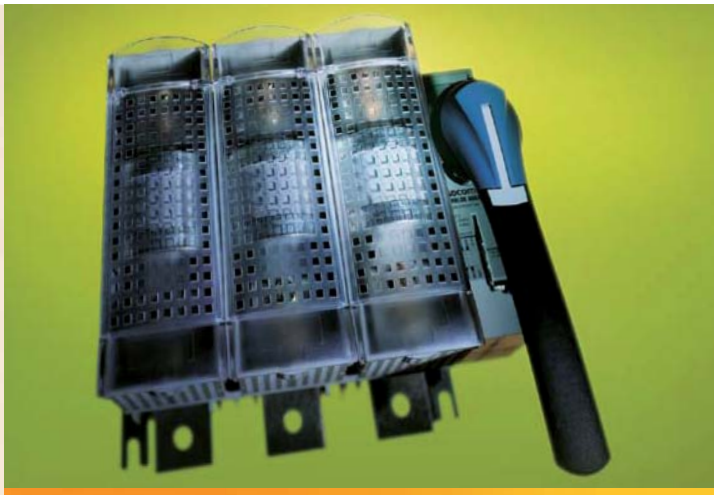
GENERAL CATALOGUE

Solutions for Power, Control, Safety & Energy Efficiency

UL/CSA
Ed.1



POWER CONTROL & SAFETY
SOLAR POWER
ENERGY EFFICIENCY

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Innovative Power Solutions

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An independent manufacturer

The benefit of a specialist

3,500 m²
of test platforms

One of the leading independent power testing labs in Europe

50,000
on-site interventions per year

Nearly 400 experts in commissioning, technical audit, consultancy and maintenance

10 %
of turnover invested in R&D

Always at the cutting-edge of technology for innovative, high-quality products

MADE IN EUROPE

ENERGY SPECIALIST SINCE 1922

THE GLOBAL COMPACT WE SUPPORT

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Four key applications: the know-how of a specialist

Critical Power

Ensuring the availability of high-quality power for critical applications.

Thanks to the company's wide range of continuously evolving products, solutions and services, SOCOMEC are experts in the three essential technologies that can ensure the high availability of supply to critical facilities and buildings i.e.:

- uninterruptible power supplies (UPS) that provide high-quality power and reduce distortion and interruptions to the mains supply due to their power storage backup,
- changeover of high availability sources to transfer supply to an operational backup source,
- continuous monitoring of installation facilities to prevent failures and reduce operating losses.

© Datadock

Power Control & Safety

Managing power and protecting individuals and property.

SOCOMEC's expertise in this domain is unquestionable; the company is an undisputed leader in power switching and changeover functions, and has been a specialist manufacturer of electrical equipment since 1922. The company has long defended the benefits of fuse protection for individuals and property, and has become a major player in cutting-edge technology such as the monitoring and detection of insulation defects. SOCOMEC guarantees solutions and services which are both relevant and efficient.

APPLI 575A

Solar Power

Guaranteeing the safety and durability of photovoltaic (PV) facilities.

As experts in the solar energy equipment field, SOCOMEC has all the specialist know-how for implementing key strategic functions in on-grid and off-grid PV facilities, including:

- safety, through specially designed switch disconnectors to cut the DC current generated by solar panels regardless of the facility configuration and operating conditions,
- the reliability of DC facilities thanks to solutions preventing the degradation of insulation and electric arc failure in DC current,
- control of very high-efficiency energy conversion, via PV inverters, to transform all energy generated by the solar panels into power to be consumed locally or re-injected into the national grid,
- PV production and energy storage solutions for on-grid and off-grid applications.

CORPO 413 A

Energy Efficiency

Improving building and facility energy efficiency.

SOCOMEC solutions, ranging from sensors to the wide choice of innovative, modular software packages, are driven by experts in energy efficiency. They meet the essential requirements of managers or operators of tertiary, industrial or local authority buildings, and make it possible to:

- measure power consumption, identify sources of excess consumption, and raise occupant awareness,
- limit reactive energy and prevent associated tariff penalties,
- use the best tariffs, check supplier invoicing and accurately distribute energy bills amongst consumer entities.

APPLI 571A

Services & Technical Assistance

the manufacturer's guarantee

Over several decades, SOCOMEC Systems have acquired a distinguished reputation in the control, safety and performance of low voltage electrical distribution equipment. Our manufacturer's expertise naturally extends to a complete offer of services designed to help you select, implement and get the most out of our solutions.

APPLI 566 A

Specially adapted skills

Our service team consists of field personnel specializing in our specific domains and experienced in the maintenance of industrial electrical systems. This means you benefit from a dual skills base:

- technical expertise relating to the products that have been installed,
- practical knowledge of your usage needs.

Reassuringly close at hand

Our geographical coverage means that we are close to each user and can respond quickly to all requests. We can provide a complete service from the technical diagnostics before repair right up to implementation of the most suitable solutions for your installation.

Customer-oriented service

True to our own principles, we encourage direct and friendly contact. Our interventions offer solutions targeted to a single problem: Yours. Our engineers are always very attentive to your needs, to ensure that we provide the most relevant technical support and advice. So you can plan your investments with confidence.

Customized support…

Assessment and sizing

Depending on your requirements, our experts collect and analyze all the relevant data in order to recommend the system best adapted to your installation.

Commissioning

Installation of your equipment is carried out by a specialist, and is totally compatible with and adapted to your use.

Maintenance

A wide range of preventive or corrective maintenance options designed to suit your installation and its environment, and to ensure continuity of service of your electrical networks.

Training

You will receive training, specially adapted to your needs, in order to familiarize yourself with our equipment and enable you to use it to your best advantage.

VALID FOR FRANCE

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Innovative Power Solutions

… to ensure you a successful project

Source inversion in complete safety

Changeover switches are strategic components that ensure continuity of service of supplies In order to guarantee **complete operational safety**, we will implement our range of innovative source transfer solutions.

Your energy consumption efficiently and comprehensively managed

Monitoring of energy consumption within a production unit is one of your primary operational considerations From the preliminary assessment of your installation to the adaptation of the software, dedicated SOCOMEC experts are on hand to assist you throughout the entire energy performance process.

Effective insulation monitoring for your electrical installation

To ensure that your fault monitoring and location system operates to its optimum capacity, our team of specialists perform all operations on site.

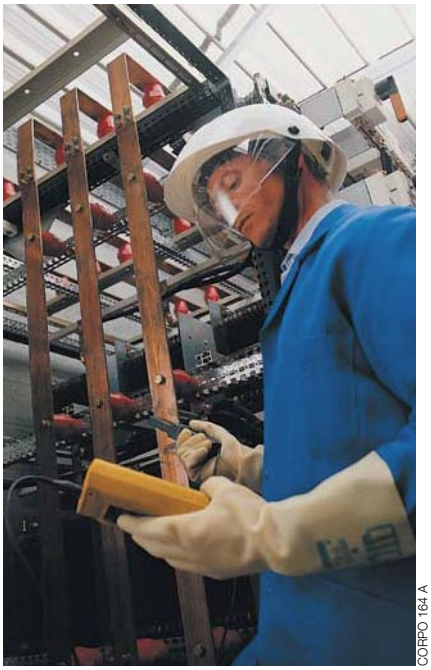
This means that you benefit from renowned expertise, as well as solutions tailored to the specific monitoring requirements of your electrical installation.

The control of reactive energy on your electricity bill

In terms of power factor correction, **the support of a specialist is essential to appropriately size your system** and meet the desired efficiency.

SOCOMEC will help you to make the right choices and therefore to benefit from a long-term solution. A real return on investment.

For more information, please see pages "Reactive energy power factory correction'.



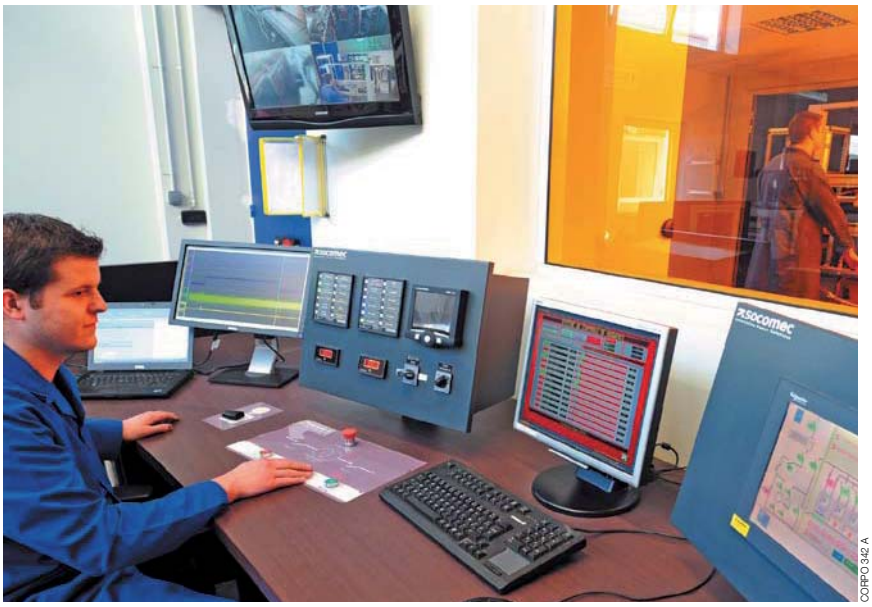
CORPO 164 A

APPLI 540 A

A cutting-edge laboratory

The backing of an expert

Since 1965, the Pierre Siat test laboratory has used its expertise to guarantee the reliability and conformity of SOCOMEC products and solutions. Our customers are also welcome…



CORPO 342 A

A decisive link

Located at the Company's headquarters in Benfeld (France), the Pierre Siat test laboratory is one of SOCOMEC's main quality pillars: its contribution to the development, qualification and certification phases plays a decisive role in the process leading to the creation of a product or solution.

Global scale

This totally independent laboratory is recognised by the major certification bodies worldwide: a member of the ASEFA(1) and the LOVAG(2), it is accredited by COFRAC(3), UL (CTDP(4)), CSA (shared certification) and KEMA (SMT/WMT(5)). It also works in partnership with numerous international certification organisations(6). The quality and safety requirements specific to each country are therefore fully taken into account.

Specialist facilities

With its 100 MVA (Idc 100 kA rms 1 s) short-circuit platform, three 10 kA overload platforms and numerous other test instruments in facilities covering 1500 m^2, the Pierre Siat laboratory is currently the 2nd French power laboratory. It combines expertise in electricity and mechanics, pneumatics and computing.

Ongoing commitment

To adapt to the increasingly demanding standards and ever more innovative and high-performance products, the Pierre Siat laboratory is permanently extending the scope of its tests, investing whenever necessary in new equipment.

A vast range of tests

The laboratory submits all SOCOMEC products and solutions (including those in enclosures) to numerous tests in the following fields:

- functional: component resistance and operating tests,
- dielectric: immunity to interference, dielectric insulation, overvoltage, overcurrent,
- mechanical: endurance and mechanical shocks, etc.,
- environment: functional or electrical tests under extreme conditions (temperatures, salt spray, etc.), vibrations,
- AC/DC endurance: in operation and under controlled temperatures (arcs, LV/HV power cuts, etc.),
- temperature rise,
- electromagnetic compatibility (EMC),
- metrology,
- safety: flammability, etc.

Conducted during the design and production phases, these tests guarantee the long-term reliability of the equipment sold.

Customized services

These test facilities and expertise are also available to our partners who require assistance with the qualification and certification of their products or equipment.

CERTIFICATE

We issue certificates of conformity and performance declarations upon request.

For more information, visit our web site: www.socomec.com/testing-laboratory_en.html

(1) Association des Stations d'Essais Françaises d'Appareils électriques basse tension (French association of low voltage electrical equipment test stations)
(2) Low Voltage Agreement Group
(3) Comité Français d'Accréditation (French accreditation body)
(4) Client test data programme
(5) Supervised Manufacturer's testing/Witnessed manufacturer's testing
(6) KEMA, CEBEC, UL, CSA, ASTA, Lloyd's Register of Shipping, Bureau Véritas, BBJ-SEP, EZU, GOST-R, etc.

socomec Innovative Power Solutions

For a high quality power supply

innovative power solutions

Critical equipment requires high quality energy and faultless continuity of the power supply. Our uninterruptible power systems (UPS), static transfer systems (STS), and DC/AC and AC/DC converters (inverters and rectifiers, respectively) comprise the most complete ranges in the world and cover a very wide range of applications for every sector of activity.

> Uninterruptible power systems (UPS)
> Static transfer systems (STS)
> Rectifier chargers
> DC/AC converters (inverters)
> Energy storage systems
> Harmonic compensators
> Communication interfaces and software
> Commissioning Inspection and Maintenance

ABSOLUTE GREEN AVAILABILITY & SAVING

High availability

The availability of electrical energy is a strategic factor in a range of industries as varied as telecommunications, data processing centres or some industrial processes. It is sometimes vital for certain medical applications. In all these sectors, SOCOMEC can put over 45 years of experience at your disposal.

Product solutions that meet requirements

Underspinned by significant R&D resources, our product offer continually evolves as a consequence of our contact with customers. Our products have gained approval from the most demanding of users: telecoms operators, the nuclear industry, naval industry etc.

Recognised expertise

Our users' needs are at the forefront of everything we do, as demonstrated by the prestigious distinctions that SOCOMEC and its UPS solutions have received:

- customer service excellence award (2004),
- product innovation award (2006),
- award for the best product offer (UPS) in Europe (2009),
- award for innovation in new UPS (2011).

Continuing innovation

The constant search for innovation is hardwired into SOCOMEC's approach to technology:

- first French manufacturer to offer static power systems (1968),
- first UPS to use PWM technology (1980),
- first range of high power UPS with IGBT technology (1996),
- first modular, upgradeable and redundant UPS (2000),
- first manufacturer to integrate hybrid components (2001),
- first 200 kVA UPS with IGBT rectifier (2003),
- new battery charging concept (2004),
- dynamic energy storage system / Flywheel (2006),
- first UPS with 96% efficiency in true online double conversion mode (2007),
- the most compact STS, in a 19" hot-swappable rack version (2009),
- most compact 900 kVA UPS (2010),
- first complete UPS range (10-2400 kW/kVA) with 3-level technology, 96% efficiency and power factor 1 (2012).

Customer-oriented service

Our sales and after-sales network means we are always there for you. Our partner-customers recognise the quality of our products, availability and flexibility in meeting requirements and commitment.

VALID FOR FRANCE — VALID FOR ITALY — FM 28237 — EMS 553476 — the green grid member — 45 YEARS OF UPS SUCCESS

www.socomec.us

to be directly connected to our solutions

1. **Find out about products, services and systems meeting the requirements of applications for which we have a real expertise**
2. **Download documentations, pictures, logos and CAD files**
3. **Find and contact the nearest Socomec contact**
4. **Find answers to technical questions (FAQ)**
5. **Find out about our job offers**
6. **Get informed about our news: products, events and advice**

Find out more on

100% mobility

Access multimedia contents from your smartphone by scanning the codes available in our catalogues or documentations.

How?

1. Download
a QR code application from your mobile phone (QR Code Sanner Pro, Mobiletag, ScanLife flashcode, etc.).

2. Scan

3. Browse!
Example:

Download section on the Socomec website

Banners Software
Selection guides **Photos**
Brochures Videos
User guides **Tutorials**

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Application Guide

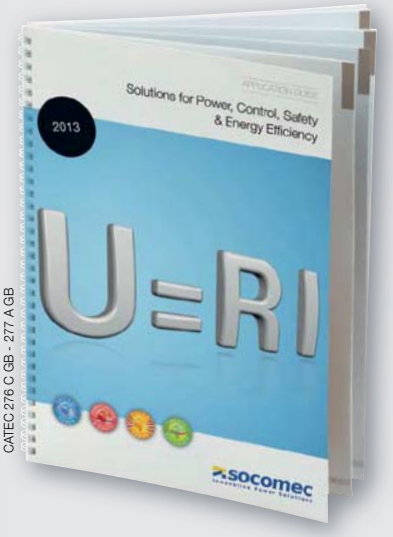
Monitor your electrical installation

The basic information for controlling and protecting an electrical installation in just a few mouse clicks!
The Socomec Application Guide is regularly updated and incorporates all the experience and know-how of our specialist engineers.

CORPO 286A

Download the Application Guide

www.socomec.com/application-guide-scp_en



CATEC 276 C GB - 277 A GB

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- Fuse protection
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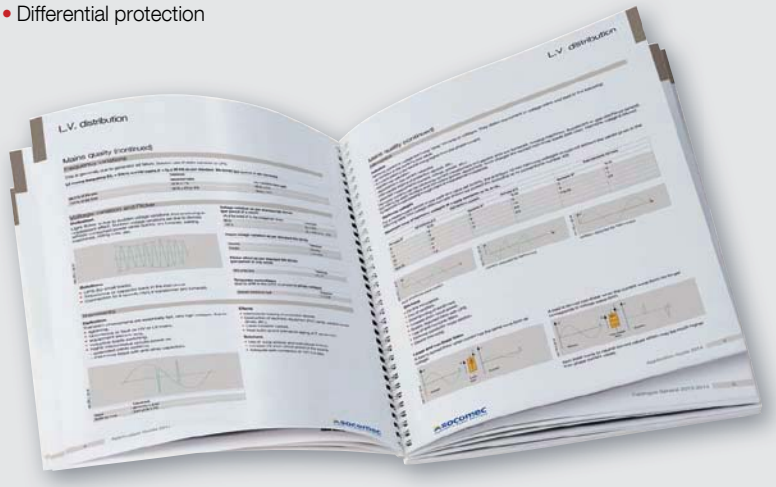
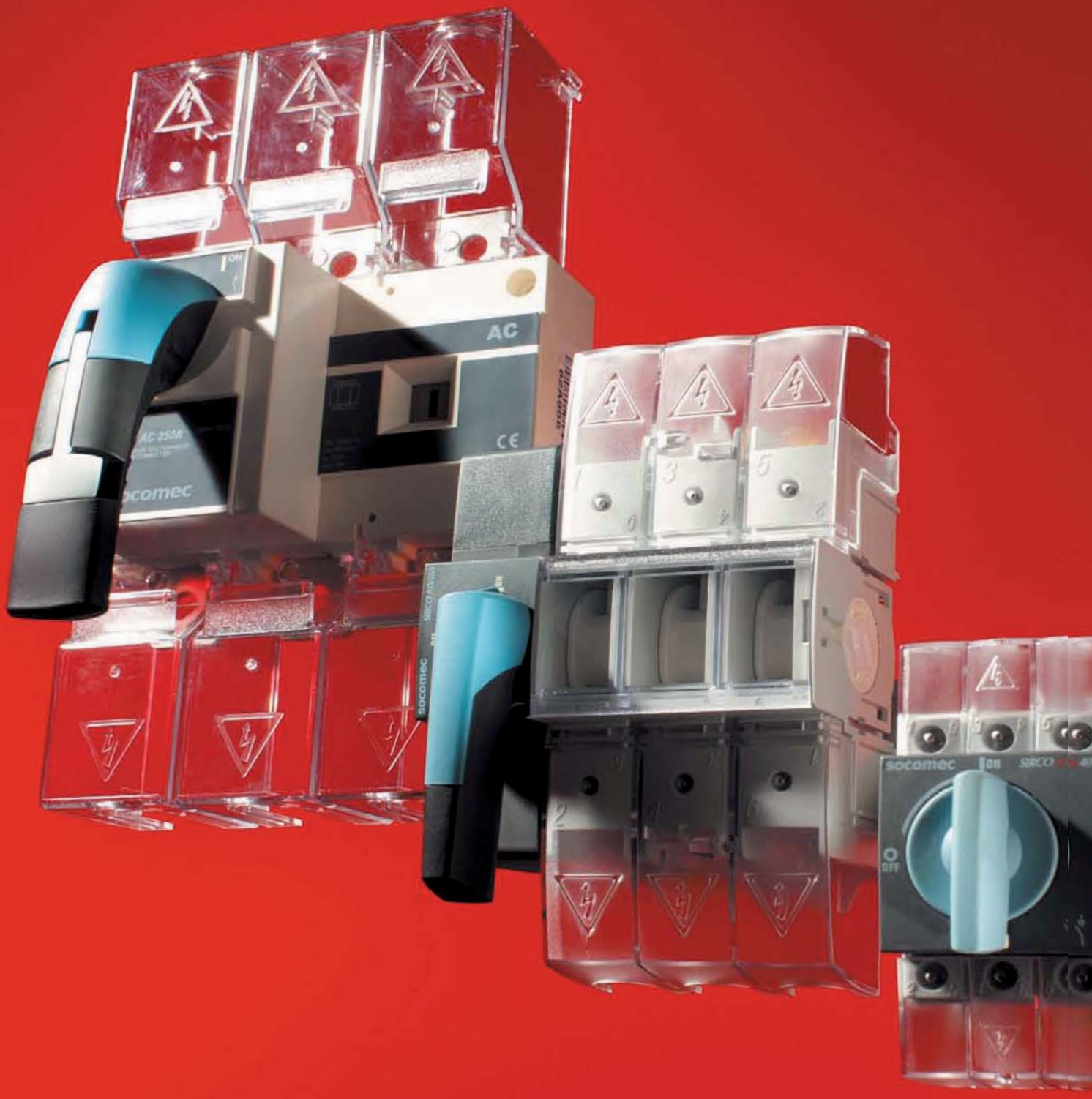
- Industrial communication networks
- Electrical measurement
- Digital protection of networks
- Differential protection
- Insulation Monitoring
- Overvoltage limitor
- Surge arresters
- Reactive energy power factor correction
- Enclosures
- Busbars
- Uninterruptible Power Systems (UPS)




AC
socomec
ON
OFF

Non-fusible disconnect switches

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Non-fusible disconnect switches

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UL508
16 to 80 A
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UL98
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TVSS Surge switch
Special designs
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Selection guide

Non-fusible disconnect switches

UL/ CSA standards for disconnect switches

UL98 - Enclosed and dead front switches (equivalent to CSA-C22.2 no 4)

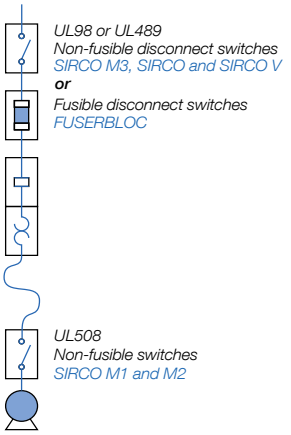
These requirements cover enclosed or dead front Switches, with or without provision for fuses, at 600 V or less.

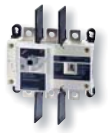
These products are used as disconnecting means without restrictions; they are heavy duty products requiring 2 inches (50 mm) minimum of creepage distance, which gives a maximum safety for users and installation. The short circuit withstand of those products goes up to 200 kA.

UL489 - Molded case switches (equivalent to CSA-C22.2 no 5)

This requirements cover Molded-case Circuit Breaker, Molded case switches and fused Molded-case switches, rated at 600 volts or less and 6000 amperes or less.

Typical control panel





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UL standards for electrical machinery

UL508 - Industrial Control Equipment (equivalent to CSA-C22.2 no 14)

These requirements cover Manual, magnetic and solidstate Starters and Controllers, Overload relays, pushbuttons, selector switches, control lights…

These products are IEC type products, smaller requiring only a creepage distance between phases of 1/2 inch. UL508 standard requested only 5 kA or 10 kA as short circuit withstand with fuse protection. Their use as a disconnecting mean is therefore limited to local disconnection of motors. These products can only be used as a disconnect mean when they have been additionally tested “suitable as motor disconnect”. This additional testing ensures that the switch as a proper closing capacity on short circuit. UL508 (switches or Circuit breakers) can not be used as main disconnect of a electrical panel. (i.e. in entrance of control panels).

A manual motor controller marked “Suitable as motor disconnect” shall be installed only on the load side of the branch circuit protective device (UL508A 30.3.3 and NEC 430.109(6)).

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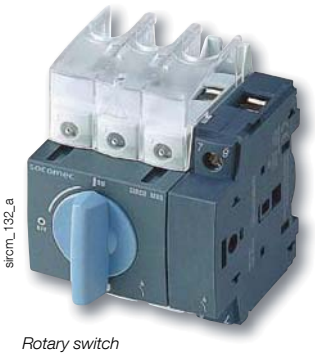
Which application? → Which function? → Which operation handle? → Which type of breaking?

	Machine control		Power distribution	
	SIRCO M UL508 **16 to 80 A** *p. 16*	***SIRCO M*** UL98 **30 to 100 A** *p. 26*	***SIRCO*** UL98 **100 to 1200 A** *p. 32*	TVSS Surge Switch *p. 40*
Applications				
Main switchboard	•	•	•	
Distribution panel	•	•	•	
Emergency disconnect	•	•	•	
Genset output		•	•	
Network coupling		•	•	
Local safety disconnect	•	•	•	
Machine control	•	•		
Photovoltaic disconnect				
Enclosed switches	•	•	•	
Surge protection				•
Functions				
3/4 pole non-fusible disconnect switch	•	•	•	•
6/8 pole non-fusible disconnect switch	•			
3/4 pole changeover switch (I-0-II)	•			
3/4 pole changeover switch (I-I+II-II)	•			
Characteristics				
Operation				
Manual (rotating)	•	•	•	•
Manual toggle	•			
Motorized			•	
Direct operation handle				
Front	•	•	•	•
External operation handle				
Front	•	•	•	•
Right side	•			
Indication of breaking				
Positive break indication	•	•	•	•
Switch body				
Modular	•	•		

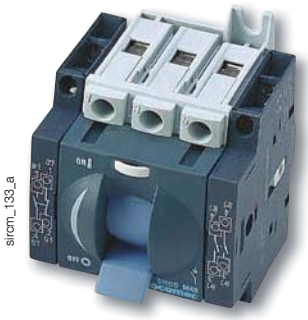
SIRCO M UL508

Non-fusible switches standards UL and CSA

16 to 80 A

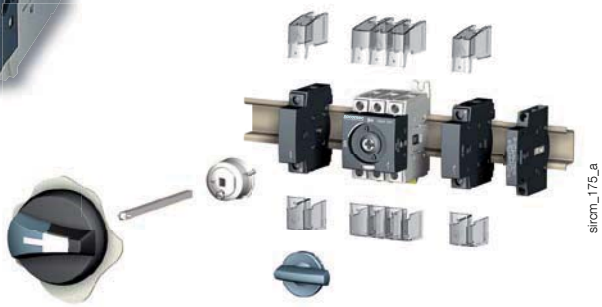


Rotary switch
***SIRCO M** 3 x 80 A*



Toggle switch
***SIRCO M** 3 x 80 A + 2 auxiliary contacts*

Rotary switch
***SIRCO M** 3 x 80 A*



Function

SIRCO M UL/CSA non-fusible disconnect switches are compact modulable and modular switches. They make and break under load conditions and provide safety isolation for any low voltage circuit, particularly for machine and control circuits.

General characteristics

- Positive break indication.
- Direct or external operation.
- Compact footprint.
- DIN-rail or base mount.
- Wide range of accessories.
- Up to 8 pole or 4 pole MTS.

The solution for

> Industrial control systems

Strong points

> Total integration
> Wide range of accessories
> Upgradeability
> Compliance to major certifications and approvals
> Specific characteristics

Conformity to standards(1)

> IEC 60947-3
> UL 508 listed, Guide NLRV, File E173959
> CSA C22.2§14, class 3211-05, File 112964

(1) Product reference on request.

UL508 non-metallic polycarbonate 4.4x enclosed SIRCO M

> Enclosed SIRCO M switches allow safe control and disconnection of any motor application.

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UL508 manual motor controller "Suitable as motor disconnect"

References

Rating (A)	No. of poles	Toggle switch (direct handle included)	Rotary switch	Direct handle	External front and right side handles[4]	Shaft for external handles	Switched fourth pole module	Auxiliary contacts	Terminal shrouds	Door mounting kit
16 A	3 P	2205 **3000**	2200 **3000**	Blue 2299 **5012**	S00 type I - 0 Black 3R, 12[1] 1473 **1111** Red/Yellow 3R, 12[1] 1474 **1111** Black 4, 4X[1] 147D **1111** Red/Yellow 4, 4X[1] 147E **1111** S0 type I - 0 Black 1, 3R, 12[1] 1483 **1111** Red/Yellow 1, 3R, 12[1] 1484 **1111** Black 4, 4X[1] 148D **1111** Red/Yellow 4, 4X[1] 148E **1111**	S00 and S0 type 150 mm 5.9 in 1407 **0515** 200 mm 7.9 in 1407 **0520** 320 mm 12.6 in 1407 **0532**[2]	1 P 2200 **1000**	M type 1 AC NO + NC 2299 **0001** 1 AC 2 NC 2299 **0011**	1 P 2294 **1005**[3] 3 P 2294 **3005**[3]	2299 **3409**
20 A	3 P	2205 **3001**	2200 **3001**				1 P 2200 **1001**			
25 A	3 P	2205 **3002**	2200 **3002**				1 P 2200 **1002**			
32 A	3 P	2205 **3003**	2200 **3003**				1 P 2200 **1003**			
40 A	3 P	2205 **3004**	2200 **3004**				1 P 2200 **1004**			
63 A	3 P	2205 **3006**	2200 **3006**				1 P 2200 **1006**		1 P 2294 **1009**[3] 3 P 2294 **3009**[3]	
80 A	3 P	2205 **3008**	2200 **3008**				1P 2200 **1008**			

(1) Nema/UL type.
(2) Please order the shaft guide: 1419 0000 with the shaft.
(3) Top and bottom.
(4) There is no door interlocking when the switch is fitted on the side of the enclosure.

UL508 non-metallic polycarbonate 4, 4X enclosed SIRCO M

References

Function

Enclosed **SIRCO M** switches allow safe control and disconnection of any motor application.

General characteristics

- Grey enclosure with red handle.
- Equipped with a 3 pole SIRCO M.
- 1 removable ground terminal.
- Possibility of adding 1 power pole and 1 auxiliary contact.
- Nema/UL type 1, 3R, 12, 4, 4X.

Conformity to standards(1)

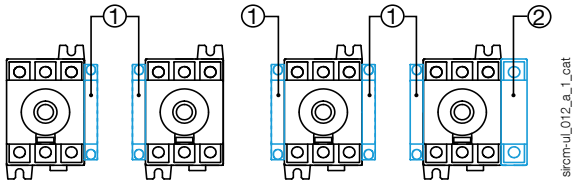
> IEC 60947-3
> UL508, Guide NLRV, file E173959
> CSA C22.2#14, Class 3211-05, file 702154

(1) Product reference on request.

Rating (A)	No. of poles	Enclosed switches	Enclosure size	Switched fourth pole module	Unswitched neutral pole	Unswitched protective ground module	Auxiliary contacts	Terminal shrouds
32 A	3 P	2214 **3503**	Size 1	1 P 2200 **1003**	1 P 2200 **5005**(1)	1 P 2200 **9005**(1)	M type 1 AC NO + NC 2299 **0001**	1 P 2294 **1005**(2) 3 P 2294 **3005**(2)
	3 P	2224 **3503**	Size 2					
63 A	3 P	2224 **3506**	Size 2	1 P 2200 **1006**(1)	1 P 2200 **5009**(1)	1 P 2200 **9009**(1)	1 AC 2 NC 2299 **0011**	1 P 2294 **1009**(2) 3 P 2294 **3009**(2)

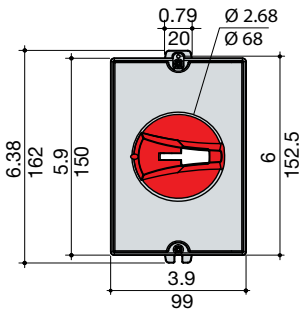
(1) Not UL.
(2) Top and bottom.

Configuration

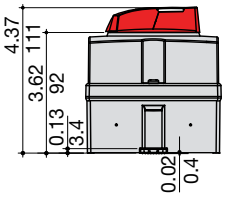


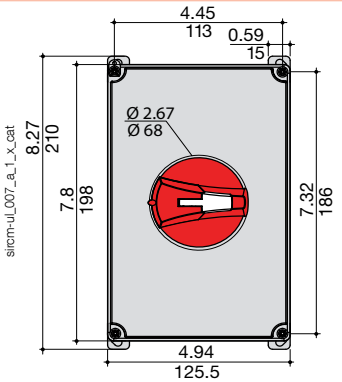
Configuration of the auxiliary contacts for enclosed SIRCO M.
1. M type auxiliary contacts.
2. Additional pole.

Dimensions (in/mm)

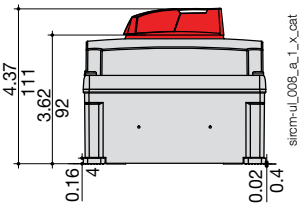


Size 1





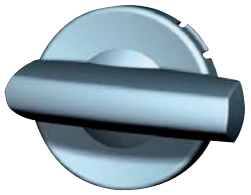
Size 2



Accessories

Direct operation handle

Rating (A)	Handle color	Handle type	Reference
16 ... 80	Blue	M00	2299 **5012**



M00 handle

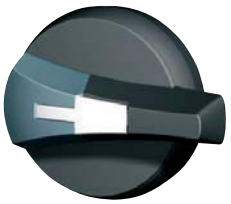
External operation handle

Use

The handle locking function prevents the user from opening the door of the enclosure when the switch is in the "ON" position (only if the handle is fitted on the door).

Opening the door when the switch is in the "ON" position is possible by defeating the interlocking function with the use of a tool (authorized persons only). The interlocking function is restored when the door is closed. The handle is padlockable with 3 padlocks.

S00 handle



S0 handle

S01 handle

Front and right side handles I - 0

Rating (A)	Handle color	Handle type	Nema/UL type	Reference
16 ... 80	Black	S00	3R, 12	1473 **1111**
16 ... 80	Red/Yellow	S00	3R, 12	1474 **1111**
16 ... 80	Black	S00	4, 4X	147D **1111**
16 ... 80	Red/Yellow	S00	4, 4X	147E **1111**
16 ... 80	Black	S0	1, 3R, 12	1483 **1111**
16 ... 80	Red/Yellow	S0	1, 3R, 12	1484 **1111**
16 ... 80	Black	S0	4, 4X	148D **1111**
16 ... 80	Red/Yellow	S0	4, 4X	148E **1111**
16 ... 80	Black	S01	3R, 12	140F **2111**
16 ... 80	Red/Yellow	S01	3R, 12	140G **2111**
16 ... 80	Black	S01	4, 4X	140D **2111**
16 ... 80	Red/Yellow	S01	4, 4X	140E **2111**

(1) Not UL.

Front handle for changeover switches I - 0 - II

Rating (A)	Handle color	Handle type	Nema/UL type	Reference
16 ... 80	Black	S00	IP65	1473 **1113**(1)

Front handle for changeover switches I - I+II - II

Rating (A)	Handle color	Handle type	Nema/UL type	Reference
16 ... 80	Black	S00	IP65	1473 **1114**(1)

Shafts for external handle

Use

Standard lengths:
- 150 mm,
- 200 mm,
- 320 mm.

Other lengths: please consult us.

For 3/4 pole switches, shaft extensions for external front and side handle.
For 6/8 pole switches and SIRCOVER M changeover switches.

For 3/4 pole

Rating (A)	Handle type	Length (inches)	Length (mm)	Reference
16 ... 80	S00	5.9 in	150 mm	1407 **0515**
16 ... 80	S00	7.9 in	200 mm	1407 **0520**
16 ... 80	S00	12.6 in	320 mm	1407 **0532**
16 ... 80	S01	7.9 in	200 mm	1404 **0520**
16 ... 80	S01	12.6 in	320 mm	1404 **0532**
16 ... 80	S01	15.7 in	400 mm	1404 **0540**

For 6/8 pole

Rating (A)	Handle type	Length (inches)	Length (mm)	Reference
16 ... 80	S00	5.9 in	150 mm	1407 **0515**
16 ... 80	S00	7.9 in	200 mm	1407 **0520**
16 ... 80	S00	12.6 in	320 mm	1407 **0532**

Accessories (continued)

Shaft guide for external handle

Use

This accessory enables handle to engage extension shaft with a misalignment of up to 15 mm.
Required for a shaft lenght from 320 mm.

Handle type	Reference
S00 and S0	1419 **0000**

acces_260_a_2_cat

Additional pole for SIRCO M

4th pole

Rating (A)	No. of poles	Type	Reference
16	1 P	switched	2200 **1000**
20	1 P	switched	2200 **1001**
25	1 P	switched	2200 **1002**
32	1 P	switched	2200 **1003**
40	1 P	switched	2200 **1004**
63	1 P	switched	2200 **1006**(1)
80	1 P	switched	2200 **1008**(1)

(1) Not UL.

Use

Transforms:
- 3 pole SIRCO M non-fusible switches into a 4 pole,
- 3 pole SIRCOVER M changeover switches into a 4 pole.

sircm_072_b_1_cat

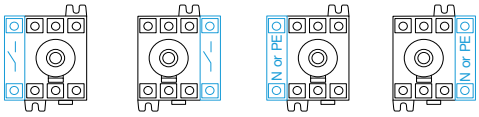
Solid neutral pole

Rating (A)	No. of poles	Type	Reference
16 … 40	1 P	unswitched	2200 **5005**(1)
63 … 80	1 P	unswitched	2200 **5009**(1)

(1) Not UL.

Use

Transforms the 3-pole switch into a 3-pole + solid neutral.



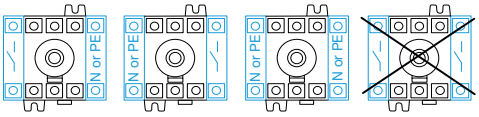
Ground module

Rating (A)	No. of poles	Type	Reference
16 … 40	1 P	unswitched	2200 **9005**(1)
63 … 80	1 P	unswitched	2200 **9009**(1)

(1) Not UL.

Use

Adds 1 protective ground module pole to the switch-disconnector.



sircm_078_a_1_gb_cat

Terminal shrouds

Use

Top and bottom additional protection against direct contact with the terminals or connection parts. 1 or 3 pole are available.

Perforation on each terminal cover enables remote thermographic inspection without dismantling.

Rating (A)	No. of poles	Position	Reference
16 … 40	1 P	top and bottom	2294 **1005**
16 … 40	3 P	top and bottom	2294 **3005**
63 … 80	1 P	top and bottom	2294 **1009**
63 … 80	3 P	top and bottom	2294 **3009**

sircm_049_a_1_cat

socomec
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M type Auxiliary Contacts

Use

Pre-break and signaling of positions 0 and I by NO+NC or 2 NO Auxiliary Contacts.
They can be mounted on the left or on the right side of the device.

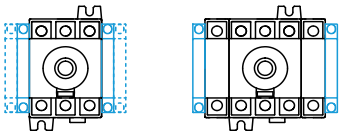
Max 4 Auxiliary Contacts per product (2 modules).

Characteristics

A300.

Rating (A)	Nb de CA	AC type	Reference
16 ... 80	1 AC	NO + NC	2299 **0001**
16 ... 80	1 AC	2 NO	2299 **0011**

sircm_075_b_2_cat


sircm_081_a_1_x_cat

Auxiliary contacts configurations for SIRCO M

Conversion kit

Use

These accessories enable the assembly of 2 switches in order to achieve:
- 6 or 8 pole switches
- 3 or 4 pole open or close transition changeover switches.

Rating (A)	Type[1]	Reference
16 ... 80	Non-fusible switches 6/8 P	2269 **6009**
16 ... 80	Transfer switch 3/4 pole (I - 0 - II)	2209 **6009**
16 ... 80	Transfer switch 3/4 pole (I - I+II - II)	2299 **6009**

(1) Non UL.

sircm_050_c_2_cat

sircm_097_b_2_x_cat

Conversion kit for 6 or 8 pole non-fusible switches

Conversion kit for 3 and 4-pole changeover switches (I - 0 - II) or (I - I+II - II)

sircm_086_b_1_cat

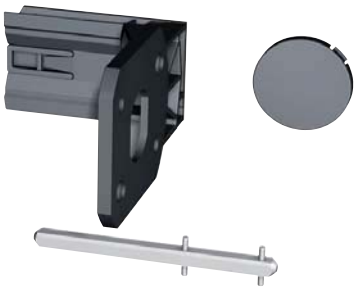
Door mounting kit

Use

This kit enables direct mounting of the switch on the panel door or on the right or left side of the panel.

The external handle is quick and easy to install due to an internal locking nut mounted on the inside of the enclosure.

Rating (A)	No. of poles	Reference
16 ... 80	3/4 P	2299 **3409**


sircm_051_b_2_cat

Characteristics

Characteristics according to UL508/CSA22.2#14 suitable as motor disconnect

	SIRCO M UL508 - 16 to 80 A						
General use rating	**16 A**	**20 A**	**25 A**	**32 A**	**40 A**	**63 A**	**80 A**
Short circuit rating at 600 VAC (kA)	65	65	65	65	10/65	50/65	50/65
Type of fuse	J	J	J	J	J	J	J
Max fuse rating (A)	30	30	30	30	60/30	100/60	100/60
Max. motor hp / FLA 3 ph motor max.							
208 VAC	3 / 10.6	5 / 16.7	7.5 / 24.2	7.5 / 24.2	7.5 / 24.2	15 / 46.2	15 / 46.2
220-240 VAC	5 / 15.2	5 / 15.2	7.5 / 22	7.5 / 22	7,5 / 22	20 / 54	20 / 54
440-480 VAC	10 / 14	10 / 14	15 / 21	20 / 27	20 / 27	40 / 52	40 / 52
600 VAC	10 / 11	15 / 17	20 / 22	25 / 27	25 / 27	40 / 41	40 / 41
Connection terminals							
Solid - 1 wire	#14 - #10	#14 - #10	#14 - #10	#14 - #10	#14 - #10	#14 - #10	#14 - #10
Solid - 2 wires	2x #12	2x #12	2x #12	2x #12	2x #12	2x #12	2x #12
Stranded - 1 wire	#14 - #4	#14 - #4	#14 - #4	#14 - #4	#14 - #4	#14 - #1	#14 - #1
Stranded - 2 wires	2x (#14 - #12)	2x (#14 - #12)	2x (#14 - #12)	2x (#14 - #12)	2x (#14 - #12)	2x (#10 - #6)	2x (#10 - #6)
Auxiliary contacts							
Electrical characteristics	A300	A300	A300	A300	A300	A300	A300
Mechanical characteristics							
Endurance (number of operating cycles)	10 000	10 000	10 000	10 000	10 000	10 000	10 000
Operating torque (lbs.in/Nm)	7/0.8	7/0.8	7/0.8	7/0.8	7/0.8	8.9/1	8.9/1

Characteristics according to IEC 60947-3

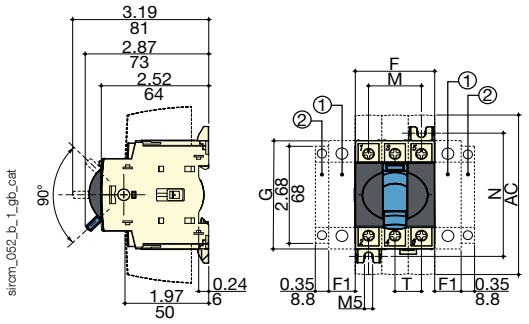
		SIRCO M UL508 - 16 to 80 A						
General use rating		**16 A**	**20 A**	**25 A**	**32 A**	**40 A**	**63 A**	**80 A**
Thermal current I_{th} (40°C)		16	20	25	32	40	63	80
Rated insulation voltage U_i (V)		800	800	800	800	800	800	800
Rated impulse withstand voltage U_{imp} (kV)		8	8	8	8	8	8	8
Rated operational currents I_e (A)								
Rated voltage	**Utilization**	**A/B(1)**	**A/B(1)**	**A/B(1)**	**A/B(1)**	**A/B(1)**	**A/B(1)**	**A/B(1)**
415 VAC	AC-23 A / AC-23 B	16/16	20/20	25/25	32/32	40/40	63/63	80/80
500 VAC	AC-22 A / AC-22 B	16/16	20/20	25/25	32/32	40/40	63/63	80/80
500 VAC	AC-23 A / AC-23 B	16/16	20/20	25/25	25/25	25/25	63/63	63/63
690 VAC	AC-21 A / AC-21 B	16/16	20/20	25/25	32/32	40/40	63/63	80/80
690 VAC	AC-22 A / AC-22 B	16/16	20/20	25/25	32/32	32/40	40/63	63/80
690 VAC	AC-23 A / AC-23 B	16/16	20/20	25/25	25/25	25/25	40/40	40/40
Operational power in AC-23 (kW)								
At 400 VAC without prebreaking AC in AC-23 (kW)(1)(2)		7.5	9	11	15	18.5	30	37
At 500 VAC without prebreaking AC in AC-23 (kW)(1)(2)		7.5	9	11	15	15	30	37
At 690 VAC without prebreaking AC in AC-23 (kW)(1)(2)		7.5	11	15	18.5	18.5	30	37
Fuse protected short-circuit withstand (kA rms prospective)								
Prospective short-circuit current (kA rms)(3)		50	50	50	50	50	50	50
Associated fuse rating (A)(3)		16	20	25	32	40	63	80
Overload capacity (U_e 415 VAC)								
Rated short-time withstand current 0.3 s. I_{CW} (kA rms)(3)		2.5	2.5	2.5	2.5	2.5	3	3
Rated short-circuit making capacity I_{cm} (kA peak)(3)		6	6	6	6	6	9	9
Connection								
Minimum Cu cable cross section (mm^2)		1.5	1.5	1.5	1.5	1.5	2.5	2.5
Maximum Cu cable section (mm^2)		16	16	16	16	16	35	35
Tightening torque min / max (Nm)		2 / 2.2	2 / 2.2	2 / 2.2	2 / 2.2	2 / 2.2	3.5 / 3.85	3.5 / 3.85

(1) A/B: Category with index A = frequent operation - Category with index B = infrequent operation.
(2) The power value is given for information only, the current values vary from one manufacturer to another.
(3) For a rated operating voltage U_e = 400 VAC.

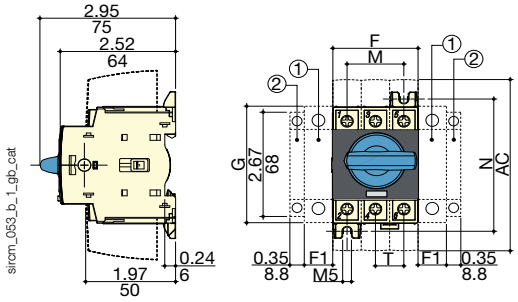
Dimensions (in/mm)

16 to 80 A

Toggle operation



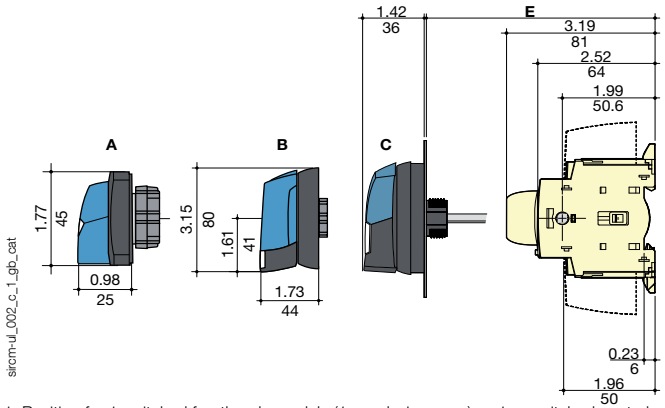
Direct operation with handle



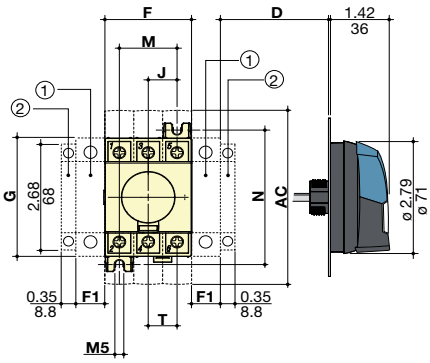
1. Position for 1 switched fourth pole module (1 per device max.) **or** 1 unswitched neutral pole **or** 1 protective ground module **or** 1 auxiliary contact.
2. Position for 1 auxiliary contact only.

Note: Maximum of 4 additional blocks.

External front handle



External side handle

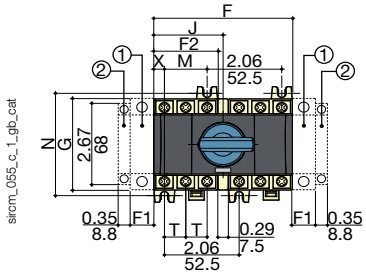


1. Position for 1 switched fourth pole module (1 per device max.) **or** 1 unswitched neutral pole **or** 1 ground module **or** 1 auxiliary contact.
2. Position for 1 auxiliary contact only.

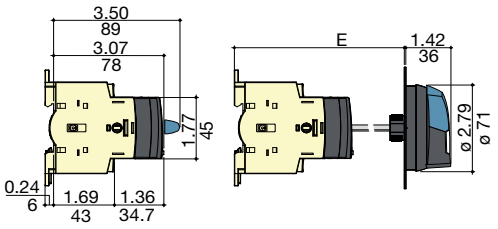
Note: Maximum of 4 additional blocks.

Rating (A)	Units	Overall dimensions				Terminal shrouds	Switch body				Switch mounting		Connection
		D min	D max	E min	E max	AC	F	F1	G	J	M	N	T
16 to 40	in	1.18	9.25	3.94	14.64	4.33	1.77	0.59	2.67	0.59	1.18	2.95	0.59
	mm	30	235	100	372	110	45	15	68	15	30	75	15
63 to 80	in	1.18	9.25	3.93	14.64	4.33	2.06	0.69	2.99	0.69	1.38	3.35	0.69
	mm	30	235	100	372	110	52.5	17.5	76	17.5	35	85	17.5

Direct front handle for 6/8-pole non-fusible switches
or 3/4-pole changeover switches



External front handle for 6/8-pole non-fusible switches
or 3/4-pole changeover switches



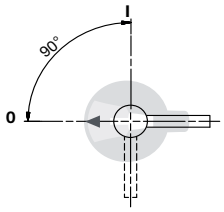
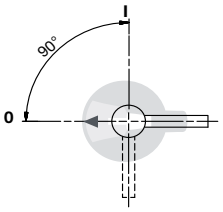
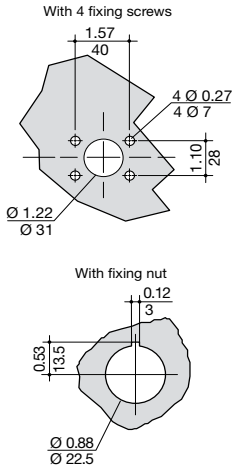
1. Position for 1 switched fourth pole module (1 per device max.) **or** 1 unswitched neutral pole **or** 1 ground module **or** 1 auxiliary contact.
2. Position for 1 auxiliary contact only.

Note: Maximum of 4 additional blocks.

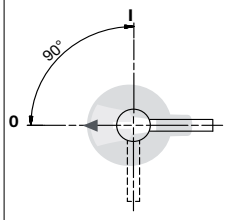
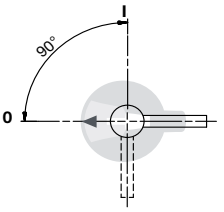
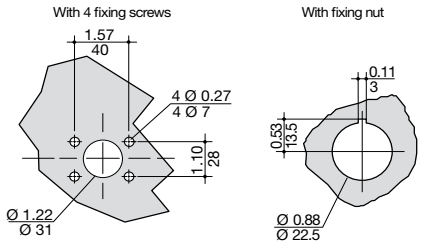
Rating (A)	Units	Overall dimensions		Switch body					Switch mounting		Connection	
		E min	E max	F	F1	F2	G	J	M	N	T	X
16 to 40	in	4.13	14.64	3.83	0.59	1.77	2.67	1.92	1.18	2.95	0.59	0.29
	mm	105	372	97.5	15	45	68	48.75	30	75	15	7.5
63 to 80	in	4.13	14.65	4.13	0.69	2.06	2.99	2.06	1.38	3.35	0.69	0.34
	mm	105	372	105	17.5	52.5	76	52.5	35	85	17.5	8.75

External handles dimensions (in/mm)

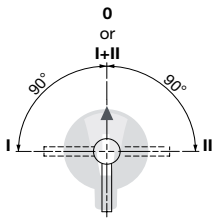
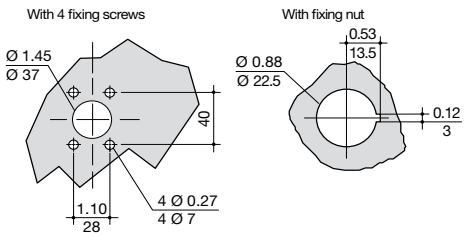
16 to 80 A

Handle type	Front operation Direction of operation	Side operation Direction of operation	Door drilling
S00 type			

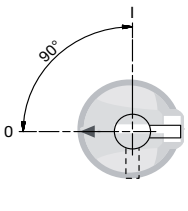
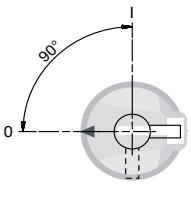
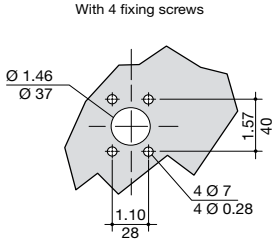
poign_059_a_1_us_cat

Handle type	Front operation Direction of operation	Side operation Direction of operation	Door drilling
S00 type			

poign_048_b_1_gb_cat

Handle type	Front operation Direction of operation	Door drilling
Typ S00 Changeover switches		

sircm_013_b_1_gb_cat

Handle type	Front operation Direction of operation	Side operation Direction of operation	Door drilling
S01 type			

poign_018_a_1_gb_cat

SIRCO M UL98

Non-fusible switches standards UL and CSA

30 to 100 A

Rotary switch
***SIRCO M** 3 x 100 A*

The solution for

> Power distribution

Strong points

> Total integration
> Wide range of accessories
> Upgradeability
> Compliance to major certifications and approvals
> Specific characteristics

Conformity to standards(1)

> IEC 60947-3
> UL98, Guide WHTY, file E201138
> CSA 22.2#4, Class 4651-02, file 112964

(1) Product reference on request.

Function

SIRCO M non-fusible disconnect switches are compact switches that break and make power circuits on and off load and provide safety isolation.
These switches are extremely durable and are tested and approved for use in the most demanding applications.

General characteristics

- Positive break indication.
- Touch safe.
- DIN rail or back plate-mounted.
- Direct or external operation handle.

Specific characteristics

- Contact point technology.

References

UL98 non-fusible disconnect switches

Rating (A)	No. of poles	Switch body	Direct handle	External front and right side handles	Shafts for external front and side handles	Switched fourth pole module	Unswitched neutral pole	Ground module	Auxiliary contacts	Terminal shrouds
30 A	3 P	2201 **3003**	Blue 2299 **5032**	S00 type I - 0 Black 4, 4X 147D **1111** Red/Yellow 4, 4X 147E **1111** S0 type I - 0 Black 4, 4X 148D **1111** Red/Yellow 4, 4X 148E **1111**	150 mm 5.9 in 1407 **0515** 200 mm 7.9 in 1407 **0520** 320 mm 12.6 in 1407 **0532**(1)	1 P 2201 **1003**	1 P 2200 **5011**(2)	1 P 2200 **9011**(2)	M type 1 AC NO + NC 2299 **0001** M type 1 AC 2 NC 2299 **0011**	1 P 2294 **1011**(3) 3 P 2294 **3016**(3)
60 A	3 P	2201 **3006**				1 P 2201 **1006**				
100 A	3 P	2200 **3010**				1 P 2200 **1010**				

(1) Shaft guide reference 14190000, is required for shaft length over 15.7 inches (400 mm).
(2) Not UL.
(3) Top and bottom.

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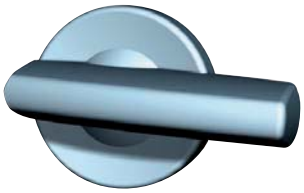
Accessories

Direct operation handle

Rating (A)	Handle color	Handle type	Reference
30 ... 100	Blue	M01	2299 **5032**


acces_283_a_2_cat

M01 handle

External operation handle

Use

The handle locking function prevents the user from opening the door of the enclosure when the switch is in the "ON" position (only if the handle is fitted on the door).

Opening the door when the switch is in the "ON" position is possible by defeating the interlocking function with the use of a tool (authorized persons only). The interlocking function is restored when the door is closed. The handle is padlockable with 3 padlocks.

acces_279_a_2_cat

S0 handle

acces_304_a_2_cat

S01 handle

Front and right side handles I - 0

Rating (A)	Handle color	Handle type	Nema/UL type	Reference
16 ... 80	Black	S0	1, 3R, 12	1483 **1111**
16 ... 80	Red/Yellow	S0	1, 3R, 12	1484 **1111**
16 ... 80	Black	S0	4, 4X	148D **1111**
16 ... 80	Red/Yellow	S0	4, 4X	148E **1111**
16 ... 80	Black	S01	3R, 12	140F **2111**
16 ... 80	Red/Yellow	S01	3R, 12	140G **2111**
16 ... 80	Black	S01	4, 4X	140D **2111**
16 ... 80	Red/Yellow	S01	4, 4X	140E **2111**

Shafts for external handle

Use

Standard lengths:
- 150 mm,
- 200 mm,
- 320 mm.

Other lengths: please consult us.

For 3/4 pole switches, shaft extensions for external front and side handle.
For 6/8 pole switches and SIRCOVER M changeover switches.

acces_280_a_2_cat

For 3/4 pole

Rating (A)	Handle type	Length (inches)	Length (mm)	Reference
16 ... 80	S0	5.9 in	150 mm	1407 **0515**
16 ... 80	S0	7.9 in	200 mm	1407 **0520**
16 ... 80	S0	12.6 in	320 mm	1407 **0532**
16 ... 80	S01	7.9 in	200 mm	1404 **0520**
16 ... 80	S01	12.6 in	320 mm	1404 **0532**
16 ... 80	S01	15.7 in	400 mm	1404 **0540**

Accessories (continued)

Shaft guide for external handle

Use
This accessory makes shaft introduction easier with up to 15 mm misalignment.
Required for a shaft length from 320 mm.

Handle type	Reference
S0	1419 **0000**

Additional pole for SIRCO M

4th pole

Rating (A)	No. of poles	Type	Reference
30	1 P	switched	2201 **1003**
60	1 P	switched	2201 **1006**
100	1 P	switched	2200 **1010**

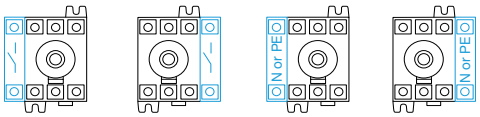
Use
Adding one or two additional poles transforms a non-fusible disconnect switch from 3 poles to 4 poles.

Solid neutral pole

Rating (A)	No. of poles	Type	Reference
30 … 100	1 P	unswitched	2200 **5011**(1)

(1) Not UL.

Use
Transforms the 3-pole switch into a 3-pole + solid neutral.

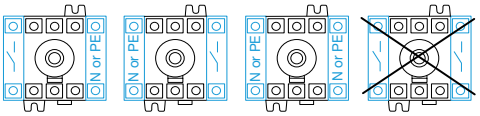


Ground module

Rating (A)	No. of poles	Type	Reference
30 … 100	1 P	unswitched	2200 **9011**(1)

(1) Not UL.

Use
Adds 1 ground module pole to the switch-disconnector.



Terminal shrouds

Use
Top and bottom additional protection against direct contact with the terminals or connection parts. 1 or 3 pole are available.

Perforation on each terminal cover enables remote thermographic inspection without dismantling.

Rating (A)	No. of poles	Position	Reference
30 … 100	1 P	top and bottom	2294 **1011**
30 ... 100	3 P	top and bottom	2294 **3016**

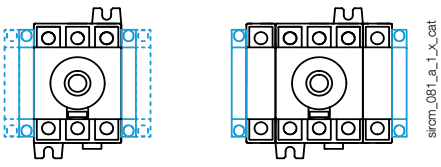
M type auxiliary contacts

Use
Pre-break and signaling of positions 0 and I by NO+NC or 2 NO auxiliary contacts.

They can be mounted on the left or on the right side of the switch.
Max 4 auxiliary contacts (2 modules).

Characteristics
A300.

Rating (A)	Nb de CA	AC type	Reference
30 ... 100	1 AC	NO + NC	2299 **0001**
30 ... 100	1 AC	2 NO	2299 **0011**



Auxiliary contacts configurations for SIRCO M

Characteristics

Characteristics according to UL98/CSA22.2#4

	SIRCO M UL98 - 30 to 100 A		
General use rating	**30 A**	**60 A**	**100 A**
Short-circuit rating at 480 VAC (kA)	100	100	100
Short circuit rating at 600 VAC (kA)	100	100	25
Type of fuse	J	J	J
Max fuse rating (A)	30	60	100
Max. motor hp / FLA 3 ph motor max.			
220-240 VAC	10 / 28	20 / 54	20 / 54
440-480 VAC	20 / 27	40 / 52	50 / 65
600 VAC	25 / 27	50 / 52	50 / 52
Max. motor hp / FLA 1 ph motor max.			
120 VAC	2 / 24	3 / 34	5 / 56
240 VAC	5 / 28	10 / 50	10 / 50
Connection terminals			
Solid - 1 wire	#12 - #10	#12 - #10	#12 - #10
Stranded - 1 wire	#12 - 2/0	#12 - 2/0	#12 - 2/0
Mechanical characteristics			
Endurance (number of operating cycles)	10000	10000	10000
Operating torque (lbs.in/Nm)	12.4/1.4	12.4/1.4	12.4/1.4
Auxiliary contacts			
Electrical characteristics	A300	A300	A300

Characteristics according to IEC 60647-3

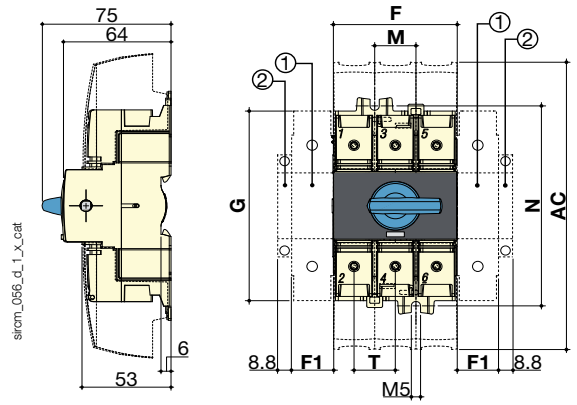
		SIRCO M UL98 - 30 to 100 A		
Thermal current I_{th} at 40°C (A)		**30 A**	**60 A**	**100 A**
Rated insulation voltage U_i (V)		800	800	800
Rated impulse withstand voltage U_{imp} (kV)		8	8	8
Rated operational currents I_e (A)				
Rated voltage	**Utilization category**	**A(1)**	**A(1)**	**A(1)**
400 VAC	AC-22 A	32	63	100
400 VAC	AC-23 A	32	63	100
690 VAC	AC-22 A	32	63	80
690 VAC	AC-23 A	32	63	63
Operational power in AC-23 (kW)				
At 400 VAC without prebreak AC in AC23 (kW)(2)(3)		15	30	45
At 500VAC without prebreak AC in AC23 (kW)(2)(3)		15	30	45
At 690VAC without prebreak AC in AC23 (kW)(2)(3)		18.5	30	45
Overload capacity (U_e 415 VAC)				
Rated short-circuit making capacity I_{cm} (kA peak)(4)		12	12	12
Connection				
Min. connection section/ (mm^2)		2.5	2.5	10
Max. connection section/ (mm^2)		70	70	70

(1) Category with index A = frequent operation.
(2) A/B: Category with index A = frequent operation - Category with index B = infrequent operation.
(3) The power value is given for information only, the current values vary from one manufacturer to another.
(4) For a rated operating voltage U_e = 400 VAC.

Dimensions (in/mm)

30 to 100 A

Direct operation with handle

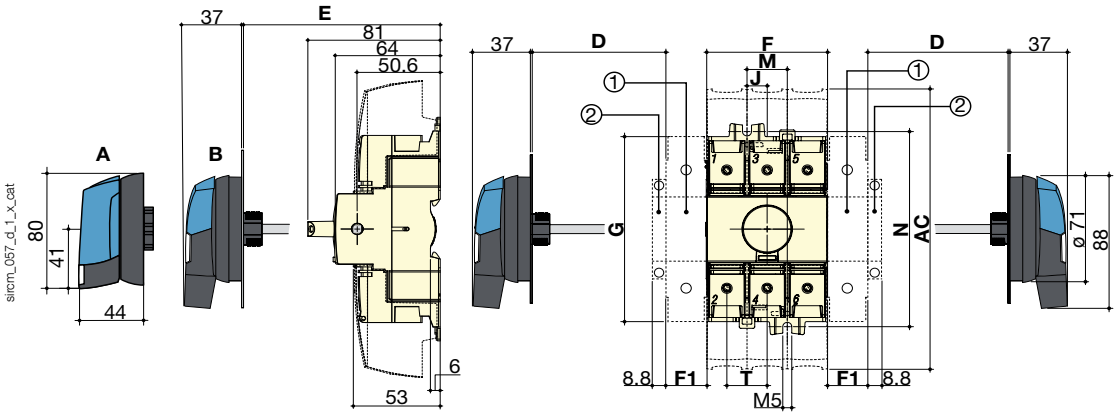


1. Location for: 1 switched fourth pole module (1 per device max.) **or** 1 unswitched neutral pole **or** 1 protective earth module **or** 1 auxiliary contact.
2. Position for 1 auxiliary contact module only.

Note: max 2 additional blocks.

External front operation

External side operation



1. Location for: 1 switched fourth pole module (1 per device max.) **or** 1 unswitched neutral pole **or** 1 protective earth module **or** 1 auxiliary contact.
2. Position for 1 auxiliary contact module only.

Note: max 2 additional blocks.

A. S01 handle
B. S00 handle

Rating (A) / Frame size	Overall dimensions				Terminal shrouds	Switch body				Switch mounting		Connection
	D min	D max	E min	E max	AC	F	F1	G	J	M	N	T
100 … 125 / M3	30	201	100	372	189	78	26	124.6	13	26	131.4	26

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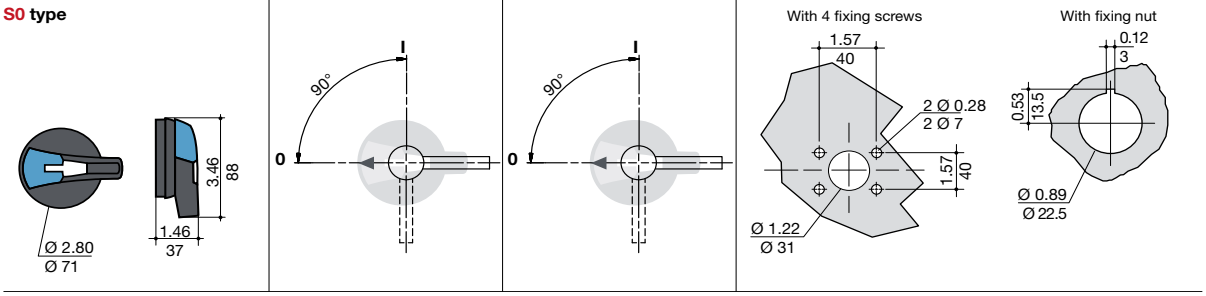
External handles dimensions (in/mm)

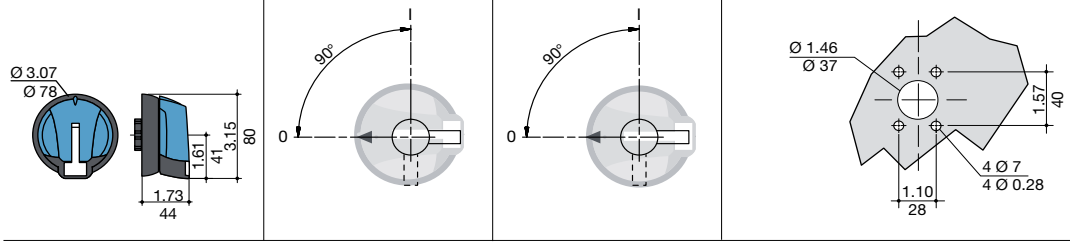
30 to 100 A

Handle type	Front operation Direction of operation	Side operation Direction of operation	Door drilling
S0 type			With 4 fixing screws With fixing nut



poign_060_a_1_us_cat

Handle type	Front operation Direction of operation	Side operation Direction of operation	Door drilling
S01 type			With 4 fixing screws

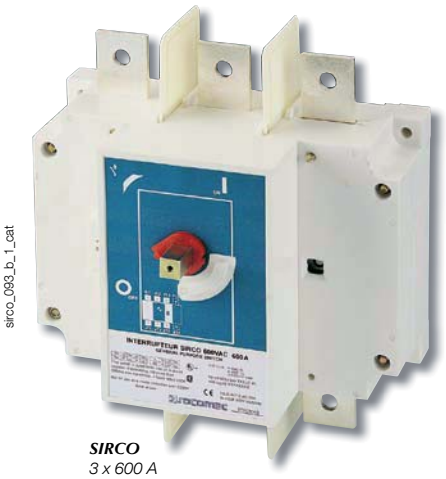


poign_018_a_1_us_cat

SIRCO UL98

Non-fusible switches standards UL and CSA

100 to 1200 A



sirco_093_b_1_cat

SIRCO
3 x 600 A

sirco-ul_022_b_1_cat

SIRCO
3 x 200 A

Function

SIRCO non-fusible disconnect switches are heavy duty switches that break and make power circuits on and off load and provide safety isolation.

These switches are extremely durable and are tested and approved for use in the most demanding applications.

General characteristics

- Positive break indication.
- Fully visualized disconnection.
- High thermal and dynamic withstand.
- Severe utilization categories.
- High electrical and mechanical endurance.

The solution for

> Power distribution

Strong points

> Reliability
> Safety of property and personnel
> Simplicity
> Easy assembling

Conformity to standards(1)

> IEC 60947-3
> UL98, Guide WHTY, file E201138
> CSA Pending 22.2#4, Class 4652-04, file 703166

(1) Product reference on request.

Customised solutions

> Please consult us

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References

Rating (A)	No. of poles	Switch body	Direct handle	External handle	Shaft for external handle	Auxiliary contacts	Terminal protection screens	Terminal Lugs kits
100 A	3 P	2700 **3011**	Black 2699 **5052**	S2 type Black 1, 3R, 12 142F **2111**(1) Red/Yellow 1, 3R, 12 142G **2111**(1) Black 4, 4X 142D **2111**(1) Red/Yellow 4, 4X 142E **2111**(1)	200 mm 7.9 inches 1400 **1020** 320 mm 12.6 inches 1400 **1032** 400 mm 15.7 inches 1400 **1040**	1st contact NO/NC 2799 **0021** 2nd contact NO/NC 2799 **0022**	3 P 2798 **3021**(2) 3 P 2798 **8021**(3) 4 P 2798 **4021**(4)	3 P 3954 **3020**(4) 4 P 3954 **4020**(4)
	4 P	2700 **4011**						
200 A	3 P	2700 **3021**						
	4 P	2700 **4021**						
400 A	3 P	2700 **3041**					3 P 2798 **3041**(2) 3 P 2798 **8041**(3) 4 P 2798 **4041**(4)	3 P 3954 **3040**(4) 4 P 3954 **4040**(4)
	4 P	2700 **4041**						
600 A	3 P	2700 **3060**	Black 3799 **6012**	S3 type Black 4, 4X 143D **3111**(1) Red/Yellow 4, 4X 143E **3111**(1)	200 mm 7.9 inches 1401 **1520** 320 mm 12.6 Inches 1401 **1532** 400 mm 15.7 Inches 1401 **1540**		3 P 2798 **3060**(4) 4 P 2798 **4060**(4)	3 P 3954 **3060** 4 P 3954 **4060**
	4 P	2700 **4060**						
800 A	3 P	2700 **3080**					3 P 2798 **3120**(4) 4 P 2798 **4120**(4)	3 P 3954 **3120** 4 P 3954 **4120**
	4 P	2700 **4080**						
1000 A	3 P	2700 **3100**						
	4 P	2700 **4100**						
1200 A	3 P	2700 **3120**						
	4 P	2700 **4120**						

(1) Defeatable handle.
(2) Top.
(3) Bottom.
(4) Top or bottom.
(5) Max. 4 ACs.

Accessories

Direct operation handle

Rating (A)	Signaling	Handle	Reference
100 ... 400	Black	B type	2699 **5052**
600 ... 1200	Black	H type	3799 **6012**

H type handle

B type handle

Accessories (continued)

External operation handle

Use

The interlocking function of the front external handle prevents the user from opening the door of the enclosure when the switch is in the "ON" position or when the switch is padlocked in the "OFF" position (S1, S2, S3 and S4 type handles only).

Opening the door when the switch is in the "ON" position is possible by defeating the interlocking function with the use of a tool (authorized persons only). The interlocking function is restored when the door is closed.

S2 type handle

S3 type handle

S4 type handle

Heavy duty S2 type handle

Front handle I - 0

Rating (A)	Handle	Signaling	Nema type	Reference
100 ... 400	S2 type	Black	1, 3R, 12	142F **2111**
100 ... 400	S2 type	Red/Yellow	1, 3R, 12	142G **2111**
100 ... 400	S2 type	Black	4, 4X	142D **2111**
100 ... 400	S2 type	Red/Yellow	4, 4X	142E **2111**
600 ... 1200	S3 type	Black	4, 4X	143D **3111**
600 ... 1200	S3 type	Red/Yellow	4, 4X	143E **3111**
600 ... 1200	S4 type	Black	4, 4X	144D **3111**
600 ... 1200	S4 type	Red/Yellow	4, 4X	144E **3111**

Front handle heavy duty I - 0 with metallic lever

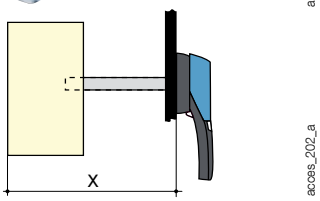
Rating (A)	Handle	Signaling	Nema type	Reference
100 ... 400	S2 type	Black	4, 4X	142D **2911**
100 ... 400	S2 type	Red/Yellow	4, 4X	142E **2911**
600 ... 1200	S3 type	Black	4, 4X	143D **3911**
600 ... 1200	S3 type	Red/Yellow	4, 4X	143E **3911**
600 1200	S4 type	Black	4, 4X	144D **3911**
600 ... 1200	S4 type	Red/Yellow	4, 4X	144E **3911**

Shaft for external handle

Use

Standard lengths:
- 7.9 in / 200 mm,
- 12.6 in / 320 mm,
- 15.7 in / 400 mm.

Other lengths: please consult us.



Rating (A)	Dimension X (in)	Dimension X (mm)	Handle	Length (inches)	Length (mm)	Reference
100 ... 400	5.31 ... 10.43	135 ... 265	S2 type	7.9	200	1400 **1020**
100 ... 400	5.31 ... 15.16	135 ... 385	S2 type	12.6	320	1400 **1032**
100 ... 400	5.31 ... 18.31	135 ... 465	S2 type	15.7	400	1400 **1040**
600 ... 1200	8.70 ... 13.50	221 ... 343	S3, S4 type	7.9	200	1401 **1520**
600 ... 1200	8.70 ... 18.23	221 ... 463	S3, S4 type	12.6	320	1401 **1532**
600 ... 1200	8.70 ... 21.38	221 ... 543	S3, S4 type	15.7	400	1401 **1540**

Alternative signaling S-type handle cover

Use

For single lever handles type S1, S2, S3 and double lever handle, type S4.

Other signalings: please consult us.

Handle signaling	Pack qty	Handle	Reference
Light grey	50	S2, S3 type	1401 **0001**
Dark grey	50	S2, S3 type	1401 **0011**
Light grey	50	S4 type	1401 **0031**
Dark grey	50	S4 type	1401 **0041**

S-type handle raiser

Use

Enables S-type handles to be fitted in place of existing older style Socomec handles. Adapter can also be utilized as a spacer to increase the distance between the panel door and the handle lever.

Dimensions

Adds 12 mm to the depth.

Handle signaling	Pack qty	Nema type	Reference
Black	10	1, 3R, 12	1493 **0000**

Shaft guide for external handle

Use

This accessory makes shaft introduction easier with up to 15 mm misalignment.

Required for a shaft length over 400 mm.

Description	Reference
Shaft guide	1429 **0000**

acces_260_a_2_cat

Auxiliary Contacts

Use

Pre-break and signaling of positions 0 and I.

Electrical characteristics

A300 for 100 to 400 A.
A600 for 600 to 1200 A.

acces_076_a_1_cat

NO/NC contact for 100 ... 1200 A

Rating (A)	No. of AC	Reference
100 ... 1200	1st	2799 **0021**
100 ... 1200	2nd	2799 **0022**

NO/NC contact for 100 ... 1200 A

Rating (A)	No. of AC	Reference
100 ... 1200	1st	2799 **0121**
100 ... 1200	2nd	2699 **0122**

Terminal screens

Use

Top or bottom protection against direct contact with terminals or connection parts.

Rating (A)	No. of poles	Position	Reference
100 ... 200	3 P	top	2798 **3021**
100 ... 200	3 P	bottom	2798 **8021**
100 ... 200	4 P	top / bottom	2798 **4021**
400	3 P	top	2798 **3041**
400	3 P	bottom	2798 **8041**
400	4 P	top / bottom	2798 **4041**
600	3 P	bottom	2798 **3060**(1)
600	4 P	bottom	2798 **4060**(1)
800 ... 1200	3 P	bottom	2798 **3120**(1)
800 ... 1200	4 P	bottom	2798 **4120**(1)

(1) Load side screen, the line side is included with the switch.

acces_079_a_1_cat

Terminal lugs

Use

Connection of bare copper cables onto the lugs (without lugs).

Rating max (A)	Wires range	No wires per lug	Lugs per kit	Wires	Reference
100 ... 200	#6 - 300MCM	1	2	Cu / Al	3954 **2020**
100 ... 200	#6 - 300MCM	1	3	Cu / Al	3954 **3020**
100 ... 200	#6 - 300MCM	1	4	Cu / Al	3954 **4020**
400	#4 - 600MCM	1	2	Cu / Al	3954 **2040**
400	#4 - 600MCM	1	3	Cu / Al	3954 **3040**
400	#4 - 600MCM	1	4	Cu / Al	3954 **4040**
400	2x (#6 - 350MCM)	2	2	Cu / Al	3954 **2041**
400	2x (#6 - 350MCM)	2	3	Cu / Al	3954 **3041**
400	2x (#6 - 350MCM)	2	4	Cu / Al	3954 **4041**
600	2x (#2 - 600MCM)	1	2	Cu / Al	3954 **2060**
600	2x (#2 - 600MCM)	2	3	Cu / Al	3954 **3060**
600	2x (#2 - 600MCM)	2	4	Cu / Al	3954 **4060**
800 ... 1200	4x (#2 - 600MCM)	2	6	Cu / Al	3954 **3120**
800 ... 1200	4x (#2 - 600MCM)	2	8	Cu / Al	3954 **4120**

ul_032_a

Characteristics

Characteristics according to UL98/CSA22.2#4

	SIRCO UL98 - 100 to 1200 A						
General use rating (A)	**100 A**	**200 A**	**400 A**	**600 A**	**800 A**	**1000 A**	**1200 A**
Short circuit rating at 600 VAC (kA)	200	200	200	200	100	100	100
Type of fuse	J	J	J	J	L	L	L
Max. fuse rating (A)	100	200	400	600	800	1000	1200
Max. motor hp / FLA 3 ph motor max.							
220-240 VAC	30 / 80	75 / 196	125 / 312	200 / 480	200 / 480	200 / 480	200 / 480
440-480 VAC	75 / 96	150 / 180	250 / 302	400 / 477	500 / 590	500 / 590	500 / 590
600 VAC	100 / 99	200 / 192	350 / 336	350 / 336	500 / 472	500 / 472	500 / 472
Max. motor hp / DC FLA motor max.							
125 VDC(1)	10 / 76	15 / 112	20 / 148	20 / 148			
250 VDC(2)	15 / 55	15 / 55	50 / 173	50 / 173			
Connection terminals							
Min. connection section / AWG	#6	#6	2x #6 / #4	2x #2	4x #2	4x #2	4x #2
Max. connection section / AWG	300MCM	300MCM	2x 350 / 600MCM	2x 600MCM	4x 600MCM	4x 600MCM	4x 600MCM
Mechanical characteristics							
Endurance (number of operating cycles)	10000	8000	6000	6000	3500	3500	3500
Operating torque (lbs.in/Nm)	88.5/10	88.5/10	128.3/14.5	327.5/37	442.5/50	442.5/50	442.5/50
Auxiliary contacts							
Electrical characteristics	A300	A300	A300	A600	A600	A600	A600

(1) 2 pole in series.
(2) 3 pole in series.

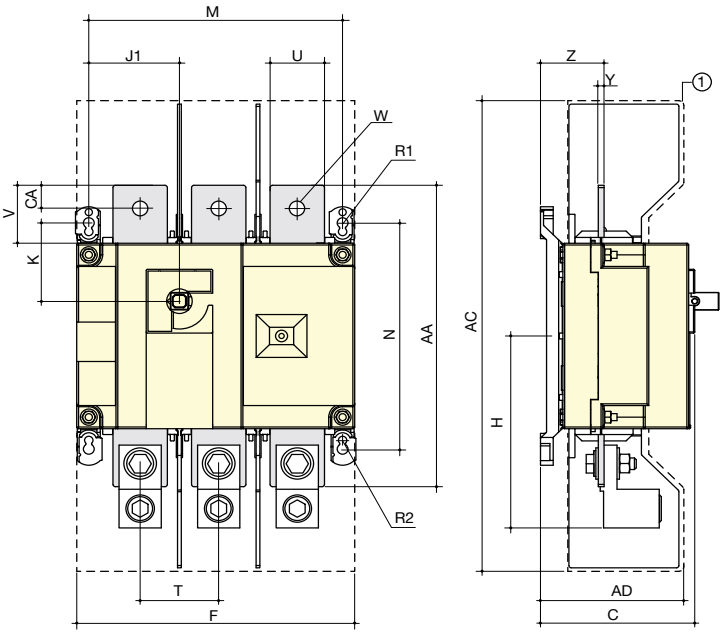
Characteristics according to IEC 60947-3

		SIRCO UL98 - 100 to 1200 A						
Thermal current I_{th} (40°C)		**100 A**	**200 A**	**400 A**	**600 A**	**800 A**	**1000 A**	**1200 A**
Rated insulation voltage U_i (V)		1000	1000	1000	1000	1000	1000	1000
Rated impulse withstand voltage U_{imp} (kV)		12	12	12	12	12	12	12
Rated operational currents I_e (A)								
Rated voltage	**Utilization category**	**A(1)**	**A(1)**	**A(1)**	**A(1)**	**A(1)**	**A(1)**	**A(1)**
400 VAC	AC-22 A	100	200	400	630	800	1000	1200
400 VAC	AC-23 A	100	200	400	630	800	1000	1000
690 VAC	AC-22 A	100	200	400	500	630	630	630
690 VAC	AC-23 A	100	200	315	200	400	400	400
Connection								
Min. Cu cable cross section (mm^2)		35	70	185	2 x 150	2 x 185	2 x 240	
Min. Cu busbar section (mm^2)					2 x 30 x 5	2 x 40 x 5	2 x 50 x 5	2 x 60 x 5
Operational power in AC-23 (kW)								
At 400 VAC without prebreaking AC in AC23 (kW)(2)(3)		51	100	220	355	450	560	560
At 500 VAC without prebreaking AC in AC23 (kW)(2)(3)		63	140	280	450	560	560	560
At 690 VAC without prebreaking AC in AC23 (kW)(2)(3)		90	185	185	185	400	400	400
Overload capacity (U_e 415 VAC)								
Rated short-circuit making capacity I_{cm} (kA peak)(4)		17,6	32	48	48	75	48	75

(1) Category with index A = frequent operation.
(2) A/B: Category with index A = frequent operation - Category with index B = infrequent operation.
(3) The power value is given for information only, the current values vary from one manufacturer to another.
(4) For a rated operating voltage U_e = 400 VAC.

Dimensions (in/mm)

100 to 400 A

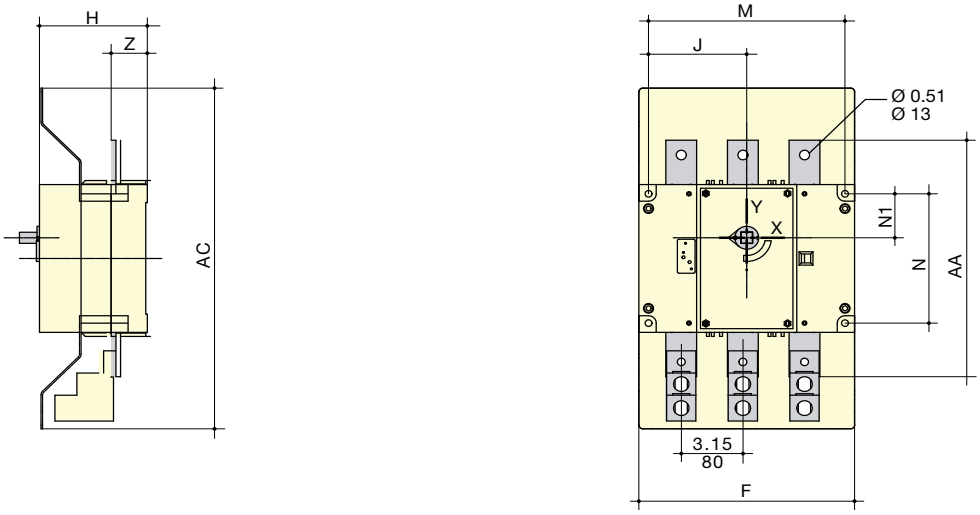


1. Terminal shrouds

sirco-ul_011_a_2_x_cat

Rating (A)	Unit	Overall dimensions	Terminal shrouds		Switch body						Switch mounting					Connection							
		C	AC	AD	F 3p.	F 4p.	H	J1 3p.	J1 4p.	K	M 3p.	M 4p.	N	R1	R2	T	U	V	W	Y	Z	AA	CA
100	in	3.72	10.1	3.05	7.09	9.06	4.22	2.17	4.13	1.8	6.3	8.27	5.31	0.35	0.27	1.97	0.98	1.18	0.43	0.14	1.35	6.3	0.6
	mm	94.6	256	77.5	180	230	107	55	105	45.6	160	210	135	9	7	50	25	30	11	3.5	34.4	160	15
200	in	3.72	10.1	3.05	7.09	9.06	4.22	2.17	4.13	1.8	6.3	8.27	5.31	0.35	0.27	1.97	0.98	1,18	0,43	0,14	1,35	6,3	0,6
	mm	94.6	256	77.5	180	230	107	55	105	45.6	160	210	135	9	7	50	25	30	11	3,5	34,4	160	15
400	in	4.92	16	4.15	9.05	11.4	6.53	2.95	5.31	2.65	8.26	10.6	7.67	0.35	0.27	2.56	1.77	1.97	0.43	0.2	2.08	10.2	0.8
	mm	128	406	115	230	290	166	75	135	67,5	210	270	195	9	7	65	45	50	13	5	53	260	20

600 A

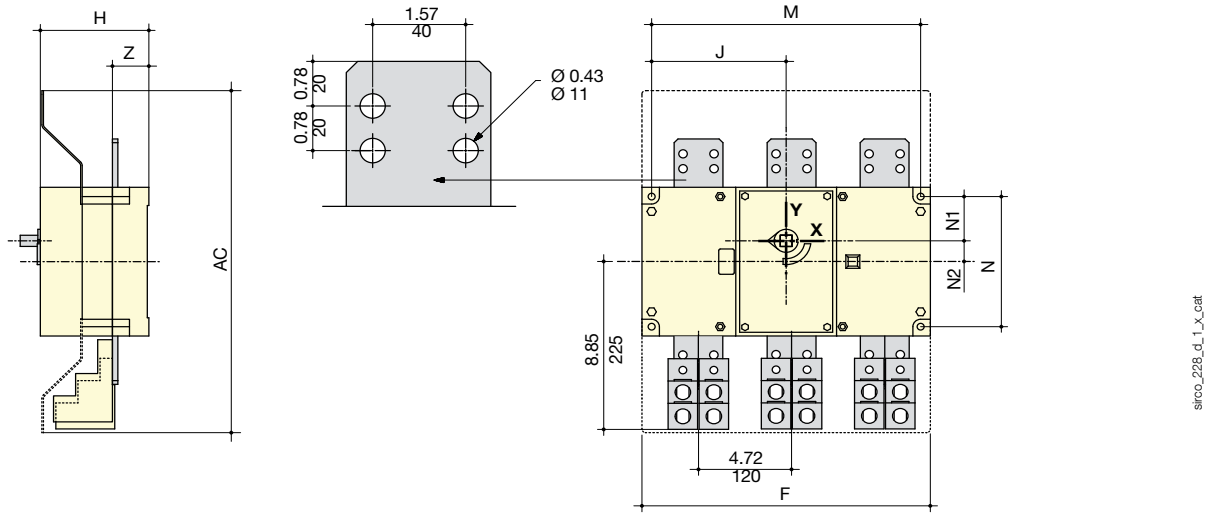


sirco_107_d_1_x_cat

Rating (A)	Unit	Terminal shrouds	Switch body					Switch mounting				Connection	
		AC	F 3p.	F 4p.	H	J 3p.	J 4p.	M 3p.	M 4p.	N	N1	AA	Z
600	in	18.12	11	14.17	5.5	5	6.59	10.03	13.19	6.88	2.34	12.6	1.85
	mm	460	280	360	140	127.5	167.5	255	335	175	59.5	320	47

Dimensions (in/mm) (continued)

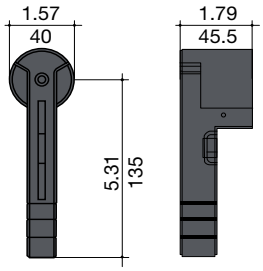
800 to 1200 A



Rating (A)	Unit	Terminal shrouds	Switch body					Switch mounting			
		AC	F 3p.	F 4p.	H	J 3p.	J 4p.	M 3p.	M 4p.	N	N1
800	in	18.12	14.64	19.37	5.5	6.83	9.19	13.66	18.38	6.88	2.34
	mm	460	372	492	140	173.5	233.5	347	467	175	59.5
1 000	in	18.12	14.64	19.37	5.5	6.83	9.19	13.66	18.38	6.88	2.34
	mm	460	372	492	140	173.5	233.5	347	467	175	59.5
1 200	in	18.12	14.64	19.37	5.5	6.83	9.19	13.66	18.38	6.88	2.34
	mm	460	372	492	140	173.5	233.5	347	467	175	59.5

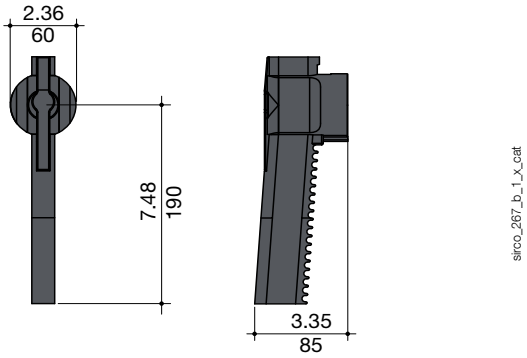
100 to 400 A

Front direct handle



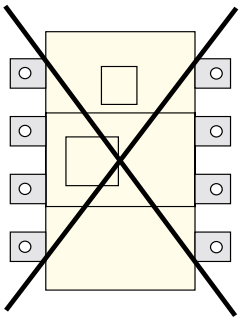
600 to 1200 A

Front direct handle



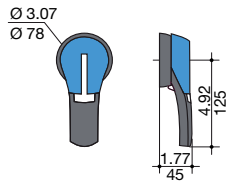
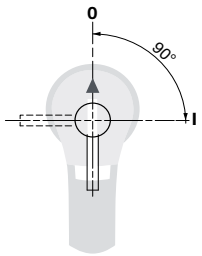
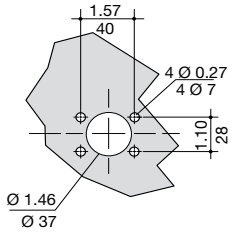
Mounting orientation

3/4 pole



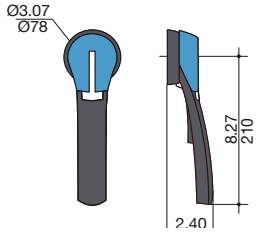
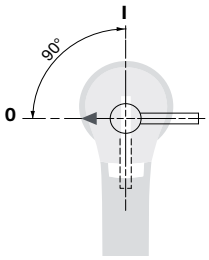
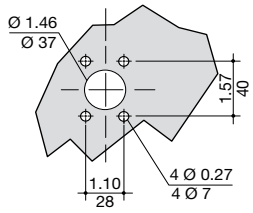
External handles dimensions (in/mm)

100 to 400 A

Handle type	Front operation Direction of operation	Door drilling
S2 type 		

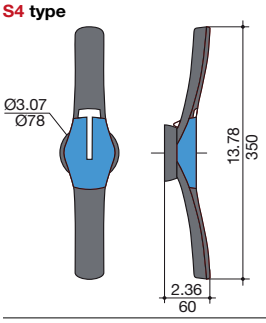
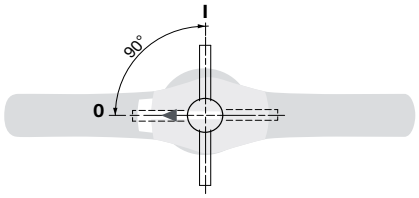
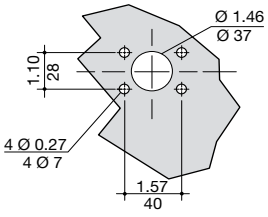
poign_013_a_1_us_cat

600 to 1200 A

Handle type	Front operation Direction of operation	Door drilling
S3 type 		

poign_046_a_1_gb_cat

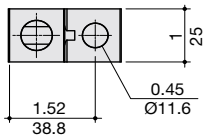
600 to 1200 A

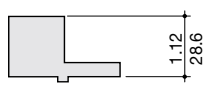
Handle type	Front operation Direction of operation	Door drilling
S4 type 		

poign_036_a_1_us_cat

Terminal lugs (in/mm)

100 to 200 A

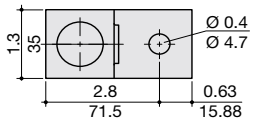


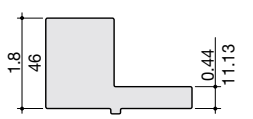


sirco_115_b_1_us_cat

300 kcmil

400 A

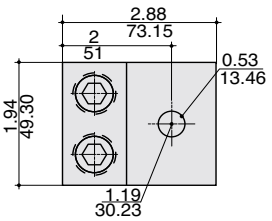


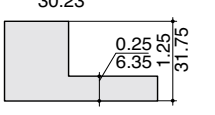


sirco-ul_010_b_1_us_cat

600 kcmil

400 A

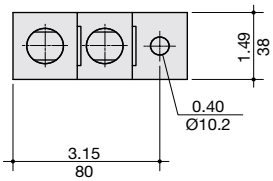


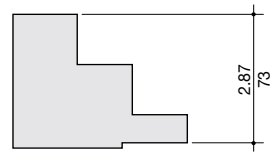


sirco-ul_026_b_1_us_cat

2 x 350 kcmil

600 to 1200 A





sirco_116_b_1_us_cat

2 x 600 kcmil

TVSS Surge switch

Special designs

TVSS (Transient Voltage Surge Suppressor) Surge Switch

sirco_123_a_2_cat

SIRCO *200 A*
3 pole

Strong points

> Compact product
> High performance

Conformity to standards(1)

> UL508,
Guide NRNT,
File E224992
> IEC 60947-3

(1) Product reference on request.

Customized solutions

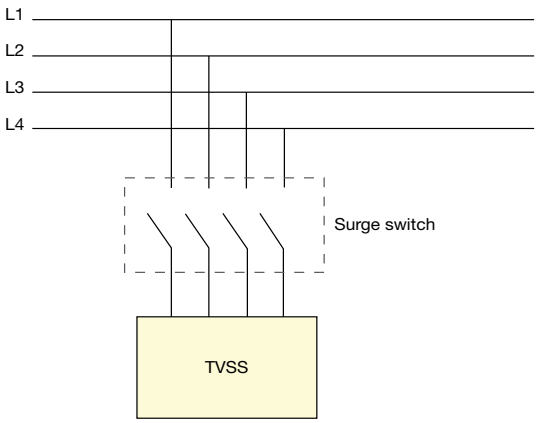
> Please consult us

Function

The **TVSS Surge switch** is an extremely compact, high performance, manually operated, non-fused switch. It is specifically designed to withstand the high surge current of 200 kA with an 8 x 20 µs waveform seen in today's transient voltage Surge Protective Device (SPD) applications. Socomec Surge Switch uses a unique contact design that actually clamp contacts tighter during a surge.

General characteristics

- 200 kA 8/20 µs shockwave withstand.
- Rated 100 A 600 VAC UL508 general use.
- High electrical and mechanical endurance.



sirco-uL_021_a_1_X_cat

socomec
Innovative Power Solutions

References

TVSS Surge Switch - Front operation - **3/4 pole**						
Rating (A)	**No. of poles**	**Switch body**	**Direct handle**	**Door interlocked external**	**Shaft for external handle**	**Terminal shrouds**
8/20 µs 200 KA 600 VAC	3 P	2700 **3017**	Black 2699 **5042** Red 2699 **5043**	S1 type Black 141F **2111** S1 type Red/Yellow 141G **2111** S1 type Black 141D **2111** S1 type Red/Yellow 141E **2111**	200 mm 1400 **1020** 320 mm 1400 **1032** 400 mm 1400 **1040**	3 P 2694 **3014**(1) 4 P 2694 **4014**(1)
	4 P	2700 **4017**				

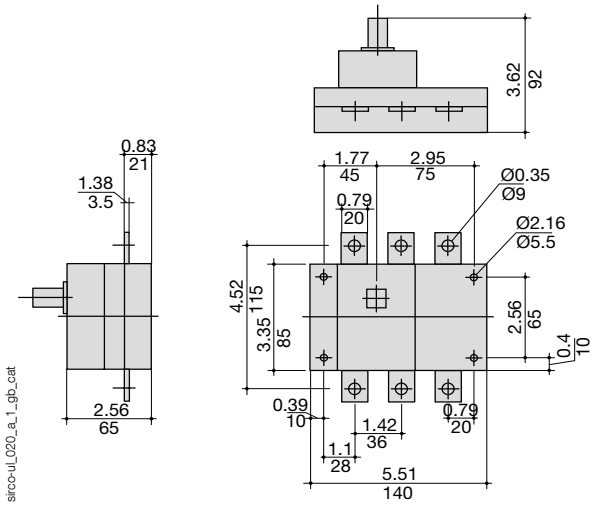
(1) Top or bottom.

UL characteristics

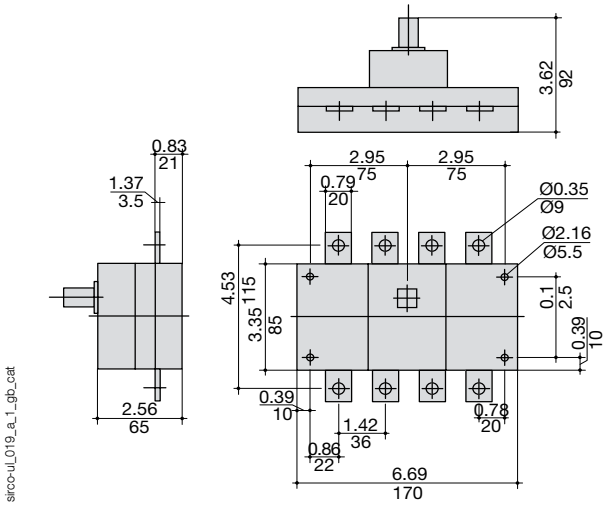
UL508 100 A 600 VAC General use

Dimensions (in/mm)

3 pole



4 pole



photovoltaic
SIRCO PV 125A
socomec

Photovoltaic range

A fully tested range for all your PV applications ..... *p. 44*

Photovoltaic disconnect switches

SIRCO MC PV
UL508i
25 to 45 A
p. 46

SIRCO PV
UL98B
100 to 2000 A
p. 54

SIRCO PV
UL98B compact
320 to 600 A
p. 78

Services & technical assistance: second nature!

For further information, see page 6.

A fully tested range for all your PV applications

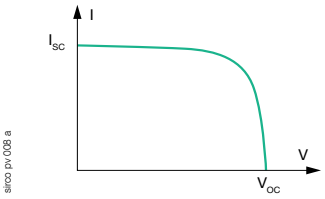
Using tested and certified components is key for the success of the design for any photovoltaic system. The SIRCO PV range is tested and certified according to main standards used in the photovoltaic industry.

Global approvals

Our SIRCO PV solar disconnect range meets UL98B, UL508i, IEC947-3 Standards and bear the CE mark. Using the SOCOMEC range in your design is therefore a unique opportunity to standardize your components and use the same switches on 5 continents.

PV critical current

Under particular conditions (cloudy, days, evenings…) PV systems can deliver a low current at high voltage. This type of current is extremely difficult to interrupt.
Standard AC or DC products are usually not tested in these particular conditions and could therefore be unable to interrupt low currents at high DC voltage. If the electrical arc produced is not interrupted it may result in operator injury or fire. The SIRCO PV range has been specifically designed and tested to interrupt the current under all current/voltage conditions.



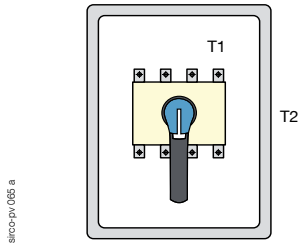
Current (I)/Voltage (V) curve of a PV system. When the current decreases (in the evening or when cloudy) the voltage may increase. SC = Short-circuit, OC = Open-circuit

Short Circuit

The complete UL98B range is tested to withstand a short circuit of 10 kA for a duration of 50 ms without any specific protection. This allows the use of any overcurrent protection device for line protection.
Our UL508i have been tested at 5 kA with fuses.

Thermal current test

Thermal tests have been performed according to both IEC and UL standards.



According to UL Standard 98B, the maximum difference authorized between T1 (temperature of terminals) and T2 is 40 °K when the switch is fully loaded.

According to IEC947, switches are tested in free air. Maximum temperature elevation on terminals is 70 °K.

Our UL98B switches are certified up to 60 °C AMBIENT without derating

The standards for PV disconnect switches

USA

- UL98B; Disconnect switches for photovoltaïc systems, usually for rating above 40 A.
- UL508i; Manual disconnect switches for photovoltaic systems, usually for ratings up to 40 A.
- UL1741; Inverters and interconnection system equipment.

Worldwide

- IEC 60947; Low-voltage switchgear and controlgear. Part 3; Switches, disconnectors, switch-disconnectors and fuse-combination units.

The 5th largest European power laboratory

Since 1965, the Pierre Siat test laboratory has used its expertise to guarantee the reliability and compliance of SOCOMEC products and solutions.

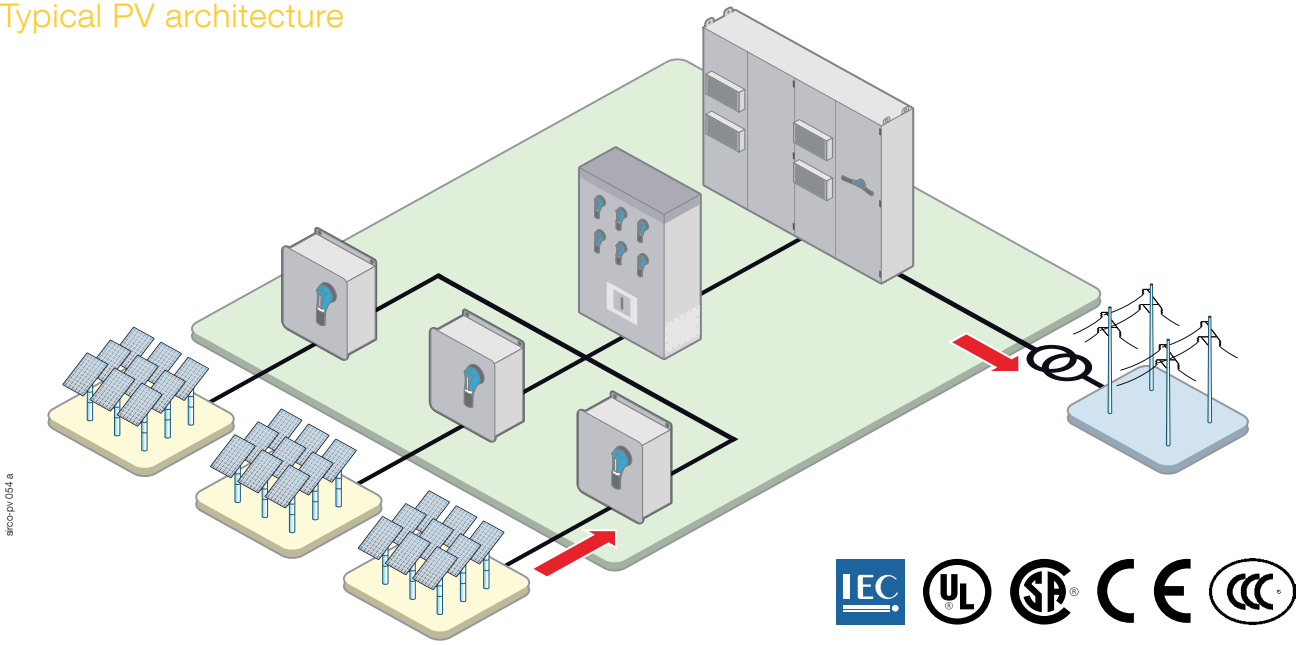
This totally independent laboratory is recognized by the major certification bodies worldwide: member of UL, CSA and KEMA. It also works in partnership with numerous international certification organizations (CEBEC, ASTA, Lloyd's, Bureau Véritas, GOST-R, etc.). The quality and safety requirements specific to each country are therefore fully taken into account.

With its 100 MVA (I_{dc} 100 kA rms 1 s) short-circuit platform, three 10 kA overload platforms and numerous other test instruments, in facilities covering 1500 m^2, the Pierre Siat laboratory is currently the 2nd largest French power laboratory. It combines expertise in electricity and mechanics, pneumatics and computing.

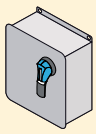
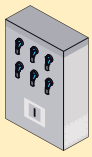
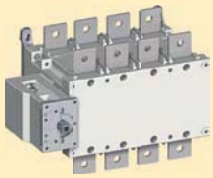
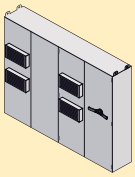
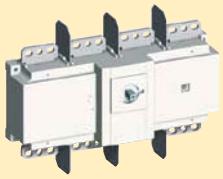
socomec Innovative Power Solutions

The SIRCO PV range provides safe disconnection and isolation at all levels within your PV installation.

Typical PV architecture



The SOCOMEC solutions

LEVEL OF INSTALLATION	SOCOMEC SOLUTIONS	
Combiner box		
		SIRCO PV One circuit up to 500 A at 1500 VDC
		SIRCO MC PV UL508i One circuit or two circuits up to 1000 VDC
Recombiner box		
		SIRCO PV 4 circuits up to 500 A at 1000 VDC 2 circuits up to 500 A at 1500 VDC
Inverter		
		SIRCO PV One circuit up to 2000 A at 1000 VDC up to 2000 A at 1500 VDC

SIRCO MC PV UL508i

Disconnect switches for photovoltaic applications
from 25 to 45 A, up to 1000 VDC

SIRCO MC PV *25 A - 1000 VDC*
DIN-rail mounting

The solution for

- Residential
- Buildings
- Solar parks

Strong points

- Compact
- High breaking capacity up to 1000 VDC
- Safety
- Easy mounting

Conformity to standards

- UL508i
- IEC 60947-3

Approvals and certifications(1)

(1) Product reference on request.

Function

SIRCO MC PV are DC disconnect switches. They make and break under load conditions and provide optimum safety isolation for any PV circuit.

Advantages

Compact

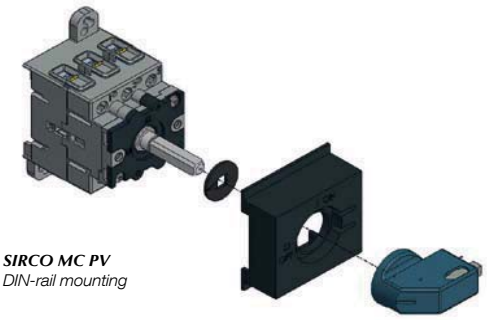
Thanks to its compact design, the space needed within the combiner box or the solar inverter is greatly reduced.

High breaking capacity up to 1000 VDC

- Making and breaking capacity under load conditions up to 1000 VDC.
- Specific photovoltaic test beyond requirements of UL508i and IEC 60947-3 standard.

Safety

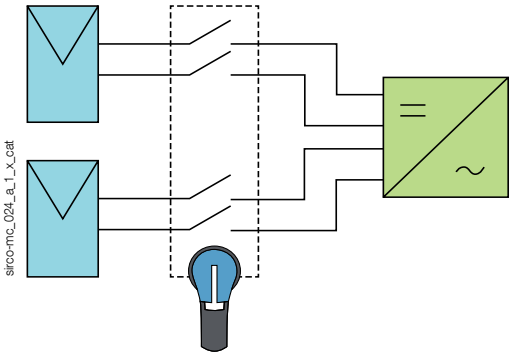
- Bridging bars are factory fitted for easier, quicker and safer connection.
- Direct access to connection terminals for adequate tightening.

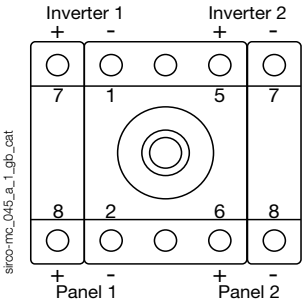


SIRCO MC PV
DIN-rail mounting

Multi-circuit switching

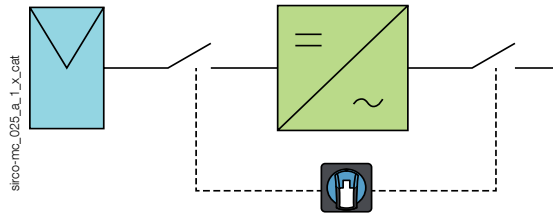
- The SIRCO MC PV for dual circuits (2 MPPT: Maximum Power Point Tracking) enables connection of two independent photovoltaic circuits to a single switch in order to reduce the costs of the global solution.

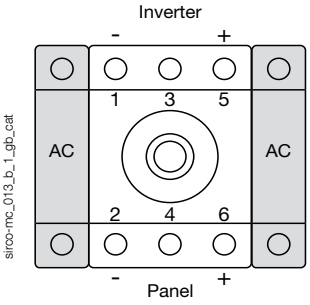




Completely isolate the inverter within one operation

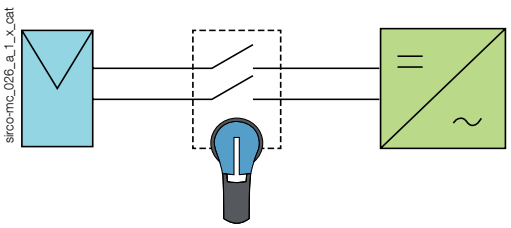
- The SIRCO MC PV with two additional AC poles can be integrated into the inverter to provide complete and simultaneous isolation of the PV and AC circuits. This improves safety and reduces the overall product size.

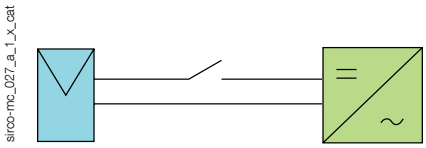




What you need to know

For grounded or ungrounded networks:
It is possible to use the SIRCO MC PV in both network systems, either switching one or both polarities.





References

SIRCO MC PV 600 VDC

Rating (A)	Circuit type	No. of poles	Switch body	Direct handle	External handle	Shaft for external handle	Auxiliary contact
25 A	Single PV circuit	2 P	21PV **2102-UL**	MC01 type Blue 2119 **1012**	S00 type Black 4.4X 147D **0111**(1) Red 4.4X 147R **0111**(1)	S00 type 265 mm 2107 **0517**	1 contact NC+NO 2119 **0001**
	Dual PV circuit	4 P	21PV **5102-UL**				
45 A	Single PV circuit	4 P	21PV **4144**				
	Dual PV circuit	8 P	21PV **8144**	MC01 type Blue 2119 **1412**			

(1) Door interlocking.

SIRCO MC PV 1000 VDC

Rating (A)	Circuit type	No. of poles	Switch body	Direct handle	External handle	Shaft for external handle	Auxiliary contact
32 A	Single PV circuit	4 P	21PV **4144**	MC01 type Black 2119 **1012**	S00 type Black 4.4X 147D **0111**(1) Red 4.4X 147R **0111**(1)	S00 type 265 mm 2107 **0517**	1 contact NC+NO 2119 **0001**
	Dual PV circuit	8 P	21PV **8144**	MC01 type Black 2119 **1412**			

(1) Door interlocking.

Accessories

Direct operation handle

Use

The direct operation conversion kit requires an additional 4 mm distance on each side of the 2 and 3 pole device.

Rating (A)	Handle color	Type of locking	Handle type	45 mm modular DIN front plate	Reference
25 … 45	Blue	-	MC0	yes	2119 **0012**(1)
25 … 45	Blue	1 padlock Ø 5 mm	MC01	yes	2119 **1012**

(1) Standard handle.

MC0 handle

acces_305_a_1_cat

2 MPPT 600 V

Rating (A)	Handle color	Type of locking	Handle type	45 mm modular DIN front plate	Reference
25	Blue	-	MC0	yes	2119 **0012**
25	Blue	1 padlock Ø 5 mm	MC01	yes	2119 **1012**
45	Blue	1 padlock Ø 5 mm	MC01	yes	2119 **1412**

MC01 handle

acces_293_a_1_cat

External operation handle

Use

The external control will allow the operator to safely disconnect and isolate the solar strings prior to any intervention.

External controls are user-friendly and adapted to meet requirements of residential installations, large roofs and ground-based generators.

acces_341_a_1_cat

S00 handle

acces_302_a_1_cat

MC1 handle

DIN-rail or back plate mounting

Rating (A)	Handle type	Handle color	Type of locking	Protection degree[1]	Reference
25 … 45	MC1	Black	3 padlocks Ø 9 mm	4.4X	2119 **3312**
25 … 45	MC1	Red/Yellow	3 padlocks Ø 9 mm	4.4X	2119 **3313**
25 … 45	S00	Black	3 padlocks Ø 8 mm	4.4X	147D **0111**
25 … 45	S00	Red/Yellow	3 padlocks Ø 8 mm	4.4X	147R **0111**

(1) Nema/UL protection degree.

Shaft for external handle

Use

The shaft can be adjusted and cut depending on the need.

Shaft length

Device + shaft:
- 265 mm

acces_297_a_1_cat

DIN-rail or back plate mounting

Rating (A)	Device + shaft Length (mm)	Reference
25 … 45	265	2107 **0517**[1]

(1) Shaft for door interlocking.

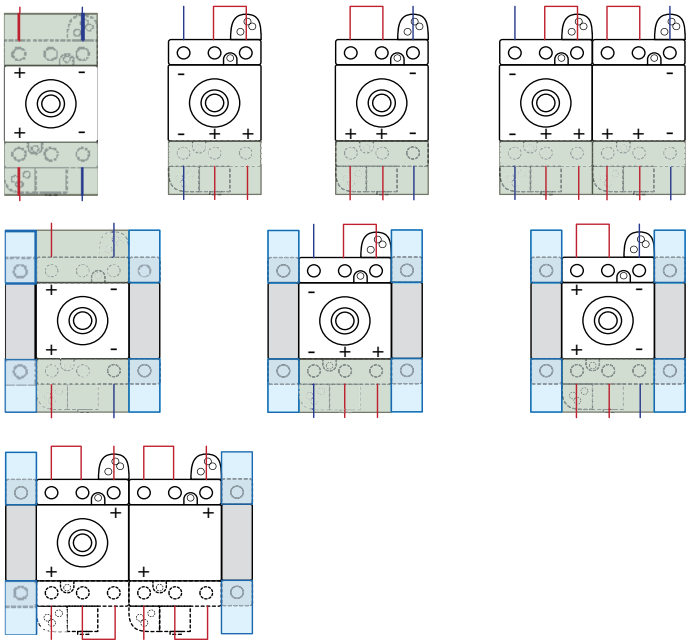
Terminal shrouds

Use

Top or bottom protection against direct contact with the terminals or connection parts.
1 and 3 poles are available.
The SIRCO MC PV disconnect switch is pre-bridged. Terminal covers are mounted on the top or bottom free space of the device.
Possibility to assemble a terminal shroud on the bridge side by removing the insulating material of the series connection bar (irreversible step).

For SIRCO MC PV

Rating (A)	Type of mounting	No. of poles	Position	Reference
25 … 45	DIN-rail	1 P	top or bottom	2194 **1004**
25 … 45	DIN-rail	3 P	top or bottom	2194 **3004**



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acces_299_a_1_cat

Terminal shrouds 1 pole

acces_300_a_1_cat

Terminal shrouds 3 pole

Characteristics

as per standard UL508i

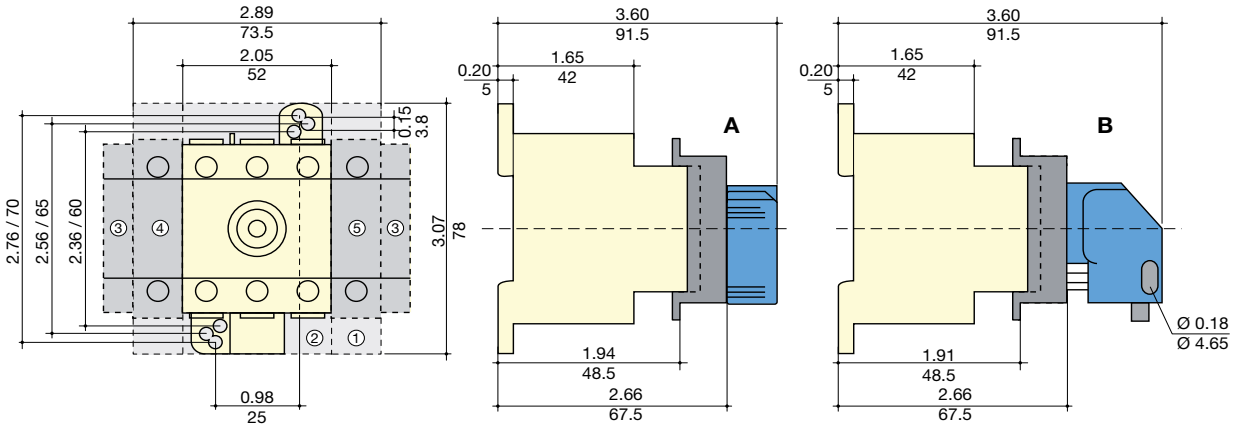
			25 A	45 A
General use rating with 200% overload extra test				
Rated voltage	**Number of poles of the device**	**Number of PV circuits**	**(A)**	**(A)**
600 VDC	2 P	1	25	-
600 VDC	4 P	1	-	45
600 VDC	2 x 2 P	2	25	-
600 VDC	2 x 4 P	2	-	45
1000 VDC	4 P	1	-	32
1000 VDC	2 x 4 P	2	-	32
Short-circuit capacity at 600 VDC				
Prospective short-circuit current (kA rms)			5	5
Type of fuse			gPV	gPV
Associated fuse rating (A)			25	80
Short-circuit capacity at 1000 VDC				
Prospective short-circuit current (kA rms)			5	5
Connection terminals				
Min. connection wire range / AWG (solid or stranded)			14-7	14-3
Mechanical characteristics				
Durability (number of operating cycles)			30000	30000
Tightening torque (Nm)			2	2

as per standard IEC 60947-3

Rated current			**25 A**	**45 A**
Thermal current I_{th} at 40°C (A)			**25**	**45**
Thermal current at 50°C (A)			**25**	**45**
Thermal current at 60°C (A)			**25**	**45**
Rated insulation voltage U_i (V)			1000	1000
Rated impulse withstand voltage U_{imp} (kV)			8	8
Rated operational currents I_e (A)				
Rated voltage	**Number of poles of the device**	**Number of PV circuits**	**(A)**	**(A)**
600 VDC	2 P	1	30	-
600 VDC	4 P	1	-	40
600 VDC	2 x 2 P	2	30	-
600 VDC	2 x 4 P	2	-	40
1000 VDC	2 P	1	10	-
1000 VDC	4 P	1	-	40
1000 VDC	2 x 2 P	2	10	-
1000 VDC	2 x 4 P	2	-	40

Dimensions (in/mm)

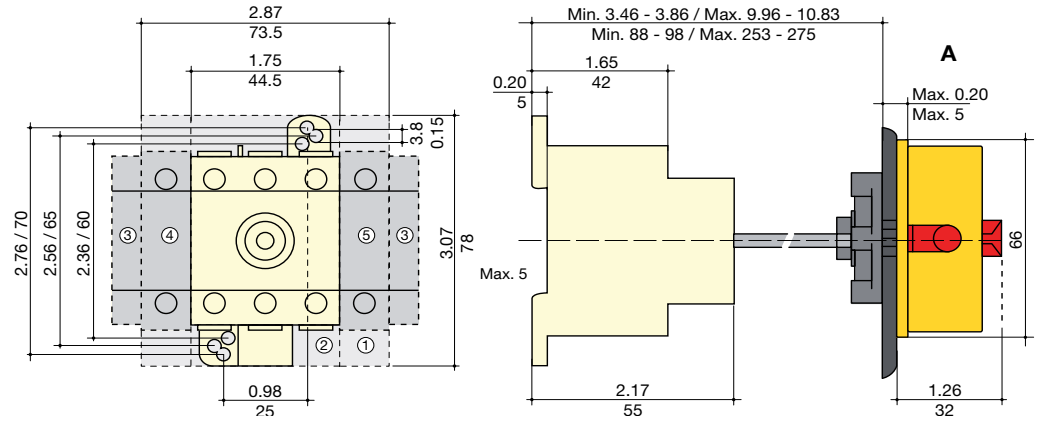
DIN-rail mounting - Direct operation



1. Terminal shrouds 1P.
2. Terminal shrouds 3P.
3. Auxiliary contact.
4. AC power pole.
5. AC or PV power pole.

A. MC0 handle
B. MC01 handle

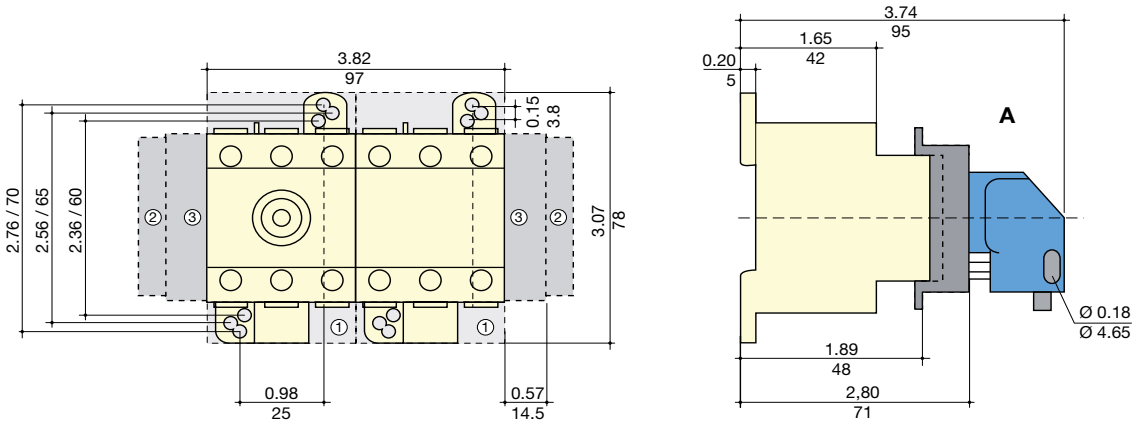
DIN-rail mounting - External operation



1. Terminal shrouds 1P.
2. Terminal shrouds 3P.
3. Auxiliary contact.
4. AC power pole.
5. AC or PV power pole.

A. MC1 handle

2 MPPT - 45 A - 600 VDC and 32 A - 1000 VDC - DIN-rail mounting - Direct operation

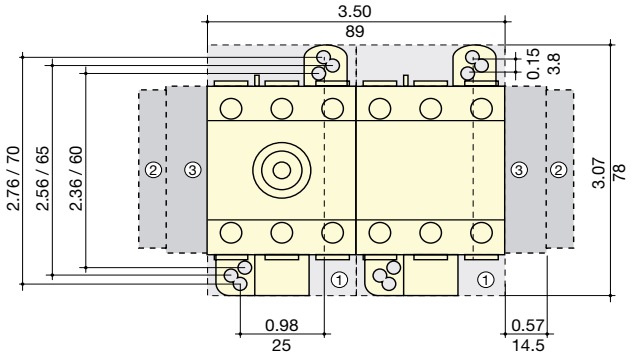


1. Terminal shrouds 3P.
2. Auxiliary contact.
3. PV power pole.

A. MC01 handle.

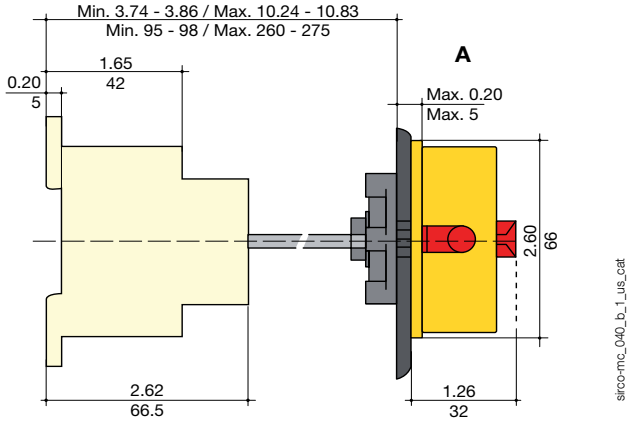
Dimensions (continued)

DIN-rail mounting - External operation



1. Terminal shrouds 3P.

2. Auxiliary contact.

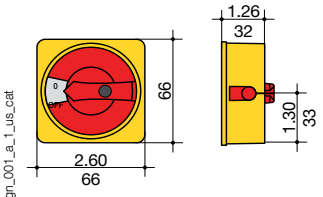
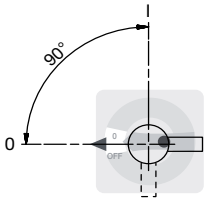
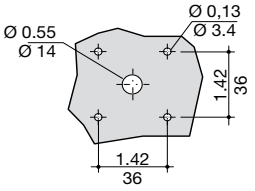


A. MC1 handle.

sirco-mc_040_b_1_us_cat

Dimensions for external handles (in/mm)

DIN-rail or back plate mounting

Handle type	Front operation Direction of operation	Door drilling
MC1 type 		

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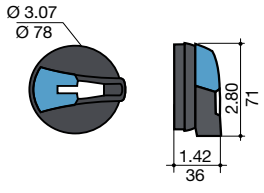
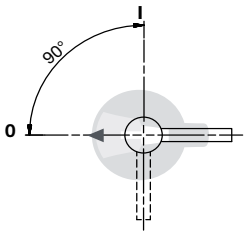
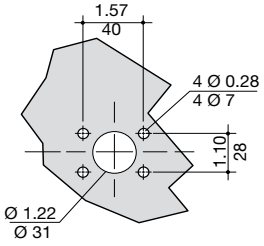
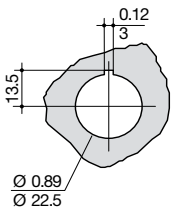
Handle type	Front operation Direction of operation	Door drilling
S00 type 		With 4 fixing screws  With fixing nut 

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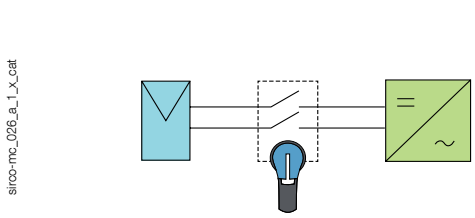
socomec
Innovative Power Solutions

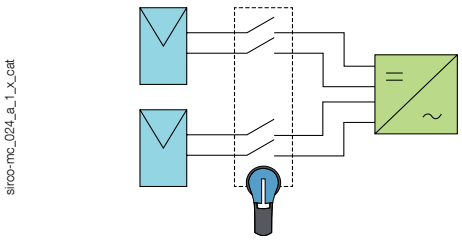
Poles connections

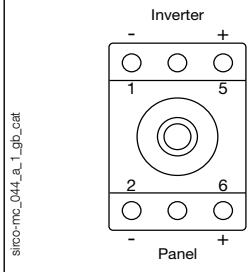
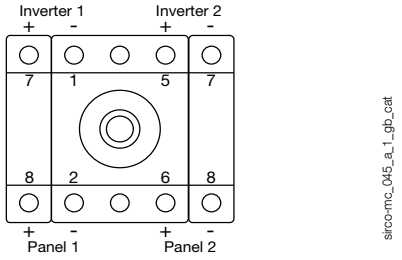
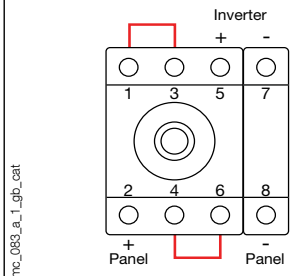
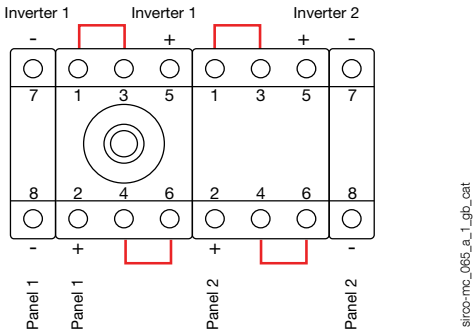
Switching of polarities + and - (1)

Single PV circuit



Dual PV circuit



Rating	Single PV circuit	Dual PV circuit
25 A - 600 VDC	21PV **2102-UL** 	21PV **5102-UL** 
45 A - 600 VDC 32 A - 1000 VDC	21PV **4144** 	21PV **8144** 

(1) For grounded systems, single polarity switching, a bridge shall be added.
For spare bridging bars, please consult use.

SIRCO PV UL98B

Disconnect switches for photovoltaic applications
from 100 to 2000 A, up to 1500 VDC

Function

SIRCO PV UL98B are manually operated multipolar disconnect switches. They make and break under load conditions and provide safety isolation for any PV circuit up to 1000 VDC (as per UL98B standard) and 1500 VDC (as per IEC 60947-3). They comply with NEC Atr. 690 (US National Electrical Code) concerning photovoltaic installations. They are compliant for use within solar inverters and enclosures governed by standard UL1741.

SIRCO PV are extremely durable switches that have been tested and approved for use in the most demanding environments.

They have been designed and tested for all types of applications: Grounded, floating or bipolar.

Advantages

Performance

A glass fibre reinforced polyester break chamber with an arc extinguishing system provides a patented safety disconnection system offering rapid extinguishing of the electric arc up to 1500 VDC and current interruption up to 2000 A.

Back-to-back double disconnect switch

The system of back-to-back double switches enables:

- on load operation of two switches with a single handle,
- compact solution when connecting two separate photovoltaic circuits compared with the use of two separate switches,
- easy connection,
- voltages above 1000 VDC are broken by the use of two poles in series.

The solution for

- Combiner box
- Recombiner box
- Inverter

Strong points

- Patented switching technology
- Positive break indication
- Up to 1000 VDC as per characteristics by UL98B
- Up to 1500 VDC as per characteristics by IEC 60947-3
- Suitable for use in accordance with NEC Art. 690

Conformity to standards

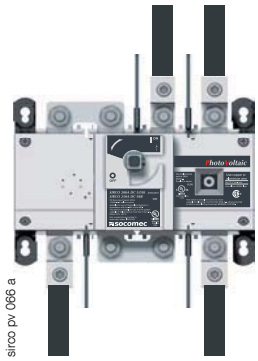
- UL98B Guide WHVA, file E346418
- CSA C22.2#4, Class 4651-02, file 112964
- NEC Art 690 Issue 2011
- IEC 60947-3

Approvals and certifications(1)

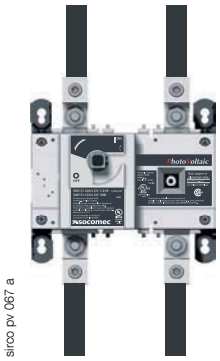
(1) Product reference on request.

New patented switching technology to break 500 VDC per pole

Most PV systems today are designed at 1000 VDC. Our new range of switches allows on-load breaking of 1000 VDC on just 2 poles. This innovation provides an extremely compact solution.



Classic solution
Example of connection of a 1000 VDC disconnect.



New
With our new range we can break 1000 VDC with 2 poles in series.

Optimise your investment

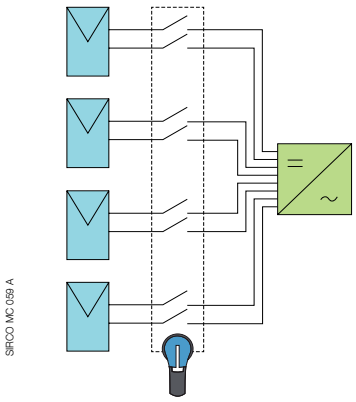
- Limit costs by reducing the number of jumpers per device.
- Gain time by having a less number of jumpers to install.
- Reduce the overall heat dissipation of the switch. A 2 pole SIRCO PV switch takes direct advantage of this, leading to possibility to use a smaller enclosure.

Limit potential risk

PV equipment is subject to extreme variation in temperature. Point of connection are therefore subject to potential loosening of connection due to breaking cooling effect. Limiting the number of poles greatly reduces the risk of a loose connection.

Allows to disconnect up to 4 circuits with one switch ("The Worlds first")

A compact and cost effective solution for recombiner applications. Allows to break up to 24 circuits by respecting the NEC article 690.



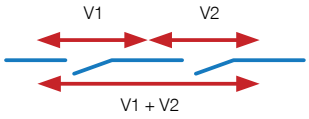
4 MPPT switches, 4 circuits are switched together.

350 A 1000 VDC 4 circuits.

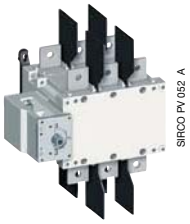
Achieving 1500 VDC characteristics in a compact footprint

SOCOMEC's new technology enables utilization at 1500 VDC by connecting three poles in series.

- Each pole of a switch has a maximum voltage breaking capacity. To break a high DC voltage it is necessary to connect poles in series. The global on-load breaking capacity of a switch is determined by multiplying the max voltage breaking capacity per pole by the number of poles in series.
- Paralleling the poles on our double-stack design permits a higher current rating to be achieved.



400 A 1500 VDC



800 A 1500 VDC with a 400 A double stack switch.

References

1000 VDC - Back plate mounting

Rating (A)	Frame size	No. of poles	Switch body	External handle	Shaft for external handle	Bridging bars
1 PV circuit						
100 A	B4	2 P	27PV **2009**	S2 type Black 1, 3R, 12 142F **2111**(1) Red/Yellow 1, 3R, 12 142G **2111**(1) Black 4, 4X 142D **2111**(1) Red/Yellow 4, 4X 142E **2111**(1)	200 mm 7.9 inches 1400 **1020** 320 mm 12.6 inches 1400 **1032** 400 mm 15.7 inches 1400 **1040**(2)	1x 2709 **1020**
200 A	B4		27PV **2019**			
250 A	B4		27PV **2024**			
325 A	B5		27PV **2032**			1x 2709 **1041**
400 A	B5		27PV **2039**			2x 2709 **1041**
600 A	B6	4 P	27PV **4060**	S3 type Black 4, 4X 143D **3111**(1) Red/Yellow 4, 4X 143E **3111**(1)	200 mm 7.9 inches 1401 **1520** 320 mm 12.6 inches 1401 **1532** 400 mm 15.7 inches 1401 **1540**(2)	2x 2709 **0062**
800 A	B7		27DC **4081**	S4 type Black 4, 4X 144D **3111**(1) Red/Yellow 4, 4X 144E **3111**(1)		2x 2709 **0081**
1200 A	B7		27DC **4121**			2x 2709 **0121**
2000 A	$B7_{DS}$	8 P	27DC **4201**	V1 type Black 3R, 12 2799 **7145**	320 mm 12.6 inches 4199 **3018**	
2 PV circuits						
100 A	$B4_{DS}$	4 P	27PV **5009**	S2 type Black 1, 3R, 12 142F **2111**(1) Red/Yellow 1, 3R, 12 142G **2111**(1) Black 4, 4X 142D **2111**(1) Red/Yellow 4, 4X 142E **2111**(1)	200 mm 7.9 inches 1400 **1020** 320 mm 12.6 inches 1400 **1032** 400 mm 15.7 inches 1400 **1040**(2)	2x 2709 **1020**
250 A	$B4_{DS}$		27PV **5024**			4x 2709 **1020**
325 A	B5		27PV **4032**			2x 2709 **0027**
400 A	B5		27PV **4039**			2x 2709 **0045** (2 units)
600 A	$B6_{DS}$	8 P	27PV **8060**	V1 type Black 3R, 12 2799 **7145**	320 mm 12.6 inches 4199 **3018**	4x 2709 **0062**
800 A	$B7_{DS}$		27DC **8081**			4x 2709 **0121**
1000 A	$B7_{DS}$		27DC **8101**			
4 PV circuits						
350 A	$B5_{DS}$	8 P	27PV **8039**	S3 type Black 4, 4X 143D **3111**(1) Red/Yellow 4, 4X 143E **3111**(1)	200 mm 7.9 inches 1401 **1520** 320 mm 12.6 inches 1401 **1532** 400 mm 15.7 inches 1401 **1540**(2)	4x 2709 **0045**

(1) Defeatable handle.
(2) Shaft guide reference 1429 0000 is required for shaft length over 15.7 inches (400mm).

1500 VDC - Back plate mounting

UL98B certification limit is 1000 VDC, that's why SIRCO PV UL switches are certified by the UL standard up to 1000 VDC and self-certified up to 1500 VDC.

Rating (A)	Frame size	No. of poles	Switch body	External handle	Shaft for external handle	Bridging bars
1 PV circuit						
275 A	B5	3 P	27PV **3026**	S2 type Black 1, 3R, 12 142F **2111**(1) Red/Yellow 1, 3R, 12 142G **2111**(1) Black 4, 4X 142D **2111**(1) Red/Yellow 4, 4X 142E **2111**(1)	200 mm 7.9 inches 1400 **1020** 320 mm 12.6 inches 1400 **1032** 400 mm 15.7 inches 1400 **1040**(2)	2x 2709 **0027** (1 unit)
325 A	B5		27PV **3032**			
400 A	B5		27PV **3039**			2x 2709 **0045** (3 units)
600 A	$B6_{DS}$	8 P	27PV **8060**	V1 type Black 3R, 12 2799 **7145**	320 mm 12.6 inches 4199 **3018**	4x 2709 **0062** (3 units)
800 A	$B7_{DS}$		27DC **8081**			4x 2709 **0121** (2 units)
1000 A	$B7_{DS}$		27DC **8101**			
2 PV circuits						
275 A	$B5_{DS}$	6 P	27PV **6026**	S3 type Black 4, 4X 143D **3111**(1) Red/Yellow 4, 4X 143E **3111**(1)	200 mm 7.9 inches 1401 **1520** 320 mm 12.6 inches 1401 **1532** 400 mm 15.7 inches 1401 **1540(2)**	4x 2709 **0027** (1 unit)
350 A	$B5_{DS}$		27PV **6039**			4x 2709 **0045** (2 units)

(1) Defeatable handle.
(2) Shaft guide reference 1429 0000 is required for shaft length over 15.7 inches (400mm).

Accessories

External operation

Use

In a combiner box, located close to the solar cell strings, or located close to the inverter, we recommend to use a door interlocked external handle for its safety features.

Door interlocked external operation handles include an escutcheon, are padlockable and must be utilized with an extension shaft.

Example

The locking function of the enclosure in the "ON" position will force the operator to safely disconnect and isolate the solar cell strings prior to any intervention. Opening the door when the switch is on "ON" position is possible by defeating the locking function using a tool (authorized persons only). The interlocking function is restored when the door is re-closed.

S2 type handle

Reinforced S2 type handle(1)

(1) Please consult us.

Frame size	Handle type	Handle color	Nema degree of protection	Reference
B4 … B5 $B4_{DS}$	S2	Black	1, 3R, 12	142F **2111**
		Red/Yellow		142G **2111**
		Black	4, 4X	142D **2111**
		Red/Yellow		142E **2111**
$B5_{DS}$ B6	S3	Black		143D **3111**
		Red/Yellow		143E **3111**
B7	S4	Black		144D **3111**
		Red/Yellow		144E **3111**
$B6_{DS}$ … $B7_{DS}$	V1	Black	1, 3R, 12	2799 **7145**

S3 type handle

S4 type handle

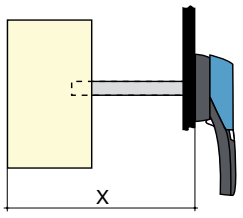
V1 type handle

Shaft for external handle

Use

Standard lengths:
- 7.9 in / 200 mm,
- 12.6 in / 320 mm,
- 15.7 in / 400 mm.

Other lengths: please consult us.



Frame size	Handle type	Dimension (inches)	Dimension X (mm)	Length (inches)	Length (mm)	Reference
B4	S2	6 … 11.6	150 … 295	7.9	200	1400 **1020**
		6 … 16.3	150 … 415	12.6	320	1400 **1032**
		6 … 19.4	150 … 495	15.7	400	1400 **1040**
B5		8 … 12.9	203 … 328	7.9	200	1400 **1020**
		8 … 17.6	203 … 448	12.6	320	1400 **1032**
		8 … 20.7	203 … 525	15.7	400	1400 **1040**
B6	S3	8.70 … 13.50	220 … 343	7.9	200	1401 **1520**
		8.70 … 18.23	220 … 463	12.6	320	1401 **1532**
		8.70 … 21.38	220 … 543	15.7	400	1401 **1540**
B7	S4	12 … 14.4	305 … 366	7.9	200	1401 **1520**
		12 … 19.1	305 … 485	12.6	320	1401 **1532**
		12 … 22.2	305 … 564	15.7	400	1401 **1540**
$B4_{DS}$	S2	12 … 14.3	305 … 363	7.9	200	1400 **1020**
		12 … 19	305 … 483	12.6	320	1400 **1032**
		12 … 22.10	305 … 561	15.7	400	1400 **1040**
$B5_{DS}$	S3, S4	16 … 18.4	406 … 467	7.9	200	1401 **1520**
		16 … 23.1	406 … 589	12.6	320	1401 **1532**
		16 … 26.3	406 … 668	15.7	400	1401 **1540**
$B6_{DS}$	V1	20 … 28.1	508 … 714	12.6	320	4199 **3018**
		20 … 31.3	508 … 795	15.7	400	4199 **3019**
$B7_{DS}$		20 … 28.1	508 … 714	12.6	320	4199 **3018**
		20 … 39.4	508 … 795	15.7	400	4199 **3019**

S-type handle adapter

Use
For handles S2, S3 and S4.

Dimensions
Increases the distance between the handle grip and the door by 12 mm, for better handling.

Color	Nema degree of protection	To be ordered in multiples of	Reference
Black	1, 3R, 12	10	1493 **0000**

Alternative S-type handle cover colors

Use
For handles S2, S3 and S4.

Other colors: please consult us.

Handle color	Handle type	To be ordered in multiples of	Reference
Light grey	S2, S3	50	1401 **0001**
Dark grey	S2, S3	50	1401 **0011**
Light grey	S4	50	1401 **0031**
Dark grey	S4	50	1401 **0041**

Auxiliary contact

Use
Pre-break and signaling of positions 0 and I:
- 1 to 2 NO/NC auxiliary contacts,
- 1 to 2 low level NO/NC auxiliary contacts.

Electrical characteristics
A300.

NO/NC contact

Frame size	Position AC	Type	Reference
B4 … B7	1 contact	NO/NC	2799 **0021**
	2 contacts		2799 **0022**
$B4_{DS}$ … $B7_{DS}$	1 contact		4159 **0021**

Low level NO/NC auxiliary contacts

Frame size	Position AC	Type	Reference
B4 … B7	1 contact	NO/NC	2799 **0121**
	2 contacts		2799 **0122**
$B4_{DS}$ … $B7_{DS}$	1 contact		4159 **0022**

Terminal screen

Use
Top or bottom protection against direct contact with terminals or connection parts.

Frame size	No. of poles	Position	Pack	Reference
B4	2 P	Top	1 unit	2798 **3021**
	2 P	Bottom	1 unit	2798 **8021**
B5	3 P	Top	1 unit	2798 **3041**
	3 P	Bottom	1 unit	2798 **8041**
B5	4 P	Top or bottom	1 unit	2798 **4041**
B6	4 P	Top or bottom	1 unit	2798 **4061**
$B4_{DS}$	2 P	Top or bottom	1 unit	4158 **3021**
$B5_{DS}$	6 P	Top or bottom	1 unit	4158 **3041**
	8 P	Top or bottom	1 unit	4158 **4041**
$B6_{DS}$	8 P	Top and bottom	2 units	2798 **8061**
$B7_{DS}$	8 P	Top or bottom	1 unit	2798 **4121**

Accessories (continued)

Bridging bars for connecting poles in series

Use

The bridging bars will make easy the connection of the poles in series, allowing the following configurations(1).

(1) *Other connections: refer to mounting instructions.*

1000 VDC

Frame size	Rating (A)	Quantity to be ordered	Fig.	Reference
1 PV circuit				
B4	100	1	1	2709 **1020**
B4	200	1	1	2709 **1020**
B4	250	1	1	2709 **1020**
B5	325	1	1	2709 **1041**
B5	400	2	2	2709 **1041**
B6	600	2	3	2709 **0062**
B7	800	2	3	2709 **0081**
B7	1200	2	3	2709 **0121**
$B7_{DS}$	2000	2	3	2709 **0121**
2 PV circuits				
$B4_{DS}$	100	2	1	2709 **1020**
$B4_{DS}$	250	4	4	2709 **1020**
B5	325	2	5	2709 **0027**
B5	400	2	6	2709 **0045**
B5	400	2	6	2709 **0045**
$B6_{DS}$	600	4	3	2709 **0062**
$B7_{DS}$	800	4	3	2709 **0121**
$B7_{DS}$	1200	4	3	2709 **0121**
4 PV circuits				
$B5_{DS}$	350	2	6	2709 **0045**

1500 VDC

Frame size	Rating (A)	Quantity to be ordered	Fig.	Reference
1 PV circuit				
B5	275	2	5	2709 **0027**
B5	325	2	5	2709 **0027**
B5	400	2	6	2709 **0045**
$B6_{DS}$	600	4	3	2709 **0062**
$B7_{DS}$	800	4	3	2709 **0121**
$B7_{DS}$	1000	4	3	2709 **0121**
2 PV circuits				
$B5_{DS}$	275	4	5	2709 **0027**
$B5_{DS}$	350	4	6	2709 **0045**

Bridging bars for connecting poles in series (continued)

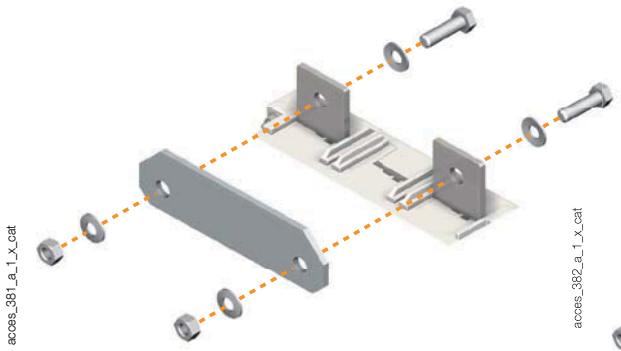


Fig. 1

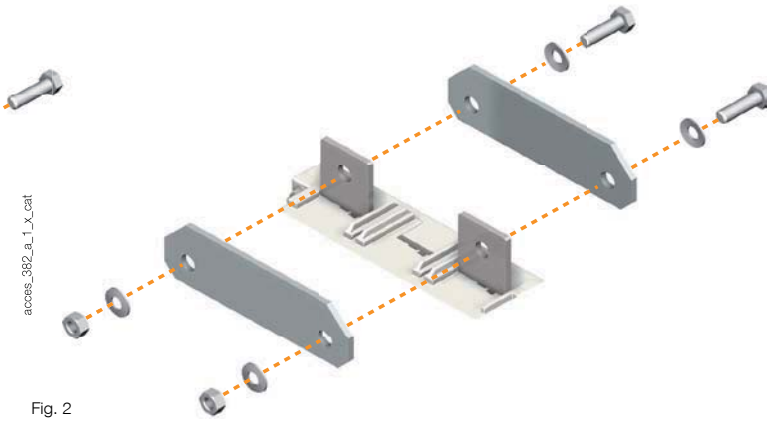


Fig. 2

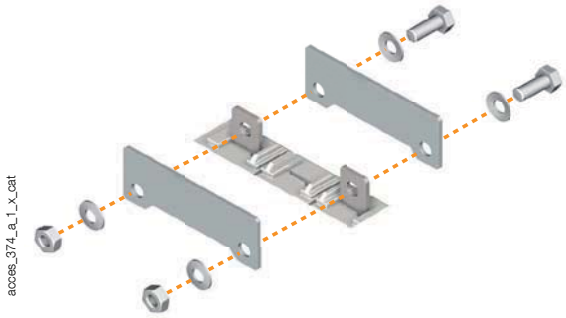


Fig.4

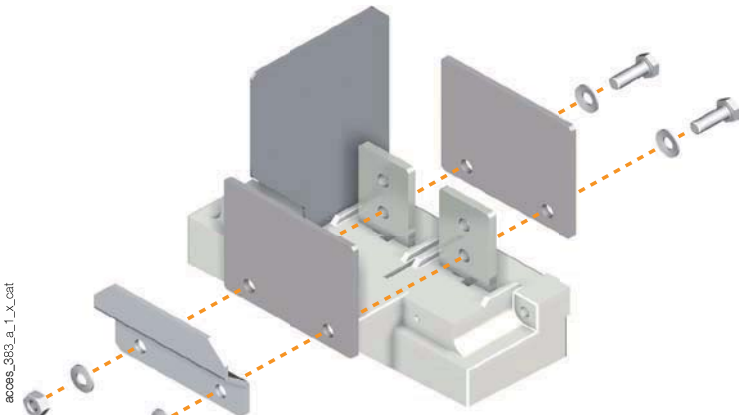


Fig. 3

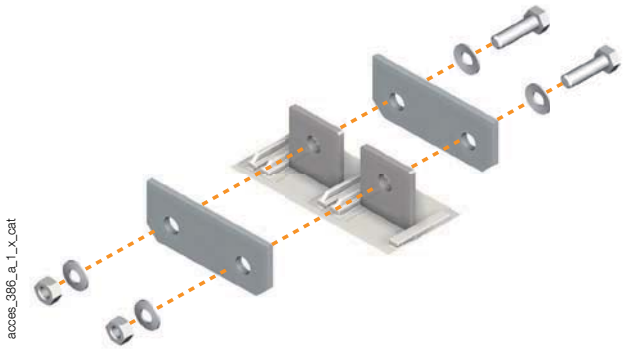


Fig. 5

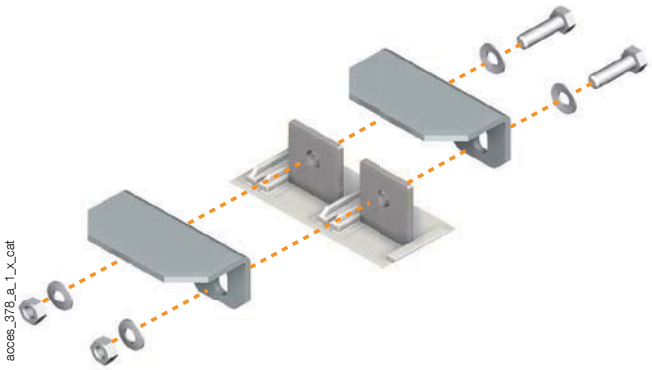


Fig. 6

Accessories (continued)

Cage terminals

Use

Connection of bare copper cables onto the terminals (without lugs).

Optional fan out kit for ratings of 800 to 1200 A for connecting several cables to the switch.

Frame size	Rating max (A)	Numbrer and size of cables	Max. number of connections per terminal	Type of cable	Quantity	Reference
B4 - $B4_{DS}$	100 … 250	1 conductor (#6-300MCM)	1	Cu / Al	2 lugs	3954 **2020**
		2 conductors (#4-2/0)	1	Cu / Al	2 lugs	3954 **2025**
B5 - $B5_{DS}$	325 … 400	1 conductor (#4-600MCM)	1	Cu / Al	2 lugs	3954 **2040**
		2 conductors (#6-350MCM)	1	Cu / Al	2 lugs	3954 **2041**
B6 - $B6_{DS}$	600	2 conductors (#2-600MCM)	1	Cu / Al	2 lugs	3954 **2060**
B7	800 … 1200	2 conductors (#2-600MCM)	2	Cu / Al	2 lugs	3954 **2060**
		2 conductors (#2-600MCM)	3(1)	Cu / Al	3 lugs	3954 **3060**
$B7_{DS}$	2000	2 conductors (#2-600MCM)	2(2)	Cu / Al	2 lugs	3954 **2060**
		2 conductors (#2-600MCM)	3(3)	Cu / Al	3 lugs	3954 **3060**

(1) Order a fan out kit reference 2709 1203 for connecting 3 connectors per terminal (6 in total for the switch).
(2) 2 connectors per terminal with the connection kit 2729 1200.
(3) 3 connectors per terminal with the connection kits 2729 1201 and 2709 1202.

Copper bar connection kits

Use

To allow connection between the two power terminals from a same pole for 2000 A ratings. (Fig. 1, Fig. 2 and Fig. 3)

Top or bottom flat connection

Frame size	Rating (A)	Figure	Quantity to order per pole	Number of terminals	Reference
$B7_{DS}$	800 … 1000	1	1	2	2729 **1200**
		2	1	3	2729 **1202**
	2000	1	1	2	2729 **1200**
		2	1	3	2729 **1202**

Top or bottom edgewise connection

Frame size	Rating (A)	Figure	Quantity to order per pole	Number of terminals	Reference
$B7_{DS}$	800 … 2000	3	1	3	2729 **1201**

Fig. 1

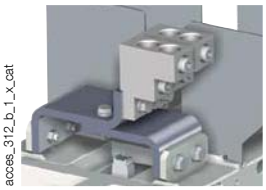
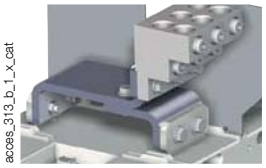


Fig. 3

Fig. 2



socomec Innovative Power Solutions

Characteristics

Compliance to UL98B and IEC 60947-3 standards

SIRCO PV UL98B switches comply with both UL98B and IEC 60947-3 standards. As acceptance test criteria are different depending on one or the other standard, the same product can be referred to with two different ratings, identified in the characteristic table as follows:

- "Rating" for characteristics as per standard UL98B.
- "Rated current" for characteristics as per standard IEC 60947-3.

UL98B									
Rating (A)			**100 A**				**200 A**		
Number of circuits	**Rated voltage**		**(A)**	**Number of pole(s) in series per polarity**	**Number of pole(s) of the device**	**Frame size**	**(A)**	**Number of pole(s) in series per polarity**	**Number of pole(s) of the device**	**Frame size**
1 circuit	1000 VDC		100	2 P	2 P	B4	200	2 P	2 P	B4
2 circuits	600 VDC		100	1 P	2 P	B4	130	1 P	2 P	B4
2 circuits	1000 VDC		100	2 P	4 P	$B4_{DS}$	200	2 P	4 P	$B4_{DS}$
4 circuits	600 VDC		100	1 P	4 P	$B4_{DS}$	130	1 P	4 P	$B4_{DS}$
Short-circuit capacity at 1000 VDC (any circuit breaker)										
Prospective short-circuit current (kA rms DC)			10[1]				10[1]			
Connection terminals										
Min. connection wire range/ AWG			#6				#6			
Max. connection wire range/ AWG			300MCM				300MCM			
Mechanical characteristics										
Durability (number of operating cycles)			10 000				10 000			
Operating effort (lbs.in/Nm)			88.5/10				88.5/10			
Auxiliary contact										
Electrical characteristics			A300				A300			
IEC 60947-3										
Rated current In			**160 A**				**250 A**			
Thermal current at 40°C (A)			**160**				**250**			
Thermal current at 50°C (A)			**160**				**250**			
Thermal current at 60°C (A)			**160**				**250**			
Rated insulation voltage U_i (V)			1500				1500			
Rated impulse withstand voltage U_{imp} (kV)			12				12			
Number of circuits	**Rated voltage**	**Utilization category**	**(A)**	**Number of pole(s) in series per polarity**	**Number of pole(s) of the device**	**Frame size**	**(A)**	**Number of pole(s) in series per polarity**	**Number of pole(s) of the device**	**Frame size**
1 circuit	1000 VDC	DC-21 B	160	2 P	2 P	B4	250	2 P	2 P	B4
1 circuit	1500 VDC	DC-21 B	160	4 P	4 P	$B4_{DS}$	250	4 P	4 P	$B4_{DS}$
2 circuits	1000 VDC	DC-21 B	160	2 P	4 P	$B4_{DS}$	250	2 P	4 P	$B4_{DS}$
4 circuits	600 VDC	DC-21 B	125	1 P	4 P	$B4_{DS}$	160	1 P	4 P	$B4_{DS}$

(1) Wwithout fuse during 50 ms.

Characteristics (continued)

as per standards UL98B and IEC 60947-3

UL98B									
Rating			**250 A**				**275 A**		
Number of circuits	**Rated voltage**	**(A)**	**Number of pole(s) in series per polarity**	**Number of pole(s) of the device**	**Frame size**	**(A)**	**Number of pole(s) in series per polarity**	**Number of pole(s) of the device**	**Frame size**
1 circuit	1000 VDC	250	2 P	2 P	B4	275	2 P	2 P	B5
2 circuits	600 VDC	130	1 P	2 P	B4	215	1 P	2 P	B5
2 circuits	1000 VDC	250	2 P	4 P	$B4_{DS}$	275	2 P	4 P	B5
4 circuits	600 VDC	130	1 P	4 P	$B4_{DS}$	215	1 P	4 P	B5
4 circuits	1000 VDC	-	-	-	-	215	2 P	8 P	$B5_{DS}$
6 circuits	600 VDC	-	-	-	-	215	1 P	6 P	$B5_{DS}$
8 circuits	600 VDC	-	-	-	-	215	1 P	8 P	$B5_{DS}$
Short-circuit capacity at 1000 VDC (any circuit breaker)									
Prospective short-circuit current (kA rms DC)			10(1)				10(1)		
Connection terminals									
Min. connection wire range/ AWG			#6				2x#6		
Max. connection wire range/ AWG			300MCM				600MCM		
Mechanical characteristics									
Durability (number of operating cycles)			10 000				6 000		
Operating effort (lbs.in/Nm)			88.5/10				128.3/14.5		
Auxiliary contact									
Electrical characteristics			A300				A300		
IEC 60947-3									
Rated current In			**315 A**				**275 A**		
Thermal current at 40°C (A)			**315**				**275**		
Thermal current at 50°C (A)			**315**				**275**		
Thermal current at 60°C (A)			**315**				**275**		
Rated insulation voltage U_i (V)			1500				1500		
Rated impulse withstand voltage U_{imp} (kV)			12				12		
Number of circuits	**Rated voltage**	**Utilization category**	**(A)**	**Number of pole(s) in series per polarity**	**Number of pole(s) of the device**	**Frame size**	**(A)**	**Number of pole(s) in series per polarity**	**Number of pole(s) of the device**	**Frame size**
1 circuit	1000 VDC	DC-21 B	315	2 P	2 P	B4	275	2 P	2 P	B5
1 circuit	1500 VDC	DC-21 B	315	4 P	4 P	$B4_{DS}$	275	2 P	3 P	B5
2 circuits	1000 VDC	DC-21 B	315	2 P	4 P	$B4_{DS}$	275	2 P	4 P	B5
4 circuits	600 VDC	DC-21 B	160	1 P	4 P	$B4_{DS}$	275	1 P	4 P	B5
4 circuits	1000 VDC	DC-21 B	-	-	-	-	275	2 P	8 P	$B5_{DS}$
6 circuits	600 VDC	DC-21 B	-	-	-	-	275	1 P	6 P	$B5_{DS}$
8 circuits	600 VDC	DC-21 B	-	-	-	-	275	1 P	8 P	$B5_{DS}$

(1) Without fuse during 50 ms.

as per standards UL98B and IEC 60947-3

UL98B									
Rating			**325 A**				**350 A**		
Number of circuits	**Rated voltage**	**(A)**	**Number of pole(s) in series per polarity**	**Number of pole(s) of the device**	**Frame size**	**(A)**	**Number of pole(s) in series per polarity**	**Number of pole(s) of the device**	**Frame size**
1 circuit	1000 VDC	325	2 P	2 P	B5	-	-	-	-
2 circuits	600 VDC	215	1 P	2 P	B5	-	-	-	-
2 circuits	1000 VDC	325	2 P	4 P	B5	350	3 P	6 P	$B5_{DS}$
4 circuits	600 VDC	215	1 P	4 P	B5	-	-	-	-
4 circuits	1000 VDC	325	2 P	8 P	$B5_{DS}$	350	2 P	8 P	$B5_{DS}$
6 circuits	600 VDC	215	1 P	6 P	$B5_{DS}$	215	1 P	6 P	$B5_{DS}$
8 circuits	600 VDC	215	1 P	8 P	$B5_{DS}$	215	1 P	8 P	$B5_{DS}$
Short-circuit capacity at 1000 VDC (any circuit breaker)									
Prospective short-circuit current (kA rms DC)		10(1)				10(1)			
Connection terminals									
Min. connection wire range/ AWG		2x#6				2x#6			
Max. connection wire range/ AWG		600MCM				600MCM			
Mechanical characteristics									
Durability (number of operating cycles)		6 000				6 000			
Operating effort (lbs.in/Nm)		128.3/14.5				128.3/14.5			
Auxiliary contact									
Electrical characteristics		A300				A300			

IEC 60947-3										
Rated current In			**400 A**				**500 A**			
Thermal current at 40°C (A)			**400**				**500**			
Thermal current at 50°C (A)			**400**				**500**			
Thermal current at 60°C (A)			**400**				**500**			
Rated insulation voltage U_i (V)			1500				1500			
Rated impulse withstand voltage U_{imp} (kV)			12				12			
Number of circuits	**Rated voltage**	**Utilization category**	**(A)**	**Number of pole(s) in series per polarity**	**Number of pole(s) of the device**	**Frame size**	**(A)**	**Number of pole(s) in series per polarity**	**Number of pole(s) of the device**	**Frame size**
1 circuit	1000 VDC	DC-21 B	400	2 P	2 P	B5	-	-	-	-
2 circuits	1000 VDC	DC-21 B	400	2 P	4 P	B5	500	3 P	6 P	$B5_{DS}$
4 circuits	600 VDC	DC-21 B	275	1 P	4 P	B5				
4 circuits	1000 VDC	DC-21 B	400	2 P	8 P	$B5_{DS}$	500	2 P	8 P	$B5_{DS}$
6 circuits	600 VDC	DC-21 B	275	1 P	6 P	$B5_{DS}$	275	1 P	6 P	$B5_{DS}$
8 circuits	600 VDC	DC-21 B	275	1 P	8 P	$B5_{DS}$	275	1 P	8 P	$B5_{DS}$

(1) Without fuse during 50 ms.

Characteristics (continued)

as per standards UL98B and IEC 60947-3

UL98B									
Rating			**400 A**				**600 A**		
Number of circuits	**Rated voltage**	**(A)**	**Number of pole(s) in series per polarity**	**Number of pole(s) of the device**	**Frame size**	**(A)**	**Number of pole(s) in series per polarity**	**Number of pole(s) of the device**	**Frame size**
1 circuit	1000 VDC	400	2 P	2 P	B5	600	4 P	4 P	B6
2 circuits	600 VDC	215	1 P	2 P	B5	600	3 P	6 P	$B6_{DS}$
2 circuits	1000 VDC	400	2 P	4 P	B5	600	4 P	8 P	$B6_{DS}$
4 circuits	600 VDC	215	1 P	4 P	B5	-	-	-	-
Short-circuit capacity at 1000 VDC (any circuit breaker)									
Prospective short-circuit current (kA rms DC)			10(1)				10(1)		
Connection terminals									
Min. connection wire range/ AWG			2x#6				2x#2		
Max. connection wire range/ AWG			600MCM				2 x 600MCM		
Mechanical characteristics									
Durability (number of operating cycles)			6 000				6 000		
Operating effort (lbs.in/Nm)			128.3/14.5				327.5/37		
Auxiliary contact									
Electrical characteristics			A300				A300		
IEC 60947-3									
Rated current In			**500 A**				**800 A**		
Thermal current at 40°C (A)			**500**				**800**		
Thermal current at 50°C (A)			**500**				**800**		
Thermal current at 60°C (A)			**500**				**800**		
Rated insulation voltage U_i (V)			1500				1200		
Rated impulse withstand voltage U_{imp} (kV)			12				12		
Number of circuits	**Rated voltage**	**Utilization category**	**(A)**	**Number of pole(s) in series per polarity**	**Number of pole(s) of the device**	**Frame size**	**(A)**	**Number of pole(s) in series per polarity**	**Number of pole(s) of the device**	**Frame size**
1 circuit	1000 VDC	DC-21 B	500	2 P	2 P	B5	800	4 P	4 P	B6
1 circuit	1500 VDC	DC-21 B	500	2 P	3 P	B5	800	8 P	8 P	$B6_{DS}$
2 circuits	1000 VDC	DC-21 B	275	1 P	4 P	B5	800	4 P	8 P	$B6_{DS}$
4 circuits	600 VDC	DC-21 B	275	1 P	4 P	B5	-	-	-	-

(1) Without fuse during 50 ms.
(2) 1200 VDC for B6.

as per standards UL98B and IEC 60947-3

UL98B									
Rating			**800 A**			**1200 A**			
Number of circuits	**Rated voltage**		**(A)**	**Number of pole(s) in series per polarity**	**Number of pole(s) of the device**	**Frame size**	**(A)**	**Number of pole(s) in series per polarity**	**Number of pole(s) of the device**	**Frame size**
1 circuit	1000 VDC		800	4 P	4 P	B7	1200	4 P	4 P	B7
2 circuits	600 VDC		800	3 P	6 P	$B7_{DS}$	1200	3 P	6 P	$B7_{DS}$
2 circuits	1000 VDC		800	4 P	8 P	$B7_{DS}$	1200	4 P	8 P	$B7_{DS}$
Short-circuit capacity at 1000 VDC (any circuit breaker)									
Prospective short-circuit current (kA rms DC)			10(1)				10(1)			
Connection terminals									
Min. connection wire range/ AWG			4x#2				4x#2			
Max. connection wire range/ AWG			6x 600MCM(2)				6x 600MCM(2)			
Mechanical characteristics									
Durability (number of operating cycles)			3 500				3 500			
Operating effort (lbs.in/Nm)			495.7/56				663.9/75			
Auxiliary contact									
Electrical characteristics			A300				A300			
IEC 60947-3									
Rated current In			**1000 A**				**1400 A**			
Thermal current at 40°C (A)			**1000**				**1400**			
Thermal current at 50°C (A)			**1000**				**1400**			
Thermal current at 60°C (A)			**1000**				**1400**			
Rated insulation voltage U_i (V)			1200				1200			
Rated impulse withstand voltage U_{imp} (kV)			12				12			
Number of circuits	**Rated voltage**	**Utilization category**	**(A)**	**Number of pole(s) in series per polarity**	**Number of pole(s) of the device**	**Frame size**	**(A)**	**Number of pole(s) in series per polarity**	**Number of pole(s) of the device**	**Frame size**
1 circuit	1000 VDC	DC-21 B	1000	4 P	4 P	B7	1400	4 P	4 P	$B7_{DS}$
1 circuit	1500 VDC	DC-21 B	1000	8 P	8 P	$B7_{DS}$	1000	8 P	8 P	$B7_{DS}$
2 circuits	1000 VDC	DC-21 B	1000	4 P	8 P	$B7_{DS}$	1000	4 P	8 P	$B7_{DS}$

(1) Without fuse during 50 ms.
(2) Maximum 6 x 600MCM with fan out kit 2729 1203.
(3) 1200 VDC for B7.

Characteristics (continued)

as per standards UL98B and IEC 60947-3

UL98B						
Rating			**2000 A**			
Number of circuits	**Rated voltage**		**(A)**	**Number of pole(s) in series per polarity**	**Number of pole(s) of the device**	**Frame size**
1 circuit	1000 VDC		2000	8 P	8 P	$B7_{DS}$
Short-circuit capacity at 1000 VDC (any circuit breaker)						
Prospective short-circuit current (kA rms DC)			10(1)			
Connection terminals						
Min. connection wire range/ AWG			4x#2			
Max. connection wire range/ AWG			6x 600MCM(2)			
Mechanical characteristics						
Durability (number of operating cycles)			3 500			
Operating effort (lbs.in/Nm)			663.9/75			
Auxiliary contact						
Electrical characteristics			A300			
IEC 60947-3						
Rated current In			**2200 A**			
Thermal current at 40°C (A)			**2200**			
Thermal current at 50°C (A)			**1850**			
Thermal current at 60°C (A)			**1600**			
Rated insulation voltage U_i (V)			1200			
Rated impulse withstand voltage U_{imp} (kV)			12			
Number of circuits	**Rated voltage**	**Utilization category**	**(A)**	**Number of pole(s) in series per polarity**	**Number of pole(s) of the device**	**Frame size**
1 circuit	1000 VDC	DC-21 B	2200	8 P	8 P	$B7_{DS}$

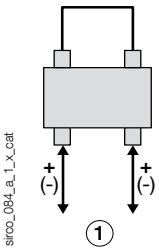
(1) Without fuse during 50 ms.
(2) Maximum 6 x 600MCM with fan out kit 2729 1203.

Pole connections in series

1 PV circuit - 1000 VDC

B4-B5 - 2P

Grounded



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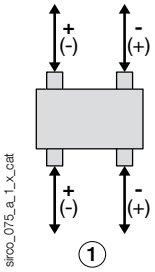
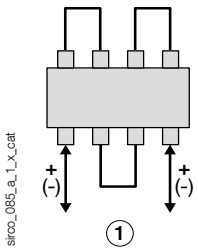


B6-B7 - 4P

Grounded



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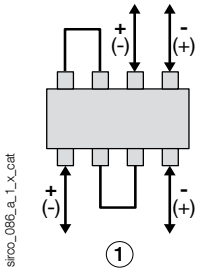

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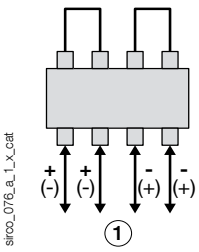
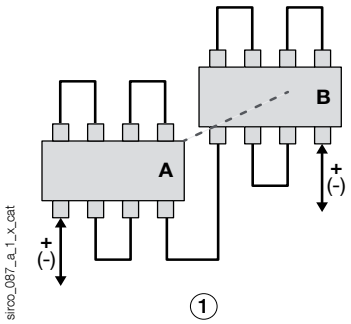


$B7_{DS}$ - 8P

Grounded



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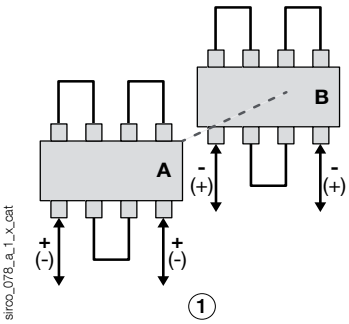
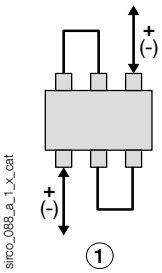


A. Front switch.
B. Rear switch.
1. Circuit 1.

1 PV circuit - 1500 VDC

B4-B5 - 2P

Grounded



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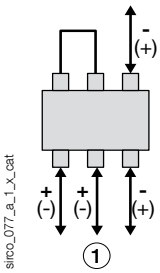
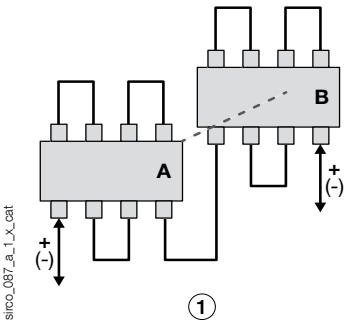


$B6_{DS}$-$B7_{DS}$- 8P

Grounded



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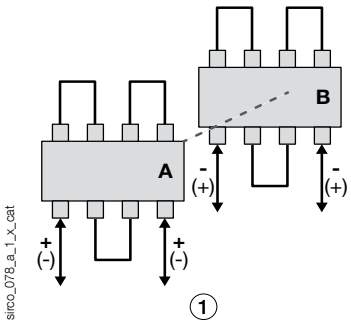


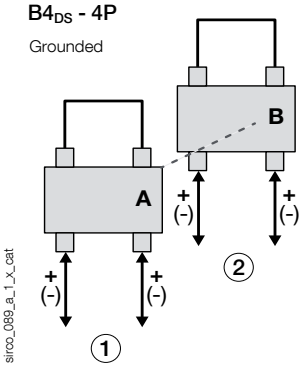
A. Front switch.
B. Rear switch.
1. Circuit 1.

Pole connections in series (continued)

2 PV circuit - 1000 VDC

$B4_{DS}$ - 4P

Grounded



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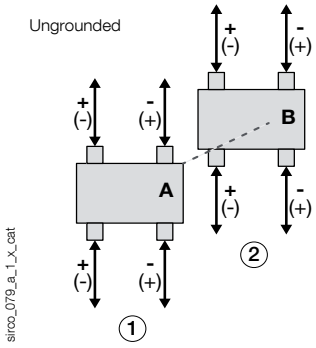
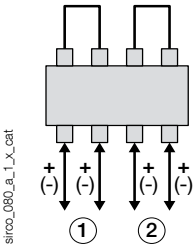


B5 - 4P

Grounded



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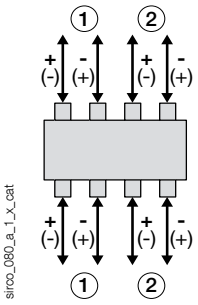
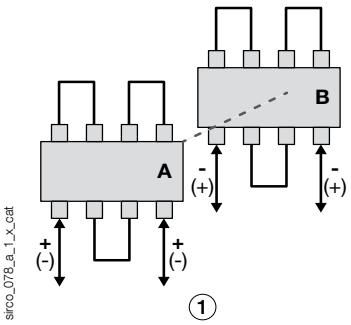


$B5_{DS}$-$B7_{DS}$ - 8P

Grounded



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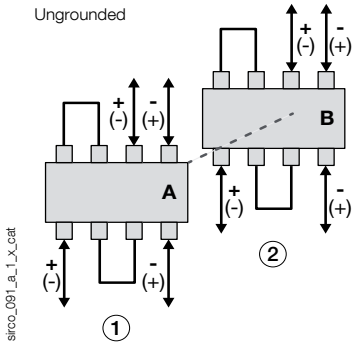
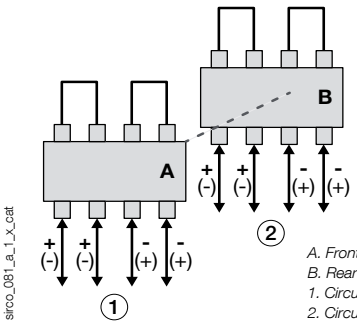


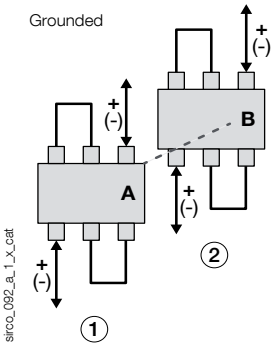


A. Front switch.
B. Rear switch.
1. Circuit 1.
2. Circuit 2.

2 PV circuits - 1500 VDC

$B5_{DS}$ - 6P

Grounded



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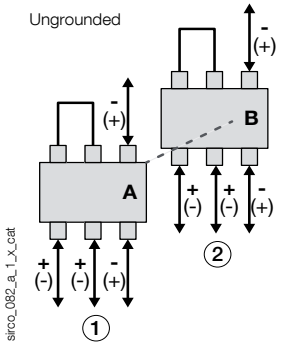
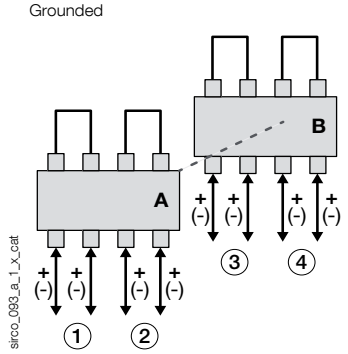


A. Front switch.
B. Rear switch.
1. Circuit 1.
2. Circuit 2.

4 PV circuits - 1000 VDC

$B5_{DS}$ - 8P

Grounded



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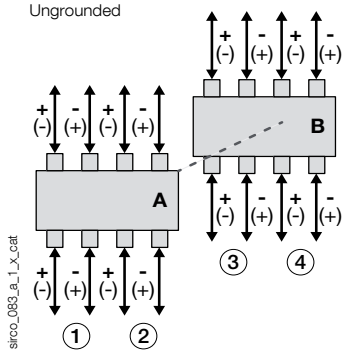
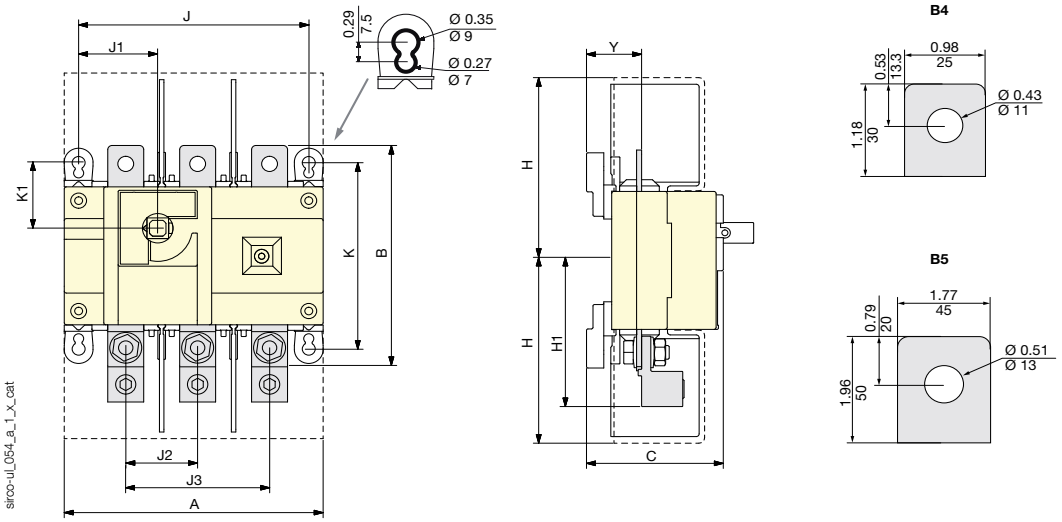


A. Front switch.
B. Rear switch.
1. Circuit 1.
2. Circuit 2.
3. Circuit 3.
4. Circuit 4.

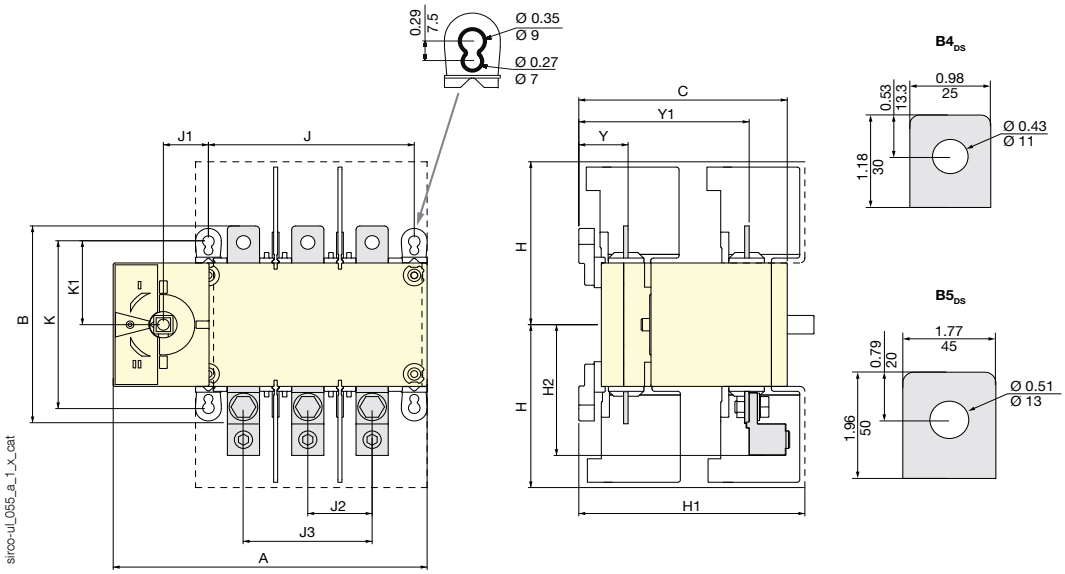
Dimensions (in/mm)

B4-B5



Frame size	No. of poles	Unit	A	B	C	H	H1 max.	J	J1	J2	J3	K	K1	Y
B4	2 P	inches	7.08	6.30	3.74	5.21	4.21	6.30	2.16	-	3.94	5.31	1.89	1.51
		mm	180	160	95	132.5	107	160	55	-	100	135	48	38.5
B5	2 P	inches	9.05	10.23	5.04	8	6.53	8.26	2.95	-	5.12	7.67	2.65	2.08
		mm	230	260	128	203	166	210	75	-	130	195	67.5	53
B5	3 P	inches	9.05	10.23	4.98	8	6.53	8.26	2.95	2.56	-	7.67	2.65	2.02
		mm	230	260	126.5	203	166	210	75	65	-	195	67.5	51.5
B5	4 P	inches	11.41	10.23	4.98	8	6.53	10.63	5.31	2.56	-	7.67	2.65	2.02
		mm	290	260	126.5	203	166	270	135	65	-	195	67.5	51.5

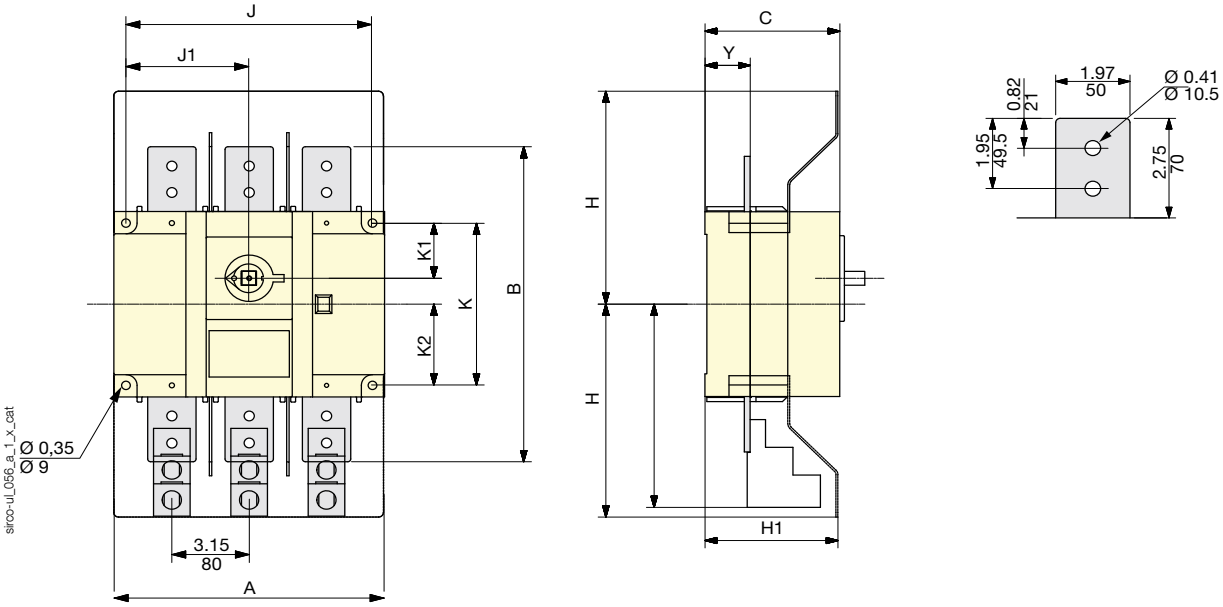
$B4_{DS}$-$B5_{DS}$



Frame size	No. of poles	Unit	A	B	C	H	H1	H1 max.	J	J1	J2	J3	K	K1	Y	Y1
$B4_{DS}$	4 P	inches	9.60	6.30	6.37	5.08	6.93	4.21	6.30	1.37	-	3.93	5.31	2.65	1.51	5.21
		mm	244	160	162	129	176	107	160	35	-	100	135	67.5	38.5	132.5
$B5_{DS}$	6 P	inches	11.85	10.23	9.39	8	6.51	6.53	6.26	1.37	2.56	-	7.67	2.70	2.02	7.44
		mm	301	260	238.5	203	165.5	166	210	35	65	-	195	68.5	51.5	189
$B5_{DS}$	8 P	inches	14.21	10.23	9.39	8	6.51	6.53	10.63	1.37	2.56	-	7.67	2.70	2.02	7.44
		mm	361	260	238.5	203	165.5	166	270	35	65	-	195	68.5	51.5	189

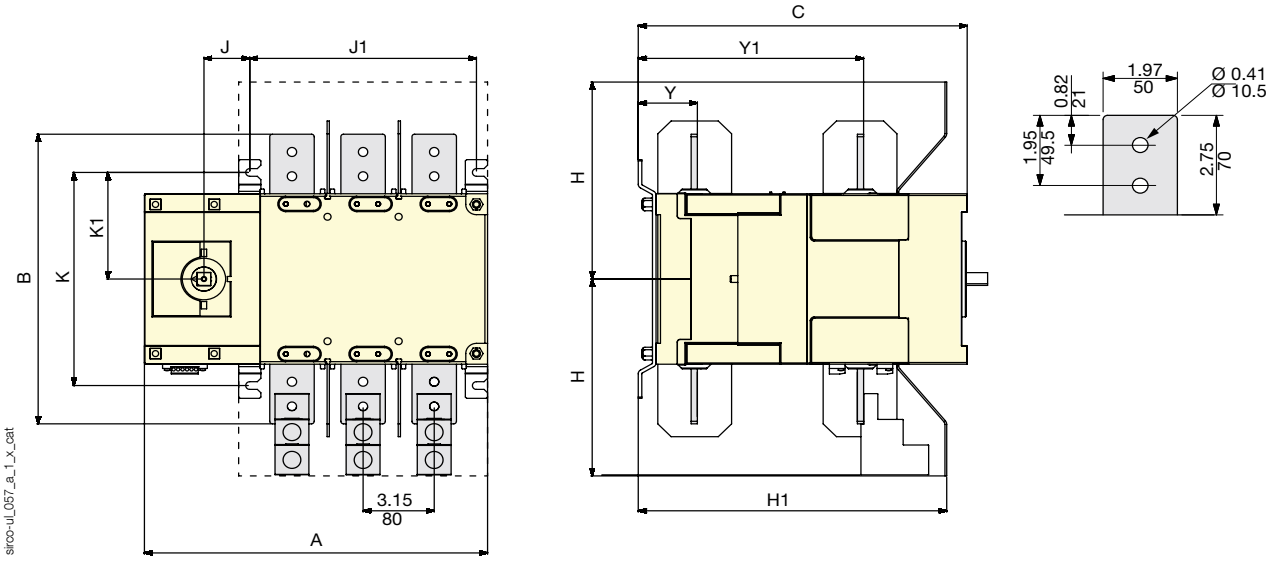
Dimensions (in/mm) (continued)

B6



Frame size	No. of poles	Unit	A	B	C	H	H1	J	J1	K	K1	K2	Y
B6	4 P	inches	24.80	13.38	5.47	10.63	5.70	13.19	6.59	6.88	2.34	1.10	1.83
		mm	630	340	139	270	145	335	167.5	175	59.5	28	46.5

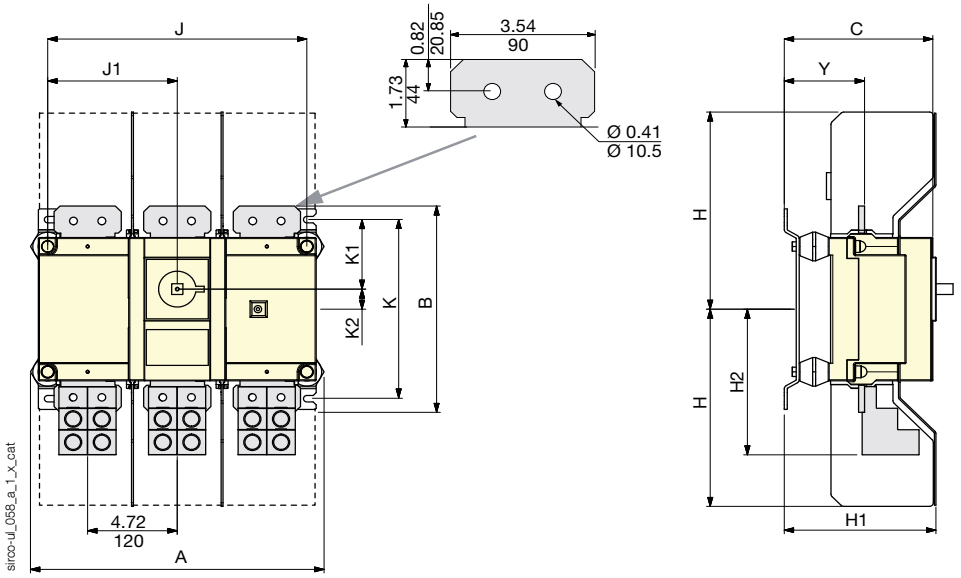
$B6_{DS}$



Frame size	No. of poles	Unit	A	B	C	H	H1	J	J1	K	K1	Y	Y1
$B6_{ds}$	8 P	inches	18.34	13.38	14.56	10.63	13.66	13.18	2.02	9.84	4.92	2.61	9.98
		mm	466	340	370	270	347	335	51.5	250	125	66.5	253.5

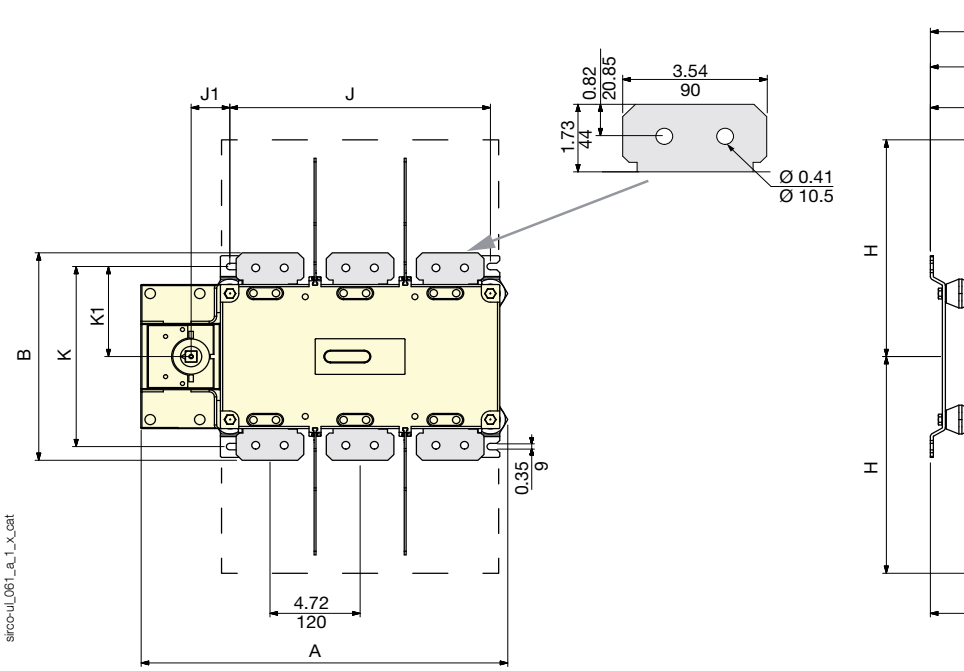
Dimensions (in/mm) (continued)

B7



Frame size	No. of poles	Unit	A	B	C	H	H1	H2	J	J1	K	K1	K2	Y
B7	4 P	inches	20.19	11.33	7.97	11.89	8.30	8.01	18.38	9.19	9.84	3.82	1.10	4.23
		mm	513	288	200	302	211	203.5	467	233.5	250	97	28	107.5

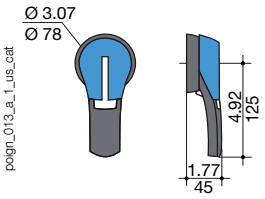
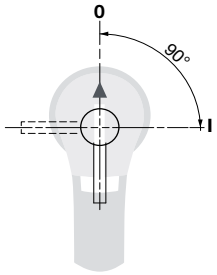
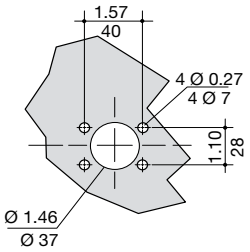
B7$_{DS}$



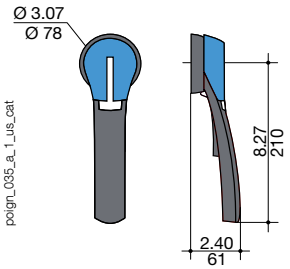
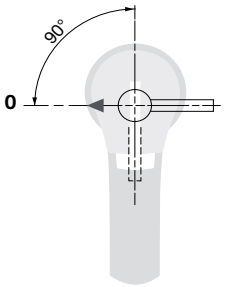
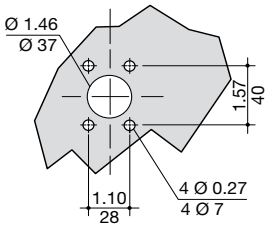
Frame size	No. of poles	Unit	A	B	C	H	H1	J	J1	K	K1	Y	Y1
B7$_{DS}$	8 P	inches	23.95	11.33	13.11	11.85	15.31	18.38	2.02	9.84	4.92	4.23	11.55
		mm	608.5	288	333	301	389	467	51.5	250	125	107.5	293.5

Dimensions for external handles (in/mm)

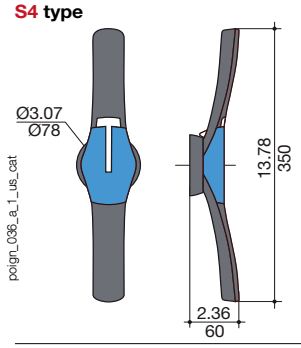
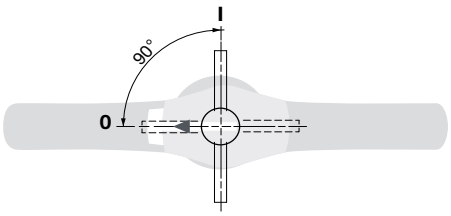
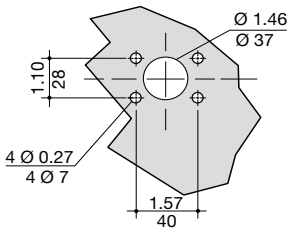
B4 - B4$_{DS}$ - B5

Handle type	Front operation Direction of operation	Door drilling
S2 type 		

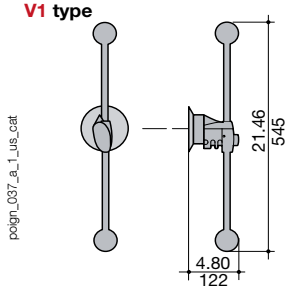
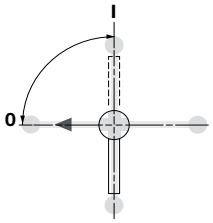
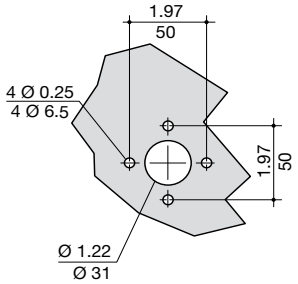
B5$_{DS}$ - B6

Handle type	Front operation Direction of operation	Door drilling
S3 type 		

B7

Handle type	Front operation Direction of operation	Door drilling
S4 type 		

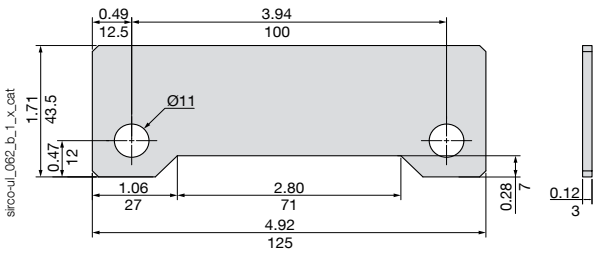
B6$_{DS}$ - B7$_{DS}$

Handle type	Front operation Direction of operation	Door drilling
V1 type 		

Bridging bars (in/mm)

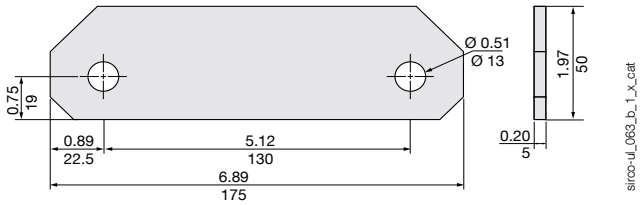
B4 - B4$_{DS}$

2709 1020

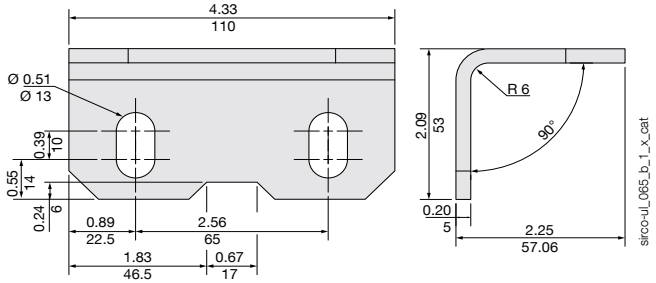


B5 - B5$_{DS}$

2709 1041

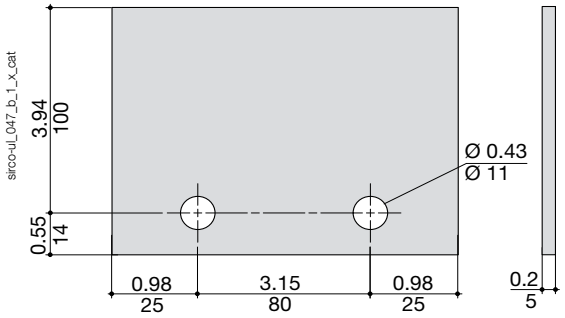


2709 0045

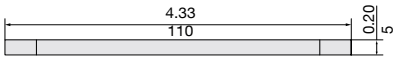


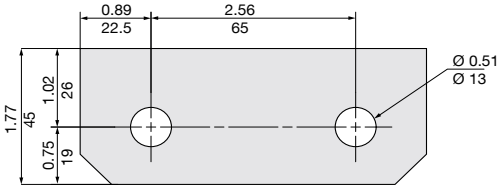
B6 - B6$_{DS}$

2709 0062



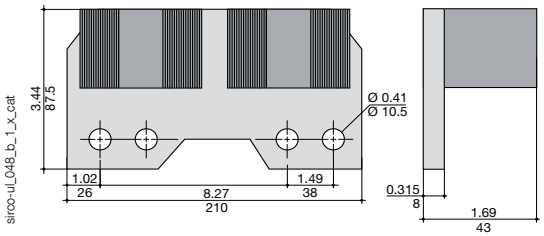
2709 0027





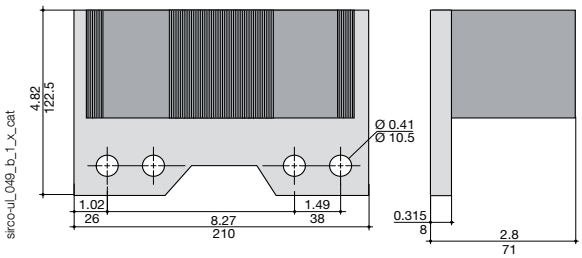
B7

2709 0081



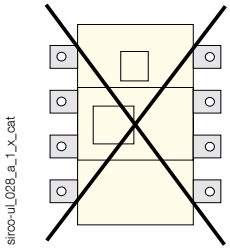
B7 - B7$_{DS}$

2709 0121

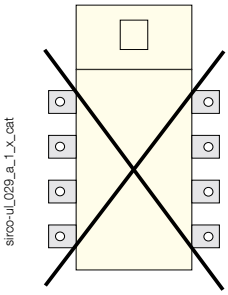


Mounting orientation

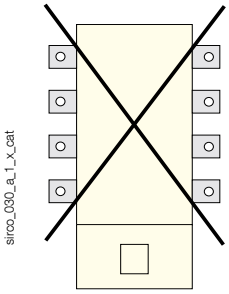
All frames



B4$_{DS}$ - B5$_{DS}$

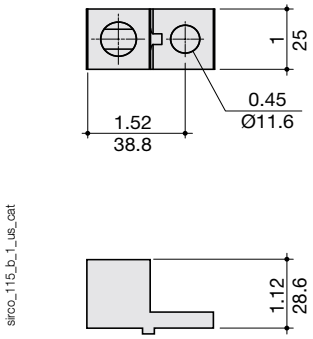


B6$_{DS}$ - B7$_{DS}$



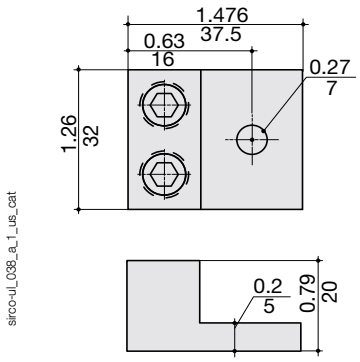
Terminal lugs (in/mm)

100 to 250 A



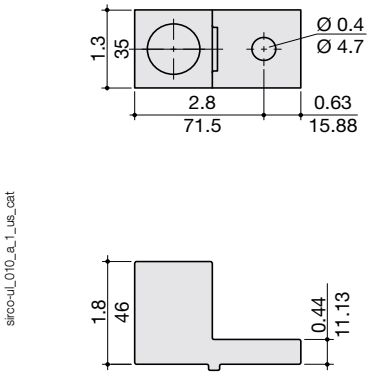
300MCM

100 to 250 A



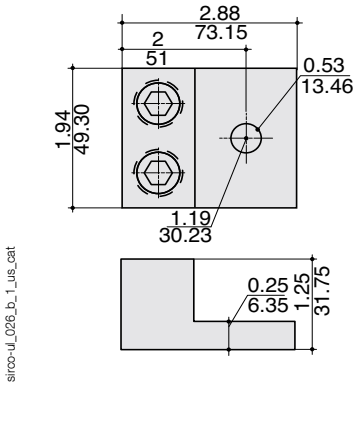
2/0

400 A



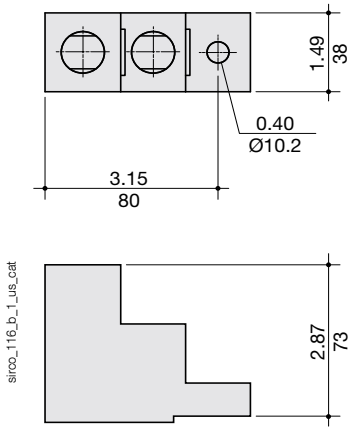
600MCM

400 A



2 x 350MCM

600 to 2000 A

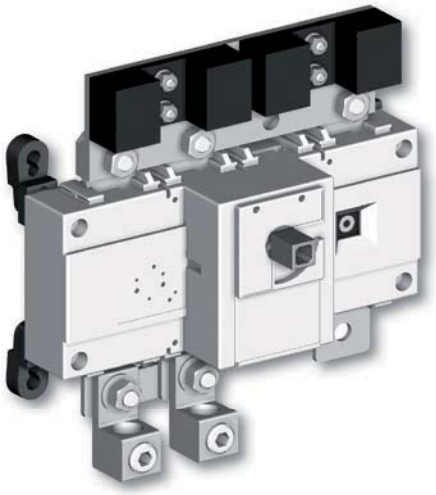


2 x 600MCM

SIRCO PV UL98B compact

Disconnect switches for photovoltaic applications

from 320 to 650 A - up to 1000 VDC



sirco-ul_066_a_1_cat

The solution for

- Combiner box
- Recombiner box
- Inverter

Strong points

- Patented switching technology
- Positive break indication
- Up to 1000 VDC as per UL98B
- Suitable for use in accordance with NEC Art. 690

Conformity to standards

- UL98B Guide WHVA, file E346418, vol. 1
- NEC Art 690

Function

Photovoltaic energy producers demand equipment and installations that combine a high production output, consistent reliability and safety with a low maintenance cost. Besides a high-efficiency production, the equipment must support the specificity and technical constraints of the severe environment related to solar applications.

Specifically designed for photovoltaic applications, **SIRCO PV UL98B compact** solar non-fusible disconnect switches have been tested for use in applications with high performance characteristics that meet or exceed of the latest industry standard requirements. These switches are suitable for use in accordance with NEC Art. 690 Photovoltaic Installations.

Advantages

High switching performance in a compact footprint

SIRCO PV switches are capable of breaking 500 VDC per pole thanks to a patented switching technology. The ratings of 320 to 650 A are achieved by putting poles in parallel which significantly reduces footprint of the product.

Reliability and performance

Our range of SIRCO PV non-fusible disconnect switches is compliant with UL98B standard and have been tested above standards expectation.

They are as well able to withstand 10 kA, 50 ms, allowing the use of any overcurrent protection device for line protection.

Guarantee safety over time

SIRCO PV are extremely robust products, with all casings made from fiber glass reinforced polyester materials that allows:

- High mechanical withstand.
- High stability to temperatures (RTI of 130°C).
- High dielectric performance (high CTI / tested according to ASTM D 2303).

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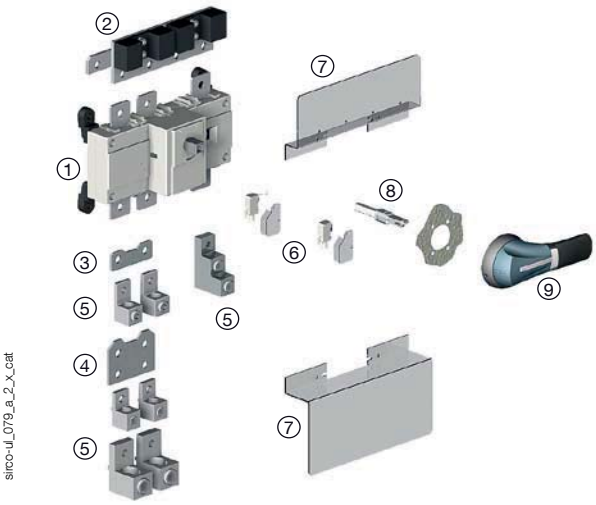
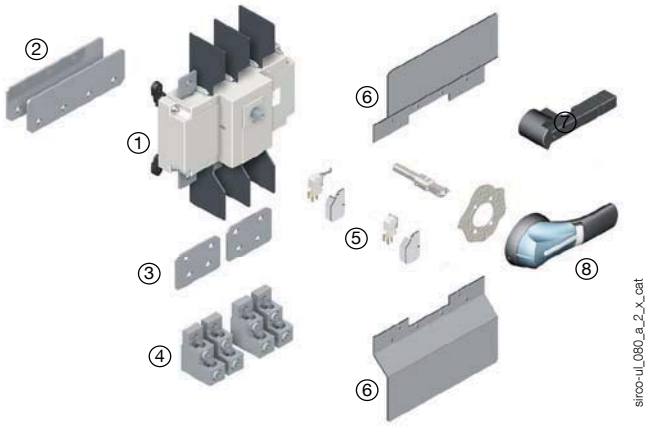
Product description

320 - 400 A



1. SIRCO PV UL98B switch
2. Top bridging bar
3. Short bottom bridging bar
4. Long bottom bridging bar
5. Lugs (optional)
6. Auxiliary contacts
7. Terminal screen
8. Shaft extension
9. External operation handle

500 - 650 A



1. SIRCO PV UL98B switch
2. Top bridging bar
3. Bottom bridging bar
4. Lugs (optional)
5. Auxiliary contacts
6. Terminal screen
7. Shaft extension
8. External operation handle

References

1000 VDC - Back plate mounting

Rating (A)	Frame size	No. of poles	Switch body	External handle	Shaft for external handle	Bridging bars	
						Top	Bottom
1 PV circuit							
320 A	B4	3 P	27PV **2029**	S2 type Black 4, 4X 142D **2111**(1) Red/Yellow 4, 4X 142E **2111**(1)	200 mm 7.9 inches 1400 **1020** 320 mm 12.6 inches 1400 **1032**	2709 **5032** Grounded	Short 2709 **0021**
400 A	B4		27PV **2038**			2709 **5043** Grounded	Long 2709 **0043**
500 A	B5	4 P	27PV **2050**			2709 **5065** Grounded	2x 2709 **0065**
600 A	B5		27PV **2065**			2x 2709 **0065** Ungrounded	
2 PV circuits							
500 A	$B5_{DS}$	8 P	27PV **5050**	S2 type Black 4, 4X 143D **3111**(1) Red/Yellow 4, 4X 143E **3111**(1)	200 mm 7.9 inches 1401 **1520** 320 mm 12.6 inches 1401 **1532**	2x 2709 **5065** Grounded	4x 2709 **0065**
650 A	$B5_{DS}$		27PV **5065**			4x 2709 **0065** Ungrounded	

(1) Defeatable handle.

Accessories

External operation

Use

In a combiner box, located close to the solar cell strings, or located close to the inverter, we recommend to use a door interlocked external handle for its safety features.

Door interlocked external operation handles include an escutcheon, are padlockable and must be utilized with an extension shaft.

Example

The locking function of the enclosure in the "ON" position will force the operator to safely disconnect and isolate the solar cell strings prior to any intervention. Opening the door when the switch is on "ON" position is possible by defeating the locking function using a tool (authorized persons only). The interlocking function is restored when the door is re-closed.

S2 type handle

Reinforced S2 type handle(1)

S3 type handle

(1) Please consult.

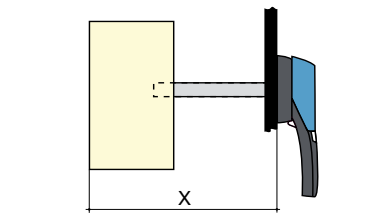
Frame size	Handle type	Handle color	Nema degree of protection	Reference
B4 - B5	S2	Black	1, 3R, 12	142F **2111**
		Red/Yellow		142G **2111**
		Black	4, 4X	142D **2111**
		Red/Yellow		142E **2111**
$B5_{DS}$	S3	Black	1, 3R, 12	143F **3111**
		Red/Yellow		143G **3111**
		Black	4, 4X	143D **3111**
		Red/Yellow		143E **3111**

Shaft for external handle

Use

Standard lengths:
- 7.9 in / 200 mm,
- 12.6 in / 320 mm,
- 15.7 in / 400 mm.

Other lengths: please consult us.



Frame size	Handle type	Dimension (inches)	Dimension X (mm)	Length (inches)	Length (mm)	Reference
B4	S2	6 ... 11.6	150 ... 295	7.9	200	1400 **1020**
		6 ... 16.3	150 ... 415	12.6	320	1400 **1032**
		6 ... 19.4	150 ... 495	15.7	400	1400 **1040**
B5	S2	8 ... 12.9	203 ... 328	7.9	200	1400 **1020**
		8 ... 17.6	203 ... 448	12.6	320	1400 **1032**
		8 ... 20.7	203 ... 525	15.7	400	1400 **1040**
$B5_{DS}$	S3	16 ... 18.4	406 ... 467	7.9	200	1401 **1520**
		16 ... 21.1	406 ... 589	12.6	320	1401 **1520**
		16 ... 26.3	406 ... 668	15.7	400	1401 **1520**

S-type handle adapter

Use

For handles S2, S3 and S4.

Dimensions

Increases the distance between the handle grip and the door by 12 mm, for better handling.

Color	Nema degree of protection	To be ordered in multiples of	Reference
Black	1, 3R, 12	10	1493 **0000**

Alternative S-type handle cover colors

Use

For handles S2.

Other colors: please consult us.

Handle color	Handle type	To be ordered in multiples of	Reference
Light grey	S2	50	1401 **0001**
Dark grey	S2	50	1401 **0011**

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Bridging bars for connecting poles in series

Use

The bridging bars will make easy the connection of the poles in series.
Refer to mounting instructions.

Frame size	Position	Rating (A)	Quantity to be ordered per switch	Figure	Reference
B4	Top	320	1	Fig. 1	2709 **5032**
		400	1	Fig. 2	2709 **5043**
	Bottom	320 … 400	1	Fig. 3	2709 **0021**
			1	Fig. 4	2709 **0043**
B5	Top	500 … 600	1 for grounded circuit	Fig. 5	2709 **5065**
			2 for ungrounded circuit	Fig. 6	2709 **0065**
	Bottom	500 … 650	2	Fig. 6	2709 **0065**

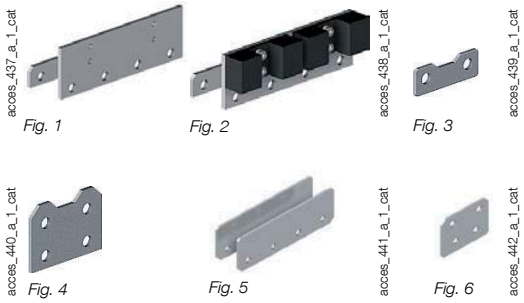


Fig. 1 Fig. 2 Fig. 3 Fig. 4 Fig. 5 Fig. 6

Terminal screen

Use

Top or bottom protection against direct contact with terminals or connection parts.

Frame size	No. of poles	Position	Utilization	Pack	Reference
B4	3 P	top or bottom	Switch equipped without lugs or with NSI 350T lugs (or strictly equivalent)	1 unit	2798 **4021**
			Switch equipped with 3954x020[(1)] or 3954x040[(1)] or PANDUIT LAM2SA300-38-3 lugs (or strictly equivalent)	1 unit	2798 **4022**
B5	4 P		Switch equipped without or with PANDUIT LAM2A-350 lugs (or strictly equivalent)	1 unit	2798 **4041**
			Switch equipped without CMC PV2-600 lugs (or strictly equivalent)	1 unit	2798 **4065**
$B5_{DS}$	8 P		Switch equipped without or with PANDUIT LAM2A-350 lugs (or strictly equivalent)	1 unit	2798 **4041**
			Switch equipped without CMC PV2-600 lugs (or strictly equivalent)	1 unit	2798 **8065**

(1) x – any number between 0 and 9.

Auxiliary contact

Use

Pre-break and signaling of positions 0 and I:
- 1 to 2 NO/NC auxiliary contacts,
- 1 to 2 low level NO/NC auxiliary contacts.

Electrical characteristics

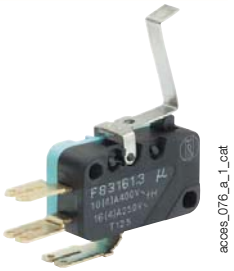
A300.

NO/NC contact

Frame size	Position AC	Type	Reference
B4 - B5	1 contact	NO/NC	2799 **0021**
	2 contacts		2799 **0022**
$B5_{DS}$	1 contact		4159 **0021**

Low level NO/NC auxiliary contacts

Frame size	Position AC	Type	Reference
B4 - B5	1 contact	NO/NC	2799 **0121**
	2 contacts		2799 **0122**
$B5_{DS}$	1 contact		4159 **0021**



Cage terminals

Use

Connection of bare copper cables onto the terminals.

Frame size	Rating (A)	Numbrer and size of cables	Type of cable	Quantity	Reference	Must be utilized with bridging bar Reference	Figure
B4	320 … 400	1 conductor (#6-300MCM)	Cu / Al	2 lugs	3954 **2020**	2709 **0043**	Fig. 2
			Cu / Al	4 lugs	3954 **4020**	2709 **0043**	
			Cu / Al	6 lugs	3954 **6020**	2709 **0043**	
		1 conductor (#2-600MCM) or 2 conductors (1/0-250MCM)	Cu / Al	2 lugs	3954 **2040**	2709 **0043**	
			Cu / Al	4 lugs	3954 **4040**	2709 **0043**	
		1 conductor (#6-350MCM)	check with supplier		NSI **350T**	2709 **0021**	Fig. 1
		2 conductors (#6-300MCM)			PANDUIT LAM2SA300-38-3	-	Fig. 3
B5 - $B5_{DS}$	500 … 650	2 conductorS (#6-350MCM)	Cu / Al	2 lugs	3954 **2041**	2709 **0065**	Fig.4
			Cu / Al	4 lugs	3954 **4041**	2709 **0065**	
		2 conductorS (2-600MCM)	Cu / Al	4 lugs	3954 **4060**	2709 **0065**	
			Cu / Al	8 lugs	3954 **8060**	2709 **0065**	

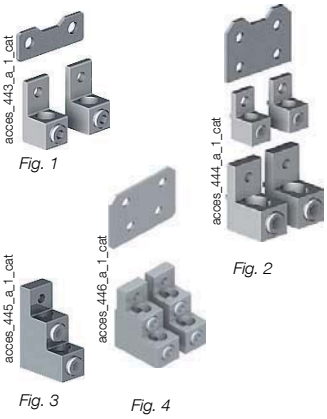


Fig. 1 Fig. 2 Fig. 3 Fig. 4

Characteristics

as per standards UL98B

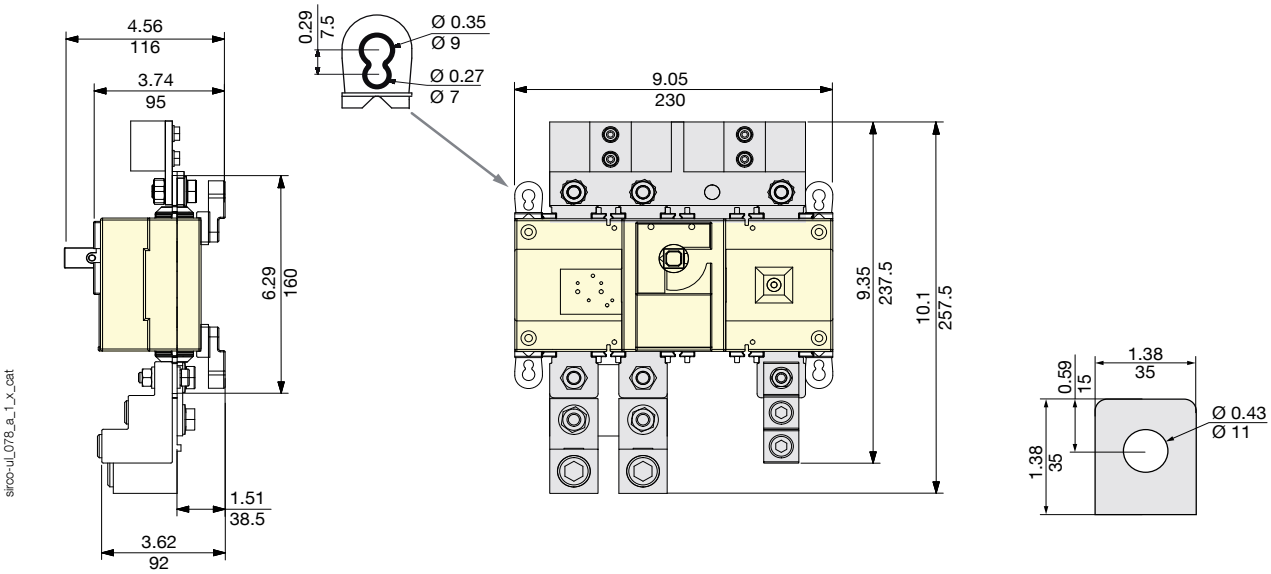
Rating		320 A				400 A			
Number of circuits	**Rated voltage**	**(A)**	**Number of pole(s) in series per polarity**	**Number of pole(s) of the device**	**Frame size**	**(A)**	**Number of pole(s) in series per polarity**	**Number of pole(s) of the device**	**Frame size**
1 circuit	1000 VDC	320	2 P in // + 1 P	3 P	B4	400	2 P in // + 1 P	3 P	B4
Short-circuit capacity at 1000 VDC (any circuit breaker)									
Prospective short-circuit current (kA rms DC)		10(1)				10(1)			
Connection terminals									
Min. connection wire range/ AWG		2x#6				2x#6			
Max. connection wire range/ AWG		600MCM				600MCM			
Mechanical characteristics									
Durability (number of operating cycles)		6000				6000			
Operating effort (lbs.in/Nm)		88.5/10				88.5/10			
Auxiliary contact									
Electrical characteristics		A300				A300			

Rating		500 A				650 A			
Number of circuits	**Rated voltage**	**(A)**	**Number of pole(s) in series per polarity**	**Number of pole(s) of the device**	**Frame size**	**(A)**	**Number of pole(s) in series per polarity**	**Number of pole(s) of the device**	**Frame size**
1 circuit	1000 VDC	500	2 P in //	4 P	B5	650	2 P in //	4 P	B5
2 circuit	1000 VDC	500	2 P in //	8 P	$B5_{DS}$	650	2 P in //	8 P	$B5_{DS}$
Short-circuit capacity at 1000 VDC (any circuit breaker)									
Prospective short-circuit current (kA rms DC)		10(1)				10(1)			
Connection terminals									
Min. connection wire range/ AWG		2 x #2				2 x #2			
Max. connection wire range/ AWG		2 x 600 MCM				2 x 600 MCM			
Mechanical characteristics									
Durability (number of operating cycles)		6000				6000			
Operating effort (lbs.in/Nm)		128.3 / 14.5				128.3 / 14.5			
Auxiliary contact									
Electrical characteristics		A300				A300			

(1) Without fuse during 50 ms.

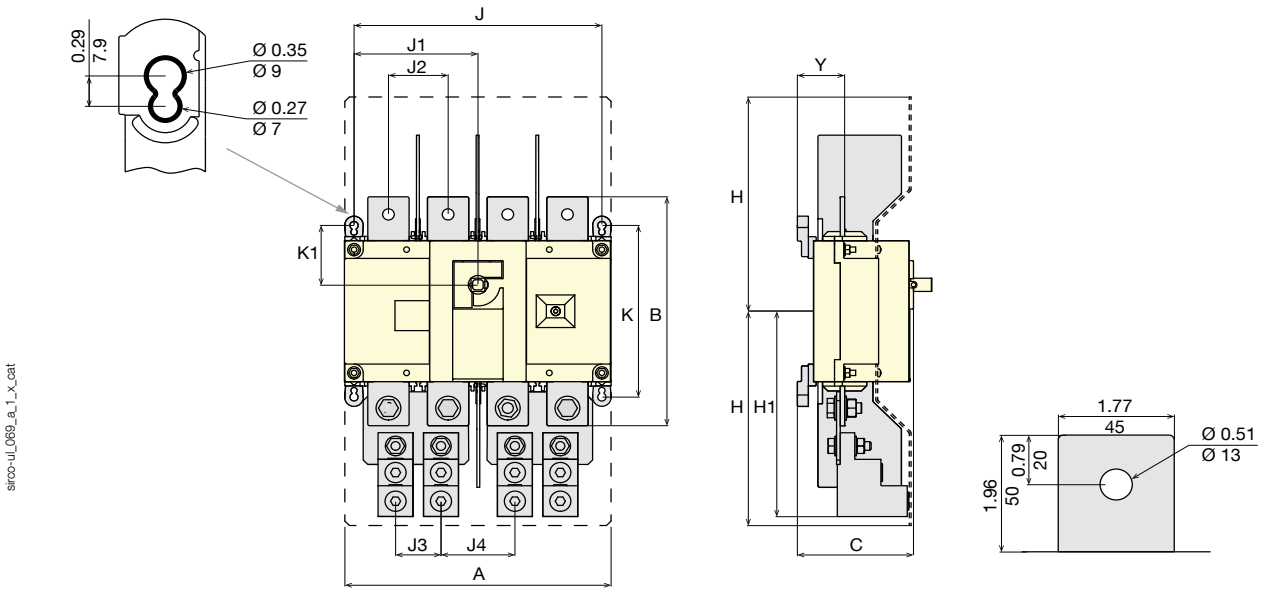
Dimensions (in/mm)

B4



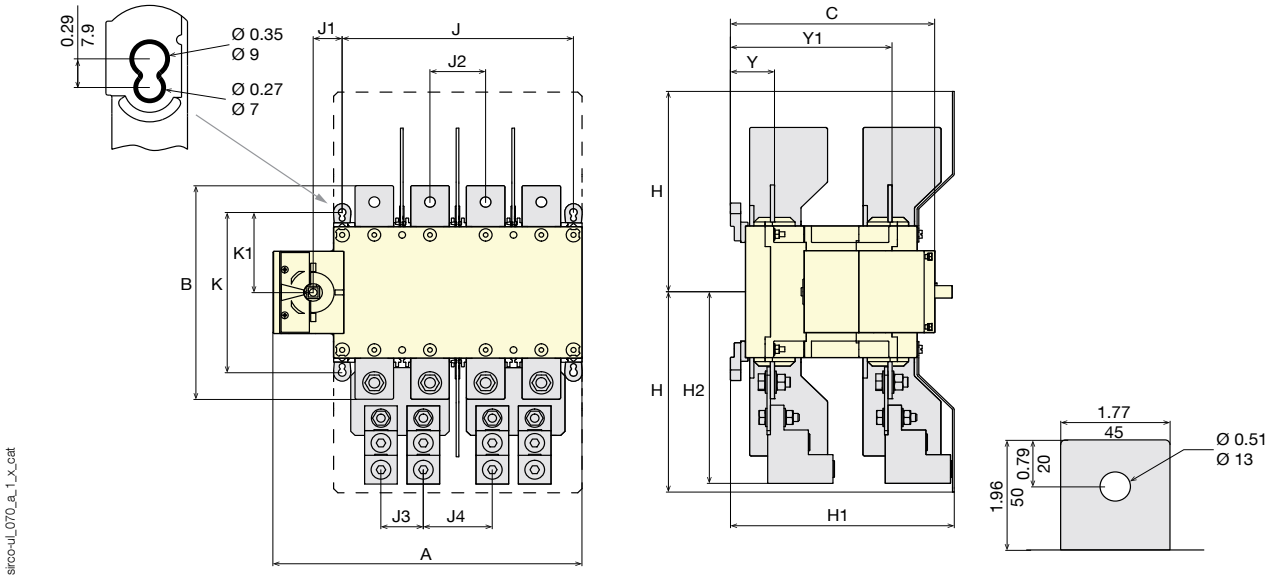
Dimensions (in/mm) (continued)

B5



Rating (A)	Units	A	B	C	H	H1	J	J1	J2	J3	J4	K	K1	Y
500 …650	in	11.41	10.23	4.98	95.9	9.17	10.63	5.31	2.56	1.94	3.17	7.67	2.65	2.02
	mm	290	260	126	243.5	233	270	135	65	49.5	80.5	195	67.5	51.5

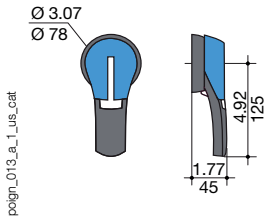
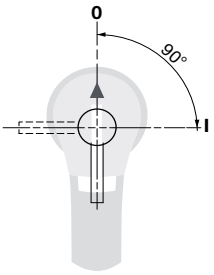
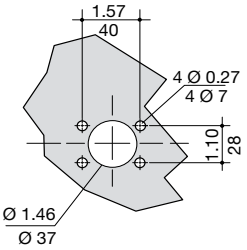
B5$_{DS}$



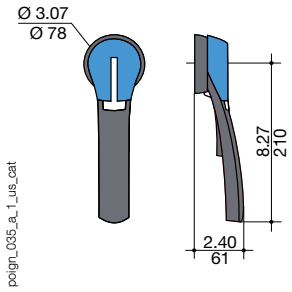
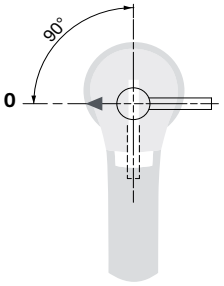
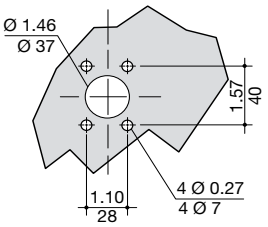
Rating (A)	Units	A	B	C	H	H1	H2 max.	J	J1	J2	J3	J4	K	K1	Y	Y1
500 … 650	in	14.21	10.23	9.41	95.9	6.51	9.17	10.63	1.37	2.56	1.94	3.17	7.67	2.70	2.02	7.44
	mm	361	260	239	243.5	165.5	233	270	35	65	49.5	80.5	195	68.5	51.5	189

Dimensions for external handles (in/mm)

B4 - B5

Handle type	Front operation Direction of operation	Door drilling
S2 type 		

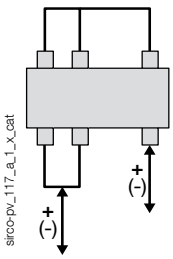
B5DS

Handle type	Front operation Direction of operation	Door drilling
S3 type 		

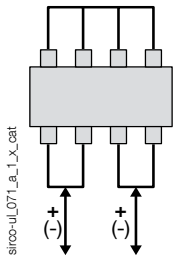
Pole connections in series

1000 VDC

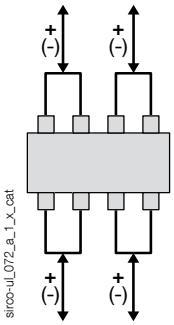
B4 - 3 P
1 PV circuit Grounded



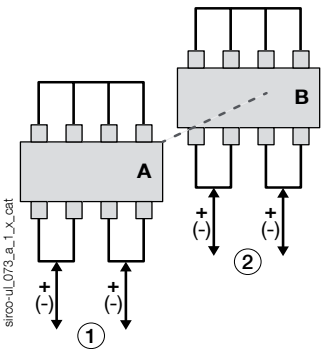
B5
1 PV circuit Grounded



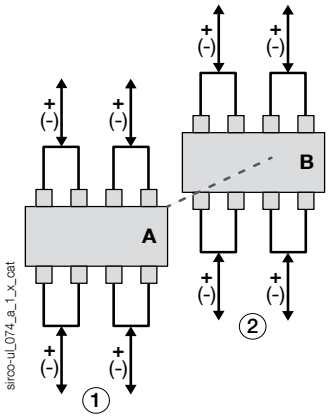
B5
1 PV circuit Ungrounded



B5DS
1 PV circuit Grounded



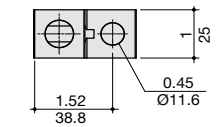
B5DS
1 PV circuit Ungrounded
or 2 PV circuit Grounded

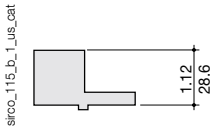


Terminal lugs (in/mm)

B4

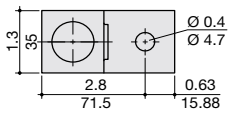
3954 x020(1)

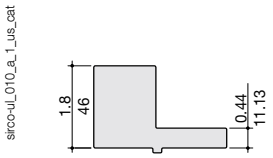




300MCM

3954 x040 (1)



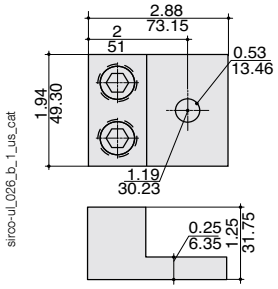


600MCM

(1) x – any number between 0 and 9.

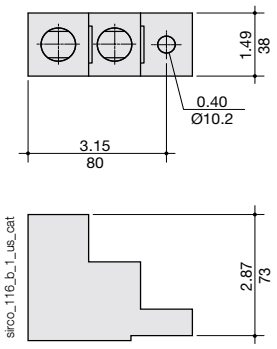
B5 - B5DS

3954 x041(1) - 2 x 350 MCM



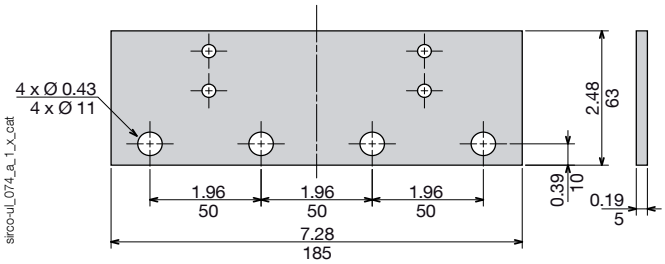
(1) x – any number between 0 and 9.

3954 x060(1) - 2 x 600 MCM



Bridging bars (in / mm)

Ref.: 2709 5032



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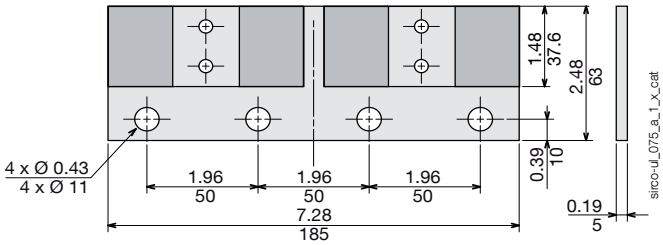
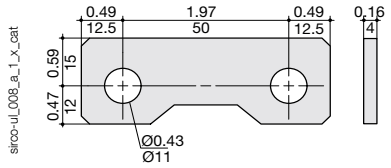


Ref.: 2709 0021



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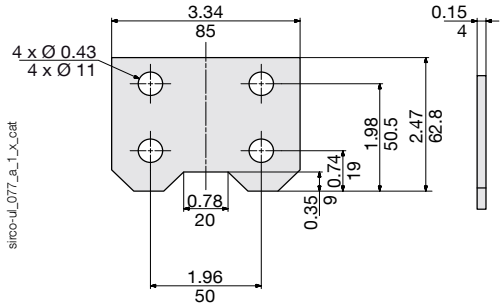
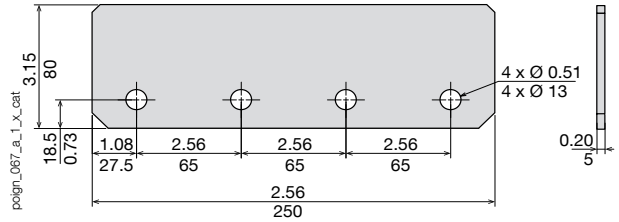


Ref.: 2709 5065



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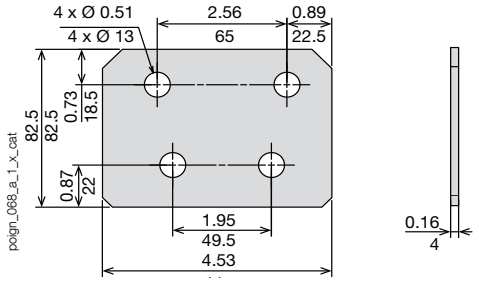
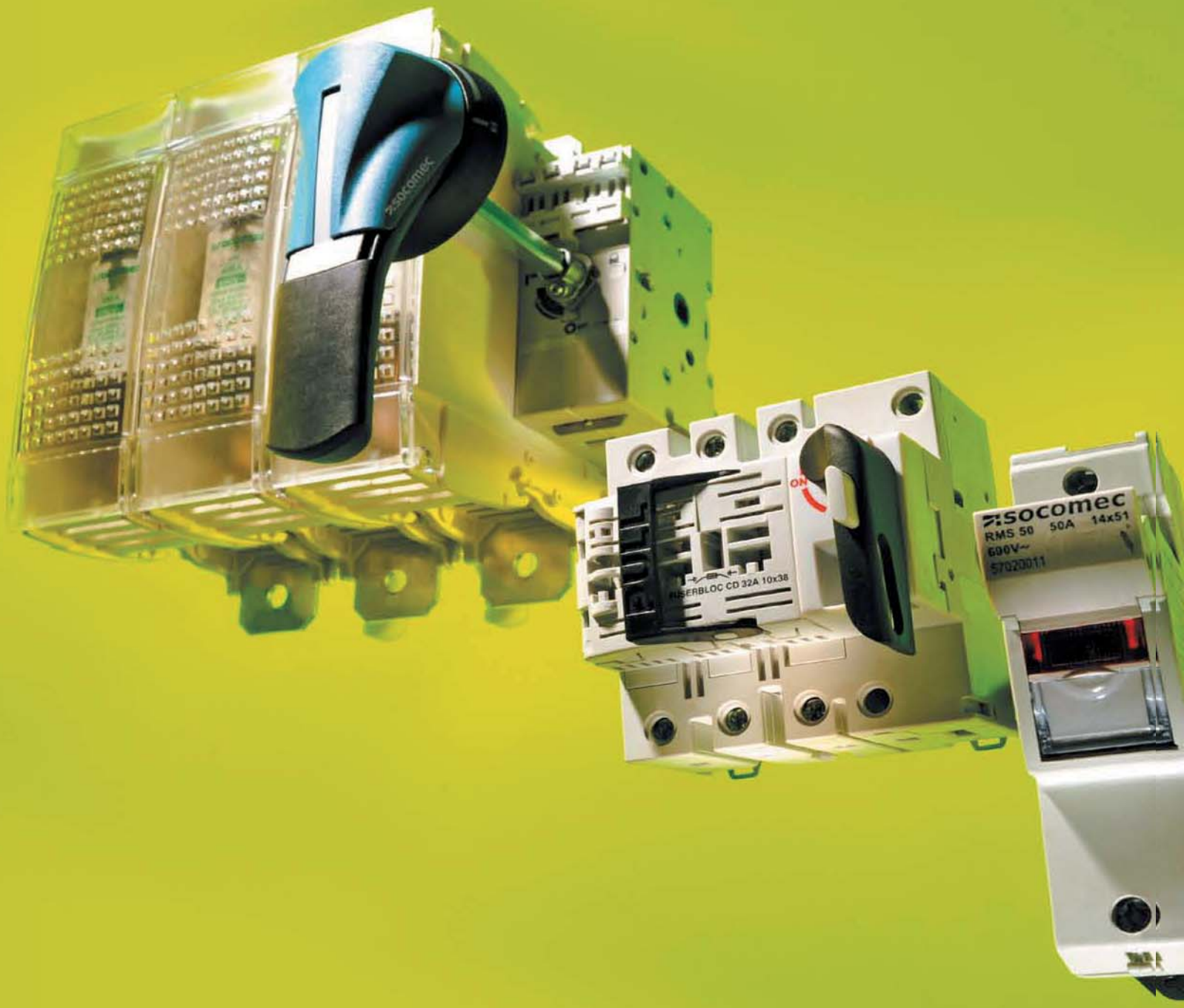



socomec
RUSERBLOC CD 32A 10x38
socomec
RMS 50 50A 14x51
600V~
57020011

Fusible disconnect switches

Fuse solutions: Definite advantages over circuit breakers ..... p. 88

FUSERBLOC

FUSERBLOC UL
30 to 800 A
p. 90

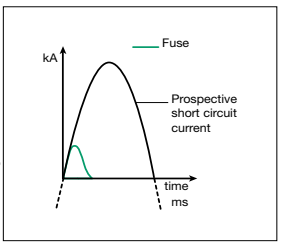
Photovoltaic applications

RM PV UL
p. 104

gPV fuses UL
p. 106

Fuse solutions: definite advantages over circuit breakers

Fuses: a high performance



fuser_185_e_gb

Thanks to the high current limiting CC, J and L type fuses, the best protection will be provided to downstream components, such as motor or motor starter.

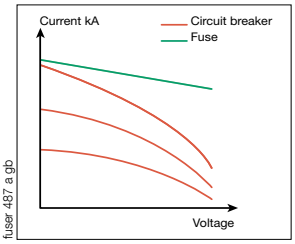
Our disconnect have been designed around this concept to provide 200 kA as a SCCR on most of the range.

Safety

fuser 192 b

The energy released during a short-circuit is contained in the sealed fuse cartridge, there is no release of ionized gases, thus no effect on surrounding equipment in comparison to what happens when circuit-breakers open on short-circuit.

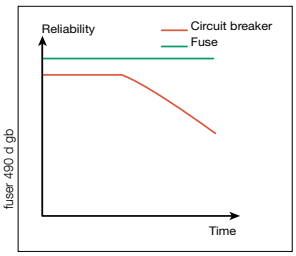
Circuit-breakers: reduced breaking capacity



fuser 487 a gb

Breaking capacity of circuit-breakers reduces dramatically when voltage increases: capacity can decrease from 100 kA at 240 V to 20 kA or even less at 600 V.

Reliability over time



fuser 490 d gb

Fuses are totally sealed products, which guarantee long-term protection without any maintenance.

Circuit-breakers are complex devices including lots of moving parts. Their mechanism is affected by dust, humidity… and needs maintenance.

Re-close or Replace ?

fuser 664 a

Circuit-breakers can be re-closed after a default: that's the biggest argument of their manufacturers.

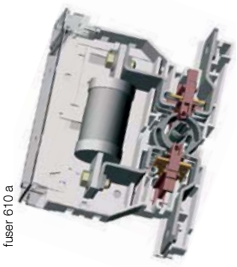
You should however consider that the circuit-breaker should be inspected each time there is a significant short-circuit.

It is hard to know how many times a circuit-breaker has operated…

In contrast, when a fuse blows, it is replaced by a new one, and the installation is as reliable as prior to the fault.

Thus… Re-close or replace ?

Last longer


fuser 610 a

Our FUSERBLOC show 2 main functionalities:

- magneto-thermal protection, made inside the encapsulated fuses,
- disconnection thru moving contacts that stay closed during short-circuit (arc won't destroy them).
- On a circuit-breaker both functionality are on the same mechanical element…

Evolution of NEC® regulation

Requirement of panel sccr
Art 409 of nec® 2005 & UL508a

According to NEC® 2005, all industrial control panels must be marked with a Short-Circuit Current Rating (SCCR).

This covers the entire panel and not just the primary rating of the over-current protection device, as commonly done before.

Calculation of this Panel SCCR is easy with Fuse Disconnect Switch, since there is a defined table SB4.1 in UL508 which specifies Ip (peak value) of feeder fuse that can be used for protection of downstream components, which is not the case on circuit-breakers. Thanks to the high current limiting characteristics of the fuses the SCCR of brauch circuits can be highly enhanced.

Arc flash NEC®2005

The NEC now contains requirements related to arc flash hazards. Section 110-16, Flash Protection, requires markings on switchboard, panel boards, industrial control panels and motor control centers to warn from potential arc flash hazards.

Arc flash mitigation is greatly enhanced by the use of fuses and their current limiting capabilities and fast opening times.

socomec Innovative Power Solutions

UL/ CSA standards for disconnect switches

UL98 - Enclosed and dead front switches (equivalent to CSA-C22.2 no 4)

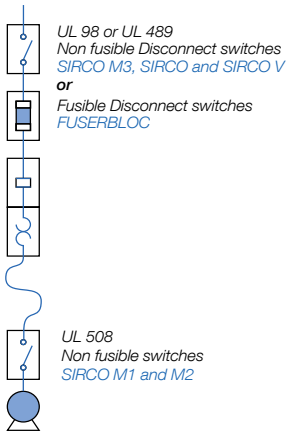
These requirements cover enclosed or dead front Switches, with or without provision for fuses, at 600 V or less.

These products are used as disconnecting meanswithout restrictions; they are heavy duty products requiring 2 inches (50 mm) minimum of creepage distance, which gives a maximum safety for users and installation. The short circuit withstand of those products goes up to 200 kA.

UL489 - Molded case switches (equivalent to CSA-C22.2 no 5)

This requirements cover Molded-case Circuit Breaker, Molded case switches and fused Molded-case switches, rated at 600 volts or less and 6000 amperes or less.

Typical control panel



sirco-ul_005_a_1_cat

sircom_174_a

UL standards for Electrical Machinery

UL508 - Industrial Control Equipment (equivalent to CSA-C22.2 no 14)

These requirements cover Manual, magnetic and solidstate Starters and Controllers, Overload relays, pushbuttons, selector switches, control lights…

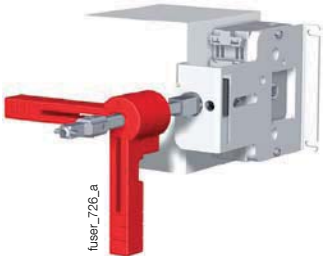
These products are IEC type products, smaller requiring only a creepage distance between phases of 1/2 inch. UL508 standard requested only 5 kA or 10 kA as short circuit withstand with fuse protection. Their use as a disconnecting mean is therefore limited to local disconnection of motors. These products can only be used as a disconnect mean when they have been additionally tested “suitable as motor disconnect”. This additional testing ensures that the switch as a proper closing capacity on short circuit. UL508 (switches or Circuit breakers) can not be used as main disconnect of a electrical panel. (i.e. in entrance of control panels).

A manual motor controller marked “Suitable as motor disconnect” shall be installed only on the load side of the branch circuit protective device (UL508A 30.3.3 and NEC 430.109(6)).

NFPA 79 Electrical Standard for industrial machinery

The following types of machines are identified as industrial machinery:

- metalworking machine tools, including machines that cut or form metal,
- plastics machinery,
- wood machinery, including woodworking, laminating, and sawmill machines,
- assembly machines,
- material handling machines, including industrial robots and transfer machines,
- inspection and testing machines, including coordinate measuring and in-process gauging machines.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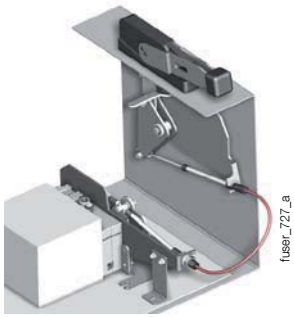
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FUSERBLOC UL

Fusible disconnect switches UL and CSA

30 to 800 A

ul_004_a

fuser-ul_006_a

fuser-ul_005_a

The solution for

- Motor on-load disconnect
- Protection of industrial cabinet
- Electrical distribution

Strong points

- Improved safety
- High breaking capacity
- A complet range of functions

Conformity to standards(1)

- IEC 60947-3
- NFPA79 (2002 Edition)
- UL489, Guide WJAZ, file E255272 (Frame size 1 and 2)
- UL98, Guide WHTY, file E201138 (Frame sizes 3 to 8)
- CSA22.2 #5, Class 4652-06, file 112964 (Frame size 1 and 2)
- CSA22.2 #4, Class 4651-02, file 112964 (Frame sizes 3 to 8)

(1) Product reference on request.

Function

FUSERBLOC UL fusible disconnect switches are heavy duty switches that break and make power circuits on and off load.

The switches employ double break contacts per pole that ensure complete isolation of the fuse when the switch is in the “OFF” position. These switches are extremely durable and are tested and approved for use in the most demanding applications.

The TEST position function is enabled with handles with the TEST position. This function tests the control circuit auxiliaries without switching the main contacts. It is a simple alternative to a separately wired push button.

Advantages

Improved safety

- On load make and break power circuit applications.
- Double break by phase.
- Touch safe covers.

High breaking capacity.

- Up to 200 kA Short circuit rating.

A complet range of functions

- Compact footprints.
- Front or side operation.
- Flange operation.
- NFPA 79 compliant kits.
- Voltage sensing terminals.

socomec Innovative Power Solutions

References

Fusible disconnect

Rating (A) Fuses Frame size	No. of poles	Switch body	Direct handle	Front external handle	External right side handle[1]	Shaft external handle	NFPA79 kit	U-type auxiliary contacts	Terminal shrouds
CD 30 A CC 1	3 P	3710 **3003**	Black 3729 **4012**	S0 type Black IP65 I - 0 1, 3R, 12 **1493 0111** 4, 4X **149D 0111**		S0 type 200 mm 7.9 inches **1405 0620** 320 mm 12.6 inches **1405 0632** 400 mm 15.7 inches **1405 0640**	3729 **4532**	1 contact NC 3999 **0701** 1 contact NO 3999 **0702**	standard
	3 P + switched neutral	3710 **4003**							
	3 P + solid neutral	3710 **5003**							
CD 30 A J 2	3 P	3710 **3004**	3729 **4014**	S1 type Black IP65 I - 0 1, 3R, 12 **141F 2111** 4, 4X **141D 2111**		S1 type 200 mm 7.9 inches **1401 0520** 320 mm 12.6 inches **1401 0532** 400 mm 15.7 inches **1401 0540**			
	3 P + switched neutral	3710 **4004**							
	3 P + solid neutral	3710 **5004**							
30 A J 4	2 P	3861 **2004**	Black 3629 **7910**	S1 type Black I - 0 1, 3R, 12 Defeatable **141F 2111** I - 0 4, 4X Defeatable **141D 2111** I - 0 - Test 4, 4X Defeatable **141D 2115**	S1 type Black I - 0 4, 4X **141H 6111** S1 type Red / yellow I - 0 4, 4X **141I 6111**	S1 type 200 mm 7.9 inches **1400 1020** 320 mm 12.6 inches **1400 1032**	3729 **7540**		
	3 P	3861 **3004**							
	4 P	3861 **6004**							
60 A J 4	2 P	3861 **2005**							
	3 P	3861 **3005**							
	4 P	3861 **6005**							

(1) No door interlocking.

References (continued)

Rating (A) fuses Frame size	No. of poles	Switch body	Direct handle	Front external handles	External right side handle(1)	Shaft for external handle	NFPA79 kit	U-type auxiliary contacts	Terminal shrouds
60 A J 5	2 P	3861 **2006**	Black 3629 **7910**	S2 type Black I - 0 1, 3R, 12 Defeatable 142F **2111** Black I - 0 4, 4X Defeatable 142D **2111**	S2 type Black I - 0 4, 4X 142H **6111** Red / yellow I - 0 4, 4X 142I **6111**	S1 type 200 mm 7.9 inches 1400 **1020** 320 mm 12.6 inches 1400 **1032**	3729 **7540**	1 contact type NC 3999 **0701** 1 contact type NO 3999 **0702**	standard
	3 P	3861 **3006**							
	4 P	3861 **6006**							
100 A J 5	2 P	3861 **2010**							
	3 P	3861 **3010**							
	4 P	3861 **6010**							
200 A J 6	2 P	3861 **2020**							3898 **2020**
	3 P	3861 **3020**							3898 **3020**
	4 P	3861 **6020**							3898 **4020**
400 A J 7	2 P	3851 **2038**					3729 **7544**		3898 **2040**
	3 P	3851 **3038**							3898 **3040**
	4 P	3851 **6038**							3898 **6040**
600 A J 8	2 P	3850 **2060**	Black 3859 **6011**	S3 type Black I - 0 1, 3R, 12 Defeatable 143F **3111** 4, 4X Defeatable 143D **3111**		S3 type 200 mm 7.9 inches 1400 **1220** 320 mm 12.6 inches 1400 **1232**	3729 **7552**		2 P 3898 **2080** 3 P 3898 **3080** 4 P 3898 **4080**
	3 P	3850 **3060**							
	4 P	3850 **6060**							
800 A L 8	2 P	3850 **2080**							
	3 P	3850 **3080**							
	4 P	3850 **6080**							

(1) No door interlocking.

Accessories

Electronic fuse operation indication (FMD)

Use
For fuse cartridge BS88, DIN and UL.

Principle
The FMD detects fuse operation using a bistable relay and a signaling LED.
It can be mounted on a DIN rail, a back plate, next to the FUSERBLOC, or on the door.

References

For FUSERBLOC 63 to 1250 A - size 000 to 4		
Nb of leds	**Operating voltage**	**Reference**
1	120 - 260 VAC	3899 **1120**
1	380 - 690 VAC	3899 **1380**
3	120 - 260 VAC	3899 **3120**
3	380 - 690 VAC	3899 **3380**

Accessories		**Reference**
Kit for connection accessories	Standard	3819 **9120**
Kit for connection accessories	Door mounted	3829 **9120**

Relay characteristics

	Relay operating current I_e (A)	
Rating (A)	**AC-15**	**DC-13**
63 ... 1250	2.5 A	0.2

1-led version

3-leds version

NFPA79 accessories

Flange handle for flange operation

Use

Meets both UL508A and NFPA79 requirements.
The handle will operate the switch by cable or rod.

Rating (A)	Type	Nema type	Reference
30 … 200	Standard handle	1, 3, 3R, 4, 12	3729 **9002**(1)
30 … 200	Chrome plated handle	1, 3, 3R, 4, 4X, 12	3729 **9003**(1)

(1) Defeatable handle.

Cable operator

Use

Link between the flange handle and the switch, please order the flange handle, the mechanism and a cable length of your choice.

Rating (A)	Description	Reference
30 ... 200 A	Cable flange mechanism	3729 **9903**

Cable length (inches)	Cable length (mm)	Reference
36	900	3729 **9992**
60	1500	3729 **9993**
120	3000	3729 **9994**

Rod operator

Use

Link between the flange handle and the switch. The rod flange is an economical solution, please order the flange handle and a rod kit.

Rating 30 ... 200 A

For enclosure depth (inches)	For enclosure depth (mm)	Reference
8 … 24	203 … 613	3729 **9904**

NFPA79 "Through the door" kit

Use

Meets both UL508A and NFPA79 requirements.
Allows retrofitt of your installations for ratings from 30 to 800 A.
Please order an S-type external handle separately.

Rating (A)	Reference
CD 30, frame 1 - 2	3729 **4532**
30 … 200, frame 3 to 6	3729 **7540**
400, frame 7	3729 **7544**
600 … 800, frame 8	3729 **7552**

Accessories

Direct handle

Rating (A)	Color	fuses	Fig.	Reference
CD 30	Black	CC	1	3729 **4012**
CD 30	Black	J	1	3729 **4014**
30 ... 400	Black	J	2	3629 **7910**
600 ... 800	Black	J / L	2	3859 **6011**

Fig.1

Fig. 2

External handle

Use

The locking function of the front external handle prevents the user from opening the door of the enclosure when the switch is in the "ON" position, and when the switch is padlocked in the “OFF” position (S1, S2, S3 and S4 type handles only).

Opening the door when the switch is in the "ON" position is possible by defeating the interlocking function with the use of a tool (authorized persons only).

The interlocking function is restored when the door is re-closed.

Front operation

Rating (A)	Frame size	Handle	Nema type	Test	Handle color	Standard Reference	Heavy duty Reference
CD 30	1	S0 type	1, 3R, 12	I - 0	Black	1493 **0111**	
CD 30	1	S0 type	1, 3R, 12	I - 0	Red/Yellow	1494 **0111**	
CD 30	1	S0 type	4, 4X	I - 0	Black	149D **0111**	
CD 30	1	S0 type	4, 4X	I - 0	Red/Yellow	149E **0111**	
CD 30 ... 60	3/4	S1 type	1, 3R, 12	I - 0	Black	141F **2111**	
CD 30 ... 60	3/4	S1 type	1, 3R, 12	I - 0	Red/Yellow	141G **2111**	
CD 30 ... 60	3/4	S1 type	4, 4X	I - 0	Black	141D **2111**	141D **2911**
CD 30 ... 60	3/4	S1 type	4, 4X	I - 0	Red/Yellow	141E **2111**	141E **2911**
CD 30 ... 60	3/4	S1 type	4, 4X	I - 0 - Test	Black	141D **2115**	141D **2915**
CD 30 ... 60	3/4	S1 type	4, 4X	I - 0 - Test	Red/Yellow	141E **2115**	141E **2915**
60 ... 200 (1)	5/6/7	S2 type	4, 4X	I - 0 - Test	Black	142D **2115**	142D **2915**
60 ... 200 (1)	5/6/7	S2 type	4, 4X	I - 0 - Test	Red/Yellow	142E **2115**	142E **2915**
60 ... 400	5/6/7	S2 type	1, 3R, 12	I - 0	Black	142F **2111**	
60 ... 400	5/6/7	S2 type	1, 3R, 12	I - 0	Red/Yellow	142G **2111**	
60 ... 400	5/6/7	S2 type	4, 4X	I - 0	Black	142D **2111**	142D **2911**
60 ... 400	5/6/7	S2 type	4, 4X	I - 0	Red/Yellow	142E **2111**	142E **2911**
600 ... 800	8	S3 type	1, 3R, 12	I - 0	Black	143F **3111**	
600 ... 800	8	S3 type	1, 3R, 12	I - 0	Red/Yellow	143G **3111**	
600 ... 800	8	S3 type	4, 4X	I - 0	Black	143D **3111**	143D **3911**
600 ... 800	8	S3 type	4, 4X	I - 0	Red/Yellow	143E **3111**	143E **3911**

(1) No test position on 400 A.

Right side operation

Rating (A)	Frame size	Handle	Nema type	Test	Handle color	Standard Reference	Heavy duty Reference
30 ... 60	3/4	S1 type	4, 4X	I - 0	Black	141H **6111**	141H **6911**
30 ... 60	3/4	S1 type	4, 4X	I - 0	Red/Yellow	141I **6111**	141I **6911**
100 ... 400	5/6/7	S2 type	4, 4X	I - 0	Black	142H **6111**	142H **6911**
100 ... 400	5/6/7	S2 type	4, 4X	I - 0	Red/Yellow	142I **6111**	142I **6911**
600 ... 800	8	S3 type	4, 4X	I - 0	Black	consult us	consult us
600 ... 800	8	S3 type	4, 4X	I - 0	Red/Yellow	consult us	consult us

S0 type handle

S1 type handle

S2 type handle

S3 type handle

S-type handle raiser

Use
Enables S-type handles to be fitted in place of existing older style SOCOMEC handles. Adapter can also be utilized as a spacer to increase the distance between the panel door and the handle lever.

Dimensions
Increases distance to door by 12 mm.

acces_187_a_1_cat

Handle color	Pack qty	External degree of protection (IP)	Reference
Black	10	IP65	1493 **0000**

Alternative color S-type handle cover

Use
For single lever handleS-type S1, S2, S3 and double lever handle, type S4.
Other colors: please consult us.

acces_198_a_1_cat

Handle color	Pack qty	Handle	Reference
Light grey	50	S2, S3 type	1401 **0001**
Dark grey	50	S2, S3 type	1401 **0011**
Light grey	50	S4 type	1401 **0031**
Dark grey	50	S4 type	1401 **0041**

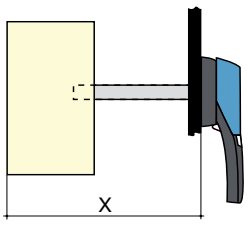
Shaft for external handle

Use
Standard lenghts:
- 7.9 in / 200 mm,
- 12.6 in / 320 mm,
- 15.7 in / 400 mm.

Other lenghts: please consult us.

acces_145_b_1_cat

acces_369_a_1_cat



acces_202_a_1_cat

Rating (A)	Dimensions X (in)	Dimensions X (mm)	Handle	Length (inches)	Length (mm)	Reference
CD 30	4.02 ... 9.65	102 ... 245	S0-type	7.9	200	1405 **0620**
CD 30	4.02 ... 14.37	102 ... 365	S0-type	12.6	320	1405 **0632**
CD 30	4.02 ... 17.52	102 ... 445	S0-type	15.7	400	1405 **0640**
CD 30	4.02 ... 9.65	102 ... 245	S1 type	7.9	200	1401 **0520**
CD 30	4.02 ... 14.37	102 ... 365	S1 type	12.6	320	1401 **0532**
CD 30	4.02 ... 17.52	102 ... 445	S1 type	15.7	400	1401 **0540**
30 ... 100	5.3 ... 9.06	135 ... 230	S2, S3 Type	7.9	200	1400 **1020**
200	5.7 ... 9.06	145 ... 230	S2, S3 Type	7.9	200	1400 **1020**
400	7.87 ... 10.24	200 ... 260	S2, S3 Type	7.9	200	1400 **1020**
30 ... 100	5.3 ... 13.78	135 ... 350	S2, S3 Type	12.6	320	1400 **1032**
200	5.7 ... 13.78	145 ... 350	S2, S3 Type	12.6	320	1400 **1032**
400	7.87 ... 14.96	200 ... 380	S2, S3 Type	12.6	320	1400 **1032**
30 ... 100	5.3 ... 16.93	135 ... 430	S2, S3 Type	15.7	400	1400 **1040**
200	5.7 ... 16.93	145 ... 430	S2, S3 Type	15.7	400	1400 **1040**
400	7.87 ... 18.1	200 ... 460	S2, S3 Type	15.7	400	1400 **1040**
600 ... 800	10.63 ... 11.97	270 ... 304	S3 Type	7.9	200	1400 **1220**
600 ... 800	10.63 ... 16.69	270 ... 424	S3 Type	12.6	320	1400 **1232**
600 ... 800	10.63 ... 19.84	270 ... 504	S3 Type	15.7	400	1400 **1240**

Accessories (continued)

Shaft guide for external handle

Use

This accessory enables handle to engage shaft with a misalignment of up to 15 mm.
Required for a shaft length over 400 mm for S1 to S3 handles and for a shaft lenght from 320 mm for S0 handle.

Description	Reference
Shaft guide for S1 to S3 handles	1429 **0000**
Shaft guide for S0 handle	1419 **0000**

acces_260_a_2_cat

U-type auxiliary contacts

Use

U-type AC can be configured to be operated on both, standard and TEST position switches from CD 30 to 800 A. Each slot can accommodate up to 2 interlocked ACs.

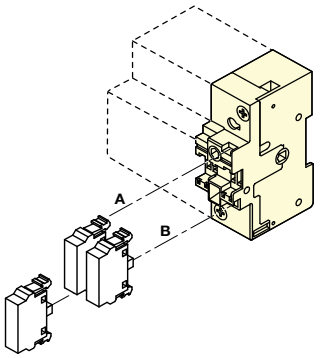
- For CD 30A/CC, a maximum of 4 ACs (8 with an additional holder),
- For CD 30A/J, maximum 2 ACs (6 with an additional holder),
- For 30 to 200A/J, maximum 4 ACs,
- For 400 to 800A/L, maximum 8 ACs.

Electrical characteristics

A600.

When FUSERBLOC is front operated, ACs are prebreak and signaling position I and 0.
When FUSERBLOC is side operated, Acs are signaling positions I and 0

acces_056_a_1_cat



acces_043_a_1_x_cat

NO auxiliary contacts		
Rating (A)	**Number of contacts**	**Reference**
CD 30 … 800	1	3999 **0701**

NC auxiliary contacts		
Rating (A)	**Number of contacts**	**Reference**
CD 30 … 800	1	3999 **0702**

Contact holder for additional auxiliary contacts		
Rating (A)	**Fuses**	**Reference**
CD 30	CC	3999 **0710**
CD 30	J	3999 **0710**

S-type auxiliary contacts

Use

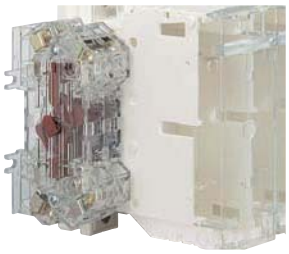
Side operated auxiliary contacts for FUSERBLOC 30 to 400 A, position OFF and ON signalled by 1 to 4 NO + NC auxiliary contacts.

Electrical characteristics

A600/D600.

S-type auxiliary contacts are signaling position I and 0.

acces_051_a_1_cat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NO+NC auxiliary contacts		
Rating (A)	**Number of contacts**	**Reference**
30 … 800	1	3999 **U041**
30 … 800	2	3999 **U042**

Terminal shrouds

Use

Top or bottom protection against direct contact with terminals or connection parts.
2 sets required to fully shroud both line and load terminals.

Front and side operation Rating (A)	No. of poles	Reference[1]
30 … 100	2/3/4 P	as standard
200	2 P	3898 **2020**
200	3 P	3898 **3020**
200	4 P	3898 **4020**
400	2 P	3898 **2040**
400	3 P	3898 **3040**
400	4 P	3898 **6040**
600 … 800	2 P	3898 **2080**[2]
600 … 800	3 P	3898 **3080**[2]
600 … 800	4 P	3898 **4080**[2]

(1) Top or bottom. (2) Line side delivered as standard.

fuser_314_a_1_cat

Terminals lugs

Use

Connection of cables to the terminals.

Rating (A)	Wires range	No wires per lug	Lugs per kit	Wires	Reference
CD 30	#14 - #10	1		Cu	as standard
30	#14 - #10	1		Cu	as standard
30 … 60	#10 - #6	1		Cu	as standard
60 … 100	#12 - #1	1		Cu	as standard
200	#6 - 300MCM	1	2	Cu / Al	3954 **2020**
200	#6 - 300MCM	1	3	Cu / Al	3954 **3020**
200	#6 - 300MCM	1	4	Cu / Al	3954 **4020**
400	#2 - 600MCM	1	2	Cu / Al	3954 **2040**
400	#2 - 600MCM	1	3	Cu / Al	3954 **3040**
400	#2 - 600MCM	1	4	Cu / Al	3954 **4040**
400	2 x (#6 - 350 MCM)	2	2	Cu / Al	3954 **2041**
400	2 x (#6 - 350 MCM)	2	3	Cu / Al	3954 **3041**
400	2 x (#6 - 350 MCM)	2	4	Cu / Al	3954 **4041**
600 … 800	2 x (#2 - 600MCM)	1	2	Cu / Al	3954 **2060**
600 … 800	2 x (#2 - 600MCM)	2	3	Cu / Al	3954 **3060**
600 … 800	2 x (#2 - 600MCM)	2	4	Cu / Al	3954 **4060**

ul_032_a

Solid links

Rating (A)	Fuses	No of links per kit	Reference
100	J	3	3799 **9010**
100	J	4	3799 **8010**
200	J	3	3799 **9020**
200	J	4	3799 **8020**
400	J	3	3799 **9040**
400	J	4	3799 **8040**
600 … 800	J / L	3	3799 **9080**
600 … 800	J / L	4	3799 **8080**

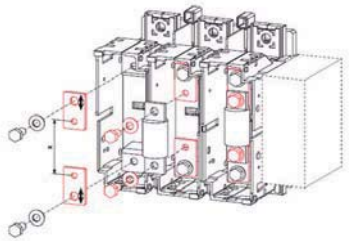
fuser-ul_013_a_1_cat

Class T fuse adapter

Use

The adapter makes it possible to fit class T fuses in the FUSERBLOC fuse switches.

Rating (A)	Size Class T fuse (in/mm)	No. of poles	Reference
100	2.34 / 59.5	3 P	3729 **8010**
200	2.48 / 63	3 P	3729 **8020**
400	2.71 / 69	3 P	3729 **8040**
600	2.95 / 75	3 P	3729 **8060**
800	3.17 / 80.5	3 P	3729 **8080**
100	2.34 / 59.5	4 P	3729 **9010**
200	2.48 / 63	4 P	3729 **9020**
400	2.71 / 69	4 P	3729 **9040**
600	2.95 / 75	4 P	3729 **9060**
800	3.17 / 80.5	4 P	3729 **9080**



fuser-ul_014_b_1_cat

Characteristics according to UL98/CSA22.2 #4

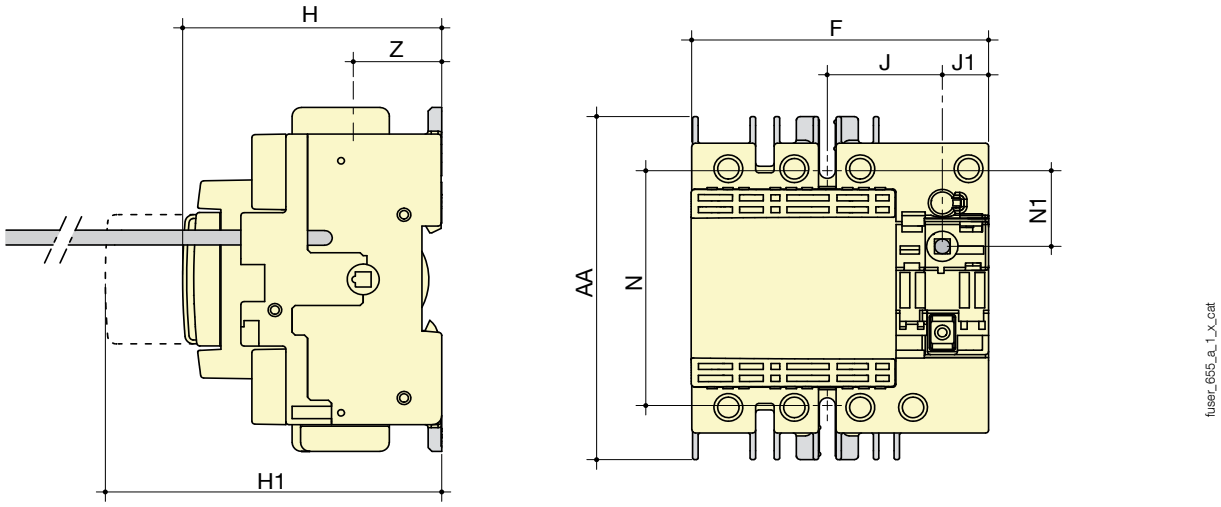
CD 30 to 800 A

Characteristics UL and CSA	CD 30A[3]	CD 30A[3]	30A	60A	60A	100A	200A	400A	600A	800A
Short circuit rating at 600 VAC (kA)	100	100	200	100	200	200	200	200	200	200
Type of fuse	CC	J	J	J	J	J	J	J	J	L
Max. fuse rating (A)	30	30	30	60	60	100	200	400	600	800
Operational power (hp) / current max Operational 3 ph (A)										
220-240 VAC	7.5 / 22	7.5 / 22	7.5 / 22	15 / 42	15 / 42	30 / 80	60 / 154	125 / 312	200 / 480	200 / 480
440-480 VAC	15 / 21	15 / 21	15 / 21	30 / 40	30 / 40	60 / 77	125 / 156	250 / 302	500 / 590	500 / 590
600 VAC	20 / 22	20 / 22	20 / 22	50 / 52	50 / 52	75 / 77	150 / 144	350 / 336	500 / 472	500 / 472
125 VDC[1]	3 / 25	3 / 25	3 / 25	3 / 25	3 / 25	7.5 / 58	15 / 112	20 / 148		
250 VDC[2]	5 / 20	5 / 20	5 / 20	10 / 38	10 / 38	20 / 38	40 / 140	50 / 173		
Mechanical endurance										
Endurance (number of operating cycles)	10 000	10 000	10 000	10 000	10 000	10 000	8 000	6 000	5 000	5 000
Operating torque (lbs.in/Nm)	3.5	3.5	4.1	8.7	8.7	9.7	10.2	17	66.2	66.2
Connection										
Min. connection cross-section/ (mm^2)[2]	#14	#14	#10	#10	#12	#12	#6	#2 or 2 x #6	2 x #2	2 x #2
Max. connection cross-section/ (mm^2)[2]	#10	#10	#6	#6	#1	#1	300MCM	600MCM or 2 x 350MCM	2 x 600MCM	2 x 600MCM

(1) 2 pole in series.
(2) 3 pole in series.
(3) UL 489/CSA22.2 #5.

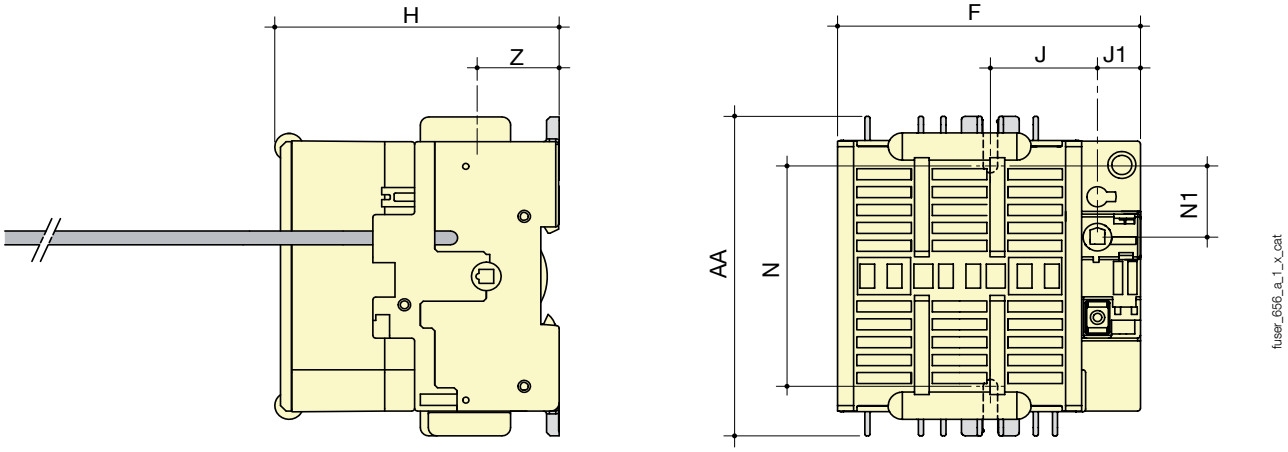
Dimensions (in/mm)

CD 30 A / CC - Frame size 1



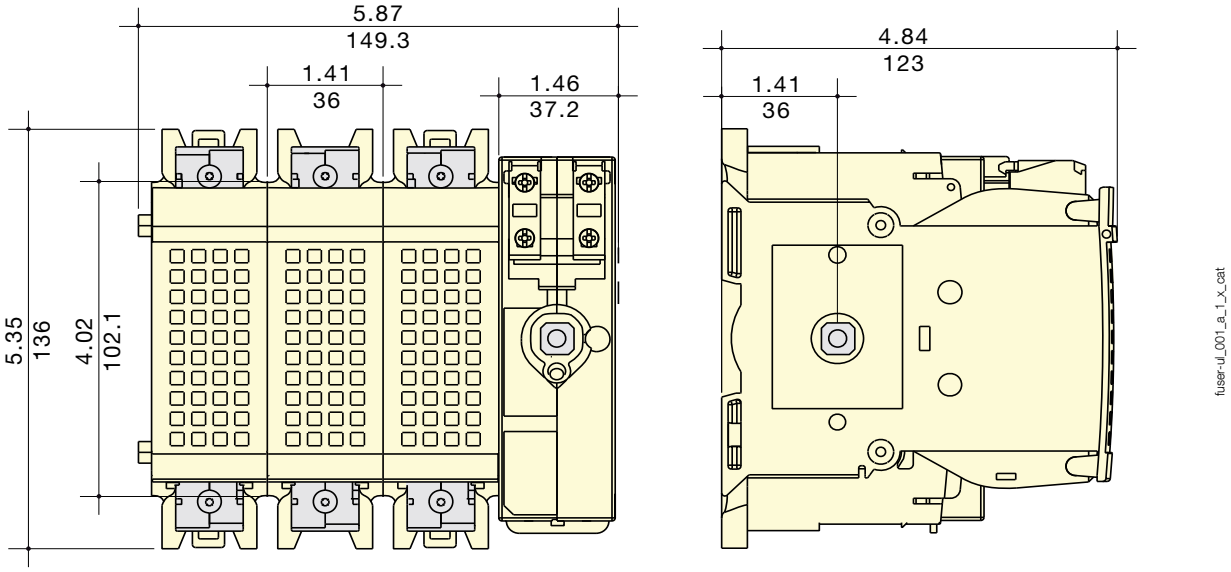
Rating (A) / Fuse	Unit	Switch body					Switch mounting		Connection	
		F	H	H1	J	J1	N	N1	AA	Z
CD 30 A / CC	in	3.78	3.28	5.19	1.47	0.59	3.13	1	4.56	1.12
	mm	96	83.5	132	37.5	15	79.5	25.5	116	28.5

CD 30 A / J - Frame size 2



Rating (A) / Fuse	Unit	Switch body				Switch mounting		Connection	
		F	H	J	J1	N	N1	AA	Z
CD 30 A / J	in	4.13	3.89	1.47	0.59	3.30	1	4.56	1.12
	mm	105	99	37.5	15	84	25.5	116	28.5

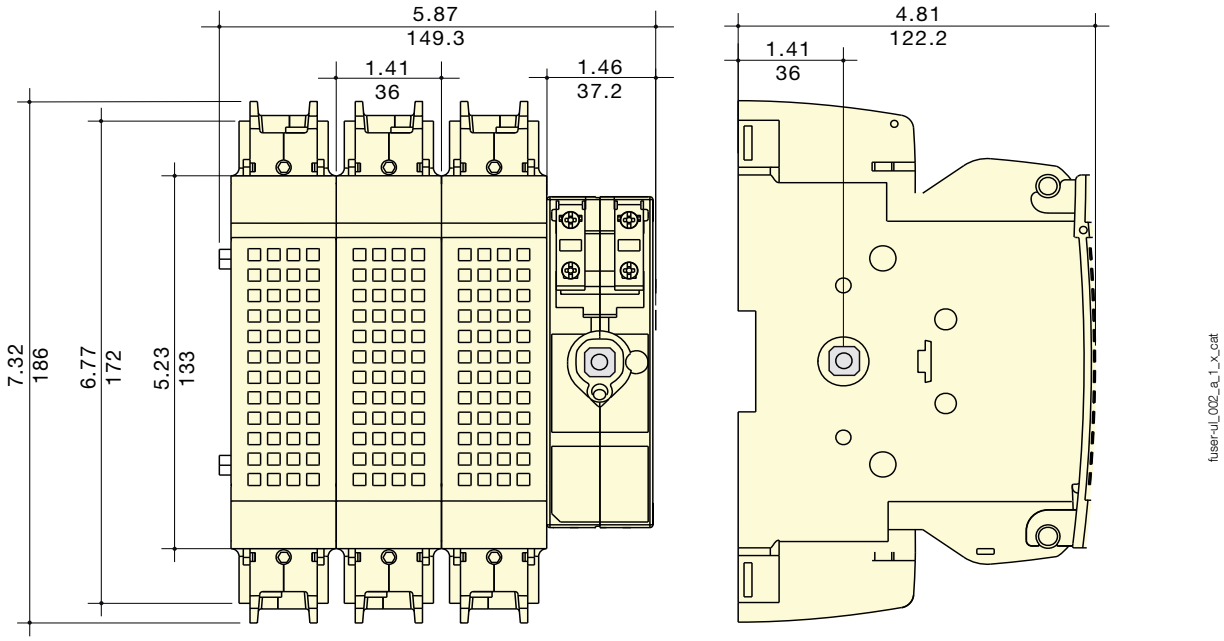
30 to 60 A / J - Frame size 4



Note for width:
For 2 pole device decrease overall width by 1.41"/36mm.
For 4 pole device increase overall width by 1.41"/36mm.

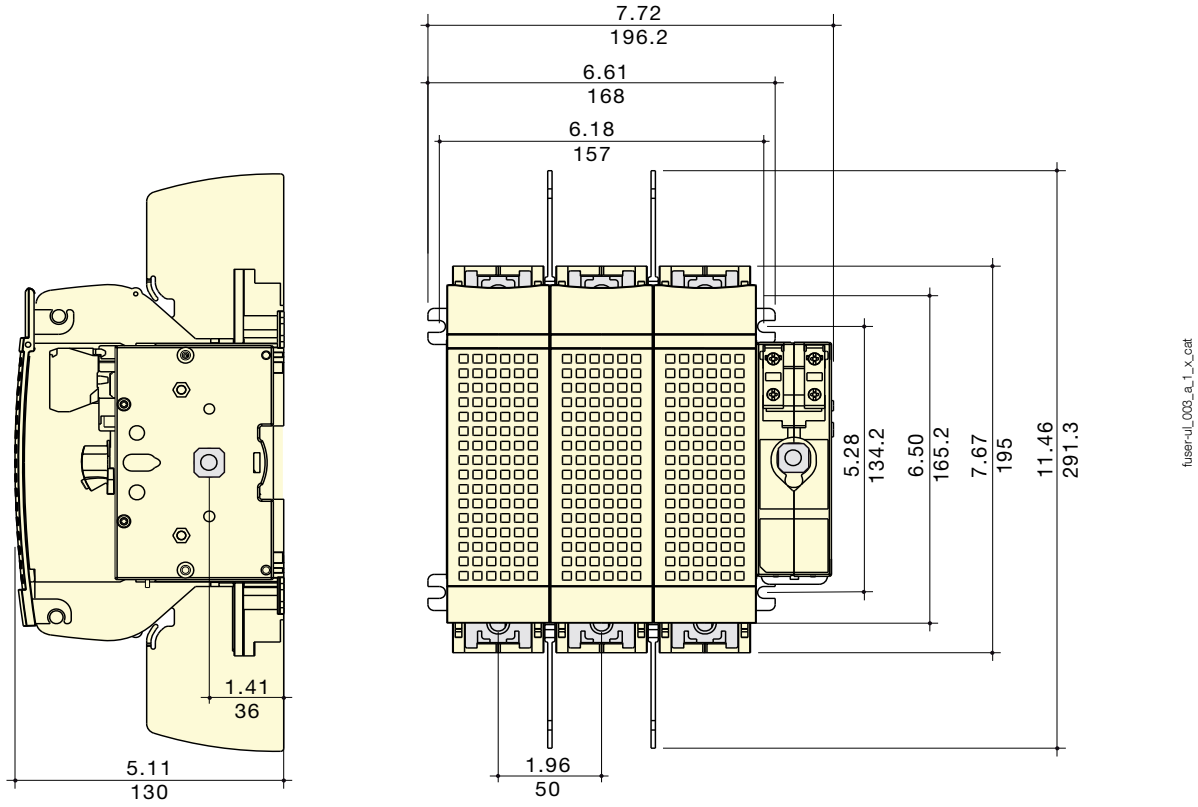
Dimensions (continued)

60 to 100 A / J - Frame size 5



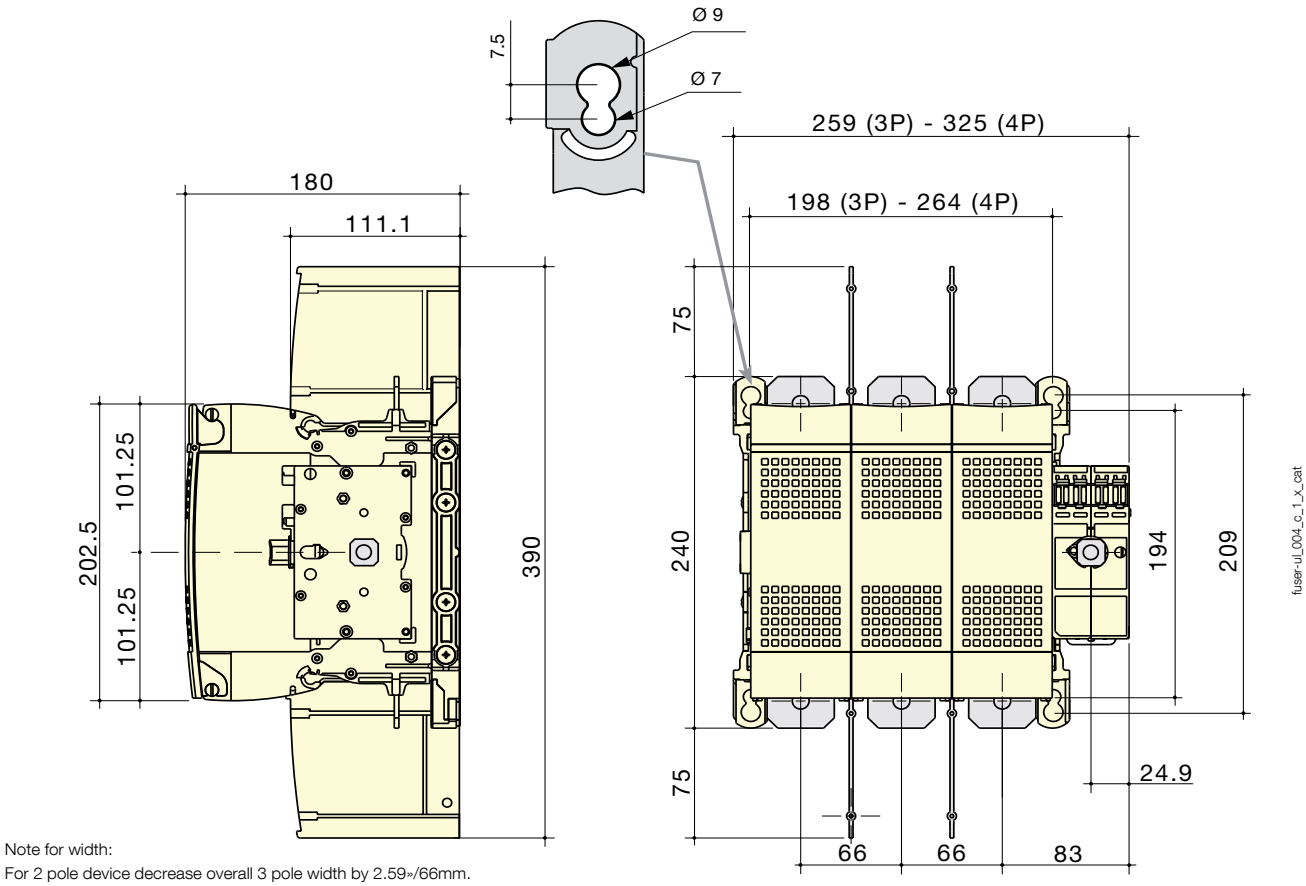
Note for width:
For 2 pole device decrease overall width by 1.41»/36mm.
For 4 pole device increase overall width by 1.41»/36mm.

200 A / J - Frame size 6



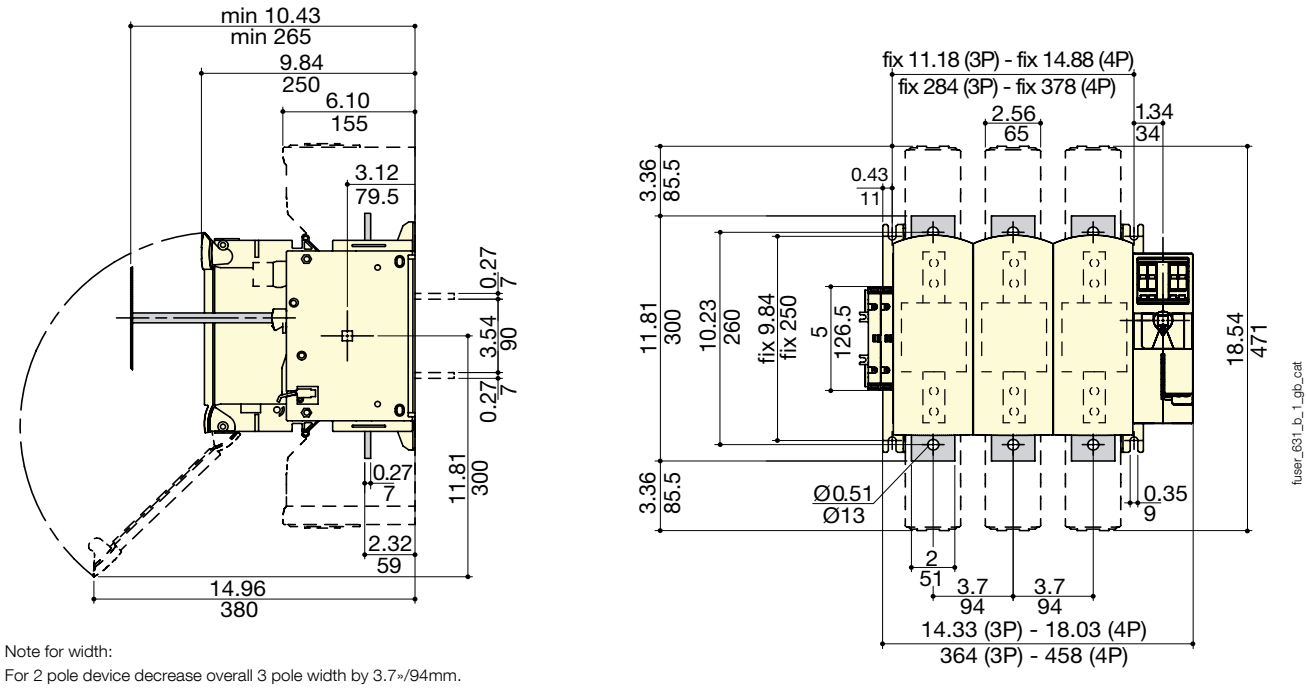
Note for width:
For 2 pole device decrease overall width by 1.96»/50mm.
For 4 pole device increase overall width by 1.96»/50mm.

400 A / J - Frame size 7



Note for width:
For 2 pole device decrease overall 3 pole width by 2.59»/66mm.

600 to 800 A / J - Frame size 8

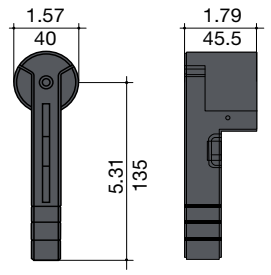


Note for width:
For 2 pole device decrease overall 3 pole width by 3.7»/94mm.

Dimensions (continued)

30 to 400 A

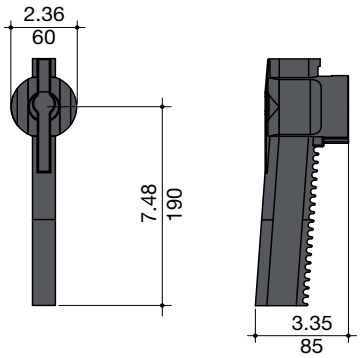
Front direct handle



sirco-ul_027_a_1_x_cat

600 to 800 A

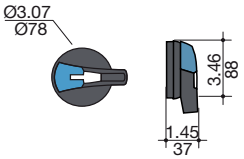
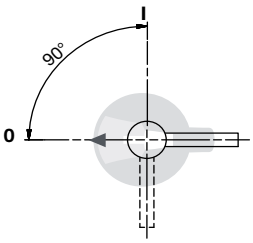
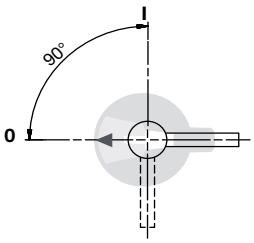
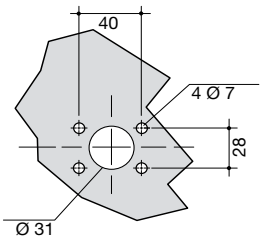
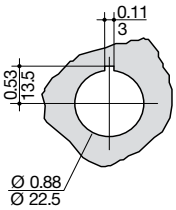
Front direct handle



sirco_267_b_1_x_cat

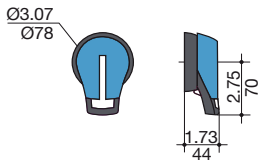
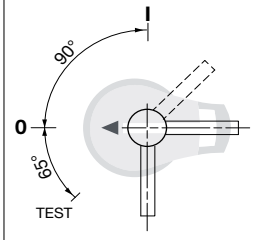
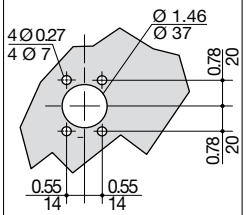
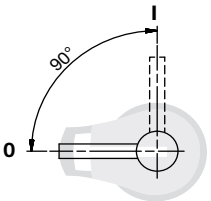
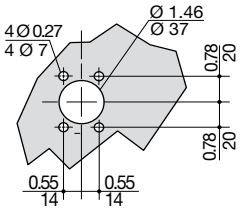
External handle dimensions (in/mm)

CD 30 A - Frames 1 / 2

Handle type	Front operation Direction of operation	Side operation Direction of operation	Door drilling
S0 type 			With 4 fixing screws  With fixing nut 

fuser-ul_015_a_1_gb_cat

CD 30 to 60 A - Frames 1 / 2 / 4

Handle type	Front operation Direction of operation	Front operation Door drilling	Side operation(1) Direction of operation	Side operation(1) Door drilling
S1 type 				

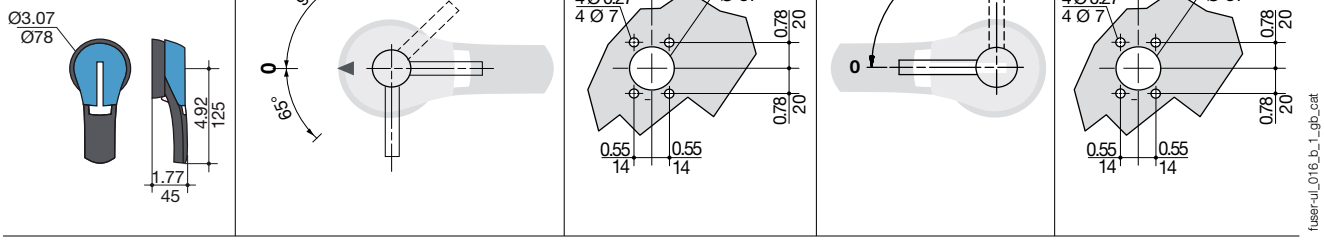
fuser-ul_015_b_1_gb_cat

(1) Not for frames 1 and 2.

External handle dimensions (in/mm)

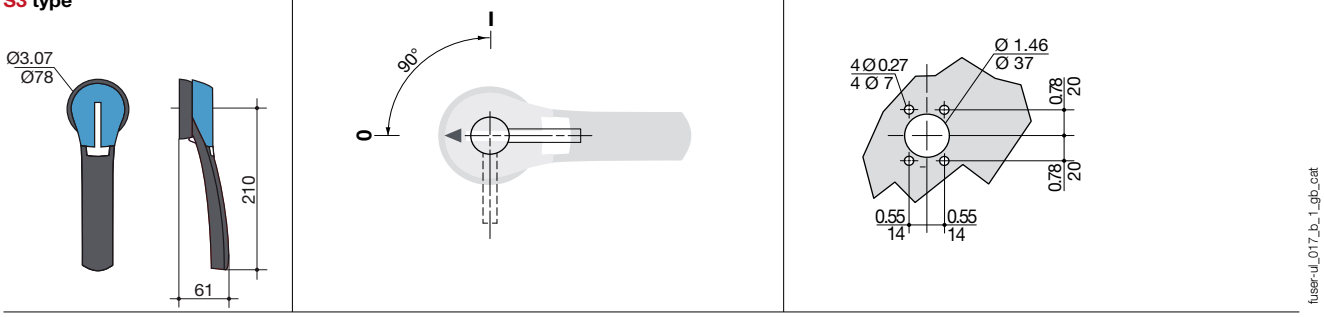
60 to 400 A - Frames 5 / 6 / 7

Handle type	Front operation		Side operation	
	Direction of operation	Door drilling	Direction of operation	Door drilling
S2 type				



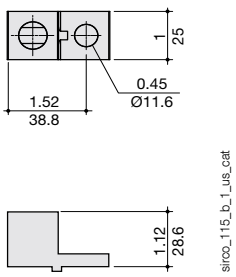
600 and 800 A - Frame 8

Handle type	Front operation	
	Direction of operation	Door drilling
S3 type		



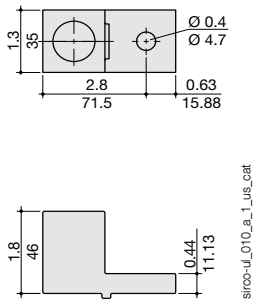
Terminal lugs (in/mm)

200 A



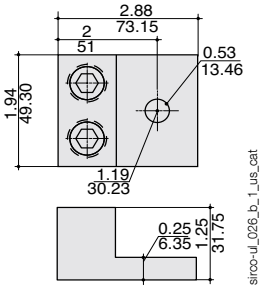
300 kcmil

400 A



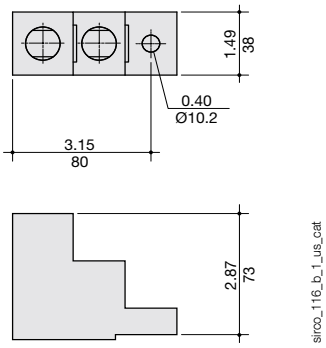
600 kcmil

400 A



2 x 350 kcmil

600 to 800 A



2 x 600 kcmil max

RM PV UL

Photovoltaic modular fuse holder
for PV Midget and 10x38 fuses

RM PV *Midget / 10x38*
30 A UL / 32 A IEC

The solution for

> Small installations up to large PV farms

Strong points

> Improved safety
> Product dedicated to PV UL and IEC applications
> Features and options

Conformity to standards

> IEC 60269-2

> UL 4248-18 (file E470731)

Function

RM PV UL are modular fuse holders for cylindrical gPV fuses. They provide safety disconnection and protection against overcurrents in photovoltaic applications up to 30 A, 1000 VDC.
RM PV are available with or without blown fuse light indicators.

Advantages

Improved safety
- Rated voltage of 1000 VDC.
- Self-extinguishing thermoplastic material.
- Finger safe, protection IP2X.

Product dedicated to PV UL and IEC applications
Protection against reverse currents thanks to gPV fuses dedicated to PV applications.

Features and options
- Modular DIN 45 mm cut-out.
- Blown fuse LED indicator option
- Front face label slot
- Rated for use with 60, 75 and 90 °C copper wire or comb bus bar
- Sealing with 1,5 mm² wire

References

No. of poles	30 A Midget, 10x38 Reference
1 P	57PV **0001**
1 P with LED signaling	57PV **0L01**

Characteristics

According to UL 4248-18

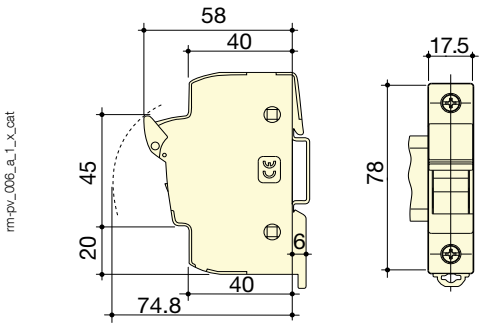
Rated current	**30 A**
Rated insulation voltage U_i	1000 V
SCCR rating	30 kA
Fuse link	
Fuse size	Midget
Fuse rating	1 to 30 A
Max fuse dissipated power	4 W
Connection terminals	
Solid wire	#8 - 18 AWG / 0,75 - 16 mm²
Stranded wire	#8 - 18 AWG / 0,75 - 16 mm²
Tightening torque on terminals	22 lb.in / 2,5 Nm
Mechanical Characteristics	
Weight NETTO	57 gr

According to IEC 60269-2

Rated current	**32 A**
Rated insulation voltage U_i	1000 V
Rated impulse withstand voltage Uimp	6 kV
Protection degree	IP20
Fuse link	
Fuse size	10X38
Fuse holder current derating by number of poles side by side	
N = 1 … 3	1
N = 4 … 6	0.8
N = 7 … 9	0.7
N ≥ 10	0.6

Dimensions

RM PV Midget, 10x38



Photovoltaic fuses UL

gPV curve

up to 20 A, 1000 VDC

fusib_168_a

The solution for

> Photovoltaic protection

Strong points

> High breaking capacity
> Product dedicated to PV applications
> High reliability
> Improved safety

Conformity to standards

> IEC 60269-6

> UL 2579 (file E358455)

Function

SOCOMEC **gPV curve fuses specially designed to** protect PV modules and cables against the inverse over-currents which could occur in the photovoltaic installation. Specially designed for use in PV systems with low faulted currents and extreme ambient temperatures.

Advantages

High breaking capacity
Up to 50 kA at 100Oui b0 VDC, ferrule fuses with high withstand to internal pressure and thermal shock allows a high breaking capacity in a reduced physical space.

Product dedicated to PV applications
Operating ranges adjusted for small over-currents specific to PV installations.

High reliability
- Absolute protection over time guaranteed by the simplicity of manufacture and function (Joule effect).
- No downgrading of fuse characteristics over time.

Improved safety
The energy released whilst eliminating the fault (fuse melting) is contained within the cartridge without any degassing.

What you need to know

Used characteristics
- I_{SC}: short circuit current of the string.
- $I_{SC\ MAX}$: short circuit current of the string related to maximum sunlight density.
- I_{RM}: maximum admitted reverse current.
- I_n: fuse rating or fuse rated current (at 25°C in a RM disconnect switch).
- N_c: number of strings connected in parallel.
- U_e: maximum fuse rated voltage.
- $U_{OC\ MAX}$: maximum open circuit voltage in the lowest temperature conditions.

When to protect
A PV string requires an over-current protection when its own maximum admissible reverse current characteristic (Irm) is less than the current generated by the rest of the installation (current generated by the "Nc-1" other strings).

How to protect
The overload protection is to be applied at each of the two polarities, regardless of whether the DC installation is earthed or not.

socomec Innovative Power Solutions

How to choose the fuse protection

Voltage

$U_e > U_{OC\ MAX}$

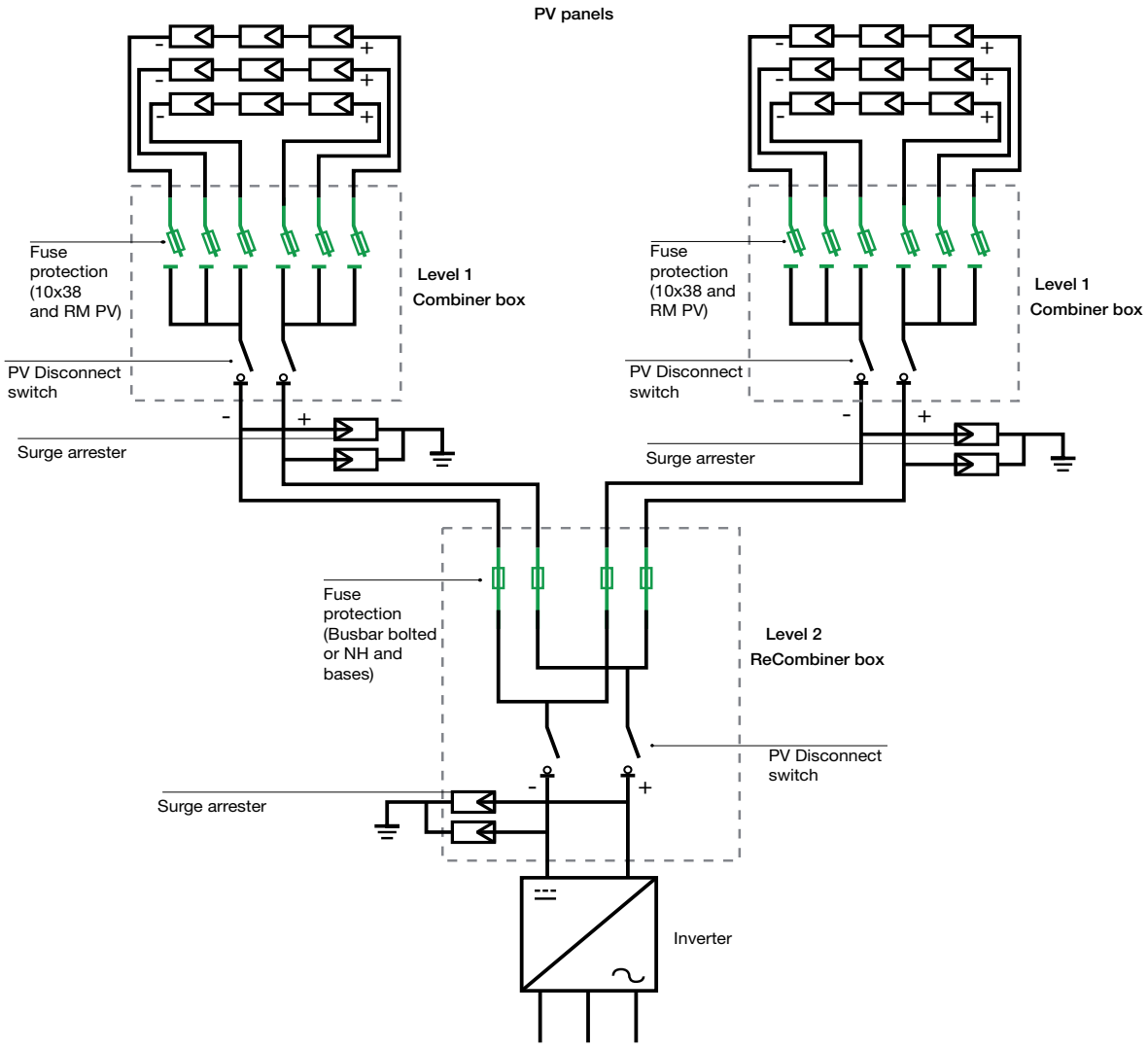
In the absence of complementary information use $U_{OC\ MAX} = 1.2\ U_{OC}$

Fuse rating determination

Determination of the fuse rated current consists of choosing a protection capable of:

- Supporting without fusing the normal overload current during the periods of maximum sunlight density at the ambient temperature of the enclosure in which the fuse is installed, $I_n > I_{SC\ MAX}$
  In the absence of complementary information use $ISC\ MAX = 1.4\ I_{SC}$

- Melting and reliably clearing the fault before the PV modules are damaged by the reverse current. $I_n < I_{RM}$



fusb_179_b_1_gb_cat

Photovoltaic fuses UL

gPV curve

up to 20 A, 1000 VDC

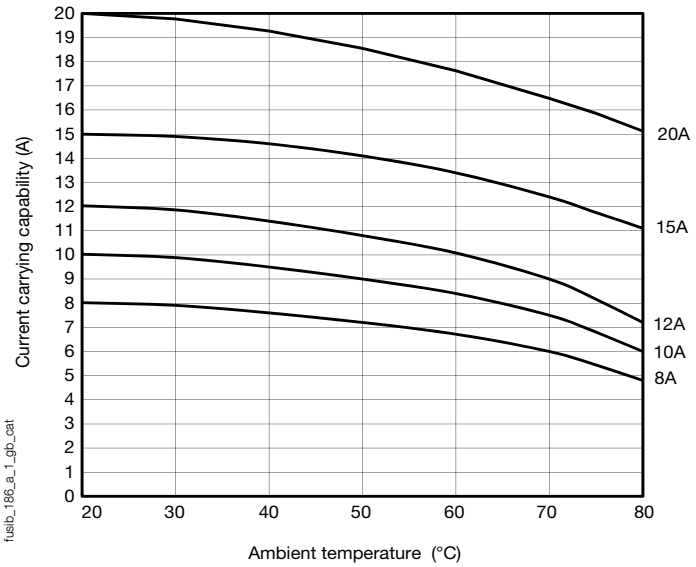
References

Rated voltage 1000 VDC

Rating (A)	Fuse size	Dissipated power		Energy I²t, A²s		Reference
		W@ In	W @ 0.8 In	Pre-arcing	Total @ 1000 V	
8	10 x 38	2.1	1.2	3	32	60PV **1008**
10	10 x 38	2.3	1.2	7	70	60PV **1010**
12	10 x 38	2.7	1.5	12	120	60PV **1012**
15	10 x 38	2.9	1.7	22	220	60PV **1015**
20	10 x 38	3.6	2.1	34	350	60PV **1020**

Ambient temperature derating

gPV cylindrical fuses 10x38 - 8 to 20 A



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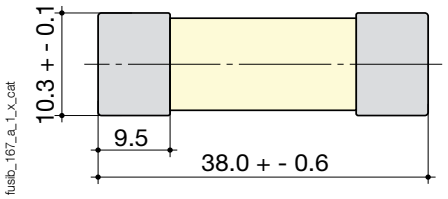
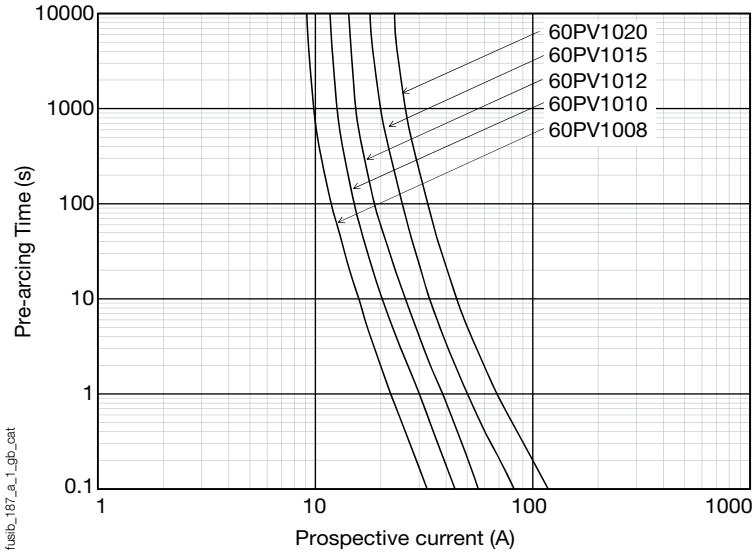
Standard dimensions (mm)

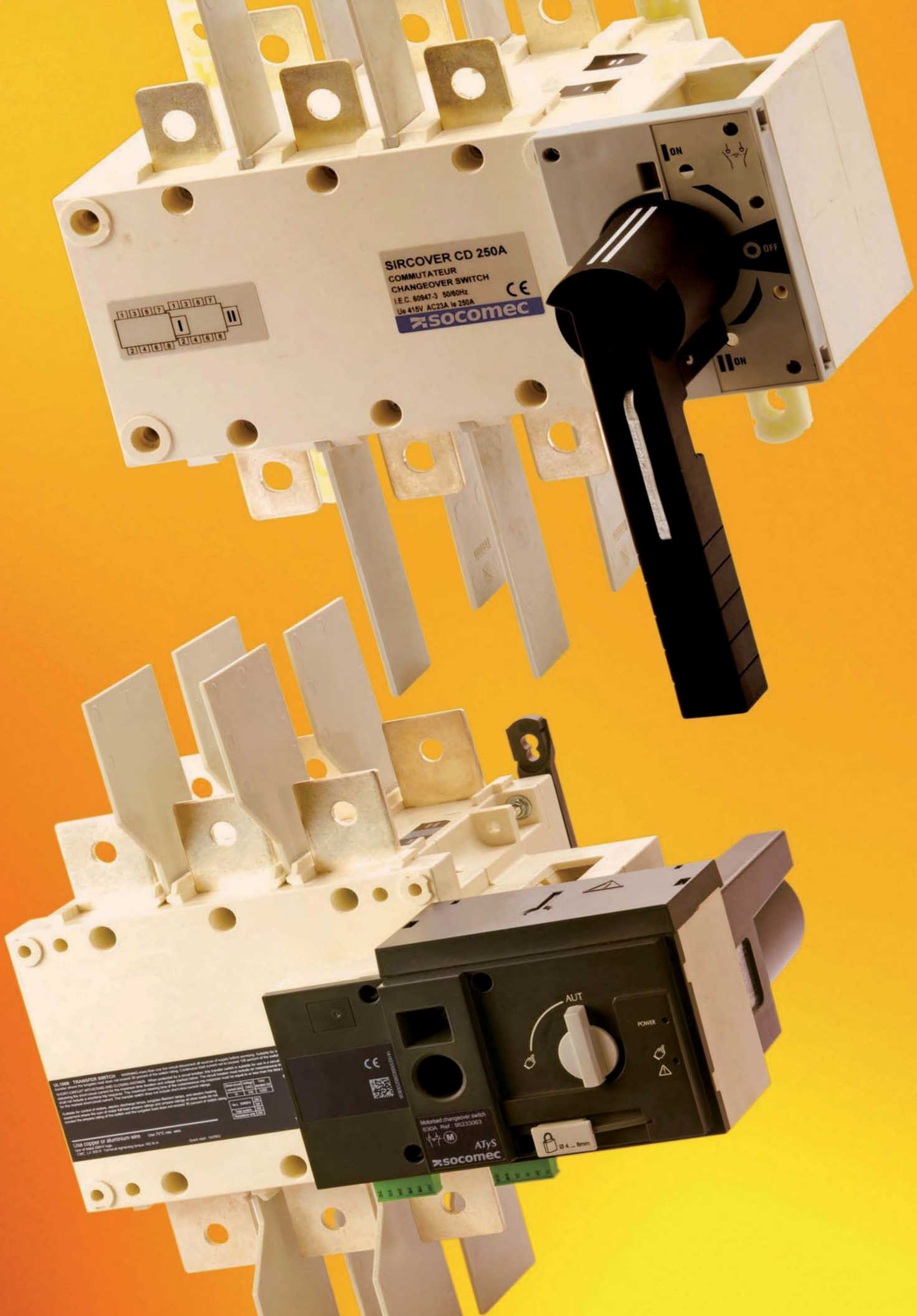
gPV cylindrical Fuses



Time/current operation characteristics

gPV cylindrical fuses 10x38 - 8 to 20 A




SIRCOVER CD 250A
COMMUTATEUR
CHANGEOVER SWITCH
I.E.C. 60947-3 50/60Hz
Ue 415V AC23A Ie 250A
socomec
ON
OFF
ON
AUT
POWER
Motorised changeover switch
630A Ref : 95233063
ATyS
socomec

Transfer switches

Manual and motorized transfer switches ..... *p. 112*

Manual transfer switches

SIRCOVER UL1008
100 to 1200 A
p. 114

Motorized transfer switches

ATyS UL1008
100 to 400 A
p. 124

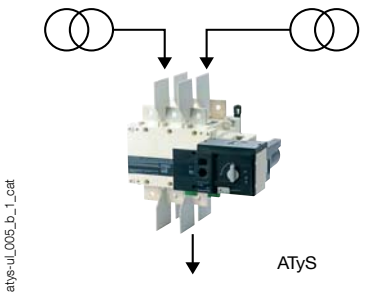
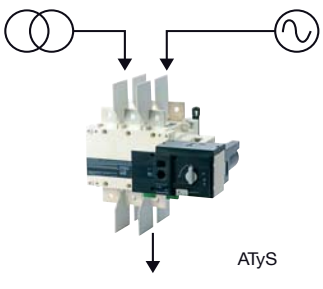
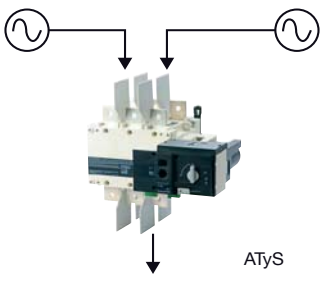
Manual & motorized transfer switches

A range of manual or remotely operated transfer switches up to 1200 A

MTSE (Manual)	**RTSE** (Remotely operated)
SIRCOVER UL1008 Manual Transfer Switch Equipment	***ATyS*** UL1008 Motorized Transfer Switch Equipment

Typical applications

The ATyS UL 1008 range provides safe transfer for mains/genset and genset/genset applications.

Mains/Mains	Mains/Genset	Genset/Genset
		

Function

ATyS and SIRCOVER UL1008 transfer switching equipment ensure:

- Maintenance free transfer switch equipment with a robust and reliable design.
- Power control and safety between a normal and an alternate source.
- Integrated and robust switch disconnection.
- A stable OFF position with built in padlocking to facilitate safe downstream maintenance.
- Positive break indication with clear visible position indication I - 0 - II.
- An inherent failsafe mechanical interlock prevents asynchronous paralleling of the two sources.
- Stable positions (I – 0 – II) non affected by typical vibration and shock.
- Constant pressure on the contacts non affected by network voltage perturbation.
- Quick, easy and extremely safe manual operation.

Further to the above the ATyS also includes:

- A simple and secure motorization remote controls interface.
- Integrated switch position auxiliary contacts.
- An active “product availability” status feedback.
- Compatibility with virtually any make of ATS, AMF, Genset controller provided with volt-free contacts.

Power supply continuity for most electrically controlled total system optional standby power applications.

SOCOMEC UL products

The ATyS UL is a full on-load disconnect transfer switch where the main switching components are proven technology devices (SIRCOVER - Manual Transfer Switches) also fulfilling requirements in UL 98 and IEC 60947-3 standards. The transfer is done in open transition with a minimum supply interruption during transfer ensuring full compliance with UL 1008 and IEC 60947-6-1 international TSE standards.

As a stand-alone product, the ATyS is a non-automatic power transfer switch (an electrically operated transfer switch that is not self-acting), generally used in applications where the load is non-emergency, does not require automatic transfer and where operating persons can be made available to initiate the transfer.
The electrical control of the ATyS UL may be direct through push-buttons and dry contacts fitted onto the enclosure door or through a dedicated ATS controller that may be fitted to the door or remotely extended outside the enclosure.

Your preferred brand of ATS controller, genset / AMF controller or power / building management system, may easily be paired with the ATyS to provide a complete automatic transfer switch to suit your needs.

Thanks to an integrated factory installed stable OFF position, the operating mechanism of the ATyS allows the user to intentionally and safely disconnect both the normal and alternate supplies regardless of supply availability.

UL Applications

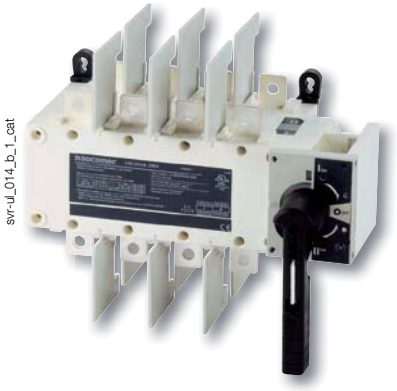
ATyS UL1008 transfer switches are rated from 100 to 400A and designed for use in total system optional standby power applications for the safe transfer of a load supply between a normal and an alternate source.

Optional standby systems are those systems installed to provide an alternate source of power for structures for which a power outage could cause discomfort or interruption or damage to products or processes.

SIRCOVER UL1008

Manual Transfer Switching Equipment

100 to 1200 A



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svr-ul_013_a_2_cat

The solution for

- Manufacturing industry
- Power distribution
- Domestic

Strong points

- Stable positions
- Compact design
- On load switching
- Reliability

Conformity to standards

- UL 1008, Guide WPYV, file 317092
- UL 98, Guide WHTY, file 201138
- CSA 22.2#4, Class 4651-02

UL 98 and CSA from 600-1200 A with 100-400 A on request with a specific reference.

Function

SIRCOVER UL1008/98 are heavy duty manual transfer switches. They ensure switching transfer of sources or transfer of two low voltage circuits on load as well as their safe disconnection.

These switches are extremely durable and are tested and approved for use in the most demanding applications, such as resitive load or total system applications.

Advantages

Stable positions

SIRCOVERs have three stable positions which are not affected by voltage drops or vibrations, thus protecting your load against network interference.

Compact design

The SIRCOVER are based on a back-to-back switching technology, providing a compact solution.

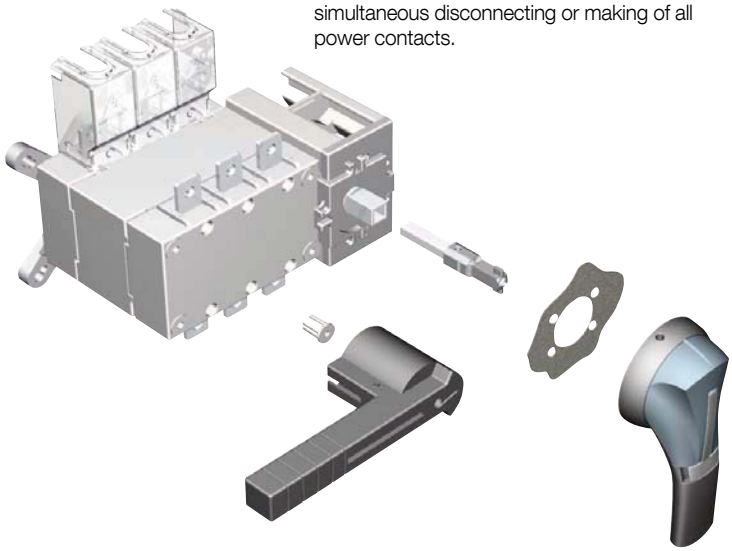
On load switching

The SIRCOVER UL enables secure and reliable switching, without the need for pre-breaking upstream.

Reliability

The SIRCOVER has double breaking per pole acheived through its sliding bar contacts system.

The quick opening and rapid closure provides simultaneous disconnecting or making of all power contacts.



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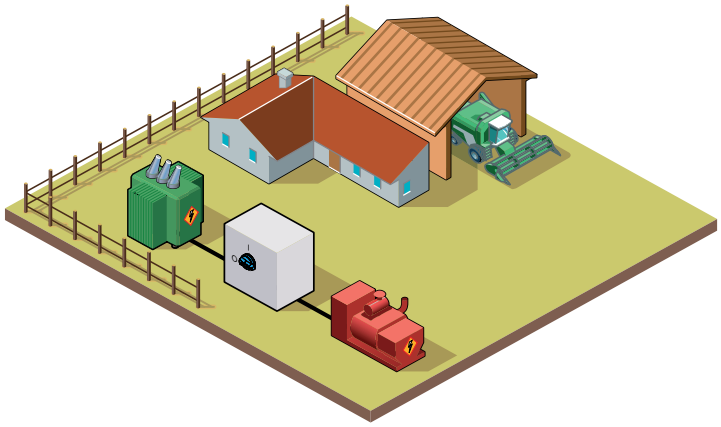
Typical application

The SIRCOVER UL 1008 range provides safe transfer and disconnection at all levels within your LV installation.
They can be used for changing motor phase for rotation control or equipmement grounding as well.

Normal power supply to genset transfer
The source transfer will be operated safely even under on-load or over-load conditions



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SOCOMEC solution up to 1200 A

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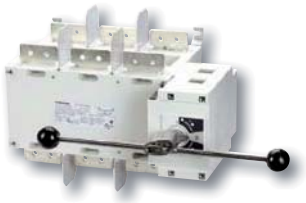
UL 1008 Manual Transfer Switch
From 100 to 400 A for resistive and total systems applications
UL 98 versions on request



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UL 1008 and UL 98 Manual Transfer Switch
From 600 to 1200 A for resistive and total systems applications
Has UL 98/CSA 22.2#4 certification

IEC solution up to 3200 A

The SIRCOVER UL 1008 is part of a large range that includes an IEC range of standalone or enclosed manual transfer switches and manual by-pass switches with overlapping options.
Contact us for further information on our complete range

References

UL 1008

Rating (A)	No. of poles	Switch body	Direct handle	External handle	Shaft for external handle	Bridging bars	Auxiliary contacts	Terminal screens
100 A	2 P	4150 **2012**	Black 4199 **4012**	S2 type Black I - 0 - II 4, 4X 142D **2113** S2 type Black I - 0 - II 4, 4X 142D **2813**(1)	S2 type 200 mm 7.9 inches 1400 **1020** 320 mm 12.6 inches 1400 **1032** 400 mm 15.7 inches 1400 **1040**	2P 4159 **2021** 3P 4159 **3021** 4P 4159 **4021**	Contact NO/NC 4159 0021 Low level 4159 **0022**	2P & 3P 4158 **3021** 4P 4158 **4021**
	3 P	4150 **3012**						
	4 P	4150 **4012**						
200 A	2 P	4150 **2022**						
	3 P	4150 **3022**						
	4 P	4150 **4022**						
260 A	2 P	4150 **2026**		S3 type Black I - 0 - II 4, 4X 143D **3113**	S3, S4 type 200 mm 7.9 inches 1401 **1520** 320 mm 12.6 inches 1401 **1532** 400 mm 15.7 inches 1401 **1540**	2P 4159 **2041** 3P 4159 **3041** 4P 4159 **4041**		2P & 3P 4158 **3041** 4P 4158 **4041**
	3 P	4150 **3026**						
	4 P	4150 **4026**						
400 A	2 P	4150 **2042**						
	3 P	4150 **3042**						
	4 P	4150 **4042**						
600 A	3 P	4150 **3060**	Black 4199 **7012**			3 P 4159 **3063** 4 P 4159 **4063**	Contact NO/NC as standard	3 P 1609 **3063** 4 P 1609 **4063**
	4 P	4150 **4060**						
800 A	3 P	4150 **3080**	Black 4199 **7062**	S4 type Black I - 0 - II 4, 4X 144D **3813**(1)		3 P 4159 **3080** 4 P 4159 **4080**		3 P 1609 **3080** 4 P 1609 **4080**
	4 P	4150 **4080**						
1200 A	3 P	4150 **3120**						
	4 P	4150 **4120**						

(1) Padlockable in all 3 positions.

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Accessories

Direct handle

Rating (A)	Type	Color	Handle type	Reference
100 … 400	B3	Black	1 lever	4199 **4012**
600	C2	Black	2 lever	4199 **7012**
800 … 1200	V1	Metal	2 lever	4199 **7062**

Type B3 *Type C2* *Type V1*

External handle

Rating (A)	Handle type	Color	Nema type	Lockable in 3 positions	Reference
100 ... 200	S2	Black	4, 4X	no	142D **2113**
100 ... 200	S2	Red/Yellow	4, 4X	no	142E **2113**
100 ... 200	S2	Black	1, 3R, 12	no	142F **2113**
100 ... 200	S2	Red/Yellow	1, 3R, 12	no	142G **2113**
100 ... 200	S2	Black	4, 4X	yes	142D **2813**
100 ... 200	S2	Red/Yellow	4, 4X	yes	142E **2813**
100 ... 200	S2	Black	1, 3R, 12	yes	142F **2813**
100 ... 200	S2	Red/Yellow	1, 3R, 12	yes	142G **2813**
260 ... 600	S3	Black	4, 4X	no	143D **3113**
260 ... 600	S3	Red/Yellow	4, 4X	no	143E **3113**
260 ... 600	S3	Black	1, 3R, 12	no	143F **3113**
260 ... 600	S3	Red/Yellow	1, 3R, 12	no	143G **3113**
260 ... 600	S3	Black	4, 4X	yes	143D **3813**
260 ... 600	S3	Red/Yellow	4, 4X	yes	143E **3813**
260 ... 600	S3	Black	1, 3R, 12	yes	143F **3813**
260 ... 600	S3	Red/Yellow	1, 3R, 12	yes	143G **3813**
800 ... 1200	S4	Black	4, 4X	no	144D **3113**
800 ... 1200	S4	Black	1, 3R, 12	no	144E **3113**
800 ... 1200	S4	Black	1, 3R, 12	no	144E **3113**
800 ... 1200	S4	Red/Yellow	1, 3R, 12	no	144G **3113**
800 ... 1200	S4	Black	4, 4X	yes	144D **3813**
800 ... 1200	S4	Red/Yellow	4, 4X	yes	144E **3813**
800 ... 1200	S4	Black	1, 3R, 12	yes	144F **3813**
800 ... 1200	S4	Red/Yellow	1, 3R, 12	yes	144G **3813**
800 ... 1200	S5	Black	1, 3R, 12(1)	no	1453 **8113**
800 ... 1200	S5	Red/Yellow	1, 3R, 12(1)	no	1454 **8113**
800 ... 1200	V1	Black	1, 3R, 12(1)	no	4199 **7149**

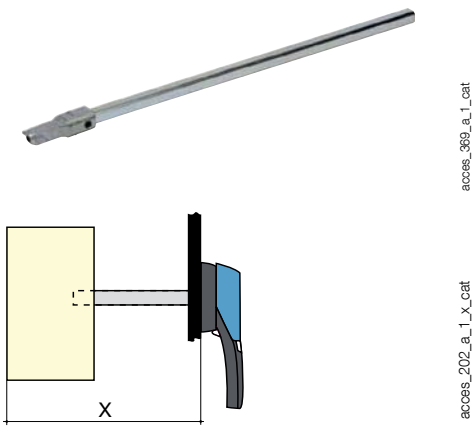
(1) For 4, 4X please consult us.

Use

The handle interlocking function prevents the user from opening the door of the enclosure when the switch is in the "ON" position.
Opening the door when the switch is in the "ON" position is possible by defeating the interlocking function (Not S5 and V handles) with the use of a tool (authorized persons only).
The interlocking function is restored when the door is re-closed.

Shaft for external handle

Rating (A)	Handle type	Length (in)	Length (mm)	Dimension X (in)	Dimension X (mm)	Reference
100 … 200	S2 type	7.9	200	10 … 14.3	254 … 362	1400 **1020**
100 … 200	S2 type	12.6	320	10 … 19	254 … 482	1400 **1032**
100 … 200	S2 type	15.7	400	10 … 22.1	254 … 562	1400 **1040**
260 … 400	S3 type	7.9	200	12 … 18.4	305 … 467	1401 **1520**
260 … 400	S3 type	12.6	320	12 … 23.1	305 … 587	1401 **1532**
260 … 400	S3 type	15.7	400	12 … 26.3	305 … 667	1401 **1540**
260 … 400	S3 type	7.9	200	20 … 23.4	508 … 594	1401 **1520**
260 … 400	S3 type	12.6	320	20 … 28.1	508 … 714	1401 **1532**
260 … 400	S3 type	15.7	400	20 … 31.3	508 … 794	1401 **1540**
800 … 1200	S4 type	7.9	200	20 … 23.4	508 … 594	1401 **1520**
800 … 1200	S4 type	12.6	320	20 … 28.1	508 … 714	1401 **1532**
800 … 1200	S4 type	15.7	400	20 … 31.3	508 … 794	1401 **1540**
800 … 1200	V1 / S5 type	12.6	320	20 … 28.1	508 … 714	4199 **3018**
800 … 1200	V1 / S5 type	15.7	400	20 … 31.3	508 … 794	4199 **3019**



Bridging bars

Use

Creation of a common point, above or below the switch, between positions I and II.

Rating (A)	No. bridging bar	Reference
100 … 200	2	4159 **2021**
100 … 200	3	4159 **3021**
100 … 200	4	4159 **4021**
260 … 400	2	4159 **2041**
260 … 400	3	4159 **3041**
260 … 400	4	4159 **4041**
600	3	4159 **3063**
600	4	4159 **4063**
800 … 1200	3	4159 **3080**
800 … 1200	4	4159 **4080**

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Terminal protection screen

Use

Top or bottom protection against direct contact with terminals or connecting parts.

Rating (A)	No. of poles	Reference
100 … 200	2P / 3P	4158 **3021**
100 … 200	4 P	4158 **4021**
260 … 400	2P / 3P	4158 **3041**
260 … 400	4 P	4158 **4041**
600	6 P	1609 **3063**
600	4 P	1609 **4063**
800 … 1200	3 P	1609 **3080**
800 … 1200	4 P	1609 **4080**

acces_207_a_1_cat

Auxiliary contacts

Use

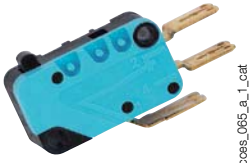
Pre-break and signalization of positions .
For low level ACs and other ACs contact us.

Electrical characteristics

A300.

NO/NC auxiliary contact

Rating (A)	Contact (s)	Reference
100 ... 400	NO/NC on position 1 and 2	4159 **0021**
100 ... 400	Low level NO/NC on position 1 and 2	4159 **0022**
600 ... 1200	NO/NC on position 1 and 2	as standard



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acces_065_a_1_cat

Terminal lugs

Use

Connection of bare copper cables onto the terminals (without lugs).

Rating (A)	Wires range	No wires per lug	Lugs per kit	Wires	Reference
100 ... 200	6 - 300MCM	1	2	Cu / Al	3954 **2020**
100 ... 200	6 - 300MCM	1	3	Cu / Al	3954 **3020**
100 ... 200	6 - 300MCM	1	4	Cu / Al	3954 **4020**
260 … 400	4 - 600MCM	1	2	Cu / Al	3954 **2040**
260 … 400	4 - 600MCM	1	3	Cu / Al	3954 **3040**
260 … 400	4 - 600MCM	1	4	Cu / Al	3954 **4040**
600	2x (#2 - 600MCM)	2	3	Cu / Al	3954 **3060**
600	2x (#2 - 600MCM)	2	4	Cu / Al	3954 **4060**
800 … 1200(1)	2x 2x(#2 - 600MCM)	2	6	Cu / Al	3954 **3120**
800 … 1200(1)	2x 2x(#2 - 600MCM)	2	8	Cu / Al	3954 **4120**

(1) Used to connect up to 4 cables per terminal. Refer to drawing on p. Two of these lugs fit side by side on a single terminal.

uL032_a

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Characteristics

Characteristics according to UL 1008

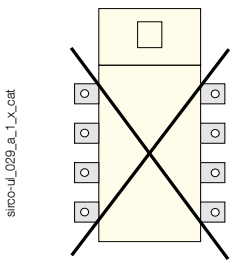
	100 to 1200 A						
General use rating (A)	**100 A**	**200 A**	**260 A**	**400 A**	**600 A**	**800 A**	**1200 A**
Operation voltage 2 P / 3-4 P	240 / 600	240 / 600	240 / 600	240 / 600	- / 600	- / 600	- / 600
Short circuit rating with circuit breaker (kA/ms)	10 / 25	10 / 25	14 / 50	14 / 50	35 / 50	35 / 50	35 / 50
Short circuit rating at 600 VAC (kA)	100	100	65	65	100	100	100
Type of fuse	J	J	J	J	L	L	L
Max. fuse rating (A)	200	400	600	600	800	1000	1600
Short circuit rating at 600 VAC with SPECIFIC CIRCUIT BREAKER (kA)							
Square D JJ breaker 250 A 2 poles 240 VAC / 3-4 poles 480 VAC	65	65	-	-	-	-	-
Schneider Electric NSX-F 160 A 3-4 poles 480 VAC	35	-	-	-	-	-	-
Operational power / current max Operational 1 ph							
240 VAC Total system (A)	100	200	260	400	-	-	-
240 VAC Resistive load (A)	100	200	260	400	-	-	-
Operational power / current max Operational 3 ph							
240 VAC Total System (A)	100	200	260	400	400	700	700
240 VAC Resistive load (A)	100	200	260	400	600	800	1200
480 VAC Total System (A)	100	100	260	400	350	600	600
480 VAC Resistive load (A)	100	200	260	400	600	800	1200
600 VAC Total System (A)	100	100	200	200			
600 VAC Resistive load (A)	100	200	260	400	400	800	1200
Mechanical endurance							
Endurance (number of operating cycles)	6050	6050	6050	4050	3050	3050	3050
Connection terminals							
Min. connection section / AWG	#6	#6	#4 / 2 x 1 / 0	#4 / 2 x 1 / 0	2 x #2	2 x #2	4 x #2
Max. connection section / AWG	300MCM	300MCM	600MCM / 2 x 250MCM	600MCM / 2 x 250MCM	2 x 600MCM	2 x 600MCM	4 x 600MCM

Characteristics according to UL 98/CSA 22.2#4

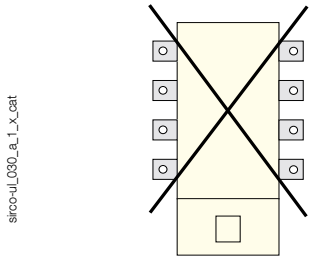
	100 to 1200 A						
General use rating at 600VAC and 250VDC (A)	**Specific reference on request**				**600 A**	**800 A**	**1200 A**
Short circuit rating at 600 VAC (kA)	-	-	-	-	200	100	100
Type of fuse	-	-	-	-	J	L	L
Max. fuse rating (A)	-	-	-	-	600	800	1200
Max. motor, hp / FLA 3 ph motor max.							
220-240 VAC	-	-	-	-	200 / 480	-	-
440-480 VAC	-	-	-	-	400 / 477	-	-
600 VAC	-	-	-	-	500 / 472	-	-
Mechanical characteristics							
Endurance (number of operating cycles)	-	-	-	-	5000	3500	2500
Operating torque (lbs.in/Nm)	-	-	-	-	327.5/37	442.5/50	442.5/50
Auxiliary contacts							
Electrical characteristics	A300	A300	A300	A300	A300	A300	A300

Mounting orientation

SIRCOVER - 100 to 400 A

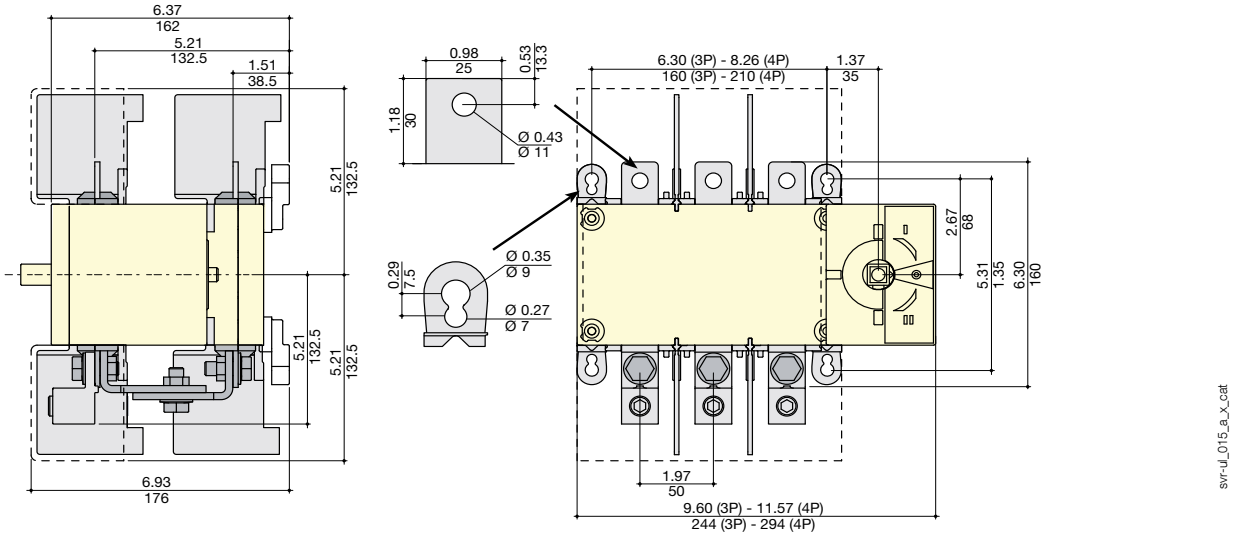


SIRCOVER - 600 to 1200 A



Dimensions (in/mm)

100 to 200 A



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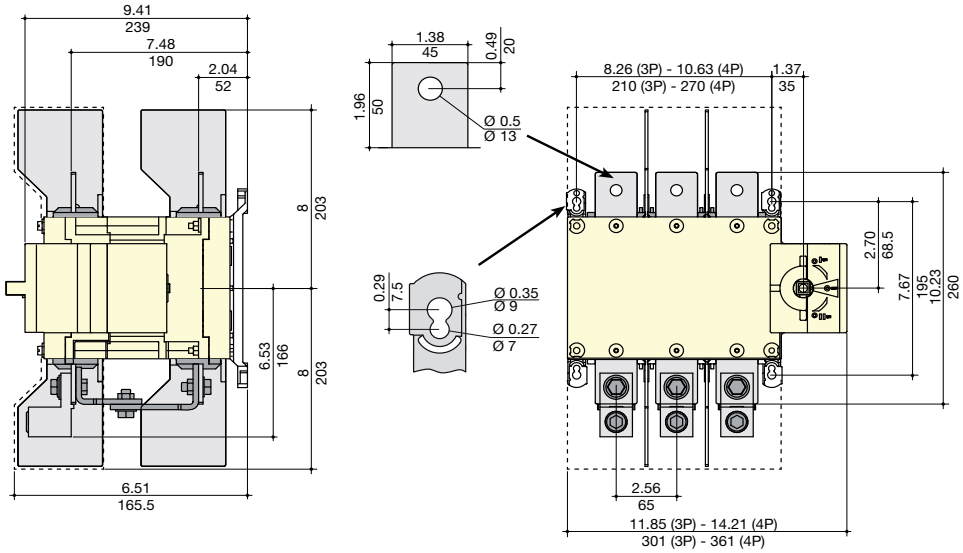
400 A



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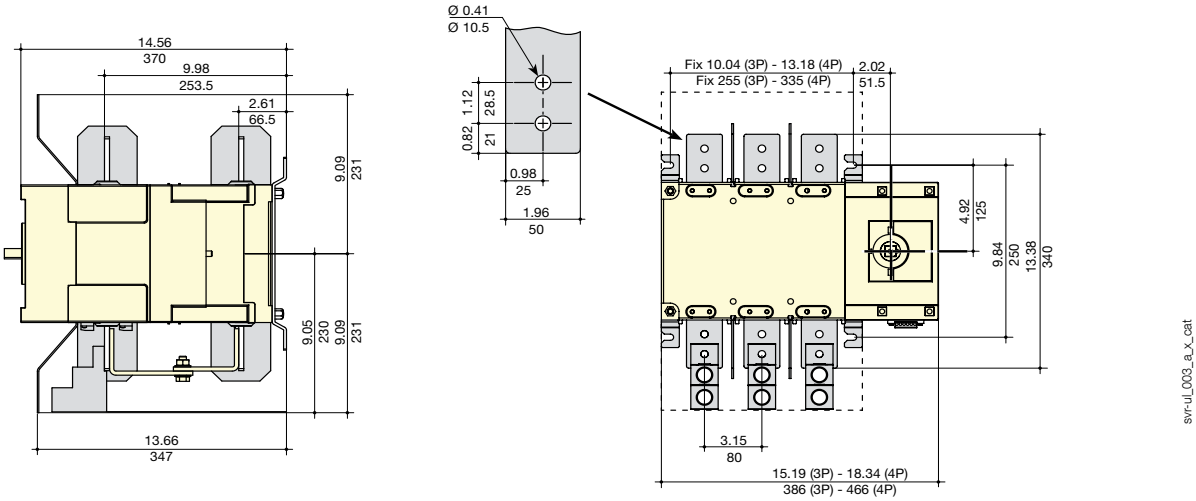
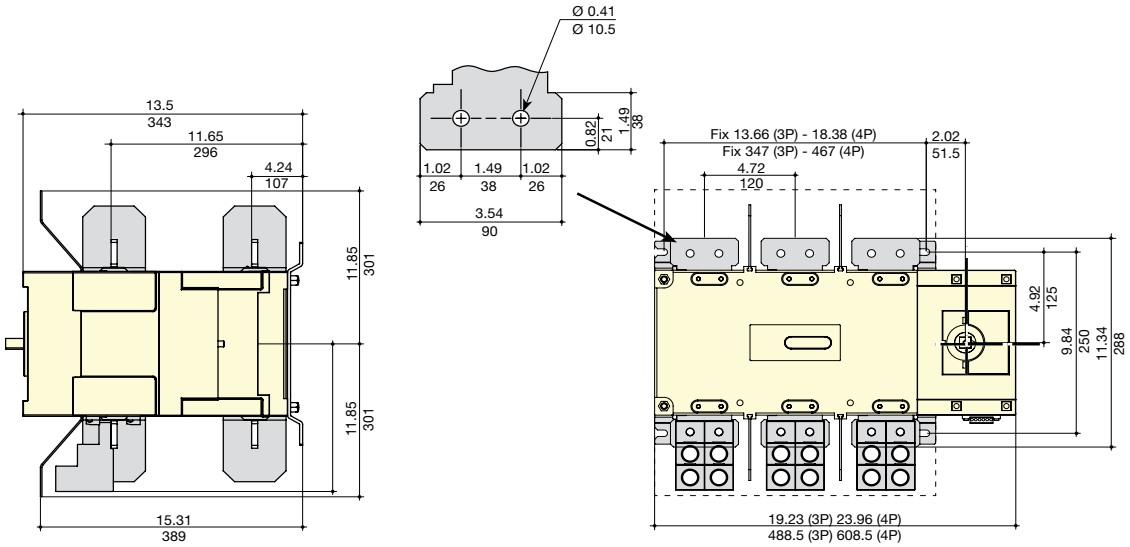
Dimensions (in/mm) (continued)

600 A

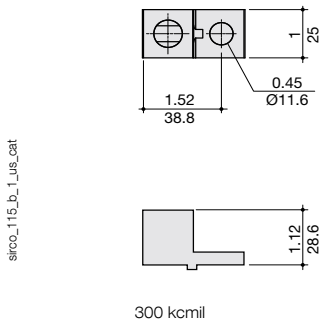


800 to 1200 A



Terminal lugs (in/mm)

SIRCOVER 100 to 200 A



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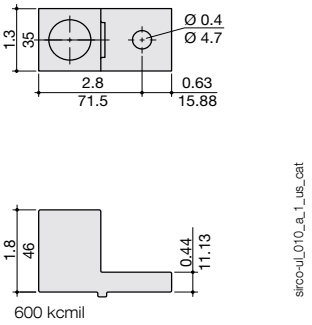
300 kcmil

SIRCOVER 260 to 400 A



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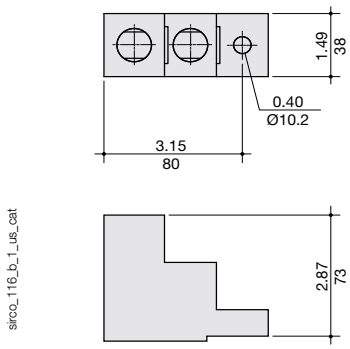
600 kcmil

SIRCOVER 600 to 1200 A



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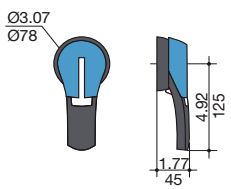
2 x 600 kcmil

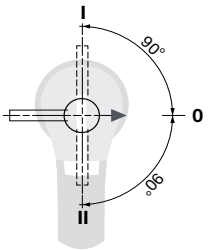
External handles dimensions (in/mm)

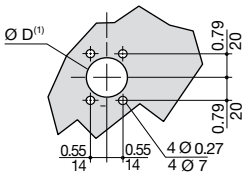
SIRCOVER 100 and 200 A

Front operation

Handle type	Direction of operation	Door drilling
S2 type		







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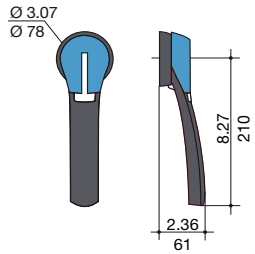
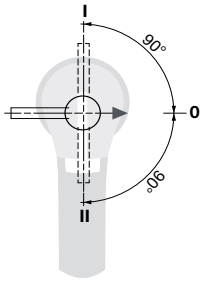
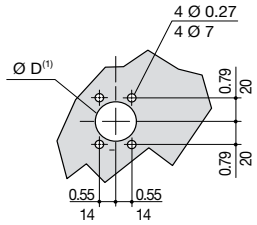
External handles dimensions (in/mm)

SIRCOVER 260 and 600 A

Handle type	Front operation Direction of operation	Door drilling
S3 type 		

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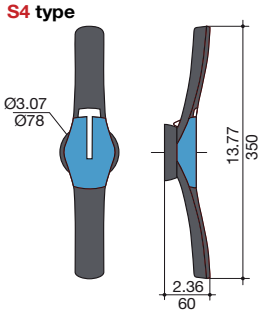
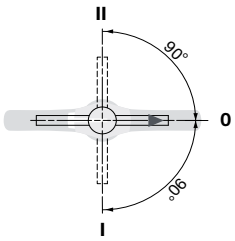
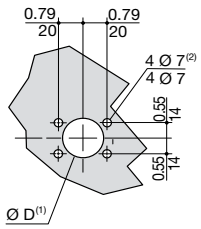
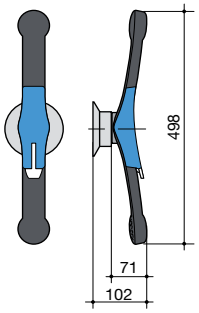
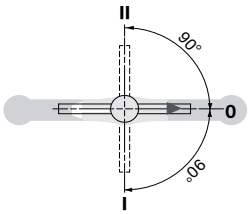
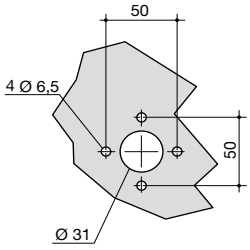
SIRCOVER 800 to 1200 A

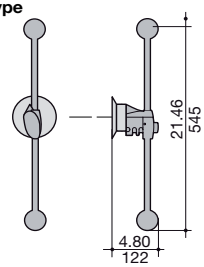
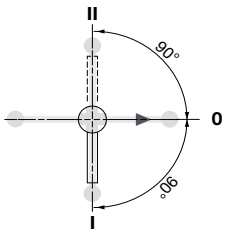
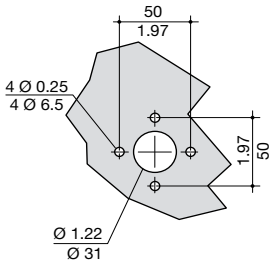
Handle type	Front operation Direction of operation	Door drilling
S4 type 		

svr-ul_011_a_1_gb_cat

SIRCOVER 800 to 1200 A

Handle type	Front operation Direction of operation	Door drilling
S5 type with V Escutcheon 		

poign_023_a_1_gb_cat

Handle type	Front operation Direction of operation	Door drilling
V1 type 		

sircv-ul_031_a_1_gb_cat

ATyS UL1008

Motorized Transfer Switching Equipment

from 100 to 400 A

The solution for

- Commercial
- Light Industry
- Residential applications

Strong points

- Robust and reliable design
- Compatible with virtually any ATS controls
- On-load manual operation
- Maintenance free

Conformity to standards

- UL 1008, Guide WPYV, file 317092

Product reference on request.

Your choice of ATS controls

- Your preferred brand of ATS controller, genset/AMF controller or power/building management system, may easily be paired with the ATyS to provide a complete automatic transfer switch that perfectly suits your needs.

Function

ATyS non-automatic transfer switches are designed for use in total system optional standby applications for the safe transfer between a normal and an alternate power source.

The changeover is done in open transition and with minimum supply interruption during transfer ensuring full compliance with UL 1008 and IEC 60947-6-1. The ATyS is a full on-load disconnect where the main components are based on proven technology also fulfilling requirements in UL 98 and IEC 60947-3 standards.

Advantages

Robust and Reliable design

ATyS is a remotely operated transfer switch tested in full compliance with UL 1008. The design integrates a failsafe mechanical interlock to ensure that the main source is never inadvertently connected to the alternate. The stable position design ensures that the switch is unaffected by vibration or network voltage perturbation. The ATyS also includes a removable handle for emergency manual operation. This is extremely safe and easy to use.

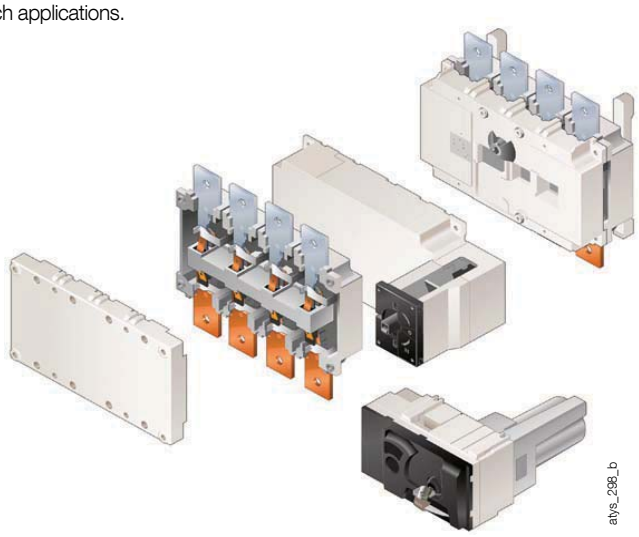
Maintenance free

The self-cleaning contacts of the ATyS allow the power section to be maintenance free. For safe downstream maintenance the ATyS includes a facility for isolation and padlocking in the zero position.

In the unlikely event of a motorization failure, the ATyS is designed in a way that the motorization can be replaced easily and very quickly. Furthermore, the ATyS remains manually operational with or without the motorization in place.

Compatible with virtually any ATS controls

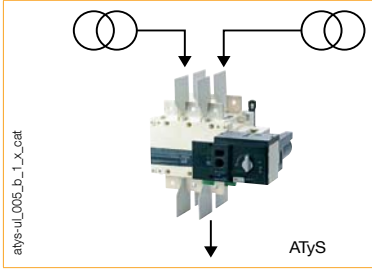
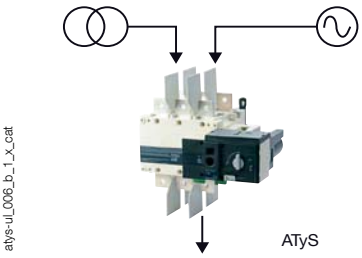
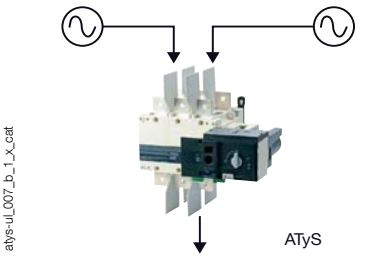
The ATyS is directly compatible with virtually any transfer switching control solution that provides volt free contacts. This allows the ATyS to be combined with most ATS controls available on the market and then used in automatic transfer switch applications.



socomec Innovative Power Solutions

Typical applications

The ATyS UL 1008 range provides safe transfer for mains/mains, mains/genset and genset/genset applications.

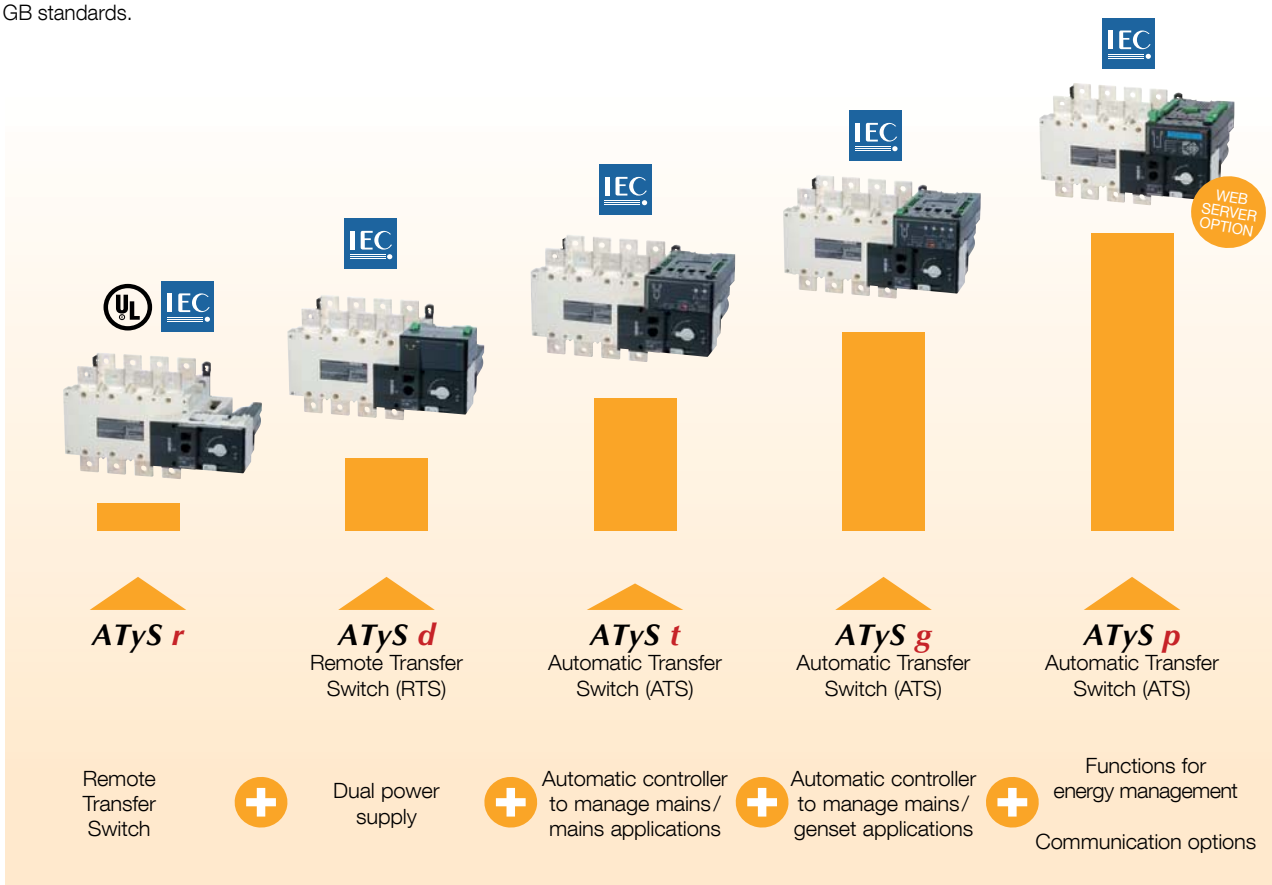
Mains / Mains	Mains / Genset	Genset / Genset
		

Part of a globally recognized range

The ATyS UL 1008 is part of a large family of products including a complete range of remotely operated and fully automatic transfer switches that comply to IEC and GB standards.

The ATyS range is a world renowned product family trusted by some of the largest manufacturers in the genset industry.

The key to success has been through reliable power availability provided by products that are safe and easy to use.



Please don't hesitate to contact SOCOMEC for any questions concerning the IEC ATyS range of products above rated from 125 to 3200 A.

References

Rating (A)	No. of poles	ATyS	Bridging bars	Terminal screens	Auxiliary contact	Lug kits
100 A	2 P	9723 **2010**	2 P 4159 **2021** 3 P 4159 **3021** 4 P 4159 **4021**	2/3 P 4158 **3021** 4 P 4158 **4021**	NO / NC 4159 **0021** Low level 4159 **0022**	2 P 3954 **2020**(1) 3 P 3954 **3020**(1) 4 P 3954 **4020**(1)
	3 P	9723 **3010**				
	4 P	9723 **4010**				
200 A	2 P	9723 **2020**				
	3 P	9723 **3020**				
	4 P	9723 **4020**				
260 A	2 P	9723 **2026**	2 P 4159 **2041** 3 P 4159 **3041** 4 P 4159 **4041**	2/3 P 4158 **3021** 4 P 4158 **4021**		2 P 3954 **2040**(2) 3 P 3954 **3040**(2) 4 P 3954 **4040**(2)
	3 P	9723 **3026**				
	4 P	9723 **4026**				
400 A	2 P	9723 **2040**				
	3 P	9723 **3040**				
	4 P	9723 **4040**				

(1) 1x #6-300MCM.
(2) 1x #6-600MCM.

Accessories

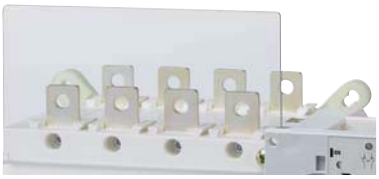
Terminal screens

Use

Top and bottom protection against direct contact with terminals or connection parts.

For upstream and downstream protection, order the reference once.

Rating (A)	No. of poles	Position	Reference
100 … 200	2/3 P	top / bottom	4158 **3021**
100 … 200	4 P	top / bottom	4158 **4021**
260 … 400	2/3 P	top / bottom	4158 **3041**
260 … 400	4 P	top / bottom	4158 **4041**



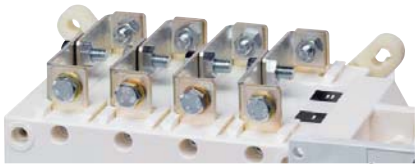
acces_207_a_2_cat

Bridging bars

Use

For bridging power terminals on the top or bottom side of the switch.
When ordering one reference is required per switch.

Rating (A)	No. bridging bar	Reference
100 … 200	2	4159 **2021**
100 … 200	3	4159 **3021**
100 … 200	4	4159 **4021**
260 … 400	2	4159 **2041**
260 … 400	3	4159 **3041**
260 … 400	4	4159 **4041**



4159 4021

acces_205_a_2_cat

Accessories (continued)

Auxiliary contacts (additional)

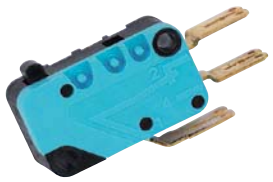
Use

Pre breaking and signaling of positions I and II: Each reference provides a single NO/NC contact.

(Note : The motorization includes 3 x NO position auxiliary contacts as standard)

Rating (A)	Designation	Reference
100 … 400	NO / NC	4159 **0021**
100 … 400	Low level NO / NC	4159 **0022**

A maximum of 2 Aux contacts per position may be added.

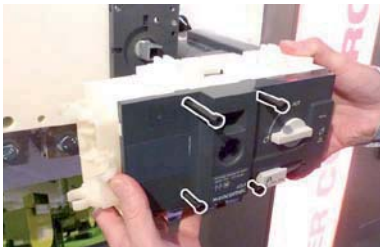

acces_065_a_1_cat

acces_065_a_1_cat

Spares

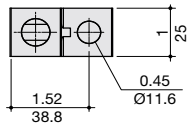
Motorization module

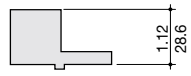
Used for ATyS reference				Ref. Spare part motorization
100 A	2, 3, 4 P	B4	9723 **2010** / 9723 **3010** / 9723 **4010**	9709 **5010**
200 A	2, 3, 4 P		9723 **2020** / 9723 **3020** / 9723 **4020**	9709 **5020**
260 A	2, 3, 4 P	B5	9723 **2026** / 9723 **3026** / 9723 **4026**	9709 **5026**
400 A	2, 3, 4 P		9723 **2040** / 9723 **3040** / 9723 **4040**	9709 **5040**



Terminals lugs (in/mm)

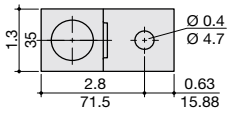
ATyS from 100 to 200 A

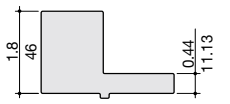




sirco_115_b_1_us_cat

ATyS from 260 to 400 A





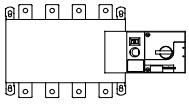
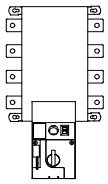
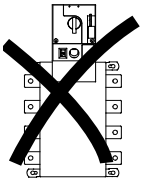
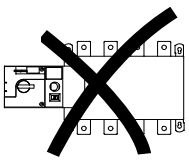
sirco-ul_010_a_1_us_cat

Rating (A)	Wires range	Lugs per kit	Wires	Reference
100 ... 200	6 - 300MCM	2	Cu / Al	3954 **2020**
100 ... 200	6 - 300MCM	3	Cu / Al	3954 **3020**
100 ... 200	6 - 300MCM	4	Cu / Al	3954 **4020**
260 … 400	4 - 600MCM	2	Cu / Al	3954 **2040**
260 … 400	4 - 600MCM	3	Cu / Al	3954 **3040**
260 … 400	4 - 600MCM	4	Cu / Al	3954 **4040**

ul_032_a

Mounting orientation

ATyS 100 to 400 A

			
Recommended	OK	Not Allowed	Not Allowed

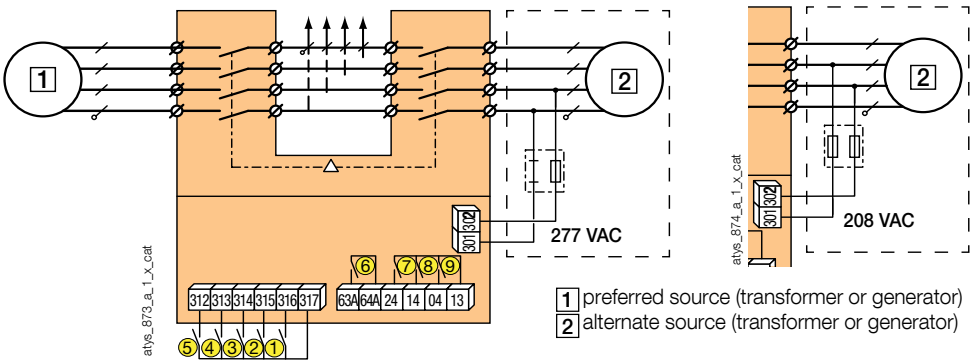
Characteristics according to UL 1008 (Optional standby)

100 to 400 A

Frame	B4		B5	
General use rating	**100 A**	**200 A**	**260 A**	**400 A**
Operation voltage 2 P / 3-4 P	240 / 600	240 / 600	240 / 600	240 / 600
Short circuit rating with ANY CIRCUIT BREAKER (kA/ms)	10 / 25	10 / 25	14 / 50	14 / 50
Short circuit rating at 600 VAC (kA) with fuses	100	100	65	65
Type of fuse	J	J	J	J
Max. fuse rating (A)	200	400	600	600
Short circuit rating at 600 VAC with SPECIFIC CIRCUIT BREAKER (kA)				
Square D JJ breaker 250 A 2 poles 240 VAC / 3-4 poles 480 VAC	65	65	-	-
Schneider Electric NSX-F 160 A 3-4 poles 480 VAC	35	-	-	-
Operational power / current max Operational 1 ph				
240 VAC Total system (A)	100	200	260	400
240 VAC Resistive load (A)	100	200	260	400
Operational power / current max Operational 3 ph				
240 VAC Total system (A)	100	200	260	400
240 VAC Resistive load (A)	100	200	260	400
480 VAC Total system (A)	100	100	260	400
480 VAC Resistive load (A)	100	200	260	400
600 VAC Total system (A)	100	100	200	200
600 VAC Resistive load (A)	100	200	260	400
Mechanical endurance				
Endurance (number of operating cycles)	6050	6050	6050	4050
Connection terminals				
Min. conncetion section / AWG	#6	#6	#4 / 2 x 1/0	#4 / 2 x 1/0
Max. connection section / AWG	300MCM	300MCM	600MCM / 2x 250MCM	600MCM / 2x 250MCM
Aux Power Supply				
Supply voltage VAC 50/60 Hz	208-277 VAC			
Switching time				
I to II or II to I (s)	1.3			
I to 0 or 0 to II (s)	0.85			
Duration of electical blackout (s)	0.6			

Terminals and connections

Typical wiring for 480/277 VAC and 208/120 VAC networks



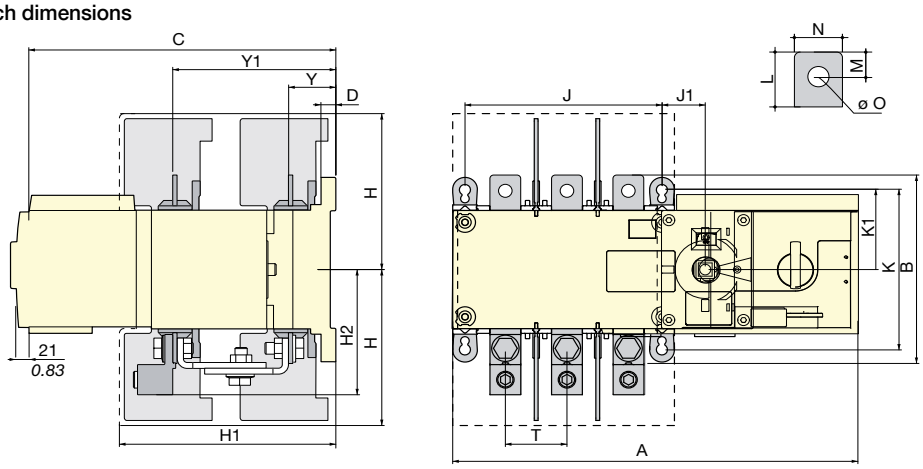
1 preferred source (transformer or generator)
2 alternate source (transformer or generator)

1 : position 0 control (contactor logic if closed)
2 : position I control
3 : position II control
4 : position 0 priority control
5 : closure of this contact enables the position control orders
6 : product availability relay
7 : auxiliary contact, closed when the switch is in position II
8 : auxiliary contact, closed when the switch is in position I
9 : auxiliary contact, closed when the switch is in position 0

Dimensions (in/mm)

100 to 400 A

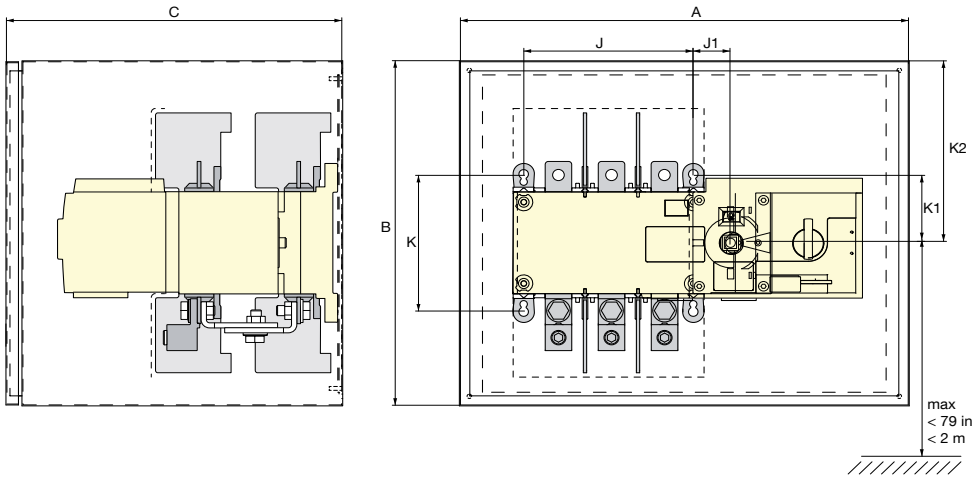
Transfer switch dimensions



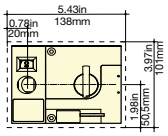
Rating	Ref. code		A		B		C		D		H		H1		H2		Y		Y1	
			in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
100 - 200 A	9723 **2010** / 9723 **3010** 9723 **2020** / 9723 **3020**	2/3P	12.91	328	6.30	160	9.60	244	0.41	10,5	5.08	129	6.93	176	4.21	107	1.51	38,5	5.21	132,5
	9723 **4010** / 9723 **4020**	4P	14.88	378																
260 - 400 A	9723 **2026** / 9723 **3026** 9723 **2040** / 9723 **3040**	2/3P	14.84	377	10.23	260	12.62	320,5	0.41	10,5	8	203	6.51	165,5	6.53	166	2.04	52	7.48	190
	9723 **4026** / 9723 **4040**	4P	17.20	437																

Rating	Ref. code		J		J1		K		K1		L		M		N		O		T	
			in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
100 - 200A	9723 **2010** / 9723 **3010** 9723 **2020** / 9723 **3020**	2/3P	6.30	160	1.37	35	7.67	195	3.84	97,5	1.18	30	0.53	13,3	0.98	25	0.43	11	2	50
	9723 **4010** / 9723 **4020**	4P	8.26	210																
260 - 400A	9723 **2026** / 9723 **3026** 9723 **2040** / 9723 **3040**	2/3P	8.26	210	1.37	35	7.67	195	3.84	97,5	1.96	50	0.49	20	1.38	45	0.51	13	2.6	65
	9723 **4026** / 9723 **4040**	4P	10.63	270																

Minimum enclosure dimensions recommended



Door cut-out for front panel



Rating	Ref. code		A		B		C		J		J1		K		K1		K2	
			in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
100 - 200 A	9723 **2010** / 9723 **3010** 9723 **2020** / 9723 **3020**	2/3P	24	610	24	610	12	305	6.30	160	1.37	35	5.31	135	2.67	68	12	305
	9723 **4010** / 9723 **4020**	4P							8.26	210								
260 - 400 A	9723 **2026** / 9723 **3026** 9723 **2040** / 9723 **3040**	2/3P	32	813	32	813	16	406	8.26	210	1.37	35	7.67	195	3.84	97,5	15	381
	9723 **4026** / 9723 **4040**	4P							10.63	270								

socomec
DIRIS Digiware D-50
ALARM COM ON
V +FREQUENCY I
CLIM BAT ID:6CABOB
INST
AVG MAX
U 1-2 398.5V 05.03.2014 11:10:00
U 2-3 398.4V 05.03.2014 11:10:00
U 3-1 398.5V 05.03.2014 11:10:00
F 60.01 HZ 05.03.2014 11:10:00
IP
E
VF
OK
DIRIS Digiware I-35
ON
ALARM
COM

Metering, monitoring & power quality

DIRIS Digiware - Build your own system ..... p. 132

Multi-circuit metering & measurement

new

DIRIS Digiware
p. 134

new

TE / TR / TF
current sensors
p. 148

Measurement metering

new

DIRIS B-30
p. 142

new

TE / TR / TF
current sensors
p. 148

Single-circuit metering, measurement & analysis

DIRIS A
p. 152

Communication gateways

new

DIRIS G
RS485 to Ethernet
p. 168

Software suite

Embedded web server

new

VERTELIS WEBVIEW
p. 172

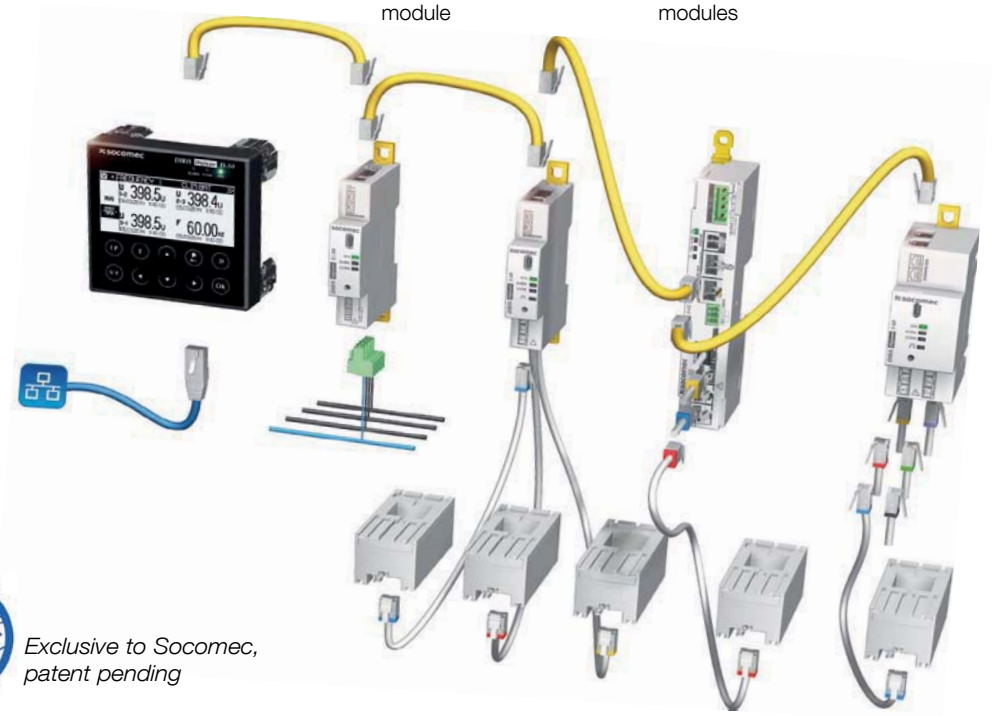
Management software for ***DIRIS***

p. 174

DIRIS Digiware

An energy measurement and monitoring system that revolutionizes electrical installations

- 1 display
- 1 voltage measurement module
- current measurement modules
- current sensors



Exclusive to Socomec, patent pending

Flexible

Shared functions:
- Common display.
- Single voltage measurement for the entire system.
- Single auxiliary power supply.

Installation of components close to the load
- Modules and sensors can be installed at the closest point to the values to be measured.
- Elimination of hazardous voltage on panel doors.

Compact design
- Compact voltage and current modules (1 to 2 modules).
- System suitable for new and existing or installations including panels with space restrictions.

Large range of current sensors
- Flexible, solid or split-core current sensors.
- Various dimensions and types.
- Numerous accessories allow the system to be installed in all panel configurations.

Multi-circuit

Ability to monitor several circuits via a single current measurement module due to independent current inputs.

Accurate

Accuracy of measurements guaranteed according to ANSI C12.20 and IEC standard 61557-12:
- Class 0.5 from 2% to 120% of rated current for the global measurement chain (associated with TE/TF current sensors).
- Class 0.2 for the meter alone.

Cost-effective

- Implementation in a quarter of the time vs existing technologies.
- Save space in panels.
- Common voltage measurement functions, display and communication.
- Up to 30% saving compared to existing metering technology.

Plug & Play

RJ12 current sensor connection
- Rapid: automatic detection of ratings and verification of current direction.
- Reliable: identification of cables by color-coding and wiring control by product.
- Safe: disconnection of the current sensor secondary under load.

RJ45 interconnection of modules (Digiware bus)
- Rapid: a single connection, no tools required.
- Intelligent: allows communication and interaction between various modules.
- Reliable: ensures auxiliary power supply to modules without the risk of disconnection.

Auto-configuration of parameters
- Network type.
- Load type.
- Addressing of devices connected to the bus.

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Build your own system

Local or remote data display? ▶ **Number of circuits to be measured?** ▶ **New or existing installation?** ▶ **Data centralization?**

Control and power supply interface (24 VDC)

DIRIS Digiware D
with display

or

DIRIS Digiware C
without display

+

Voltage measurement module

DIRIS Digiware U-x

+

Current measurement modules

DIRIS Digiware I-3x
3 inputs

DIRIS Digiware I-4x
4 inputs

DIRIS Digiware I-6x
6 inputs

+

Current sensors

TE
Solid

TR
Split-core

TF
Flexible

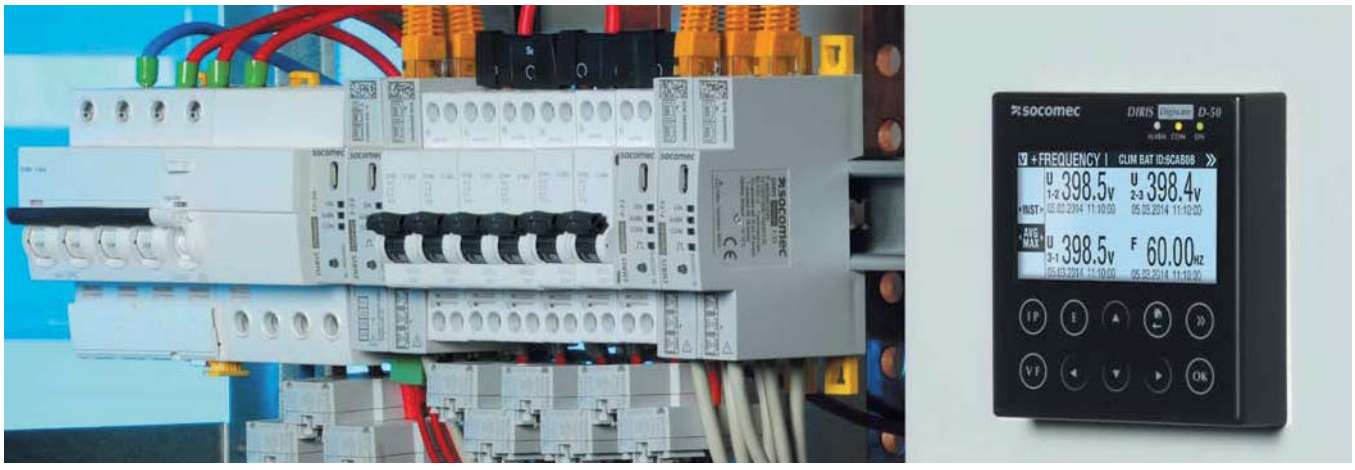
+

Communication gateway

DIRIS G
RS485 Ethernet

+

DIRIS D-90
Touch-screen tablet that can be fitted on the panel door



APPLI_636_A

Selection guide

Measurement and monitoring system for electrical installations

DIRIS Digiware

new

appli_637_a

Application	Voltage measurement module		
	Metering	Monitoring	Analysis
DIRIS Digiware U	***U-10*** *p. 136*	***U-20*** *p. 136*	***U-30*** *p. 136*
Multi-measurement			
U12, U23, U31, V1, V2, V3, f	•	•	•
U system, V system			•
Ph/N unbalance			•
Ph/Ph unbalance			•
Power quality			
THDv1, THDv2, THDv3, THDu12, THDu23, THDu31		•	•
Individual harmonics U & V (up to rank 63)			•
Voltage dips, interruptions and swells			•
Alarms			
On threshold			•
History of average values			
45 days (max.)			•
Format			
Width/Number of modules	18 mm / 1	18 mm / 1	18 mm / 1

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Control and power supply interface + Voltage measurement module + Current measurement modules

Application	Control and power supply interface			
	Centralization and display of data		Data centralization	Repeater
DIRIS Digiware	***D-40*** *p. 136*	***D-50*** *p. 136*	***C-31*** *p. 136*	***C-32*** *p. 136*
Function				
Centralization of measurement points	•	•	•	
High-resolution LCD display (configuration, selection and visualization display of circuits)	•	•		
Repeater				•
Power supply				
24 VDC	•	•	•	•
Communication				
RS485 Modbus	• Output	• Input	•	
Digiware BUS	•	•	•	•
Ethernet Modbus TCP		•		

Application	Current measurement modules						
	Metering		Monitoring	Analysis		Metering	
DIRIS Digiware I	***I-30*** *p. 136*	***I-31*** *p. 136*	***I-33*** *p. 136*	***I-35*** *p. 136*	***I-45*** *p. 136*	***I-60*** *p. 136*	***I-61*** *p. 136*
Number of current inputs							
	3	3	3	3	4	6	6
Metering							
+/- kWh, +/- kvarh, kVAh	•	•	•	•	•	•	•
Load curves		•		•	•		•
Multi-tariff		•		•	•		•
Multi-measurement							
I1, I2, I3, In, ΣP, ΣQ, ΣS, ΣPF	•	•	•	•	•	•	•
P, Q, S, PF per phase			•	•	•		
Predictive power				•	•		
Current unbalance (Inba, Idir, Iinv, Ihom, Inb)				•	•		
Phi, cos Phi, tan Phi				•	•		
Quality							
THDi1, THDi2, THDi3, THDin			•	•	•		
Individual harmonics I (up to level 63)				•	•		
Overcurrents				•	•		
Alarms							
On threshold				•	•		
Inputs/Outputs					2 / 2		
History of average values							
45 days (max.)				•	•		
Format							
Width/Number of modules	18 mm / 1	18 mm / 1	18 mm / 1	18 mm / 1	27 mm / 1.5	36 mm / 2	36 mm / 2

DIRIS Digiware

Measurement and monitoring system for electrical installations

new

diris-dw_006_a_cat

DIRIS Digiware D-50

diris-dw_005_a_cat

DIRIS Digiware U-30

diris-dw_004_a_cat

DIRIS Digiware I-35

Configuration with EasyConfig, see page 174.

The solution for

- Industry
- Building
- Infrastructure
- Local authority

Strong points

- Multi-circuit
- Global accuracy class 0.5 in accordance with ANSI C12.20 and IEC 61557-12
- Cost effective and flexible
- Plug & Play

Conformity to standards

- IEC 61557-12
- ISO 14025
- UL 61010
- FCC
- ANSI C12.20

Function

The **DIRIS Digiware** system is a hub of technological innovations that revolutionizes the world of measurements, bringing a high degree of flexibility to installations and making connection and configuration easy.

These innovations, together with unrivaled performance in terms of accuracy and functionality, make DIRIS Digiware the most effective solution for metering consumption, measuring and monitoring the quality of electrical energy in industrial and commercial applications.

- Management and optimization of the power installed DIRIS Digiware allows you to identify most demanding loads and monitor abnormal electrical values, providing you with a perfectly-managed electrical network.
- Simplified network maintenance: the electrical energy quality monitoring functions offered by DIRIS Digiware make it easier to anticipate electrical malfunctions.

Advantages

Multi-circuit

Ability to monitor several circuits via a single current measurement module due to independent current inputs.

Accuracy as per standard ANSI C12.20 and IEC 61557-12

- Class 0.5 from 2% to 120% of nominal current for the global measurement chain (associated with TE/TF current sensors).
- Class 0.2 for the meter alone.

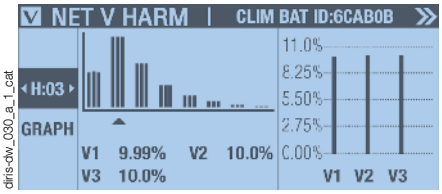
Cost effective and flexible

- Implementation in a quarter of the time vs existing technologies.
- Installation of modules and sensors at the closest point to the load.
- Shared functions:
  - Common display.
  - Single voltage measurement for the entire system.
  - Single auxiliary power supply.
- Compact design: suitable for new and existing installations including panels with space restrictions.
- Large range of current sensors.

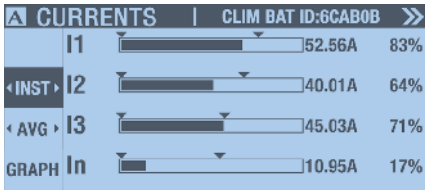
Plug & Play

- RJ12 current sensor connection
  - Automatic detection of ratings.
  - Identification of cables by color-coding.
  - Disconnection of the current sensor secondary under load.
- RJ45 interconnection of I and U modules via Digiware bus.
- Auto-configuration of parameters: Network and load type - addressing of devices connected to the bus.

Example of displays on DIRIS Digiware D-40/D-50



diris-dw_030_a_1_cat



diris-dw_031_a_1_cat

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DIRIS Digiware System

- 1 display
- 1 voltage measurement module
- current measurement modules
- current sensors

diris-dw_011_a_cat

Control and power supply interface (24 VDC)

or

DIRIS Digiware D-40/D-50

- High-resolution LCD display
- Centralization of measurement points:
  - circuit selection,
  - data display.
- Keys on the front face for direct access to:
  - measurement data,
  - circuits selection,
  - device configuration.
- 24 VDC power supply
- Communication
  - Digiware Bus,
  - RS485 Modbus (input),
  - Ethernet (Modbus TCP).

DIRIS Digiware C-31/C-32

- No-display mode
- Centralization of DIRIS Digiware measurement data on RS485 Modbus
- 24 VDC power supply
- Communication
  - Digiware Bus,
  - RS485 Modbus.
- Repeater (more than 15 W or more than 100 m)

\+

Voltage measurement module

DIRIS Digiware U-xx

U-10
- U12, U23, U31, V1, V2, V3, f

U-20
- U12, U23, U31, V1, V2, V3, f
- THDv1, THDv2, THDv3, THDu12, THDu23, THDu31

U-30
- U12, U23, U31, V1, V2, V3, f
- U system, V system
- Ph/N unbalance (Vnb, Vnba, Vdir, Vinv, Vhom)
- Ph/Ph unbalance (Unb, Unba, Udir, Uinv)
- THDv1, THDv2, THDv3, THDu12, THDu23, THDu31
- Individual harmonics U & V (up to rank 63)
- Voltage dips, interruptions and swells (EN 50160)
- Alarms
- History of average values

\+

Current measurement modules

DIRIS Digiware I-3x
3 inputs

DIRIS Digiware I-4x
4 inputs

DIRIS Digiware I-6x
6 inputs

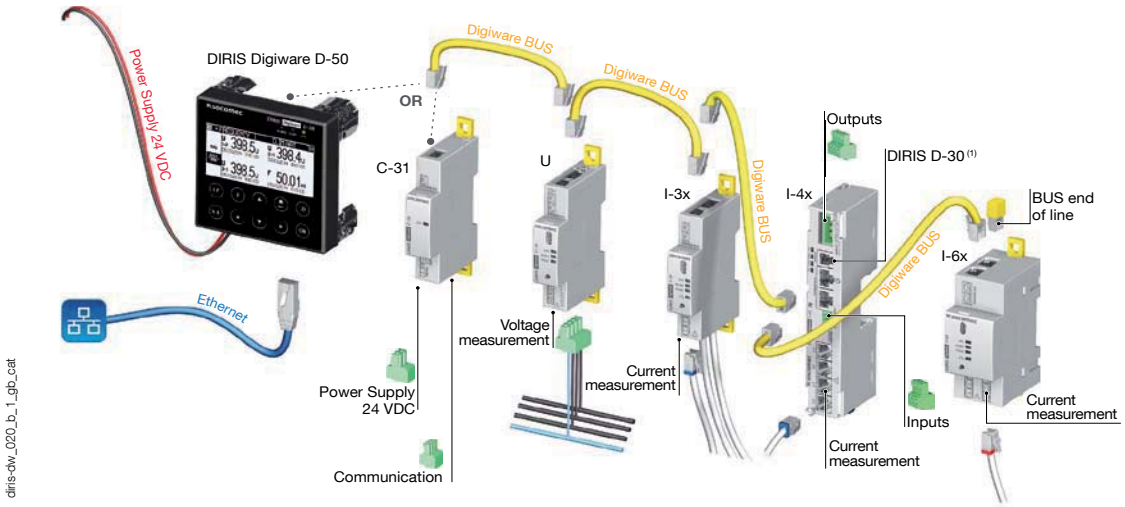
I-30 / I-60
- ± kWh, ± kvarh, kVAh
- I1, I2, I3, In, ΣP, ΣQ, ΣS, ΣPF

I-31 / I-61
- ± kWh, ± kvarh, kvah
- Load curves
- I1, I2, I3, In, ΣP, ΣQ, ΣS, ΣPF

I-33
- ± kWh, ± kvarh, kvah
- I1, I2, I3, In, ΣP, ΣQ, ΣS, ΣPF
- P, Q, S, PF per phase
- THDi1, THDi2, THDi3, THDin

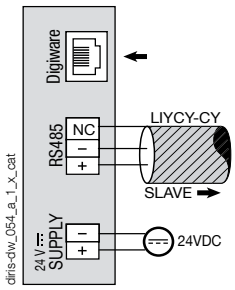
I-35 / I-45
- ± kWh, ± kvarh, kVAh
- Load curves
- I1, I2, I3, In, ΣP, ΣQ, ΣS, ΣPF
- P, Q, S, PF per phase
- Predictive power (ΣP, ΣQ, ΣS)
- I System
- Current unbalance (Inba, Idir, Iinv, Ihom, Inb)
- Phi, cos Phi, tan Phi
- THDi1, THDi2, THDi3, THDin
- Individual harmonics I (up to rank 63)
- Overcurrents
- Alarms
- 2 inputs / 2 outputs (I-45)
- History of average values

Terminals

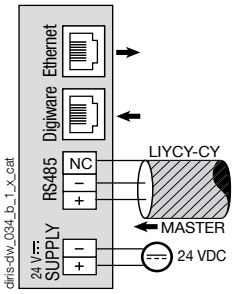


(1) a local single-point DIRIS D-30 display can be connected to the I-45 module

DIRIS Digiware D-40



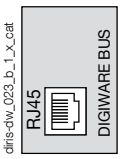
DIRIS Digiware D-50



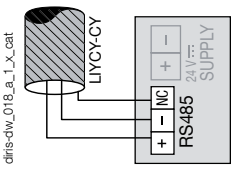
DIRIS Digiware C-31

Power supply

Digiware BUS

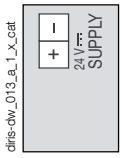


Communication

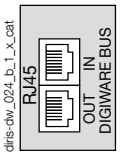


DIRIS Digiware C-32

Power supply

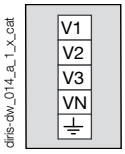


Digiware BUS

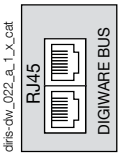


DIRIS Digiware U

Voltage measurement

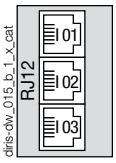


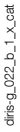
Digiware BUS



DIRIS Digiware I-3x

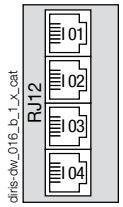
Current measurement



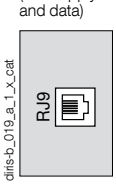


DIRIS Digiware I-45

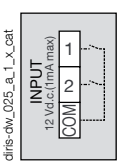
Current measurement



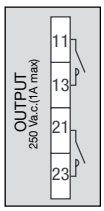
RJ9 for DIRIS D-30 (self-supply and data)



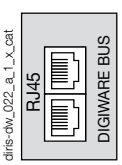
Inputs



Outputs

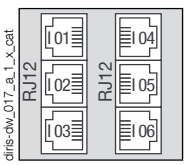


Digiware BUS

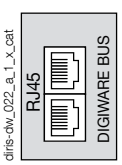


DIRIS Digiware I-6x

Current measurement



Digiware BUS



Connections

Associated current sensors

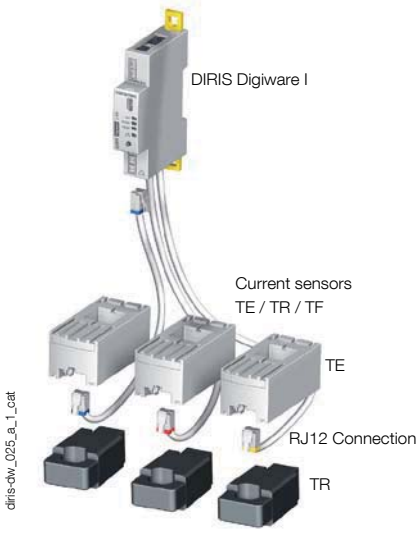
Various types of current sensors can be connected to the DIRIS Digiware: Solid TE , split-core TR , flexible TF current sensors. This range of sensors can be adapted to all types of new or existing installations. A rapid RJ12 connection makes wiring easy and reliable and prevents wiring errors. The DIRIS Digiware automatically recognizes the sensor size and type. This guarantees the overall accuracy of the DIRIS Digiware + current sensor measurement chain.

For more information: see page 148.

TE solid current sensors

TR Split-core current sensors

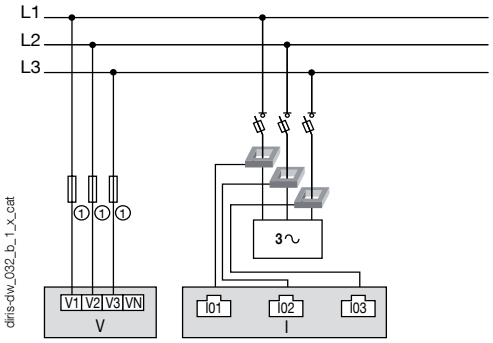
TF Flexible current sensors



Network and connection examples

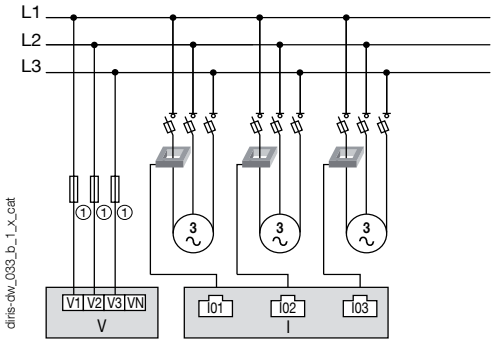
Three-phase

3P - 3CTs (1 three-phase load)



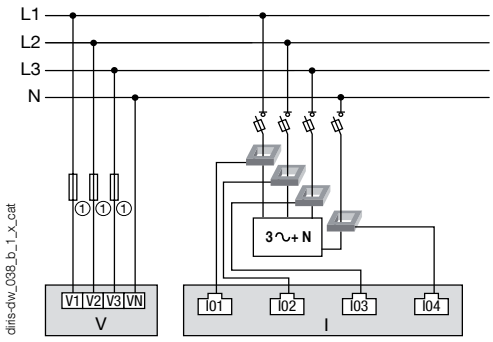
Three-phase

3P - 1CT (3 three-phase balanced loads)



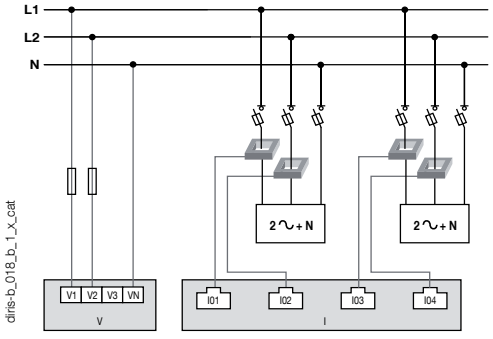
Three phase + neutral

3P+N - 4CTs (1 three-phase load + Neutral)



Single-phase

2P+N – 2CT (2 single-phase loads)

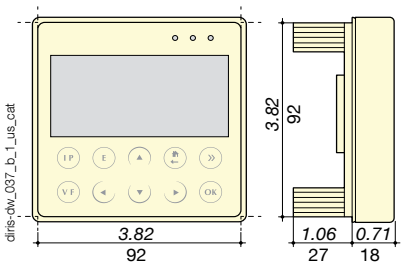


1. Fuses 0.5 A gG / 0.5 A class CC.

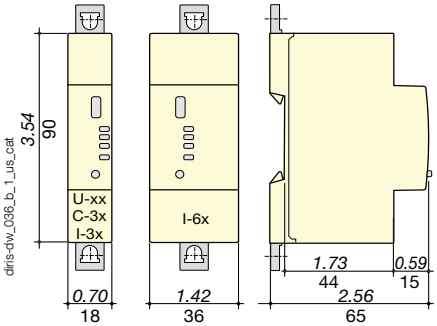
CT: Current sensors 3~ Load

Dimensions (in/mm)

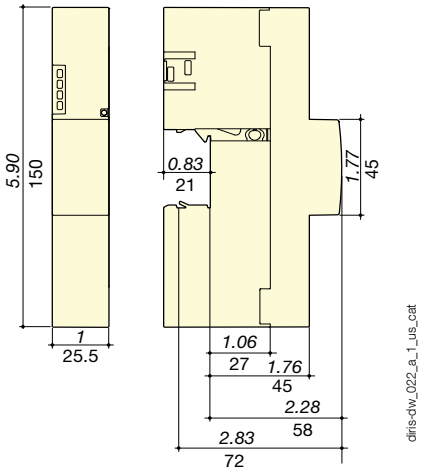
DIRIS Digiware D-X0



DIRIS Digiware U / C / I-3x / I-6x



DIRIS Digiware I-45



Configuration

Power consumption of devices

Components	Power supplied (W)	Power consumption (W)
Power supply		
P15 100-240 VAC / 24 VDC	15	
Cables		
50 metre package		1.5
System interfaces		
DIRIS Digiware D-X0		2
DIRIS Digiware C-31		0.8
Voltage module		
DIRIS Digiware U-xx		0.72
Current modules		
DIRIS Digiware I-3x		0.52
DIRIS Digiware I-45		1.125
DIRIS Digiware I-6x		0.7
Repeater		
DIRIS Digiware C-32		1.5

Rules to set the maximum number of products on the Digiware BUS

The total power consumptions by the devices connected to the Digiware BUS must not exceed the power supplied by the 24 VDC supply.
The power supply must not exceed 20 W.

System configuration with P15 power supply (ref: 4829 0120) providing 15 W

System can include:
- 1 display DIRIS Digiware D-50 (2 W)
- 1 voltage module DIRIS Digiware U-xx (0.72 W)
- 50 meter cable (1.5 W)

and
- 20 current modules DIRIS Digiware I-3x (20 x 0.52 = 10.4 W)
  ⇨ **Total power = 14.62 W**

or
- 9 current modules DIRIS Digiware I-45x (9 x 1.125 = 10.125 W)
  ⇨ **Total power = 14.345 W**.

System configuration with a 24 VDC power supply providing a maximum of 20 W

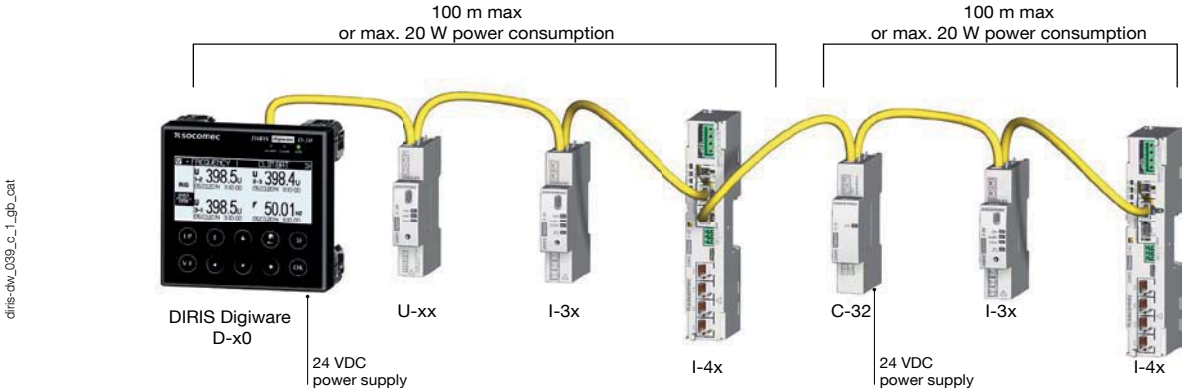
System can include:
- 1 display DIRIS Digiware D-50 (2 W)
- 1 voltage module DIRIS Digiware U-xx (0.72 W)
- 50 meter cable (1.5 W)

and
- 30 current modules DIRIS Digiware I-3x (30 x 0.52 = 15.6 W)
  ⇨ **Total power = 19.82 W**

or
- 14 current modules DIRIS Digiware I-45x (14 x 1.125 = 15.72 W)
  ⇨ **Total power = 19.97 W**.

Repeater

When the power consumption is over 20 W or the distance exceeds 100 m/328 feet, a DIRIS Digiware C-32 repeater is required.
In a DIRIS Digiware system, maximum 2 repeaters can be used. A C32 repeater can also be used in heavy EMC environments.



Technical characteristics

Electrical characteristics

DIRIS Digiware C-31	
Input voltage	24 VDC ± 20 % - 20 W max
Connection	Removable screw terminal, 2 positions, 0.2 to 2.5 mm² stranded or solid cable
P15 power supply	Characteristics: 100-240 VAC/ 24 VDC - 0.63 A - 15 W Modular format - Dimensions (H x L): 3.5 x 1 in / 90 x 25 mm

Measurement characteristics

Energy and power measurement	
Accuracy Active energy and active power	Class 0.2 DIRIS Digiware alone Class 0.5 with TE or TF current sensors Class 1 with TR current sensors
Reactive energy accuracy	Class 2 with TE, TR or TF current sensors
Power factor measurement	
Accuracy	Class 0.5 with TE or TF current sensors Class 1 with TR current sensors
Voltage measurement - DIRIS Digiware U	
Network characteristics measured	50-300VAC (Ph/N) - 87-520VAC (Ph/Ph) - CAT III
Frequency range	45 … 65Hz
Frequency accuracy	Class 0.02
Network type	Single-phase / Two-phase / Two-phase with neutral / Three-phase / Three-phase with neutral
Measurement by voltage transformer	Primary: 400 000 VAC Secondary: 60, 100, 110, 173, 190 VAC
Input consumption	≤ 0.1 VA
Permanent overload	300 VAC Ph/N
Voltage measurement accuracy	Class 0.2
Connection	Removable screw terminal, 4 positions, AWG 10 to AWG 32 or 0.2 to 2.5 mm² stranded or solid cable
Current measurement - DIRIS Digiware I	
Number of current inputs	I-3x: 3 / I-45: 4 / I-6x: 6
Associated current sensors	Solid TE , split-core TR , flexible TF current sensors
Current measurement accuracy	Class 0.2 DIRIS Digiware alone Class 0.5 with TE or TF current sensors Class 1 with TR current sensors
Connection	Specific SOCOMEC cable with RJ12 connectors
Inputs - DIRIS Digiware I-45	
Number of inputs	2
Type / Power supply	Non insulated input, internal polarization 12 VDC max, 1mA
Input functions	Logic status or pulse meter
Connection	Removable screw terminal, AWG 15 to AWG 35 or 0.14 to 1.5 mm² stranded or solid cable
Outputs - DIRIS Digiware I-45	
Number of outputs	2
Relay type	230 VAC ±15 % - 1 A
Function	Configurable alarm (current, power,…) on threshold overruns or remote controlled status
Connection	Removable screw terminal, AWG 10 to AWG 32 or 0.2 to 2.5 mm² stranded or solid cable

Communication characteristics

Digiware BUS	
Function	Connection between DIRIS Digiware modules
Type of cable	Specific SOCOMEC cable with RJ45 connectors
RS485	
Connection type	2 … 3 half duplex wires
Protocol	Modbus RTU
Speed	1200 … 115200 bauds
Function	Configuration and data transmission
Location	Single-point on DIRIS Digiware C
USB	
Protocol	Modbus RTU over USB
Function	Configuration of DIRIS Digiware U and I modules
Location	On each DIRIS Digiware U and I measuring module
Connection	B-type micro USB connector

Mechanical characteristics

Types of casing	Modular for DIN-rail or back plate mounting
Casing degree of protection	IP20 / IK06
Front face degree of protection	IP40 (panel face with modular mounting) / IK06

Environment characteristics

Operating temperature	-10 … +70 °C / +14 °F … +158 °F
Storage temperature	-25 … +70 °C / -13 °F … + 158 °F
Operating humidity	55 °C / 131 °F / 97% relative humidity
Operating altitude	6560 feet / 2000 m

DIRIS Digiware D-40 / D-50 characteristics

Mechanical characteristics	
Screen type	Capacitive touch-screen technology, 10 keys
Screen resolution	350 x 160 pixels
Front face degree of protection	IP65
Communication	
Ethernet RJ45 10/100 Mbs	Modbus TCP gateway function (D-50 only)
RJ45 Digiware	Control and power supply interface function
RS485 2-3 wires	Modbus RTU communication function (master D-50; slave D-40)
USB	Updating via B-type micro USB connector
Electrical characteristics	
Power supply	24 VDC +10% / -20%
Consumption	2 VA
Environment characteristics	
Storage temperature	-20 … +70 °C / -4 °F … +158 °F
Operating temperature	-10 … +70 °C / +14 °F … +158 °F
Humidity	95 % at 40 °C / 104 °F
Installation category - degree of pollution	CAT III, 2

References

DIRIS Digiware		**Reference**
D-40	Multi-point display - RS485 output	4829 **0199**
D-50	Multi-point display - Ethernet output	4829 **0201**
C-31	System interface	4829 **0101**
C-32	Repeater	4829 **0103**
U-10	Metering	4829 **0105**
U-20	Monitoring	4829 **0106**
U-30	Analysis	4829 **0102**
I-30	Metering - 3 current inputs	4829 **0110**
I-31	Metering + load curve - 3 current inputs	4829 **0111**
I-33	Monitoring - 3 current inputs	4829 **0128**
I-35	Analysis - 3 current inputs	4829 **0130**
I-45	Analysis 2 inputs / 2 outputs - 4 current inputs	4829 **0131**
I-60	Metering - 6 current inputs	4829 **0112**
I-61	Metering + load curve - 6 current inputs	4829 **0113**

Power supply		**Reference**
P15	100-240 VAC/ 24 VDC 15 W power supply	4829 **0120**
Digiware connection cables		**Reference**
RJ45 cables for BUS Digiware	0.32 feet / 0.10 m length	4829 **0181**
	1.64 feet / 0.50 m length	4829 **0182**
	3.28 feet / 1 m length	4829 **0183**
	6.56 feet / 2 m length	4829 **0184**
	16.4 feet / 5 m length	4829 **0186**
	32.8 feet / 10 m length	4829 **0187**
	164 feet / 50 m + 50 connectors	4829 **0185**
Termination for Digiware BUS (fitted on C-31 and D-50)		4829 **0180**
USB configuration cable		4829 **0050**

DIRIS B-30

RS485 power monitoring devices

new

Configuration with EasyConfig, see page 174.

DIRIS B-30
RS485

The solution for

- Industry
- Building
- Infrastructure
- Local authority

Strong points

- Plug & Play
- Global accuracy class 0.5 in accordance with ANSI C12.20 and IEC 61557-12
- Multi-circuit
- Communication

Conformity to standards

- IEC 61557-12
- EN 50160
- ISO 14025
- **Not compliant to UL, please contact SOCOMEC.**

PEP ecoPASSPORT®

Function

The **DIRIS B-30** is a power monitoring device in a modular format that communicates via RS485. The 4 RJ12 independent current inputs of the device allow it to manage several types and number of circuits: for example, 4 single-phase loads or 1 three-phase load + 1 single-phase load.

The DIRIS B-30 is connected to current sensors(1) (RJ12 connection) that are suitable for all types of installation: solid TE, split-core TR, and flexible TF current sensors.

(1) See page 148.

Advantages

Plug & Play

A rapid RJ12 connection makes wiring easy and reliable and prevents wiring errors. Automatically addressing and configuring the product (communication address, load type, type and ratio of current sensor) allow you to simplify implementation and to save time.

Class 0.5 in accordance with ANSI C12.20 and IEC 61557-12

- Class 0.2 for the meter alone.
- Class 0.5 from 2% to 120% of nominal current for the global measurement chain (associated with TE/TF current sensors).

Multi-circuit

- 4 current measurement inputs allow you to configure multiple circuits in order to optimize the number of measurement devices per installation.

Communication

- The DIRIS B-30 can be connected to:
  - a remote DIRIS D-30 screen for displaying measurement and metering data.
  - a DIRIS G(1) gateway for centralization and communication of data via RS485 and Ethernet.
  - optional modules to communicate in BACnet IP, BACnet MSTP and PROFIBUS DP protocol. Digital or analogue input/output modules can also be connected.

(1) See page 143.

Selection guide

DIRIS B-30	
DIRIS B-30 RS	RS485 MODBUS communication
Optional modules	
DIRIS O-iod	2 digital inputs / 2 digital outputs
DIRIS O-ioa	2 analogue inputs / 2 analogue outputs
DIRIS O-it	3 temperature inputs
DIRIS O-m	Additional RS485 communication
DIRIS O-p	PROFIBUS communication
DIRIS O-b/ip	BACnet IP communication
DIRIS O-b/mstp	BACnet MSTP communication

Functions

Multi-measurement
- Currents
  - I1, I2, I3, In, Isystem
- Voltages & frequency
  - V1, V2, V3, VN, Vsystem, U12, U23, U31, Usystem, f
- Power
  - P1, P2, P3, ΣP, Q1, Q2, Q3, ΣQ, S1, S2, S3, ΣS
  - Predictive power ΣP, ΣQ, ΣS
- Power factor
  - PF1, PF2, PF3, ΣPF
- Cos φ & tanφ
  - Instantaneous values per phase

Metering
- Active energy: +/- kWh
- Reactive energy: +/- kvarh
- Apparent energy: kVAh
- Multi-tariff (8 max.)

Quality
- Voltage Unbalance
  - Vdir, Vinv, Vhom, Udir, Uinv, Unba, Vnba, Vnb, Unb
- Current unbalance
  - Idir, Iinv, Ihom, Inba, Inb
- Total harmonic distortion
  - Currents THDi1, THDi2, THDi3,THDiN
  - Phase-to-neutral voltage THDv1, THDv2, THDv3
  - Phase-to-phase voltage THDu12, THDu23, THDu31
- Individual harmonics up to rank 63
  - Currents: I1h, I2h, I3h, INh
  - Phase-to-neutral voltage: V1h, V2h, V3h
  - Phase-to-phase voltage: U12h, U23h, U31h
- Active
  - Dips, interruptions, swells

Load curves and history logs (130 days max.)
- Active, reactive and apparent power
- Currents, voltages and frequency

Alarms
- Alarms for all electrical values, events and input status changes, possibility of boolean combination

Communication
- DIRIS B-30 RS: RS485 Modbus,
- Optional modules: RS485, BACnet IP, BACnet MSTP, PROFIBUS DPV1

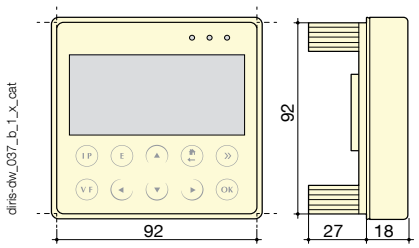
Inputs
- 2 digital inputs
  - Supply by the DIRIS B-30 or external supply
  - Function: logic status, circuit breaker status, pulse meter or synchronization pulse

socomec Innovative Power Solutions

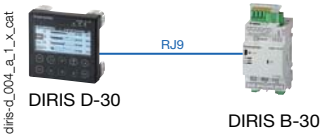
DIRIS B-30 display

DIRIS D-30

Dimensions

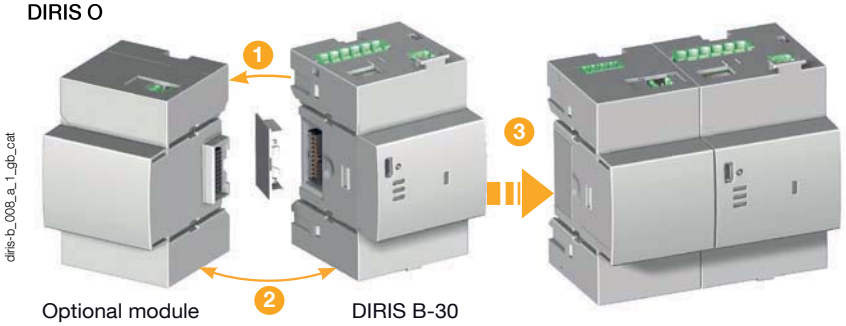


Connection



Optional modules

DIRIS O



Optional modules (4 max.)*

- Digital inputs/outputs
- Analogue inputs/outputs
- Temperature inputs
- Communication protocols

** maximum 4 optional modules with maximum 1 temperature module and 1 communication module (Modbus, PROFIBUS, BACnet IP or BACnet MSTP).*

DIRIS O-iod

- 2 digital inputs centralizes the metering pulses or the input status changes of the auxiliary contacts.
- 2 digital outputs can be connected to configurable alarms warning of exceeded thresholds (power, current, etc.) or can be piloted remotely.

DIRIS O-ioa

- 2 inputs (4-20 mA) centralize analogue sensors (pressure, humidity, temperature, etc.)
- 2 outputs (4/-20 mA) report the measurements (power, currents, etc.) to PLCs.

DIRIS O-it

- 3 temperature inputs to be connected to PT100 or PT1000 sensors.
- Ambient air temperature:

DIRIS O-m

- Provides a second RS485 Modbus communication port to the DIRIS B-30 for simultaneous sending of information via RS485 to two supervision stations.

DIRIS O-p

- Adds a PROFIBUS DPV1 communication port to the DIRIS B-30.

DIRIS O-b/ip

- Adds a BACnet IP communication port to the DIRIS B-30.

DIRIS O-b/mstp

- Adds a BACnet MSTP communication port to the DIRIS B-30.

Accessories

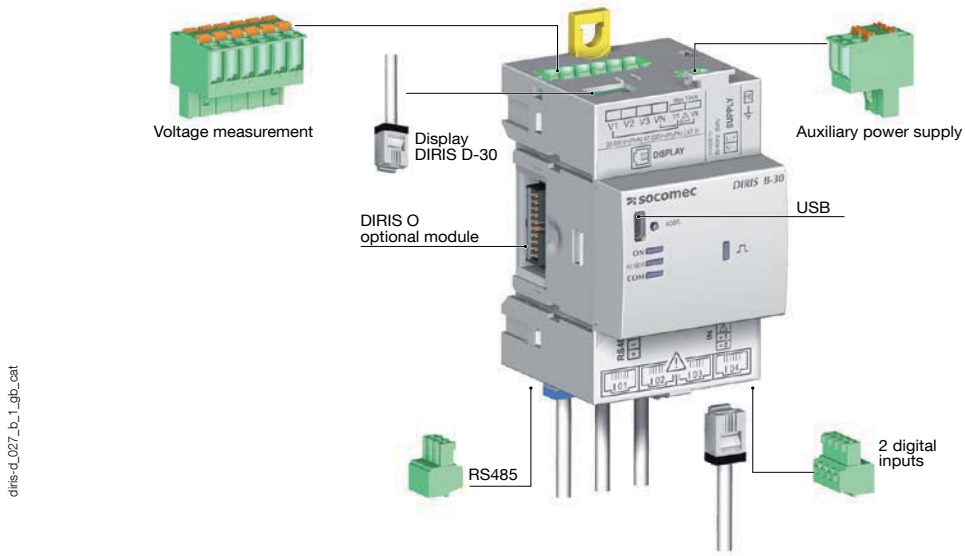
DIRIS B-30 sealing cover

- Prevents access to the cabling of the monitoring device.

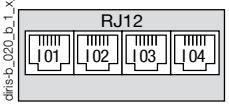
USB configuration cable (6.5 feet / 2 m)

- Advanced configuration of DIRIS B-30 gateways can be achieved using the EASY CONFIG software via Ethernet or direct USB connection.

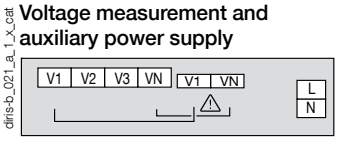
DIRIS B-30 terminals



Current measurement

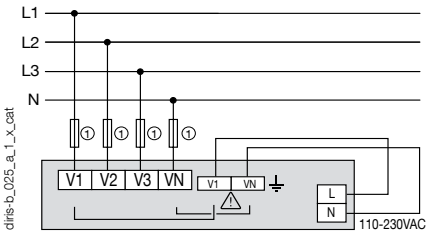


Voltage measurement and auxiliary power supply



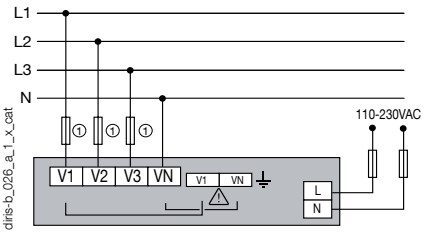
Self supply

Easy connection of the power supply from the measurement terminal (specific terminals)



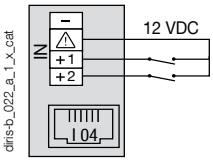
1. Fuses 0.5 A gG / 0.5 A class CC.

Separate power supply

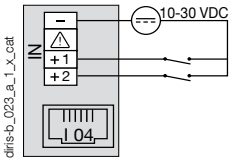


1. Fuses 0.5 A gG / 0.5 A class CC.

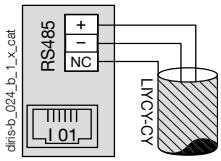
2 inputs supplied by the product



2 inputs with external power supply

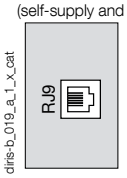


RS485



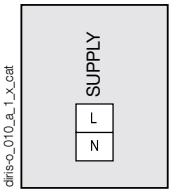
RJ9 for DIRIS D-30

(self-supply and data)

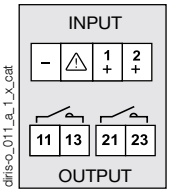


Terminals of optional DIRIS O modules

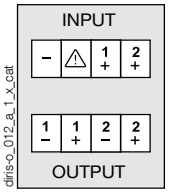
Optional module power supply



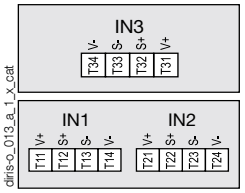
DIRIS O-iod



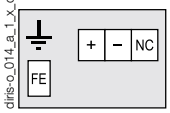
DIRIS O-ioa



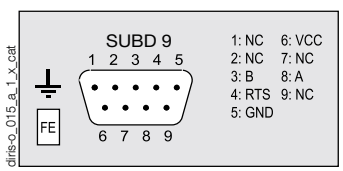
DIRIS O-it



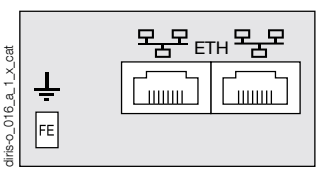
DIRIS O-m RS485



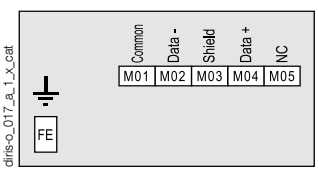
DIRIS O-p



DIRIS O-b/ip



DIRIS O-b/mstp



Connections

Associated current sensors

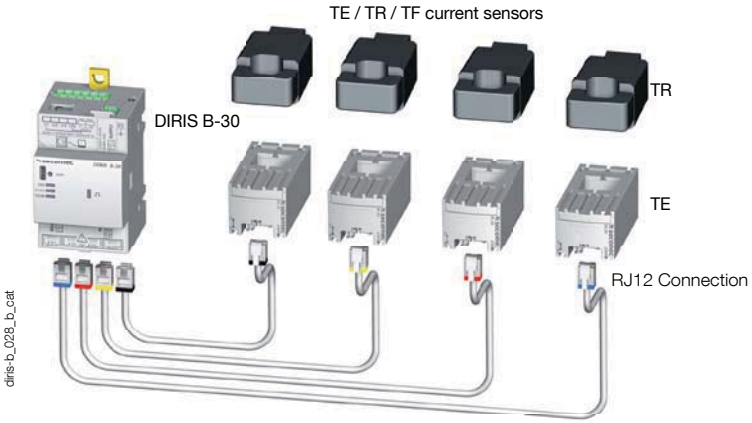
Various types of current sensors can be connected to the DIRIS Digiware: Solid TE , split-core TR , flexible TF current sensors. This range of sensors can be adapted to all types of new or existing installations. A rapid RJ12 connection makes wiring easy and reliable and prevents wiring errors. The DIRIS B-30 automatically recognizes the sensor size and type. This guarantees the overall accuracy of the DIRIS B-30 + current sensor measurement chain.

For more information: see page 148.

TE solid current sensors

TR Split-core current sensors

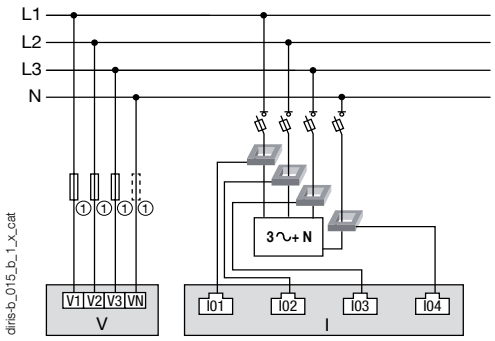
TF Flexible current sensors



Network and connection examples

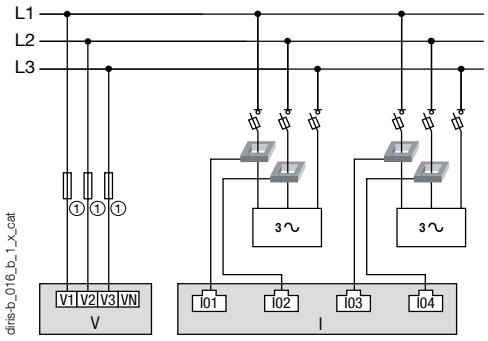
Three phase + neutral

3P+N - 4CTs (measurement for 1 three-phase load + Neutral)



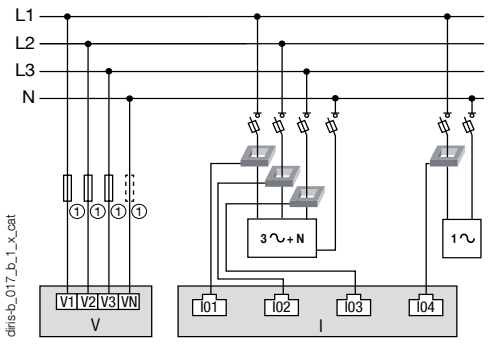
Three-phase

3P - 2CTs (2 three-phase loads without neutral)



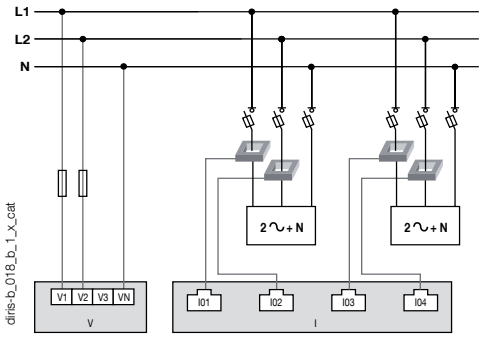
Three-phase

3P+N - 3CTs & 1P+N - 1CT (1 three-phase load & 1 single-phase load)



Single-phase

2P+N – 2CT (2 single-phase loads)

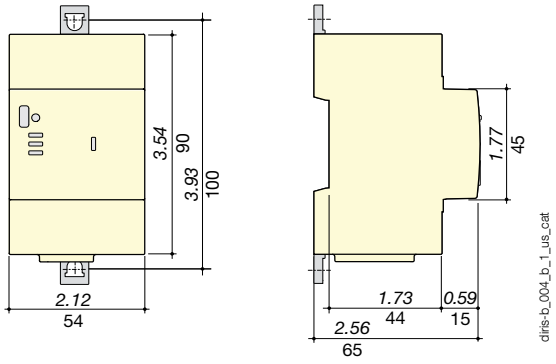


1. Fuses 0.5 A gG / 0.5 A class CC.
In case of self-supply, a fuse must be added on the neutral.

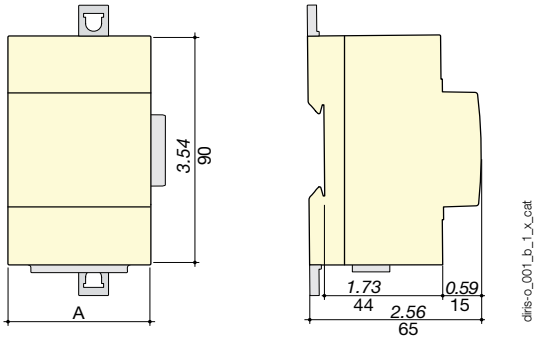
CT: Current sensors 3~ Load

Dimensions (in/mm)

DIRIS B-30



DIRIS O optional modules

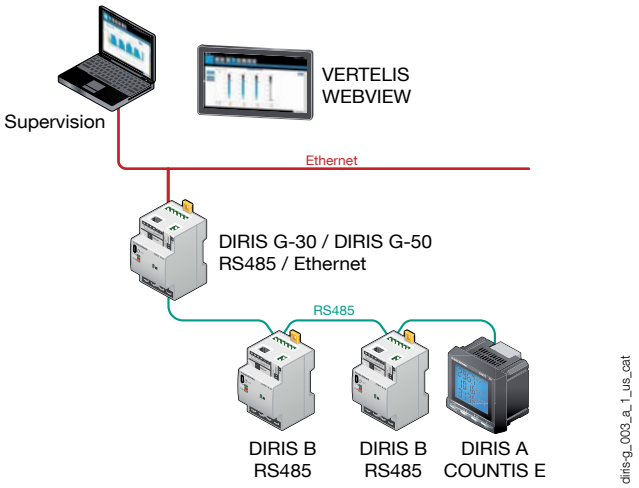


DIRIS O optional modules	A
DIRIS O-iod - DIRIS O-ioa - DIRIS O-it	1.8 in / 45 mm
DIRIS O-m - DIRIS O-p - DIRIS O-b/ip - DIRIS O-b/mstp	2.1 in / 54 mm

Communication architecture

Example of communication architecture with DIRIS G gateway and WEBVIEW embedded WEB server

For more information about DIRIS G, see page 168.



References

Not compliant to UL, please contact SOCOMEC.

DIRIS B-30 monitoring devices		Reference
DIRIS B-30	RS485 - Modbus - 230VAC	4829 **0000**

DIRIS O optional modules		Reference
DIRIS O-iod	2 digital inputs / 2 digital outputs	4829 **0030**
DIRIS O-ioa	2 analogue inputs/2 analogue outputs 4-20 mA	4829 **0031**
DIRIS O-it	3 temperature inputs PT 100 / PT 1000	4829 **0032**
DIRIS O-m	RS485 Modbus communication	4829 **0033**
DIRIS O-p	PROFIBUS communication	4829 **0034**
DIRIS O-b/ip	BACnet IP communication	4829 **0035**
DIRIS O-b/mstp	BACnet MSTP communication	4829 **0036**

Accessories	Reference
DIRIS D-30 - Single-point display	4829 **0200**
RJ9 cable for DIRIS D-30 display - 4.9 feet / 1.5 m	4829 **0280**
RJ9 cable for DIRIS D-30 display - 9.8 feet / 3 m	4829 **0281**
DIRIS B-30 sealing cover for I/O terminals	4829 **0049**
USB configuration cable	4829 **0050**

DIRIS B-30 characteristics

Electrical characteristics

Auxiliary power supply	
AC voltage	110-230VAC ±15 % (Ph/N ou Ph/Ph) Cat III
Frequency	50/60 Hz
Consumption	< 2VA without display < 6VA with display
Connection	Removable spring-cage terminal, 2 x 2 positions, AWG 10 … 24 / 0.5 … 2.5 mm² solid cable or AWG 15 … 30 / 0.25 … 1.5 mm² stranded cable with ferrule

Measurement characteristics

Energy and power measurement	
Accuracy Active energy and active power	Class 0.2 DIRIS B-30 alone Class 0.5 with TE or TF current sensors Class 1 with TR current sensors
Reactive energy accuracy	Class 2 with TE, TR or TF current sensors

Power factor measurement	
Accuracy	Class 0.5 with TE or TF current sensors Class 1 with TR current sensors

Voltage measurement	
Network characteristics measured	50-300VAC (Ph/N) - 87-520VAC (Ph/Ph) - CAT III
Frequency range	45 … 65Hz
Frequency accuracy	Class 0.02
Network type	Single-phase / Two-phase / Two-phase with neutral / Three-phase / Three-phase with neutral
Measurement by voltage transformer	Primary: 400 000 VAC Secondary: 60, 100, 110, 173, 190 VAC
Input consumption	≤ 0.1 VA
Permanent overload	300VAC Ph/N
Voltage measurement accuracy	Class 0.2
Connection	Removable spring-cage terminal,2 x 6 positions, AWG 10 … 24 / 0.5 … 2.5 mm² solid cable or AWG 15 … 30 / 0.25 … 1.5 mm² stranded cable with ferrule

Current measurement	
Number of current inputs	4
Associated current sensors	Solid TE , split-core TR , flexible TF current sensors
Accuracy	Class 0.2 DIRIS B-30 alone Class 0.5 with TE or TF current sensors Class 1 with TR current sensors
Connection	RJ12 connectors with specific SOCOMEC cable

Input characteristics

Number	2
Type / Power supply	Optocoupler internal polarization (12 VDC ± 10 %) or external polarization (10-30 VDC ± 10%)
Input function	Logic status, pulse meter or synchronization pulse status (input 1)

Communication characteristics

DIRIS B-30 RS485	
Link	RS485
Connection type	2 … 3 half duplex wires
Protocol	Modbus RTU
Speed	1200 … 115200 bauds
USB	DIRIS B-30 configuration

Environment characteristics

Operating temperature	-10 … +70 °C / +14 °F … +158 °F
Storage temperature	-25 … +85 °C / -13 °F … +185 °F
Operating humidity	55 °C / 131 °F / 97% relative humidity
Operating altitude	6560 feet / 2000 m
Vibration	1G from 10 Hz to 100Hz

DIRIS D-30 display characteristics

Mechanical characteristics	
Screen type	Capacitive touch-screen technology, 10 keys
Screen resolution	350 x 160 pixels
Single product connection	
RJ9	Self-supply and data
Micro-USB	Updating
Degree of protection	IP65 (front face)
Electrical characteristics	
Power supply	24 VDC +10 % / -20 %
Consumption	2 VA
Environment	
Storage temperature (°C)	-20 ... +70°C / -4 °F … +158 °F
Operating temperature (°C)	-20 ... +70°C / -4 °F … +158 °F
Humidity	95 % to 40°C / 104 °F
Installation category	CAT III
Degree of pollution	2

DIRIS O optional modules characteristics

Power supply(1)	
AC voltage	110-230 VAC ±15 %
Frequency	50/60 Hz

(1) No power supply on DIRIS O-it.

DIRIS O-iod - 2 digital inputs/2 digital outputs	
Number of inputs	2 per optional modules - max. 4 optional modules
Type	Optocoupler internal polarization (12 VDC ± 10 %) or external polarization (10-30 VDC ± 10%)
Function	Logic status or pulse meter
Number of outputs	2 per optional modules - max. 4 optional modules
Type	Relay / 230VAC ±15 % - 1 A
Function	Configurable alarm (current, power,…) on threshold overruns or remote controlled status
Inputs/Outputs connection	Removable screw terminal, 4 positions, AWG 15 … 35 / 0.14 to 1.5 mm² stranded or solid cable

DIRIS O-ioa - 2 analogue inputs/2 analogue outputs	
Number of inputs	2 per optional modules - max. 4 optional modules
Type	4-20 mA
Function	Connection of analogue sensors (pressure, humidity, temperature…)
Number of outputs	2 per optional modules - max. 4 optional modules
Type	4-20 mA
Function	Transmission of measurement image (current, power…) to PLCs

DIRIS O-it - 3 temperature inputs	
Number of inputs	3 external inputs + 1 measurement for ambient temperature
Dynamic	-20 °C to 150 °C / -4 °F … 302 °F
Type	PT100 or PT1000
Function inputs 1, 2 and 3	Temperature measurement

DIRIS O-m - RS485 communication	
Link	RS485 2 … 3 half duplex wires
Protocol	Modbus RTU
Speed	1200 … 115200 bauds
Connection	Removable screw terminal, 3 positions, AWG 15 … 35 / 0.14 to 1.5 mm² stranded or solid cable

DIRIS O-p - PROFIBUS communication	
Protocol	PROFIBUS DPV1

DIRIS O-b/ip - BACnet IP communication	
Protocol	BACnet IP
Speed	10 … 100 Mbit/s

DIRIS O-b/mstp - BACnet MSTP communication	
Protocol	BACnet MSTP
Speed	9600 … 76800 bauds

TE, *TR* and *TF* current sensors

Current sensors
associated to DIRIS Digiware and DIRIS B-30

new

TE *Solid current sensors*

TR *Split-core current sensors* ***TF*** *Flexible current sensors*

Function

TE, TR and **TF** current sensor ranges can be connected to DIRIS Digiware and DIRIS B-30 via a rapid RJ12 connection. Various accessories are available to allow the installation of sensors in all panel configurations.

Thanks to a wide measurement range, the TE current sensors cover the full current range from 5 to 1000 A, with only 6 models.

Advantages

Plug & Play
- A rapid RJ12 connection makes wiring easy and reliable and prevents wiring errors. This also allows automatic detection of the sensor type and size/transformation ratio.
- Mounting orientation of current sensors is indifferent.

Accuracy as per standard ANSI C12.20 and IEC 61557-12
- Class 0.5 from 2% to 120% of nominal current for the global measurement chain (associated with TE or TF current sensors).
- Class 1 from 2% to 120% of nominal current for the global measurement chain (associated with TR current sensors).

Suitable for any installation

Dimensions of the range allow:
- New installation: a range of solid TE sensors adapted to the pitch of protective devices.
- Existing installations: a range of split-core TR sensors for existing sites.
- Existing space-constrained installations with high-intensity currents: a range of flexible TF current sensors (Rogowski).

Selection guide

Current sensors	TE Solid current sensors	TR Split-core current sensors	TF Flexible current sensors
Nominal current range (A)	5 … 1000	25 … 600	150 … 6000

The solution for
- Industry
- Building
- Infrastructure
- Local authority

Strong points
- Plug & Play
- Accuracy as per standard ANSI C12.20 and IEC 61557-12
- Suitable for any installation

Services & Technical Assistance
- Technical site audits and solution specification, commissioning, maintenance, training… Our Services & Technical Assistance experts offer you personalized support to ensure success with all your projects.

Conformity to standards
- IEC 60044-1
- IEC 61869-1
- ISO 14025
- UL 61010
- FCC

Functions

TE range
- Solid current sensors.
- Plug & Play RJ12 connection.
- High accuracy over the whole operating range.
- 6 models with ratings from 5 to 1000 A that are adapted to the pitch of protective devices (0.7/1/1.4/1.8/2.2 in) - (18/25/35/45/55 mm).
- A 5A/RJ12 adapter for use with TC 5A current transformers in the DIRIS Digiware and DIRIS B-30 ranges.
- Accessories for back-plate, DIN-rail, cable or bar mounting.

TR range
- Split-core current sensors.
- Plug & Play RJ12 connection.
- High accuracy over the whole operating range.
- 4 models with ratings from 25 to 600 A.
- Apertures from 0.4 to 1.4 in or 10 to 36 mm.

TF range
- Split-core current sensors.
- Plug & Play RJ12 connection.
- High accuracy over the whole operating range.
- 3 models with different ratings (from 150 to 6000 A).
- Apertures from 2.2 to 11.8 in or 55 to 300 mm.

Mounting

TE range

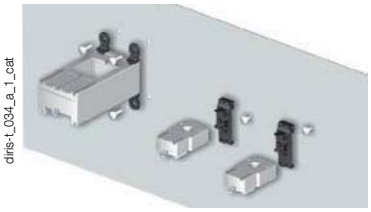
Linear mounting (circuit breaker pitch)
TE-25 / TE-35 / TE-45 / TE-55

Staggered mounting
TE-18 / TE-35 / TE-45 / TE-55

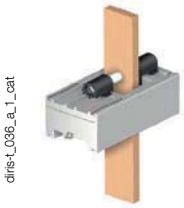
Cable mounting

DIN-rail mounting

Back-plate mounting

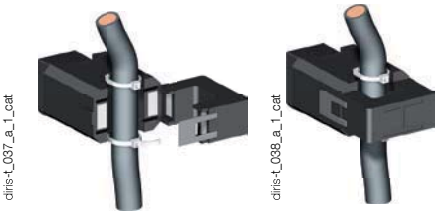


Bar mounting



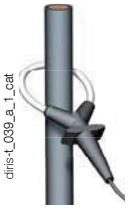
TR range

Cable mounting

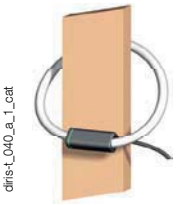


TF range

Cable mounting



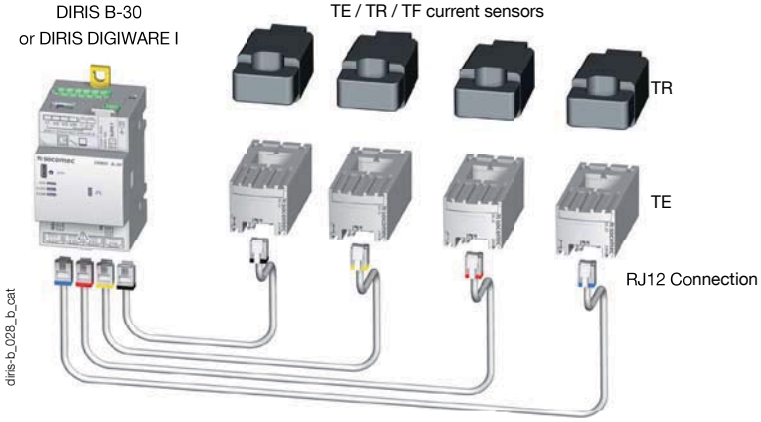
Bar mounting



Connections

DIRIS B-30
or DIRIS DIGIWARE I

TE / TR / TF current sensors



Mounting accessories

Mounting accessories provided
with TE current sensors

Fixing	TE-18	TE-25	TE-35 TE-45 TE-55
DIN-rail or back plate	1 part		
DIN-rail		2 parts	2 parts
Back plate		4 parts	4 parts
Bar			2 parts

diris-t_042_a - 043_a - 044_a - 045_a

Accessories

Adapter for 5A CT

- This adapter is for use with a 5 A CT with output terminals on the DIRIS Digiware and DIRIS B-30. For use with standard 5 A current sensors for > 1000 A measurement requirements. Dimensions are identical to TE-18.
See page 148.

Coupling link

- Associated with the TE range, this accessory is for inter-connecting the sensors when linear or staggered mounted.

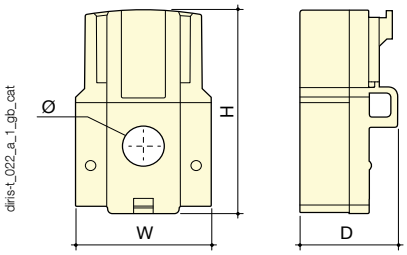
Sealable cover

- Using a sealable cover guarantees the immunity of the sensor connection on TE/TR/TF current sensors.

Dimensions (in/mm)

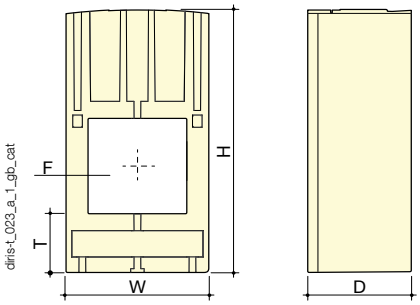
TE - Solid current sensors

TE-18



Model	Nominal current range (A)	Pitch (mm)	H x W x D (inch/mm)	Ø (inch/mm)
TE-18	5 … 63	0.7 / 18	1.77 x 1.10 x 0.79 45 x 28 x 20	0.33 8,6

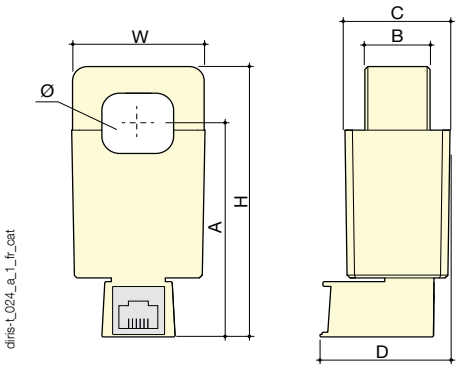
TE-25 / TE-35 / TE-45 / TE-55



Model	Nominal current range (A)	Pitch (inch/mm)	H x W x D (inch/mm)	F (inch/mm)	T
TE-25	40 … 160	0.98 / 25	2.56 x 0.98 x 1.28 65 x 25 x 32.5	0.53 x 0.53 13.5 x 13.5	0.69 17,5
TE-35	63 … 250	1.37 / 35	2.79 x 1.37 x 1.28 71 x 35 x 32.5	0.82 x 0.82 21 x 21	0.69 17,5
TE-45	160 … 630	1.77 / 45	3.38 x 1.77 x 1.28 86 x 45 x 32.5	1.22 x 1.22 31 x 31	0.77 19,5
TE-55	400 … 1000	2.16 / 55	3.93 x 2.16 x 1.28 100 x 55 x 32.5	1.61 x 1.61 41 x 41	0.85 21,5

TR - Split-core current sensors

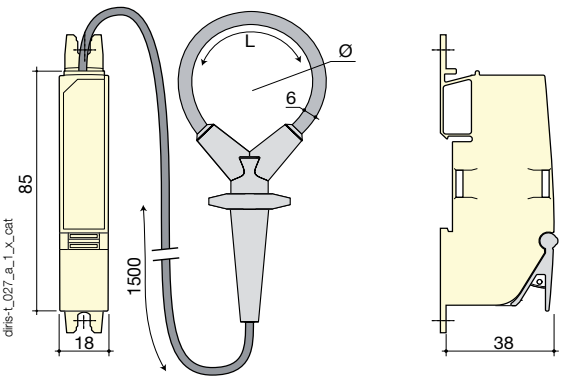
TR-10 / TR-16 / TR-24 / TR-36



Model	Nominal current range (A)	H x W x D (inch/mm)	Ø (inch/mm)	A	W	C
TR-10	25 … 75	2.79 x 0.98 x 1.54 71 x 25 x 39	0.39 10	2.28 58	0.57 14.5	1.02 26
TR-16	32 … 100	2.91 x 1.18 x 1.65 74 x 30 x 42	0.63 16	2.40 61	0.75 19	1.22 31
TR-24	63 … 200	3.74 x 1.77 x 1.73 95 x 45 x 44	0.94 24	2.83 72	0.87 22	1.34 34
TR-36	200 … 600	4.37 x 2.24 x 1.65 111 x 57 x 42	1.42 36	3.23 82	0.87 22	1.59 40.5

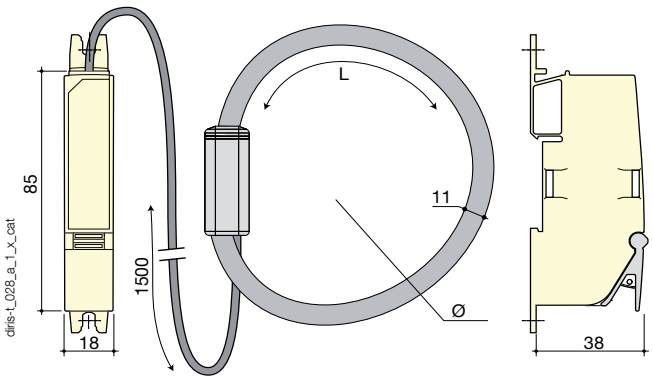
TF - Flexible current sensors

TF -55



Model	Nominal current range (A)	Ø loop (inch/mm)	L = loop length (inch/mm)
TF -55	150 … 600	2.16 / 55	6.77 / 172

TF-120 / TF-300



Model	Nominal current range (A)	Ø loop (inch/mm)	L = loop length (inch/mm)
TF -120	500 … 2000	4.72 / 120	14.80 / 376
TF -300	1600 … 6000	11.81 / 300	37.08 / 942

Technical characteristics

TE - Solid current sensors

Model	TE-18	TE-18	TE-25	TE-35	TE-45	TE-55
Nominal current range (A)	5 … 20	25 … 63	40 … 160	63 … 250	160 … 630	400 … 1000(1)
Max. current (A)	24	75.6	192	300	756	1200
Weight (oz/g)	0.84 / 24	0.84 / 24	2.4 / 69	3.1 / 89	4.9 / 140	6.6 / 187
Max. voltage	300 V			600 V		
Rated withstand voltage	3 kV			3,6 kV		
Frequency	50/60 Hz					
Intermittent overload	10 x I_n during 1sec					
Measurement category	CAT III					
Degree of protection	IP30 / IK06					
Operating temperature	-10 … +70 °C / +14 °F … +158 °F					
Storage temperature	-25 … +85 °C / -13 °F … +185 °F					
Relative humidity	95 % non-condensing					
Altitude	6560 feet / 2000 m					
Connection	SOCOMEC cable or equivalent RJ12 straight, twisted pair, unshielded 300 V cat. III UL 61010 cable. -40 °C … +85 °C / -40 °F … +185 °F					

(1) > 1000 A with 5A CT adapter.

TR - Split-core current sensors

Model	TR-10	TR-16	TR-24	TR-36
Nominal current range (A)	25 … 75	32 … 100	63 … 200	200 … 600
Max. current (A)	90	120	240	720
Weight (oz/g)	2.6 / 74	4.1 / 117	7.4 / 211	10.9 / 311
Max. voltage	300 V			
Rated withstand voltage	3 kV			
Frequency	50/60 Hz			
Intermittent overload	10 In for 1 s			
Measurement category	CAT III			
Degree of protection	IP20 / IK06			
Operating temperature	-10 … +70 °C / +14 °F … +158 °F			
Storage temperature	-25 … +85 °C / -13 °F … +185 °F			
Relative humidity	95 % non-condensing			
Altitude	6560 feet / 2000 m			
Connection	SOCOMEC cable or equivalent RJ12 straight, twisted pair, unshielded 300 V cat. III cable. -40 °C … +85 °C / +40 °F … +185 °F			

TF - Flexible current sensors

Model	TF -55	TF -120	TF -300
Nominal current range (A)	150 … 600	500 … 2000	1600 … 6000
Weight (oz/g)	4 / 114	5 / 142	7.8 / 220
Max. voltage	600 V		
Rated withstand voltage	3,6 kV		
Frequency	50 / 60 Hz		
Intermittent overload	10 I_n for 1 s		
Measurement category	CAT III		
Degree of protection	IP30 / IK07		
Operating temperature	-10 … +70 °C / +14 °F … +158 °F		
Storage temperature	-25 … +85 °C / -13 °F … +185 °F		
Relative humidity	95 % non-condensing		
Altitude	6560 feet / 2000 m		
Connection	SOCOMEC cable or equivalent RJ12 straight, twisted pair, unshielded 300 V cat. III cable. -40 °C … +85 °C / +40 °F … +185 °F		

References

TE - Solid current sensors

Model	Nominal current range (A)	Pitch (inch/mm)	Reference
TE-18	5 … 20	0.7 / 18	4829 **0500**
TE-18	25 … 63	0.7 / 18	4829 **0501**
TE-25	40 … 160	0.98 / 25	4829 **0502**
TE-35	63 … 250	1.37 / 35	4829 **0503**
TE-45	160 … 630	1.77 / 45	4829 **0504**
TE-55	400 … 1000	2.16 / 55	4829 **0505**

TR - Split-core current sensors

Model	Nominal current range (A)	Ø (inch/mm)	Reference
TR-10	25 … 75	0.39 / 10	4829 **0551**
TR-16	32 … 100	0.63 / 16	4829 **0552**
TR-24	63 … 200	0.94 / 24	4829 **0553**
TR-36	200 … 600	1.42 / 36	4829 **0554**

TF - Flexible current sensors

Model	Nominal current range (A)	Ø (inch/mm)	Reference
TF -55	150 … 600	2.16 / 55	4829 **0570**
TF -120	500 … 2000	4.72 / 120	4829 **0571**
TF -300	1600 … 6000	11.81 / 300	4829 **0572**

Accessories	Reference
Coupling links (20 parts for linear mounting and 10 parts for staggered mounting)	4829 **0598**
5A/CT adapter (measurement >1000 A)	4829 **0599**
Sealable covers (20 parts)	4829 **0600**

	Cable length (ft/m)								
RJ12 connection cables	0.32 / 0,1	0.64 / 0,2	0.96 / 0,3	1.64 / 0,5	3.3 / 1	6.5 / 2	16.4 / 5	32.8 / 10	164 / 50 m + 50 connectors
N° of cables	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
1	-	-	-	-	-	-	4829 **0602**	4829 **0603**	4829 **0601**
3	4829 **0580**	4829 **0581**	4829 **0582**	4829 **0595**	4829 **0583**	4829 **0584**	-	-	-
4	4829 **0585**	4829 **0586**	4829 **0587**	4829 **0596**	4829 **0588**	4829 **0589**	-	-	-
6	4829 **0590**	4829 **0591**	4829 **0592**	4829 **0597**	4829 **0593**	4829 **0594**	-	-	-

Selection guide

Multifunction meters

DIRIS

Which application? ▶ Which functions? ▶

Application	Multifunction metering (PMD)	
	DIRIS A10 *p. 154*	***DIRIS A20*** *p. 158*
Multi-measurement		
Currents, voltages (ph / ph and ph / n), active / reactive / apparent powers, power factor, frequency	•	•
Currents, voltages, frequency (average values)	(max. average value for currents)	(max. average value for currents)
Max. power demand	•	•
Temperatures	Internal	
Hour meter	•	•
Memorization of min / max instantaneous values		
Metering		
kWh (+ / -), kvarh (+ / -)	kWh (+), kvarh (+)	kWh (+), kvarh (+)
Logical input(s) for pulse meter(s)		
Multi-tariff meters	•	
Pulse output(s)	1 as standard	with optional module
Active energy accuracy / IEC 62053-22 class 0.5 s	•	•
Reactive energy accuracy / IEC 62053-23 class 2	•	•
Compability with IEC 61557-12	•	•
Power management		
Load curves (period 5, 8, 10, 15, 20 and 30 minutes)		
Predictive power		
Power quality		
THD voltages, currents and neutral currents	Row 51	Row 51
Individual harmonics		
Plug-in modules		
	• 1 logical input as standard • 1 logical output as standard • Modbus as standard for 1 reference	• 1 logical output • Modbus RS485 communication

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Which dimensions? ▶ Which communication protocol? ▶ Which options?

	Power monitoring (PMD)
	DIRIS A40 *p. 162*
	•
	•
	•
	•
	optional
	•
	up to 6 with optional module
	up to 6 with optional module
	•
	•
	•
	optional
	•
	Row 63
	Row 63
	• 2 pulse outputs • Modbus RS485 communication • PROFIBUS DP communication • Ethernet communication (available with Modbus gateway) • 2 analogue outputs • 2 inputs / 2 outputs • Memory

DIRIS A10

Multifunction meters - PMD

Modular multifunction meter

diris_791_c_1_cat

DIRIS A10

Function

The **DIRIS A10** is a modular multifunction meter for measuring electrical values in low voltage networks.

It allows all electrical parameters to be displayed and utilized for communication and/or output functions.

Advantages

Easy to use

Five direct access pushbuttons enable all measurements to be clearly viewed on its backlit LCD display.

Integrated temperature sensor

It allows variations in temperature to be detected.

Detects wiring errors

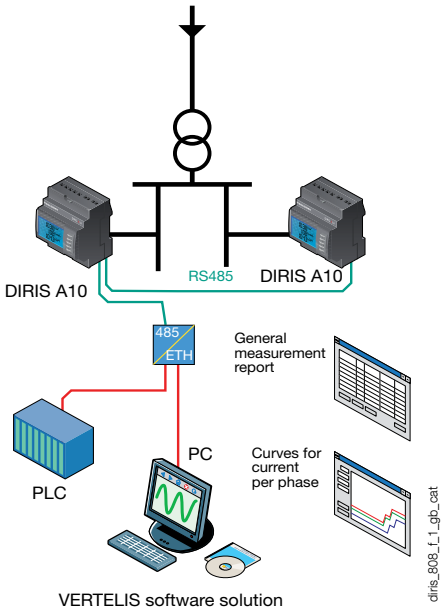
An integrated test function can be utilized to detect incorrect wiring and to automatically correct CT installation errors.

Compliant with ANSI C12.20 and IEC 61557-12

IEC 61557-12 is a high-level standard for all PMDs (Performance Monitoring Devices) that are designed to measure and monitor electrical parameters in distribution networks.

Compliance with IEC 61557-12 ensures a high level of equipment performance, in terms of metrology, and the mechanical and environmental aspects (EMC, temperature, etc.).

Principle diagram



diris_808_f_1_gb_cat

The solution for

- Industry
- Infrastructures
- Data centres

Strong points

- Easy to use
- Integrated temperature sensor
- Detects wiring errors
- Compliant with ANSI C12.20 and IEC 61557-12

Conformity to standards

- IEC 61557-12
- IEC 62053-22 class 0.5S
- IEC 62053-23 class 2
- UL
- ANSI C12.20

Functions

Multi-measurement

- Currents
  - instantaneous: I1, I2, I3, In
  - maximum average: I1, I2, I3, In
- Voltages & frequency
  - instantaneous: V1, V2, V3, U12, U23, U31, F
- Power
  - instantaneous: 3P, ΣP, 3Q, ΣQ, 3S, ΣS
  - maximum average: ΣP, ΣQ, ΣS
- Power factors
  - instantaneous: 3PF, ΣPF

- **Metering**
- Active energy: + kWh
- Reactive energy: + kVarh
- Hours:
- **Harmonic analysis**
- Total harmonic distortion (level 51)
  - Currents: thd I1, thd I2, thd I3
  - Phase-to-neutral voltage: thd V1, thd V2, thd V3
  - Phase-to-phase voltage: thd U12, thd U23, thd U31

Dual tariff function

Selection of one out of 2 billing tariffs

Events

Alarms on all electrical values

Communications(1)

RS485 with MODBUS protocol

Input

- Tariff selection
- Remote device status

Output

- Remote command of device
- Alarm report
- Pulse report

(1) Available on specific version (see the following pages).

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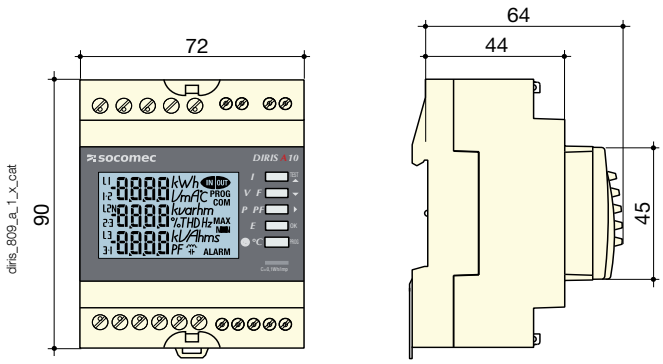
Front panel

1. Backlit LCD display.
2. Direct access key for currents (instant and maximum), current THD and test function.
3. Direct access key for voltages, frequency and voltage THD.
4. Direct access key for active, reactive and apparent power (instantaneous and max. values) and power factor.
5. Direct access key for energies.
6. Pushbutton for hour meter, temperature and programming menu access.
7. Metrological LED.

Case



Type	modular
Number of modules	4
Dimensions W x H x D	3.54 x 2.51 x 2.83 in / 72 x 90 x 64 mm
Case degree of protection	IP 30
Front degree of protection	IP 52
Display type	backlit LCD display
Voltage and current connection cross-section	AWG 6 / 4 mm^2
Connection cross-section for AUX supply, input, output and comms.	AWG 10 / 2.5 mm^2
Weight	7.23 oz / 205 g (4825 U010) 7.58 oz / 215 g (4825 U011)

Electrical characteristics

Current measurement (TRMS)	
Via CT primary	9 999 A
Via CT secondary	5 A
Measurement range	0 … 11 kA
Input consumption	0.6 VA
Measurement updating period	1 s
Accuracy	0.2 %
Permanent overload	6 A
Intermittent overload	10 I_n for 1 s
Voltage measurements (TRMS)	
Direct measurement between phases	50 … 500 VAC
Direct measurement between phase and neutral	28 … 289 VAC
Input consumption	≤ 0.1 VA
Measurement updating period	1 s
Accuracy	0.2 %
Permanent overload	800 VAC
Power measurement	
Measurement updating period	1 s
Accuracy	0.5 %
Power factor measurement	
Measurement updating period	1 s
Accuracy	0.5 %
Frequency measurement	
Measurement range	45 … 65 Hz
Measurement updating period	1 s
Accuracy	0.1 %

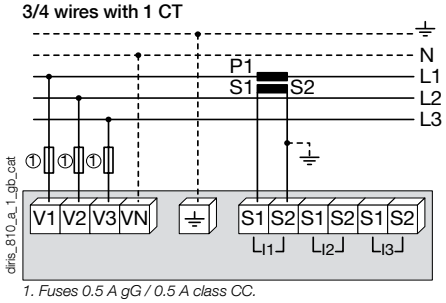
Energy accuracy	
Active (according to IEC 62053-22)	Class 0.5 S
Reactive (according to IEC 62053-23)	Class 2
Metrological LED (EA+)	
Pulse weight	10000 pulses/kWh
Color	Red
Auxiliary power supply	
Alternating voltage	110 … 277 VAC
AC tolerance	± 15 %
Frequency	50 / 60 Hz
Consumption	< 3 VA
Digital output (pulses or on/off)	
Number	1
Type	20 / 30 VDC - 0.5 A - 10 VA
Max. number of operations	≤ 10^8
Input (tariff)	
Number	1
Type	0 VAC: T1 / 200-277 VAC: T2
Communication	
Link	RS485
Type	2 … 3 half duplex wires
Protocol	MODBUS RTU
MODBUS® speed	2400 … 38400 bauds
Operating conditions	
Operating temperature	- 10 … + 55 °C / +14 °F … +131 °F
Storage temperature	- 20 … + 70 °C / -4 °F … +158 °F
Relative humidity	85 %

Connection

Recommendation:
- For IT earthing systems, it is recommended that the CT secondary is not connected to earth.
- When disconnecting the DIRIS, the secondary of each current transformer must be short-circuited. This operation can be carried out automatically by a SOCOMEC PTI, an accessory which is included in this catalogue. Please consult us.
- It is recommended that the earthing point for the DIRIS A10 and the current transformer secondaries are not earthed at the same time.

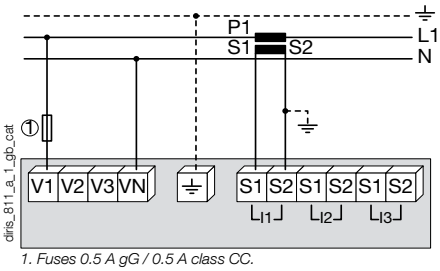
Low voltage balanced network

3/4 wires with 1 CT



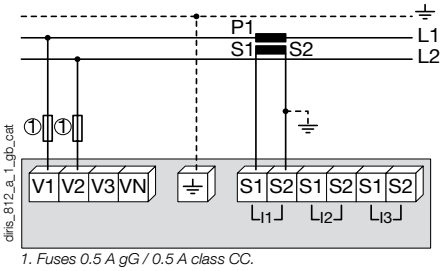
1. Fuses 0.5 A gG / 0.5 A class CC.

Single-phase



1. Fuses 0.5 A gG / 0.5 A class CC.

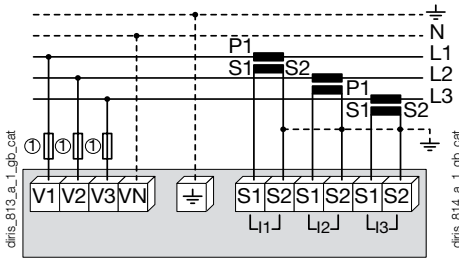
Two-phase



1. Fuses 0.5 A gG / 0.5 A class CC.

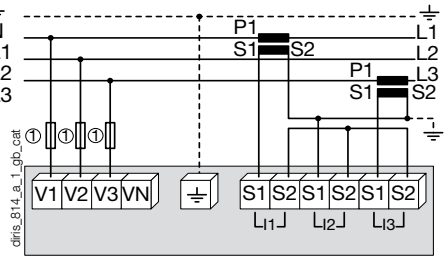
Low voltage unbalanced network

3/4 wires with 3 CTs



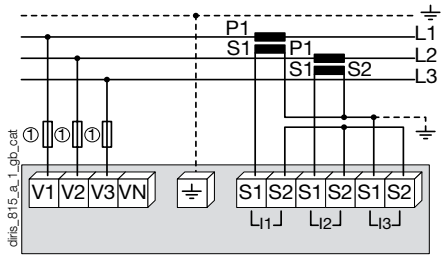
1. Fuses 0.5 A gG / 0.5 A class CC.

3 wires with 2 CTs



Use of 2 CTs reduces by 0.5% the accuracy of the phases, the current of which is worked out by vector calculation.
1. Fuses 0.5 A gG / 0.5 A class CC.

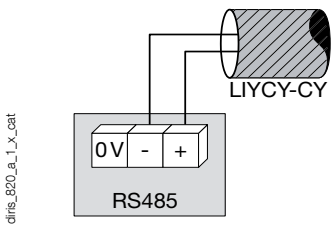
3 wires with 2 CTs



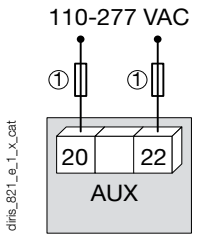
Use of 2 CTs reduces by 0.5% the accuracy of the phases, the current of which is worked out by vector calculation.
1. Fuses 0.5 A gG / 0.5 A class CC.

Additional information

Communication via RS485 link

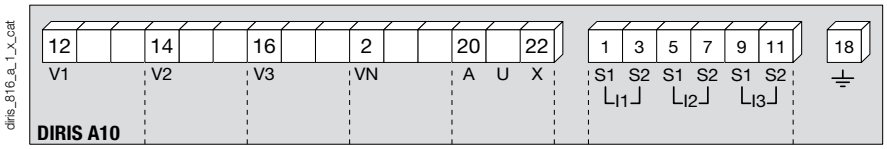


AC auxiliary power supply



1. Fuses 0.5 A gG / 0.5 A class CC.

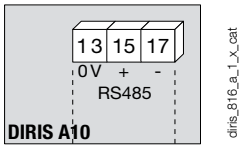
Terminals



AUX: auxiliary power supply U_s.
V1, V2, V3 & VN: voltage inputs.

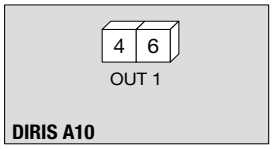
S1 - S2: current inputs.

Communication terminals



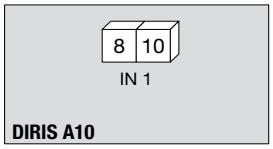
RS485 link.

Pulse or alarm output terminals



4 - 6: output n°1

Input terminals



8 - 10: input n°1

References

Basic device **Description**	**DIRIS A10** **Reference**
DIRIS A10	4825 **U010**
DIRIS A10 with RS485 MODBUS communication	4825 **U011**
Description of accessories	**Reference**
Management software for DIRIS	See page 174

Services & Technical Assistance

> Technical site audits and solution specification, commissioning, maintenance, training… Our Services & Technical Assistance experts offer you personalized support to ensure success with all your projects.

DIRIS A20

Multifunction meters - PMD

Multi-measurement meter - dimensions 96 x 96 mm

DIRIS A20

The solution for

- Industry
- Infrastructure
- Data centres

Strong points

- Easy to use
- Compliant with ANSI C12.20 and IEC 61557-12
- Detects wiring errors

Conformity to standards

- IEC 61557-12
- IEC 62053-22 class 0.5S
- IEC 62053-23 class 2
- UL
- ANSI C12.20

Management software

- To get the most effective use from your Socomec measurement and metering devices, we offer a range of dedicated software tools. See page 174.

Function

DIRIS A20 are panel mounted measurement units which ensure the user has access to all the measurements required for successfully carrying out energy efficiency projects and ensuring the electrical distribution is monitored.

All this information can be analyzed remotely using the VERTELIS software solution.

Advantages

Easy to use

Thanks to its large backlit LCD display and its multiple viewing screens with direct pushbutton access, DIRIS A20 provide clear readings and are easy to use.

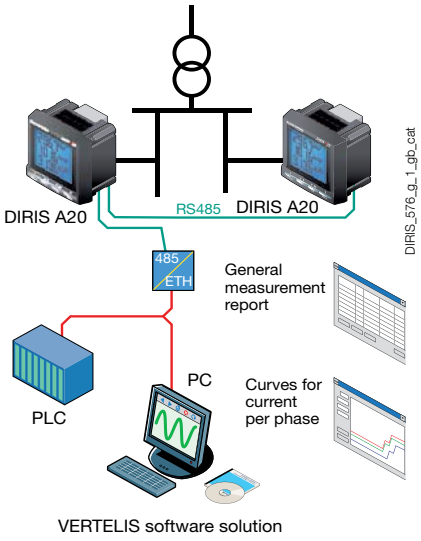
They directly display a number of multi-measurement and metering values : + kWh, + kvarh, I, U, V, F, P, Q, S, PF, etc.

Compliant with ANSI C12.20 and IEC 61557-12

IEC 61557-12 is a high-level standard for all PMDs (Performance Monitoring Devices) that are designed to measure and monitor electrical parameters in distribution networks.

Compliance with IEC 61557-12 ensures a high level of equipment performance, in terms of metrology, and the mechanical and environmental aspects (EMC, temperature, etc.).

Principle diagram



VERTELIS software solution

Detects wiring errors

An integrated test function can be utilized to detect incorrect wiring and to automatically correct CT installation errors.

Functions

Multi-measurement
- Currents
  - instantaneous: I1, I2, I3, In
  - maximum average: I1, I2, I3, In
- Voltages & frequency
  - instantaneous: V1, V2, V3, U12, U23, U31, F
- Power
  - instantaneous: 3P, ΣP, 3Q, ΣQ, 3S, ΣS
  - maximum average: ΣP, ΣQ, ΣS
- Power factors
  - instantaneous: 3PF, Σ

Metering
- Active energy: + kWh
- Reactive energy: + kvarh
- Hours:

Harmonic analysis
- Total harmonic distortion (level 51)
  - Currents: thd I1, thd I2, thd I3
  - Phase-to-neutral voltage: thd V1, thd V2, thd V3
  - Phase-to-phase voltage: thd U12, thd U23, thd U31

Events

Alarms on all electrical values

Communications(1)

RS485 with MODBUS protocol

Output
- Remote command of device
- Alarm report
- Pulse report

Inputs
- Remote status device

(1) Available as an option (see the following pages).

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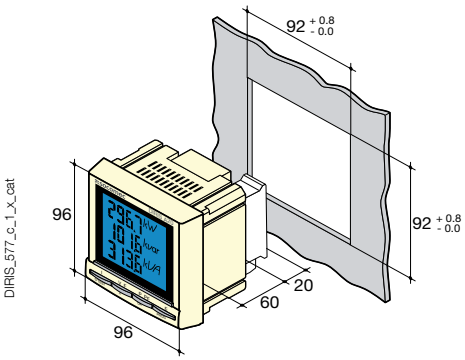
Front panel

1. Backlit LCD display.
2. Direct access key for currents (instantaneous and max. values), current THD and test function.
3. Direct access key for voltages, frequency and voltage THD.
4. Pushbutton for active, reactive, and apparent power (instantaneous and max. values) and power factor.
5. Direct access key for energies, hour meter and programming menu.

Case



Type	panel mounting
Dimensions W x H x D	3.78 x 2.36 x 3.78 / 96 x 96 x 60 mm
Case degree of protection	IP30
Front degree of protection	IP52
Display type	backlit LCD display
Terminal block type	Fixed or plug-in
Voltage and other connection cross-section	AWG 34 ... 10 / 0.2 ... 2.5 mm^2
Current connection cross-section	AWG 20 ... 9 / 0.5 ... 6 mm^2
Weight	14.11 oz / 400 g

Plug-in modules

DIRIS® A20

1 Output

1 output assignable to:
- Pulses: configurable (type, weight, duration) in kWh or kvarh.
- Monitoring: 3I, In, 3V, 3U, F, ΣP, ΣQ, ΣS, ΣPFL/C, THD 3I, THD 3V, THD 3U and timer.
- Remote command of device.

Communication

RS485 link with JBUS / MODBUS protocol (speed up to 38400 bauds)

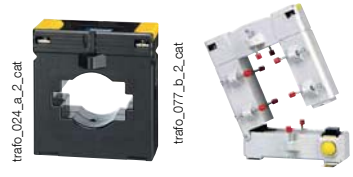
3 inputs, 1 output

3 inputs assignable to:
- Remote status device.

1 output assignable to:
- Pulses: configurable (type, weight, duration) in kWh or kvarh.
- Monitoring: 3I, In, 3V, 3U, F, ΣP, ΣQ, ΣS, ΣPFL/C, THD 3I, THD 3V, THD 3U and timer.
- Remote command of device.

Accessories

Current transformers (please consult us)



IP65 protection

Panel mounting kit for a 144 x 96 mm cut-out

DIRIS A20

Multifunction meters - PMD

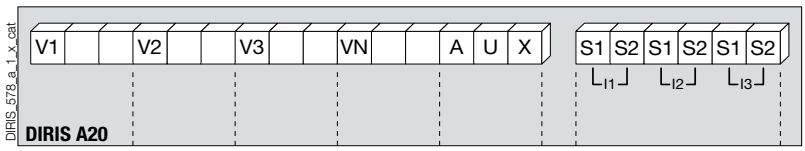
Multi-measurement meter - dimensions 96 x 96 mm

Electrical characteristics

Current measurement (TRMS)	
Via CT primary	9 999 A
Via CT secondary	5 A
Measurement range	0 … 11 kA
Input consumption	0.6 VA
Measurement updating period	1 s
Accuracy	0.2 %
Permanent overload	6 A
Intermittent overload	10 I_n for 1 s
Voltage measurements (TRMS)	
Direct measurement between phases	50 … 500 VAC
Direct measurement between phase and neutral	28 … 289 VAC
Input consumption	≤ 0.1 VA
Measurement updating period	1 s
Accuracy	0.2 %
Permanent overload	800 VAC
Power measurement	
Measurement updating period	1 s
Accuracy	0.5 %
Power factor measurement	
Measurement updating period	1 s
Accuracy	0.5 %
Frequency measurement	
Measurement range	45 … 65 Hz
Measurement updating period	1 s
Accuracy	0.1 %

Energy accuracy	
Active (according to IEC 62053-22)	Class 0.5 S
Reactive (according to IEC 62053-23)	Class 2
Auxiliary power supply	
Alternating voltage	110 … 400 VAC
AC tolerance	± 10 %
Direct voltage	120 … 350 VDC
DC tolerance	± 20 %
Frequency	50 / 60 Hz
Consumption	10 VA
Pulse or alarm output	
Number	1
Type	100 VDC - 0.5 A - 10 VA
Max. number of operations	≤ 10^8
Inputs	
Number	3
Power supply	10 … 30 VDC
Minimum signal width	10 ms
Minimum duration between 2 pulses	18 ms
Type	Phototransistors
Communication	
Link	RS485
Type	2 … 3 half duplex wires
Protocol	MODBUS RTU
MODBUS® speed	1400 … 38400 bauds
Operating conditions	
Operating temperature	- 10 … + 55 °C / +14 °F … +131 °F
Storage temperature	- 20 … + 85 °C / -4 °F … +185 °F
Relative humidity	95 %

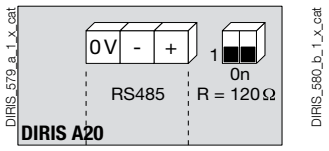
Terminals



S1 - S2: current inputs.

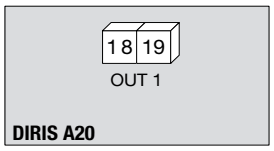
AUX: auxiliary power supply U_s.
V1, V2, V3 & VN: voltage inputs.

Communication module



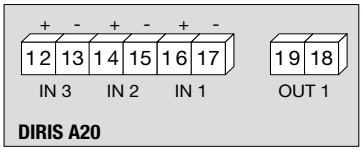
RS485 link.
R = 120 Ω: selectable internal resistance for RS485 end of line termination.

Output or alarm module



18 - 19: output n°1

3 inputs, 1 output module



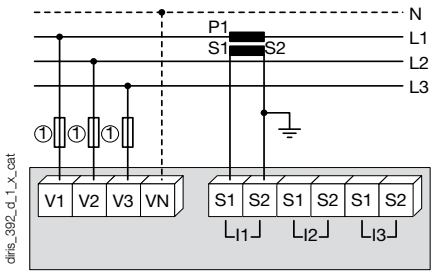
Connection

Recommendation:

- For IT earthing systems, it is recommended that the CT secondary is not connected to earth.
- When disconnecting the DIRIS, the secondary of each current transformer must be short-circuited. This operation can be carried out automatically by a SOCOMEC PTI, an accessory which is included in this catalogue. Please consult us.

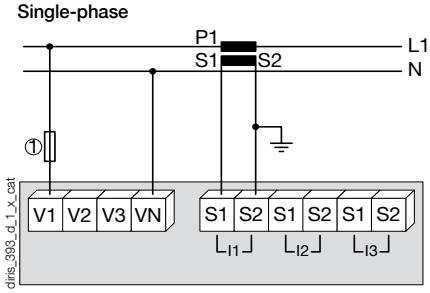
Low voltage balanced network

3/4 wires with 1 CT



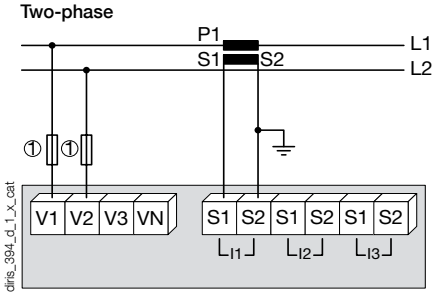
Use of 1 CT reduces by 0.5% the accuracy of the phases, the current of which is worked out by vector calculation.
1. Fuses 0.5 A gG / 0.5 A class CC.

Single-phase



1. Fuses 0.5 A gG / 0.5 A class CC.

Two-phase



1. Fuses 0.5 A gG / 0.5 A class CC.

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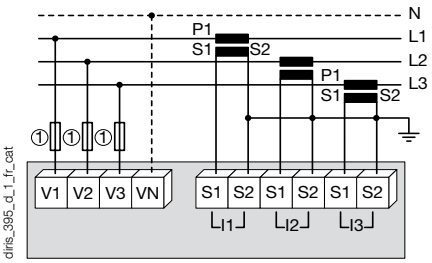
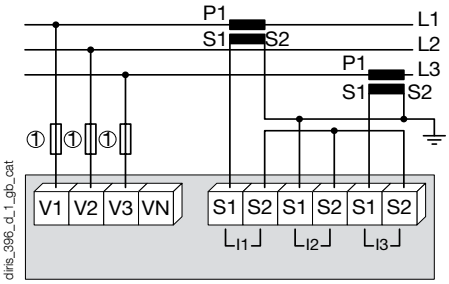
Low voltage unbalanced network

3/4 wires with 3 CTs



1. Fuses 0.5 A gG / 0.5 A class CC.

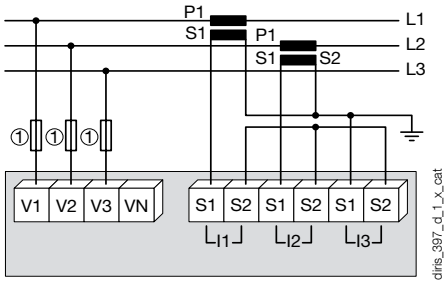
3 wires with 2 CTs



Use of 2 CTs reduces by 0.5% the accuracy of the phases, the current of which is worked out by vector calculation.

1. Fuses 0.5 A gG / 0.5 A class CC.

3 wires with 2 CTs

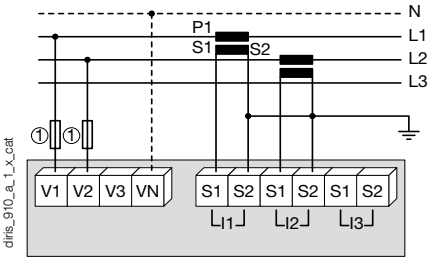


Use of 2 CTs reduces by 0.5% the accuracy of the phases, the current of which is worked out by vector calculation.

1. Fuses 0.5 A gG / 0.5 A class CC.

Low voltage unbalanced network

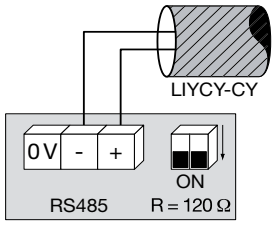
2 wires with 2 CTs



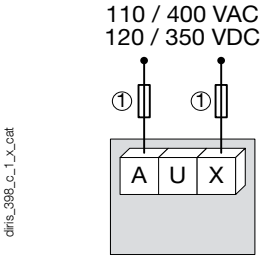
1. Fuses 0.5 A gG / 0.5 A class CC.

Additional information

Communication via RS485 link



AC & DC auxiliary power supply



1. Fuses 0.5 A gG / 0.5 A class CC.

References

Basic device **Auxiliary power supply U_s**	**DIRIS A20** **Reference**
110 … 400 VAC / 120 … 350 VDC	4825 **U200**
Optional plug-in modules	**Reference**
1 output	4825 **0080**
RS485 MODBUS® communication	4825 **0082**

Services & Technical Assistance

> Technical site audits and solution specification, commissioning, maintenance, training… Our Services & Technical Assistance experts offer you personalized support to ensure success with all your projects.

DIRIS A40

Multifunction meters - PMD

Multi-measurement meter - dimensions 96 x 96 mm

DIRIS A40

The solution for

- Industry
- Data centres
- Infrastructures

Strong points

- Easy to use
- Detects wiring errors
- Customizable
- Webserver function
- Compliant with ANSI C12.20 and IEC 61557-12

Conformity to standards

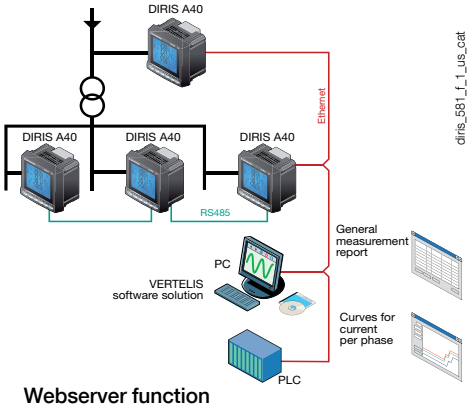
- IEC 61557-12
- IEC 62053-22 class 0.5S
- IEC 62053-23 class 2
- UL
- ANSI C12.20

Function

DIRIS A40 are panel mounted measurement units which ensure the user has access to all the measurements required for successfully carrying out energy efficiency projects and ensuring the electrical distribution is monitored.

All this information can be analyzed remotely using the VERTELIS software solution.

Principle diagram



Advantages

Easy to use

Thanks to its large backlit LCD display and its multiple viewing screens with direct pushbutton access, DIRIS A40 provide clear readings and are easy to use.

They directly display a number of multi-measurement and metering values : +/- kWh, +/- kvarh, kVAh, I, U, V, F, P, Q, S, PF, etc.

Detects wiring errors

An integrated test function can be utilized to detect incorrect wiring and to automatically correct CT installation errors.

Customizable

Thanks to the wide range of optional modules, the product can be customized or upgraded after installation.

Webserver function

Optional Ethernet communication modules include a Webserver function for monitoring and exploiting data remotely without additional software.

Compliant with ANSI C12.20 and IEC 61557-12

IEC 61557-12 is a high-level standard for all PMDs (Performance Monitoring Devices) that are designed to measure and monitor electrical parameters in distribution networks.

Compliance with IEC 61557-12 ensures a high level of equipment performance, in terms of metrology, and the mechanical and environmental aspects (EMC, temperature, etc.).

Functions

Multi-measurement

- Currents
  - instantaneous: I1, I2, I3, In, Isystem
  - average/maximum average: I1, I2, I3, In
- Voltages & frequency
  - instantaneous: V1, V2, V3, U12, U23, U31, F, Vsystem, Usystem
  - average/maximum average: V1, V2, V3, U12, U23, U31, F
- Power
  - instantaneous: 3P, ΣP, 3Q, ΣQ, 3S, ΣS
  - maximum average: ΣP, ΣQ, ΣS
  - predictive: (ΣP), (ΣQ), (ΣS)
- Power factors
  - instantaneous: 3PF, ΣPF
  - average/maximum average: ΣPF

Metering

- Active energy: +/- kWh
- Reactive energy: +/- kvarh
- Apparent power: kVAh
- Hours:

Harmonic analysis

- Total harmonic distortion
  - Currents: thd I1, thd I2, thd I3, thd In
  - Phase-to-neutral voltage: thd V1, thd V2, thd V3
  - Phase-to-phase voltage: thd U12, thd U23, thd U31
- Individual up to level 63
  - Currents: HI1, HI2, HI3, HIn
  - Phase-to-neutral voltage: HV1, HV2, HV3,
  - Phase-to-phase voltage: HU12, HU23, HU31

Load curves(1)

- Active and reactive power: ΣP+/- ; ΣQ+/-
- Voltages & frequency: V1, V2, V3, U12, U23, U31, F

Events(1)

- Alarms on all electrical values.

Communications(1)

- RS485 MODBUS RTU & PROFIBUS DP
- Ethernet (MODBUS TCP or RTU over TCP and Web server)
- Ethernet with RS485 gateway MODBUS RTU over TCP

Inputs / Outputs(1)

- Pulse metering
- Remote control/command
- Alarm report
- Pulse report

Analogue output

- 0/4- 20 mA analogue output

(1) Available as an option (see the following pages).

socomec Innovative Power Solutions

Front panel

1. Backlit LCD display.
2. Direct access key for currents and test function.
3. Direct access key for voltages and frequency.
4. Direct access key for active, reactive, and apparent powers and power factor.
5. Direct access key for maximum and average current and power values.
6. Direct access key for harmonic values.
7. Direct access key for energies, hour meter and programming menu.

Plug-in modules

DIRIS® A40

Pulse outputs

2 configurable pulse outputs (type, weight and duration) on ± kWh, ±kvarh and kVAh.

Communication MODBUS®

RS485 link with MODBUS® protocol (speed up to 38400 bauds).

PROFIBUS® DP communication

SUB-D9 link with PROFIBUS® DP protocol (speed up to 12 Mbauds).

Ethernet communication

- Ethernet connection with MODBUS TCP or MODBUS RTU over TCP protocol.
- Embedded Webserver function (1).

Ethernet communication with RS485 MODBUS gateway

- Ethernet connection with MODBUS TCP or MODBUS RTU over TCP protocol.
- Connection of 1 to 247 RS485 MODBUS slaves.
- Embedded Webserver function (1).

Analogue outputs

A maximum of 2 modules may be connected, providing up to 4 analogue outputs.
Per module 2 outputs assignable to:
3I, In, 3V, 3U, F, ± ΣP, ± ΣQ, ΣS, ΣPFL/C, I sys, Vsys, Usys, Ppred, Q pred, Spred, T°C internal, T°C 1, T°C 2, T°C3 and to 17 VDC power supply.

2 inputs - 2 outputs

A maximum of 3 modules may be connected, providing up to 6 inputs and 6 outputs.
Per module 2 outputs assignable to:
- monitoring: 3I, In, 3V, 3U, F, ±ΣP, ±ΣQ, SS, ΣPFL/C, THD 3I, THD In, THD 3V, THD 3U, Ppred, Qpred, Spred, internal T°C, T°C 1, T°C2, T°C3 and hour meter,
- remote control,
- timed remote control.
- 2 inputs for pulse metering.

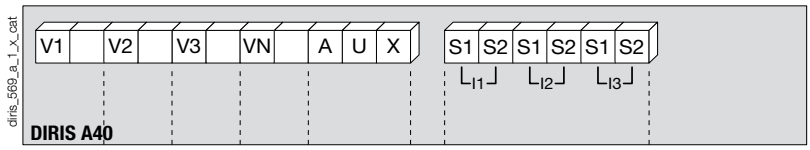
Memory

- Storing up to a maximum of 62 days of P+, P-, Q+, Q- with an internal or external synchronization signal of 5, 8, 10, 15, 20, 30 and 60 minutes.
- Storing of 10 hour-dated last alarms.
- Storing of the last minimum and maximum instantaneous values for 3U, 3V, 3I, In, F, ΣP±, ΣQ±, ΣS, THD 3U, THD 3V, THD, 3U, THD, 3V, THD, 3I, THD In.
- Storing of 3U, 3V and F average values based on synchronization function (maximum 60 days).

(1) See "Management software for DIRIS" page 174.

Terminals

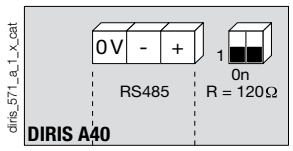
DIRIS A40



S1 - S2: current inputs

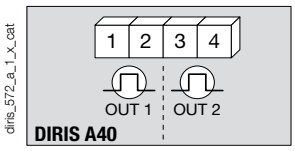
AUX: auxiliary power supplies U_s
V1 - V2 - V3 - VN: voltage inputs

Communication module



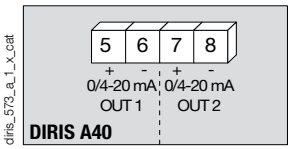
RS485 link.
R = 120 Ω: selectable internal resistance for RS485 end of line termination.

Pulse output module



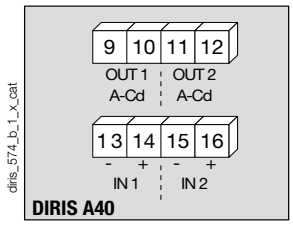
1 - 2: pulse output n°1.
3 - 4: pulse output n°2.

Analogue output module



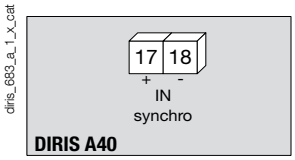
5 - 6: analogue output n°1.
7 - 8: analogue output n°2.

2 inputs / 2 outputs module



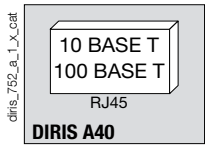
9 - 10: relay output n°1.
11 - 12: relay output n°2.
13 - 14: opto input n°1.
15 - 16: opto input n°2.

Memory module

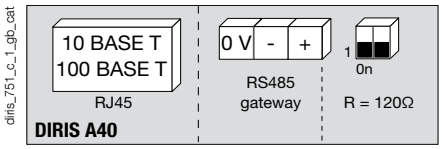


17 - 18: synchronization input.

Ethernet Module



Ethernet module + RS485 MODBUS gateway



Electrical characteristics

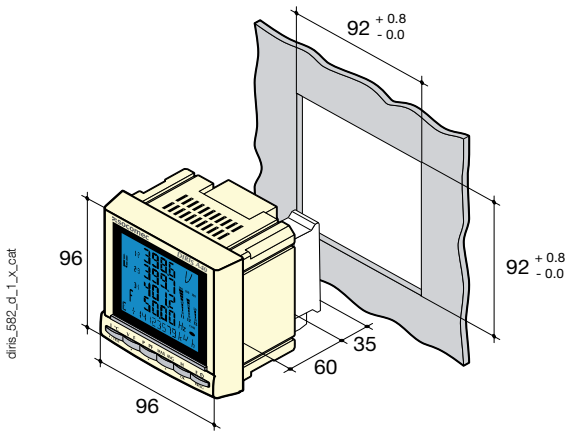
Current measurement on insulated inputs (TRMS)	
Via CT primary	9 999 A
Via CT secondary	1 or 5 A
Measurement range	0 … 11 kA
Input consumption	≤ 0.1 VA
Measurement updating period	1 s
Accuracy	0.2 %
Permanent overload	6 A
Intermittent overload	10 I_n for 1 s
Voltage measurements (TRMS)	
Direct measurement between phases	50 … 700 VAC
Direct measurement between phase and neutral	28 … 404 VAC
VT primary	500 000 VAC
VT secondary	60, 100, 110, 173, 190 VAC
Frequency	50 / 60 Hz
Input consumption	≤ 0.1 VA
Measurement updating period	1 s
Accuracy	0.2 %
Permanent overload	800 VAC
Current-voltage product	
Limitation for 1A CT	10 000 000
Limitation for 5A CT	10 000 000
Power measurement	
Measurement updating period	1 s
Accuracy	0.5 %
Power factor measurement	
Measurement updating period	1 s
Accuracy	0.5 %
Frequency measurement	
Measurement range	45 … 65 Hz
Measurement updating period	1 s
Accuracy	0.1 %
Energy accuracy	
Active (according to IEC 62053-22)	Class 0.5 S
Reactive (according to IEC 62053-23)	Class 2
Auxiliary power supply	
Alternating voltage	110 … 400 VAC
AC tolerance	± 10 %
Direct voltage	120 … 350 VDC
DC tolerance	± 20 %
Frequency	50 / 60 Hz
Consumption	≤ 10 VA

2 inputs / 2 outputs module: Outputs (alarms / control)	
Number of relays	2(1)
Type	250 VAC - 5 A - 1150 VA
2 inputs / 2 outputs module: Phototransistor inputs	
Number	2(1)
Power supply	10 … 30 VDC
Minimum signal width	10 ms
Minimum duration between 2 pulses	18 ms
Type	phototransistors
Pulse output module	
Number of relays	2
Type	100 VDC - 0.5 A - 10 VA
Max. number of operations	≤ 10^8
Analogue output module	
Number of outputs	2(2)
Type	insulated
Range	0 / 4 … 20 mA
Load resistance	600 Ω
Maximum current	30 mA
MODBUS communication module	
Link	RS485
Type	2 … 3 half duplex wires
Protocol	MODBUS RTU
MODBUS® speed	4800 … 38400 bauds
PROFIBUS-DP communication module	
Link	SUB-D9
Protocol	PROFIBUS® DP
PROFIBUS® speed	9.8 kbauds … 12 Mbauds
Ethernet communication module	
Connection	RJ45
Speed	10 base T / 100 base T
Protocol	MODBUS TCP or MODBUS RTU over TCP

Operating conditions	
Operating temperature	- 10 … + 55 °C / +14 °F … +131 °F
Storage temperature	- 20 … + 85 °C / -4 °F … +185 °F
Relative humidity	95 %

(1) Max. 3 modules / DIRIS.
(2) Max. 2 modules / DIRIS.

Case



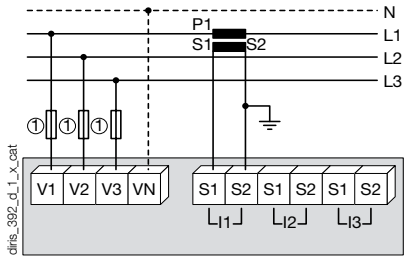
Type	panel mounting
Dimensions W x H x D	3.78 x 2.36 x 3.78 in / 96 x 96 x 60 mm
Case degree of protection	IP30
Front degree of protection	IP52
Display type	backlit LCD display
Terminal blocks type	fixed or plug-in
Voltage and other connection cross-section	AWG 34 … 10 / 0.2 … 2.5 mm^2
Current connection cross-section	AWG 20 … 9 / 0.5 … 6 mm^2
Weight	14.11 oz / 400 g

Connections

Recommendation: When disconnecting the DIRIS, the secondary of each current transformer must be short-circuited. This operation can be carried out automatically by a SOCOMEC PTI, an accessory which is included in this catalogue. Please consult us.
In TNC neutral systems it is recommended to use the functional earth module.

Low voltage balanced network for DIRIS A40

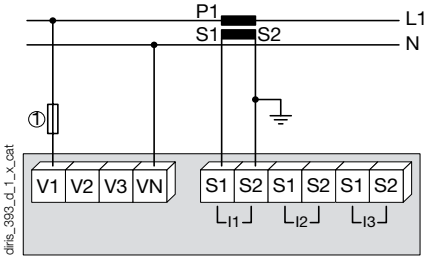
3/4 wires with 1 CT



Use of 1 CT reduces by 0.5% the accuracy of the phases, the current of which is worked out by vector calculation.

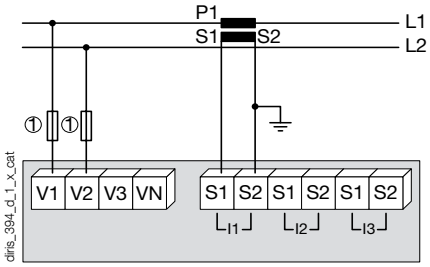
1. Fuses 0.5 A gG / 0.5 A class CC.

Single-phase



1. Fuses 0.5 A gG / 0.5 A class CC.

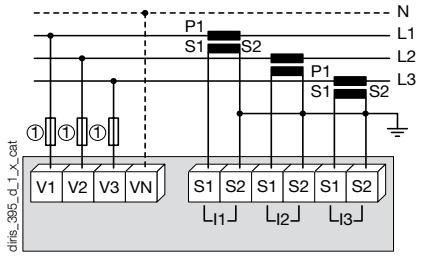
Two-phase



1. Fuses 0.5 A gG / 0.5 A class CC.

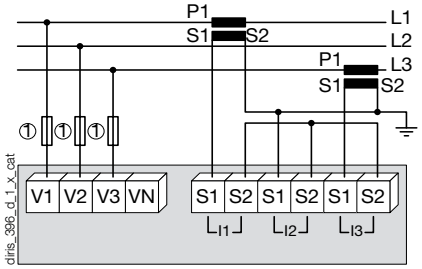
Low voltage unbalanced network for DIRIS A40

3/4 wires with 3 CTs



1. Fuses 0.5 A gG / 0.5 A class CC.

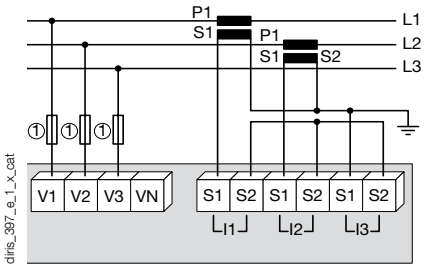
3 wires with 2 CTs



Use of 2 CTs reduces by 0.5% the accuracy of the phases, the current of which is worked out by vector calculation.

1. Fuses 0.5 A gG / 0.5 A class CC.

3 wires with 2 CTs

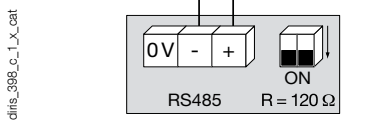


Use of 2 CTs reduces by 0.5% the accuracy of the phases, the current of which is worked out by vector calculation.

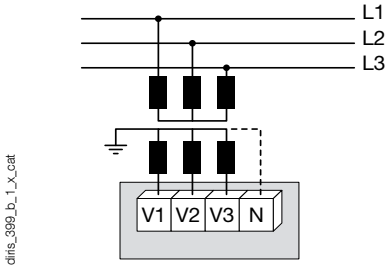
1. Fuses 0.5 A gG / 0.5 A class CC.

Additional information

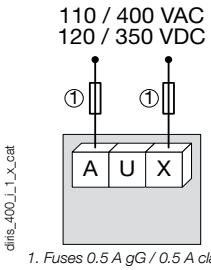
Communication via RS485 link



Connection of voltage transformer for HV networks



AC & DC auxiliary power supply



1. Fuses 0.5 A gG / 0.5 A class CC.

References

Basic device **Auxiliary power supply U_s**	**DIRIS A40** **Reference**
110 ... 400 VAC / 120 ... 350 VDC	4825 **U201**

Options **Plug-in modules**(1)	 **Reference**
Pulse outputs	4825 **0090**
RS485 MODBUS® communication	4825 **0092**
Analogue outputs	4825 **0093**
2 inputs / 2 outputs	4825 **0094**
Communication Sub D9 PROFIBUS®DP(2)	4825 **0205**
Memory	4825 **0097**
Embedded Webserver function (2).	4825 **0203**
Ethernet communication + RS485 MODBUS gateway (Embedded Webserver function)(2)	4825 **0204**

(1) Ease of integration for additional functions (maximum 4 slots on A40).
(2) Dimension of the plug-in module: 2 slots.

Accessories	**Reference**
Management software for DIRIS	See page 174

Services & technical assistance

> Technical site audits and solution specification, commissioning, maintenance, training… Our Services & Technical Assistance experts offer you personalized support to ensure success with all your projects.

DIRIS G

RS485 to Ethernet communication gateways

new

Configuration with EasyConfig, see page 174.

DIRIS G-30/G-50
RS485/Ethernet

The solution for

- Industry
- Building
- Infrastructure
- Local authority

Strong points

- WEBVIEW embedded web server
- Plug & Play

Conformity to standards

- IEC 61010
- ISO 14025
- UL 61010
- FCC

Function

With **DIRIS G** communication gateways, all information from metering and measurement devices communicating via the RS485 bus are centralized in a single device and then made available on the Ethernet network via Modbus TCP.

The gateway has an embedded WEBVIEW web server, allowing real time monitoring of electrical values and analysis of consumption data. The user can be alerted of any alarms via email.

Advantages

WEBVIEW embedded web server(1)
DIRIS G gateways include an embedded web server. Two versions are available:

- Power Monitoring:
  - Real time measurements and alarms
- Power & Energy Monitoring:
  - Real time measurements and alarms,
  - Historical of measurements and analysis of consumptions.
- DIRIS D-90 touch-screen tablet can be fitted on the panel door to display WEBVIEW pages.

(1) See page 172.

Plug & Play
Connected metering and measurement devices are automatically addressed and detected by the DIRIS G gateway.
DIRIS G gateways provide:

- Automatic clock synchronization (SNTP) with battery recording.
- Synchronization of connected devices.
- Warning messages in case of alarms (e-mail SMTP).
- Automatic recording and storage of measurements and consumption data.
- Automatic distribution of tariff changes.

Selection guide

	Gateway	DIRIS G-30	DIRIS G-50
Communication	RS485 Modbus	•	•
	Ethernet	•	•
WEBVIEW embedded web server	Power Monitoring	•	•
	Power & Energy Monitoring		•

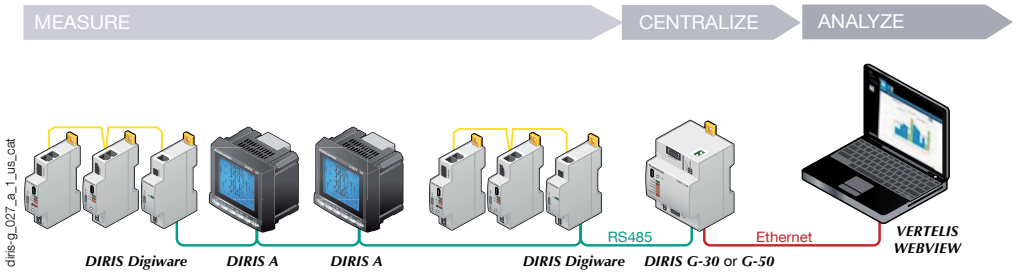
Functions

DIRIS G-30 / DIRIS G-50

- RS485 and Ethernet ports (2 ports with integrated switch)
- Automatic addressing and detection of connected devices.
- Historical of measurements: max 1 year
- Internal clock (SNTP synchronization)
- Sending of alarm by email (SMTP)
- WEBVIEW embedded web server

Architecture

Example of communication architecture with DIRIS G gateway and WEBVIEW embedded WEB server



Tablet

D-90 Touch-screen tablet

- Door mounting
- Connected to Ethernet or Wi-Fi (via router)

Embedded web server

WEBVIEW embedded web server(1)

- Power Monitoring version: embedded in DIRIS G-30
- Power & Energy Monitoring version: embedded in DIRIS G-50
- 32 devices max

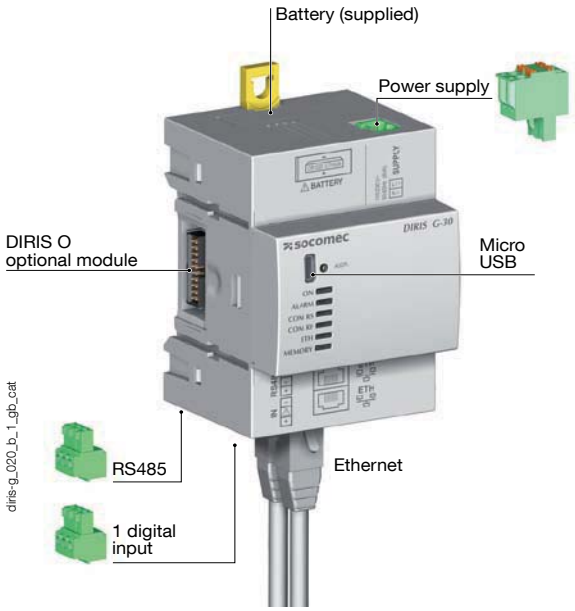
(1) For more details see page 172.

Accessories

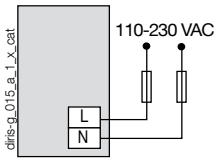
USB configuration cable

- Configuration of DIRIS G gateways can be achieved using the EASY CONFIG software via Ethernet or direct USB connection.

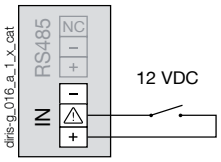
DIRIS G terminals



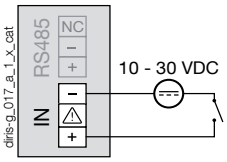
Power supply



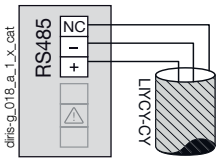
Input supplied by the product



Input with external power supply

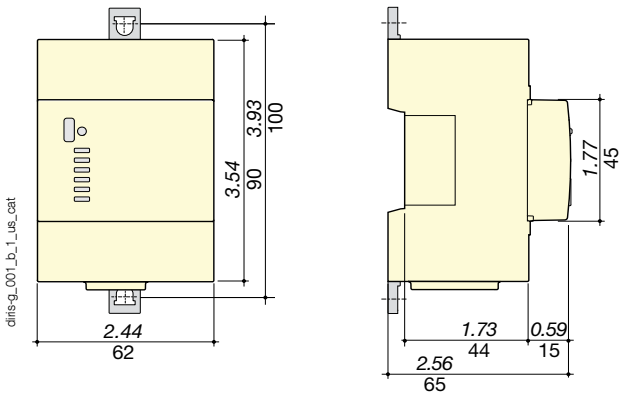


RS485



Dimensions (in/mm)

DIRIS G-30 / G-50



Technical characteristics

Mechanical characteristics

Casing type	Modular for DIN-rail or back plate mounting
Case degree of protection	IP20 / IK06
Front degree of protection	IP40 (panel face with modular mounting) / IK08
Weight	DIRIS G-30, G-50 = 6.7 oz / 190 g

Electrical characteristics

Power supply	
AC voltage	110-230 VAC ±15% (Ph/N or Ph/Ph) Cat III
Frequency	50/60 Hz
Consumption	6 VA
Battery	CR 1220 3 V lithium button cell battery

Input	
Number	1
Type / Power supply	Optocoupler internal polarization (12 VDC ± 10 %) or external polarization (10-30 VDC ± 10%)
Input function	Logic status, pulse meter or synchronization pulse status

Communication characteristics

DIRIS G	
Link	RS485
Connection type	2 … 3 half duplex wires
Protocol	Modbus RTU
Speed	2400 … 115200 bauds
Function	Communication with PMDs and meters

Ethernet	
Link	Ethernet 10/100 base-T, 2 RJ45 bases with integrated switch
Protocol	Modbus TCP (port 502), Modbus RTU over TCP (port 503), HTTP, SMTP, SNTP, DHCP
Clock	Internal
SNTP protocol	Gateway time updating from an NTP server. Connected PMDs time updating.
SMTP protocol	Sending of alarm emails from the gateway
Function	Configuration of the gateway, connected PMDs and meters Access to the WEBVIEW web server, data centralization

USB	
Connection type	USB 2 (Easy Config software required)
Protocol	Modbus RTU over USB
Function	Configuration of the gateway, connected PMDs and meters
Connection	B-type micro USB connector

Memory capacity

Historical of consumptions (memory capacity extension of meters and monitoring devices)	1 year (1-hour period)
Electrical values	2 months (10-minute period)
Number of events	Alarms: 1000 Network quality as per EN 50160: 1000

Environment characteristics

Operating temperature	-10 … +70 °C / +14 °F … +158 °F
Storage temperature	-25 … +85 °C / -13 °F … +185 °F
Operating humidity	55 °C / 131 °F / 97% relative humidity

References

DIRIS G gateways		**Reference**
DIRIS G-30	RS485 / Ethernet - WEBVIEW Power Monitoring	4829 **0300**
DIRIS G-50	RS485 / Ethernet - WEBVIEW Power & Energy Monitoring	4829 **0302**
Tablet		**Reference**
DIRIS D-90		4829 **0210**
Accessories		**Reference**
USB configuration cable		4829 **0050**

VERTELIS WEBVIEW

Web server embedded in the DIRIS G communication gateway

new

soft_027_a_1_fr_cat

The solution for

- Industry
- Building
- Infrastructure
- Local authority

Strong points

- Plug & Play
- Easy to use
- Various functions

Function

The **WEBVIEW** web server embedded in DIRIS G gateways enables measurement monitoring up to 32 devices and displays the energy consumptions by usage.

Pre-set alarms defined by the user can sent by e-mail.

User can access WEBVIEW via a web browser on a PC or a tablet.

Advantages

Plug & Play

Automatic detection of connected devices facilitates the WEBVIEW configuration. In order to achieve the consumption distribution, the user is assisted in the metering plan definition.

Easy to use

WEBVIEW centralizes all the devices measurements via a unique, clear and easy-to-use interface.

It provides easy and rapid monitoring of the devices by displaying the parameters and events on summary pages.

Various functions

WEBVIEW ensures real time monitoring of all electrical parameters measured thanks to summary pages showing graphs or charts. Time-logged alarms are recorded and displayed by usage, type, nature and criticality. The user receives alarm notification by email.

Energy consumption breakdown is displayed per utility (electricity, water, gas…) and usage (heating, lightning…).

Selection guide

WEBVIEW	Functions	Hosted on Gateway (32 devices max.)
Power Monitoring	**Monitor** - Real time measurement - Alarms	DIRIS G-30
Power & Energy Monitoring	**Monitor** - Real time measurement - Alarms **Display** - Measurement history - Consumptions	DIRIS G-50

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VERTELIS WEBVIEW

Web server embedded in the DIRIS G communication gateway

Functions

2 versions available:

Power Monitoring

Monitor

- Automatic detection of connected devices.
- Summary of the parameters measured on the electrical network and the loads.
- Measurements of voltage, current, power, power factor, harmonic distortion rate (THD) and harmonics per rank.
- Display of average/instantaneous values with min/max limits depending on the devices.
- Total and partial energy consumption per load.
- Input/output status.
- Synchronization of device clocks.
- Graphical or table representation.

Alarm

- Alarms for overloads, events and input status changes.
- Display of alarm history.
- Sorting by type, nature, criticality or state.
- Alarm displayed on the main page.
- Sending of alarm by email (SMTP).

Power & Energy Monitoring

Display

- Historical measurements and consumption (one year of data).
- Distribution of consumption by usage and by utility (water, gas, electricity, etc.).
- Export of consumption data in CSV format.

Power & Energy Monitoring also includes the "Monitoring" and "Alarm" functions.

soft_027_a_1_gb_cat

Real-time display.

soft_025_a_1_gb_cat

Alarm history.

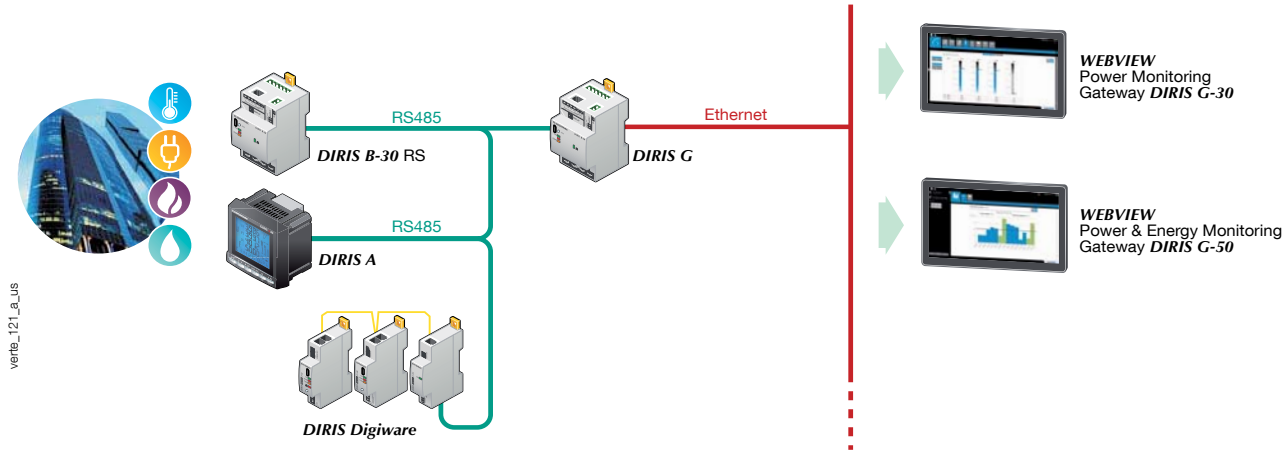
soft_036_a_1_gb_cat

Consumption history.

Architecture

MEASURE | CENTRALIZE | MONITOR

vente_121_a_us

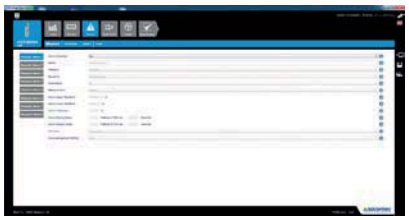


References

Type		Reference
DIRIS G-30	RS485 / Ethernet - WEBVIEW Power Monitoring	4829 **0300**
DIRIS G-50	RS485 / Ethernet - WEBVIEW Power & Energy Monitoring	4829 **0302**

DIRIS management software tools

Software suite



Easy Config *software*

Webserver function

Function

To get the most effective use from your Socomec measurement and metering devices, we can provide dedicated software tools:

Easy Config software

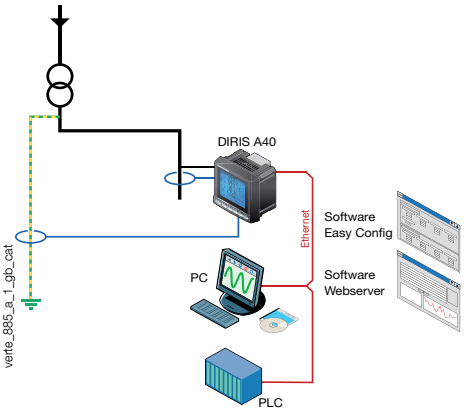
The Easy Config software enables quick and easy remote device configuration for DIRIS Digiware, DIRIS B, DIRIS G and DIRIS A devices. Configuration files can be copied from and sent to these devices, or they can be created without communication and sent at a later time.
Multiple devices can be configured from a single file which is especially useful for OEMs and panel builders, saving time when having to program many devices with the same configuration.

Webserver function

The DIRIS A's optional Ethernet modules integrate HTML pages, enabling the Webserver function to be directly accessed through a standard web browser (Internet Explorer, Firefox....), eliminating the need for software installation.
The Webserver function enables:

- monitoring of electrical values,
- viewing of energy consumption,
- managing alarms,
- configuration of the main parameters of installation
- viewing and extracting load curves (through a .CSV file).

Principle diagram



	Easy Config	Webserver	WEBVIEW See page 172
DIRIS A10 and A20 with RS485 communication	•	•(1)	•
DIRIS A40 with RS485 communication	•	•(1)	•
DIRIS A40 with Ethernet communication module	•	•	•
DIRIS B	•		•
DIRIS Digiware	•		•
DIRIS G	•		•

(1) through DIRIS A fitted with an Ethernet communication module with RS485 gateway.

Compatible with:

DIRIS A

DIRIS Digiware

DIRIS B

DIRIS G

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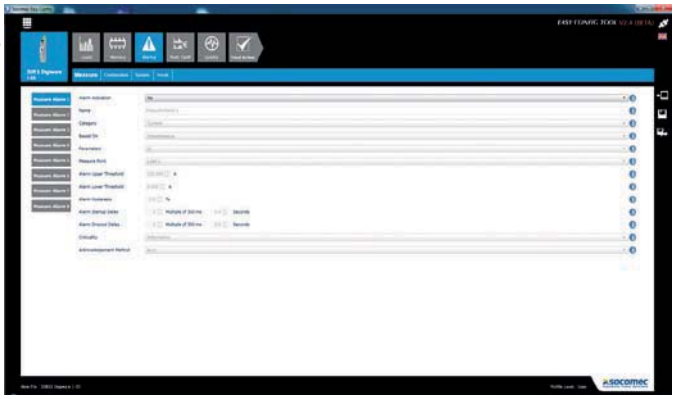
Easy Config software

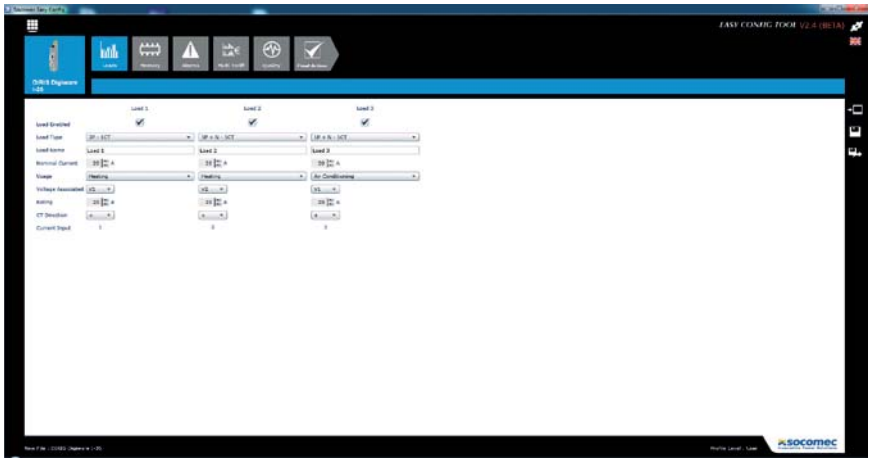
The Easy Config software enables quick and easy remote configuration of DIRIS Digiware, DIRIS B, DIRIS G and DIRIS A devices.


diris_886_a_1_gb_cat

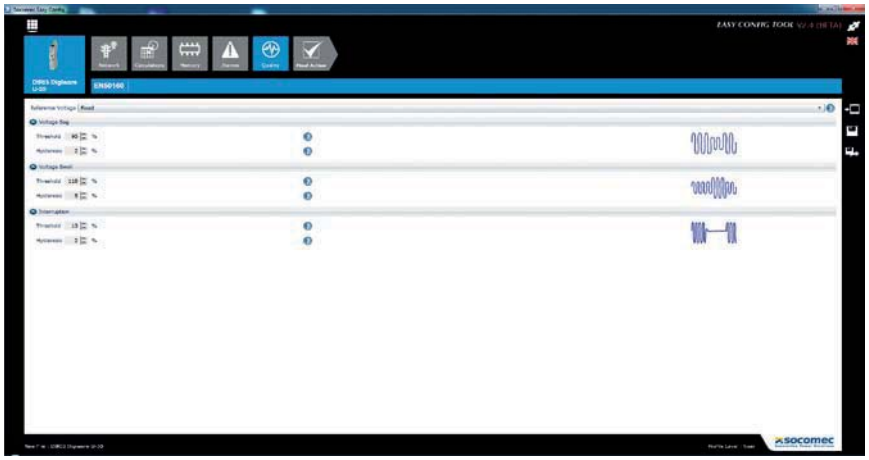
It offers the following functions:

- Creating the configuration of devices prior to their connection (configuration template).
- Saving a configuration to a PC.
- Loading the configuration to devices through USB, RS485 or Ethernet.
- Retrieving the configuration of a device through USB, RS485 or Ethernet for saving, copying or modification purposes.

Configuration of loads


diris_883_a_1_gb_cat

Configuration of Quality events


diris_884_b_1_gb_cat

Webserver function

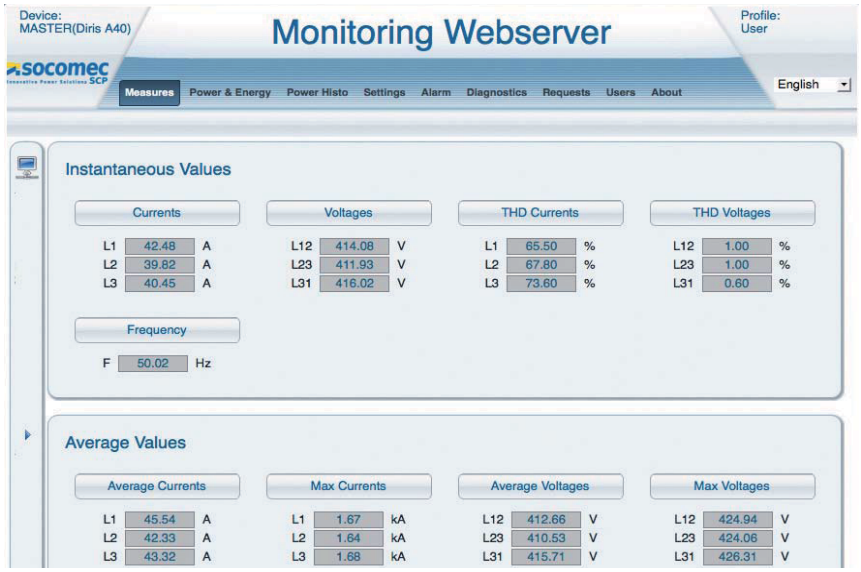
diris_776_a_1_cat

DIRIS A Ethernet communication module with RS485 gateway

The Webserver function comprises HTML pages embedded within the optional Ethernet communication module of the DIRIS A's multifunction meter. These pages can be accessed via an internet browser, simply by entering the DIRIS A IP address.
The Webserver offers the following functions:

- Monitoring of electrical values.
- Viewing of energy consumption.
- Management of alarms.
- Remote configuration of the main parameters for meters within the installation.
- Viewing and extracting load curves (through a .CSV file).

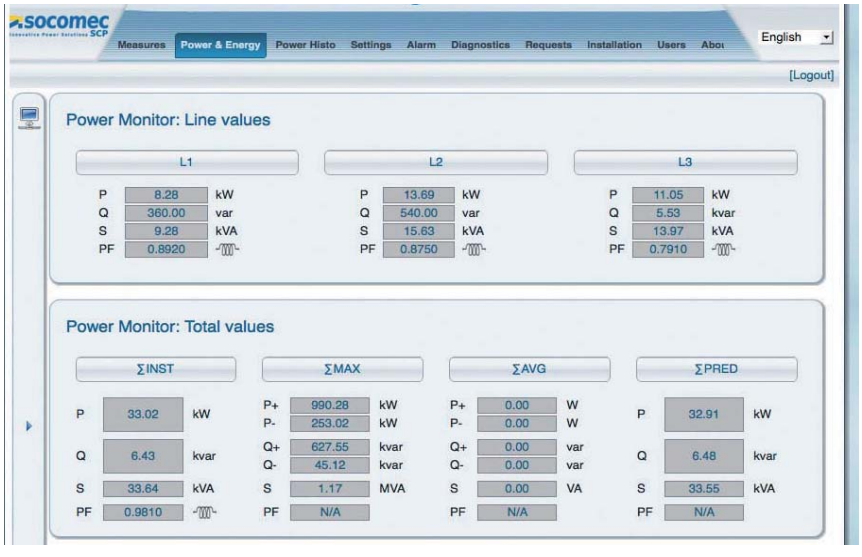
Instantaneous report of measurements



diris_867_a_1_gb_cat

Display for viewing instantaneous and average electrical values.

Power and energy



diris_869_a_1_gb_cat

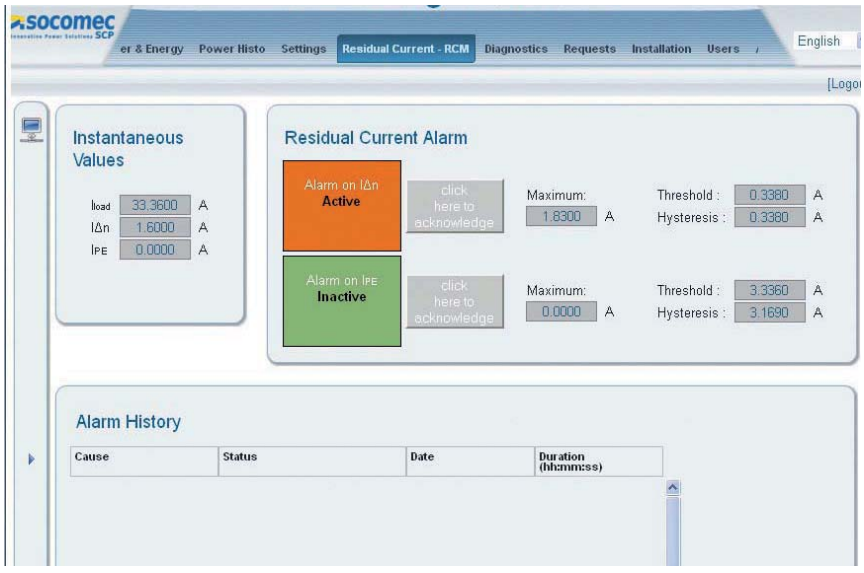
Display for viewing instantaneous and average power measurements and energy consumption.

Webserver function (continued)

Configuration of the devices

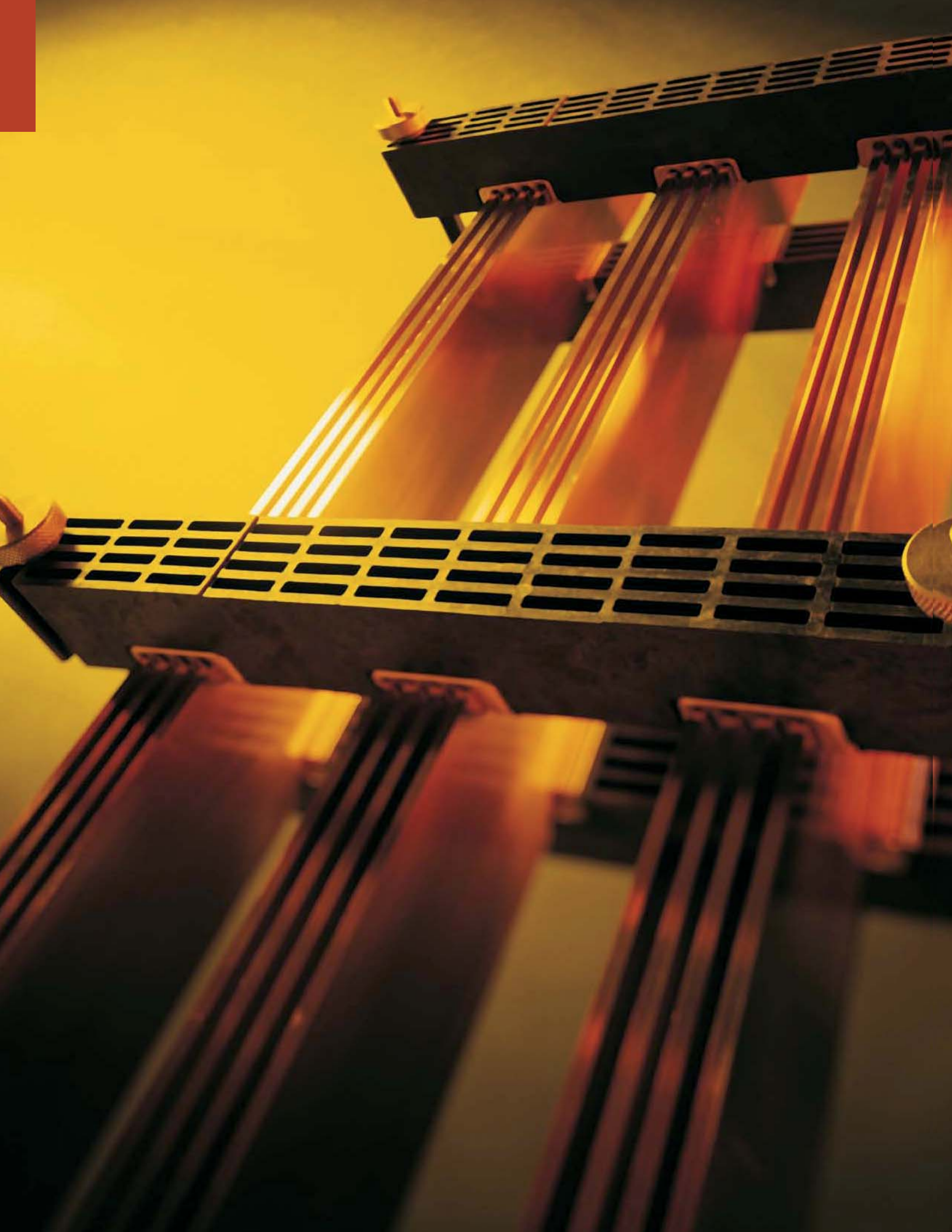
diris_868_a_1_gb_cat

Alarms



diris_884_a_1_gb_cat

The latest alarms are date and time registered. The duration and value for each alarm (low limit value / high limit value), as well as the related output alarm number, are also displayed. Data can be extracted in *.csv format.



Enclosures & accessories

Busbar

Flexible copper bars

p. 180

Insulated copper braids

p. 182

Insulated flexible copper bars

Busbars

barre_011_a_1_cat

The solution for

> Electrical distribution

Strong points

> Easy to install
> Increased safety by the elimination of crimped connections

Conformity to standards

> VDE 207 Y16
> BS 6746
> NF A 51-050
> VDE 207 YM4
> DIN 40050

Available on request

> Specific lengths
> Halogen-free
> Please consult us

Function

SOCOMEC **insulated flexible** copper bars are mainly utilized for providing the power connections between series of distribution busbars and the disconnection devices within an electrical panel.

The insulated layered copper allows the flexible copper bar to be easily formed to provide a customized solution.

Advantages

Easy to install

- Compact version.
- High level of flexibility enabling easy manipulation of the busbar.
- Reduced installation time with the elimination of terminal lugs and their crimping.

Increased safety by the elimination of crimped connections

- Better behaviour under short-circuit conditions.
- Decreased number of heating points.
- More reliable connections.

Characteristics

- Width of 9 to 100 mm.
- Copper layer thickness from 0.8 to 1 mm.
- Length of 2 m.

Conductor

- Layers of electrolytic copper Cu/ETP, final annealing state.

Insulator

- High temperature co-extruded vinyl compound on the copper strips (insulation thickness: 1.5 to 2 mm).
- Self-extinguisher: NFC 32200 and UL 94 V0.
- Continuous temperature withstand: 105 °C.
- Shore hardness A: 89 +/- 2.
- Module 100 % elongation: 16 Mpa.
- Resistance to elongation: < 15 % mini.
- Breaking stress: 20 Mpa.
- Transversal volume resistivity: 6.1015 Ω.
- Oxygen index: 29.5 %.
- Scratch and tear resistant.

Insulated flexible busbar

- Operating-temperature range: from -40 °C to +105 °C.
- Maximum operating voltage: 1000 VAC / 1500 VDC.
- Alternating voltage withstand (10 minute test):
  - between core and insulation: 16.5 kV,
  - between two insulating elements in contact: 33 kV,
  - Conductivity: 100 IACS,
  - HV < 50,
  - Resistance to traction Rm > 200 N/cm^2,
  - Stretch before break 35 %,
  - Resistivity: 1.724 micro Ω/cm at 20 °C.

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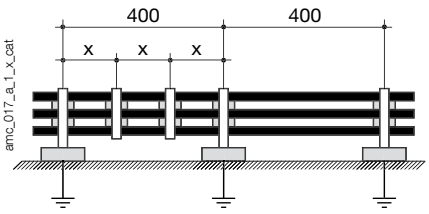
References

I x N x e (mm)	L (mm)	Permissible amperage for ΔT (°C) (1) 40°C (A)	50°C (A)	60°C (A)	To be ordered in multiples of	Reference
9 x 2 x 0.8	2000	113	129	143	4	4518 **0902**
9 x 3 x 0.8	2000	140	160	178	4	4518 **0903**
9 x 4 x 0.8	2000	165	188	209	4	4518 **0904**
9 x 5 x 0.8	2000	187	214	238	4	4518 **0905**
9 x 6 x 0,8	2000	208	238	264	4	4518 **0906**
13 x 3 x 0.5	2000	142	162	180	4	4518 **1303**
13 x 4 x 0.5	2000	165	189	210	4	4518 **1304**
13 x 5 x 0.5	2000	186	213	237	4	4518 **1305**
13 x 6 x 0.5	2000	206	235	261	4	4518 **1306**
15.5 x 2 x 0.8	2000	167	191	212	4	4518 **1502**
15.5 x 3 x 0.8	2000	207	237	263	4	4518 **1503**
15.5 x 4 x 0.8	2000	242	277	308	4	4518 **1504**
15.5 x 6 x 0.8	2000	304	347	386	4	4518 **1506**
15.5 x 8 x 0.8	2000	358	409	455	4	4518 **1508**
15.5 x 10 x 0.8	2000	408	466	519	4	4518 **1510**
20 x 2 x 1	2000	228	261	290	4	4518 **2002**
20 x 3 x 1	2000	283	324	360	4	4518 **2003**
20 x 4 x 1	2000	331	378	421	4	4518 **2004**
20 x 5 x 1	2000	374	428	476	4	4518 **2005**
20 x 6 x 1	2000	415	474	527	4	4518 **2006**
20 x 8 x 1	2000	488	558	621	4	4518 **2008**
20 x 10 x 1	2000	556	635	705	4	4518 **2010**
24 x 2 x 1	2000	263	301	335	4	4518 **2402**
24 x 3 x 1	2000	326	373	414	4	4518 **2403**
24 x 4 x 1	2000	380	435	483	4	4518 **2404**
24 x 5 x 1	2000	429	491	546	4	4518 **2405**
24 x 6 x 1	2000	475	542	603	4	4518 **2406**
24 x 8 x 1	2000	557	636	708	4	4518 **2408**
24 x 10 x 1	2000	632	722	803	4	4518 **2410**
32 x 2 x 1	2000	331	379	421	4	4518 **3202**
32 x 3 x 1	2000	409	468	520	4	4518 **3203**
32 x 4 x 1	2000	476	544	605	4	4518 **3204**
32 x 5 x 1	2000	536	612	681	4	4518 **3205**
32 x 6 x 1	2000	591	675	751	4	4518 **3206**
32 x 8 x 1	2000	689	787	876	4	4518 **3208**
32 x 10 x 1	2000	777	887	987(1)	4	4518 **3210**
40 x 2 x 1	2000	398	455	506	2	4518 **4002**
40 x 3 x 1	2000	490	560	623	2	4518 **4003**
40 x 4 x 1	2000	569	650	723	2	4518 **4004**
40 x 5 x 1	2000	639	730	812	2	4518 **4005**
40 x 6 x 1	2000	703	803	893	2	4518 **4006**
40 x 8 x 1	2000	815	932	1036	2	4518 **4008**
40 x 10 x 1	2000	915	1045	1163	2	4518 **4010**
50 x 3 x 1	2000	589	673	749	2	4518 **5003**
50 x 4 x 1	2000	682	780	867	2	4518 **5004**
50 x 5 x 1	2000	764	873	971	2	4518 **5005**
50 x 6 x 1	2000	838	957	1062	2	4518 **5006**
50 x 8 x 1	2000	967	1105	1229	2	4518 **5008**
50 x 10 x 1	2000	1080	1234	1373	2	4518 **5010**
63 x 3 x 1	2000	715	816	908	2	4518 **6303**
63 x 4 x 1	2000	825	943	1048	2	4518 **6304**
63 x 5 x 1	2000	921	1052	1171	2	4518 **6305**
63 x 6 x 1	2000	1041	1187	1324	2	4518 **6306**
63 x 8 x 1	2000	1157	1321	1470	2	4518 **6308**
63 x 10 x 1	2000	1286	1469	1634	2	4518 **6310**
80 x 3 x 1	2000	874	998	1110	2	4518 **8003**
80 x 4 x 1	2000	1006	1149	1278	2	4518 **8004**
80 x 5 x 1	2000	1119	1279	1422	2	4518 **8005**
80 x 6 x 1	2000	1220	1393	1550	2	4518 **8006**
80 x 8 x 1	2000	1393	1592	1771	2	4518 **8008**
80 x 10 x 1	2000	1543	1763	1961	2	4518 **8010**
100 x 4 x 1	2000	1211	1383	1538	2	4518 **9004**
100 x 5 x 1	2000	1343	1534	1707	2	4518 **9005**
100 x 6 x 1	2000	1460	1668	1855	2	4518 **9006**
100 x 8 x 1	2000	1660	1897	2110	2	4518 **9008**
100 x 10 x 1	2000	1833	2094	2329	2	4518 **9010**
100 x 12 x 1	2000	1993	2277	2531	2	4518 **9012**

(1) For ambient air temperature of 40 °C
Important: max. busbar temperature = 105 °C.
L: length of bar in metres.
I: width of bare busbar in mm.
N: number of copper layers.
e: copper layer thickness in mm.

Implementation



Flexible bars should be mounted on insulated supports with a maximum distance of 400 mm. Bars should also be held together with straps, as shown in the above diagram. The distance between successive straps depends on the electro-dynamic constraints in the event of a short-circuit. The table below gives the recommended distances between straps.

I_{cc} max. (kA rms)	Distance x between straps (mm)(1)
20	350
25	200
35	100
45	70

(1) 9 mm straps, load 80 kg.

Insulated flat copper braids

Busbars

tress_002_a_1_cat

The solution for

> Electrical distribution

Strong points

> Easy to install
> Wide range of utilization
> Compatibility

Conformity to standards

Customized solutions

> Tin-plated contact surface
> Other lengths: please consult us

Function

SOCOMEC **insulated flat copper braids** are mainly utilized for providing the power connections between series of distribution busbars and the disconnection devices within an electrical panel.
Their flexibility is especially adapted to achieve complex and customized connections in cases where minimum spaceis available.

Technical characteristics

- Electrolytic copper, final annealing state.
- Operating voltage 1000 VAC - 1500 VDC
- Dielectric strength 20 KV / mm
- Operating temperature:- 40°C / +105°C
- Self-extinguishing: UL 94 V0
- Contact surface: bare copper

Advantages

Easy to install

- Compact and flexible.
- Length and orientation are easily adapted.
- Pre-mounted connection terminals reduces installation time.

Wide range of utilization

- Parallel connections permit currents of up to 1000 A.
- Adapted to various types of connection terminals.
- Connection distance from 200 to 800 mm.

Compatibility

- With SOCOMEC devices.
- With most circuit-breakers on the market.

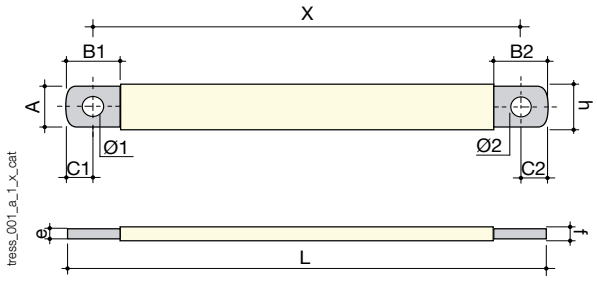
References

Connections in parallel

Correction factor	
	Rated current (no derating)
	2 x rated current x 0.8
	3 x rated current x 0.65

Dimensions						Admissible current at an ambient temperature of			
A Width (mm)	e Thickness (mm)	L Length (mm)	Ø 1 (mm)	Ø 2 (mm)	X Fixing centres (mm)	35 °C (A)	Nominal rating 45 °C (A)	55 °C (A)	Reference
20	1.5	220	8.5	10.5	200	180	160	140	4516 **1620**
20	1.5	270	8.5	10.5	250	180	160	140	4516 **1625**
20	1.5	320	8.5	10.5	300	180	160	140	4516 **1630**
20	1.5	370	8.5	10.5	350	180	160	140	4516 **1635**
20	1.5	420	8.5	10.5	400	180	160	140	4516 **1640**
20	1.5	520	8.5	10.5	500	180	160	140	4516 **1650**
20	3	220	8.5	10.5	200	280	250	220	4516 **2520**
20	3	270	8.5	10.5	250	280	250	220	4516 **2525**
20	3	320	8.5	10.5	300	280	250	220	4516 **2530**
20	3	370	8.5	10.5	350	280	250	220	4516 **2535**
20	3	420	8.5	10.5	400	280	250	220	4516 **2540**
20	3	520	8.5	10.5	500	280	250	220	4516 **2550**
32	5	222	10.5	10.5	200	440	400	320	4516 **4020**
32	5	272	10.5	10.5	250	440	400	320	4516 **4025**
32	5	322	10.5	10.5	300	440	400	320	4516 **4030**
32	5	372	10.5	10.5	350	440	400	320	4516 **4035**
32	5	422	10.5	10.5	400	440	400	320	4516 **4040**
32	5	522	10.5	10.5	500	440	400	320	4516 **4050**
32	5	622	10.5	10.5	600	440	400	320	4516 **4060**
32	5	822	10.5	10.5	800	440	400	320	4516 **4080**
32	10	274	12.5	10.5	250	690	630	560	4516 **6325**
32	10	324	12.5	10.5	300	690	630	560	4516 **6330**
32	10	374	12.5	10.5	350	690	630	560	4516 **6335**
32	10	424	12.5	10.5	400	690	630	560	4516 **6340**
32	10	524	12.5	10.5	500	690	630	560	4516 **6350**
32	10	624	12.5	10.5	600	690	630	560	4516 **6360**
32	10	824	12.5	10.5	800	690	630	560	4516 **6380**

Dimensions



Nominal rating 45 °C (A)	A (mm)	e (mm)	B1 (mm)	B2 (mm)	C1 (mm)	C2 (mm)	Ø1 (mm)	Ø2 (mm)	f (mm)	h (mm)
160	20	1.5	25	30	8	12	8.5	10.5	3.5	22
250	20	3	25	30	8	12	8.5	10.5	5	22
400	32	5	25	30	10	12	10.5	10.5	7	27
630	32	10	35	30	12	12	12.5	10.5	12	32

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