ABL SURSUM

Switching Devices
according to UL489, UL508 and UL1077


Altech Corp. Phone (908) 806-9400, www.altechcorp.com
UL489-Molded Case Circuit Breaker 1 pole
File E329510
10kA IR
Line 18-3 AWG
Load 18-2 AWG
Use Copper Wire Only 60/75C
Line/Load Reversible 50/60Hz
Type UL: Frequency 50/60Hz
Type DL: Observe Polarity Markings
2.5Nm/
22.2lbs.in
min. 0.16 in (4 mm)
Made in Germany
9967430
ABL SURSUM
C16
277V AC
1C16UL
HACR
LISTED
C.B.
10kA
OFF
Altech Corp. Phone (908) 806-9400, www.altechcorp.com
MANUAL MOTOR CONTROLLER Series V-EA
- Suitable for Motor Disconnect
- Suitable for the following load
1 PHASE / FLA & LRC CONVERTED TO TABLE HORSEPOWER
NOMINAL CIRCUIT VAC
MOTOR NAMEPLATE
FLA
STARTING/LRC
110-120
200
208
220-240
265
277
0.30A
1.80A
Models rated up to 25A 42V dc, 30-60A 24V dc, general purpose
ABL SURSUM
C10
277V AC
1C10UM
240/415V AC
EN 80898
10kA
LISTED
4CB7
in Germany
590

Editorial

Dear Customers,
Dear Business Partners,

with this catalogue we invite you to explore the multi-faceted world of modern electrical installation in industry applications with the focus on the North American standards according to UL and CSA.

We are a traditional family-owned company and we look back with pride on more than 70 years of experience in developing and exporting products according to UL and CSA all around the world. We offer an extensive range of products according to UL489, UL508 and UL1077 for modern DIN-Rail installation. Combined with the wide range of accessories, we can offer our customers a flexible system to create state-of-the-art individual solutions.

Quality is the decisive factor for us. With proven materials, first-class workmanship and the highest quality standards, ABL SURSUM products are ideal for use in industry.

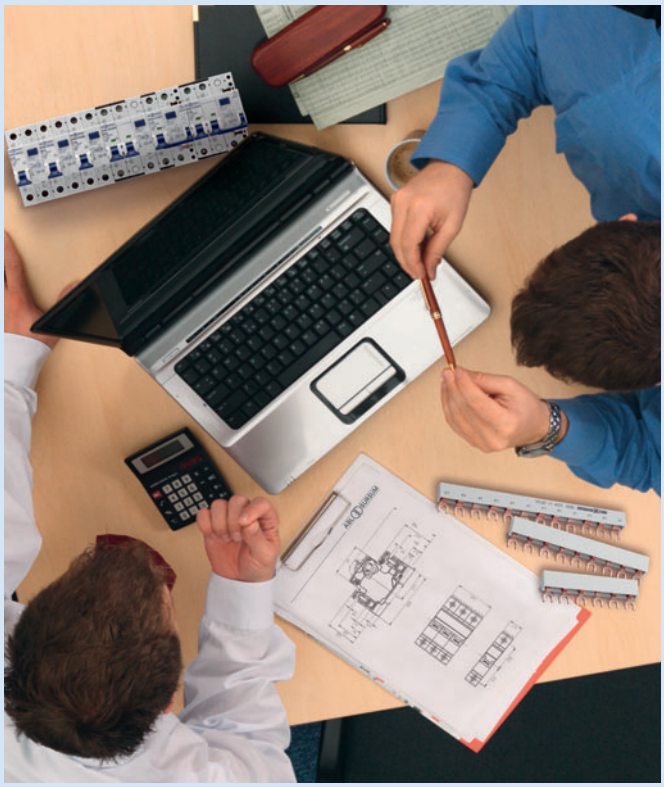
Only those who are open to change will be successful in the future. This guiding principle is what motivates us daily to make sure that we always use state-of-the-art technology, do not remain still, and continuously develop products innovatively for our customers with the most modern means available.

At ABL SURSUM, emotion is the enthusiasm for successful products. That is why we always work closely with our customers and can meet their specific requirements and offer individual solutions as quickly as possible. Our excellent service is always at your side, ready to provide support.

Sincerely

Dr. Stefan Schlutius
CEO

Your direct Line to us

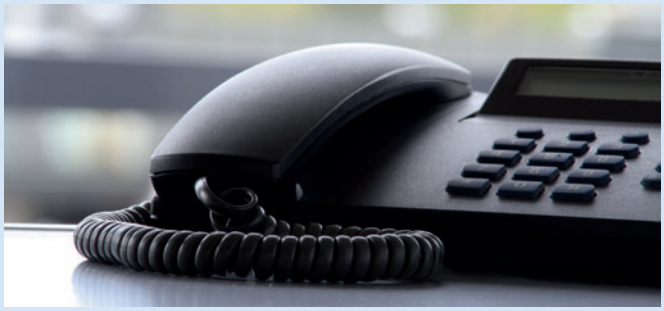


We see service as a top priority - and our customers realise and appreciate it!

Every order contains special requirements, requires competent advice, needs efficient, cost-effective solutions and, of course, must be fast.

Those are exactly the strengths of ABL SURSUM:

- Open to the technical problems and individual requirements of our customers
- Proximity to customers and flexibility in working out individual solutions
- Advice and problem analysis with the excellent technical qualifications of our employees
- Fast offer and order processing
- High degree of vertical integration in-house
- Need-based warehouse storage – that means that for you as a customer: short delivery times for all standard products
- High degree of on-time delivery using a finely-meshed distribution network and modern logistics



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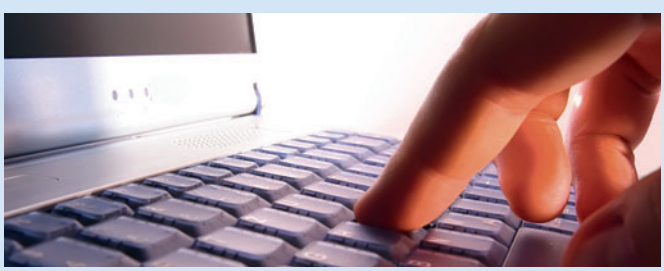
Fax: **+49 (0)9123/188-188, -189**
E-mail: **info@abl-sursum.com**



Detailed information can be found at:
www.abl-sursum.com

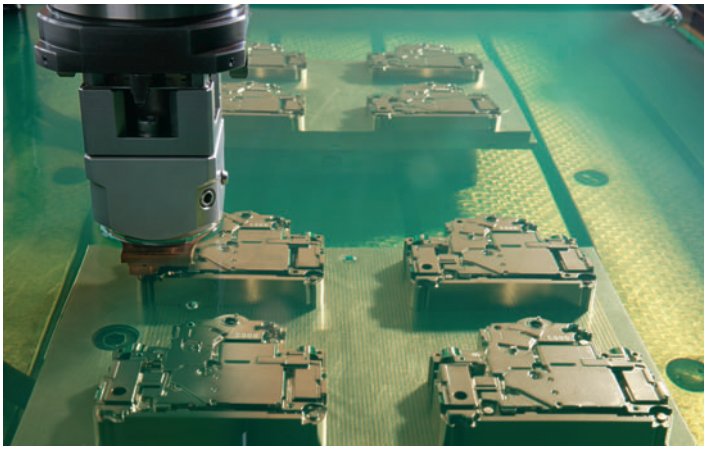
Table of Contents

From Conception to Delivery

We are oriented towards the requirements of the national and international markets and the desires of our customers which we approach passionately with a wealth of ideas, engineering skills and the power of innovation.

Location:
Innovative products from Lauf

With a wide range of more than 7,000 products, the traditional German company ABL SURSUM delivers to markets all around the world.

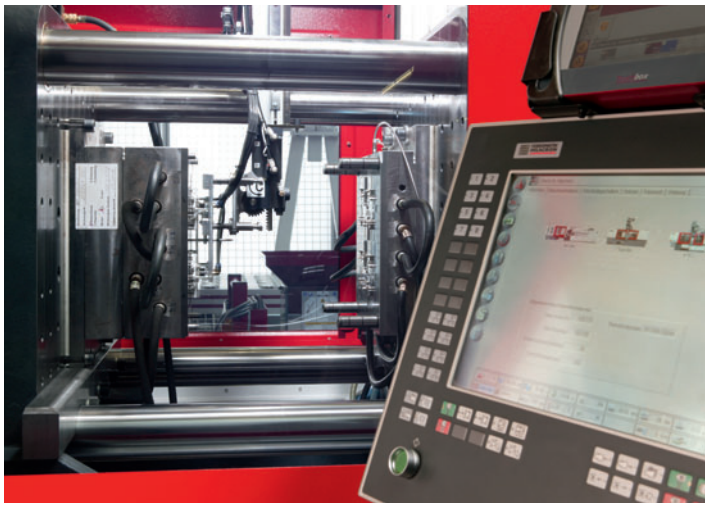


Development:
Everything in-house

Every new product begins with an idea. In order to implement it, a lot of experience and the right tools are needed. That is why development at ABL SURSUM is not only carried out with the most modern CAD software available, but also in constant dialogue with customers. Because it is only with exact knowledge of products and markets that one can create innovative, need-based products.

Tool and equipment manufacture:
Focus on quality

The quality of a production starts with the right production facilities. That is why ABL SURSUM builds and maintains its own custom plastic and metal machining tools. At the same time, a large proportion of the machines and equipment are constructed in our own equipment manufacturing facilities. Because if you plan and build something yourself, you can maintain it optimally, adjust it to meet new challenges and constantly develop it further.



Vertical integration:
Greatest perfection down to the smallest detail

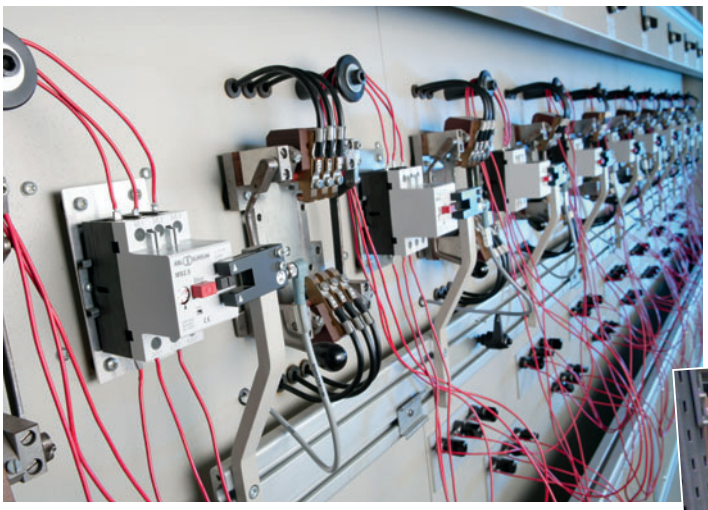
Even the smallest detail can be decisive in determining the perfection of the whole. The extensive vertical integration of ABL SURSUM guarantees the highest quality and dimensional accuracy over a product's entire life cycle. An Acquisition Management perfectly harmonised with Production allows materials to be available on time without interruption of work flow.

Final assembly:
Combining know-how and technology

Experienced, qualified employees and a high level of automation enable on-time production, while maintaining a consistently high level of quality. Because only high-quality products are convincing in the long term.

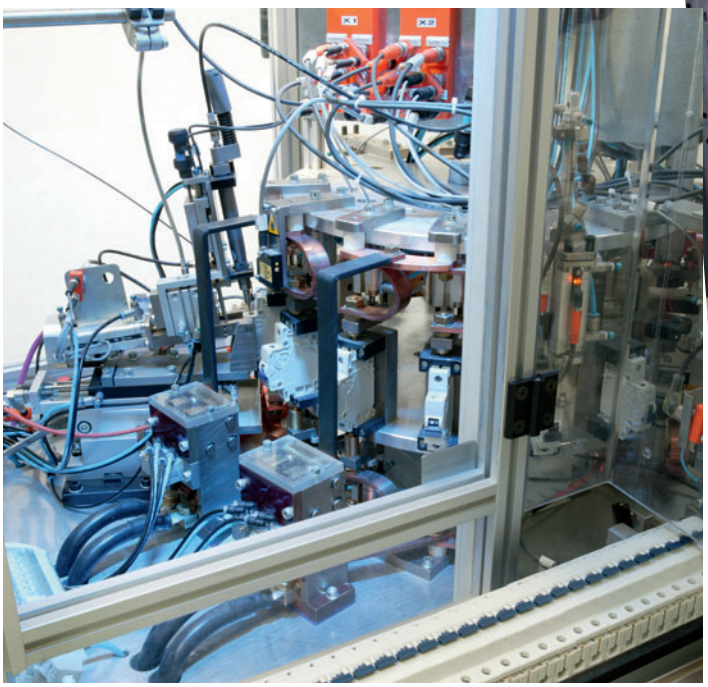
Quality control:
No compromises

Permanent quality monitoring with the assistance of the most up-to-date inspection procedures is a matter of course at ABL SURSUM. That is why there are no compromises when it comes to monitoring ongoing production and the final inspections.
ABL SURSUM is also certified according to DIN ISO 9001.



Logistics:
Service begins with delivery

In this day and age of tighter and tighter schedules, a well-organised distribution network and modern logistics ensure on-time delivery to both domestic and foreign markets. This ensures that ABL SURSUM with an export rate of over 50%, can deliver daily on-time to numerous customers all over the world.



ABL SURSUM

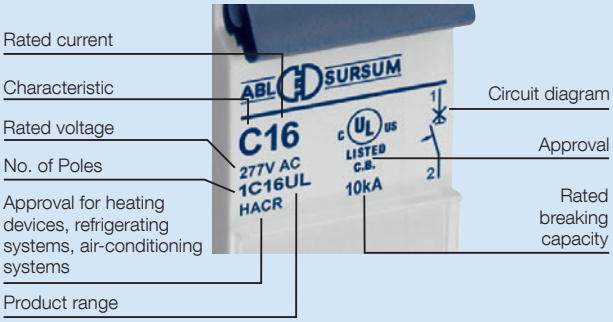
We are available for you – wherever you are

Representatives throughout Europe:	
Belgium	Netherlands
Denmark	Norway
Estonia	Austria
Finland	Poland
France	Portugal
Greece	Romania
Great Britain	Sweden
Ireland	Switzerland
Italy	Slovakia
Latvia	Spain
Lithuania	Czech Republic
Luxemburg	Hungary

International representatives:	
Egypt	Mexico
Argentina	New Zealand
Azerbaijan	Russia
Bolivia	Singapore
Bosnia Herzegovina	South Africa
Chile	Taiwan
China	Thailand
Georgia	Ukraine
India	USA
Iceland	Venezuela
Canada	United Arab Emirates
Croatia	Vietnam
Morocco	Belarus

1 Functional form

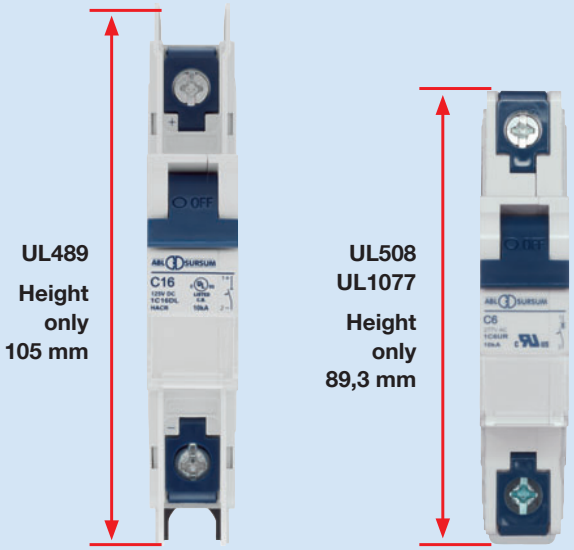
- Modern design
- User-friendly ergonomics
- Easy-to understand product designation
- Clearly legible ON/OFF labelling



3 UL Circuit breakers in an uniform and modern design

2 Compact design offering maximum wiring space

- With 105 mm installation height one of the smallest circuit breakers according to UL489
- With 89,3 mm the smallest UL508 manual motor controller
- The same small dimensions of 89,3 mm for UL1077 supplementary protector



4 Extensive application possibilities

- Three product ranges for circuit protection, manual motor controlling and supplementary protection applications
- AC and DC versions available
- European and North American standard tripping characteristics with the widest range of nominal ratings

- **UL489**

  AC, 0.3 - 63 A, 1-pole/2-pole/3-pole
  UL product range characteristics AC: B, C, D, Z

  DC, 0.3 - 63 A, 1-pole/2-pole
  DL product range characteristic C

- **UL508**

  0.3 - 63 A, 1-pole/2-pole/3-pole
  acc. to UL508 and CSA-22.2 No.14
  UM product range, B, C, D, G, E and Z characteristic
  B, C and D up to 25 A also acc. to IEC 60898-1,
  DIN EN 60898-1, VDE 0641-11

- **UL1077**

  0.5 - 63 A, 1-pole/2-pole/3-pole
  acc. to UL1077 and CSA-22.2 No.235
  UR product range characteristic B, C, and D

Switching Devices from ABL SURSUM have a lot to commend them

5 **Complete Product System**

- Full range of accessories for UL489 Circuit breakers
- Common line of accessories for UL508 and UL1077 Product lines
- Full range of auxiliary switches
- Shunt trip and neutral pole can be added on the left and the right side

c UL us
LISTED
C.B. ACC.
3NY7
File E 335632

Auxiliary contact | Shunt trip | Neutral switch | Lock-off/ Lock-on device | Touch protection caps

6 **Professional labeling System with a marking window**

Blank perforated labels available for one pole, two pole and three pole windows for convenient circuit indication

1 module

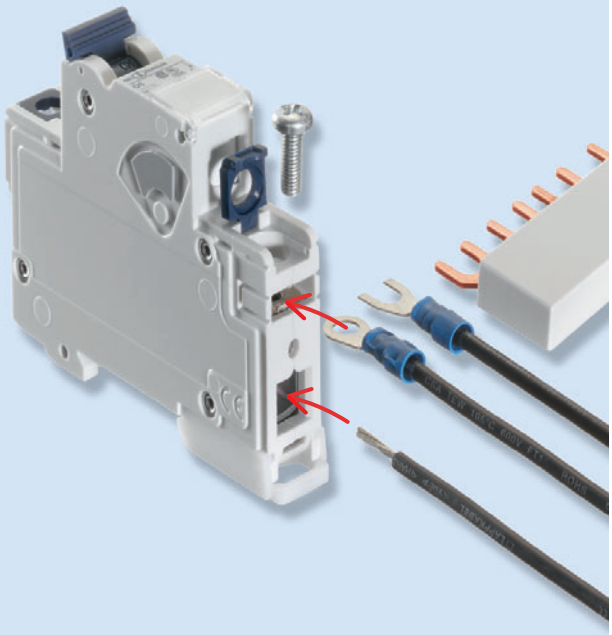
2 modules

3 modules

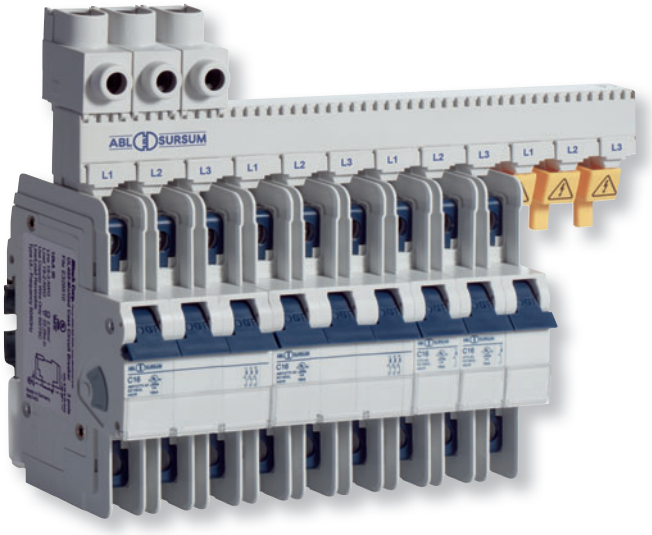
7 **Standard dual connection method for all three product ranges**

- Box clamp terminal (line load reversible)
- for solid and flexible conductors
  Top: 18-3AWG (1,0 mm^2 - 25 mm^2)
  Bottom: 18-2AWG (1,0 mm^2 - 35 mm^2)
- for busbars

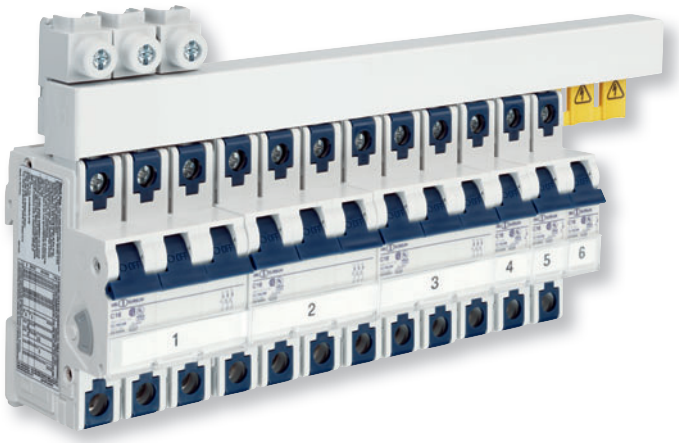
Unique way of connecting for convenient connection of all types of cable lugs (ring tonque and fork cable lugs)



Busbars available for UL489 device



Busbars available for UL508 and UL1077 device



Extensive application possibilities

- Extensive application possibilities
- Three product ranges for circuit protection, manual motor controlling and supplementary protection applications
- AC and DC versions available
- European and North American standard tripping characteristics with the widest range of nominal ratings

Product Range	UL			DL		UM **						UR **	
Standards	UL489					UL508						UL1077	
UL File	E 329510					E 137938						E 137915	
Rated voltage	240 V AC	277 V AC	480 V AC	125 V DC	250 V DC	277 V AC	480 V AC	42 V DC	80 V DC	24 V DC	60 V DC	277 V AC	480 V AC
Number of poles	1 / 1+N* / 2 / 3 / 3+N*	1 / 1+N*	2 / 3 / 3+N*	1	2	1 / 1+N*	2 / 3 / 3+N*	1	2	1	2	1 / 1+N*	2 / 3 / 3+N*
B - Characteristic						1-63 A	1-63 A	1-25 A	1-25 A	30-63 A	30-63 A	1-63 A	1-63 A
C - Characteristic	40-63 A	0.3-32 A	0.3-32 A	0.3-63 A	0.3-63 A	0.3-63 A	0.3-63 A	0.3-25 A	0.3-25 A	30-63 A	30-63 A	0.3-63 A	0.3-63 A
D - Characteristic	40-63 A	0.3-32 A	0.3-32 A			0.3-63 A	0.3-63 A	0.3-25 A	0.3-25 A	30-63 A	30-63 A	0.3-63 A	0.3-63 A
E - Characteristic						0.3-63 A	0.3-63 A	0.3-25 A	0.3-25 A	30-63 A	30-63 A		
G - Characteristic						0.3-63 A	0.3-63 A	0.3-25 A	0.3-25 A	30-63 A	30-63 A		
Z - Characteristic						0.3-50 A	0.3-50 A	0.3-25 A	0.3-25 A	30-50 A	30-50 A		

* N pole to be mounted separately

** UL approval up to 60 A

Full range of accessories for UL489 , UL508 and UL1077

- Auxiliary switches
- Shunt trip and Neutral pole can be added on the left and the right side

Lock-off/ Lock-on device

Neutral switch UL489

Shunt trip UL489

Auxiliary contact UL489

Neutral switch UL508 UL1077

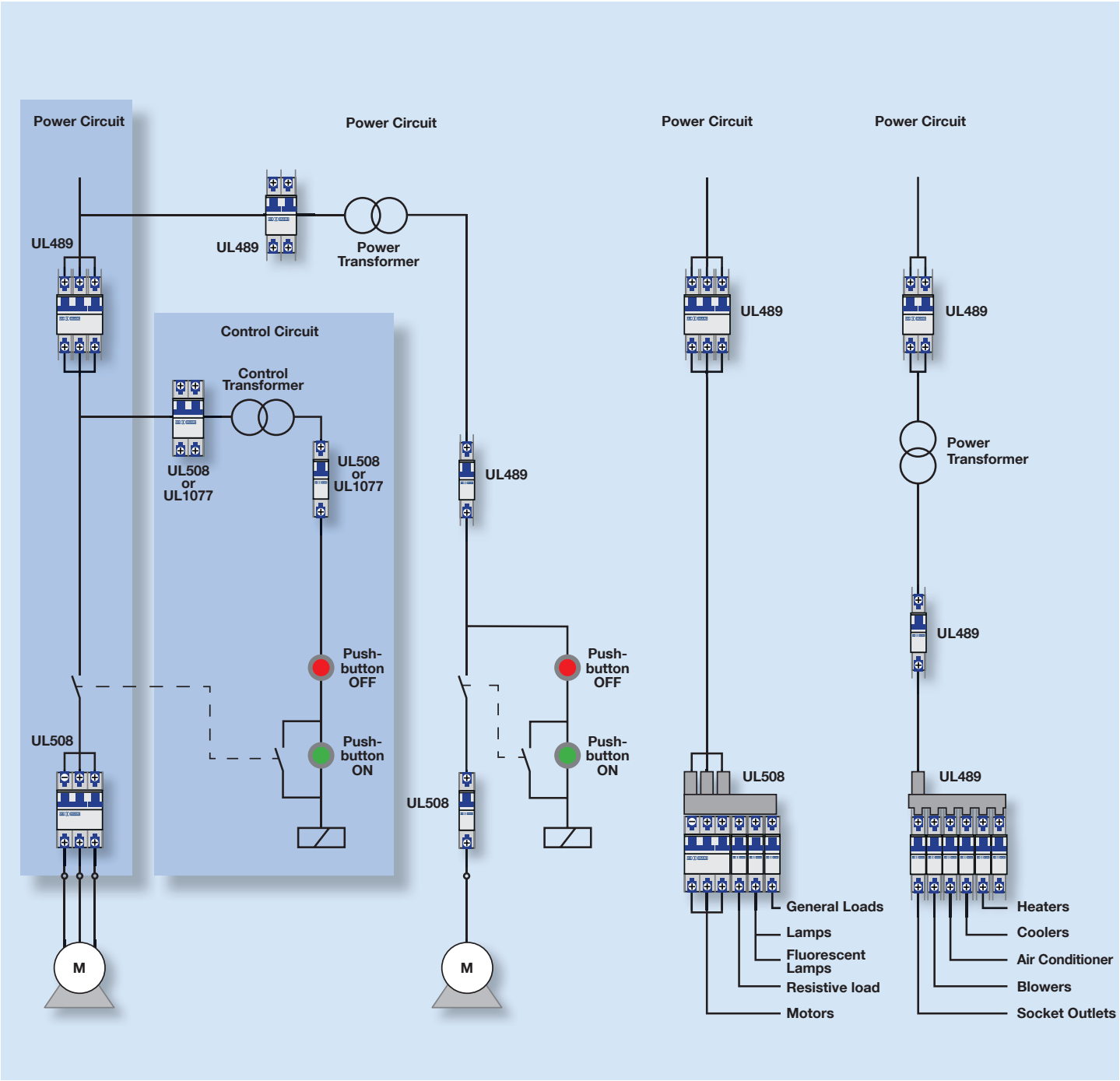
Shunt trip UL508 UL1077

Auxiliary contact UL508 UL1077

	UL489 Listed Circuit Breakers AC Distribution Equipment	UL508 Listed Manual Motor Controller Industriel Control Equipment	UL1077 Supplementary Protector
Main Characteristics			
Listed component	●	●	
Recognized components for supplementary protection only			●
Field wiring	●	●	
Factory wiring	●	●	●
Feeder circuit protection	●		
Branch circuit protection	●		
Control Circuits	●	●	●
Functions			
Short circuit protection	●		
Switching function	●	●	
Disconnect function	●	●	
Overload protection	●	●	●
Applications			
Heaters, coolesr, -air conditioning (HACR approval)	●		
Protection of outlets	●		
Transformers	●		
Motor protection	●	●	
Control transformers	●	●	●
Resistive load	●	●	●
Appliances, Business Equipment	●	●	●
General lamps	●	●	●
Fuorescent lamps	●	●	●

Wiring Diagram with Switching Devices acc. to UL489, UL508 and UL1077

Scematics according to European standards

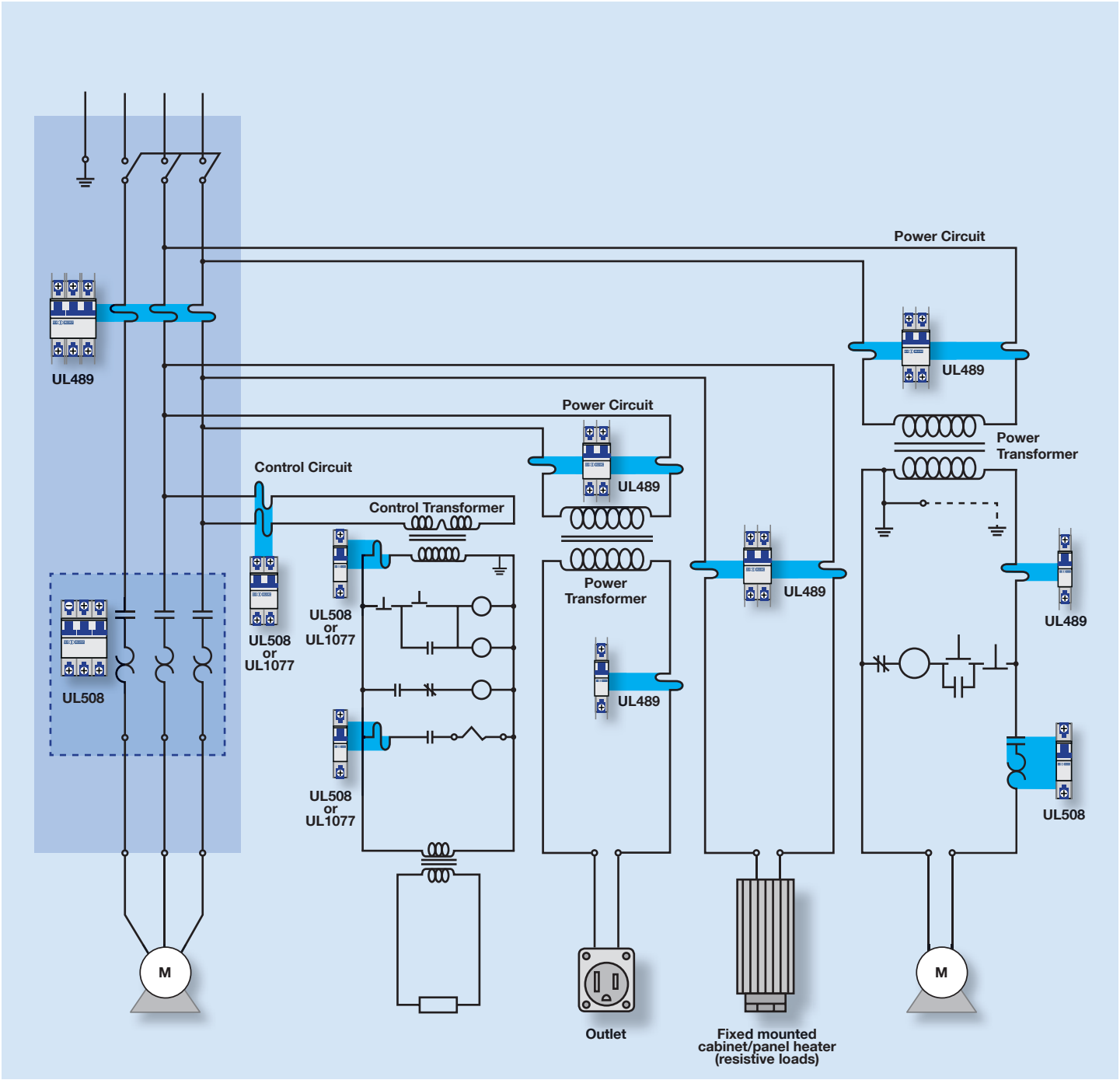


Sizing of main branch circuit protector according to table 430.52 in NEC®

- **Dual Element (Time Delay) Fuse**
  Maximum fuse = largest motor FLA x 175 %
  + FLA of all other motors and general loads in group
- **Inverse Time Breaker**
  Maximum circuit breaker = largest motor FLA x 250 %
  + FLA of all other motors and general loads in group
  (for other fuse/breaker types see table 430.52)

Wiring Diagram with Switching Devices acc. to UL489, UL508 and UL1077

Scematics according to North American standards



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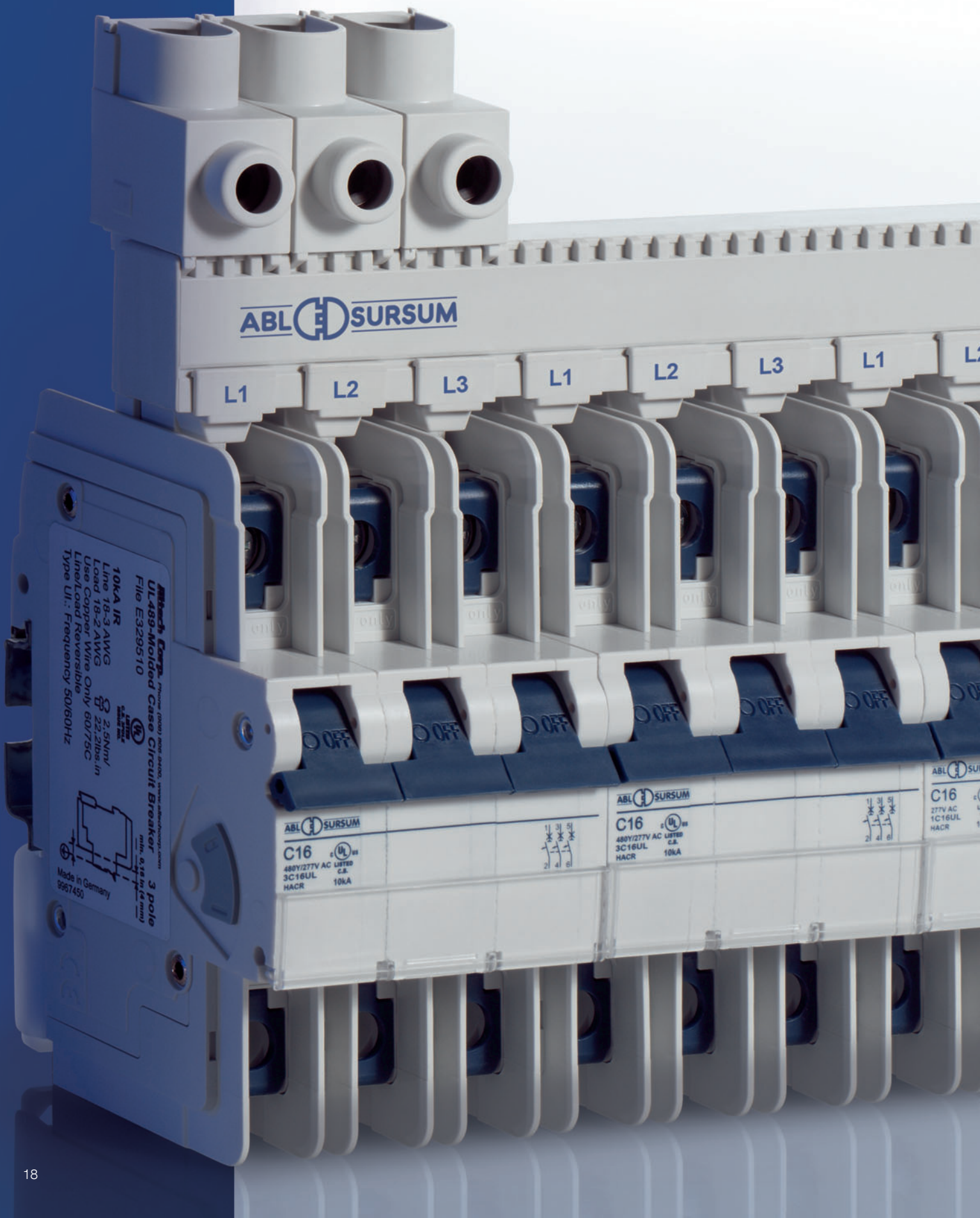

ABL SURSUM
L1
L2
L3
L1
L2
L3
L1
C16
480Y/277V AC
3C16UL
HACR
10kA
Made in Germany

Switching Devices according to UL489 and CSA-22.2 No. 5-09

Listed circuit breakers according to UL489 and CSA-22.2 No.5-09 help with the complex selection of the correct type and characteristics compared to traditional fuse installation, and offer a less space-consuming installation solution. Our range of miniature moulded case circuit breakers combined with our factory or field mounted accessories offer enhanced control and monitoring capabilities. Field mounting kits include all parts and instructions to ensure easy installation on site.

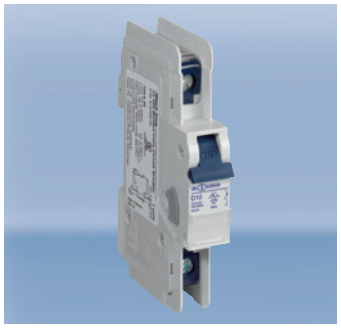
We supply 1, 2 and 3-pole-type switching devices according to UL489 from 0.3 to 63 Ampere and with C and D characteristics.
Furthermore, attachments such as neutral switches, auxiliary contacts and shunt trips are available for this system.
All accessories for modern busbar installations are available in accordance with the relevant UL standards.

Switching Devices
Listed Circuit Breakers AC

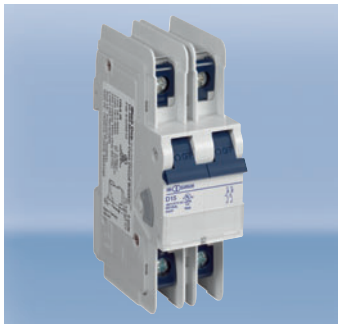
according to UL489 and CSA-22.2 No. 5-09
UL Product Range, AC Version, C and D Characteristics

c UL us LISTED C.B.

File E 329510



Rated current I_n A	Rated voltage Volt AC	Characteristic * C Article no.	Characteristic * D Article no.	Weight g/each	Packing unit
1-pole					
0.3	277/480	**1C03UL**	**1D03UL**	155	12
0.5	277/480	**1C05UL**	**1D05UL**	155	12
1	277/480	**1C1UL**	**1D1UL**	155	12
1.6	277/480	**1C1.6UL**	**1D1.6UL**	155	12
2	277/480	**1C2UL**	**1D2UL**	155	12
3	277/480	**1C3UL**	**1D3UL**	155	12
4	277/480	**1C4UL**	**1D4UL**	155	12
5	277/480	**1C5UL**	**1D5UL**	155	12
6	277/480	**1C6UL**	**1D6UL**	155	12
8	277/480	**1C8UL**	**1D8UL**	155	12
10	277/480	**1C10UL**	**1D10UL**	155	12
12	277/480	**1C12UL**	**1D12UL**	155	12
13	277/480	**1C13UL**	**1D13UL**	155	12
15	277/480	**1C15UL**	**1D15UL**	155	12
16	277/480	**1C16UL**	**1D16UL**	155	12
20	277/480	**1C20UL**	**1D20UL**	155	12
25	277/480	**1C25UL**	**1D25UL**	155	12
30	277/480	**1C30UL**	**1D30UL**	155	12
32	277/480	**1C32UL**	**1D32UL**	155	12
40	240	**1C40UL**	**1D40UL**	155	12
50	240	**1C50UL**	**1D50UL**	155	12
60	240	**1C60UL**	**1D60UL**	155	12
63	240	**1C63UL**	**1D63UL**	155	12



2-pole					
0.3	277/480	**2C03UL**	**2D03UL**	310	6
0.5	277/480	**2C05UL**	**2D05UL**	310	6
1	277/480	**2C1UL**	**2D1UL**	310	6
1.6	277/480	**2C1.6UL**	**2D1.6UL**	310	6
2	277/480	**2C2UL**	**2D2UL**	310	6
3	277/480	**2C3UL**	**2D3UL**	310	6
4	277/480	**2C4UL**	**2D4UL**	310	6
5	277/480	**2C5UL**	**2D5UL**	310	6
6	277/480	**2C6UL**	**2D6UL**	310	6
8	277/480	**2C8UL**	**2D8UL**	310	6
10	277/480	**2C10UL**	**2D10UL**	310	6
12	277/480	**2C12UL**	**2D12UL**	310	6
13	277/480	**2C13UL**	**2D13UL**	310	6
15	277/480	**2C15UL**	**2D15UL**	310	6
16	277/480	**2C16UL**	**2D16UL**	310	6
20	277/480	**2C20UL**	**2D20UL**	310	6
25	277/480	**2C25UL**	**2D25UL**	310	6
30	277/480	**2C30UL**	**2D30UL**	310	6
32	277/480	**2C32UL**	**2D32UL**	310	6
40	240	**2C40UL**	**2D40UL**	310	6
50	240	**2C50UL**	**2D50UL**	310	6
60	240	**2C60UL**	**2D60UL**	310	6
63	240	**2C63UL**	**2D63UL**	310	6

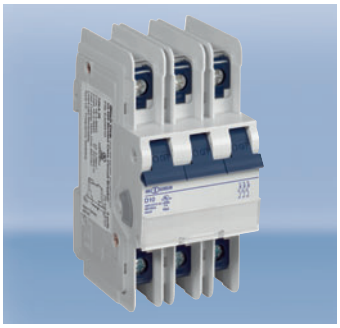
*** Also available in B and Z characteristics on request**

Switching Devices
Listed Circuit Breakers AC

according to UL489 and CSA-22.2 No. 5-09
UL Product Range, AC Version, C and D Characteristics

c UL us LISTED C.B.

File E 329510

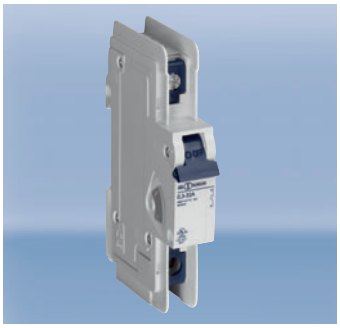


Rated current I_n A	Rated voltage Volt AC	Characteristic * C Article no.	Characteristic * D Article no.	Weight g/each	Packing unit
3-pole					
0.3	277/480	**3C03UL**	**3D03UL**	415	4
0.5	277/480	**3C05UL**	**3D05UL**	415	4
1	277/480	**3C1UL**	**3D1UL**	415	4
1.6	277/480	**3C1.6UL**	**3D1.6UL**	415	4
2	277/480	**3C2UL**	**3D2UL**	415	4
3	277/480	**3C3UL**	**3D3UL**	415	4
4	277/480	**3C4UL**	**3D4UL**	415	4
5	277/480	**3C5UL**	**3D5UL**	415	4
6	277/480	**3C6UL**	**3D6UL**	415	4
8	277/480	**3C8UL**	**3D8UL**	415	4
10	277/480	**3C10UL**	**3D10UL**	415	4
12	277/480	**3C12UL**	**3D12UL**	415	4
13	277/480	**3C13UL**	**3D13UL**	415	4
15	277/480	**3C15UL**	**3D15UL**	415	4
16	277/480	**3C16UL**	**3D16UL**	415	4
20	277/480	**3C20UL**	**3D20UL**	415	4
25	277/480	**3C25UL**	**3D25UL**	415	4
30	277/480	**3C30UL**	**3D30UL**	415	4
32	277/480	**3C32UL**	**3D32UL**	415	4
40	240	**3C40UL**	**3D40UL**	415	4
50	240	**3C50UL**	**3D50UL**	415	4
60	240	**3C60UL**	**3D60UL**	415	4
63	240	**3C63UL**	**3D63UL**	415	4

*** Also available in B and Z characteristics on request**

c UL us LISTED C.B. ACC. 3NY7

File E 335632



Rated current I_n A	Rated voltage Volt AC	Test currents * electromagnetic not tripping I_4 A	Test currents * electromagnetic tripping I_5 A	Article no.	Weight g/each	Packing unit
Neutral switch – for mounting instructions please consult page 9						
0.3 - 32	277/480	400	700	**N32UL**	165	6
40 - 63	240	630	1000	**N63UL**	165	6

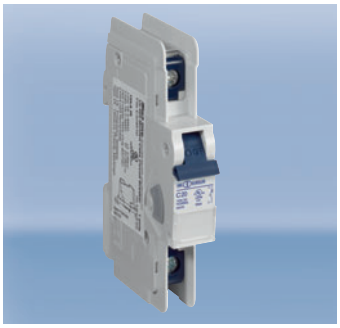
* additional electromagnetic protection

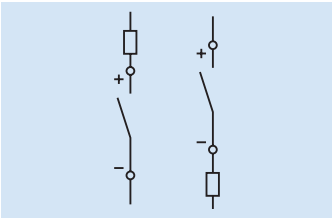
Switching Devices
Listed Circuit Breakers DC

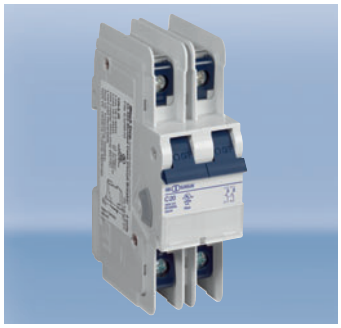
according to UL489 and CSA-22.2 No. 5-09
DL Product Range, DC Version, C Characteristic

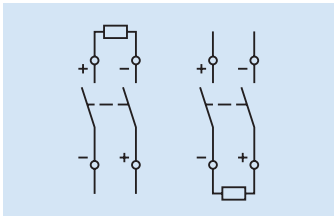
c UL us LISTED C.B.

File E 329510









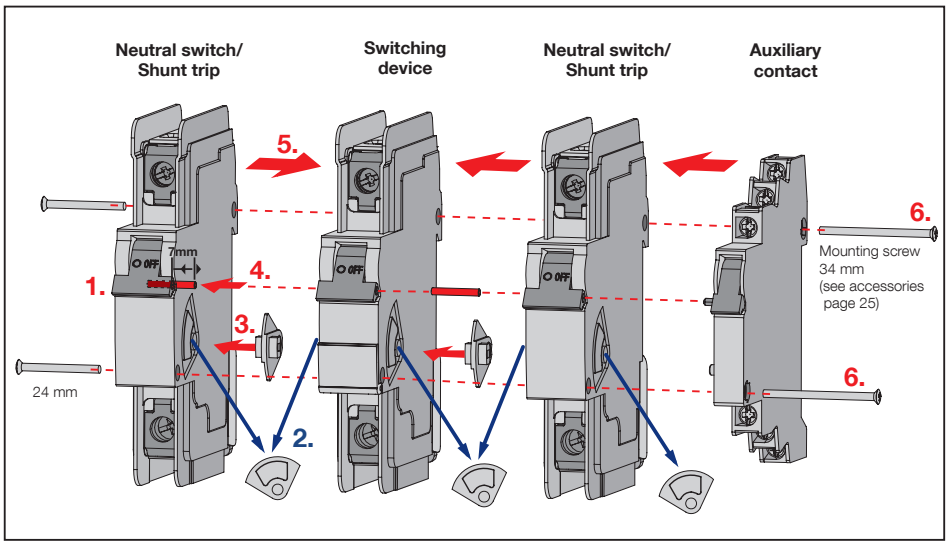
Rated current I_n A	Rated voltage Volt DC	Characteristic C Article no.	Weight g/each	Packing unit
1-pole				
0.3	125	**1C03DL**	165	12
0.5	125	**1C05DL**	165	12
1	125	**1C1DL**	165	12
1.6	125	**1C1.6DL**	165	12
2	125	**1C2DL**	165	12
3	125	**1C3DL**	165	12
4	125	**1C4DL**	165	12
5	125	**1C5DL**	165	12
6	125	**1C6DL**	165	12
8	125	**1C8DL**	165	12
10	125	**1C10DL**	165	12
12	125	**1C12DL**	165	12
13	125	**1C13DL**	165	12
15	125	**1C15DL**	165	12
16	125	**1C16DL**	165	12
20	125	**1C20DL**	165	12
25	125	**1C25DL**	165	12
30	125	**1C30DL**	165	12
32	125	**1C32DL**	165	12
40	125	**1C40DL**	165	12
50	125	**1C50DL**	165	12
60	125	**1C60DL**	165	12
63	125	**1C63DL**	165	12
2-pole				
0.3	250	**2C03DL**	330	6
0.5	250	**2C05DL**	330	6
1	250	**2C1DL**	330	6
1.6	250	**2C1.6DL**	330	6
2	250	**2C2DL**	330	6
3	250	**2C3DL**	330	6
4	250	**2C4DL**	330	6
5	250	**2C5DL**	330	6
6	250	**2C6DL**	330	6
8	250	**2C8DL**	330	6
10	250	**2C10DL**	330	6
12	250	**2C12DL**	330	6
13	250	**2C13DL**	330	6
15	250	**2C15DL**	330	6
16	250	**2C16DL**	330	6
20	250	**2C20DL**	330	6
25	250	**2C25DL**	330	6
30	250	**2C30DL**	330	6
32	250	**2C32DL**	330	6
40	250	**2C40DL**	330	6
50	250	**2C50DL**	330	6
60	250	**2C60DL**	330	6
63	250	**2C63DL**	330	6

Correct polarity must be ensured when connecting the DC switching devices!

Accessories for Switching Devices Listed Circuit Breakers

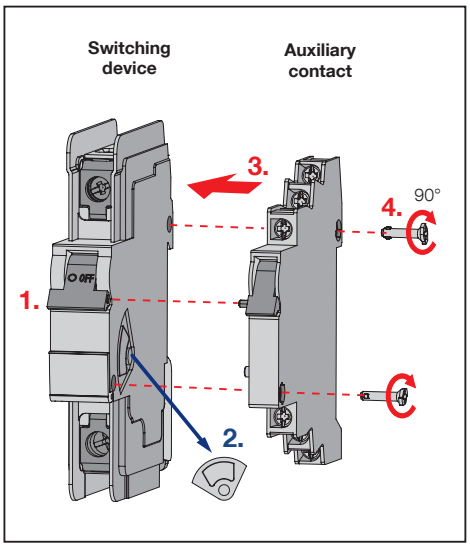
according to UL489 and CSA-22.2 No. 5-09 for Product Ranges UL and DL

Mounting Instructions of Accessories



Applies to N...UL and FA...UL:
The accessory devices N...UL and FA...UL can be mounted **on the right or left.**
The auxiliary contact H...UL can only be mounted **on the right.**

Mounting:
1. Bring the blue knobs of all devices into the "OFF" position
2. Remove grey cover from the switching device and attachment
3. Insert drive plate between the switching device and N...UL or FA...UL
4. Insert connecting pin into the knob (insertion depth approx. 7 mm)
5. Combine switching device and N...UL or FA...UL
6. Screw devices together (observe correct screw length)



Applies to H...UL:
The auxiliary contact H...UL can only be mounted **on the right.**

Mounting:
1. Bring the blue knobs of both devices into the "OFF" position
2. Remove grey cover from the switching device
3. Combine switching device and H...UL
4. Insert connection screws and connect the two devices by turning the screws by 90°
5. After mounting close and open to check operation

Applies to all switching devices ...UL, ...DL, N32UL, N63UL and FA...UL:
The load and mains can be connected either from the top or the bottom (Line/Load Reversible).

Box terminal for
- solid conductors
- flexible conductors with or without cable lug

Screw terminal for forked cable lug

Screw terminal for ring cable lug (ring tongue)

Design of the terminals

- Optical detection of the screw position
- Increased break resistance if the screwdriver becomes jammed
- Universal connecting terminals, suitable for connecting all known cable lugs such as ring or forked cable lugs and pin terminals
- Ring cable lugs can be connected by opening the flap and removing the connecting screw
- Can also be used for applications that require ring cable lugs (e.g. nuclear power stations)
- Protection against contact with live parts according to DIN EN 50274, VDE 0660-514 is fully guaranteed

Accessories for Switching Devices
Listed Circuit Breakers

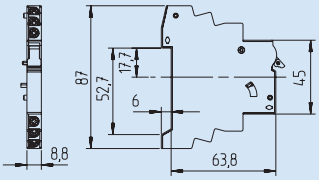
according to UL489 and CSA-22.2 No. 5-09
for Product Ranges UL and DL

c UL us LISTED
C.B. ACC. 3NY7

File E 335632

Auxiliary contact, for mounting on the right

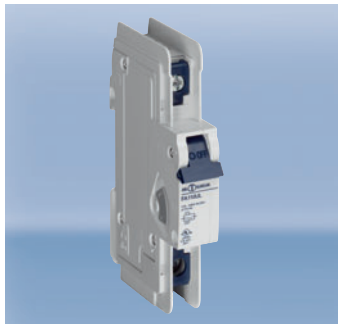
Module	Type of contact	Contacts	**Article no.**	Weight g/each	Packing unit
1/2	1 auxiliary contact	1NO	**H10UL**	35	6
1/2	2 auxiliary contacts	1NO + 1NC	**H11UL**	40	6
1/2	3 auxiliary contacts	1NO + 2NC	**H12UL**	45	6
1/2	3 auxiliary contacts	2NO + 1NC	**H21UL**	45	6



Standards	UL489 and CSA-22.2 Nr. 5-09	
Rated operating currents	10 A /240 V AC 3 A / 110 V DC 1 A / 220 V DC	
Minimum contact load	1 mA at 24 V DC	
Conductor cross sections		
Type of conductor *)	min.	max.
Single wire	1.0 mm² (AWG18)	2.5 mm² (AWG14)
Stranded wire	1.0 mm² (AWG18)	1.5 mm² (AWG16)
Stranded wire with ferrule	1.0 mm² (AWG18)	1.5 mm² (AWG16)
Torque	max. 0.8 Nm (7 lb.in)	

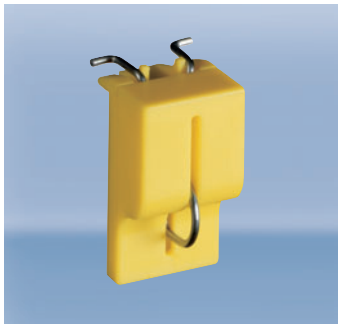
***) Stripped length 8 - 9 mm**

( ) values in brackets = measurement units for North America



Shunt trip, for mounting on the right or left

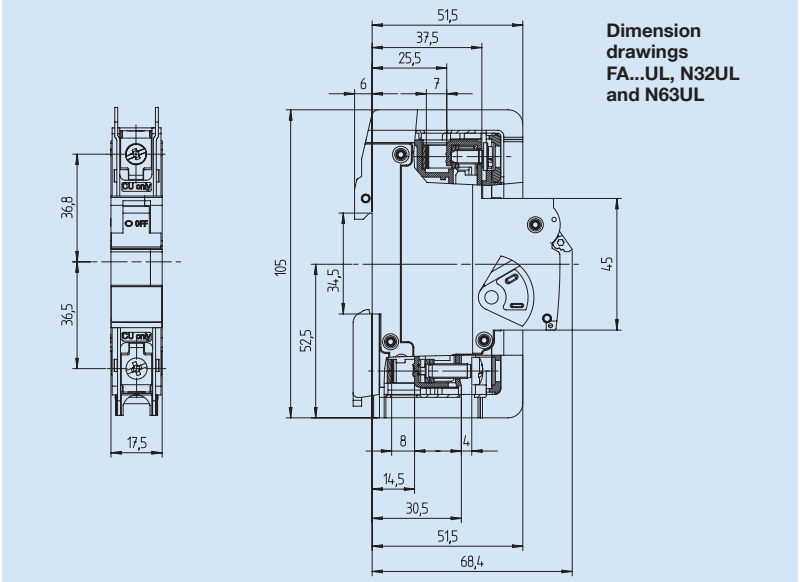
Module	Rated operating voltage	max. operating current at U_n (t < 10 ms)	**Article no.**	Weight g/each	Packing unit
1	12 V UC	1.3 A	**FA12UL**	110	5
1	24 V UC	0.6 A	**FA24UL**	110	5
1	48 - 72 V UC	0.2 A	**FA48UL**	110	5
1	110 - 240 V UC, 277 V AC	0.25 A at 110 V	**FA110UL**	110	5
		0.5 A at 240 V			
		0.58 A at 277 V			



Lock-off/Lock-on device

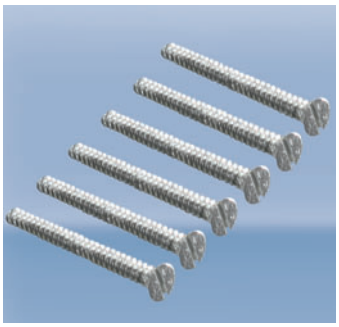
Article no.	Weight g/each	Packing unit
EASS	2	10

Dimension drawings FA...UL, N32UL and N63UL



Accessories for Switching Devices
Listed Circuit Breakers

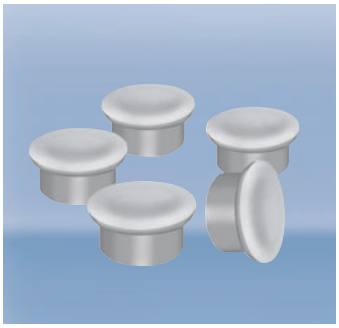
according to UL489 and CSA-22.2 No. 5-09
for Product Ranges UL and DL



Mounting screw 34 mm

to connect the auxiliary contact and shunt trip or neutral switch to the switching devices

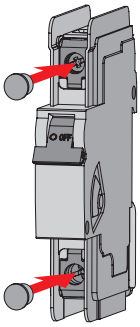
Packing unit: 10 pieces
Article no. E983419



Touch-protection caps

to cover the connecting screws on the switching devices, neutral switches and shunt trips for increased touch protection

Packing unit: 100 pieces
Article no. BS.UL



Busbars pin type					
Cross section [mm²]	Busbar current	Number of poles	**Article no.**	Weight g/each	Packing unit
1-phase					
16	115	6	**S106U**	58	1
16	115	12	**S112U**	115	1
2-phase					
16	115	6	**S206U**	67	1
16	115	12	**S216U**	132	1
3-phase					
16	115	6	**S306U**	72	1
16	115	12	**S316U**	140	1
Power feed terminals					
6 - 35	115		**AK35U**	33	3
Protection cover for busbars					
			S3BRU	5	5

Busbars cannot be cut to length!

Switching Devices
Listed Circuit Breakers AC

according to UL489 and CSA-22.2 No. 5-09
Technical Data Product Range UL

c UL us LISTED C.B. File E 329510

Characteristic *		C	D
Application		Lighting Wiring protection Control circuits Business equipment Appliances Motors low inrush	Transformers Power supplies Heaters Motors high inrush Reactive load
Number of poles		1 - 3; 1 + N; 3 + N	
Standards		UL489 and CSA-22.2 Nr. 5-09	
Interrupting capacity		10 kA	
Back-up fuse ≤ 10 kA interrupting capacity		none	
Rated voltage AC 50/60 Hz 0.3 - 32 A		277 / 480 V	
Rated voltage AC 50/60 Hz 40 - 63 A		240 V	
Rated current range		0.3 - 63 A	0.3 - 63 A
Test currents	Thermal not tripping I_1 (A) > 1 h	1.05 x I_n	1.05 x I_n
	Thermal tripping I_2 (A) < 1 h	1.35 x I_n	1.35 x I_n
	Electromagnetic not tripping I_4 (A) > 0.1 s	5 x I_n	10 x I_n
	Electromagnetic tripping I_5 (A) < 0.1 s	10 x I_n	16 x I_n
Reference calibration temperature of the thermal tripping		40 °C Influence of the ambient temperature on the thermal release: Decrease of the current values with higher ambient temperature and increase with lower temperatures of approximately 5 % per 10 °C difference in temperature	
Frequency range of the electromagnetic trip		16 $^2/_3$ to 60 Hz With higher frequencies, the electromagnetic tripping values increase by approximately a factor of 1.1 at 100 Hz; 1.2 at 200 Hz; 1.3 at 300 Hz; 1.4 at 400 Hz; 1.5 for DC	
Ambient temperature		-25 °C to +55 °C	
Storage temperature		-40 °C to +70 °C	
Device depth according to DIN 43880		68 mm	
Mechanical life		10,000 switching cycles (ON / OFF)	
Protection cover		Finger safe and safe to back of hand according to DIN EN 50274, VDE 0660-514	
Degree of protection acc. EN / IEC 60529		IP20	
Installation position		any	
Mounting		DIN-rail according to DIN EN 60715 35 mm	
Lockability		The handle can be secured against manual switching in the on and off position by a lead seal	
Climatic resistance		Humid heat constant according to DIN EN 60068-2-78 Humid heat cycle according to DIN EN 60068-2-30	
Vibration resistance		> 15 g according to DIN EN 60068-2-59 during a load with I_1	
Resistance to mechanical shocks		25 g 11 ms	

*** Other switching devices in B and Z characteristics available on request**

Switching Devices
Listed Circuit Breakers DC

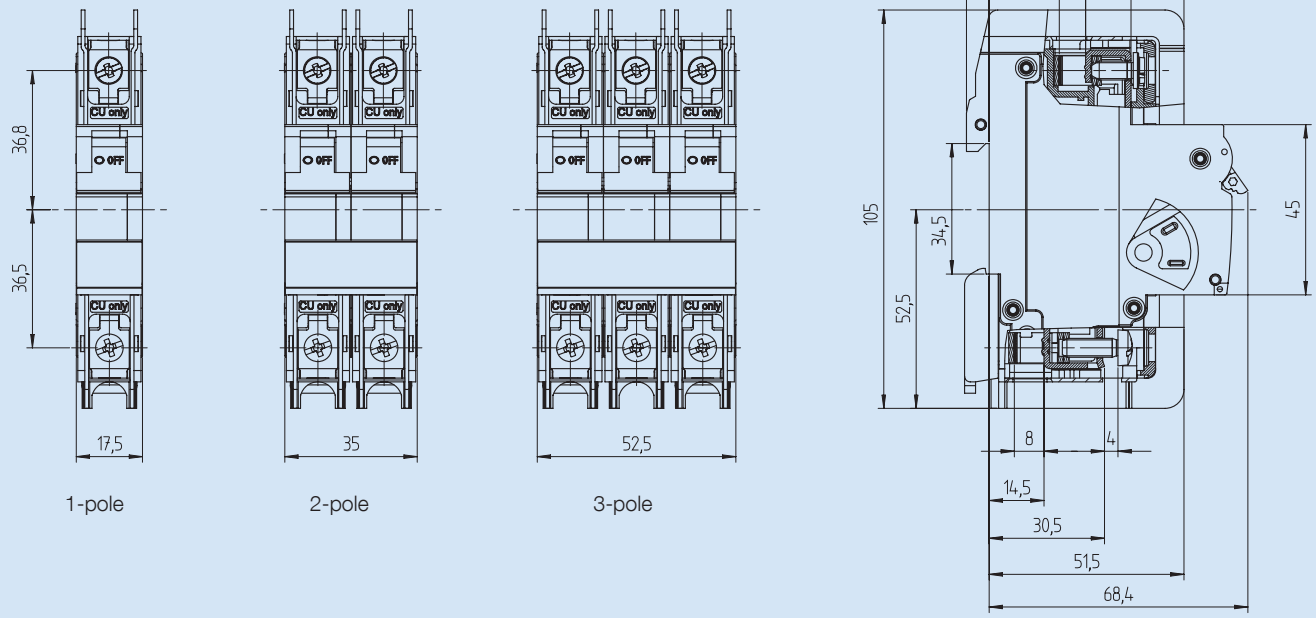
according to UL489 and CSA-22.2 No. 5-09
Technical Data Product Range DL

c UL us LISTED C.B. File E 329510

Characteristic		C
Application		Lighting Wiring protection Control circuits Business equipment Appliances Motors low inrush
Number of poles		1 and 2
Standards		UL489 and CSA-22.2 Nr. 5-09
Interrupting capacity		10 kA
Back-up fuse ≤ 10 kA interrupting capacity		none
Rated voltage DC 1-pole		125 V
Rated voltage DC 2-pole		250 V
Rated current range		0.3 - 63 A
Test currents	Thermal not tripping I_1 (A) > 1 h	1.05 x I_n
	Thermal tripping I_2 (A) < 1 h	1.35 x I_n
	Electromagnetic not tripping I_4 (A) > 0.1 s	7 x I_n
	Electromagnetic tripping I_5 (A) < 0.1 s	14 x I_n
Reference calibration temperature of the thermal tripping		40 °C Influence of the ambient temperature on the thermal release: Decrease of the current values with higher ambient temperature and increase with lower temperatures of approximately 5 % per 10 °C difference in temperature
Ambient temperature		-25 °C to +55 °C
Storage temperature		-40 °C to +70 °C
Device depth according to DIN 43880		68 mm
Mechanical life		10,000 switching cycles (ON / OFF)
Protection cover		Finger safe and safe to back of hand according to DIN EN 50274, VDE 0660-514 BGV A3
Degree of protection acc. EN / IEC 60529		IP20
Installation position		any
Mounting		DIN-rail according to DIN EN 60715 35 mm
Lockability		The handle can be secured against manual switching in the on and off position by a lead seal
Climatic resistance		Humid heat constant according to DIN EN 60068-2-78 Humid heat cycle according to DIN EN 60068-2-30
Vibration resistance		> 15 g according to DIN EN 60068-2-59 during a load with I_1
Resistance to mechanical shocks		25 g 11 ms

c UL us LISTED C.B. File E 329510

Dimension drawings product ranges UL and DL



c UL us LISTED C.B. File E 329510

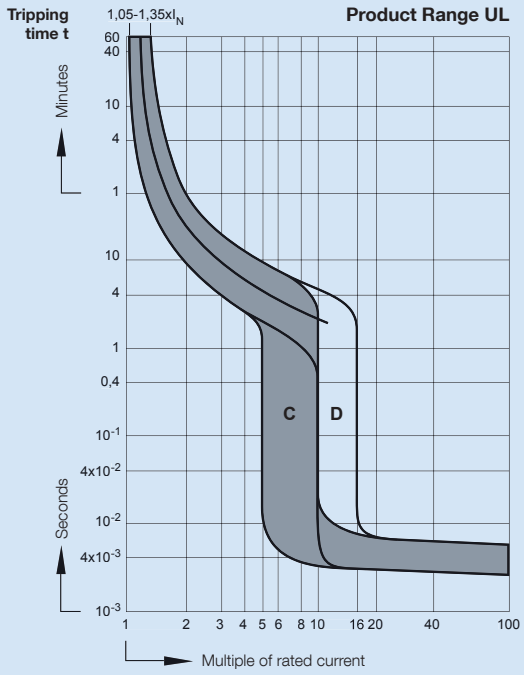
	Conductor cross sections			
	Box terminal bottom		Box terminal top	
Type of conductor *)	max.	min.	max.	min.
Single wire	35 mm² (AWG2)	1.0 mm² (AWG18)	25 mm² (AWG3)	1.0 mm² (AWG18)
Multiple wire	35 mm² (AWG2)	16 mm² (AWG6)	25 mm² (AWG3)	16 mm² (AWG6)
Stranded wire	25 mm² (AWG3)	1.0 mm² (AWG18)	16 mm² (AWG6)	1.0 mm² (AWG18)
Stranded wire with ferrule	16 mm² (AWG6)	1.0 mm² (AWG18)	16 mm² (AWG6)	1.0 mm² (AWG18)
Busbar cable lug	up to 3 mm thickness		up to 1.5 mm thickness	
Combined, conductor and busbar or cable lug	up to 35 mm² and up to 2 mm thickness		not possible	
Torque	max. 2.5 Nm (22.2 lb.in)			

***) Stripped lengths: 12 - 14 mm at the bottom, 10 - 12 mm at the top**
( ) values in brackets = measurement units for North America
Copper conductor with sheath insulation for 60/75 °C

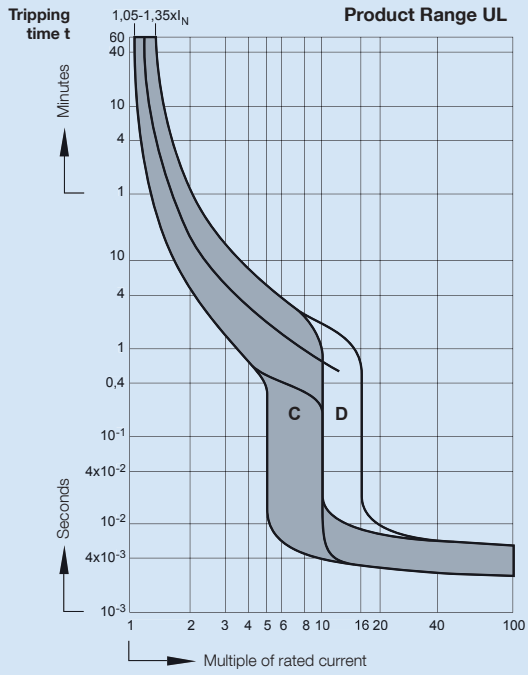
Internal Resistance for Product Ranges UL and DL

Rated current [A]	Trip characteristic	
	C [Ohm]	D [Ohm]
0.3	16.8620	16.8620
0.5	6.8540	6.0009
1.0	1.7000	1.7560
1.6	0.5870	0.5870
2.0	0.4190	0.4190
3.0	0.2020	0.2020
4.0	0.1090	0.1090
5.0	0.0654	0.0654
6.0	0.0528	0.0491
8.0	0.0278	0.0240
10	0.0216	0.0187
12	0.0084	0.0085
13	0.0084	0.0085
15/16	0.0085	0.0076
20	0.0067	0.0064
25	0.0050	0.0041
30/32	0.0032	0.0027
40	0.0025	0.0022
50	0.0019	0.0018
60/63	0.0018	0.0017

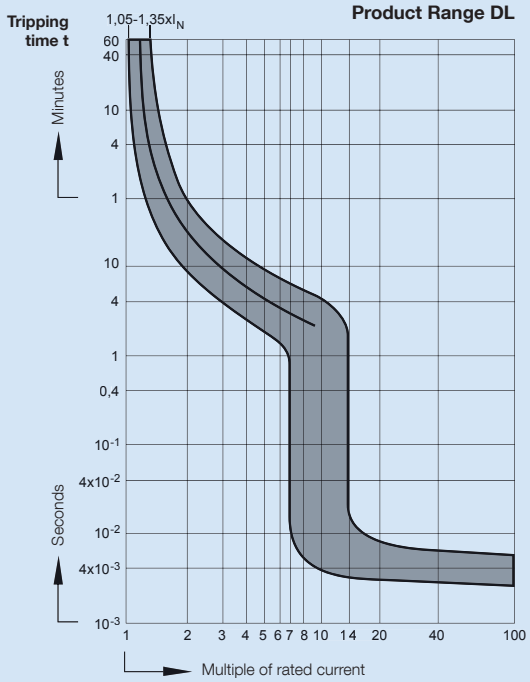
c UL us LISTED C.B. File E 329510



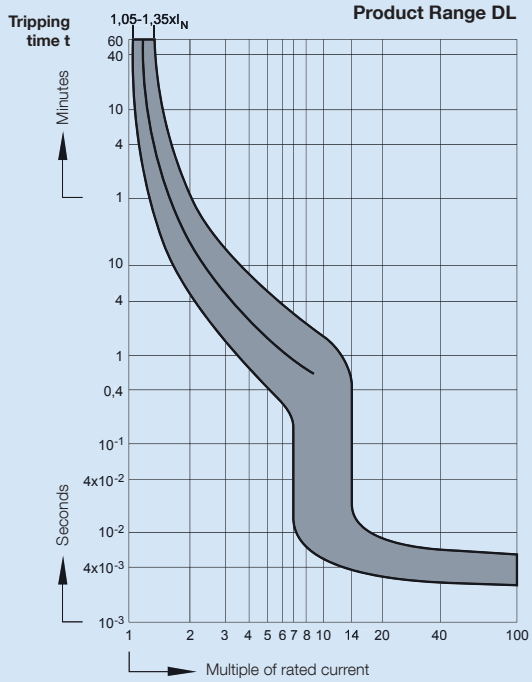
C and D characteristic AC I_n = 0,3 - 10 A
UL



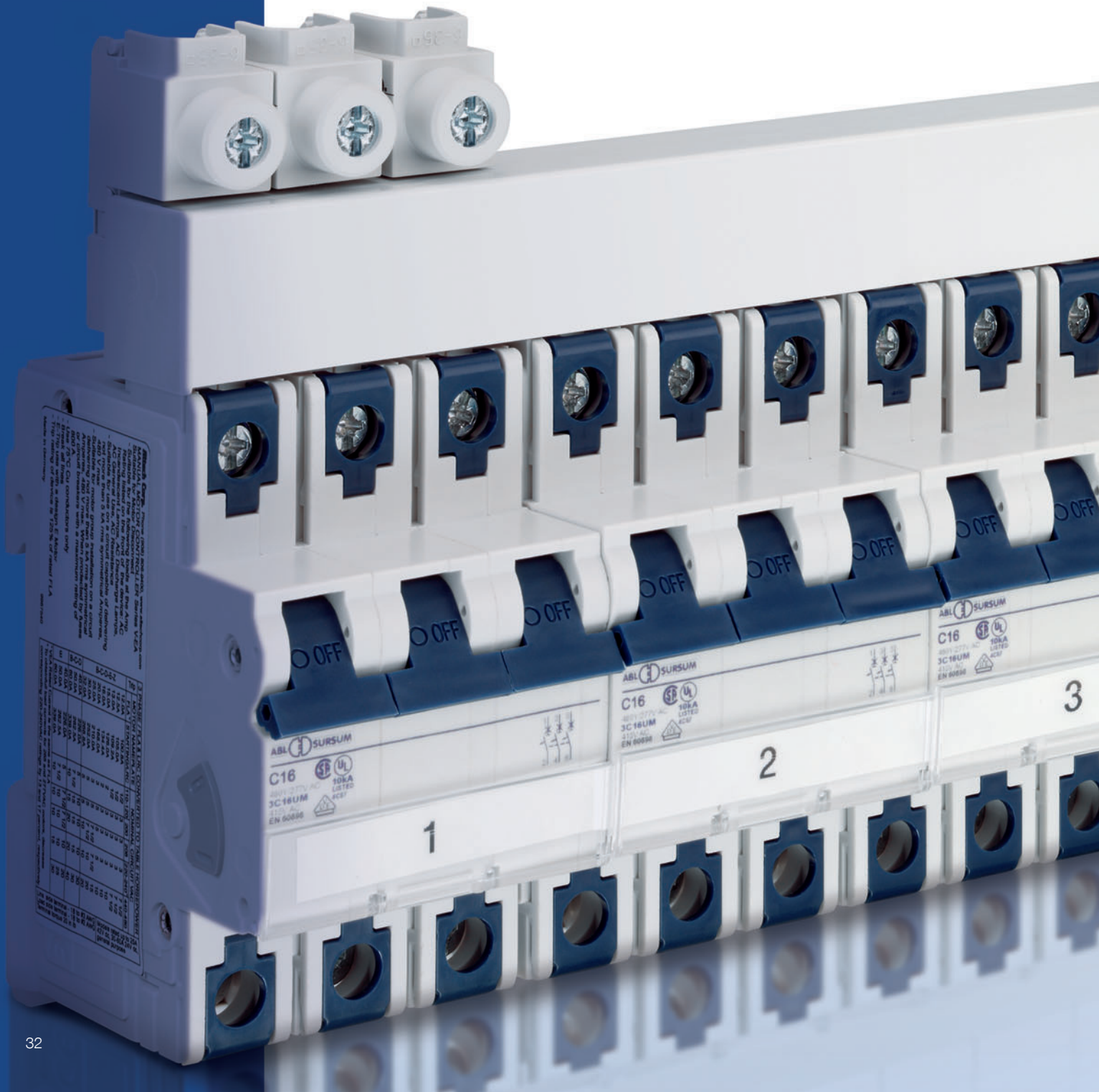
C and D characteristic AC I_n = 12 - 63 A
UL



C characteristic DC I_n = 0,3 - 10 A
UL



C characteristic DC I_n = 12 - 63 A
UL


OFF
C16
1
2
3

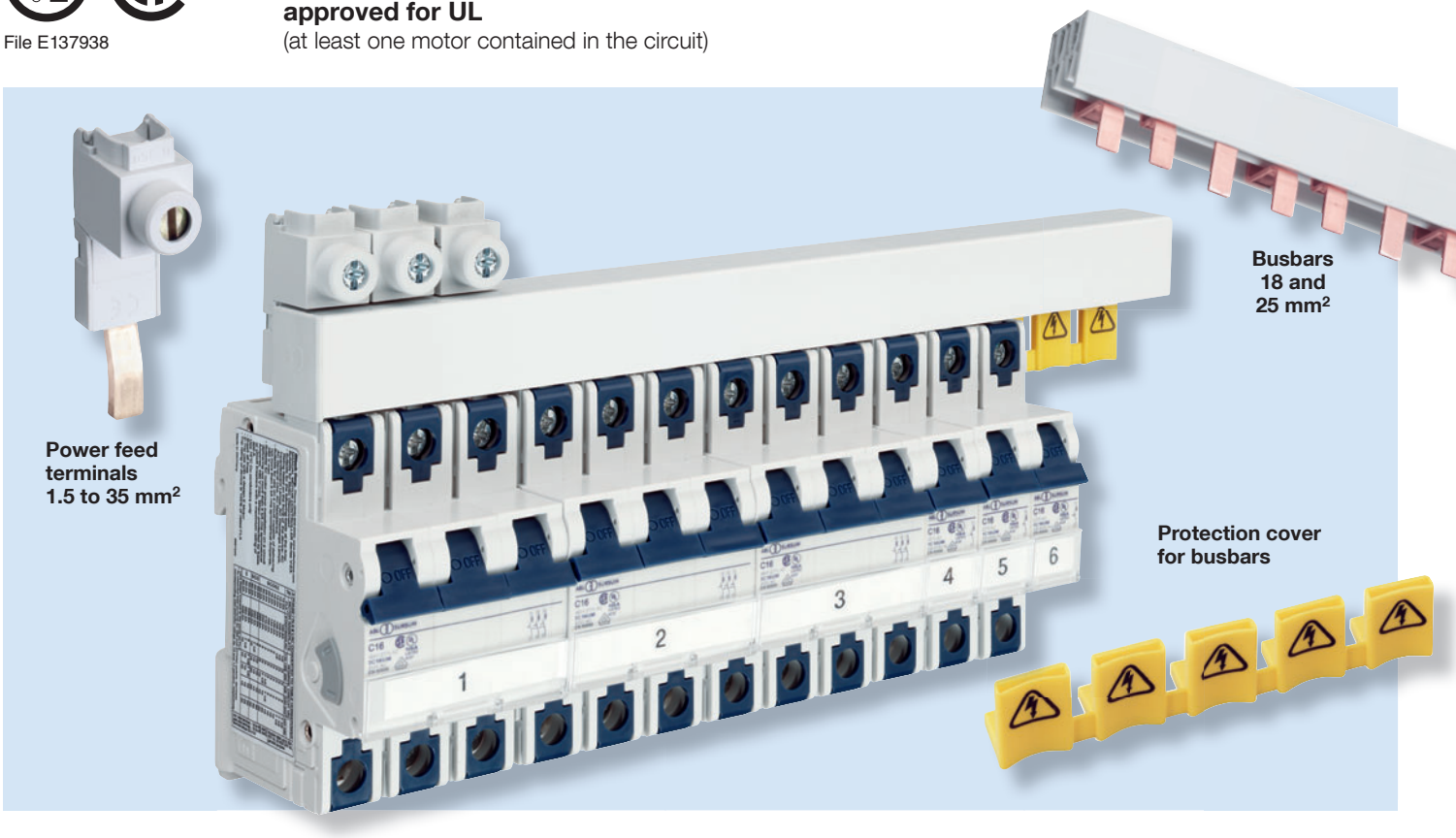
ABL SURSUM Switching Devices according to UL508 and CSA-22.2 no. 14

Manual motor controllers according to UL508 and CSA-22.2 are considered to be control equipment without the function of short circuit protection.
Our range of UL508 motor controllers in the design of a "miniature circuit breaker" offers a convenient installation solution with the availability of single and double pole versions – especially for single phase motors.
They are "Suitable as Motor Disconnect" and they can be used for "Motor Starting Across the Line". In addition, with the wide range of tripping characteristics, it is the ideal protection in some specific applications.
The "Z" characteristic offers the best protection of electronic devices, semiconductors and components with low surge currents and withstand capabilities.

Our range offers 1, 2 and 3 pole devices, available in the UL characteristics G and E, as well as in the IEC characteristics B, C, D, and Z. In combination with the typical nominal ratings of both standards, we can offer the ideal protection in each application.
Our system is most convenient for applications up to 25 A, where our devices carry the IEC and the UL approval. Together with UL approved busbar technology, the installation can be easily adapted for both standards, and offers OEMs to broadly standardise the electrical installation independently of the location where the equipment will later be used.

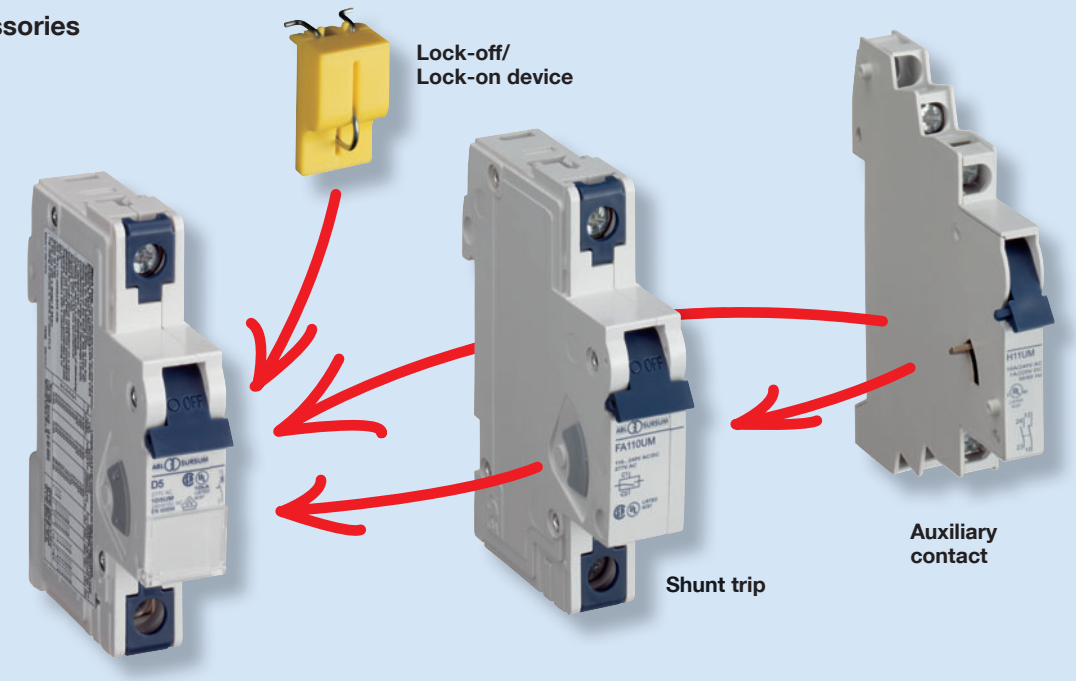
File E137938

European-type of busbar wiring tested and approved for UL
(at least one motor contained in the circuit)



UL-approved accessories

File E137938



Switching devices
1-pole to 3-pole
Neutral switch
can be mounted

Characteristic:
B, C, D, E, G and Z

Rated currents:
0.3 to 63 A
(63 A without UL approval)

Switching Devices
Manual Motor Controller

according to UL508 and CSA-22.2 No.14
UM Product Range, B, C, D,G, E and Z Characteristic
B, C and D also acc. to IEC 60898-1, DIN EN 60898-1, VDE 0641-11 (B, C, D Characteristic 0.3 - 25 A)

File E137938

Rated current I_n A	Characteristic B Article no.	C Article no.	D Article no.	G Article no.	E Article no.	Z Article no.	Weight g/each	Packing unit
1-pole								
0.3		1C03UM	1D03UM	1G03UM	1E03UM	1Z03UM	150	12
0.5		1C05UM	1D05UM	1G05UM	1E05UM	1Z05UM	150	12
0.75		1C075UM	1D075UM		1E075UM	1Z075UM	150	12
0.8				1G08UM				
1	1B1UM	1C1UM	1D1UM	1G1UM	1E1UM	1Z1UM	150	12
1.6	1B1.6UM	1C1.6UM	1D1.6UM	1G1.6UM	1E1.6UM	1Z1.6UM	150	12
2	1B2UM	1C2UM	1D2UM	1G2UM	1E2UM	1Z2UM	150	12
2.5	1B2.5UM	1C2.5UM	1D2.5UM	1G2.5UM	1E2.5UM	1Z2.5UM	150	12
3	1B3UM	1C3UM	1D3UM	1G3UM	1E3UM	1Z3UM	150	12
3.5	1B3.5UM	1C3.5UM	1D3.5UM	1G3.5UM	1E3.5UM	1Z3.5UM	150	12
4	1B4UM	1C4UM	1D4UM	1G4UM	1E4UM	1Z4UM	150	12
5	1B5UM	1C5UM	1D5UM	1G5UM	1E5UM	1Z5UM	150	12
6	1B6UM	1C6UM	1D6UM	1G6UM	1E6UM	1Z6UM	150	12
8		1C8UM	1D8UM	1G8UM	1E8UM	1Z8UM	150	12
10	1B10UM	1C10UM	1D10UM	1G10UM	1E10UM	1Z10UM	150	12
12				1G12UM		1Z12UM		
13	1B13UM	1C13UM	1D13UM	1G13UM	1E13UM	1Z13UM	150	12
15	1B15UM	1C15UM	1D15UM	1G15UM	1E15UM	1Z15UM		
16	1B16UM	1C16UM	1D16UM	1G16UM	1E16UM	1Z16UM	150	12
20	1B20UM	1C20UM	1D20UM	1G20UM	1E20UM	1Z20UM	150	12
25	1B25UM	1C25UM	1D25UM	1G25UM	1E25UM	1Z25UM	150	12
30	1B30UM	1C30UM	1D30UM	1G30UM	1E30UM	1Z30UM		
32	1B32UM	1C32UM	1D32UM	1G32UM	1E32UM	1Z32UM	150	12
40	1B40UM	1C40UM	1D40UM	1G40UM	1E40UM	1Z40UM	150	12
50	1B50UM	1C50UM	1D50UM	1G50UM	1E50UM	1Z50UM	150	12
60	1B60UM	1C60UM	1D60UM	1G60UM	1E60UM		150	12
63 *	1B63UM	1C63UM	1D63UM	1G63UM	1E63UM		150	12

* 63 A without UL approval

Switching Devices
Manual Motor Controller

according to UL508 and CSA-22.2 No.14
UM Product Range, B, C, D,G, E and Z Characteristic
B, C and D also acc. to IEC 60898-1, DIN EN 60898-1,
VDE 0641-11 (B, C, D Characteristic 0.3 - 25 A)

File E137938

10000

Rated current I_n A	Characteristic B Article no.	C Article no.	D Article no.	G Article no.	E Article no.	Z Article no.	Weight g/each	Packing unit
2-pole								
0.3		2C03UM	2D03UM	2G03UM	2E03UM	2Z03UM	300	6
0.5		2C05UM	2D05UM	2G05UM	2E05UM	2Z05UM	300	6
0.75		2C075UM	2D075UM		2E075UM	2Z075UM	300	6
0.8				2G08UM				
1	2B1UM	2C1UM	2D1UM	2G1UM	2E1UM	2Z1UM	300	6
1.6		2C1.6UM	2D1.6UM	2G1.6UM	2E1.6UM	2Z1.6UM	300	6
2		2C2UM	2D2UM	2G2UM	2E2UM	2Z2UM	300	6
2.5		2C2.5UM	2D2.5UM	2G2.5UM	2E2.5UM	2Z2.5UM	300	6
3	2B3UM	2C3UM	2D3UM	2G3UM	2E3UM	2Z3UM	300	6
3.5		2C3.5UM	2D3.5UM	2G3.5UM	2E3.5UM	2Z3.5UM	300	6
4	2B4UM	2C4UM	2D4UM	2G4UM	2E4UM	2Z4UM	300	6
5	2B5UM	2C5UM	2D5UM	2G5UM	2E5UM	2Z5UM	300	6
6	2B6UM	2C6UM	2D6UM	2G6UM	2E6UM	2Z6UM	300	6
8		2C8UM	2D8UM	2G8UM	2E8UM	2Z8UM	300	6
10	2B10UM	2C10UM	2D10UM	2G10UM	2E10UM	2Z10UM	300	6
12				2G12UM		2Z12UM		
13	2B13UM	2C13UM	2D13UM	2G13UM	2E13UM	2Z13UM	300	6
15	2B15UM	2C15UM	2D15UM	2G15UM	2E15UM	2Z15UM		
16	2B16UM	2C16UM	2D16UM	2G16UM	2E16UM	2Z16UM	300	6
20	2B20UM	2C20UM	2D20UM	2G20UM	2E20UM	2Z20UM	300	6
25	2B25UM	2C25UM	2D25UM	2G25UM	2E25UM	2Z25UM	300	6
30	2B30UM	2C30UM	2D30UM	2G30UM	2E30UM	2Z30UM		
32	2B32UM	2C32UM	2D32UM	2G32UM	2E32UM	2Z32UM	300	6
40	2B40UM	2C40UM	2D40UM	2G40UM	2E40UM	2Z40UM	300	6
50	2B50UM	2C50UM	2D50UM	2G50UM	2E50UM	2Z50UM	300	6
60	2B60UM	2C60UM	2D60UM	2G60UM	2E60UM		300	6
63 *	2B63UM	2C63UM	2D63UM	2G63UM	2E63UM		300	6

* 63 A without UL approval

Switching Devices
Manual Motor Controller

according to UL508 and CSA-22.2 No.14
UM Product Range, B, C, D,G, E and Z Characteristic
B, C and D also acc. to IEC 60898-1, DIN EN 60898-1,
VDE 0641-11 (B, C, D Characteristic 0.3 - 25 A)

File E137938

10000

Rated current I_n A	Characteristic B Article no.	C Article no.	D Article no.	G Article no.	E Article no.	Z Article no.	Weight g/each	Packing unit
3-pole								
0.3		3C03UM	3D03UM	3G03UM	3E03UM	3Z03UM	450	4
0.5		3C05UM	3D05UM	3G05UM	3E05UM	3Z05UM	450	4
0.75		3C075UM	3D075UM		3E075UM	3Z075UM	450	4
0.8				3G08UM				
1	3B1UM	3C1UM	3D1UM	3G1UM	3E1UM	3Z1UM	450	4
1.6	3B1.6UM	3C1.6UM	3D1.6UM	3G1.6UM	3E1.6UM	3Z1.6UM	450	4
2	3B2UM	3C2UM	3D2UM	3G2UM	3E2UM	3Z2UM	450	4
2.5	3B2.5UM	3C2.5UM	3D2.5UM	3G2.5UM	3E2.5UM	3Z2.5UM	450	4
3	3B3UM	3C3UM	3D3UM	3G3UM	3E3UM	3Z3UM	450	4
3.5	3B3.5UM	3C3.5UM	3D3.5UM	3G3.5UM	3E3.5UM	3Z3.5UM	450	4
4	3B4UM	3C4UM	3D4UM	3G4UM	3E4UM	3Z4UM	450	4
5	3B5UM	3C5UM	3D5UM	3G5UM	3E5UM	3Z5UM	450	4
6	3B6UM	3C6UM	3D6UM	3G6UM	3E6UM	3Z6UM	450	4
8		3C8UM	3D8UM	3G8UM	3E8UM	3Z8UM	450	4
10	3B10UM	3C10UM	3D10UM	3G10UM	3E10UM	3Z10UM	450	4
12				3G12UM		3Z12UM		
13	3B13UM	3C13UM	3D13UM	3G13UM	3E13UM	3Z13UM	450	4
15	3B15UM	3C15UM	3D15UM	3G15UM	3E15UM	3Z15UM		
16	3B16UM	3C16UM	3D16UM	3G16UM	3E16UM	3Z16UM	450	4
20	3B20UM	3C20UM	3D20UM	3G20UM	3E20UM	3Z20UM	450	4
25	3B25UM	3C25UM	3D25UM	3G25UM	3E25UM	3Z25UM	450	4
30	3B30UM	3C30UM	3D30UM	3G30UM	3E30UM	3Z30UM		
32	3B32UM	3C32UM	3D32UM	3G32UM	3E32UM	3Z32UM	450	4
40	3B40UM	3C40UM	3D40UM	3G40UM	3E40UM	3Z40UM	450	4
50	3B50UM	3C50UM	3D50UM	3G50UM	3E50UM	3Z50UM	450	4
60	3B60UM	3C60UM	3D60UM	3G60UM	3E60UM		450	4
63 *	3B63UM	3C63UM	3D63UM	3G63UM	3E63UM		450	4

* 63 A without UL approval

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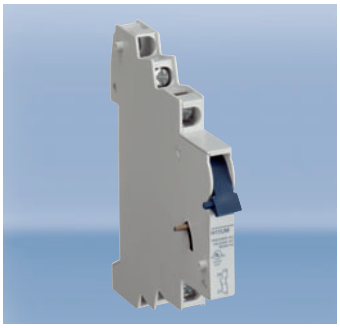
Rated current I_n A	Rated voltage Volt AC	Test currents * electromagnetic not tripping I_4 A	tripping I_5 A	Article no.	Weight g/each	Packing unit
Neutral switch – for mounting instructions please consult page 39						
0.3 - 63	277/480	400	700	**N63UM**	150	5

* additional electromagnetic protection

Accessories for Switching Devices Manual Motor Controller and Supplementary Protectors

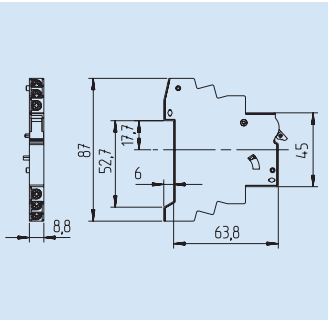
according to UL508 and CSA-22.2 No.14
for Product Ranges UM and UR

File E137938



Auxiliary contact

Module	Type of contact	Contacts	**Article no.**	Weight g/each	Packing unit
1/2	1 auxiliary contact	1NO	**H10UM**	35	10
1/2	2 auxiliary contacts	1NO + 1NC	**H11UM**	40	10
1/2	3 auxiliary contacts	1NO + 2NC	**H12UM**	45	10
1/2	3 auxiliary contacts	2NO + 1NC	**H21UM**	45	10

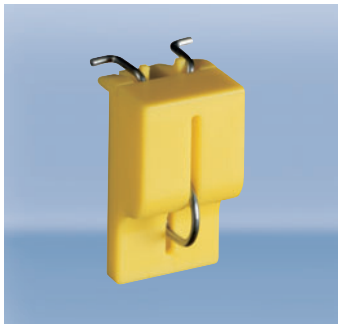


Standards	Acc. to IEC 60947-5-1, DIN EN 60947-5-1, VDE 0660-200, UL508	
Rated operating currents	10 A /240 V AC 3 A / 110 V DC 1 A / 220 V DC	
Minimum contact load	1 mA at 24 V DC	
Conductor cross sections		
Type of conductor *)	min.	max.
Single wire	1.0 mm² (AWG18)	2.5 mm² (AWG14)
Stranded wire	1.0 mm² (AWG18)	1.5 mm² (AWG16)
Stranded wire with ferrule	1.0 mm² (AWG18)	1.5 mm² (AWG16)
Torque	max. 0.8 Nm (7 lb.in)	

***) Stripped length 8 - 9 mm**

Shunt trip

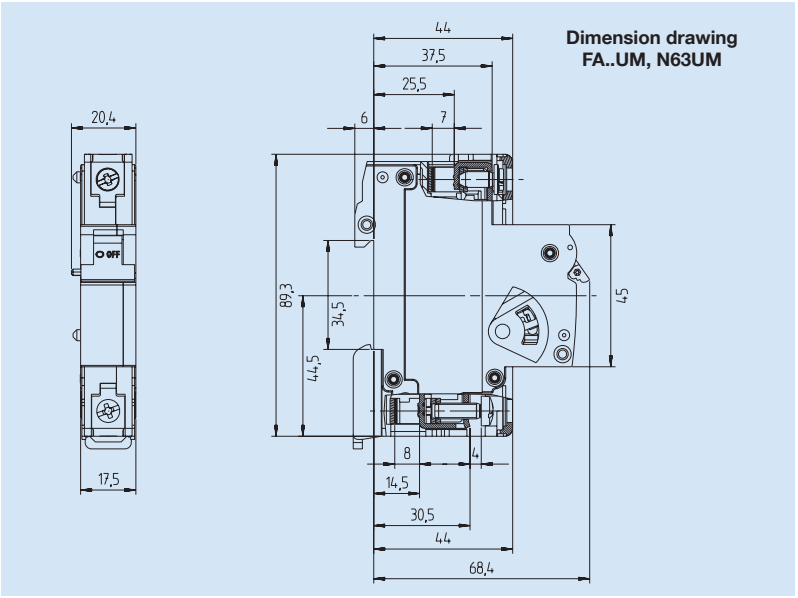
Module	Rated operating voltage	max. operating current at U_n (t < 10 ms)	**Article no.**	Weight g/each	Packing unit
1	12 V UC	1.3 A	**FA12UM**	105	5
1	24 V UC	0.6 A	**FA24UM**	105	5
1	48 - 74 V UC	0.2 A	**FA48UM**	105	5
1	110 - 240 V UC, 415 V AC	0.25 A at 110 V	**FA110UM**	105	5
		0.5 A at 240 V			
		0.58 A at 277 V			



Lock-off/Lock-on device

Article no.	Weight g/each	Packing unit
EASS	2	10

Dimension drawing
FA..UM, N63UM

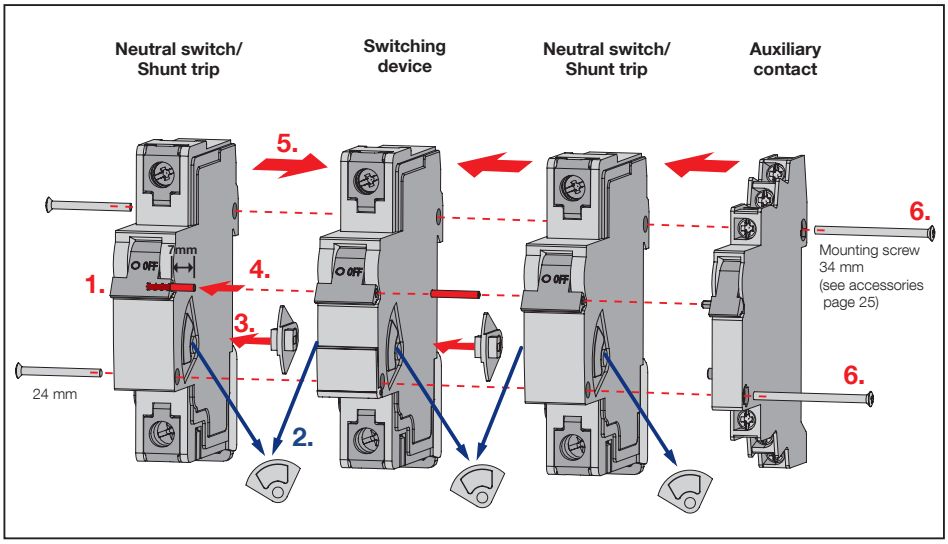


Accessories for Switching Devices Manual Motor Controller and Supplementary Protectors

according to UL508 and CSA-22.2 No.14 for Product Ranges UM and UR

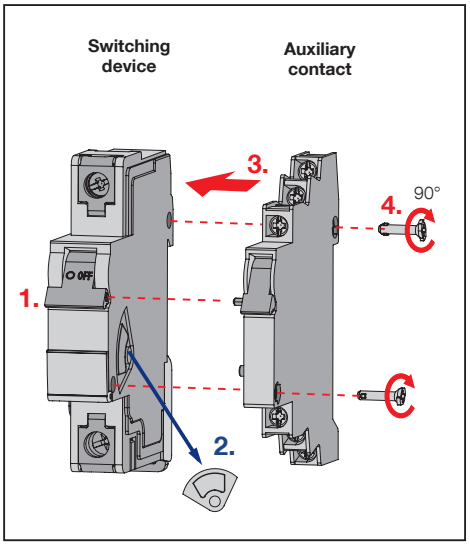
File E137938

Mounting Instructions of Accessories



Applies to N...UM and FA...UM:
The accessory devices N...UM and FA...UM can be mounted **on the right or left.**
The auxiliary contact H...UM can only be mounted **on the right.**

Mounting:
1. Bring the blue knobs of all devices into the "OFF" position
2. Remove grey cover from the switching device and attachment
3. Insert drive plate between the switching device and N...UM or FA...UM
4. Insert connecting pin into the knob (insertion depth approx. 7 mm)
5. Combine switching device and N...UM or FA...UM
6. Screw devices together (observe correct screw length)

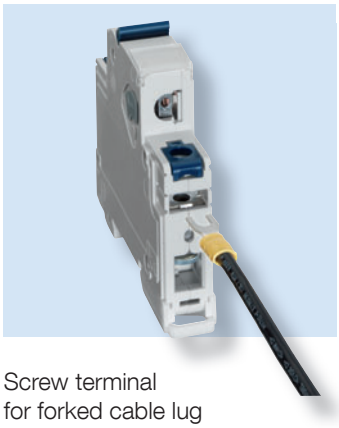


Applies to H...UM:
The auxiliary contact H...UM can only be mounted **on the right.**

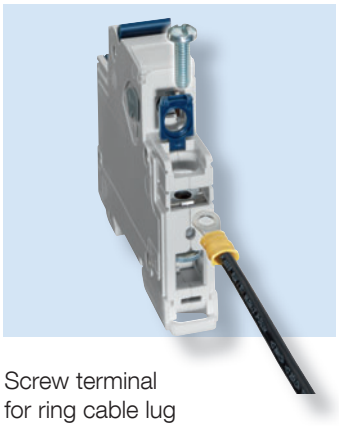
Mounting:
1. Bring the blue knobs of both devices into the "OFF" position
2. Remove grey cover from the switching device
3. Combine switching device and H...UM
4. Insert connection screws and connect the two devices by turning the screws by 90°
5. After mounting close and open to check operation

Applies to all switching devices ...UM, N63UM and FA...UM:
The load and mains can be connected either from the top or the bottom (Line/Load Reversible).

Box terminal for
- solid conductors
- flexible conductors with or without cable lug



Screw terminal for forked cable lug



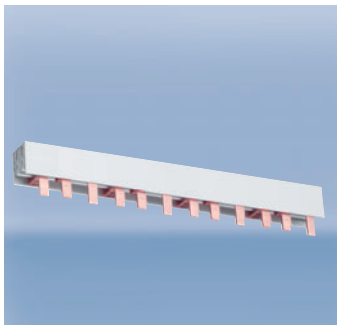
Screw terminal for ring cable lug (ring tongue)

Design of the terminals

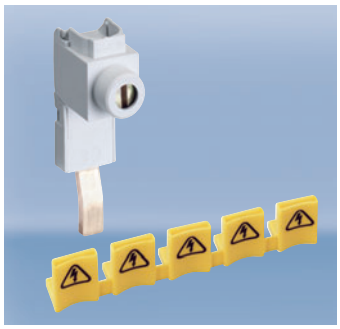
- Optical detection of the screw position
- Increased break resistance if the screwdriver becomes jammed
- Universal connecting terminals, suitable for connecting all known cable lugs such as ring or forked cable lugs and pin terminals
- Ring cable lugs can be connected by opening the flap and removing the connecting screw
- Can also be used for applications that require ring cable lugs (e.g. nuclear power stations)
- Protection against contact with live parts according to DIN EN 50274, VDE 0660-514 is fully guaranteed

Busbars for Switching Devices Manual Motor Controller

according to UL508 and CSA-22.2 No.14
for Product Ranges UM and MA...UM



Cross section (mm^2)	Busbar current Start of busbar/ Middle infeed	Modules/ Phases	**Article no.**	Weight g/each	Packing unit	Suitable end cap Article no.
Busbars pin type acc. to UL and CSA						
1-phase						
18	80/130	57	**SB.U1**	300	1	
1-phase 1-pole switching device + auxiliary contact						
18	80/130	37/1	**SB.U1H**	280	1	
3-phase						
18	80/130	19/3	**SB.U3**	800	1	SB.U8
3-phase 3-pole switching device + auxiliary contact						
25	100/180	16/3	**SB.U3H**	1020	1	SB.U8

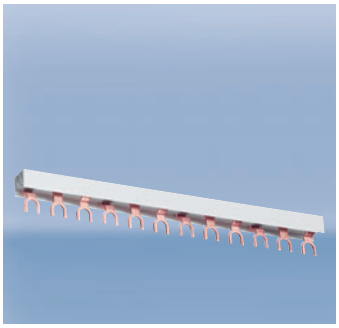


Power feed terminals						
6 - 35	115		**AK.U1**	35	1	

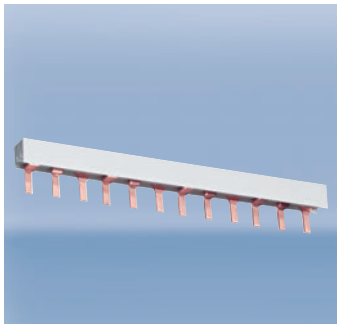
Protection cover for busbars UL and CSA					
			SB.U9	0.6/3	1 strip = 5 pieces

Busbars

for Manual Motor Controllers, Product Ranges UM and MA...UM



Cross section [mm²]	Busbar current Start of busbar/ Middle infeed	Modules/ Phases	**Article no.**	Weight g/each	Packing unit	Suitable end cap Article no.
Busbars fork type without UL and CSA approval						
1-phase						
12	65/110	56/1	**SB16010**	250	50	
1-phase 1-pole switching device + auxiliary contact						
24	90/150	37/1	**SDO.124**	200	50	
2-phase and 1-phase + N						
10	63/100	28/2	**SB26010**	390	20	SB.A5
2-phase 2-pole switching device + auxiliary contact						
16	80/130	22/2	**SB26216**	310	20	SB.A2
3-phase						
10	63/100	4/3	**SB31210**	84	25	SB.A1
10	63/100	19/3	**SB36010**	420	20	SB.A1
16	80/130	19/3	**SB36016**	675	20	SB.A2
3-phase 3-pole switching device + auxiliary contact						
16	80/130	16/3	**SB36316**	630	20	SB.A2
3-phase 1-pole switching device + auxiliary contact						
16	80/130	36/1	**SDO.316**	500	20	SB.A2
4-phase and 3-phase + N						
16	80/130	14/4	**SB46016**	835	15	SB.A3



Busbars pin type without UL and CSA approval						
3-phase						
16	80/130	19/3	**SB718U**	500	20	SB.A2

Switching Devices
Manual Motor Controller

according to UL508 and CSA-22.2 No.14
Technical Data Product Range UM

File E137938

Characteristic		B	C	D	E	G	Z
Application		Lighting Circuits control Wiring protection Business equipment Appliances	Lighting Circuits control Wiring protection Business equipment Appliances Motors low inrush	Transformers Power supplies Reactive load Motors high inrush	Transformers Power supplies Motors high efficiency	Lighting Circuits control Wiring protection Transformers Solenoid Motors general	Wiring protection Semiconductor protection General electronics
Number of poles		1 - 3; 1 + N; 3 + N					
Standards		IEC 60898-1, DIN EN 60898-1, VDE 0641-11, UL508, CSA-22.2 No.14					
Interrupting capacity		see data sheet for use in the USA, Canada and Europe (page 44)					
Current limiting class		3	3				
Max. back-up fuse		see data sheet for use in the USA, Canada and Europe (page 44)					
Rated voltage AC		277 / 480 V					
Rated voltage DC L/R = 4 ms		1-pole 42 V and 2-poles 80 V in serial connection of both poles (up to 25 A rated current)					
		1-pole 24 V and 2-poles 60 V in serial connection of both poles (30 A - 60 A rated current)					
Rated current range		1 - 63* A	0.3 - 63* A	0.3 - 63* A	0.3 - 63* A	0.3 - 63* A	0.3 - 50 A
Test currents	Thermal not tripping I_1 (A) > 1 h	1.13 x I_n	1.13 x I_n	1.13 x I_n	1.05 x I_n	1.05 x I_n	1.05 x I_n
	Thermal tripping I_2 (A) < 1 h	1.45 x I_n	1.45 x I_n	1.45 x I_n	1.35 x I_n	1.35 x I_n	1.35 x I_n
	Electromagnetic not tripping I_4 (A) > 0,1 s	3 x I_n	5 x I_n	10 x I_n	14 x I_n	8 x I_n	2 x I_n
	Electromagnetic tripping I_5 (A) < 0,1 s	5 x I_n	10 x I_n	16 x I_n	18 x I_n	10 x I_n	3 x I_n
Reference calibration temperature of the thermal tripping		30° C + 5° C			20° C + 5° C		
		Influence of the ambient temperature on the thermal release: Decrease of the current values with higher ambient temperature and increase with lower temperatures of approximately 5% per 10°C difference in temperature					
Frequency range of the electromagnetic trip		16 $^2/_3$ to 60 Hz With higher frequencies, the electromagnetic tripping values increase by approximately a factor of 1.1 at 100 Hz; 1.2 at 200 Hz; 1.3 at 300 Hz; 1.4 at 400 Hz; 1.5 for DC					
Ambient temperature		-25 °C to +55 °C					
Storage temperature		-40 °C to +70 °C					
Device depth according to DIN 43880		68 mm					
Mechanical life		10,000 switching cycles (ON / OFF)					
Protection cover		Finger safe and safe to back of hand according to DIN EN 50274/ VDE0660-514, BGV A3					
Insulation group acc. to DIN/VDE 0110		C at 250 V AC B at 400 V AC					
Degree of protection acc. to EN/IEC 60529		IP20					
Installation position		any					
Mounting		DIN-rail according to DIN EN 60715 35 mm					
Lockability		The handle can be secured against manual switching in the on and off position by a lead seal					
Climatic resistance		Humid heat constant according to DIN EN 60068-2-78 Humid heat cycle according to DIN EN 60068-2-30					
Vibration resistance		> 15 g according to DIN EN 60068-2-59 during a load with I_1					
Resistance to mechanical shocks		25g 11ms					

* 63 A without UL approval

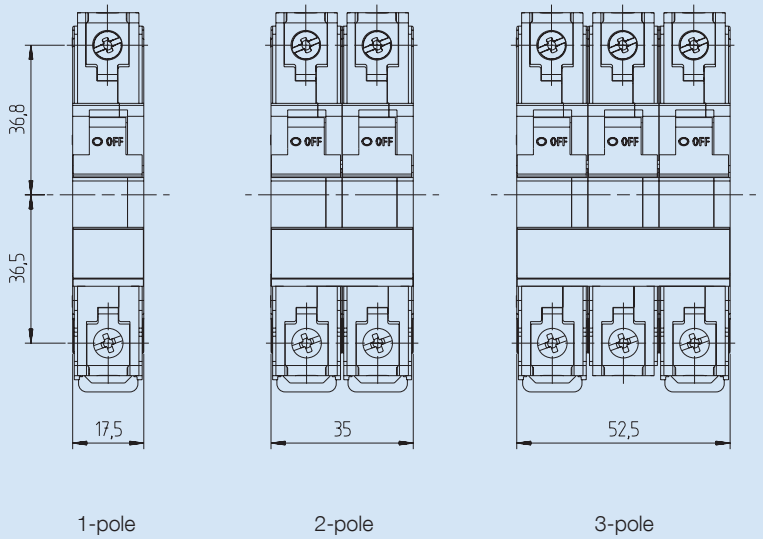
Switching Devices
Manual Motor Controller

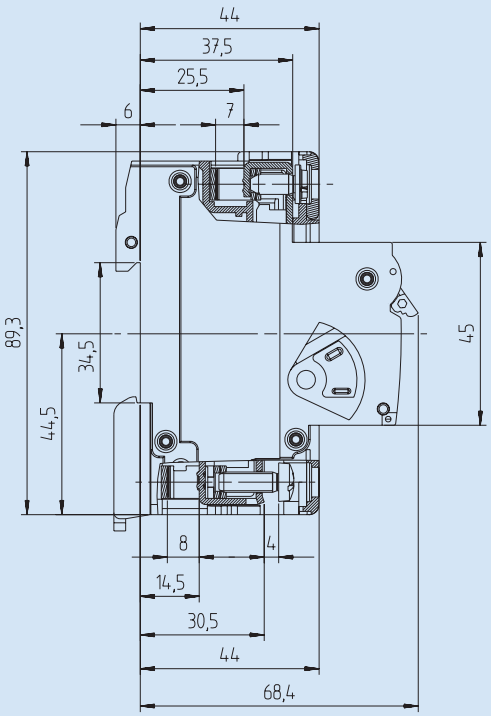
according to UL508 and CSA-22.2 No.14
Technical Data Product Range UM

File E137938

	Conductor cross sections			
	Box terminal bottom		Box terminal top	
Type of conductor *)	max.	min.	max.	min.
Single wire	35 mm² (AWG2)	1.0 mm² (AWG18)	25 mm² (AWG3)	1.0 mm² (AWG18)
Multiple wire	35 mm² (AWG2)	16 mm² (AWG6)	25 mm² (AWG3)	16 mm² (AWG6)
Stranded wire	25 mm² (AWG3)	1.0 mm² (AWG18)	16 mm² (AWG6)	1.0 mm² (AWG18)
Stranded wire with ferrule	16 mm² (AWG6)	1.0 mm² (AWG18)	16 mm² (AWG6)	1.0 mm² (AWG18)
Busbar cable lug	up to 3 mm thickness		up to 1.5 mm thickness	
Combined, conductor and busbar or cable lug	up to 35 mm² and up to 2 mm thickness		not possible	
Torque	max. 2.5 Nm (22.2 lb.in)			

***) Stripped length: bottom 12 - 14 mm, top 10 - 12 mm**





File E137938

Interrupting capacity and maximum back-up fuse according to UL508 and CSA-22.2 No.14

Characteristic	B; C; D; E; G and Z				
Standards	UL508 and CSA-22.2 No.14				
	Number of poles	Maximum rated voltage V	Rated current A	Interrupting capacity kA	Maximum back-up fuse A
Interrupting capacity at rated voltage Ambient temperature 40 °C	1 / 1 + N	277	0.3 - 10	10	70 A
	1 / 1 + N	277	12 - 60	10	4 x I_n
	2 / 3 / 3 + N	480	0.3 - 10	10	70 A
	2 / 3 / 3 + N	480	12 - 60	10	4 x I_n
Back-up fuse for group installations	1 / 1 + N	277	0.3 - 10	10	800 A
	1 / 1 + N	277	12 - 60	5	800 A
	2 / 3 / 3 + N	480	0.3 - 10	10	800 A
	2 / 3 / 3 + N	480	12 - 60	5	800 A

Interrupting capacity and maximum back-up fuse according to EN and IEC

Characteristic	B; C; D; E; G and Z				
Standards	IEC 60947-2, DIN EN 60947-2, VDE 0660-101 B, C and D characteristic acc. to IEC 60898-1, DIN EN 60898-1, VDE 0641-11				
	Number of poles	Maximum rated voltage V	Rated current A	Interrupting capacity kA	Maximum back-up fuse A
Interrupting capacity at rated voltage	1 / 1 + N	277	0.3 - 60	10	160
	2 / 3 / 3 + N	480	0.3 - 60	10	160

Internal Resistance for Product Ranges UM and UR

Rated current [A]	Trip characteristic] B [Ohm]	C [Ohm]	D [Ohm]	G [Ohm]	E [Ohm]	Z [Ohm]
0.3		16.8620	16.8620	16.862	14.52000	31.5060
0.5		6.8540	6.0009	6.854	5.92000	10.2460
0.75/0.8		3.0540	3.0540	3.054	2.70000	5.3920
1.0	1.7000	1.7000	1.7560	1.756	1.48000	2.6910
1.6	0.5870	0.5870	0.5870	0.587	0.57400	0.9440
2.0	0.4190	0.4190	0.4190	0.419	0.40500	0.8900
2.5	0.2950	0.2950	0.2950	0.295	0.26900	0.4290
3.0	0.2020	0.2020	0.2020	0.202	0.18600	0.3460
3.5	0.1390	0.1390	0.1390	0.139	0.13900	0.1790
4.0	0.1090	0.1090	0.1090	0.109	0.10600	0.1620
5.0	0.0654	0.0654	0.0654	0.0654	0.05900	0.1050
6.0	0.0528	0.0528	0.0491	0.0491	0.04600	0.0823
8.0		0.0278	0.0240	0.0333	0.03040	0.0371
10	0.0216	0.0216	0.0187	0.0211	0.02020	0.0278
12				0.0084	0.00724	0.0151
13	0.0113	0.0084	0.0085	0.0084	0.00724	0.0151
15/16	0.0085	0.0085	0.0076	0.0076	0.00731	0.0114
20	0.0067	0.0067	0.0064	0.0064	0.00582	0.0075
25	0.0050	0.0050	0.0041	0.0046	0.00411	0.0050
30/32	0.0032	0.0032	0.0027	0.003	0.00272	0.0032
40	0.0025	0.0025	0.0022	0.0022	0.00212	0.0022
50	0.0019	0.0019	0.0018	0.0019	0.00184	0.0020
60/63 *	0.0018	0.0018	0.0017	0.00179	0.00172	–

* 63 A without UL approval

File E137938

Ampere rating and horsepower rating 1 phase								
			FLA and LRC converted to table horsepower (see Note 2) use FLA and LRC ratings where no hp rating is given					
Rated current [A] (see Note 1)	Motor nameplate FLA rating [A]	Motor nameplate Starting/ LCR rating [A]	Nominal circuit voltage					
			110 – 120 VAC [hp]	200 VAC [hp]	208 VAC [hp]	220 – 240 VAC [hp]	265 VAC [hp]	277 VAC [hp]
0.30 **0.50** **0.75**	0.30 0.50 0.75	1.80 3.00 4.35						
0.80 **1.0** **1.6**	0.80 1.0 1.6	4.8 6.0 9.6						
2.0 **2.5** **3.0**	2.0 2.5 3.0	12.0 15.0 18.0		1/6 1/6	1/6 1/6	1/6 1/6 1/4	1/6 1/6 1/4	1/6 1/4 1/3
3.5 **4.0**	3.5 4.0	21.0 24.0		1/4 1/4	1/4 1/3	1/4 1/3	1/3 1/3	1/3 1/3
5.0 **6.0** **8.0**	5.0 6.0 8.0	30.0 36.0 48.0	1/6 1/4 1/3	1/3 1/2 3/4	1/2 1/2 3/4	1/2 1/2 1	1/2 3/4 1	1/2 3/4 1
10.0	10	60.0	1/2	1	1	1 1/2	1 1/2	2
12.0 **12.5**	12.0 12.5	72.0 75.0	1/2 1/2	1 1/2 1 1/2	1 1/2 1 1/2	2 2	2 2	2 2
13.0 **15.0** **16.0**	13.0 15.0 16.0	78.0 90.0 96.0	1/2 3/4 1	1 1/2 2 2	1 1/2 2 2	2 2 2	2 3 3	2 3 3
20.0 **25.0**	20.0 25.0	120.0 150.0	1 1/2 2	3 3	3 3	3 3	3 5	3 5
30.0	30.0	180.0	2	3	3	5	5	5
32.0	32.0	192.0	2	3	5	5	5	5
40.0	40.0	240.0	3	5	7 1/2	7 1/2	7 1/2	7 1/2
50.0 **60.0**	50.0 60.0	300.0 360.0	3 5	7 1/2 10	10 10	10 10	10 10	10 15

Note 1:
For AC motor circuit nameplate full load current, AC general-use loads, AC resistance loads, AC incandescent lamp (tungsten) loads, AC electric discharge lamp (ballast) loads

Note 2:
Conversions per UL508 Table 45.2 and NFPA-70: National Electrical Code® 2008 Tables 430-248 and 430-251(A)

File E137938

Ampere rating and horsepower rating 3 phase and 2 phase – 4 wire

Rated current [A] (see Note 1)	Motor nameplate FLA rating [A]	Motor nameplate Starting/ LCR rating [A]	FLA and LRC ratings converted to table horsepower (see Note 2) use FLA and LRC ratings where no hp rating is listed									
			Nominal circuit voltage									
			110 – 120 VAC		200 VAC		208 VAC		220 – 240 VAC		440 – 480 VAC	
			Motordesign		Motordesign		Motordesign		Motordesign		Motordesign	
			B, C, D [hp]	E [hp]	B, C, D [hp]	E [hp]	B, C, D [hp]	E [hp]	B, C, D [hp]	E [hp]	B, C, D [hp]	E [hp]
0.30 **0.50** **0.75**	0.30 0.50 0.75	3.0 5.0 7.5										
0.80 **1.0** **1.6**	0.80 1.0 1.6	8.0 10.0 16.0									½	½
2.0 **2.5** **3.0**	2.0 2.5 3.0	20.0 25.0 30.0			½ ½	½ ½	½ ½	½ ½	½ ½ ½	½ ½ ½	¾ 1 1 ½	¾ 1 1 ½
3.5 **4.0**	3.5 4.0	35.0 40.0			½ ¾	½ ¾	¾ ¾	¾ ¾	¾ ¾	¾ ¾	2 2	2 2
5.0 **6.0** **8.0**	5.0 6.0 8.0	42.0 50.4 67.2	½ ½ ¾	½ ½ ¾	1 1 2	1 1 2	1 1 2	1 1 2	1 1 ½ 2	1 1 ½ 2	3 3 5	3 3 5
10.0 **12.0** **12.5**	10.0 12.0 12.5	84.0 100.8 105.0	1 1 ½ 1 ½	1 1 ½ 1 ½	2 3 3	2 3 3	2 3 3	2 3 3	3 3 3	3 3 3	5 7 ½ 7 ½	5 7 ½ 7 ½
13.0 **15.0** **16.0**	13.0 15.0 16.0	109.2 126.0 134.4	1 ½ 2 2	1 ½ 2 2	3 3 3	3 3 3	3 3 3	3 3 3	3 3 5	3 3 5	7 ½ 10 10	7 ½ 10 10
20.0 **25.0**	20.0 25.0	168.0 210.0	3 3	3 3	5 5	5 5	5 7 ½	5 7 ½	5 7 ½	5 7 ½	10 15	10 15
30.0	30.0	252.0	5	5	5	5	7 ½	7 ½	10	10	20	20
32.0	32.0	268.8	5	5	5	5	10	10	10	10	20	20
40.0	40.0	226.0	5	5	10	7 ½	10	7 ½	10	10	30	20
50.0 **60.0**	50.0 60.0	282.5 339.0	7 ½ 10	7 ½ 10	15 15	10 10	15 20	10 10	15 20	10 15	30 40	25 30

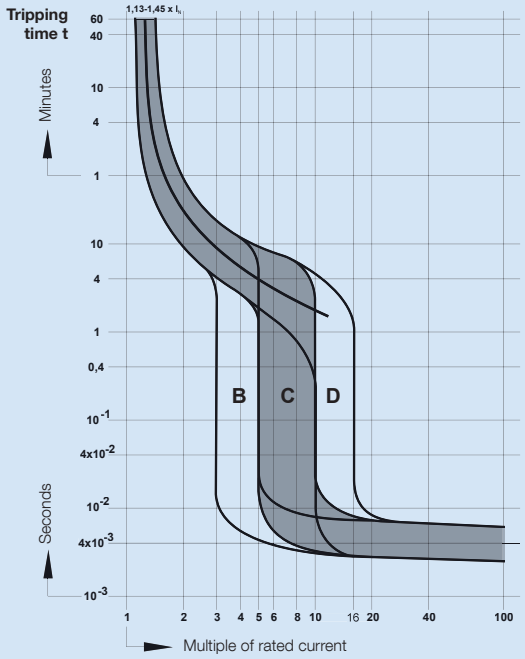
Note 1:
For AC motor circuit nameplate full load current, AC general-use loads, AC resistance loads, AC incandescent lamp (tungsten) loads, AC electric discharge lamp (ballast)loads

Note 2:
Conversions per UL508 proposed Tables 45.2 and 45.4 and NFPA-70: National Electrical Code® 2008 Tables 430-249, 430-250 and 430-251B)

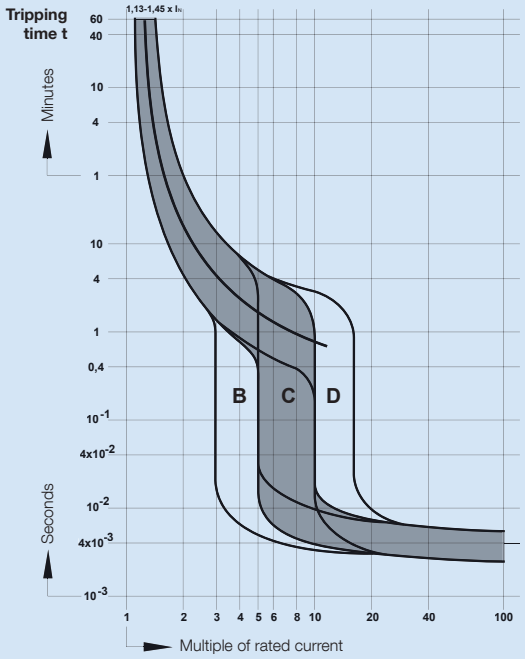
Switching Devices
Manual Motor Controller

according to UL508 and CSA-22.2 No.14
Characteristic Product Range UM

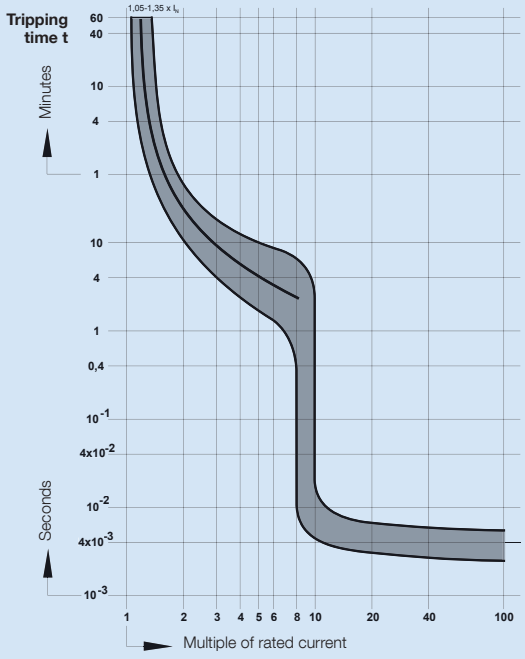
File E137938



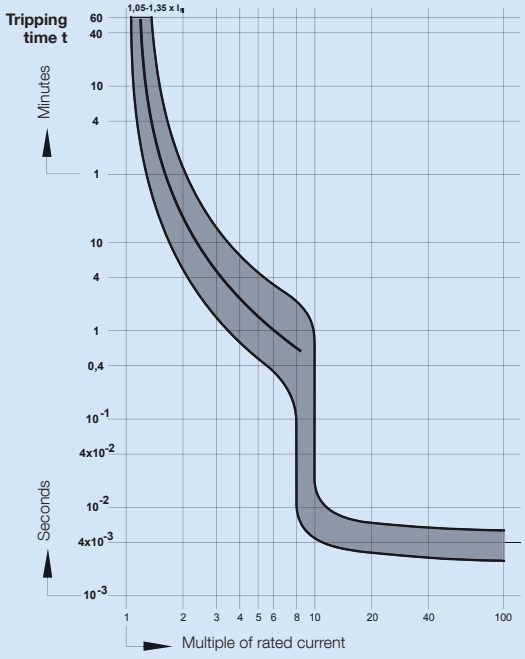
B, C and D characteristic I_n = 0.3 - 10 A
UM



B, C and D characteristic I_n = 13 - 63* A
UM



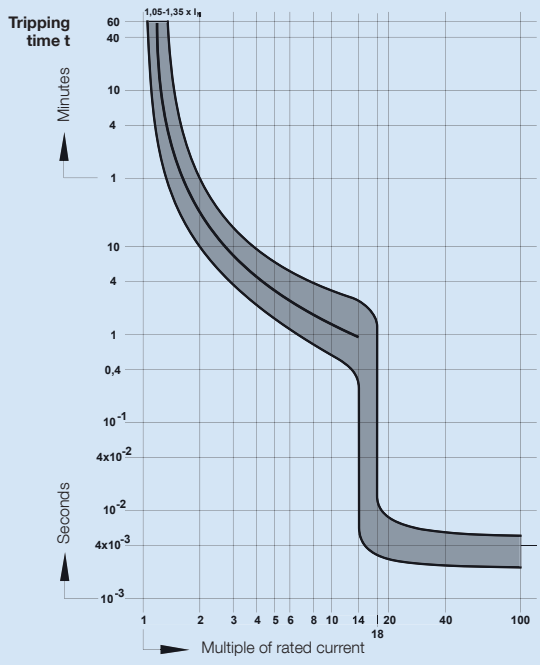
G characteristic I_n = 0.3 - 10 A
UM



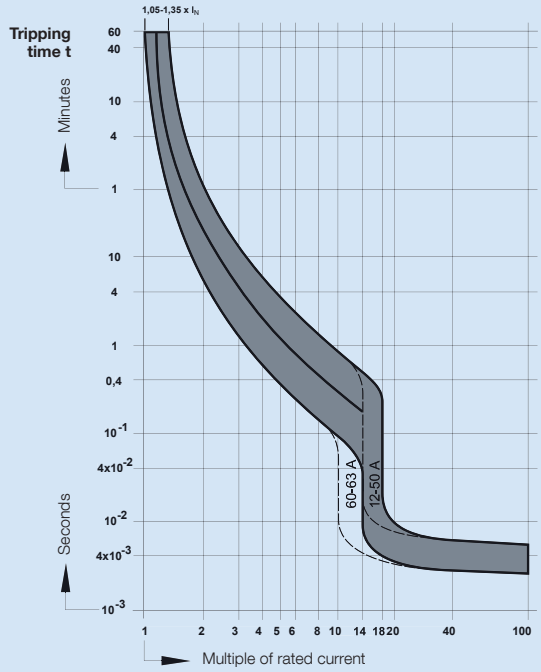
G characteristic I_n = 12 - 63* A
UM

* 63 A without UL approval

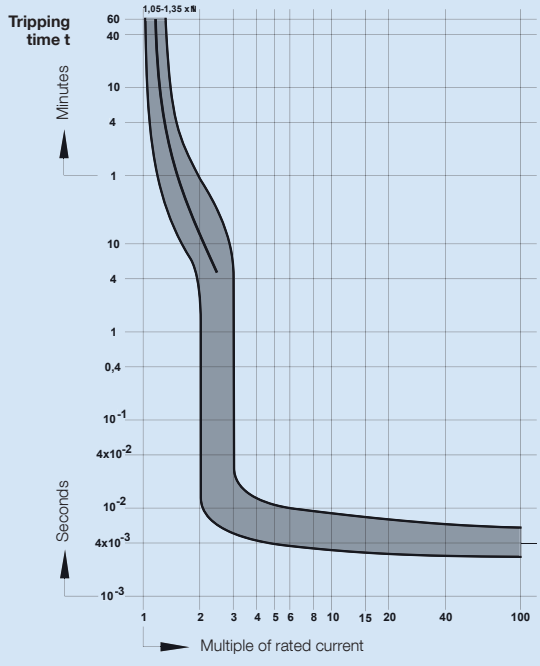
File E137938



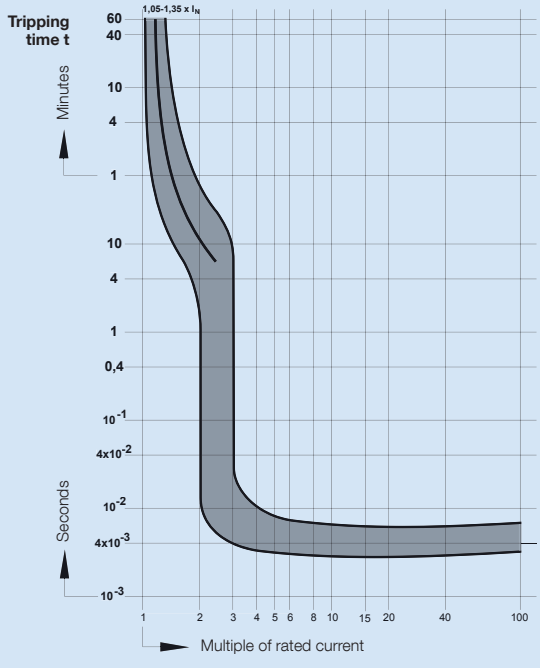
E characteristic I_n = 0.3 - 10 A
UM



E characteristic I_n = 12 - 63* A
UM



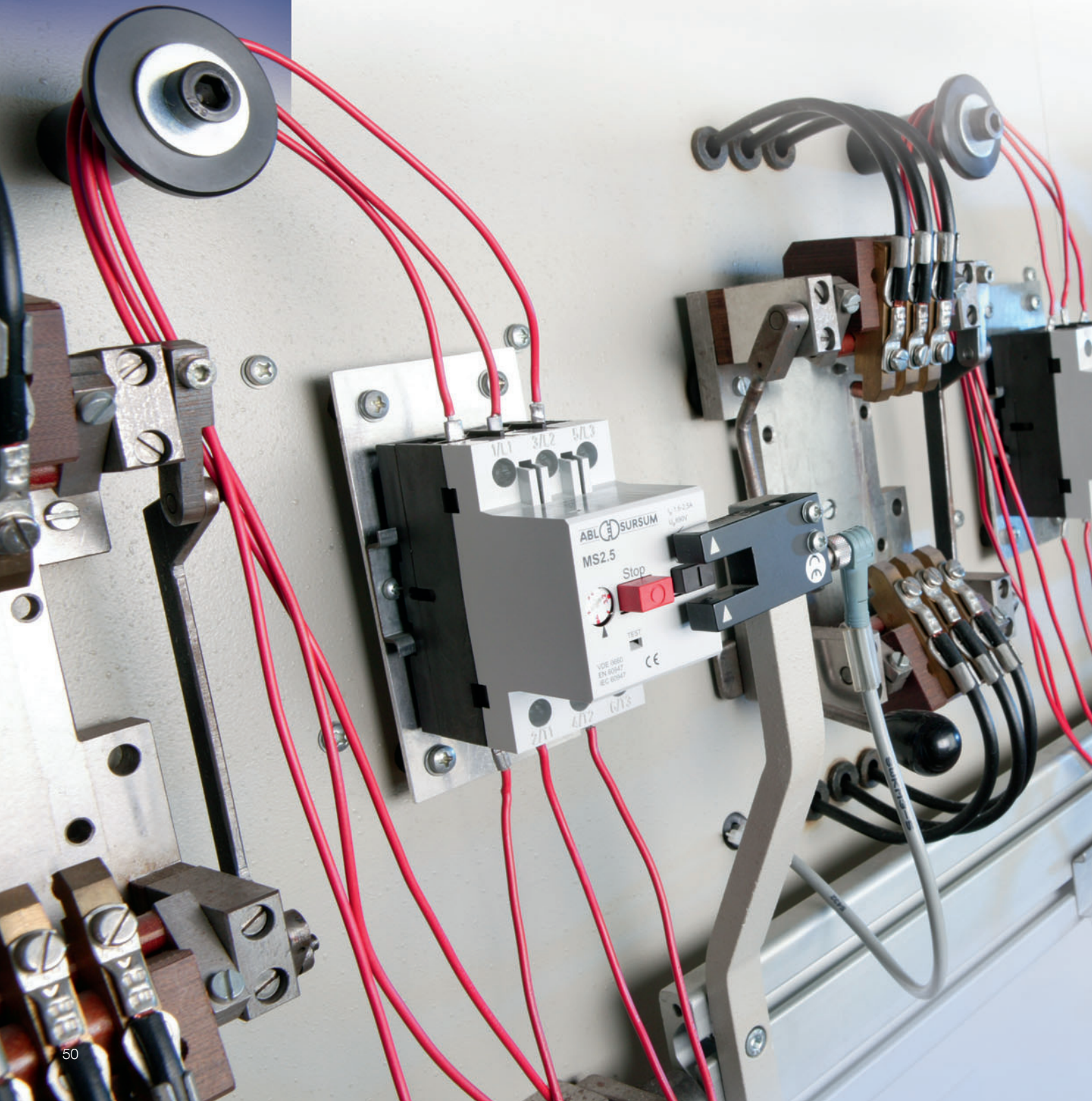
Z characteristic I_n = 0.3 - 10 A
UM



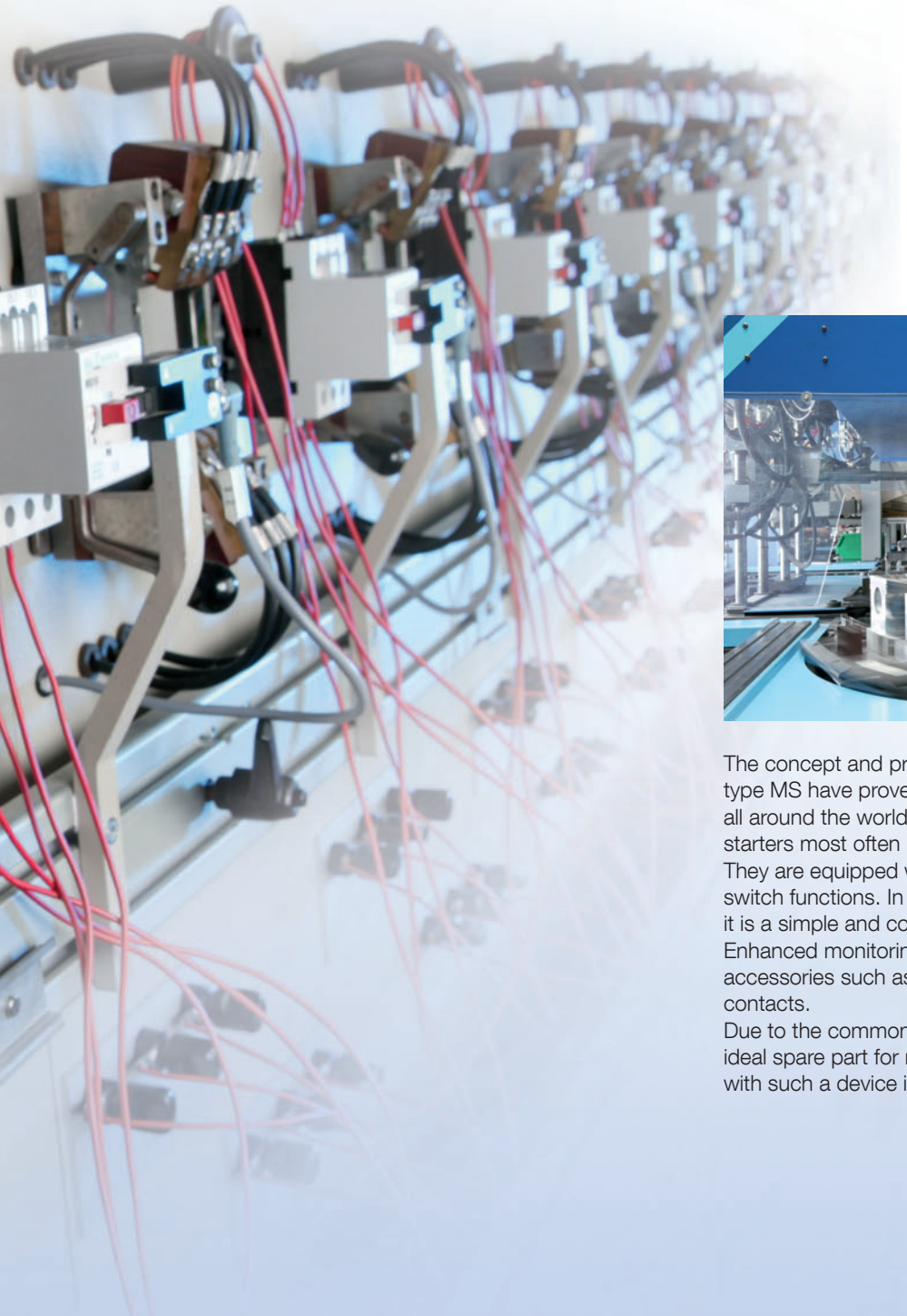
Z characteristic I_n = 12.5 - 50 A
UM

* 63 A without UL approval

Extensively tested for practical use – ABL SURSUM Switching Devices according to UL508 and CSA-22.2 No.14

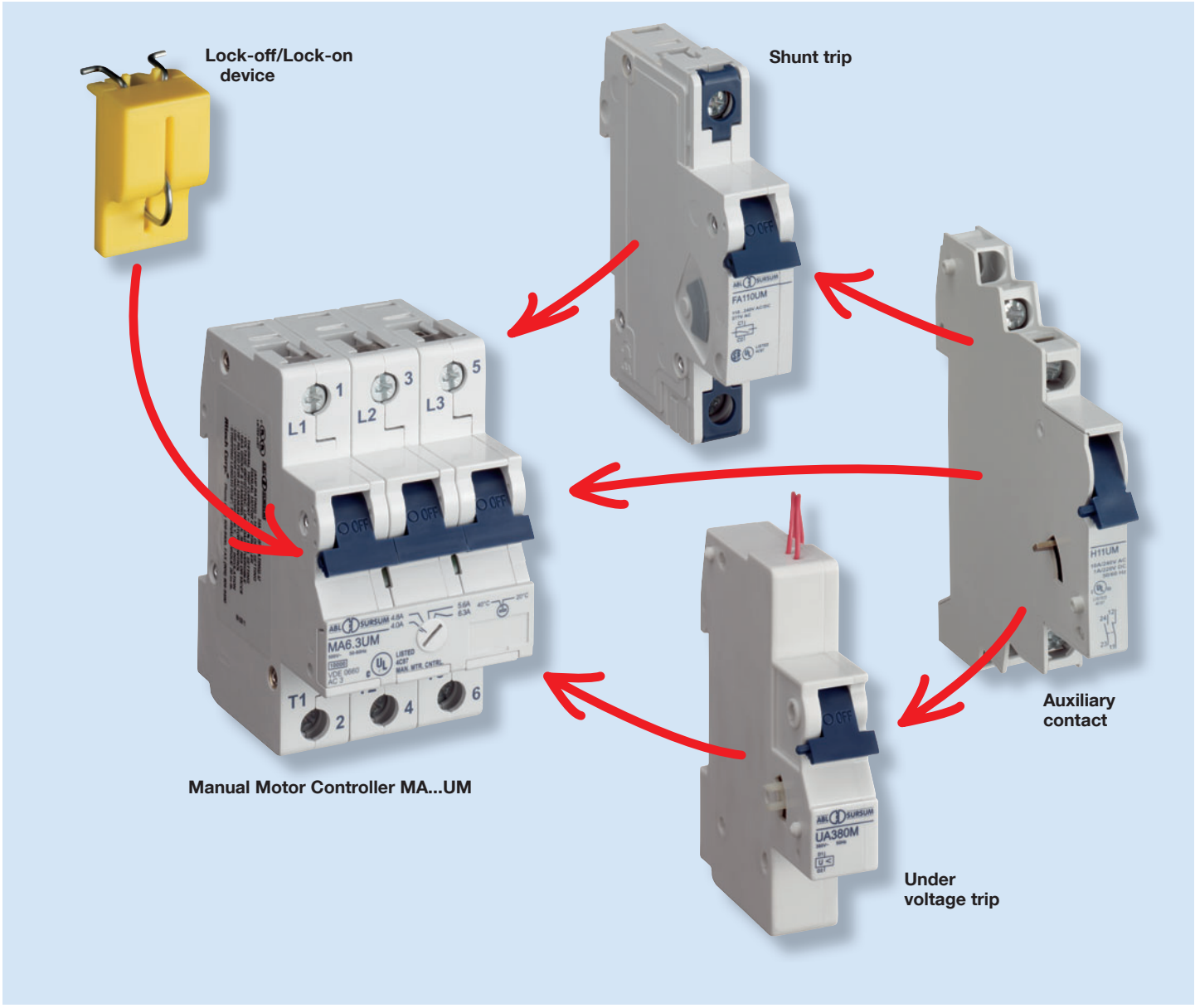


The manual motor starter type MA is a specific development, and combines the design of the miniature circuit breaker with the traditional features of a manual motor controller. The adjustable calibration of the thermal tripping in the IEC nominal rating ranges goes up to 40 A.
It was designed to handle high inrush loads from power supplies, motors etc. wiring and equipment can be protected from damages due to overcurrent, and nuisance tripping in cases of high inrush currents can be reduced significantly. With the UL508 approval, this device is available either in an IEC or in a UL approved version.



The concept and principles of design of the manual motor starters type MS have proven their reliability through 40 years of experience all around the world. It is still one of the types of manual motor starters most often used in the world for single motor protection. They are equipped with phase failure sensitivity, isolating and main switch functions. In combination with the emergency push button, it is a simple and convenient complete solution for machinery. Enhanced monitoring and control is given with the wide range of accessories such as undervoltage release, shunt trip and auxiliary contacts.
Due to the common design and the years of production, it is the ideal spare part for millions of machines which have been equipped with such a device in the past.

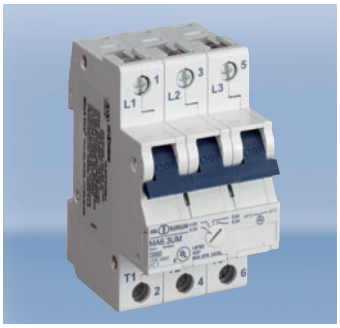
File E137938

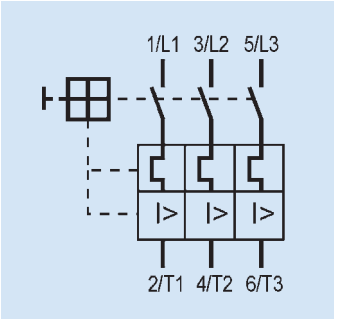


Switching Devices
Manual Motor Controller MA

according to UL508 and CSA-22.2 no. 14
Product Range MA...UM

File E137938





Rated Current [A]	Horsepower ratings at normal line voltage					Operating current short circuit trip [A]	Article no.	Weight g/each	Packing unit
	110-120 V hp (kW)	200V hp (kW)	208 V hp (kW)	220-240 V hp (kW)	460-480 V hp (kW)				
0.1 – 0.16	Through MA2.5UM, ampere rated for motor circuits having a fullload-amperage (FLA) not exceeding the MA´s general purpose rated current (RC, equals maximum dial setting) and a lockedrotor current not exceeding 6 times the MA´s RC.					1.92	**MA016UM**	450	1
0.16 – 0.25						3.00	**MA025UM**	450	1
0.25 – 0.40						4.80	**MA040UM**	450	1
0.40 – 0.63						7.60	**MA063UM**	450	1
0.63 – 1.0						12.00	**MA1.0UM**	450	1
1.0 – 1.6						19.20	**MA1.6UM**	450	1
1.6 – 2.5						30.00	**MA2.5UM**	450	1
2.5 – 4.0	½ (0.37)	¾ (0.56)	¾ (0.56)	1 (0.75)	2 (1.5)	48.00	**MA4.0UM**	450	1
4.0 – 6.3	¾ (0.56)	1½ (1.2)	1½ (1.2)	1 (0.75)	3 (2.24)	75.60	**MA6.3UM**	450	1
6.3 – 10	1 (0.75)	2 (1.5)	2 (1.5)	3 (2.24)	5 (3.73)	120.00	**MA10UM**	450	1
10 – 16	2 (1.5)	3 (2.24)	3 (2.24)	5 (3.73)	10 (7.46)	192.00	**MA16UM**	450	1
16 – 20	3 (2.24)	5 (3.73)	5 (3.73)	5 (3.73)	10 (7.46)	240.00	**MA20UM**	450	1
20 – 25	3 (2.24)	5 (3.73)	7½ (5.6)	7½ (5.6)	15 (11.19)	300.00	**MA25UM**	450	1
25 – 32	5 (3.73)	7½ (5.6)	7½ (5.6)	10 (7.46)	20 (14.92)	240.00	**MA32UM**	450	1
32 – 40	5 (3.73)	10 (7.46)	10 (7.46)	10 (7.46)	25 (18.65)	300.00	**MA40UM**	450	1

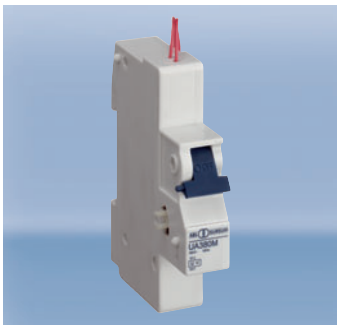
Accessories for Switching Devices Manual Motor Controller MA

according to UL508 and CSA-22.2 No.14 for Product Ranges UM and MA...UM

File E137938

Shunt trip

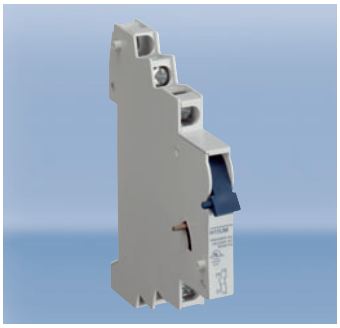
Module	Rated operating voltage	Max. operating current at U_n (t < 10 ms)	**Article no.**	Weight g/each	Packing unit
1	12 V ≃	1.3 A	**FA12UM**	105	5
1	24 V ≃	0.6 A	**FA24UM**	105	5
1	48 - 72 V ≃	0.2 A	**FA48UM**	105	5
1	110 - 240 V ≃, 415 V~	0.25 A at 110 V	**FA110UM**	105	5
		0.5 A at 240 V			
		0.58 A at 277 V			
Pull-in voltage 0.7 x U_e			Switch in duration for U_e 100%		



Undervoltage trip (60 Hz) *

Module	Rated voltage		**Article no.**	Weight g/each	Packing unit
1	120 V		**UA120UM**	150	5
1	220 V		**UA220UM**	150	5
Pull-in voltage ≥ 0.85 x U_e		Drop out voltage 0.35 - 0.7 x U_e		Switch in duration for U_e 100 %	

* without UL approval



Auxiliary contact

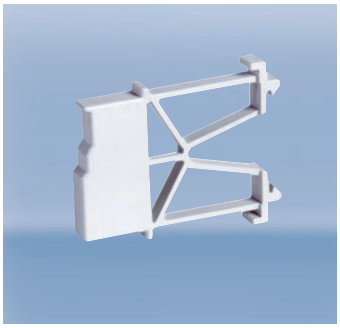
Module	Type of contact	Contacts	**Article no.**	Weight g/each	Packing unit
1/2	1 auxiliary contact	1NO	**H10UM**	35	10
1/2	2 auxiliary contacts	1NO + 1NC	**H11UM**	40	10
1/2	3 auxiliary contacts	1NO + 2NC	**H12UM**	45	10
1/2	3 auxiliary contacts	2NO + 1NC	**H21UM**	45	10

Standards	according to IEC 60947-5-1, DIN EN 60947-5-1, VDE 0660-200, UL508	
Rated operating currents	10 A /240 V AC 3 A / 110 V DC 1 A / 220 V DC	
Minimum contact load	1 mA at 24 V DC	
Conductor cross sections		
Type of conductor ***)**	min.	max.
Single wire	1.0 mm^2 (AWG18)	2.5 mm^2 (AWG14)
Stranded wire	1.0 mm^2 (AWG18)	1.5 mm^2 (AWG16)
Stranded wire with ferrule	1.0 mm^2 (AWG18)	1.5 mm^2 (AWG16)
Torque	max. 0.8 Nm (7 lb.in)	

***)** Stripped length 8 - 9 mm

Accessories for Switching Devices Manual Motor Controller MA

according to UL508 and CSA-22.2 No.14 for Product Ranges UM and MA...UM



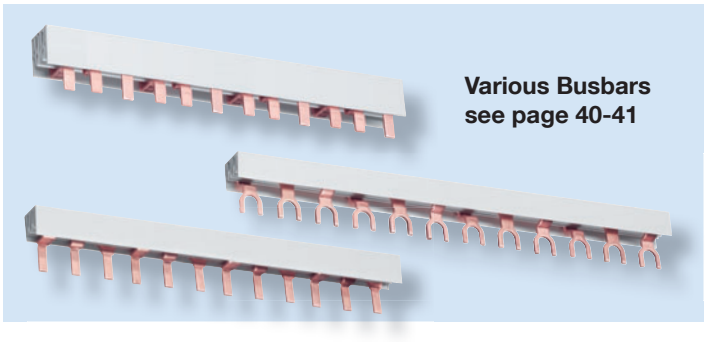
Distance device 9 mm

Module	**Article no.**	Weight g/each	Packing unit
1/2	HDS	7	10

Lock-off/Lock-on device

For miniature circuit breakers and motor protective circuit breakers

	Article no.	Weight g/each	Packing unit
	EASS	4	10



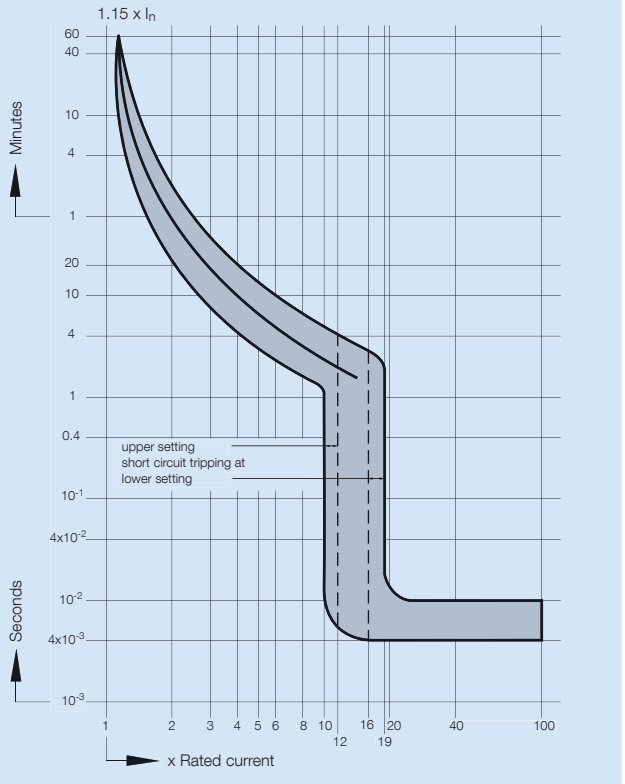
Various Busbars
see page 40-41

Technical Data		
Standards		UL508 and CSA-22.2 No.14
Interrupting capacity		0.16 A – 2.5 A / 42 kA, 4 A – 16 A / 14 kA, 20 – 40 A / 10 kA
Utilization category		AC 3 at U_e 415 V~ (up to I_n 25 A)
Group Short Circuit Ratings (UL/CSA Ratings)		1200 A / 42 kA, 350 A / 14 kA, 350 A / 10 kA
Rated voltage AC		480Y / 277 VAC
Rated current range		15 setting ranges from 0.1 up to 40 A
Rated uninterrupted current I_{th}		40 A
Tripping time at 6 x I_e		> 5s/TII
Test currents	Thermal not tripping I_1 (A) > 2 h	1.05 x I_e
	Thermal tripping I_2 (A) < 2 h	1.15 x I_e
	Electromagnetic not tripping I_4 (A) > 0.1 s	for the lower setting 16 x I_e (12.5 x I_e > 16 A) for the upper setting 10 x I_e
	Electromagnetic tripping I_5 (A) < 0.1 s	for the lower setting 19 x I_e (15 x I_e > 16 A) for the upper setting 12 x I_e
Temperature compensation		up to +40 °C
Permitted ambient temperature		open -20 °C to +50 °C, enclosure -20 °C to +40 °C storage/transport -40 °C to +70 °C
Device depth according to DIN 43880		68 mm
Mechanical endurance		30 000 switching cycles (30 000 ON / 30 000 OFF)
Permitted operating frequency		30 switching cycles/h
Protection cover		Safe for fingers and back of hand acc. to DIN EN 50274, VDE 0660-514 BGV A2
Degree of protection according to EN/IEC 60529		IP20
Installation position		any
Mounting		On DIN-rail acc. to DIN EN 60715 35 mm
Lockability		The handle can be secured against manual switching in the on and off position by a lead seal
Climatic resistance		Humid heat constant according to DIN IEC 60068-2 – 78 Humid heat cyclic according to DIN EN 60068-2 – 30
Vibration resistance		> 15 g according to DIN EN 60068-2 – 59 for a load with I_1
Resistance to mechanical shocks		25 g 11 ms

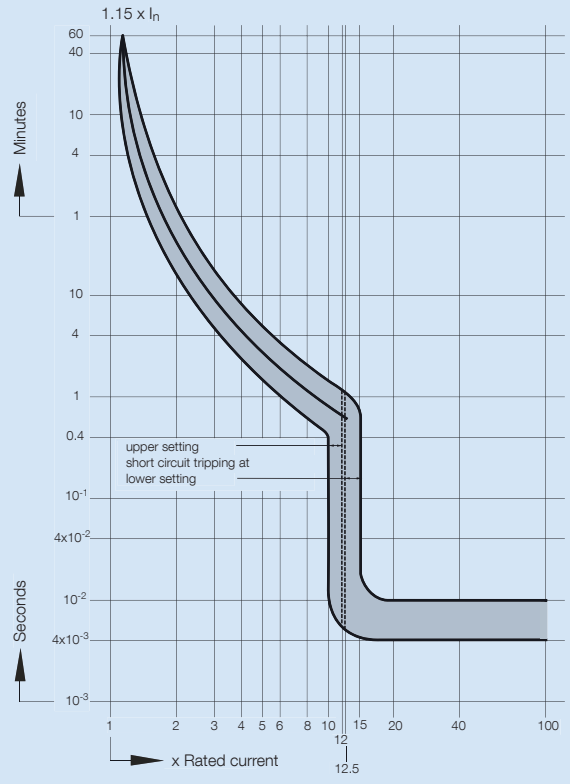
File E137938

Conductor cross sections				
	Box terminal bottom		**Box terminal top**	
Type of conductor ***)**	max.	min.	max.	min.
Single wire	25 mm² (AWG3)	1.0 mm² (AWG18)	25 mm² (AWG3)	1.0 mm² (AWG18)
Multiple wire	25 mm² (AWG3)	16 mm² (AWG6)	25 mm² (AWG3)	16 mm² (AWG6)
Stranded wire	16 mm² (AWG6)	1.0 mm² (AWG18)	25 mm² (AWG3)	1.0 mm² (AWG18)
Stranded wire with ferrule	16 mm² (AWG6)	1.0 mm² (AWG18)	16 mm² (AWG6)	1.0 mm² (AWG18)
Busbar Cable lug	up to 3 mm thickness		up to 1.5 mm thickness	
Combined, conductor and busbar or cable lug	up to 25 mm² and up to 2 mm thickness		not possible	
Torque	max. 2.5 Nm (22.2 lb.in)			

***) Stripped length: bottom 12 - 14 mm, top 10 - 12 mm**



Characteristic for MA016UM – MA16UM



Characteristic for MA20UM – MA40UM

Internal resistance per pole in mΩ and power loss in Watt of the complete device

Type	Lower setting A	Upper setting A	Internal resistance per pole mΩ	Power loss for the complete device for lower setting Watt	Power loss for the complete device for upper setting Watt
MA016UM	0.10	0.16	85500	2.6	6.6
MA025UM	0.16	0.25	35000	2.7	6.6
MA040UM	0.25	0.40	15000	2.8	7.2
MA063UM	0.40	0.63	5200	2.5	6.2
MA1.0UM	0.63	1.0	2300	2.7	6.9
MA1.6UM	1.0	1.6	950	2.9	7.3
MA2.5UM	1.6	2.5	355	2.7	6.7
MA4.0UM	2.5	4.0	142	2.7	6.8
MA6.3UM	4.0	6.3	54	2.6	6.4
MA.10UM	6.3	10	28	3.3	8.4
MA.16UM	10	16	13.9	4.2	10.7
MA.20UM	16	20	9.9	5.2	8.2
MA.25UM	20	25	6.3	8	12.3
MA.32UM	25	32	3.85	6.4	10.5
MA.40UM	32	40	3.1	8.6	13.4

Type	**Rated Current [A]**	FLA Dial Adjustment Markings	Group short circuit rating at 480 VAC [a] (and BCP size)	3 Ø horsepower ratings at nominal line voltage (see note for HEA definition) 110 – 120 V hp (HEA)	200 V hp (HEA)	208 V hp (HEA)	220 – 240 V hp (HEA)	460 – 480 V hp (HEA)
MA016UM	**0.16**	0.1/ 0.12/0.14/0.16	42 kARMS symmetrical (max. 1200 A MCCB or RK5)	Through MA2.5UM, ampere rated for motor circuits having a fullload-amperage (FLA) not exceeding the MA´s general purpose rated current (RC, equals maximum dial setting) and a lockedrotor current not exceeding 6 times the MA´s RC.				
MA025UM	**0.25**	0.16/0.19/0.22/0.25						
MA040UM	**0.40**	0.25/0.30/0.35/0.40						
MA063UM	**0.63**	0.40/0.48/0.56/0.63						
MA1.0UM	**1.00**	0.63/0.75/0.87/1.0						
MA1.6UM	**1.60**	1.0/1.2/1.4/1.6						
MA2.5UM	**2.50**	1.6/1.9/2.2/2.5						
MA4.0UM	**4.00**	2.5/3.0/3.5/4.0	14 kARMS symmetrical (max. 350 A MCCB or RK5)	½ (4.0)	¾ (3.2)	¾ (3.1)	1 (3.6)	2 (3.42)
MA6.3UM	**6.30**	4.0/4.8/5.6/6.3		¾ (5.6)	1½ (6.0)	1½ (5.7)	1½ (5.2)	3 (4.8)
MA10UM	**10**	6.3/7.5/8.7/10		1 (7.2)	2 (7.8)	2 (7.5)	3 (9.6)	5 (7.6)
MA16UM	**16**	10/12/14/16		2 (13.6)	3 (11.0)	3 (10.6)	5 (15.2)	10 (14.0)
MA20UM	**20**	16/17/18.5/20	10 kARMS symmetrical (max. 350 A MCCB or RK5)	3 (19.2)	5 (17.5)	5 (16.7)	5 (15.2)	10 (14.0)
MA25UM	**25**	20/21.5/23/25		3 (19.2)	5 (17.5)	7½ (24.2)	7½ (22.0)	15 (21.0)
MA32UM	**32**	25/27/30/32		5 (30.4)	7½ (25.0)	7½ (24.2)	10 (28.0)	20 (27.0)
MA40UM	**40**	32/34/37/40		5 (30.4)	10 (32.0)	10 (31.0)	10 (28.0)	25 (34.0)

Note:
HEA - Horsepower Equivalent Amperes, the nominal amperage assigned to standard motor horsepower ratings in design guide tables such as NFPA-70 Tables 430-248, 430-249, 430-250; UL1077 Table 16.2;
CSA - C22.2 No. 235-M89 Tables 44 and 45;
CSA-C22.2 No. 14-M91 Table 19, etc.
Multiply HEA values (in parenthesis) by 1.1 if power factor is 90%, and by 1.2 if power factor is 80%.

a) The standard-circuit short-circuit rating is 14 kA for all types. Group ratings can be used in a standard circuit (e.g., MA1.0UM at 42 kA), but a higher standard rating cannot be used in a group circuit (e.g., MA40UM at 14 kA only in standard circuit.)

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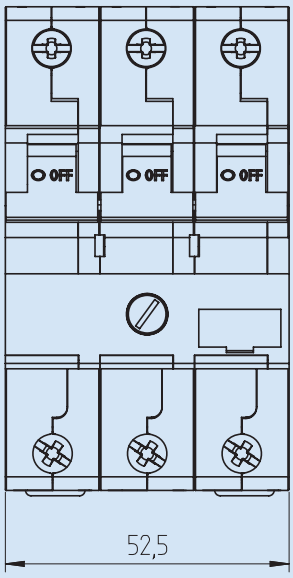
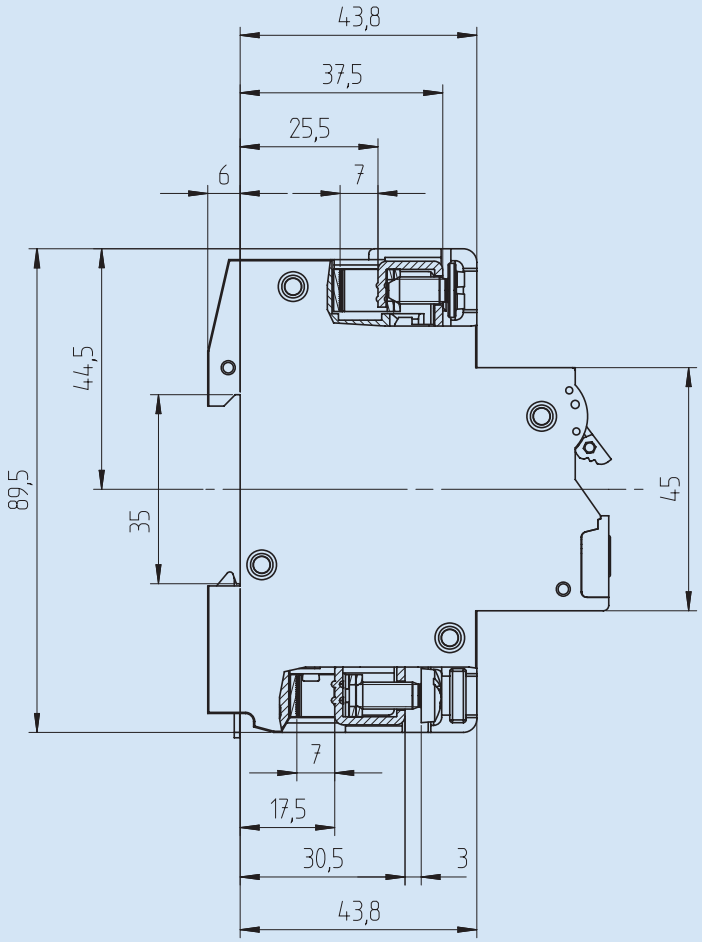
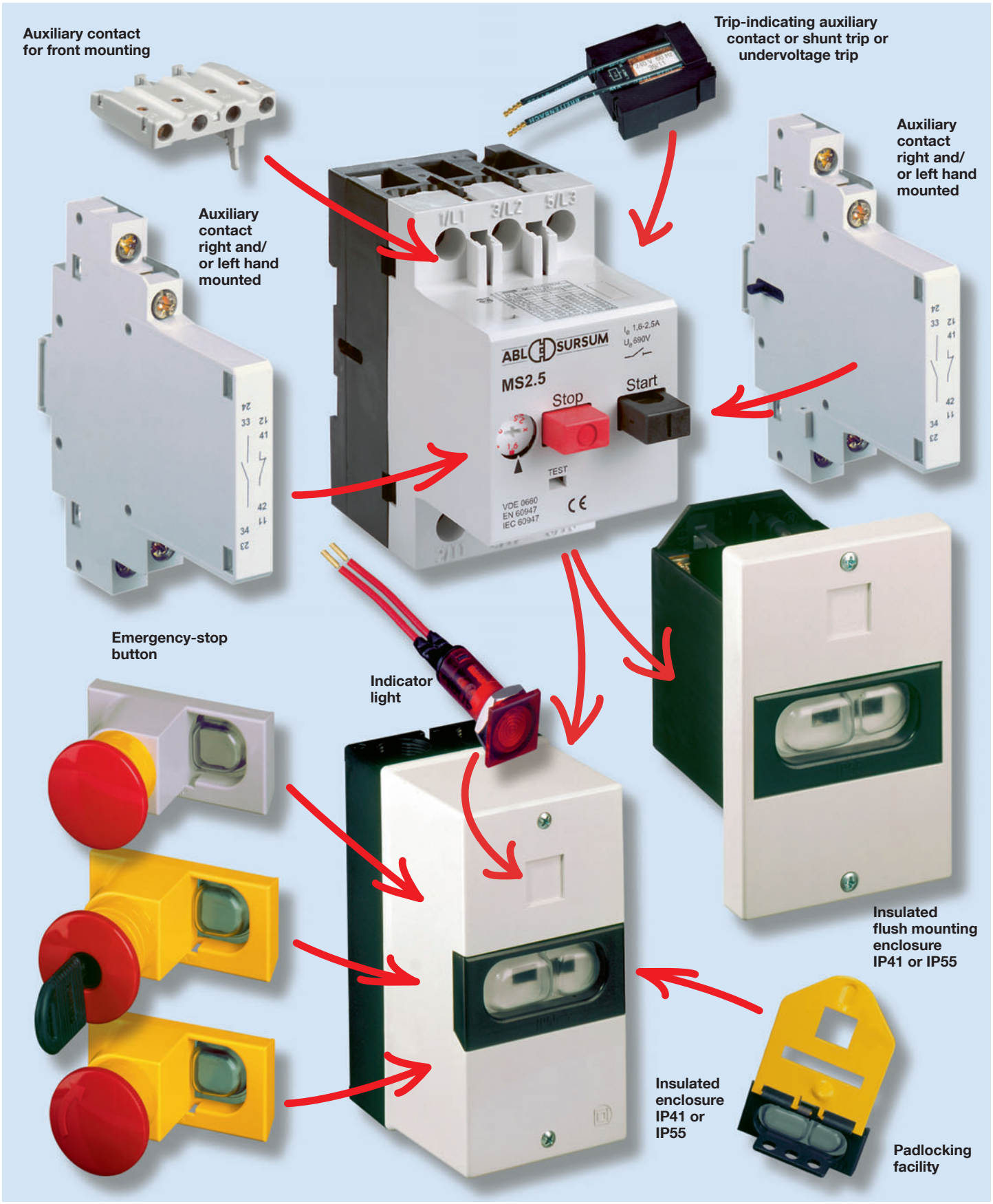
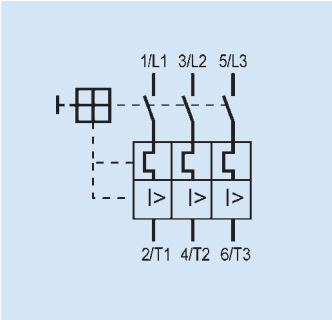
according to UL508 and CSA-22.2 No.14
Dimension Drawing






Auxiliary contact for front mounting
Trip-indicating auxiliary contact or shunt trip or undervoltage trip
Auxiliary contact right and/ or left hand mounted
Auxiliary contact right and/ or left hand mounted
1/L1
3/L2
5/L3
ABL SURSUM
MS2.5
Stop
Start
TEST
VDE 0660
EN 60947
IEC 60947
Emergency-stop button
Indicator light
Insulated flush mounting enclosure IP41 or IP55
Insulated enclosure IP41 or IP55
Padlocking facility

File E137938



Rated Current [A]	Horsepower ratings at nominal line voltage					Operating current short circuit trip [A]	Article no.	Weight g/each	Packing unit
	115V hp (kW)	200V hp (kW)	230V hp (kW)	480V hp (kW)	600 hp (kW)				
0.1 - 0.16	Ampere rated for motor circuits having a full-load-amperage (FLA) not exceeding the MS's general purpose rated current and a locked rotor current not exceeding 6 times the MS's rated current.					1.92	**MS016**	250	1
0.16 - 0.25						3.00	**MS025**	250	1
0.25 - 0.40						4.80	**MS040**	250	1
0.40 - 0.63						7.60	**MS063**	250	1
0.63 - 1.0				1/2 (0.37)	1/2 (0.37)	12.00	**MS1**	250	1
1.0 - 1.6				3/4 (0.56)	1 (0.75)	19.20	**MS1.6**	250	1
1.6 - 2.5		1/2 (0.37)	1/2 (0.37)	1 (0.75)	11/2 (1.2)	30.00	**MS2.5**	250	1
2.5 - 4.0	1/2 (0.37)	3/4 (0.56)	1 (0.75)	2 (1.5)	3 (2.24)	48.00	**MS4**	250	1
4.0 - 6.3	3/4 (0.56)	11/2 (1.2)	1 (0.75)	3 (2.24)	5 (3.73)	75.60	**MS6.3**	250	1
6.3 - 10	1 (0.75)	2 (1.5)	3 (2.24)	5 (3.73)	71/2 (5.6)	120.00	**MS10**	250	1
10 - 16	2 (1.5)	3 (2.24)	5 (3.73)	10 (7.46)	10 (7.46)	192.00	**MS16**	250	1
16 - 20	3 (2.24)	5 (3.73)	5 (3.73)	10 (7.46)	_	240.00	**MS20**	250	1
20 - 25	3 (2.24)	5 (3.73)	71/2 (5.6)	15 (11.19	_	300.00	**MS25**	250	1

Accessories for Manual Motor Controller MS

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Modules	Wiring diagram	Contacts	**Article no.**	Weight g/each	Packing unit
Auxiliary contact for side mounting					
1/2 M		2 NO	**HMS20**	40	5
1/2 M		1 NO + 1 NC	**HMS11**	40	5
1/2 M		1 NO	**HMS10**	40	5
1/2 M		2 NC	**HMS02**	40	5
1/2 M		1 NC	**HMS01**	40	5
Early make auxiliary contact for side mounting					
1/2 M		1 NO + 1 NC	**VHMS11**	40	5
1/2 M		2 NO	**VHMS20**	40	5

Technical Data	**HMS, VHMS**
Rated impulse withstand voltage U_{imp}	4 000 V
Rated operating voltage U_e	500 V
Overvoltage category/Pollution level	III/3
Max. current (with free air circulation) I_{th}	6A
Rated operating current I_e	3.5/2 A
Can also be used for low voltage and PLC-inputs	24 V DC, 10 mA
Cross section: 1 conductor mm^2 2 conductor mm^2 only HMS, VHMS	 0.75 – 2.5 r; 0.75 – 1.5 f (with ferrule) 0.75 – 2.5 r; 0.75 – 1.5 f (with ferrule)

Accessories for Manual Motor Controller MS

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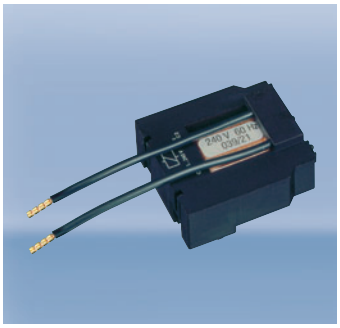
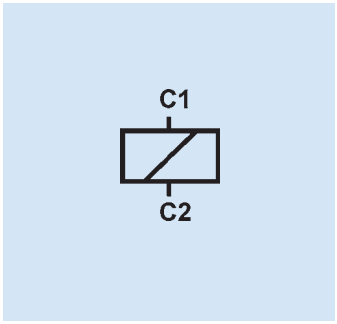
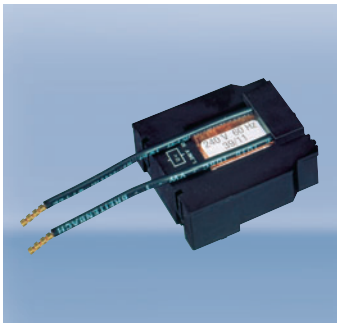
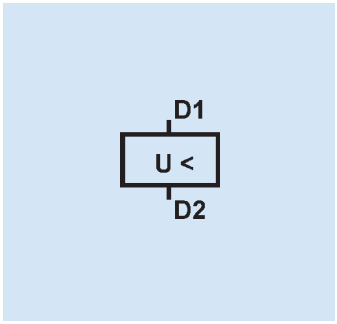
	Rated operating voltage	Article no.	Weight g/each	Packing unit
	**Shunt trip for inside mounting with connecting cable (140 mm long)**			
	110 V 50 Hz, 120 V 60 Hz	**AMS110**	75	10
	220-230V 50 Hz, 240 V 60 Hz	**AMS220**	75	10
	380-415 V 50 Hz, 440 V 60 Hz	**AMS380**	75	10
	24 V 50/60 Hz	**AMS24**	75	10
	500 V 50 Hz	**AMS500**	75	10
	24 V DC	**AMSD24**	75	10
	Pull-in voltage 0.7 x U_e		Switch in duration for U_e 100 % AC	



	**Undervoltage trip for inside mounting with connecting cable (140 mm long)**			
	110 V 50 Hz, 120 V 60 Hz	**UMS110**	75	10
	220-230 V 50 Hz, 240 V 60 Hz	**UMS220**	75	10
	380-415 V 50 Hz, 440 V 60 Hz	**UMS380**	75	10
	24 V 50/60 Hz	**UMS24**	75	10
	500 V 50 Hz	**UMS500**	75	10
Pull-in voltage ≥ 0.85 x U_e		Drop out voltage 0.35-0.7 x U_e		Switch in duration for U_e 100%



Accessories for Manual Motor Controller MS

Insulated enclosure IP55

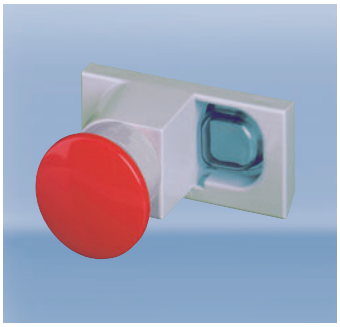
with integrated PE(N) terminal
top and bottom each 2 metric knock-outs

	Article no.	Weight g/each	Packing unit
	MS.G55	240	1

Insulated flush mounting enclosure IP55

with integrated PE(N) terminal

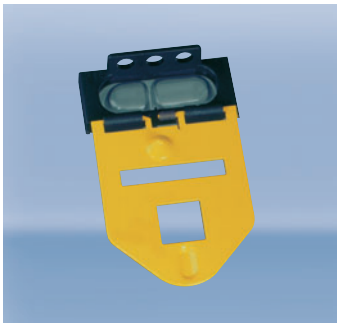
	Article no.	Weight g/each	Packing unit
	MS.F55	170	1



Stop button

not latching
red, on grey surface

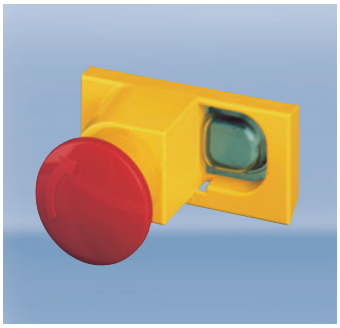
	Article no.	Weight g/each	Packing unit
	MS.PT	55	5



Padlocking facility

for up to three padlocks

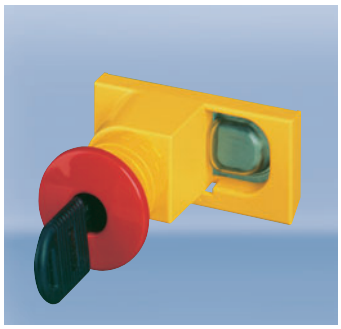
	Article no.	Weight g/each	Packing unit
	MS.VS	100	10



Emergency-stop button

latching,
turn to release
red, on yellow surface

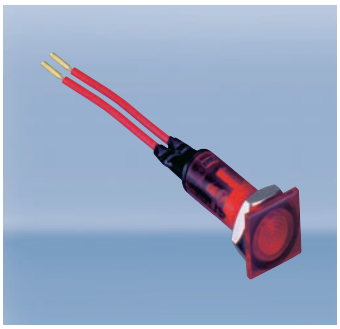
	Article no.	Weight g/each	Packing unit
	MS.PV	60	5



Emergency-stop button

latching,
key release (2 keys)
red, on yellow surface

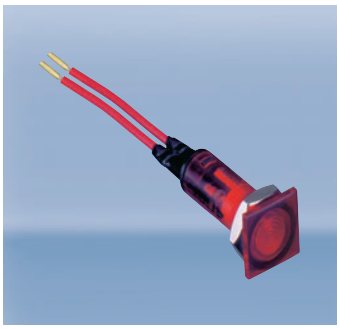
	Article no.	Weight g/each	Packing unit
	MS.PS2	65	5



Indicator light

with glow bulb,
nominal rated voltage: 220-240 V

Colour	Article no.	Weight g/each	Packing unit
transp.	**MS.SLW2**	10	5
green	**MS.SLG2**	10	5
red	**MS.SLR2**	10	5
yellow	**MS.SLJ2**	10	5

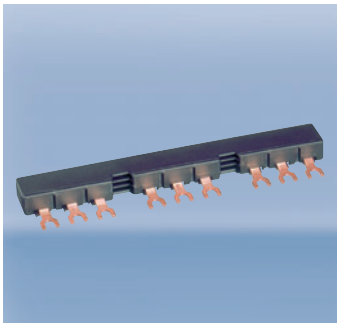


Indicator light

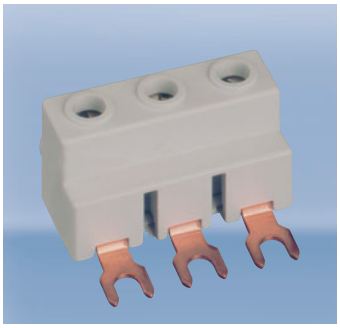
with glow bulb,
nominal rated voltage: 380-440 V

Colour	Article no.	Weight g/each	Packing unit
transp.	**MS.SLW3**	10	5
green	**MS.SLG3**	10	5
red	**MS.SLR3**	10	5
yellow	**MS.SLJ3**	10	5

Accessories for Manual Motor Controller MS



Description	max. busbar current (A)	Length	Article no.	Weight g/each	Packing unit
Busbars					
for 2 MPCBs without auxiliary contacts	63	90 mm	**SB.D02**	37	10
for 3 MPCBs without auxiliary contacts	63	136 mm	**SB.D03**	55	10
for 4 MPCBs without auxiliary contacts	63	180 mm	**SB.D04**	75	10
for 2 MPCBs each with 1 auxiliary contact fitted on the right side	63	99 mm	**SB.D12**	40	10
for 3 MPCBs each with 1 auxiliary contact fitted on the right side	63	153 mm	**SB.D13**	65	10
for 4 MPCBs each with 1 auxiliary contact fitted on the right side	63	207 mm	**SB.D14**	90	10
for 5 MPCBs each with 1 auxiliary contact fitted on the right side	63	261 mm	**SB.D15**	115	10
for 2 MPCBs each with 2 auxiliary contacts	63	108 mm	**SB.D22**	45	10
for 4 MPCBs each with 2 auxiliary contacts	63	234 mm	**SB.D24**	105	10



Incoming terminal block					
	63		**SB.DE1**	30	10

Shroud					
			SB.DA1	5	10

File E137938

Standards	IEC 60947, DIN EN 60947, VDE 0660
Mechanical endurance = Electrical endurance	0.1 x 10^6 switching cycles
Max. operating frequency	30 switching cycles / h
Ambient temperature not enclosed, max./min. enclosed, max./min.	 +55 °C / -20 °C +40 °C / -20 °C
Resistance to mechanical shocks	15 g / 10 ms
Installation position	any, in IP41 enclosure vertical
Cross section (1 or 2 conductors)	1.0 – 6 r; 0.75 – 4 f (with ferrule) 2 conductors differing by not more than 2 sizes
Torque for terminal screws - Main conductor - Auxiliary conductor - Auxiliary contact for front mounting	 1.2 Nm 1.0 Nm 0.5 Nm
Rated impulse withstand voltage U_{imp}	6 000 V
Overvoltage category / Pollution level	III / 3
Rated operating voltage U_e	690 V AC
Rated operating current I_e	0.16 – 25 A according to setting range
Frequency	40…60 Hz
	At higher frequencies, the electromagnetic tripping values rise by a factor of about 1.1 at 100 Hz; 1.2 at 200 Hz; 1.4 at 400 Hz; 1.5 at 500 Hz
Utilization category (IEC 60947-4-1, DIN EN 60947-4-1, VDE 0660-102)	AC-3 max. 690 V
Temperature compensation (reference values to VDE / IEC)	-5 °C / +40 °C
Temperature compensation Operating range	-20 °C…+55 °C
Power loss in watt per path of current	by min. setting range 0.6 – 1.05 W / by max. setting range 1.5 – 2.6 W

Rated interrupting capacity I_{cu} MS
IEC 60947-2, DIN EN 60947-2, VDE 0660-101

Upper setting Thermal tripping	I_{cu} (kA)			
	230 V	400 V	500 V	690 V
0.16 – 1.6 A	No additional protective devices needed inherently stable for any selected short circuit currents			
2.5 – 6.3 A			3	2.5
10 A		6	3	2.5
16 – 25 A	10	6	2.5	2

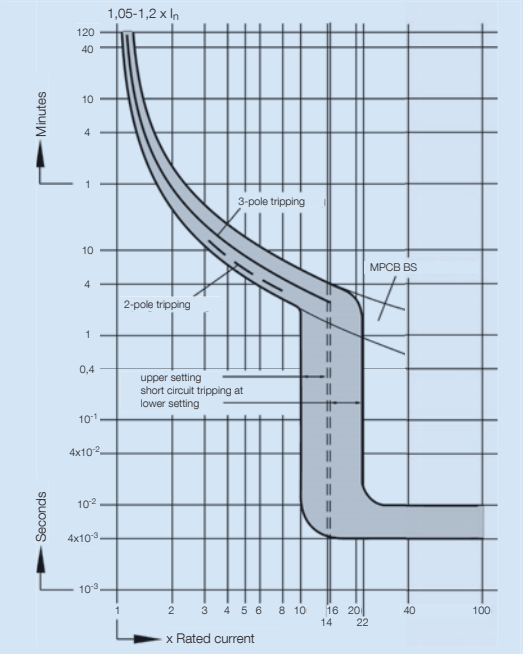
Switching times at short circuit

minimum command time	2 ms
opening delay	2 ms
opening time	7 ms

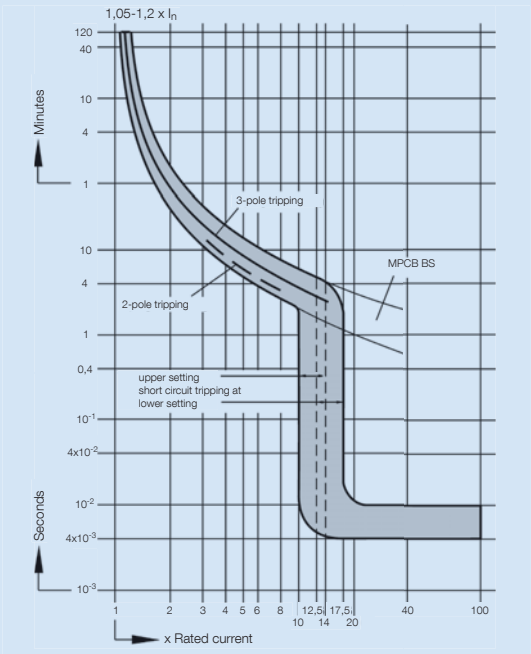
Technical Data

File E137938

Back-up-protection MS								
UL and CSA Rating					**EN and IEC Rating**			
Type	Fuse [A]	Group Fusing [A]	Voltage [V]	Interrupting Capacity [kA]	Back-up fuse (gL, aM) [A] 230 V	400 V	500 V	690 V
MS016	1	100	600	5	No back-up fuse necessary inherently stable for any selected short circuit currents			
MS025	1	100	600	5				
MS040	1	100	600	5				
MS063	2	100	600	5				
MS1	4	100	600	5				
MS1.6	6	100	600	5				
MS2.5	10	100	600	5			25	20
MS4	15	100	600	5			35	25
MS6.3	25	50	600	5			50	35
MS10	40		600	5		80	50	35
MS16	60		600	5	80	80	63	35
MS20	60		480	5	80	80	63	50
MS25	70		480	5	80	80	63	50



Characteristic for MS 016 – MS 16

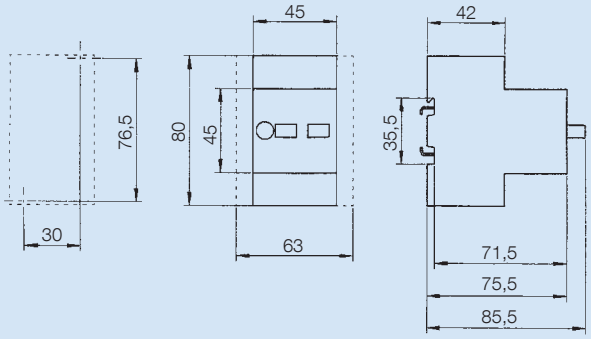


Characteristic for MS 20 – MS 25

Dimension Drawings

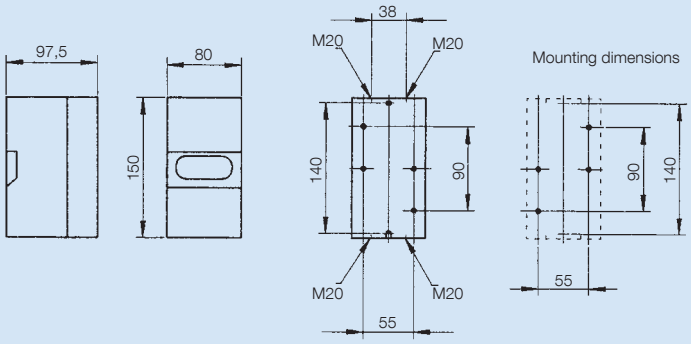
Motor protective circuit breaker MS

Mounting dimensions

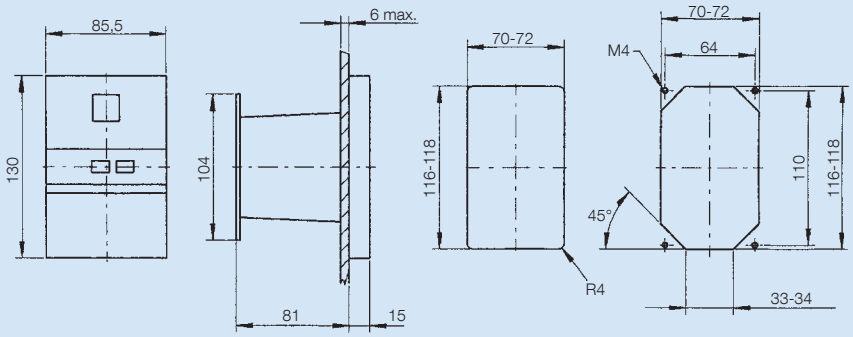


Insulated enclosure MS.G55

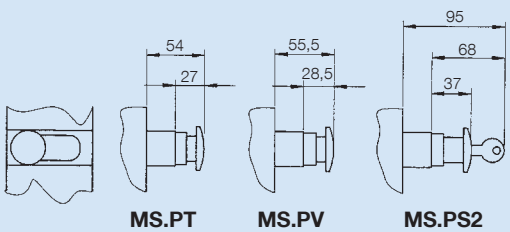
possible to integrate 1 MPCB and 2 side mounted auxiliary contacts



Insulated flush mounting enclosur MS.F55



Emergency-stop button MS.PT – PS.PS2



Horsepower rating and Kilowatt rating	
Horsepower [hp]	**Kilowatt [kW]**
0.167	0.13
0.25	0.184
0.5	0.38
0.75	0.55
1	0.735
1.25	0.919
1.5	1.103
1.75	1.287
2	1.471
2.5	1.839
3	2.206
4	2.942
5	3.677
6	4.413
7	5.148
7.5	5.516
8	5.884
9	6.619
10	7.355
11	8.09
12	8.826
13	9.561
14	10.297
15	11.032
16	11.768

Wire cross section in AWG and mm²		
AWG No.	**Cross section [mm^2]**	**Diameter [mm]**
21	0.412	0.724
20	0.519	0.813
19	0.653	0.912
18	0.824	1.27
17	1.01	1.151
16	1.307	1.29
15	1.651	1.45
14	2.082	1.628
13	2.627	1.829
12	3.307	2.052
11	4.169	2.304
10	5.26	2.588
9	6.633	2.906
8	8.367	3.264
7	10.55	3.665
6	13.229	4.115
5	16.767	4.62
4	21.148	5.189
3	26.667	5.827
2	33.624	6.543
1	42.406	7.348
1/0	53.182	8.252
2/0	67.43	9.266
3/0	85.014	10.404
4/0	107.22	11.684


ABL SURSUM
D10
277V AC
1D10UR
10 kA
ABL SURSUM
D16
480Y/277V AC
2D16UR
10kA
ABL SURSUM
D16
480Y/277V AC
3D16UR
10kA
OFF
Load
Line

ABL SURSUM Switching Devices according to UL1077 and CSA-22.2 No. 235

Our range of UL1077 supplementary protectors can be used where any additional protection in control circuits is required, and – combined with the accessories from our UL508 UM range – it also offers enhanced monitoring and control capabilities.

Switching Devices
Supplementary Protector

according to UL1077 and CSA-22.2 No.235
UR Product Range, B, C and D Characteristics

File E 137915

Rated current I_n A	Characteristic B Article no.	C Article no.	D Article no.	Weight g/each	Packing unit
1-pole					
0.5		1C05UR	1D05UR	150	12
1	1B1UR	1C1UR	1D1UR	150	12
2	1B2UR	1C2UR	1D2UR	150	12
3	1B3UR	1C3UR	1D3UR	150	12
4	1B4UR	1C4UR	1D4UR	150	12
5	1B5UR	1C5UR	1D5UR	150	12
6	1B6UR	1C6UR	1D6UR	150	12
8	1B8UR	1C8UR	1D8UR	150	12
10	1B10UR	1C10UR	1D10UR	150	12
12	1B12UR	1C12UR	1D12UR	150	12
13	1B13UR	1C13UR	1D13UR	150	12
15	1B15UR	1C15UR	1D15UR	150	12
16	1B16UR	1C16UR	1D16UR	150	12
20	1B20UR	1C20UR	1D20UR	150	12
25	1B25UR	1C25UR	1D25UR	150	12
30	1B30UR	1C30UR	1D30UR	150	12
32	1B32UR	1C32UR	1D32UR	150	12
40	1B40UR	1C40UR	1D40UR	150	12
50	1B50UR	1C50UR	1D50UR	150	12
60	1B60UR	1C60UR	1D60UR	150	12
63 *	1B63UR	1C63UR	1D63UR	150	12

* 63 A without UL approval

Rated current I_n A	Characteristic B Article no.	C Article no.	D Article no.	Weight g/each	Packing unit
2-pole					
0.5		2C05UR	2D05UR	300	6
1	2B1UR	2C1UR	2D1UR	300	6
2		2C2UR	2D2UR	300	6
3	2B3UR	2C3UR	2D3UR	300	6
4	2B4UR	2C4UR	2D4UR	300	6
5	2B5UR	2C5UR	2D5UR	300	6
6	2B6UR	2C6UR	2D6UR	300	6
8	2B8UR	2C8UR	2D8UR	300	6
10	2B10UR	2C10UR	2D10UR	300	6
12	2B12UR	2C12UR	2D12UR	300	6
13	2B13UR	2C13UR	2D13UR	300	6
15	2B15UR	2C15UR	2D15UR	300	6
16	2B16UR	2C16UR	2D16UR	300	6
20	2B20UR	2C20UR	2D20UR	300	6
25	2B25UR	2C25UR	2D25UR	300	6
30	2B30UR	2C30UR	2D30UR	300	6
32	2B32UR	2C32UR	2D32UR	300	6
40	2B40UR	2C40UR	2D40UR	300	6
50	2B50UR	2C50UR	2D50UR	300	6
60	2B60UR	2C60UR	2D60UR	300	6
63 *	2B63UR	2C63UR	2D63UR	300	6

* 63 A without UL approval

Switching Devices
Supplementary Protector

according to UL1077 and CSA-22.2 No.235
UR Product Range, B, C and D Characteristics

File E 137915

Rated current I_n A	Characteristic B Article no.	C Article no.	D Article no.	Weight g/each	Packing unit
3-pole					
0.5		**3C05UR**	**3D05UR**	450	4
1	**3B1UR**	**3C1UR**	**3D1UR**	450	4
2	**3B2UR**	**3C2UR**	**3D2UR**	450	4
3	**3B3UR**	**3C3UR**	**3D3UR**	450	4
4	**3B4UR**	**3C4UR**	**3D4UR**	450	4
5	**3B5UR**	**3C5UR**	**3D5UR**	450	4
6	**3B6UR**	**3C6UR**	**3D6UR**	450	4
8	**3B8UR**	**3C8UR**	**3D8UR**	450	4
10	**3B10UR**	**3C10UR**	**3D10UR**	450	4
12	**3B12UR**	**3C12UR**	**3D12UR**	450	4
13	**3B13UR**	**3C13UR**	**3D13UR**	450	4
15	**3B15UR**	**3C15UR**	**3D15UR**	450	4
16	**3B16UR**	**3C16UR**	**3D16UR**	450	4
20	**3B20UR**	**3C20UR**	**3D20UR**	450	4
25	**3B25UR**	**3C25UR**	**3D25UR**	450	4
30	**3B30UR**	**3C30UR**	**3D30UR**	450	4
32	**3B32UR**	**3C32UR**	**3D32UR**	450	4
40	**3B40UR**	**3C40UR**	**3D40UR**	450	4
50	**3B50UR**	**3C50UR**	**3D50UR**	450	4
60	**3B60UR**	**3C60UR**	**3D60UR**	450	4
63 *	**3B63UR**	**3C63UR**	**3D63UR**	450	4

* 63 A without UL approval

File E 137938

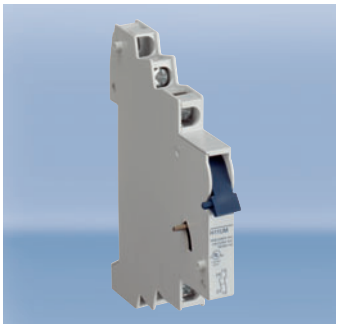
Rated current I_n A	Rated voltage Volt AC	Test currents * electromagnetic not tripping I_4 A	tripping I_5 A	Article no.	Weight g/each	Packing unit
Neutral switch – for mounting instructions please consult page 75						
0.3 - 63	277/480	400	700	**N63UM**	150	5

* additional electromagnetic protection

Accessories for Switching Devices Manual Motor Controller and Supplementary Protectors

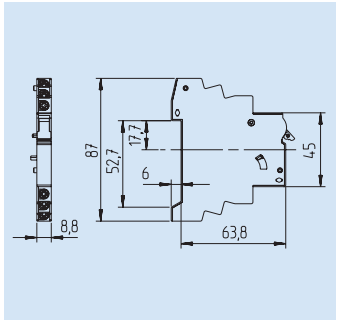
according to UL508 and CSA-22.2 No.14
for Product Ranges UM and UR

File E 137938



Auxiliary contact

Module	Type of contact	Contacts	**Article no.**	Weight g/each	Packing unit
1/2	1 auxiliary contact	1NO	**H10UM**	35	10
1/2	2 auxiliary contacts	1NO + 1NC	**H11UM**	40	10
1/2	3 auxiliary contacts	1NO + 2NC	**H12UM**	45	10
1/2	3 auxiliary contacts	2NO + 1NC	**H21UM**	45	10

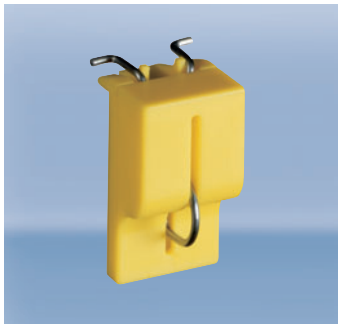


Standards	Acc. to IEC 60947-5-1, DIN EN 60947-5-1, VDE 0660-200, UL508	
Rated operating currents	10 A /240 V AC 3 A / 110 V DC 1 A / 220 V DC	
Minimum contact load	1 mA at 24 V DC	
Conductor cross sections		
Type of conductor *)	min.	max.
Single wire	1.0 mm² (AWG18)	2.5 mm² (AWG14)
Stranded wire	1.0 mm² (AWG18)	1.5 mm² (AWG16)
Stranded wire with ferrule	1.0 mm² (AWG18)	1.5 mm² (AWG16)
Torque	max. 0.8 Nm (7 lb.in)	

***) Stripped length 8 - 9 mm**

Shunt trip

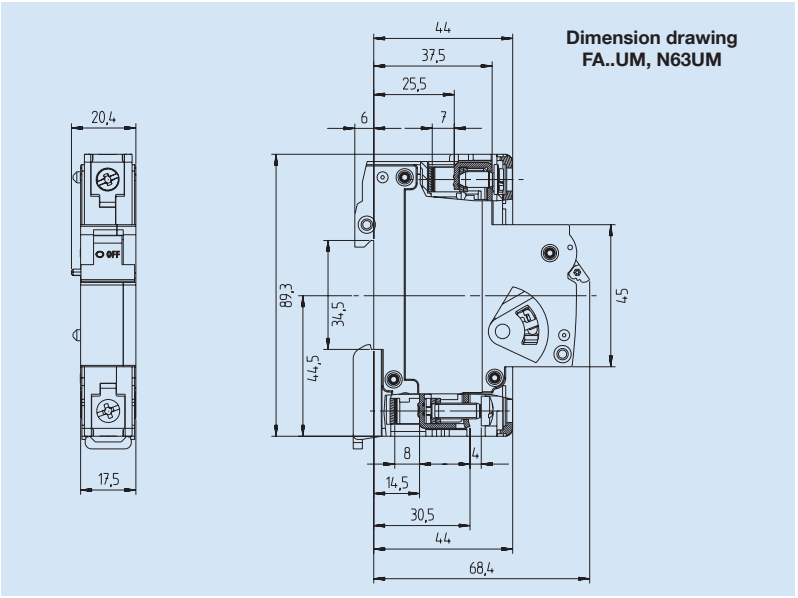
Module	Rated operating voltage	max. operating current at U_n (t < 10 ms)	**Article no.**	Weight g/each	Packing unit
1	12 V UC	1.3 A	**FA12UM**	105	5
1	24 V UC	0.6 A	**FA24UM**	105	5
1	48 - 74 V UC	0.2 A	**FA48UM**	105	5
1	110 - 240 V UC, 415 V AC	0.25 A at 110 V	**FA110UM**	105	5
		0.5 A at 240 V			
		0.58 A at 277 V			



Lock-off/Lock-on device

Article no.	Weight g/each	Packing unit
EASS	2	10

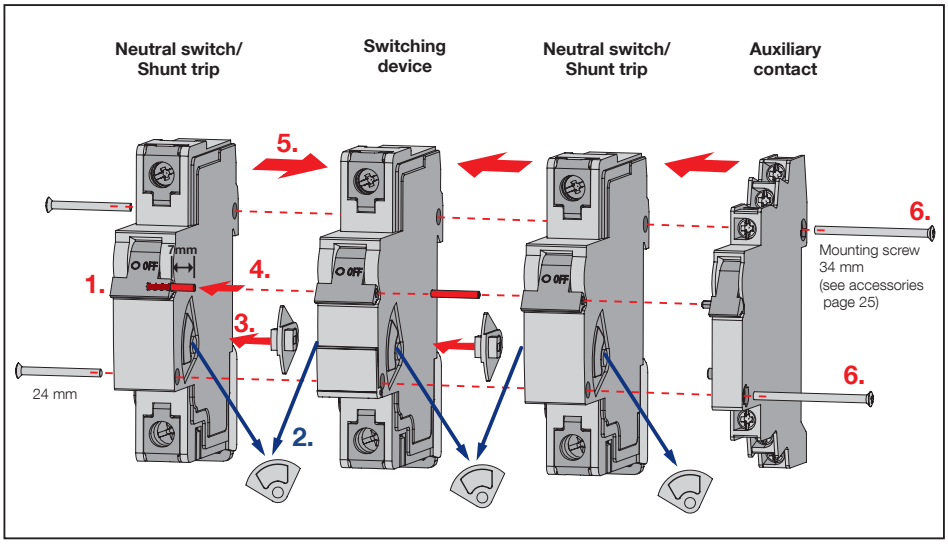
Dimension drawing
FA..UM, N63UM



Accessories for Switching Devices Manual Motor Controller and Supplementary Protectors

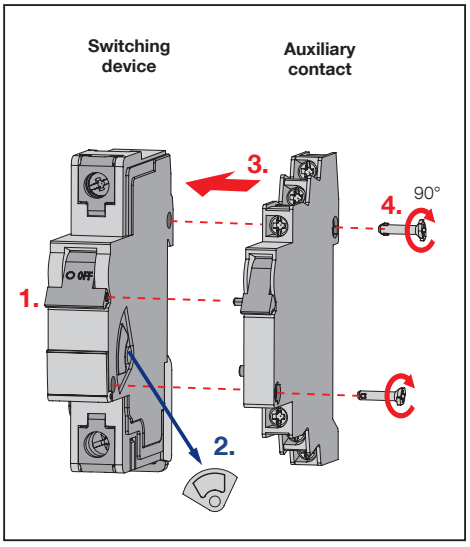
according to UL508 and CSA-22.2 No.14 for Product Ranges UM and UR

Mounting Instructions of Accessories



Applies to N...UM and FA...UM:
The accessory devices N...UM and FA...UM can be mounted **on the right or left.**
The auxiliary contact H...UM can only be mounted **on the right.**

Mounting:
1. Bring the blue knobs of all devices into the "OFF" position
2. Remove grey cover from the switching device and attachment
3. Insert drive plate between the switching device and N...UM or FA...UM
4. Insert connecting pin into the knob (insertion depth approx. 7 mm)
5. Combine switching device and N...UM or FA...UM
6. Screw devices together (observe correct screw length)

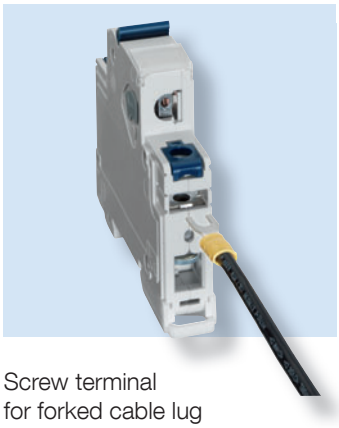


Applies to H...UM:
The auxiliary contact H...UM can only be mounted **on the right.**

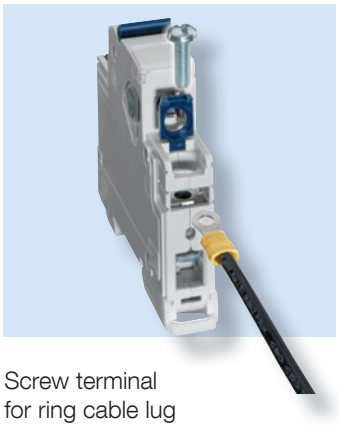
Mounting:
1. Bring the blue knobs of both devices into the "OFF" position
2. Remove grey cover from the switching device
3. Combine switching device and H...UM
4. Insert connection screws and connect the two devices by turning the screws by 90°
5. After mounting close and open to check operation

Applies to all switching devices ...UM, ...UR, N63UM and FA...UM

Box terminal for
- solid conductors
- flexible conductors with or without cable lug



Screw terminal for forked cable lug



Screw terminal for ring cable lug (ring tongue)

Design of the terminals

- Optical detection of the screw position
- Increased break resistance if the screwdriver becomes jammed
- Universal connecting terminals, suitable for connecting all known cable lugs such as ring or forked cable lugs and pin terminals

- Ring cable lugs can be connected by opening the flap and removing the connecting screw
- Can also be used for applications that require ring cable lugs (e.g. nuclear power stations)

- Protection against contact with live parts according to DIN EN 50274, VDE 0660-514 is fully guaranteed

ABL SURSUM

File E137915

Switching Devices
Supplementary Protector

according to UL1077 and CSA-22.2 No.235
Product Range UR, B, C and D Characteristics
Technical Data

Characteristic		B	C	D
Application		Lighting,Control circuits General electronics Wiring protection, Business equipment, Appliances	Lighting,Control circuits Wiring protection, Business equipment Appliances	Control transformers Power supplies Reactive load
Number of poles		1 - 3; 1 + N; 3 + N		
Standards		UL1077 and CSA-22.2 No.235		
Interrupting capacity		see data sheet for use in the USA and Canada (page 77)		
Current limiting class		3	3	
Max. back-up fuse		see data sheet for use in the USA and Canada (page 77)		
Rated voltage AC		277 / 480 V		
Rated current range		1 - 63* A	0.5 - 63* A	0.5 - 63* A
Test currents	Thermal not tripping I_1 (A) > 1 h	1.13 x I_n	1.13 x I_n	1.13 x I_n
	Thermal tripping I_2 (A) < 1 h	1.45 x I_n	1.45 x I_n	1.45 x I_n
	Electromagnetic not tripping I_4 (A) > 0,1 s	3 x I_n	5 x I_n	10 x I_n
	Electromagnetic tripping I_5 (A) < 0,1 s	5 x I_n	10 x I_n	16 x I_n
Reference calibration temperature of the thermal tripping		30° C + 5° C Influence of the ambient temperature on the thermal release: Decrease of the current values with higher ambient temperature and increase with lower temperatures of approximately 5% per 10°C difference in temperature		
Frequency range of the electromagnetic trip		16 $^2/_3$ to 60 Hz With higher frequencies, the electromagnetic tripping values increase by approximately a factor of 1.1 at 100 Hz; 1.2 at 200 Hz; 1.3 at 300 Hz; 1.4 at 400 Hz; 1.5 for DC		
Ambient temperature		-25 °C to +55 °C		
Storage temperature		-40 °C to +70 °C		
Device depth according to DIN 43880		68 mm		
Mechanical live		10,000 cycles (ON / OFF)		
Protection cover		Finger safe and safe to back of hand according to DIN EN 50274/ VDE0660-514, BGV A3		
Insulation group acc. to DIN/VDE 0110		C at 250 V AC B at 400 V AC		
Degree of protection acc. to EN/IEC 60529		IP20		
Installation position		any		
Mounting		DIN-rail according to DIN EN 60715 35 mm		
Lockability		The handle can be secured against manual switching in the on and off position by a lead seal		
Climatic resistance		Humid heat constant according to DIN EN 60068-2-78 Humid heat cycle according to DIN EN 60068-2-30		
Vibration resistance		> 15 g according to DIN EN 60068-2-59 during a load with I_1		
Resistance to mechanical shocks		25g 11ms		

* 63 A without UL approval

c UL us
File E137915

	Conductor cross sections			
	Box terminal bottom		Box terminal top	
Type of conductor *)	max.	min.	max.	min.
Single wire	35 mm² (AWG2)	1 mm² (AWG18)	25 mm² (AWG3)	1 mm² (AWG18)
Multiple wire	35 mm² (AWG2)	16 mm² (AWG6)	25 mm² (AWG3)	16 mm² (AWG6)
Stranded wire	25 mm² (AWG3)	1 mm² (AWG18)	16 mm² (AWG6)	1 mm² (AWG18)
Stranded wire with ferrule	16 mm² (AWG6)	1 mm² (AWG18)	16 mm² (AWG6)	1 mm² (AWG18)
Busbar cable lug	up to 3 mm thickness		up to 1.5 mm thickness	
Torque	max. 2.5 Nm (22.2 lb.in)			

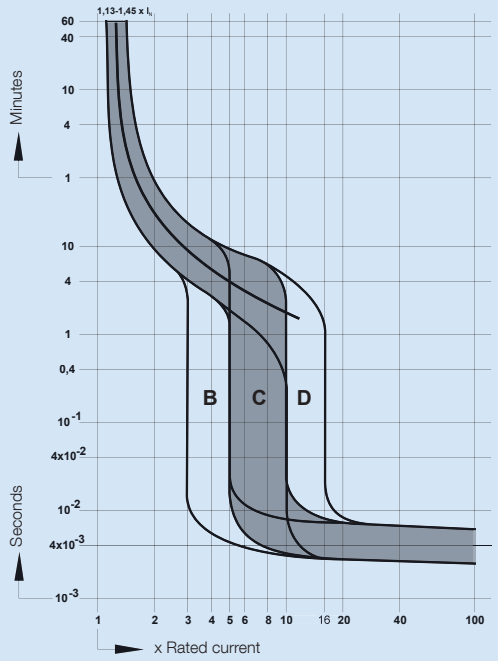
***) Stripped length: bottom 12 - 14 mm, top 10 - 12 mm**

Interrupting capacity and maximum back-up fuse for use in the USA and Canada					
Characteristic	**B, C and D**				
Standards	UL1077 and CSA-22.2 No.235				
	Number of poles	Maximum rated voltage [V]	Rated current [A]	Interrupting capacity [kA]	Maximum back-up fuse [A]
Interrupting capacity at rated voltage Ambient temperature 40 °C	1 / 1 + N	277	0.3 - 10	10	70 A
	1 / 1 + N	277	12 - 60	10	4 x I_n
	2 / 3 / 3 + N	480	0.3 - 10	10	70 A
	2 / 3 / 3 + N	480	12 - 60	10	4 x I_n

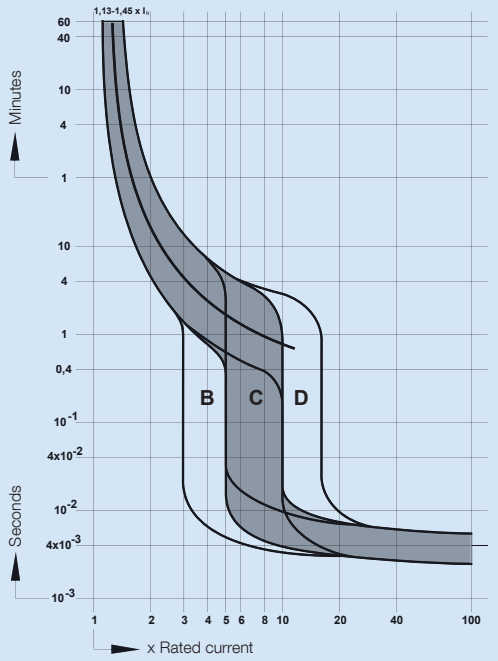
Internal resistance for Product Ranges UR			
Rated current [A]	**Trip characteristic**		
	B [Ohm]	**C [Ohm]**	**D [Ohm]**
0.5		6.8540	6.0009
1,0	1.7000	1.7000	1.7560
2,0	0.4190	0.4190	0.4190
3,0	0.2020	0.2020	0.2020
4,0	0.1090	0.1090	0.1090
5,0	0.0654	0.0654	0.0654
6,0	0.0528	0.0528	0.0491
8,0	0.0278	0.0278	0.0240
10	0.0216	0.0216	0.0187
12/13	0.0113	0.0084	0.0085
15/16	0.0085	0.0085	0.0076
20	0.0067	0.0067	0.0064
25	0.0050	0.0050	0.0041
30/32	0.0032	0.0032	0.0027
40	0.0025	0.0025	0.0022
50	0.0019	0.0019	0.0018
60/63 *	0.0018	0.0018	0.0017

* 63 A without UL approval

File E137915



B, C and D characteristic I_n = 0.3 - 10 A
UR



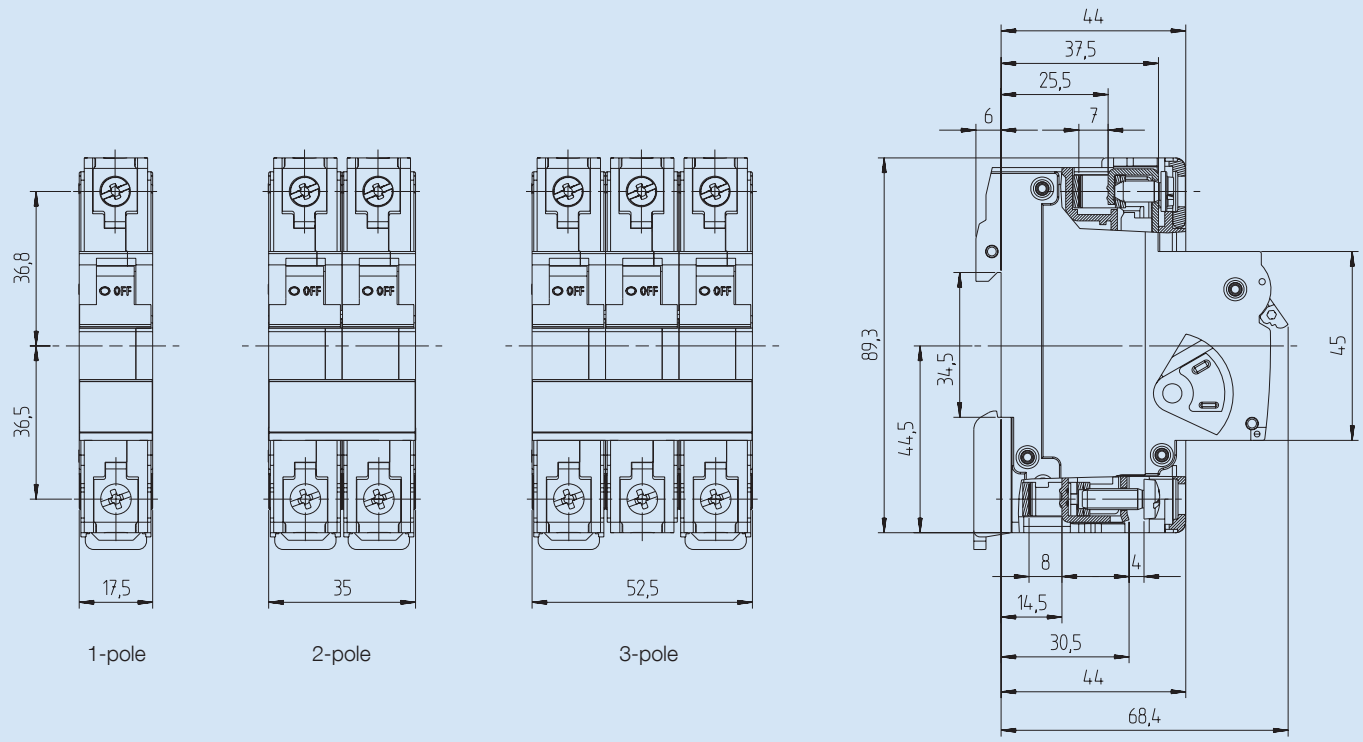
B, C and D characteristic I_n = 13 - 63* A
UR

* 63 A without UL approval

Switching Devices
Supplementary Protector

according to UL1077 and CSA-22.2 No.235
Product Range UR, B, C and D Characteristics
Dimension Drawing

File E137915



Where Innovation is a Tradition

Setting market standards with new developments has always been a fundamental concern for ABL SURSUM. Such is the idea behind the SCHUKO system, to this day one of the most popular plug connection systems in the world and the creation of ABL founder Albert Büttner.

The first screw-in circuit breaker with an electromagnetic release was created at SURSUM, founded in 1912 by Wilhelm Leyhausen. These two inventions were the prelude to a series of innovative developments which have gave the two companies a central role in the annals of consumer electronics for decades.

In 1986 the two traditional medium-sized companies merged; plug connection specialist ABL and circuit breaker specialist SURSUM formed one highly productive company now known as ABL SURSUM Bayerische Elektrozubehör GmbH & Co.KG.

SCHUKO plug connections

Naturally, the inventor of the SCHUKO system has a large selection of SCHUKO plug connections in its product range.
This range of products is actually so extensive that even experts are constantly surprised!

SCHUKO plugs and connectors, socket outlets, international plug connections, infeed plugs, outlet boxes, supply connections for boats and caravans, Perilex plug connections and Industrial Ethernet connections can be found in our catalogue “Connection Technology”.

Detailed information can be found at:
www.abl-sursum.com

Regardless of whether you need building installation, industrial installation, switchgear manufacturing or cable pre-assembly:
Whatever you need, you can be sure that you will find the right solution in our extensive range of approx. 7,000 products.

If you need a specific solution, let us know – our experts will find it!

Miniature circuit breakers

Even today, ABL SURSUM is continuously developing new innovative market-driven products to ensure constant development of installation technology.

We meet the daily installation demands for ever more effectiveness and speed with our screwless clamping technology “plug2power”, to be found in our **miniature circuit breakers, our distribution boards, CEE plug connections, socket outlets and outlet boxes.**

Our new generation of miniature circuit breakers, with their completely new design and technology, are divided into the three product ranges S, SL and T, and allow us to offer you numerous advantages in terms of functionality, compatibility, and quality. This has created an ideal complete system for the wide-ranging installation requirements for both craftsmen and industry. These products are so attractive because of the low height, clear design, clearly legible labels and the new mounting system, which allows for removing from a busbar combination - below (“singlefix”) with the S and SL series and both above and below with the T series (“twinfix”).

RCCBs, RCBOs

ABL SURSUM offers an extensive range of RCCBs to provide protection from dangerous shock currents or as fire-protection measures.
Regardless of whether you need a short-time delayed switch-off e.g. for the operation of suppressor capacitors or need a selective switch-off, whether it needs to be sensitive to pulsating current or universal current, you will find what you need in our range. Combined RCBOs offer the possibility of implementing these person and line protection measures in one device.

Product range
Switching devices

DIN rail panel products

Off and toggle switches, 1 or multiple poles, with or without light signals, buttons, SCHUKO sockets for DIN-rails, installation/ storage/control and time relays, mechanical impulse switches, touch dimmers, network activators, installation contactors, staircase lighting timers, time switches and transformers – our range of DIN rail panel products is as varied as the requirements of modern domestic installation.

MADE IN GERMANY

Distribution boards

And to make sure that these DIN rail panel products can be installed in a proper manner and more importantly as specified, we of course also supply distribution boards in different sizes and versions.

Product Range
Industrial Plugs and Sockets

Plugs and sockets

We provide the best CEE connections: for plugs and connectors, appliance/ wall-mounted/ flanged socket outlets, input plugs, inverter plugs, container/ extra-low voltage/ boat and caravan plug connections, on adapters or multiple plugs…
CEE plugs and sockets by ABL SURSUM can do more than just transfer electricity. They support everyday work effectively and reliably, because they withstand the toughest conditions.
It doesn‘t matter whether they are subjected to cold or heat, dust and water or pressure, strain and impact in the most diverse requirements in extreme working conditions.

You can rely on our products – in every situation, no matter where.

**Products for every application.
An incredibly large diversity of models awaits you in our catalogue “Industrial Plugs and Sockets”.**

Product Range
Socket Outlet Combinations

Socket outlet combinations, socket outlet cases, free-standing distribution units and power cubes

Large variation for a large variety of different uses is what sets this extensive ABL SURSUM product range apart.
Almost unlimited combination possibilities with CEE and SCHUKO socket outlets in the degrees of protection IP44 and IP67, as well as the protection provided by high performance RCCBs and miniature circuit breakers, can be manufactured for almost every individual need.
And with the sockets available in many different country versions, our combinations are also very well suited for international use.
These combinations from ABL SURSUM are available in different versions: stationary, mobile and for suspension. The housings are made of high-quality thermoplastics in different qualities or from solid rubber and combine excellent mechanical, thermal and electric characteristics.

Individual solutions for every application. An incredibly large diversity of models awaits you in our catalogue "Socket Outlet Combinations".

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