	320	400	500	630 (1)
	750	750	750	750	750	750	750	750
	8	8	8	8	8	8	8	8
	690	690	690	690	690	690	690	690
	250	250	250	250	250	250	250	250
	750	750	750	750	750	750	750	750
	■	■	■	■	■	■	■	■
	- (INS) ■ (INV)	- (INS) ■ (INV)	- (INS) ■ (INV)	- (INS) ■ (INV)	- (INS) ■ (INV)	- (INS) ■ (INV)	- (INS) ■ (INV)	- (INS) ■ (INV)
	■	■	■	■	■	■	■	■

	INS630b INV630b	INS800 INV800	INS1000 INV1000	INS1250 INV1250	INS1600 INV1600	INS2000 INV2000	INS2500 INV2500
	3-4	3-4	3-4	3-4	3-4	3-4	3-4
	630	800	1000	1250	1600 (2)	2000	2500
	630	800	1000	1250	1600 (2)	2000	2500
	1000	1000	1000	1000	1000	1000	1000
	12	12	12	12	12	12	12
	690	690	690	690	690	690	690
	250	250	250	250	250	250	250
	1000	1000	1000	1000	1000	1000	1000
	■	■	■	■	■	■	■
	- (INS) ■ (INV)	- (INS) ■ (INV)	- (INS) ■ (INV)	- (INS) ■ (INV)	- (INS) ■ (INV)	- (INS) ■ (INV)	- (INS) ■ (INV)
	■	■	■	■	■	-	-

Protection of switch-disconnectors
INS40, INS/INV100 to INS/INV2500 by fuses

Interpact switch-disconnectors INS40 to INS160			INS40	INS63
Upstream protection				
By fuse	Type aM [1]/ max. rating (A)		40	63
500 V	Isc max.	kA rms	80	80
	Making capacity	kA peak	176	176
	Type gG [2] / max. rating (A)		32	50
	Isc max.	kA rms	100	100
	Making capacity	kA peak	220	220
	Type gG [1] / max. rating (A)		125	125
	Isc max.	kA rms	100	100
	Making capacity	kA peak	220	220
	Type BS [2] / max. rating (A)		32	50 & 32M50
	Isc max.	kA rms	80	80
	Making capacity	kA peak	176	176
	Type BS [1] / max. rating (A)		125 & 100M125	125 & 100M125
	Isc max.	kA rms	80	80
	Making capacity	kA peak	176	176

Interpact switch-disconnectors INS/INV100 to INS/INV630			INS250-100 INV100	INS250-160 INV160
Upstream protection				
By fuse	Type aM [1] / max. rating (A)		100	160
500 V	Isc max.	kA rms	100	100
	Making capacity	kA peak	220	220
	Type gG [2] / max. rating (A)		80	125
	Isc max.	kA rms	100	100
	Making capacity	kA peak	220	220
	Type gG [1] / max. rating (A)		100	160
	Isc max.	kA rms	100	100
	Making capacity	kA peak	220	220
	Type BS [2] max. rating (A)		80 & 63M80	100 & 100M125
	Isc max.	kA rms	80	80
	Making capacity	kA peak	176	176
	Type BS [1] / max. rating (A)		250 & 200M250	250 & 200M250
	Isc max.	kA rms	80	80
	Making capacity	kA peak	176	176

Interpact switch-disconnectors INS/INV630b to 2500			INS/INV630b	INS/INV800
Upstream protection				
By fuse	Type aM [1] / max. rating (A)		630	800
500 V	Isc max.	kA rms	100	100
	Making capacity	kA peak	220	220
	Type gG [2] / max. rating (A)		630	800
	Isc max.	kA rms	100	100
	Making capacity	kA peak	220	220
	Type gG [1] / max. rating (A)		1250	1250
	Isc max.	kA rms	100	100
	Making capacity	kA peak	220	220
	Type BS [2] / max. rating (A)		630	630
	Isc max.	kA rms	80	80
	Making capacity	kA peak	176	176
	Type BS [1] / max. rating (A)		1250	1250
	Isc max.	kA rms	80	80
	Making capacity	kA peak	176	176

(1) Mandatory protection by an external thermal relay.
(2) No external thermal protection.

Protection of switch-disconnectors
INS40, INS/INV100 to INS/INV2500 by fuse (cont.)

	INS80	**INS100**	**INS125**	**INS160**		
	80	100	125	160		
	80	80	55	33		
	176	176	121	69		
	63	80	100	125		
	100	100	100	100		
	220	220	220	220		
	125	160	160	160		
	100	100	100	100		
	220	220	220	220		
	63 & 32M63	80 & 63M80	100 & 63M100	125 & 100M125		
	80	80	80	80		
	176	176	176	176		
	125 & 100M125	160 & 100M160	160 & 100M160	160 & 100M160		
	80	80	80	80		
	176	176	176	176		
	INS250-200 INV200	**INS250 INV250**	**INS320 INV320**	**INS400 INV400**	**INS500 INV500**	**INS630 INV630**
	200	250	320	400	500	500
	100	100	100	100	100	100
	220	220	220	220	220	220
	160	160	250	315	400	500
	100	100	100	100	100	100
	220	220	220	220	220	220
	200	200	320	400	500	630
	100	100	100	100	100	100
	220	220	220	220	220	220
	160 & 100M160	200 & 100M200	250 & 200M250	315 & 200M315	400	500
	80	80	80	80	80	80
	176	176	176	176	176	176
	250 & 200M250	250 & 200M250	355 & 315M355	355 & 315M355	450 & 400M450	450 & 400M450
	80	80	80	80	80	80
	176	176	176	176	176	176
	INS/INV1000	**INS/INV1250**	**INS/INV1600**	**INS/INV2000**	**INS/INV2500**	
	1000	1250	1250	-	-	
	100	100	100	-	-	
	220	220	220	-	-	
	1000	1250	1250	-	-	
	100	100	100	-	-	
	220	220	220	-	-	
	1250	1250	1250	-	-	
	100	100	100	-	-	
	220	220	220	-	-	
	800	1000	1250	-	-	
	80	80	80	-	-	
	176	176	176	-	-	
	1250	1250	1250	-	-	
	80	80	80	-	-	
	176	176	176	-	-	

Guiding TOOLS

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This international site allows you to access all the Merlin Gerin products in just 2 clicks via comprehensive range data-sheets, with direct links to:
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Last but not least, they optimise use of our products while also complying with standards and proper procedures.

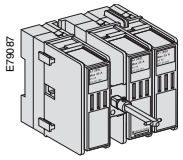
Catalogue numbers

The symbol . stands for:
the type of fuse-link associated with INF switch-disconnector fuses
- *INF. + BS fuse-link = INFB*
- *INF. + NFC fuse-link = INFC*
- *INF. + DIN fuse-link = INFD*

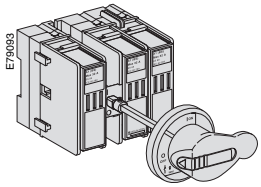
the type of fuse-link arrangement for ISF fuse-switch disconnectors:
- *ISF. + side-by-side fuse-link arrangement (DIN) = ISFT*
- *ISF. + vertical fuse-link arrangement (DIN) = ISFL.*

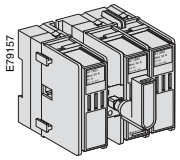
INF.32 and INFD40 fixed, front-connected switch-fuses

Basic device supplied with 150 mm operating shaft (without handle)

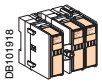


Front control

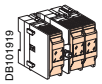




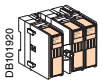
Basic device for front control



Switch/ Type of fuse	3P	4P/3F	4P/4F
INFC32 / NFC (10x38), 32 A	**49500**	**49501**	**49502**
INFC32 / NFC (14x51), 32 A	**49506**	**49507**	**49508**



INFD40 / DIN (000), 40 A	**49530**	**49531**

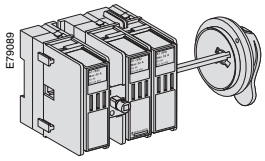


INFB32 / BS (A1), 32 A	**49565**	**49566**
INFB32 / BS (A2), 32 A	**49569**	**49570**
INFB32 / BS (F1), 32 A	**49573**	**49574**

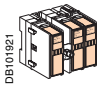
Rotary handle for basic front-control device

Direct rotary handle	**49613**
Black extended rotary handle	**49618**
Red/yellow extended rotary handle	**49615**

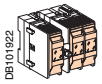
Lateral control



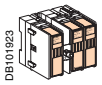
Basic device for lateral control



Switch/ Type of fuse	3P	4P/3F	4P/4F
INFC32 / NFC (10x38), 32 A	**49503**	**49504**	**49505**
INFC32 / NFC (14x51), 32 A	**49509**	**49510**	**49511**



INFD40 / DIN (000), 40 A	**49532**	**49533**



INFB32 / BS (A1), 32 A	**49567**	**49568**
INFB32 / BS (A2), 32 A	**49571**	**49572**
INFB32 / BS (F1), 32 A	**49575**	**49576**

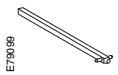
Rotary handle for basic lateral-control device

Black extended rotary handle	**49618**
Red/yellow extended rotary handle	**49615**

INF•32 and INFD40 (cont.)
Accessories

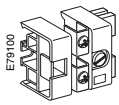
Accessories

Shaft



400 mm shaft		**49625**

Connection



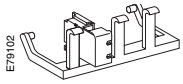
Removable neutral link		**49643**

Electrical auxiliaries

Auxiliary contacts

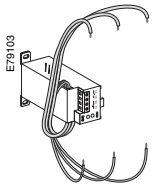
For mounting between poles	1 NO + NC contact (changeover)	**49605**
For mounting on left-hand side	Contact support required	**49608**
	1 NO contact	**49609**
	1 NC contact	**49610**

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**

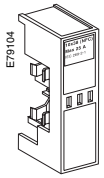
Fuse monitor (for NFC, DIN and BS fuses)



100 to 260 V AC 50/60 Hz	3P, 4P	**49639**
380 to 690 V AC 50/60 Hz	3P, 4P	**49640**
For mounting on left-hand side	Contact support required	**49608**

Spare parts

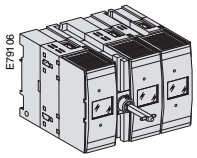
Fuse carrier



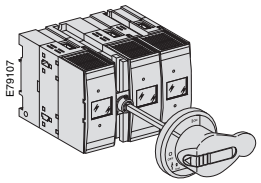
NFC (10 x 38) 32 A	3P, 4P/3F	(set of 3)	**49662**
	4P/4F	(set of 4)	**49663**
NFC (14 x 51) 32 A	3P, 4P/3F	(set of 3)	**49664**
	4P/4F	(set of 4)	**49665**
BS (A1) 32 A	3P, 4P/3F	(set of 3)	**49666**
BS (A2) 32 A	3P, 4P/3F	(set of 3)	**49667**
BS (F1) 32 A	3P, 4P/3F	(set of 3)	**49668**

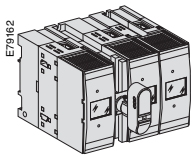
INF.63 fixed, front-connected switch-fuses

Basic device supplied with 161 mm operating shaft (without handle)



Front control





Basic device for front control

Switch/ Type of fuse	3P	4P/3F	4P/4F
INFC63 / NFC (14 x 51), 50 A	**49512**	**49513**	**49514**
INFC63 / NFC (22 x 58), 63 A	**49518**	**49519**	**49520**

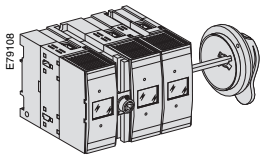
INFD63 / DIN (000/00), 63 A	**49535**	**49536**	**49537**

INFB63 / BS (A2/A3), 63 A	**49577**	**49578**	

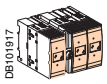
Rotary handle for basic front-control device

Direct rotary handle	**49614**
Black extended rotary handle	**49619**
Red/yellow extended rotary handle	**49616**

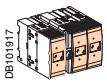
Lateral control



Basic device for lateral control



Switch/ Type of fuse	3P	4P/3F	4P/4F
INFC63 / NFC (14 x 51), 50 A	**49515**	**49516**	**49517**
INFC63 / NFC (22 x 58), 63 A	**49521**	**49522**	**49523**



INFD63 / DIN (000/00), 63 A	**49538**	**49539**	**49540**

INFB63 / BS (A2/A3), 63 A	**49579**	**49580**	

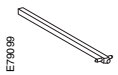
Rotary handle for basic lateral-control device

Black extended rotary handle	**49619**
Red/yellow extended rotary handle	**49616**

INF•63 (cont.)
Accessories

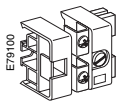
Accessories

Shaft



430 mm shaft		**49626**

Connection



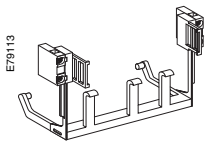
Removable neutral link		**49644**
Terminal shields	(6 parts)	**49658**

Electrical auxiliaries

Auxiliary contacts

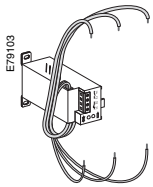
1 NO contact	**49609**
1 NC contact	**49610**

Blown fuse indicator (only for NFC type fuse-links)



3P (supplied with 1 NO contact + 1 NC contact)	**49632**
4P (supplied with 1 NO contact + 1 NC contact)	**49633**

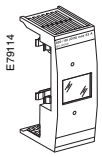
Fuse monitor (for NFC, DIN and BS fuses)



100 to 260 V AC 50/60 Hz	3P, 4P	**49639**
380 to 690 V AC 50/60 Hz	3P, 4P	**49640**

Spare parts

Fuse carrier

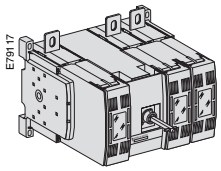


NFC (14 x 51) 50 A	3P, 4P/3F	(set of 3)	**49669**
	4P/4F	(set of 4)	**49670**
NFC (22 x 58) 63 A	3P, 4P/3F	(set of 3)	**49671**
	4P/4F	(set of 4)	**49672**
DIN (000/00)	3P, 4P/3F	(set of 3)	**49673**
	4P	(set of 4)	**49674**
BS (A2/A3) 63 A	3P, 4P/3F	(set of 3)	**49675**

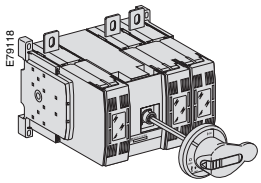
INF.100 to INF.160
Devices

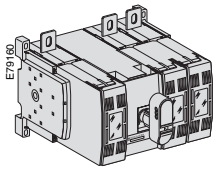
INF.100 to INF.160 fixed, front-connected switch-fuses

Basic device supplied with 161 mm operating shaft (without handle)

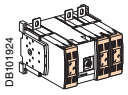
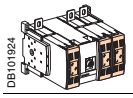
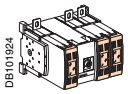


Front control





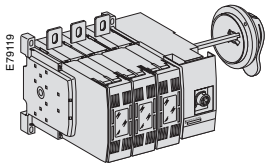
Basic device for front control

	Switch/ Type of fuse	3P	4P/3F	4P/4F
	INFC125 / NFC (22 x 58)	**49524**	**49525**	**49526**
	INFD160 / DIN (000/00)	**49541**	**49542**	**49543**
	INFB100 / BS (A2/A3/A4)	**49581**	**49582**	
	INFB160 / BS (A2/A3/A4)	**49585**	**49586**	

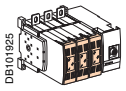
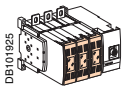
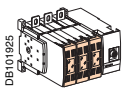
Rotary handle for basic front-control device

Direct rotary handle	**49614**
Black extended rotary handle	**49619**
Red/yellow extended rotary handle	**49616**

Lateral control



Basic device for lateral control

	Switch/ Type of fuse	3P	4P/3F	4P/4F
	INFC125 / NFC (22 x 58)	**49527**	**49528**	**49529**
	INFD160 / DIN (000/00)	**49544**	**49545**	**49546**
	INFB100 / BS (A2/A3/A4)	**49583**	**49584**	
	INFB160 / BS (A2/A3/A4)	**49587**	**49588**	

Rotary handle for basic lateral-control device

Black extended rotary handle	**49619**
Red/yellow extended rotary handle	**49616**

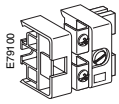
INF•100 to INF•160 (cont.)
Accessories

Accessories

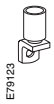
Shaft

430 mm shaft			**49626**

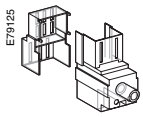
Connection



Removable neutral link			**49644**



Crimp lugs for copper cables	For 120 mm² cables	Set of 3	**29252**
		Set of 4	**29256**
	For 150 mm² cables	Set of 3	**29253**
		Set of 4	**29257**
	For 185 mm² cables	Set of 3	**29254**
		Set of 4	**29258**
Crimp lugs for aluminium cables	For 150 mm² cables	Set of 3	**29504**
		Set of 4	**29505**
	For 185 mm² cables	Set of 3	**29506**
		Set of 4	**29507**
Terminal shield for bars or cables with lugs		(1 part)	**49659**
Bare cable connectors	25 to 120 mm²	(1 part)	**49649**
Terminal shield for 25 to 120 mm² bare cable connectors			**49650**

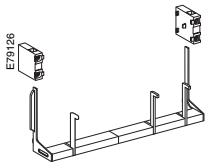


Electrical auxiliaries

Auxiliary contacts

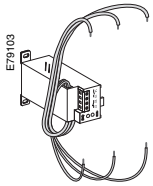
1 NO contact			**49609**
1 NC contact			**49610**

Blown fuse indicator (only for NFC type fuse-links)



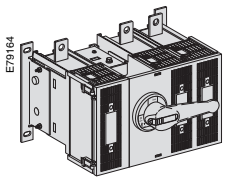
3P/4P (supplied with 1 NO contact + 1 NC contact)			**49634**

Fuse monitor (for NFC, DIN and BS fuses)

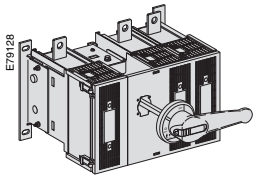


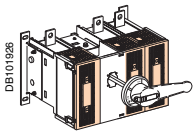
100 to 260 V AC 50/60 Hz	3P, 4P		**49639**
380 to 690 V AC 50/60 Hz	3P, 4P		**49640**

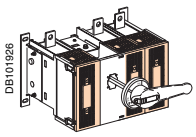
INF.250 to INF.800 fixed, front-connected switch-fuses



Front control

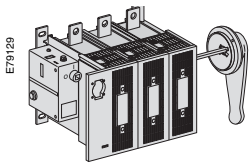


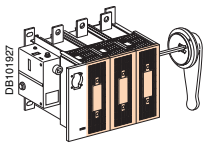


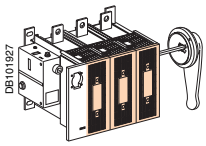


Switch/ Type of fuse	3P	4P/3F	4P/4F
INFD250 / DIN (0/1)	**49547**	**49548**	**49549**
INFD400 / DIN (0/1/2)	**49553**	**49554**	**49555**
INFD630 / DIN (3)	**49556**	**49557**	**49558**
INFD800 / DIN (3)	**49559**	**49560**	**49561**
INFB250 / BS (B1/B2/B3)	**49589**	**49590**	
INFB400 / BS (B1/B2/B3/B4)	**49593**	**49594**	
INFB630 / BS (C1/C2/C3)	**49595**	**49596**	
INFB800 / BS (C1/C2/C3)	**49597**	**49598**	

Lateral control







Switch/ Type of fuse	3P	4P/3F	4P/4F
INFD250 / DIN (0/1)	**49550**	**49551**	**49552**
INFB250 / BS (B1/B2/B3)	**49591**	**49592**	

INF•250 to INF•800 (cont.)
Accessories

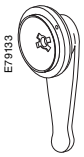
Accessories

Rotary handles


E79132

Rotary handle for basic front-control device

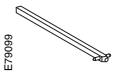
Black direct and extended rotary handle (for spare)	**49620**
Red/yellow direct and extended rotary handle	**49617**


E79133

Rotary handle for basic lateral-control device

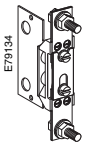
Black extended rotary handle (for spare)	**49622**
Red/yellow extended rotary handle	**49621**

Shaft


E79099

465 mm shaft	**49627**
Handle locking accessory for Ronis EL11AP keylock (not supplied)	**49053**
Fuse cover locking accessory	**49629**

Connection

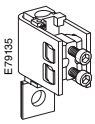

E79134

Removable neutral link	250 and 400 A		**49645**
	630 and 800 A		**49646**

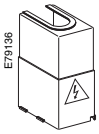

E79122


E79123

Crimp lugs for copper cables	For 240 mm² cables	Set of 3	**32500**
		Set of 4	**32501**
	For 300 mm² cables	Set of 3	**32502**
		Set of 4	**32503**
Crimp lugs for aluminium cables	For 240 mm² cables	Set of 3	**32504**
		Set of 4	**32505**
	For 300 mm² cables	Set of 3	**32506**
		Set of 4	**32507**


E79135

Bare cable connectors	70 to 185 mm² Al/Cu (1)	(1 part)	**49651**
	2 x (70 to 185 mm²) Al/Cu (1)	(1 part)	**49652**
	120 to 240 mm² Al/Cu (1)	(1 part)	**49653**
	120 to 300 mm² Al/Cu (1)	(1 part)	**49654**
(1) Terminal shield included.	2 x (120 to 300 mm²) Al/Cu (1)	(1 part)	**49655**


E79136

Terminal shields for crimp lugs and bars	250 and 400 A	(1 part)	**49255**
	630 and 800 A	(1 part)	**49257**

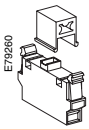
Electrical auxiliaries

Auxiliary contacts


E79137

1 NO + 1 NC contact	**49089**
2 NO + 2 NC contacts	**49090**

Blown fuse indicator (only for DIN type fuse-links)


E79260

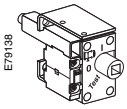
3P (supplied with 3 NC contacts)		**49635**
4P (supplied with 4 NC contacts)		**49636**
Option: NO contact	(1 part)	**49607**

Fuse monitor (for DIN and BS fuses)


E79103

100 to 260 V AC 50/60 Hz	3P, 4P	**49639**
380 to 690 V AC 50/60 Hz	3P, 4P	**49640**

Test position

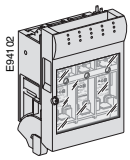

E79138

Mechanical subassembly	**49623**
1 NO contact	**49606**
1 NC contact	**49607**

ISFT100
Devices and accessories

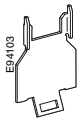
ISFT100 3-pole fixed front-connected fuse-switch disconnectors

Basic device for mounting on a backplate

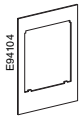


Connection via 1.5 to 50 mm^2 bare cable connectors		**49800**

Accessories

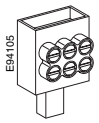


Accessory for mounting on a DIN rail		**49877**

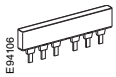


Escutcheon (not compatible with comb busbars)	For 1 device	**49878**
	For 2 devices	**49879**

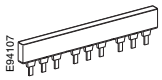
Connection (accessories for 1.5 to 50 mm^2 bare cable connectors)



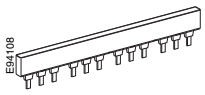
Distribution connector 3 x 10 mm^2	Set of 3	**49860**



Comb busbar to supply 2 devices		**49861**

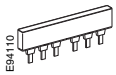


Comb busbar to supply 3 devices		**49862**

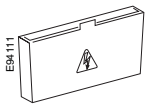


Comb busbar to supply 4 devices		**49863**

Incoming connector (25 to 95 mm$^{2)}$ for comb busbars	Set of 3	**49865**

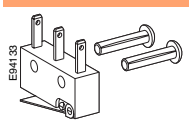


Comb busbar coupler to supply 5 devices (joins 2-device + 3-device comb)		**49890**



Insulated comb cover for free outgoer		**49864**

Electrical auxiliaries

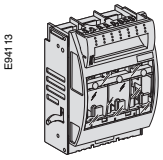


Auxiliary changeover contact NO + NC		**49885**

ISFT160
Devices and accessories

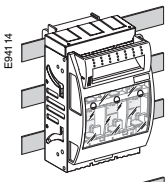
ISFT160 3-pole fixed front-connected fuse-switch disconnectors

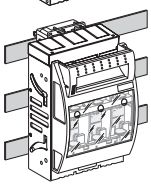
Basic device for mounting on a backplate



Connection via standard M8 terminals	**49803**
Connection via 1.5 to 50 mm² bare cable connectors	**49804**

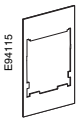
Basic device for mounting on busbars





Push-on connection to 60 mm busbars	**49805**
Hook-on connection to 60 mm busbars	**49806**

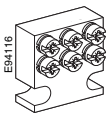
Accessories

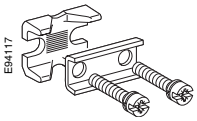


Escutcheon	For 1 device	**49881**
	For 1 device + 1 free outgoer	**49882**

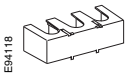
Connection (terminal shields are mandatory for lugs)

Lugs for 95 mm² copper cables		Set of 3	**28951**



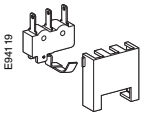


Connectors	distribution	3 x 16 mm²	Set of 3	**49867**
	for Cu/Al bare cables	1.5 x 95 mm²	Set of 3	**49866**
	for flexible bars	12 x 6 mm	Set of 3	**49868**

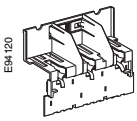


Long terminal shields	Set of 1	**49869**
Short terminal shields	Set of 1	**49880**

Electrical auxiliaries

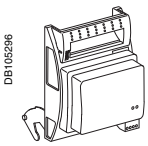


Auxiliary changeover contact NO+NC	**49883**



Blown fuse indication changeover contact NO+NC (1)	**49892**

Fuse monitor (to be mounted on all ISFT160 models)



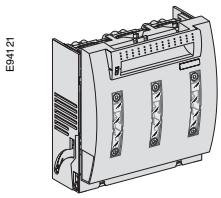
Downstream distribution	**49856**
Upstream distribution	**49896**

(1) Used with DIN 00 blade type fuse-links as defined by standard IEC 60269-2-1, Annex A, section 1A, table B.

ISFT250 to ISFT630
Devices and accessories

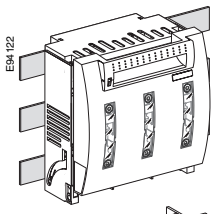
ISFT250 to ISFT630 3-pole fixed front-connected fuse-switch disconnectors

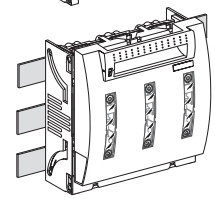
Basic device for mounting on a backplate


E94121

Connection via standard M10 terminals	ISFT250	**49813**
	ISFT400	**49819**
	ISFT630	**49825**

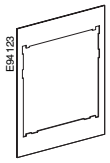
Basic device for mounting on busbars


E94122



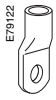
Push-on connection to 60 mm busbars	ISFT250	**49814**
Hook-on connection to 60 mm busbars	ISFT250	**49815**
	ISFT400	**49820**
	ISFT630	**49826**
Hook-on connection to 100 mm busbars	ISFT250	**49816**
	ISFT400	**49821**
	ISFT630	**49827**

Accessories

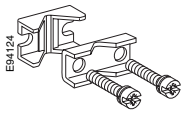

E94123

Escutcheon for 1 device	For ISFT250	**49884**
	For ISFT400	**49887**
	For ISFT630	**49889**
Escutcheon for 1 device + 1 free outgoer	For ISFT250	**49886**
	For ISFT400	**49888**

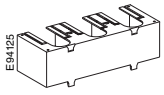
Connection (terminal shields are mandatory for lugs)


E79122

Lugs for 120 mm² copper cables	For ISFT250 to 630	Set of 3	**29252**
Lugs for 150 mm² copper cables	For ISFT250 to 630	Set of 3	**29253**
Lugs for 185 mm² copper cables	For ISFT250 to 630	Set of 3	**29254**
Lugs for 240 mm² copper cables	For ISFT400 to 630	Set of 3	**32500**
Lugs for 300 mm² copper cables	For ISFT400 to 630	Set of 3	**32502**

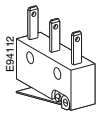

E94124

Connectors	for Cu/Al bare cables	6 to 150 mm²	For ISFT250	Set of 3	**49870**
		6 to 240 mm²	For ISFT400 to 630	Set of 3	**49873**
	for flexible bars	16 x 15 mm	For ISFT250	Set of 3	**49871**
		21 x 15 mm	For ISFT400 to 630	Set of 3	**49874**


E94125

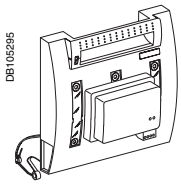
Terminal shields	For ISFT250	Set of 1	**49872**
	For ISFT400	Set of 1	**49875**
	For ISFT630	Set of 1	**49876**

Electrical auxiliaries


E94112

Auxiliary changeover contact NO+NC	**49885**

Fuse monitor (to be mounted on all ISFT250 to 630 models)

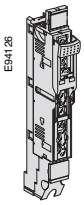

DB105295

Downstream distribution	ISFT250	**49857**
	ISFT400	**49858**
	ISFT630	**49859**
Upstream distribution	ISFT250	**49897**
	ISFT400	**49898**
	ISFT630	**49899**

ISFL160
Devices and accessories

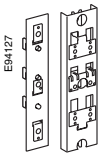
ISFT160 3-pole fixed front-connected fuse-switch disconnectors

Basic device for mounting on busbars



Direct hook-on connection to 60 mm busbars	Downstream distribution	**49838**
	Upstream distribution	**49839**
Direct connection to 100 mm busbars	Downstream and upstream distribution	**49840**

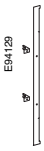
Conversion kit for connection to busbars (for ISFL160 direct connection)



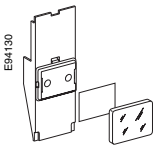
Hook-on connection to 60 mm busbars	**49850**
Direct connection to 185 mm busbars	**49851**
Direct connection to 185 mm busbars for 2 ISFL160 devices	**49852**

Hooks for hook-on connection to 100 mm busbars or for use with conversion kit **49852**	Set of 3	**49853**

Accessories



Side cover for door cutout	**49903**

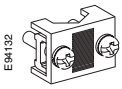


Length adapter - Identification label holder	**49904**

Cover for free outgoer + depth adjustment kit	**49905**

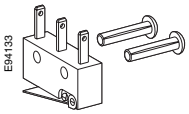
Connection (accessories for standard M8 terminals)

Lugs for 95 mm² copper cables			Set of 3	**28951**

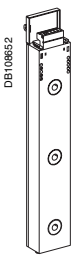


Connectors	for Cu/Al bare cables	1.5 x 95 mm²	Set of 3	**49900**
	for flexible bars	12 x 6 mm	Set of 3	**49901**
Terminal shields				Included

Electrical auxiliaries



Auxiliary changeover contact NO + NC	**49885**

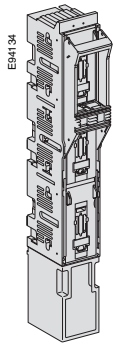


3P single block 3 current transformers	60/5 class 1	2.5 VA	Set of 1	**49906**
	100/5 class 1	2.5 VA	Set of 1	**49907**
	125/5 class 1	2.5 VA	Set of 1	**49908**
	160/5 class 1	2.5 VA	Set of 1	**49909**
3P single block 1 current transformer	60/5 class 1	2.5 VA	Set of 1	**49921**
	100/5 class 1	2.5 VA	Set of 1	**49922**
	125/5 class 1	2.5 VA	Set of 1	**49923**
	160/5 class 1	2.5 VA	Set of 1	**49924**
3 dummy single block for depth compensation			Set of 1	**49911**
Terminal city pin cover option for 3 poles city				**49926**

ISFL250 to ISFL630
Devices and accessories

ISFL250 to ISFL630 3-pole fixed front-connected fuse-switch disconnectors

Basic device for mounting on busbars



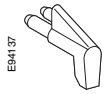
Direct connection to 185 mm busbars	ISFL250		**49842**
	ISFL400		**49844**
	ISFL630		**49846**

Accessories

Side cover for door cutout			**49910**

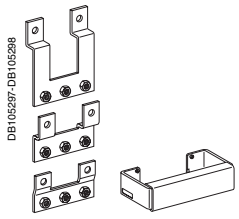
Cover for free outgoer + depth adjustment kit			**49912**

Connection (accessories for standard M12 terminals)



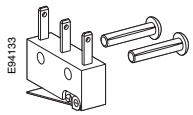
Connectors (V type)	for Cu/Al bare cables	1 x 25 to 240 mm	Set of 3	**49894**
		2 x 25 to 240 mm (1)	Set of 3	**49895**
Terminal shields				Included
Device positioning pins (not compatible with CT)			Set of 2	**49854**

Accessories for parallel connection

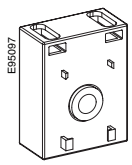


Connections for downstream coupling	For Cu/Al bare cables	Set of 3	**49902**
Coupling 2 handles (ISFL400 to 630)			**49893**

Electrical auxiliaries



Auxiliary changeover contact NO + NC				**49885**



Current transformer	150/5 class 1	2.5 VA	Set of 1	**49913**
	200/5 class 1	5 VA	Set of 1	**49914**
	250/5 class 1	5 VA	Set of 1	**49915**
	300/5 class 1	10 VA	Set of 1	**49916**
	400/5 class 1	10 VA	Set of 1	**49917**
	500/5 class 1	15 VA	Set of 1	**49918**
	600/5 class 1	15 VA	Set of 1	**49919**
Dummy transformer for depth compensation			Set of 1	**49920**

(1) Deliver with specific terminal shields.

Notes

Guiding TOOLS

merlin-gerin.com

This international site allows you to access all the Merlin Gerin products in just 2 clicks via comprehensive range data-sheets, with direct links to:

- complete library: technical documents, catalogs, FAQs, brochures…
- selection guides from the e-catalog.
- product discovery sites and their Flash animations.

You will also find illustrated overviews, news to which you can subscribe, the list of country contacts…

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Training allows you to acquire the Merlin Gerin expertise (installation design, work with power on, etc.) for increased efficiency and a guarantee of improved customer service.
The training catalogue includes beginner's courses in electrical distribution, knowledge of MV and LV switchgear, operation and maintenance of installations, design of LV installations to give but a few examples.

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