

Description

Application

3WE circuit-breakers
for 3 phase distribution systems
for switching motors etc.

The 3WE circuit-breakers are intended for use as: protective circuit-breakers, feeders and branch switches in three-phase distribution systems and for switching and protecting motors, alternators, transformers, capacitors and similar equipment.

The 3WE circuit-breakers can be used as main switches on processing equipment or machinery (VDE 0113). The regulations concerning enclosure, installation, operating mechanisms etc., (VDE 0113) must be adhered to by the user.

If the circuit-breaker is equipped with an undervoltage release, it can then be used as an EMERGENCY STOP unit, conforming to VDE 0113, when used in conjunction with an EMERGENCY OFF switch.

3WE circuit-breakers
for selective short-circuit protection by time-grading

The 3WE circuit-breaker can be used for power distribution systems with time selective grading, by using a short-delay overcurrent release (z-release also in combination as az-, azn- and zn-releases).

3WE circuit-breakers used as network protectors

Network protectors are intended for use in low-voltage interconnected systems with multiple infeeds from a number of high-voltage lines and transformers (see illustration). They prevent the flow of reverse power in the event of a fault in a transformer station or high-voltage line. In such cases the network protector receives the trip command from a network protection relay (reverse-power relay). The network protection relay trips the circuit-breaker through which the current flows to the location where the short circuit occurred. With an independent control supply system a normal shunt-release can be used to trip the circuit-breaker.

If the control voltage is supplied from the mains, which will be non-existent in the event of a supply short-circuit a network protection release is available (fc-release, shunt release with capacitor).

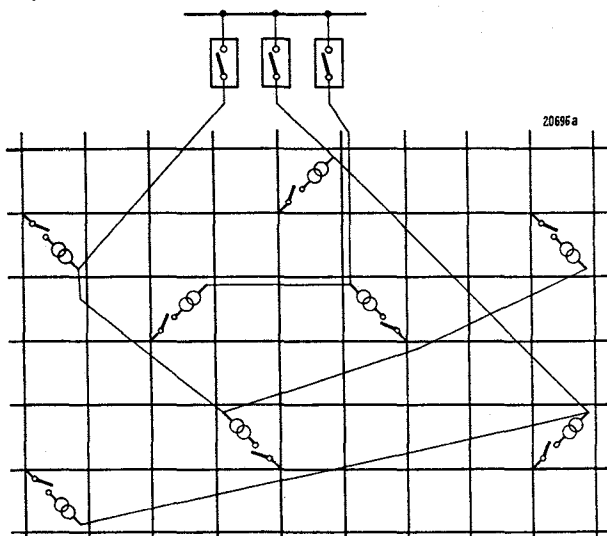


Fig. 3/1 Interconnected system with multiple feeds (diagrammatic)

3WE circuit-breakers for d.c. systems

The 3WE circuit-breakers, with standard contacts and arc-chutes, are available for use in d.c. systems.

For d.c. the overcurrent releases are only available with an electromagnetical short-circuit protection release. For overload protection a separately fitted protection arrangement must be used (e.g. thermal overcurrent release 3UA2 – see Cat. NS2 E).

Technical data, order nos., schematic diagrams and dimensions for 3WE circuit-breakers in d.c. systems are detailed in Section 5.

Versions and form of delivery details

3WE circuit-breakers are available in permanently installed (fixed mounting) and withdrawable versions.

The circuit-breakers of sizes I and II (rated current of up to 1600 A) are available in 3-pole and 4-pole versions. The circuit-breakers of size III are only available in the 3-pole version.

The circuit-breakers can be supplied completely assembled or partially as modules (refer to page 3/14).

Installation requirements

The 3WE circuit-breakers are climate-proof.

The circuit-breaker must be protected from dust, erosive atmospheres, gases, etc., if necessary, by an appropriate housing.

The maximum permissible ambient temperatures and the permissible rated operating currents at various temperatures are quoted in the "Technical data".

Standards and Specifications

The 3WE circuit-breakers comply with VDE 0660 and IEC 157-1.

This also means that the equipment conforms to the safety requirements for low-voltage equipment as specified in the EEC directive of February 19, 1973.

The 3WE circuit-breakers are suitable for marine use. They comply with the requirements of the following Classification Societies: ABS, BV, GL, LRS, NV, RINA. Further information (permissible loads, switching capacity and approvals) is available in the Cat. SET 2.

Installation

The 3WE circuit-breakers are suitable for installation in:

Open-type switchboards	(e.g. Siemens 8NA1)	} See "Technical data"
Enclosed switchboards	(Switch cabinets e.g. Siemens Motor Control Center)	
Encapsulated distribution systems	(Plastics housing distribution system, metal encapsulated housing distribution system, sheet-steel housing distribution system)	} Refer to Cats. NV 11 and NV 21

Details about the additional manual operating mechanisms (rotary drive mechanism for installation in doors, lever operating mechanism) are to be found in Cat. NV 21.

For details about the combination of "3WE circuit-breakers with front-operating mechanisms – detachable operating mechanisms for installation in doors" refer to the page 3/43.

The incoming supply can be connected to either the upper or lower terminals connections. The performance of the circuit-breakers (rated current, switching capacity) is the same in both cases.

3WE circuit-breakers, rated current 630 to 4000 A a.c.

Description

Construction

The 3WE circuit-breaker consists of the following:

Basic unit,

Operating mechanism (manual operating mechanism, motor operating mechanism, motorized stored-energy operating mechanism),

Overcurrent release (mechanical, electronic),

Undervoltage release, shunt release,

Auxiliary switches,

Signalling switches.

The circuit-breakers 3WE73 and 3WE83 have 6 current paths which have to be connected parallel in groups of 2 (i.e. 3 groups).

Trip-free feature

The circuit-breakers have a trip-free feature, so that the tripping and opening action is not impeded by the operating mechanism.

Contact position indication

The position of the main contacts is indicated on the left-hand side of the front plate of the circuit-breaker (green = contacts are opened, red = contacts are closed).

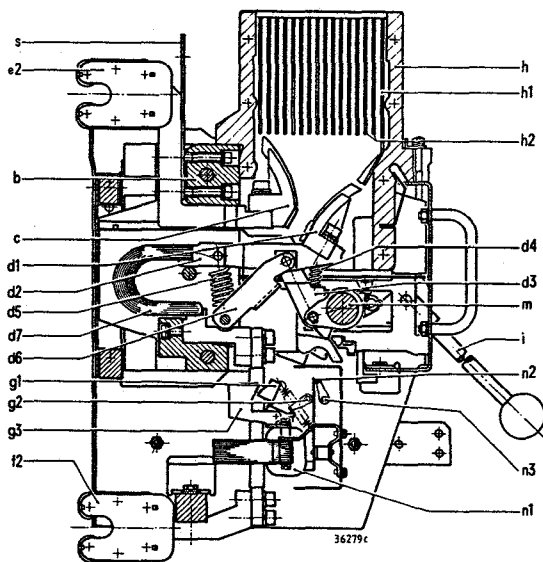


Fig. 3/2
Cross-section of size II circuit-breakers (3WE4 and 3WE5) with vertical-throw handle mechanism, withdrawable version

- | | |
|--|---|
| a Sheet steel frame | e2 Upper isolating contact |
| b Moulded-plastic base | f1 Lower terminal |
| c Fixed contact | f2 Lower isolating contact |
| d1 Moving contact | g Instantaneous electromagnetic overcurrent release |
| d2 Contact support | g1 Armature |
| d3 Actuating lever | g2 Intermediate shaft |
| d4 Contact pressure spring | g3 Magnet iron |
| d5 Contact pressure and opening spring | h Arc chute |
| d6 Toggle arm | h1 Arc baffle |
| d7 Flexible connector | h2 Arc splitter |
| e1 Upper terminal | |

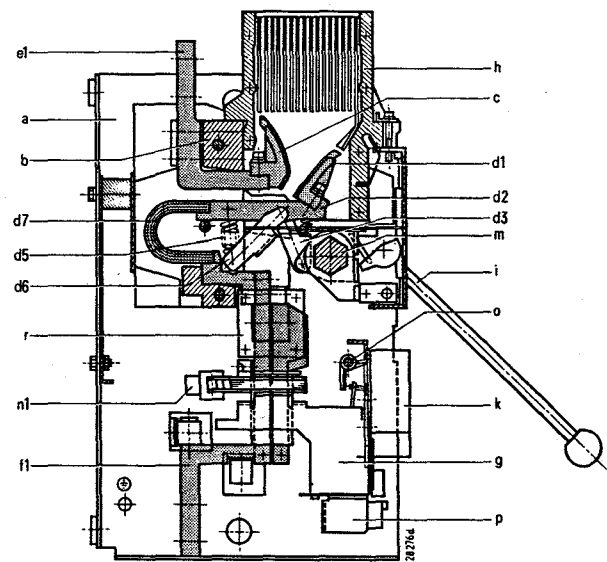


Fig. 3/3
Cross-section of 3WE8 circuit-breaker with vertical-throw handle mechanism for permanent installation

- | |
|---|
| i Operating mechanism |
| k Undervoltage or shunt release |
| m Main shaft |
| n1 Current transformer for long (thermally) delayed overcurrent release |
| n2 Bimetal strips |
| n3 Intermediate shaft |
| o Tripping shaft |
| p Long (thermally) delayed overcurrent release |
| r Balancing current core |
| s Crane eyelet |

Description

Operating mechanisms

The 3WE circuit-breakers can be supplied with a variety of manual or power operating mechanisms.

Manual operating mechanisms without high-speed closing feature:

Vertical-throw handle mechanism (Sizes I, II and III)

Front operating mechanism without high-speed closing feature (Sizes I and II)

Rear operating mechanism (Sizes I and II)

Linkage lever operating mechanism (Sizes I and II)

Manual operating mechanism with high-speed closing feature

Front operating mechanism with high-speed closing feature (Sizes I and II)

Power operating mechanisms with high-speed closing feature

Motor operating mechanisms (Sizes I, II and III)

Motorized stored-energy operating mechanisms (Sizes I, II and III)

Motorized stored-energy operating mechanisms should be selected if a precisely defined instant of circuit-breaker closing (e.g. when synchronising) is required.

All operating mechanisms have a high-speed opening feature.

Manual operating mechanisms

The manual operating mechanisms are available in modules. They are interchangeable with the motor operating mechanism. (Refer to page 3/14.)

When the circuit-breaker has been tripped by one of its releases, the manual handle or linkage lever remains in the closed position: it must be manually returned to the open position before the circuit-breaker can be reclosed.

The manually operated circuit-breakers without the high-speed closing feature must be opened and closed with a quick movement, especially, if the closing currents in service are high. If this type of operation cannot be guaranteed, an operating mechanism with a high-speed closing feature or a power operating mechanism should be selected for safety reasons.

In the case of manual operating mechanisms with a high-speed closing feature the contacts close regardless of the speed of the handle operation.

Power operating mechanisms

Power operating mechanisms can be used for remote operation of the circuit-breaker. An undervoltage or shunt release is required for tripping.

The motor operating mechanism is available as a module and can be exchanged with the manual operating mechanisms.

The motorized stored-energy operating mechanism is not available as a module.

Motor operating mechanism

The motor operating mechanism consists of the operating motor and the centrifugal force system. The motor is switched directly by a momentary-contact switch or maintained-contact switch or indirectly by a contactor control system. (Schematic diagrams 3/46 and 3/47.) As soon as the circuit-breaker has closed, the motor current circuit is interrupted by the motor switch (S4).

If the circuit-breaker is released or opened shortly after closing it can be reclosed as soon as the motor drive has come to a standstill (with size I after approx. 20 s, with sizes II and III after approx. 60 s.). In order to prevent the motor from being restarted, before it has reached standstill, the "Circuit for adhering to the minimum switch-on pause for the motor operating mechanism" should be used. (Schematic diagram 3/48.)

If the command signal is of insufficient duration the contacts will not move: inching will therefore not be possible.

The motor control switch (S4) opens the motor current circuit as soon as the required speed is reached. As soon as the speed falls the switch recloses. Therefore, to prevent the motor from pumping (i.e. Self-acting) "anti-pumping switching circuitry" should be used.

If there is danger that the momentary-contact switch is actuated for too long and thereby causes the drive motor to "pump" the "circuitry for attaining the minimum pause between 2 starts of the motor" should be used.

If the motor operating mechanism is actuated by a maintained contact switch "the anti-pumping switching circuitry" has always to be used.

In the cases where the supply voltage fails the circuit-breaker can be switched on by a auxiliary handle. The switching off can be done by the "Off" button which is located on the front of the circuit-breaker.

Motorized stored-energy operating mechanism

The motorized stored-energy operating mechanism comprises of a spring-store, a motorized winding mechanism and a magnetic closing mechanism.

In order to operate the circuit-breaker when a control voltage failure occurs, it is provided with an auxiliary tensioning lever r20, an "On" pushbutton r23 and an "Off" pushbutton r24.

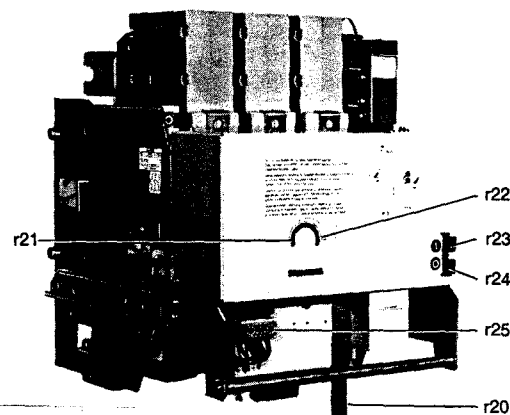
The motor tensions the spring-store in approx. 6 s (Sizes I and II) or 8 s (Size III). The mechanical storage indicator r21 shows when the spring mechanism has been tensioned. Additionally, an electrical storage indication is possible with the aid of the switch S3 (refer to the Schematic diagram 3/52).

With the aid of the magnetic closing mechanism or the "On" pushbutton r23 the spring-store can be released, this closes the circuit-breaker (because the maximum energising time of the closing magnet is 100 ms, the circuit has to be switched by the auxiliary contact 31/32; refer to the Schematic diagrams 3/52 and 3/53).

The "On" button r23 (manual releasing of the spring store) has a direct effect on the magnetic closing mechanism. Thus, an electric interlocking of the closing magnet has no effect when actuating the "On" button r23.

The max. total closing time of the circuit-breaker (the time from when the spring-store is released until the main contacts are closed) is 30 ms.

The motorized stored-energy operating mechanism can also be charged, when the circuit-breaker is closed. A pause of approx. 80 ms must be included (if necessary using a time relay) between the switching off of the circuit-breaker and releasing of the pre-charged spring store, in order to ensure, that the circuit-breaker mechanism comes to a standstill before the circuit-breaker is reclosed after having been tripped.



3WE circuit-breakers, rated current 630 to 4000 A a.c.

Description

Releases

Overcurrent releases

For overcurrent protection, the mechanical and electronic releases with the following protection functions are available:

Protection function	Symbol	Version Mechanical	Available for sizes	Electronic	Available for sizes
Overload protection	a	Long-delay overcurrent release	I, II, III	Long-delay release function	I, II, III
Selective short-circuit protection by selective time grading	z	Short-delay electro-magnetical overcurrent release • with delay via a mechanical retarding mechanism • with delay via a time relay	I, II I, II, III	Short-delay release function	I, II, III
Short-circuit protection	n	Instantaneous electro-magnetical overcurrent release	I, II, III	Instantaneous release function	I, II, III

The available versions of overcurrent releases (an, zn, azn, etc.) are given in the Selection tables.

All the functions of the release are enclosed in one housing (with the exception of the time-relay for the "z-release with delay via a time relay").

The overcurrent releases can be supplied incorporated in the circuit-breaker (see the "1st Order-No. suffix") or as modules (see "Modules" on page 3/33).

The supplementary fitting and exchange of the overcurrent release in the withdrawable circuit-breaker is only possible to a limited degree (see "Modular system" on page 3/14).

On the three-pole a.c. circuit-breakers each of the three main current paths is fitted with an overcurrent release. On the four-pole circuit-breaker no overcurrent release is fitted to the N- path (7-8).

The release can be supplied with an alarm switch to indicate that it has operated. (See "Signalling switches" on page 3/13.)

Mechanical overcurrent releases

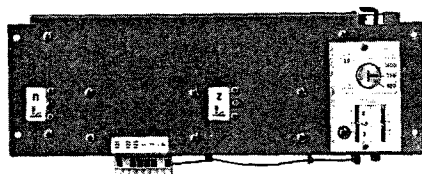


Fig. 3/4
Mechanical
overcurrent release

The mechanical overcurrent release can be supplied for use on the following frequencies:

Frequency	Version	Symbol	Range
50 Hz	Standard version	a, z, n	All setting ranges
16 ² /3 Hz	Special version	a, z, n	Available setting ranges on request
60 Hz	Special version (see "Special designs")	a, z, n	All setting ranges
above 60 Hz to 400 Hz	Special version	only z, n	Available setting ranges on request

For frequencies between 60 Hz and 400 Hz, the thermally delayed overcurrent release can be replaced by the overcurrent relay type 3UA2 (1 relay per phase; refer to Cat. NS2 E).

For supply systems with a high degree of harmonics, the built-in thermally delayed overcurrent release is unsuitable. In such cases the following can be used:

The electronic overcurrent release instead of the mechanical overcurrent release (refer to page 3/8)

or:

Short-circuit protection by the "n" or/and "z"-release built into the circuit-breaker. Overload protection by three separately mounted 3UA2 overcurrent relays (refer to Cat. NS2 E)

or:

Short-circuit protection by the "n"- or/and "z"-release built into the circuit-breaker. Overload protection by three separately mounted current transformers with an overcurrent factor of ≥ 5 (refer to Cats. E and NV)

and a separately mounted thermally delayed overcurrent relay e.g. 3UC2, 3UC3 (refer to Cat. NS2).

Long-delay (thermally-delayed) overcurrent release (a) (Overload protection)

The long delay overcurrent release consists of 3 current transformers and 3 bimetal elements (Size I and II) or a bimetal relay (Size III) respectively.

The overcurrent releases have a time-inverse characteristic. The release characteristics indicate the operation of the thermally delayed overcurrent release from a cold state. At full load operating temperatures the release time is about 25% of the cold state release time.

The long delay overcurrent releases are compensated for the temperature range of -20°C to $+55^{\circ}\text{C}$ so that the response current only changes in accordance with the limits given in the IEC 157-1 publication.

The long delay overcurrent releases are short-circuit proof due to the special design of the current transformer.

Due to the current transformer the long delay overcurrent releases are unsuitable for use on d.c. (refer also to Section 5).

Circuit-breakers 3WE1 to 3WE5

The current transformers feed bimetal strips, which in turn operate the mechanical release of the circuit-breakers.

Circuit-breakers 3WE6 to 3WE8

The current transformers feed a secondary overcurrent relay which in turn trips the circuit-breaker via an undervoltage or shunt release. The overcurrent relay is delivered with "automatic reset". It can be changed to "manual reset" if this is required.

Description

Short-delay electromagnetic overcurrent release (z)

Short delay overcurrent releases are used for selective short-circuit protection by selective time-grading.

Circuit-breakers are designed for a specific maximum permissible thermal load and dynamic stress. Should the short-circuit load on the circuit-breaker with short-delay exceed this permissible rating a "n"-release must be additionally fitted to complement the "z"-release so that with very high currents the short-circuit release can operate instantaneously (the maximum permissible short-circuit currents with short-delay are given in the tables "Overcurrent releases" on page 3/20).

The response current of the short-delay overcurrent release is adjustable (refer to the Selection tables on pages 3/28 and 3/34).

The release delay time can be adjusted from 50 to 500 ms.

The delay is achieved with the aid of either a time relay (3WE1 to 3WE8) or by a mechanical retarding mechanism (only applicable to 3WE1 to 3WE5).

a) Short-delay electromagnetic overcurrent release with delay by a time relay (3WE1 to 3WE8)

The release is fitted with an auxiliary switch, which itself operates the time relay (contacts 121-122-123, refer to the diagrams 3/14, 3/15 and others). For tripping the circuit-breaker an undervoltage or shunt release is required.

If a short-circuit current occurs which is the equivalent or greater than the response current, the magnetic armature operates the auxiliary contact 121-122-123, which in turn causes the time relay to function.

If the short-circuit remains approx. 30 ms before the rundown of the set time of the time relay, the circuit-breaker will be tripped. If the short-circuit disappears before this time, the time relay will reset to its original position, so that the circuit-breaker will not be tripped. The shortest possible selective grading time between two circuit-breakers is approx. 100 ms.

If the control voltage supply is not effected by the short-circuit (e.g. battery) a "pick-up delay" time relay can be used.

For tripping the circuit-breaker, an undervoltage release (r) or a shunt release (f) can be used. (Schematic diagrams refer to page 3/53.)

If the control voltage is taken from the mains supply and falls to an undetermined value in the event of a short-circuit, a "drop-off delay" time relay must be used. For tripping the circuit-breaker an undervoltage release with a "drop-off" delay (rc) must be used. (Schematic diagrams refer to page 3/53.)

The time relay must be ordered separately (refer to "Accessories" on page 3/41).

b) Short-delay electromagnetic overcurrent release with delay by a mechanical retarding mechanism (3WE1 to 3WE5)

It consists of three magnetic systems (one per current path) and a retarding mechanism. In the case of a short-circuit which is the equivalent or in excess of the release response current the magnetic systems operate the retarding mechanism.

If the short-circuit remains up to approx. 30 ms of the set time of the z-release the circuit-breaker will be tripped. If the short-circuit disappears before this time (e.g. by a series-connected circuit-breaker) the retarding mechanism is reset and the circuit-breaker is not tripped.

1) A buffered control voltage (e.g. a battery) is necessary for the electrical interlocking and signalling, due to the fact the mains voltage decreases to an unspecified value under short-circuit-conditions.

The shortest possible selective grading time between two circuit-breakers is approx. 150 ms. The z-release with a mechanical retarding mechanism can be supplied with a mechanical reclosing lock-out (v).

Instantaneous electromagnetic overcurrent release (n) (Short-circuit protection)

The response current of the instantaneous overcurrent release is either set or adjustable (refer to the Selection tables).

The opening delay (start of the short-circuit until the opening of the circuit-breaker contacts) is approx. 20 ms.

When selecting the instantaneous overcurrent releases of the circuit-breaker for switching and protecting a motor, the starting and rush currents have to be taken into account.

The instantaneous overcurrent releases can be supplied with a mechanical reclosing lock-out.

Mechanical reclosing lock-out (v)

The instantaneous electromagnetic overcurrent release (n), (also in combination an, azn) for the circuit-breakers 3WE1 to 3WE8 and the short-delay electromagnetic overcurrent releases (z), (also in combination az, zn, azn) with retarding mechanism for the circuit-breakers 3WE1 to 3WE5 can be supplied with a mechanical reclosing lock-out.

With the short-delay electromagnetic overcurrent release with delay via a time relay for the circuit-breakers 3WE1 to 3WE8 the lock-out¹⁾ must be achieved by electrical means (refer to Schematic diagram 3/65).

The mechanical reclosing lock-out prevents the circuit-breaker, which has been tripped due to a short-circuit, from being switched on before the lock-out has been manually released. With the following types of circuit-breakers an additional electrical lock-out¹⁾ has to be used to prevent damage to the mechanism of the circuit-breaker by mechanical idle operation:

with motor operating mechanisms
with motorized stored-energy operating mechanisms
(refer to the Schematic diagram 3/65).

If a circuit-breaker 3WE1 to 3WE5 (or an overcurrent release module for these circuit-breakers) is required with a mechanical reclosing lock-out this has to be stated in the order (refer to "Special designs" on page 3/32). A subsequent fitting is not possible.

The mechanical reclosing lock-out for the 3WE6 to 3WE8 circuit-breakers can be supplied fitted to the circuit-breaker (refer to "Special designs" on page 3/32) or it can be subsequently fitted (refer to "Modules" on page 3/38).

Signalling switches "Overcurrent release has tripped" for the mechanical overcurrent release

(Schematic diagrams refer to page 3/56)

The signalling switches can be used for signalling "the overcurrent release has tripped" and also for establishing an electrical lock-out.

Circuit-breakers 3WE1 to 3WE5

- 1) Mechanical overcurrent releases an- and n-, and also z-, az-, azn-, zn-, with mechanical retarding mechanisms can be supplied with a common signalling switch (Changeover p-1-2). (Internal connection diagrams 3/14, 3/17; for permissible loads refer to Technical data.)

3WE circuit-breakers, rated current 630 to 4000 A a.c.

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If the signalling switch is required, it must be ordered with the circuit-breakers/overcurrent release modules (refer to "Special designs" on page 3/32).

They cannot be subsequently fitted.

The switch contact changes over from the position p-2 to the position p-1 in the event of an overload or a short-circuit tripping. Approx. 30 ms after the removal of the overload or short-circuit current, the signalling switch returns to its original position.

Therefore, it is important, that a quick operating auxiliary relay (e.g. comb relay) is used so that the signal is registered¹⁾ (see schematic diagram 3/76).

If an instantaneous or short delay overcurrent release (n- or z-release with mechanical retarding mechanism) is fitted with a mechanical reclosing lock-out (v), the signalling switch will only return to its original position when the lock-out has been released.

3) Mechanical overcurrent releases z-, az-, azn-, zn-, with delay via a time relay

For signalling the tripping of the a- and n-releases, a signalling switch p-1-2, as described in (1) is available. (When ordering state that this is required.)

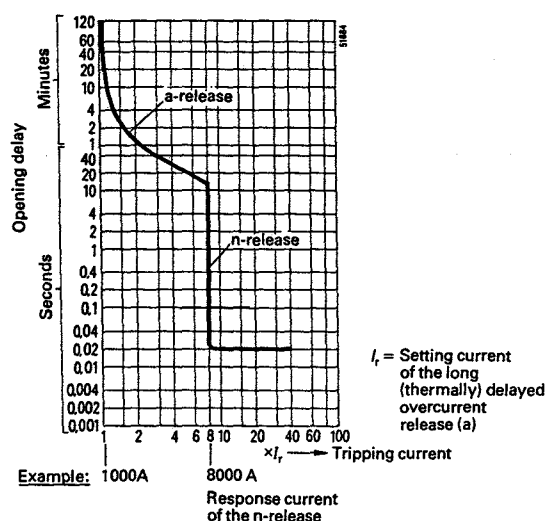
For signalling the tripping of the z-release the contacts of the time relay are to be used. To register the signal a quick operating relay must be used (e.g. comb relay). (Refer to Schematic diagram 3/56.)¹⁾

Circuit-breaker 3WE6 to 3WE8

To signal an overload tripping the auxiliary switch of the thermally delayed overcurrent relay can be used (refer to Schematic diagrams 3/69 and 3/70; Technical data see Cat. NS 2).

Tripping characteristics of the mechanical overcurrent releases (average value from the cold state)

an-release (non-adjustable n-)



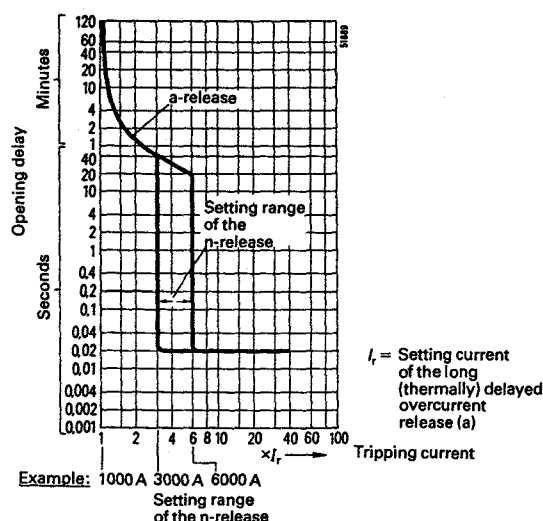
Circuit-breaker 3WE33...-DF..
a 520-1000 A
n 8000 A

a set to 1000 A

Fig. 3/5

A buffered control voltage (e.g. a battery) is necessary for the electrical interlocking and signalling, due to the fact the mains voltage decreases to an unspecified value under short-circuit conditions.

an-release (adjustable n-)



Circuit-breaker 3WE33...-DT..
a 520-1000 A
n 3000-6000 A

a set to 1000 A

Fig. 3/6

If the overcurrent relay is set on "automatic reset" it will reset after operating to its original position upon cooling down, therefore, to register the release signal a relay is required.

If the overcurrent relay is set on "manual reset" it will remain in the released position even after cooling down, until the relay is manually reset. A relay to register the release signal is therefore not required.

An instantaneous short-circuit tripping can be signalled by "signalling switches" fitted into each current path of the n-release. The three switches are parallel connected to the terminals 121-122-123 (refer to the Schematic diagrams 3/15 and the "Technical data" on page 3/21).

If the signalling switch on the n-release is required, this should be stated when ordering the circuit-breaker (refer to the Special designs on page 3/32). The signalling switch can also be fitted subsequently (refer to modules on page 3/40).

With a short-circuit tripping the signalling contacts changeover from 122-123 to 122-121, but after 30 ms they return to their original position 122-123. For this reason a quick operating relay must be used (e.g. comb-relay). (Refer to the Schematic diagram 3/65.)¹⁾

If the n-release is fitted with a mechanical lock-out the signalling switch resets to the position 122-123 only after the lock-out has been released.

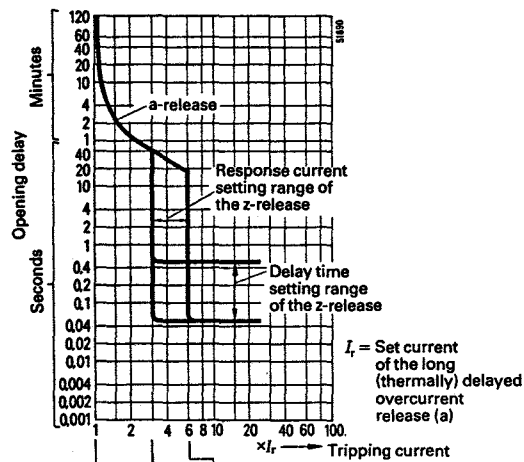
To signal when a short-delay overcurrent release (z) has tripped due to a short circuit the contacts of the time relay can be used (refer to the Schematic diagrams 3/65, 3/68).

With a short-circuit tripping, the time relay contact switches over (15-18) but after 30 ms it resets to its original position (15-16). For this reason a quick operating relay must be used in order to register the release signal (e.g. comb-relay). (Refer to the Schematic diagrams 3/65.)¹⁾

Description

Tripping characteristics of the mechanical overcurrent releases (average value from the cold state)

az-release



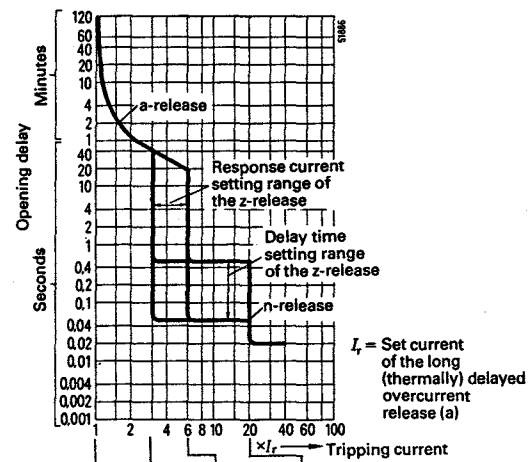
Example: 1000 A 3000 A 6000 A
Setting range of the z-release

Circuit-breaker 3WE33...-FT..
a 520-1000 A
z 3000-6000 A

a set to 1000 A

Fig. 3/7

azn-release



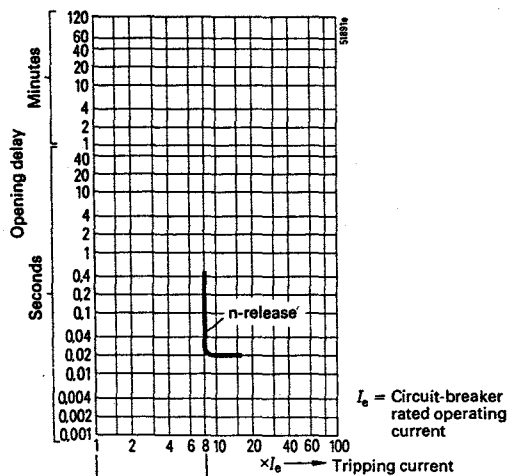
Example: 1000 A 3000 A 6000 A 20000 A
Setting range of the z-release Response current of the n-release

Circuit-breaker 3WE33...-GF..
a 520-1000 A
z 3000-6000 A
n 20000 A

a set to 1000 A

Fig. 3/8

n-release (non-adjustable)

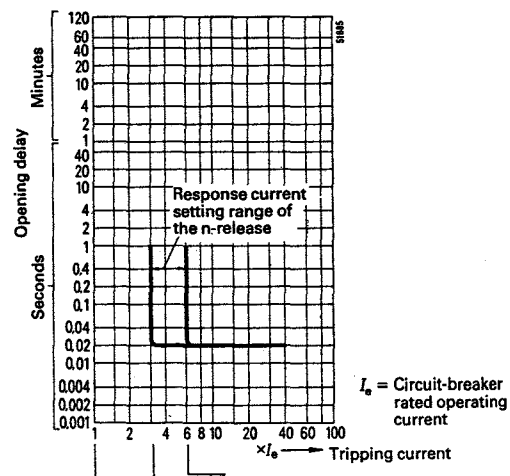


Example: 1000 A 8000 A
Response current of the n-release

Circuit-breaker 3WE33...-CF..
Circuit-breaker rated operating current
n 8000 A

Fig. 3/9

n-release (adjustable)



Example: 1000 A 3000 A 6000 A
Setting range of the n-release

Circuit-breaker 3WE33...-CT..
Circuit-breaker rated operating current
n 3000-6000 A

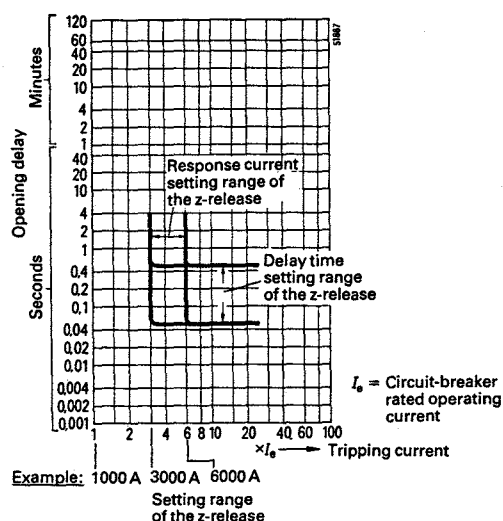
Fig. 3/10

3WE circuit-breakers, rated current 630 to 4000 A a.c.

Description

Tripping characteristics of the mechanical overcurrent releases (average value from the cold state)

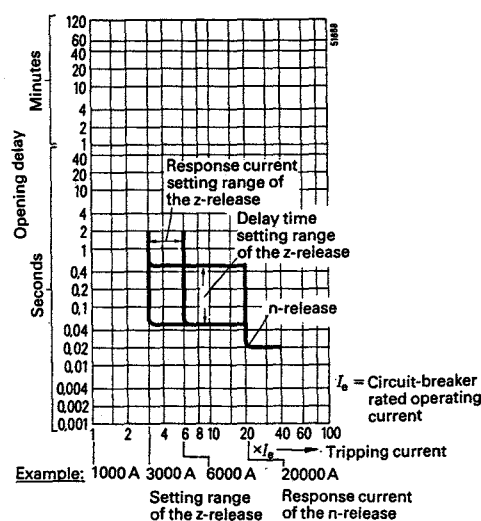
z-release



Circuit-breaker 3WE33...-EF..
Circuit-breaker rated operating current 1000 A
z 3000-6000 A

Fig. 3/11

zn-release



Circuit-breaker 3WE33...-HT..
Circuit-breaker rated operating current 1000 A
z 3000-6000 A
n 20000 A

Fig. 3/12

Electronic overcurrent releases

The electronic releases offer wide setting ranges (one setting range for each circuit-breaker rated current), narrow grading times for selective short-circuit protection, and simple function tests.

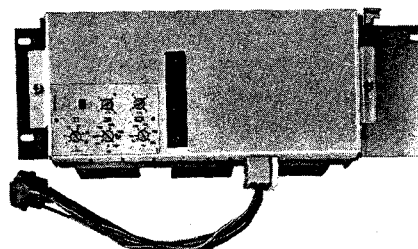
A separate auxiliary supply is not necessary for the electronic overcurrent releases; they are supplied by an iron-core current transformer in the main current paths. Air-core transformers are used for the measured value acquisition.

The tripping magnet of the electronic overcurrent release acts direct mechanically on the latching mechanism of the circuit-breaker.

The electronic overcurrent releases can be used on main frequencies of 40 to 60 Hz. Since the operation of the electronic overcurrent releases are only minutely influenced by harmonic waves, these releases are suitable for use in current supply systems having high harmonic wave components.

The tripping operation of the electronic overcurrent releases is only slightly influenced by the ambient temperature as follows.

Ambient temperature at the overcurrent release	Tolerance range of the response value
-5°C to +55°C	Response value = Set value $\pm 10\%$
-25°C to -5°C	additional tolerance -5% is possible
+55°C to +75°C	additional tolerance +5% is possible



Long-delay release¹⁾

- 1 Current setting
- 2 Setting the release time for $6 \times$ setting current
- 3 Selection switch for the response time characteristic of the overcurrent release after an overload trip

Position 1: shortened response time for immediate reclosing. (Characteristic from the operational condition of a thermally delayed overcurrent release is simulated)

Position 2: unshortened response time for immediate reclosing. (Characteristic from the cold state of a thermally delayed overcurrent release is simulated)

Short-delay release

- 4 Current setting
- 5 Delay time setting

Instantaneous release

- 6 Current setting

Test unit connection

- 7 Socket for connecting the test unit

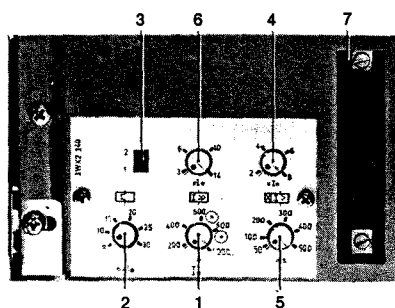


Fig. 3/13
Electronic overcurrent release

1) With zn-release for setting the circuit-breaker operating current.

Description

Long-delay release (a-release function)

One current setting range is allocated to each circuit-breaker rated current. The release time for $6 \times I_r$ can be set to between 6 and 30 s.

In contrast to the thermally delayed overcurrent releases, which have a characteristic dependent upon the pre-load conditions of the release (cold or warm tripping characteristic), the electronic release is independent of the pre-load conditions. Therefore the selected tripping characteristics must be suitable for the "warmed-up" motor.

The electronic overcurrent releases have a memory. As long as the operational current does not exceed the set rated current, the result of the current measurement is not fed into the memory. Therefore if the circuit-breaker is switched off during a period where the load current has not been exceeded the set rated current behaviour of the overcurrent release upon reclosing is the same as before the load was switched (a motor can be started without restriction).

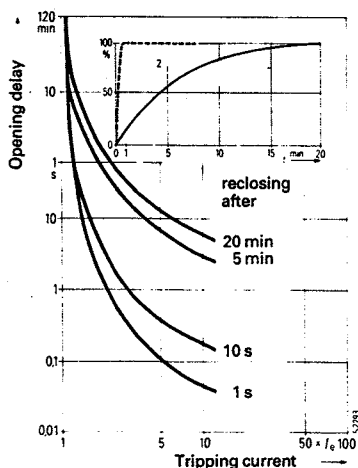
If the circuit-breaker has been:

- tripped by an overload,
 - switched-off during, or shortly after, an overload period,
 - switched-off during, or shortly after, a motor start-up,
- then the measured value of this overcurrent or starting current is stored by the memory. Due to this, the behaviour of the overcurrent release at reclosing changes: the release time becomes temporarily shorter.

The time in which the memory retains the previously monitored data stored, can be chosen by the "Selector switch 1-2".

Selector switch position 1: Shortened release time.
(Normal overload protection for motors)

After an overload trip (or switching-off during, or shortly after an overload period or motor start) the circuit-breaker can be immediately reclosed, but 1 s after tripping the actual release delay time, on overload or motor restart, will only be approx. 0.3% of the set release delay time. The set release delay time will be fully re-established 20 minutes after tripping (or switching-off) has occurred. The motor has had sufficient time to cool down before being restarted and loaded to its full capacity or even overload.



Opening delay = Tripping time of the overcurrent release + inherent operating time of the circuit-breaker.
t... Time between the overload tripping and reclosing at overload or motor restart.

Fig. 3/13a
Tripping characteristics of the a-release

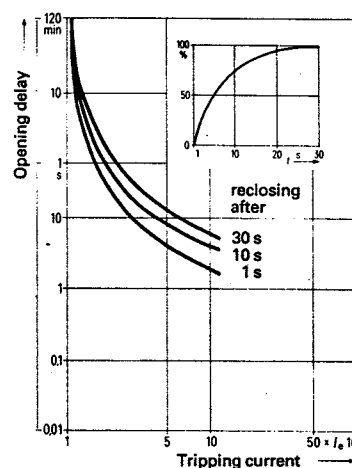
Time (t) between an overload tripping and reclosing at overload or motor start	Actual release delay time in % of the set release delay time
1 s	0.3%
10 s	3%
5 min	60%
20 min	100%

Selector switch position "2": Unshortened release time.

(Suitable only for motors and switchboards, which can be immediately restarted or operated after an overload tripping.)

After an overload tripping (or a switching-off, during or shortly after an overload period or motor start) the circuit-breaker can be immediately reclosed, but 1 s after tripping the actual release delay time will be 20% of the set release delay time. The full set release delay time will be re-established 30 s after tripping (or switching-off).

If the motor is immediately re-started after this 30 s period, it will be exposed to the load of the starting process and, eventually, the still existent overload, without having had time to cool down.



Opening delay = Tripping time of the overcurrent release + inherent operating time of the circuit-breaker.
t... Time between the overload tripping and reclosing at overload or motor start.

Fig. 3/13b
Tripping characteristics of the a-release

Time (t) between an overload tripping and reclosing at overload or motor start	Actual release delay time in % of the set release delay time
1 s	20%
10 s	75%
30 s	100%

Short-delay overcurrent release (z-release function)

a) z-release for the selective short-circuit protection by time-grading

The short-delay overcurrent release is suitable for the time grading for selective short-circuit protection.

The response current is adjustable from 2 to $8 \times I_r$.

The time delay is adjustable from 50 to 500 ms.

The shortest possible selective grading time between two circuit-breakers is 70 ms.

b) z-release used to prevent "rush" tripping during the starting of a motor

If during the starting-up of a squirrel-cage motor a very high start current peak (rush) occurs, it may cause the overcurrent release to operate. By using a short-delay overcurrent release instead of an instantaneous overcurrent release this nuisance tripping can be avoided. (Delay time set to 50 ms.)

If there is a possibility that the short-circuit will be excessively larger than the "rush" current then it is advisable to use an azn-release so that with larger short-circuit currents, an instantaneous tripping is possible.

3WE circuit-breakers, rated current 630 to 4000 A a.c.

Description

Instantaneous overcurrent release (n-release function)

The response current is adjustable from 3 to $14 \times I_r$.

The opening delay is approx. 20 ms.

Signalling switch "Overcurrent release has tripped"

For indicating that the electronic overcurrent release has operated a signalling switch can be fitted: a changeover contact is available for each function (a, z, n) (Schematic diagrams see page 3/44 and 3/45; for Technical data refer to page 3/21).

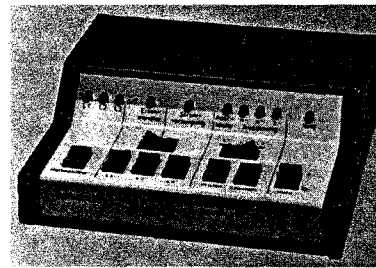
The changeover contact switches over for approx. 50 ms after a release has operated. The signal can be registered by using an additional auxiliary relay (e.g. comb relay).

The signalling switch is also available as a module for subsequent fitting (refer to page 3/40).

Reclosing lock-out

A lock-out can be achieved using the signalling switch and the undervoltage release. For circuit-breakers having motor or motorized stored-energy operating mechanisms the motor and closing magnet control circuit must also be interlocked¹⁾.

Functional testing unit



The functions of the electronic overcurrent release can be tested using the portable functional testing unit.

The following can be checked: a-, z-, n-release functions and both the transformer circuits and closing magnet for continuity. If the electronic release is built into the circuit-breaker the efficiency of the release magnet can also be checked. The overcurrent release can be tested – either when built-into the circuit-breaker or when used as a module.

It is permissible to carry out the functional tests when the circuit-breaker is closed but under no-load conditions; the circuit-breaker however will be tripping by the test. It is not permissible to test the overcurrent release when the circuit-breaker is under load.

The rated voltage of the functional testing unit is 220 V/ 50 Hz and 240 V/ 60 Hz.

Tripping characteristics of the electronic overcurrent release

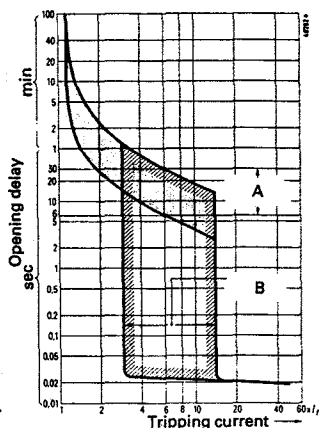


Fig. 3/14
Characteristic of the electronic an-overcurrent release

- A Delay setting range of the a-release for $6 \times I_r$ (6 to 30 s)
- B Response current setting range of the n-release (3 to $14 \times I_r$)

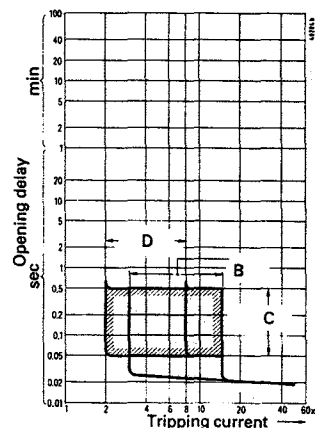


Fig. 3/15
Characteristic of the electronic zn-overcurrent release

- B Response current setting range of the n-release (3 to $14 \times I_r$)
- C Delay setting range of the z-release (50 to 500 ms)
- D Response current setting range of the z-release (2 to $8 \times I_r$)

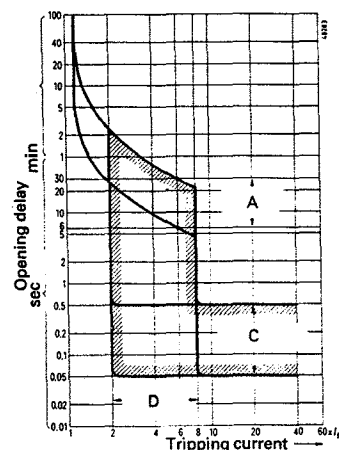


Fig. 3/16
Characteristic of the electronic az-overcurrent release

- A Delay setting range of the a-release for $6 \times I_r$ (6 to 30 s)
- C Delay setting range of the z-release (50 to 500 ms)
- D Response current setting range of the z-release (2 to $8 \times I_r$)

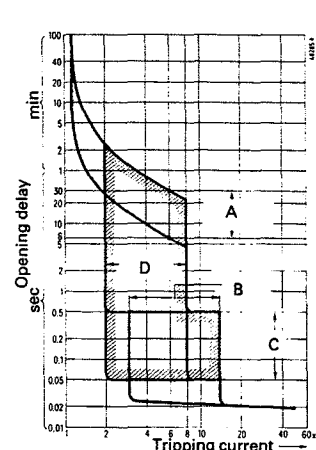


Fig. 3/17
Characteristic of the electronic azn-overcurrent release

- A Delay setting range of the a-release for $6 \times I_r$ (6 to 30 s)
- B Response current setting range of the n-release (3 to $14 \times I_r$)
- C Delay setting range of the z-release (50 to 500 ms)
- D Response current setting range of the z-release (2 to $8 \times I_r$)

¹⁾ A buffered control voltage (e.g. a battery) is necessary for the electrical interlocking and signalling, due to the fact that the mains voltage decreases to an unspecified value under short-circuit-conditions.

I_r is the setting current of the a-release with the an-, az- and azn-releases and the "response current basic value" with the zn-release.

Description

Undervoltage and shunt releases

Undervoltage releases

Undervoltage release without delay (r-release)

(Schematic diagrams on page 3/52)

The undervoltage release is used for the remote tripping of the circuit-breaker and for interlocking purposes. The circuit-breakers cannot be closed until the undervoltage release has been energised. Otherwise a false closure occurs, without the contacts coming into contact with each other (trip-free). All 3WE circuit-breakers, with the exception of the 3WE63 with motorized stored-energy mechanism are trip free.

The opening delay on tripping is 20 to 50 ms.

Undervoltage release with drop-off delay (rc-release)

(Schematic diagram 3/60)

An undervoltage release having a drop-off delay can be used to bridge a short-time voltage fluctuation or voltage failure.

The delay is achieved with the use of delay units, which are mounted separately to the circuit-breaker:

Capacitor delay unit 3WX9 910 with delay time approx. 1 s.

Additional delay unit 3WX9 214 increases the delay time to 2 or 3 s (reconnectable).

For instantaneous tripping of the release the supply to the undervoltage release coil must be interrupted. (Contact S50 in the Schematic diagram 3/60; please note: with a.c. supply voltage operation the contact S50 must be suitable for a d.c. voltage = a.c. control voltage $U_c \sqrt{2}$.)

Shunt releases

Shunt release (f-release)

The shunt release is used for the remote tripping of the circuit-breaker and for interlocking purposes.

The shunt release for use on a.c. has a tapped coil and can therefore be used to interlock two circuit-breakers:

- Pick-up winding (Coil tapping c1-c2)

It is only designed for short-time operation. Therefore it must be switched off by an auxiliary contact immediately after the circuit-breaker has tripped (auxiliary contact block S1, contact 13-14).

- Hold-in winding (Coil tapping c1-d)

It is designed for continuous operation.

It holds the shunt-release in the released position, after the pick-up winding has tripped the circuit-breaker. This prevents reclosing of the circuit-breaker (refer to the Schematic diagrams 3/59 and 3/61).

At rated operating current, the winding does not have enough force to trip a closed circuit-breaker. But it can prevent an open circuit-breaker from being closed by picking up of the shunt release.

The standard shunt release for use on d.c. is provided with only one coil and is only suitable for tripping a circuit-breaker but *not* for interlocking purposes (a special release for interlocking purposes is available on request).

A requirement for the safe operation of the shunt release is a reliable voltage supply.

To monitor the shunt release circuit a circuit as shown in diagram 3/61 can be used. Opening delay on tripping is 15 to 25 ms.

Network protection release (fc-release)

The network protection release consists of a shunt release and a separate capacitor delay unit.

A standard shunt release which obtains its supply from the mains, becomes inoperational in the event of a supply short-circuit because the mains has collapsed.

The capacitor delay unit stores enough energy to allow the network protection shunt release to operate after the mains supply has collapsed.

Auxiliary switches (Internal connection diagrams refer to page 3/48)

Auxiliary switches, dependent upon the main contact position

Generally the auxiliary contacts are leading with respect to the main contacts. The leading time depends on the type of operating mechanism used.

The 3WE circuit-breaker can be supplied with 1 or 2 auxiliary switch blocks.

The 1st auxiliary switch block can only be supplied with 2 NO and 1 NC contacts.

The 2nd auxiliary switch block normally has 2 NO and 1 NC but can be supplied with 1 NO and 2 NC or 3 NC contacts fitted (refer to "Special designs" on page 3/32).

With circuit-breakers having a motorized stored-energy operating mechanism the contact 31-32 of the 1st auxiliary switch block is used for the closing magnet. In order to have sufficient auxiliary contacts available, these circuit-breakers have to be ordered with two auxiliary switch blocks as standard.

With the withdrawable circuit-breakers the contact 13-14 of the first auxiliary switch block is used for the shunt release or is left unused if no shunt release is fitted.

It must be additionally noted that with certain circuit-breaker versions some plug pins which are normally used by the auxiliary contacts can be used for other functions and thereby the auxiliary switch contacts will not be available. (e.g. Schematic diagrams 3/54, 3/55).

The second auxiliary switch block can be supplied as a module and can be subsequently fitted to the following

Vertical throw handle operating mechanisms

Front operating mechanisms

Rear handle operating mechanisms

Linkage lever operating mechanisms

Motor operating mechanisms

Only with permanently installed circuit-breakers.

Auxiliary switches, dependent upon the position of the operating mechanism (operating mechanism auxiliary switches)

Leading auxiliary switches can be used for leading switch-on of the undervoltage release.

Lagging auxiliary switches can be used for the making of an "alarm signalling system". The handle of a manual operating mechanism will remain in the "On" position even if the circuit-breaker has been tripped by the overcurrent or undervoltage/shunt release. This means that the operating mechanism auxiliary switch contacts remain operated.

The discrepancy between the position of the handle and the main contacts can be indicated by a "Signalling switching system" as shown in the Schematic diagram 3/76 (for withdrawable circuit-breakers refer to pages 3/24, 3/25, 3/26, 3/27).

The following circuit-breaker operating mechanisms can be supplied with operating mechanism auxiliary switches:

Mechanism	Circuit-breakers	Type of auxiliary switch
Front operating mechanism	Sizes I and II	Leading auxiliary switch 1NO + 1NC Lagging auxiliary switch 1NO + 1NC
Vertical-throw handle operating mechanism (handle must not be removed)	Sizes I, II, and III	Lagging auxiliary switch 1NO + 1NC or 2NO + 1NC

With the permanently installed circuit-breakers the operating mechanism can be factory mounted (refer to "Special designs" on page 3/32), or can be supplied as a module for subsequent mounting (refer to "Modules" on page 3/38).

With the withdrawable circuit-breakers the operating mechanism auxiliary switches must be factory mounted (refer to "Special designs" on page 3/32).

Description

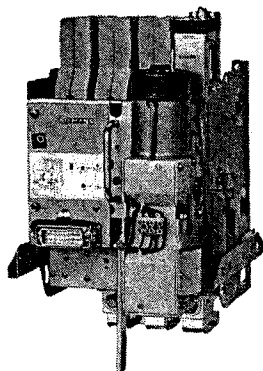


Fig. 3/18
Size I
Withdrawable design

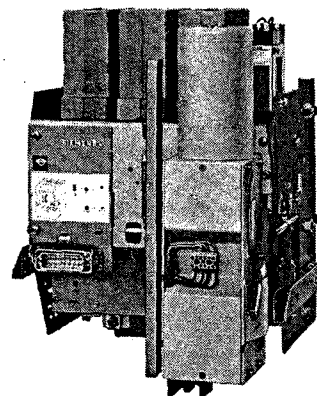


Fig. 3/19
Size II
Withdrawable design

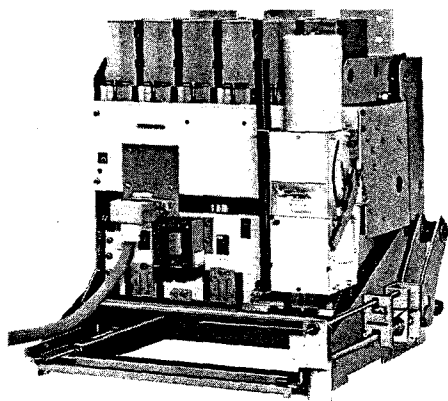


Fig. 3/20
Size III
Withdrawable design with guide frame
with contact engagement spindle

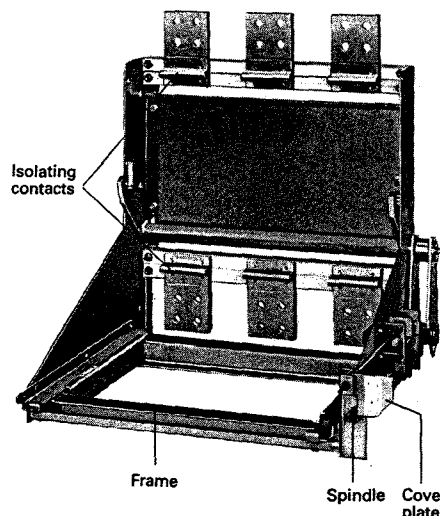


Fig. 3/21
Guide frame for
withdrawable
circuit-breakers

Withdrawable circuit-breakers 3WE

The circuit-breaker in its withdrawable version is held in the guide frame. The main current paths are connected by engagement contacts. The control circuits are connected by plugs, which can be manually removed.

The circuit-breaker can be placed into the following positions:

Connected position:

The circuit-breaker is fully located. The engagement contacts are closed. The control plugs are connected. The circuit-breaker is ready for closing.

Test position:

The circuit-breaker is fully withdrawn, the engagement contacts are disengaged.

The control plugs are connected.

The circuit-breaker can be functionally tested.

Disconnected position:

The circuit-breaker is fully withdrawn.

The engagement contacts are disengaged.

The control plugs have to be disconnected.

The circuit-breaker is electrically fully isolated.

} Same as the
test position

If the circuit-breaker is either in the connected or the test/disconnected position it is mechanically locked into position. Additionally this lock ensures that the circuit-breaker can only be moved from the connected position to the test/disconnected position and vice-versa, when the circuit-breaker is open.

) Prevents insertion of crank for contact engagement spindle as long as the locking shaft is in locked position.

Signalling switches can be supplied for the remote indication of the circuit-breaker position (refer to "Signalling switches" on page 3/13 and the Selection tables).

The 3WE circuit-breakers are available in 2 versions:

1. With guide frame without contact engagement spindle (Sizes I and II)

The circuit-breaker is inserted into the test/disconnected position and then manually pushed into the connected position. The reverse procedure is carried out when changing from the connected position to the test/disconnected position.

If the circuit-breaker is used in cabinets (enclosed switchboards) the above detailed procedure has to be carried out with the door open.

For the installation in cabinets (enclosed switchboards), circuit-breakers with motor or motorized stored-energy operating mechanism should be used.

2. With guide frame with contact engagement spindle (Sizes I, II and III)

(Size I will be available from the middle of 1982)

The circuit-breaker is inserted into the test/disconnected position and is then after having closed the cabinet door brought into the connected position by using a contact engagement spindle which is operated by a crank.

Description

The reverse procedure is carried out when changing from the connected position into the test/disconnected position, with the cabinet door still closed.

The opening for inserting the crank into the spindle is only accessible after the mechanical position lock has been released and thereby the circuit-breaker has opened if it was in the closed state. Thus is ensured that the circuit-breaker can only be moved when open.

If the circuit-breaker is mounted in cabinets (enclosed switchboards), for the actuation of the mechanical position lock the door operating mechanism 8UC42 (with door locking, locking possibility and override) can be used.

If the withdrawable circuit-breaker is used in an open-type switchboard, a knob handle 8UC93 can be used for actuating the mechanical position lock.

For the installation in cabinets (enclosed switchboards) circuit-breakers with motor or motorized stored-energy operating mechanisms should be used.

Guide frames

The guide frames must be ordered separately and are supplied as sets of pre-mounted parts.

Each set consists of the following items:

Support panels,

Knife contacts (6 for the 3-pole circuit-breaker and 8 for the 4-pole circuit-breaker),

Isolating carriers for the knife contacts,

Parts for the mechanical position lock and also for the contact engagement spindle if applicable,

Control leads (1.5 m long) with a 25-pole plug.

Plug connections for control systems

For the connection of the control systems the 3WE withdrawable circuit-breakers are supplied with disconnectable plugs:

25-pole plug connector:

for all the control functions, with the exception of those of the motorized stored-energy operating mechanism and the signalling switch of the electronic overcurrent release.

The fixed part of the connector is fitted onto the circuit-breaker, the plug with the lead (1.5 m long) is supplied with the guide frame. The connector is suitable for voltages up to 380V a.c. and 440V d.c.

12-pole plug connector:

for the motorized stored-energy operating mechanism. The fixed part of the connector is fitted onto the motorized stored-energy operating mechanism. The plug with the lead (1.5 m long) is supplied with the circuit-breaker.

The connector is suitable for voltage up to 240 V a.c./d.c.

9-pole plug connector:

for the signalling switch of the electronic overcurrent release.

The fixed part of the plug is fitted onto the electronic overcurrent release. The plug with the lead (1.5 m long) is supplied with the electronic overcurrent release.

The connector is suitable for voltages up to 240V a.c./d.c.

The end of the leads are marked with the terminal designations as shown in the schematic diagrams.

Signalling switches on the guide frames

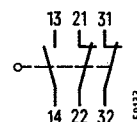
The signalling switches are to be ordered separately (refer to Selection tables) and are supplied as modules complete with the mounting parts.

Signalling switches for the guide frames

without contact engagement spindle (3WX2 386 and 3WX2 586)

Signal "Circuit-breaker in the connected position, mechanically locked, ready for switching"

1 NO + 2 NC

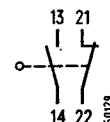


(Contact block 3SE3 023-0A)

Signal "Circuit-breaker in the test position, mechanically locked, ready for functional tests"

"Circuit-breaker in disconnected position, mechanically locked"

1 NO + 1 NC



(Contact block 3SE3 020-0A)

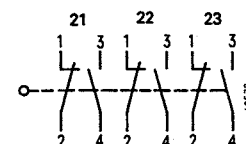
Permissible load refer to the Technical data on page 3/21.

Signalling switches for the guide frames

with contact engagement spindle (3WX2 394 and 3WX2 794)

Signal "Circuit-breaker in the connected position, mechanically locked, ready for switching"

3 NO + 3 NC

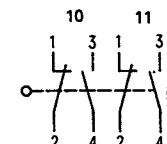


(3 Contact blocks each with 1 NO + 1 NC)

Signal "Circuit-breaker in the test position, mechanically locked, ready for functional tests"

"Circuit-breaker in the disconnected position, mechanically locked"

2 NO + 2 NC



(2 Contact blocks each 1 NO + 1 NC)

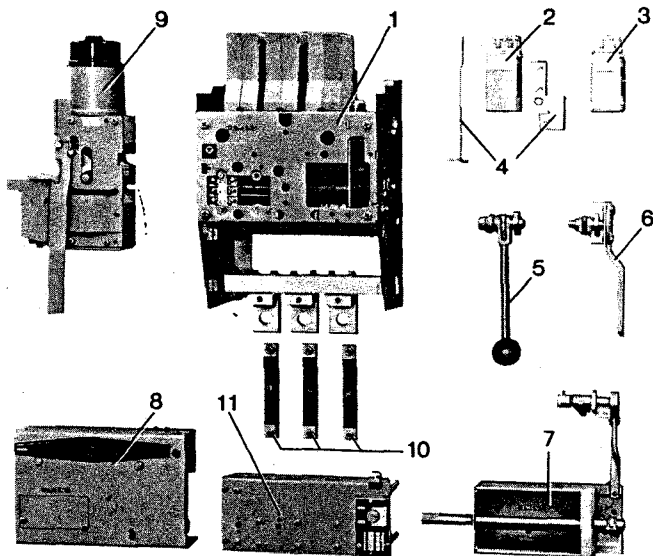
Permissible load refer to the Technical data on page 3/21.

3WE circuit-breakers, rated current 630 to 4000 A

Description

Modular system

The 3WE circuit-breakers can also be partially delivered as modules, so that the circuit-breakers can be modified and extended.



- 1 Basic unit
- 2 Shunt release
- 3 Undervoltage release
- 4 Mounting parts for shunt release or undervoltage release
- 5 Vertical-throw handle mechanism
- 6 Linkage lever operating mechanism
- 7 Rear operating mechanism
- 8 Front operating mechanism
- 9 Motor operating mechanism
- 10 Bridging bars
- 11 Overcurrent release

Fig. 3/22
Modules for the 3WE circuit-breakers for permanent installation

The following modules can be replaced, or subsequently added:

Modules	Size	Permanently installed circuit-breakers			Withdrawable circuit-breakers		
		three-pole	four-pole	four-pole	three-pole	four-pole	four-pole
Basic unit		x	x	x	-	-	-
Vertical-throw handle mechanism		x	x	x	x ¹⁾	x ¹⁾	x ¹⁾
Front operating mechanism with high-speed closing feature		x	x	-	x ¹⁾	x ¹⁾	-
Front operating mechanism without high-speed closing feature		x	x	-	x ¹⁾	x ¹⁾	-
Rear operating mechanism		x	x	-	-	-	-
Linkage lever operating mechanism		x	x	-	-	-	-
Motor operating mechanism		x	x	x	x ²⁾	x ²⁾	x ²⁾
Overcurrent releases (an, n, az, zn, azn, z)		x	x	x ⁴⁾	x ³⁾	x ³⁾	x ³⁾
Bridging bars		x	x	-	x	x	x
Shunt release		x	x	x	x ²⁾	x ²⁾	x ²⁾
Undervoltage release		x	x	x	x ²⁾	x ²⁾	x ²⁾
Second auxiliary contact block		x ⁵⁾	x ⁵⁾	x ⁵⁾	-	-	-
Lagging auxiliary switch for vertical-throw handle mechanism		x	x	x	x ²⁾	x ²⁾	x ²⁾
Lagging auxiliary switch for front operating mechanism		x	x	-	x ²⁾	x ²⁾	-
Leading auxiliary switch for front operating mechanism		x	x	-	x ²⁾	x ²⁾	-
Mechanical reclosing lock-out		-	-	x	-	-	-
Signalling switches for "tripped" indication		-	-	x	-	-	-
Fan mounting unit		-	-	x	-	-	-
Temperature monitoring unit		-	-	x	-	-	-

With the withdrawable circuit-breaker the subsequent fitting or exchanging of modules is only possible when no internal wiring changes are necessary.

- 1) The hand operating mechanisms can be exchanged if no additional operating mechanism auxiliary switch required.
- 2) Modules of the same type can be exchanged but not subsequently fitted.
- 3) The exchange of the overcurrent releases of the same type and design but with different setting ranges is possible.
The overcurrent release modules are, without alterations, suitable for both the permanently installed and withdrawable circuit-breakers.
- 4) The electronic overcurrent release modules of size III, can only be used for the replacement of already fitted electronic overcurrent releases.
Replacement of a mechanical with an electronic overcurrent release is not possible.
- 5) With circuit-breakers with stored-energy operating mechanism a subsequent fitting is not possible.

Spare parts (refer to page 3/42)

The main contacts, arc chutes, coils for the undervoltage and shunt releases and the auxiliary contact blocks are all available as spare parts. Special tools (allen key) for exchanging the main contacts and the bridging bars are available (refer to "Accessories" page 3/41).

Description

Increasing the rated current of circuit-breaker by using a fan

The rated current of the permanently installed and withdrawable circuit-breaker 3WE83 can be increased up to 4000A, by using a fan which is mounted underneath the circuit-breaker.

The circuit-breaker temperature is monitored by three double-temperature thermostats which are located on the upper current paths (Schematic diagram 3/74).

- If the response temperature of the lower set sensor is reached the fan will be switched on. The temperature sensor has a large time constant to avoid continuous operational switching.
- If the response temperature of the higher set sensor is reached, e.g. due to the fan having failed, the circuit-breaker must be switched off or at least the circuit-breaker load must be reduced to a current which the circuit-breaker can carry without use of a fan.

For fitting the fan onto the circuit-breaker a module is available (refer to "Modules" on page 3/40).

Fans are detailed on page 3/41 (for Technical data, etc., refer to the Cats. V and E).

The double-temperature thermostats are available factory fitted to the circuit-breaker (refer to "Special designs" on page 3/32) or as a separate module, for subsequent fitting (refer to "Modules" on page 3/40).

Thermostats:

- 1 NO contact for the lower temperature sensors
- 1 NO contact for the higher temperature sensors

Schematic diagrams refer to pages 3/48 and 3/55

Technical data refer to page 3/21

Parallel connection of two circuit-breakers

By connecting two circuit-breakers of the same design in parallel the current carrying capacity can be increased but not the switching capacity.

1. Current carrying capacity

If two circuit-breakers are connected in parallel, the total operating current per phase is shared between the two individual pole assemblies, in inverse proportion to their resistances. For an equal distribution between the parallel current paths it is necessary that the busbar inlet is arranged as shown in the illustrations 1 and 2, to obtain the same length of the connecting bars.

Bus arrangement		Circuit-breakers 2 of 3WE7 2 of 3WE8 Max. permissible total operating current I_o for open-type mounting and an ambient temperature up to +35°C	
1	2	5000 A	6000 A

2. Making and breaking capacity

When the circuit-breakers are connected in parallel, the making and breaking capacity which can be expected, is only that of one of the circuit-breakers as the contacts of the parallel circuit-breaker do not close and open simultaneously.

3. Overcurrent releases

3.1 Long-delay overcurrent releases (a-release, thermally delayed or electronic)

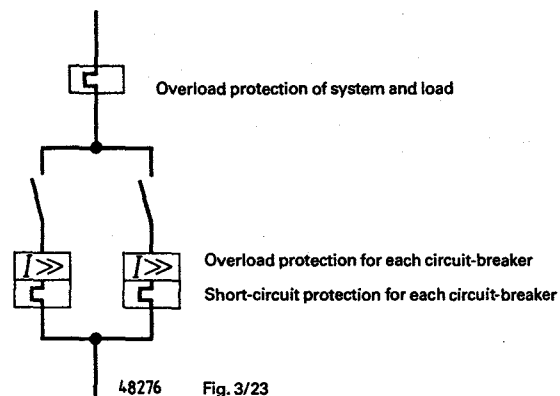
For the protection of the circuit-breaker:

In order to prevent that one of the two parallel circuit-breakers is overloaded it is necessary that all the poles of both the circuit-breakers are equipped with long-delay overcurrent releases. The overcurrent releases should be set for the maximum permissible operating current of the circuit-breaker.

This eliminates false tripping of the heavier loaded circuit-breaker due to slight unequal distribution of the total current between the circuit-breakers.

For the protection of the system and load:

In order to protect system and load, a thermally-delayed overcurrent release which is suitable for the total operating current, has to be arranged separately from the circuit-breakers (e.g. overcurrent relay 3UC3 with current transformer). The setting current of this common overcurrent release should be equivalent to the total operating current.



3.2 Instantaneous overcurrent releases (n-release)

Since one of the circuit-breakers closes first the switch-on current flows through its contacts. This is independent of the type of operating mechanism used.

In order to prevent the first closing circuit-breaker from tripping, the instantaneous releases of each circuit-breaker must be set so high, that they will not be tripped by the highest operational current occurring.

4. Undervoltage and shunt releases

The undervoltage and shunt releases, respectively, of both the circuit-breakers should be connected in parallel (refer to page 3/57 for Schematic diagrams).

5. Operating mechanisms

For parallel connection, circuit-breakers with motor- or motorized stored-energy operating mechanisms should be used.

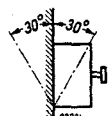
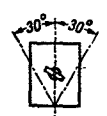
The operating mechanisms of both circuit-breakers should be connected in parallel (refer to Fig. 3/82 and 3/83 for Schematic diagrams for motor operating mechanisms and to Fig. 3/84 for motorized stored-energy operating mechanisms).

3WE circuit-breakers, rated current 630 to 4000 A

Technical data												
Size		I			II		III					
Type	3-pole 4-pole	3WE13 3WE14	3WE23 3WE24	3WE33 3WE34	3WE43 3WE44	3WE53 3WE54	3WE63 —	3WE73 —	3WE83 —	3WE83 with fan		
Performance data												
Rated current Δ continuous current I_n												
Permanently installed circuit-breaker		A	630	800	1000	1250	1600	2000	2500	3150	4000	
Withdrawable circuit-breaker		A	630	800	1000	1250	1600	1900	2500	2700	4000	
Insulation rating U_i and insulation group to VDE 0110												
Main pole		V	1000 a.c. Group C									
Control circuits		V	500 a.c. Group C (withdrawable circuit-breakers 380 V a.c./440 V d.c.)									
Rated operational voltage U_n of the main poles		V	1000 a.c.									
Max. permissible ambient temperatures at the circuit-breaker												
Operation		°C	- 20 to + 75, measured near the circuit-breaker at its horizontal centre line.									
Storage		°C	- 55 to + 55									
Rated operating current $I_n^{(1)}$ (continuous duty) dependent on the ambient temperature of the switchboard												
Max. No. of circuit-breakers per control panel												
Permanently installed circuit-breakers												
in open switchboards		at 35°C	A	630	800	1000	1250	1600	2000	2500	3150	4000
		40°C	A	630	800	1000	1250	1600	1950	2440	3080	3950
		45°C	A	630	780	1000	1250	1600	1900	2370	3010	3900
		50°C	A	630	760	1000	1250	1600	1850	2300	2940	3850
		55°C	A	630	730	1000	1250	1560	1780	2200	2850	3780
in enclosed switchboards ²⁾ with air vents		at 35°C	A	630	780	1000	1250	1600	1900	2370	3000	3600
Circuit-breaker installed in the upper part of the switchboard		40°C	A	630	760	1000	1250	1600	1850	2310	2910	3550
		45°C	A	630	740	1000	1250	1560	1800	2240	2820	3500
		50°C	A	630	710	970	1220	1520	1750	2160	2730	3430
		55°C	A	610	690	950	1180	1470	1700	2090	2640	3350
Circuit-breaker installed in the lower part of the switchboard		at 35°C	A	630	660	920	1150	1430	1640	2010	2540	3250
		40°C	A	630	640	880	1110	1380	1580	1930	2440	3200
		45°C	A	610	610	840	1080	1340	1520	1850	2340	3150
		50°C	A	590	590	800	1040	1290	1450	1770	2230	3080
		55°C	A	560	560	760	1010	1240	1380	1670	2110	3000
in enclosed switchboards ²⁾ without air vents		at 35°C	A	630	740	1000	1250	1560	1800	2240	2820	3250
Circuit-breaker installed in the upper part of the switchboard		40°C	A	630	710	970	1220	1520	1750	2160	2730	3200
		45°C	A	630	690	950	1180	1470	1700	2090	2640	3150
		50°C	A	630	660	920	1150	1430	1640	2010	2540	3080
		55°C	A	630	640	880	1110	1380	1580	1930	2440	3000
Circuit-breaker installed in the lower part of the switchboard		at 35°C	A	630	710	970	1220	1520	1750	2160	2730	3600
		40°C	A	630	690	950	1180	1470	1700	2090	2640	3550
		45°C	A	630	660	920	1150	1430	1640	2010	2540	3500
		50°C	A	630	640	880	1110	1380	1580	1930	2440	3430
		55°C	A	630	610	850	1080	1330	1520	1850	2340	3350
Withdrawable circuit-breakers												
in open switchboards		at 35°C	A	630	800	1000	1250	1600	1900	2500	2700	4000
		40°C	A	630	780	1000	1250	1560	1860	2450	2650	3950
		45°C	A	630	760	1000	1250	1520	1820	2400	2600	3900
		50°C	A	630	740	1000	1250	1480	1770	2350	2550	3850
		55°C	A	630	720	1000	1250	1450	1720	2300	2500	3800
in enclosed switchboards ²⁾ with air vents		at 35°C	A	630	660	800	1050	1220	1650	2120	2400	3600
Circuit-breaker installed in the upper part of the switchboard		40°C	A	630	640	780	1020	1180	1600	2060	2350	3550
		45°C	A	600	620	760	990	1140	1550	2000	2300	3500
		50°C	A	570	590	730	950	1100	1500	1940	2240	3430
		55°C	A	550	570	700	910	1050	1430	1880	2160	3350
Circuit-breaker installed in the lower part of the switchboard		at 35°C	A	630	720	940	1200	1380	1650	2120	2400	3600
		40°C	A	630	700	910	1160	1340	1600	2060	2350	3550
		45°C	A	630	680	880	1120	1300	1550	2000	2300	3500
		50°C	A	630	650	850	1080	1250	1500	1940	2240	3430
		55°C	A	630	630	820	1040	1200	1430	1880	2160	3350
in enclosed switchboards ²⁾ without air vents		at 35°C	A	570	580	700	910	1070	1440	1840	2080	3250
Circuit-breaker installed in the upper part of the switchboard		40°C	A	550	560	680	890	1030	1400	1790	2040	3200
		45°C	A	520	540	660	860	1000	1350	1740	2000	3150
		50°C	A	490	520	640	830	970	1300	1690	1950	3080
		55°C	A	470	500	610	790	920	1250	1630	1880	3000
Circuit-breaker installed in the lower part of the switchboard		at 35°C	A	600	630	820	1050	1200	1440	1840	2080	3250
		40°C	A	580	610	790	1020	1170	1400	1790	2040	3200
		45°C	A	560	590	770	980	1130	1350	1740	2000	3150
		50°C	A	550	570	740	950	1090	1300	1690	1950	3080
		55°C	A	540	550	720	910	1040	1250	1630	1860	3000

- 1) NOTE: The permissible load of the circuit-breaker depends to a large degree upon the type, size, cabinet position, etc. of the switchboard. For this reason the operating currents quoted are only the recommended values. Under no circumstances must the ambient temperature at the circuit-breaker exceed 75°C, measured at its horizontal centre line.
- 2) Rated operating current with installation in enclosures refer to Cats. NV 11 and NV 12.

Technical data

Size		I						II		III			
Type	3-pole	3WE13 1/3WE13 2		3WE23 1/3WE23 2		3WE33 1/3WE33 2		3WE43	3WE53	3WE63	3WE73	3WE83	3WE83 with fan
	4-pole	3WE13 5/3WE13 8		3WE23 5/3WE23 8		3WE33 5/3WE33 8		3WE44	3WE54	-	-	-	-
		3WE14 1/3WE14 2		3WE24 1/3WE24 2		3WE34 1/3WE34 2							
		3WE14 5/3WE14 8		3WE24 5/3WE24 8		3WE34 5/3WE34 8							
Rated short-time current (1 s current)	kA	25 (10) ¹⁾		25 (10) ¹⁾		25 (10) ¹⁾		40		45	60	60	60
Rated peak withstand current	kA	84	110	84	110	84	110	110		132	176	176	176
Rated making and breaking capacity (a.c.) Test sequence O—t—CO (P-1)													
Rated making capacity (peak value)													
up to 500 V a.c.	kA	84	110	84	110	84	110	110		132	176	176	176
up to 660 V a.c.	kA	84	110	84	110	84	110	110		132	132	132	132
up to 1000 V a.c.	kA	42	42	42	42	42	42	42		42	42	42	42
Rated breaking capacity (rms)													
up to 500 V a.c.	kA	40	50	40	50	40	50	50		60	80	80	80
up to 660 V a.c.	kA	40	50	40	50	40	50	50		60	60	60	60
up to 1000 V a.c.	kA	20	20	20	20	20	20	20		20	20	20	20
p.f.		0.25	0.2	0.25	0.2	0.25	0.2	0.2		0.2	0.2	0.2	0.2
Test sequence O—t—CO—t—CO (P-2)													
Rated making capacity (peak value)													
up to 500 V a.c.	kA	73	94	73	94	73	94	110 (84) ²⁾		110	176	176	176
up to 660 V a.c.	kA	73	94	73	94	73	94	110 (84) ²⁾		110	132	132	132
up to 1000 V a.c.	kA	42	42	42	42	42	42	42		42	42	42	42
Rated breaking capacity (rms)													
up to 500 V a.c.	kA	35	45	35	45	35	45	50 (40) ²⁾		50	80	80	80
up to 660 V a.c.	kA	35	45	35	45	35	45	50 (40) ²⁾		50	60	60	60
up to 1000 V a.c.	kA	20	20	20	20	20	20	20		20	20	20	20
p.f.		0.25	0.25	0.25	0.25	0.25	0.25	0.2		0.2	0.2	0.2	0.2
Rotor standstill voltage U_{20}	V	2000		2000		2000		2000		2000			
Starting operation													
Maximum rated power of three-phase transformers allowing for overload capacity to VDE 0532, Appendix 1 (circuit-breaker ambient temperature of 35°C) no-load voltage at 50 Hz:													
231/134 V	kVA	250		315		400		500	630	800	1000	1250	1600
400/231 V	kVA	400		500		630		800	1000	1250	1600	2000	2500
525 V	kVA	500		630		800		1000	1250	1600	2000	2500	3150
700 V	kVA	630		800		1000		1250	1600	2000	2500	3150	4000
Maximum rated power of three-phase capacitors (circuit-breaker ambient temperature of 35°C) rated voltage at 50 Hz:													
220 V	kvar	180		230		285		360	450	570	665	840	
380 V	kvar	310		395		500		620	800	1000	1150	1450	
500 V	kvar	405		520		650		810	1050	1300	1520	1900	
660 V	kvar	540		690		850		1080	1350	1700	2000	2500	
Rated mechanical life with manual and motor operating mechanisms	Ops.	20000						20000		10000			
with motorized stored-energy operating mechanisms	Ops.	10000						5000		3000			
Maximum switching frequency	Ops./h	100						50		25			
Mounting position				and/or									

In the middle of 1982, the circuit-breakers 3WE13 1/3WE14 1, 3WE23 1/3WE24 1, 3WE33 1/3WE34 1 will be replaced by the circuit-breakers 3WE13 2/3WE14 2, 3WE23 2/3WE24 2, 3WE33 2/3WE34 2 and the circuit-breakers 3WE13 5/3WE14 5, 3WE23 5/3WE24 5, 3WE33 5/3WE34 5 will be replaced by the circuit-breakers 3WE13 8/3WE14 8, 3WE23 8/3WE24 8, 3WE33 8/3WE34 8.

For the differences see above.

1) Circuit-breakers with z- or n-releases adjustable from 900 A to 1800 A have a 1 s current of 10 kA.
2) Values in brackets are valid for 4-pole designs.

3WE circuit-breakers, rated current 630 A to 4000 A

Technical data

Conductor cross section

Size	I	II	III
Type	3WE13 3WE14	3WE43 3WE44	3WE63 —
3-pole	3WE23 3WE24	3WE53 3WE54	3WE73 —
4-pole	3WE33 3WE34	—	3WE83 —
			3WE83 with fan

Main conductors

Maximum permissible busbar width	mm	40	60	120
Connection screws	M 12	M 12	M 12	
Recommended torque with screws having a minimum strength of 8.8 (according to DIN)	Nm	21	21	21

Minimum cross section for rated current¹⁾

Multi-stranded conductor with cable shoes										
Copper	mm ²	2 × 150	2 × 185	2 × 300	not directly connectable					
Aluminium	mm ²	2 × 185	2 × 300	3 × 240						
Busbars										
Copper:	plain	mm	2 × (30 × 5)	2 × (40 × 5)	2 × (30 × 10)	2 × (40 × 10)	2 × (60 × 10)	2 × (80 × 10)	2 × (120 × 10)	3 × (100 × 10)
	painted	mm	2 × (30 × 5)	1 × (40 × 10)	2 × (30 × 10)	2 × (40 × 10)	2 × (50 × 10)	2 × (80 × 10)	2 × (100 × 10)	2 × (120 × 10)
Aluminium:	plain	mm	2 × (40 × 5)	2 × (30 × 10)	2 × (40 × 10)	2 × (60 × 10)	3 × (50 × 10)	2 × (100 × 10)	2 × (120 × 15)	3 × (120 × 10)
	painted	mm	2 × (40 × 5)	2 × (30 × 10)	2 × (40 × 10)	2 × (50 × 10)	2 × (60 × 10)	2 × (100 × 10)	2 × (120 × 10)	2 × (120 × 15)

Auxiliary conductors (Copper)

Connection screws	M 4	M 4	M 4
Recommended torque	Nm	12	12
Max. number of leads × (cross-section) solid	mm ²	2 × (1 to 2.5)	2 × (1 to 2.5)
fine-stranded with end sleeves	mm ²	2 × (0.75 to 1.5)	2 × (0.75 to 1.5)

Protective conductors

Connection screws	M 10	M 12	M 12
Minimum cross-section			
Multi-stranded conductor with cable shoes ²⁾			
Copper	mm ²	185	300
Aluminium	mm ²	300	2 × 240
Busbars ²⁾			
Copper	mm	30 × 5	30 × 10
Aluminium	mm	50 × 5	40 × 10

NOTE: The stated values are the minimum cross-sections for the breakers full rated current. These cross-sections must also be adhered to, even when the breakers full rated current is lowered to compensate for higher ambient temperatures.

2) Depending upon the usage requirements a smaller cross section can be used.

Technical data

Operating mechanisms

		Size	I	II	III
		Type	3WE1, 3WE2, 3WE3	3WE4, 3WE5 3WE6	3WE7, 3WE8
Manual operating mechanisms	Torque for operating:				
	Front operating mechanism without high speed closing feature, vertical-throw handle mechanism, rear operating mechanism, linkage lever operating mechanism. Nm		30 (40) ¹⁾	70 (80) ¹⁾ 80	150
Motor operating mechanism	Front operating mechanism with high-speed closing feature. Nm		55	95 -	-
	Rated operating voltage U_c	V d.c. V a.c.	24, 60, 110, 220 110/125, 220/240, 40 to 60 Hz for voltages above 240 V a transformer has to be used (for special transformers see page 3/41)	60, 110, 220 110/125, 220/240, 40 to 60 Hz	
Motorized stored-energy operating mechanism	Permissible voltage tolerance		0.85 to 1.1 U_c	0.85 to 1.1 U_c	
	Rated power consumption (short time) a.c./d.c.	VA/W	1800	7000	
Motorized stored-energy operating mechanism	Short-circuit protection				
	Smallest permissible fuse / miniature circuit-breaker with G-characteristics	24 V d.c. 60 V d.c. 110 V d.c. 220 V d.c. 110 V a.c. 220 V a.c.	16 A time-lag / 8 A 10 A time-lag / 4 A 6 A time-lag / 3 A 4 A time-lag / 2 A 6 A time-lag / 6 A 4 A quick-response / 2 A	- 25 A time-lag / 16 A 16 A time-lag / 10 A 6 A time-lag / 10 A 16 A time-lag / 16 A 10 A quick-response / 10 A	
Motorized stored-energy operating mechanism	Minimum command time at U_c				
	without contactor control	s	0.5	0.5	
Motorized stored-energy operating mechanism	with contactor control	s	approx. 0.05	approx. 0.05	
	Total closing time at U_c	s	0.5	0.5	
Motorized stored-energy operating mechanism	Running down time of the motor	s	approx. 20	approx. 60	
	After the circuit-breaker has been closed by the motor, a repeated closing action can only be successful when the motor has come to a complete standstill. ²⁾				
Motorized stored-energy operating mechanism	Rated operating voltage U_c	V d.c. V a.c.	48, 60, 110, 220 110/125, 220/240, 40 to 60 Hz	48, 60, 110, 220 110/125, 220/240, 40 to 60 Hz	
	A normal control transformer has to be used for voltages exceeding 240 V (see "Accessories" page 3/41). The special transformers for motor operating mechanisms are not suitable.				
Motorized stored-energy operating mechanism	Permissible voltage tolerance		0.85 to 1.1 U_c	0.85 to 1.1 U_c	
	Rated power consumption				
Motorized stored-energy operating mechanism	Motor a.c./d.c.	VA/W	300	300	
	Closing magnet a.c./d.c.	VA/W	2400	2400	
Motorized stored-energy operating mechanism	Short-circuit protection				
	Smallest permissible fuse / miniature circuit-breaker with G-characteristics	48 V d.c. 60 V d.c. 110/125 V a.c., 110 V d.c. 220/240 V a.c., 220 V d.c.	Motor 4 A quick-response / 3 A 4 A quick-response / 2 A 2 A quick-response / 1 A 2 A quick-response / 1 A	Closing magnet 10 A quick-response 10 A quick-response 6 A quick-response / 4 A 4 A quick-response / 2 A	
Motorized stored-energy operating mechanism	Charging time of the energy-store (via the motor)	s	6	6	8
	Minimum command time at U_c				
Motorized stored-energy operating mechanism	For charging the energy-store via the motor with contactor control	s	approx. 0.05	approx. 0.05	approx. 0.05
	For closing the circuit-breaker via the closing magnet				
Motorized stored-energy operating mechanism	a) without contactor control	s	>0.03	>0.03	>0.03
	b) with contactor control	s	approx. 0.05	approx. 0.05	approx. 0.05
Motorized stored-energy operating mechanism	Total closing time at U_c				
	without contactor control	s	<0.03	<0.03	<0.03
Motorized stored-energy operating mechanism	with contactor control	s	<0.08	<0.08	<0.08
	Ready for reclosing after switching-off the circuit-breaker				
Motorized stored-energy operating mechanism	energy-store pre-charged	s	approx. 0.08	approx. 0.08	approx. 0.08
	energy-store to be charged	s	approx. 6	approx. 6	approx. 8

1) The values in brackets refer to the 4-pole version.
2) Refer to Schematic diagram 3/48.

3WE circuit-breakers, rated current 630 to 4000 A

Technical data

Overcurrent releases

If the max. possible short-circuit current at the mounting site is higher than the max. permissible short-circuit load of a circuit-breaker with the z-release then the n-release has to be used in addition to the z-release (i.e. zn- or azn-release).

Max. possible short-circuit current I_k'' at the circuit-breaker mounting site (up to the rated voltage of 500 V a.c.) ¹⁾	Response current / Setting range of the required n-release for circuit-breakers						
	3WE13 1/3WE23 1/3WE33 1 3WE13 5/3WE23 5/3WE33 5 3WE14 1/3WE24 1/3WE34 1 3WE14 5/3WE24 5/3WE34 5	3WE13 2/3WE23 2/3WE33 2 3WE13 8/3WE23 8/3WE33 8 3WE14 2/3WE24 2/3WE34 2 3WE14 8/3WE24 8/3WE34 8	3WE4 and 3WE5	3WE6	3WE7 and 3WE8		
kA	with z-release adjustable from 900 to 1800 A	with all other z-releases	with z-release adjustable from 900 to 1800 A	with all other z-releases	with all z-releases	with all z-releases	with all z-releases
up to 10	The z-release does not require an additional n-release						
above 10 to 25	10 kA ²⁾		10 kA ²⁾				
above 25 to 40		20 kA ²⁾ /3–14 $I_r^{3)}$		20 kA ²⁾ /3–14 $I_r^{3)}$			
above 40 to 45					20 kA ²⁾ /3–14 $I_r^{3)}$		
above 45 to 50			An additional n-release is required (zn-release)		8–24 kA ²⁾ /3–14 $I_r^{3)}$		
above 50 to 60			The circuit-breaker cannot be used				
above 60 to 80						8–24 kA ²⁾ /3–14 $I_r^{3)}$	

Undervoltage and shunt releases

Undervoltage release	without delay (r-release)	Response values	Pick-up	0.8 (Circuit-breaker can be closed) approx. 0.5 U_c (Circuit-breaker is tripped)			
		Permissible voltage tolerance	Drop-off	0.8 to 1.1 U_c			
		Rated power-consumption		Rated operating voltage up to 380 V, 50 Hz 440 V, 60 Hz	220 V d.c.	440 V d.c.	600 V d.c.
			Pick-up Continuous	170 VA 25 VA	220 W 3 W	220 W 12 W	220 W 15 W
	with delay (rc-release)	Response values	Pick-up	$\geq 0.8 U_c$ (Circuit-breaker can be closed) approx. 0.5 U_c (Circuit-breaker is tripped after delay)			
		Permissible voltage tolerance	Drop-off	0.8 to 1.1 U_c			
		Rated power-consumption (from the mains)		Rated operating voltage up to 240 V, 40 to 60 Hz 380 V, 40 to 60 Hz	440 V, 40 to 60 Hz	500 V, 40 to 60 Hz	110 V d.c. 220 V d.c.
			Pick-up Continuous	220 W 5 W	260 W 7 W	280 W 8 W	290 W 8 W

Shunt release	Shunt release (f-release)	Response values	Pick-up	$>0.5 U_c$ (Circuit-breaker trips)	
		Trip winding (c1 to c2)			
		Hold-in winding (c1 to d) (for a.c. current only)	Pick-up Drop-off	$>0.8 U_c$ (Circuit-breaker cannot be closed) approx. 0.5 U_c (Circuit-breaker can be closed)	
		Permissible voltage tolerances		0.5 to 1.1 U_c (short-time)	
		Hold-in-winding (c1 to d) (for a.c. current only)		0.8 to 1.1 U_c	
		Rated power consumption		Rated operating voltages up to 500 V a.c.	up to 220 V d.c.
		Trip winding (c1 to c2)	Pick-up	320 VA	320 W
		Hold-in winding (c1 to d)	Pick-up Continuous	Rated operating voltages up to 380 V a.c.	up to 500 V a.c.
	Protective network release (fc-release)	Capacitor unit Rated connection voltage Rated power consumption (only during the charging period of the capacitors)		220 V, 40 to 60 Hz 10 VA	
		Shunt release Rated power consumption		470 W (Capacitor discharge)	

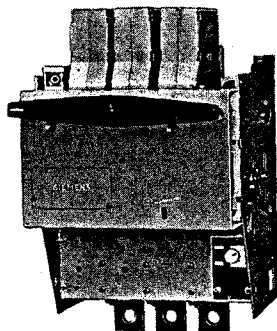
For higher rated voltages the max. permissible short-circuit currents I_k have to be limited to the values shown in "Breaking capacity" (refer to the Technical data).

Mechanical overcurrent release.

3) Electronic overcurrent release.

3WE circuit-breakers, rated current 630 to 3150 A (4000 A)

Selection and ordering data



Permanently installed circuit-breakers, 3-pole

* The circuit-breakers 3WE131, 3WE231, 3WE331 will be replaced by the circuit-breakers 3WE132, 3WE232, 3WE332 in the middle of 1982. For the differences see "Technical data".

Example for ordering:

Circuit-breaker 1600 A, open-type, with motor operating mechanism 220 V/240 V, 40 to 60 Hz
With long-delay overcurrent release 900 A to 1600 A and instantaneous electromagnetic overcurrent release 14000 A
With shunt release 220 V, 50 Hz, with 2 auxiliary contact blocks (4NO + 2NC)

Express supply program

Circuit-breakers with Order No. and Order No. suffixes marked with a § can be supplied in small quantities with a short delivery time.
Permanently installed: 2 weeks (ex-works)
Withdrawable: 4 weeks (ex-works)

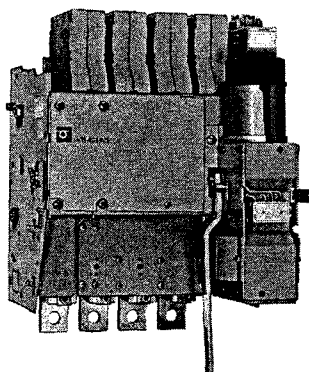
Order No. 3WE53 11-3
1st Order No. suffix DH ..
2nd Order No. suffix 41
When ordering state: 3WE53 11-3DH41

		Open-type, degree of protection IP 00, with operating mechanism, without releases					
		Order No. (Order No. suffixes from pages 3/28 to 3/31 required)		Weight approx. kg		Order No. (Order No. suffixes from pages 3/28 to 3/31 required)	
		Weight approx. kg		Order No. (Order No. suffixes from pages 3/28 to 3/31 required)		Weight approx. kg	
Size I	Rated current	630 A		800 A		1000 A	
Circuit-breaker with: Vertical-throw handle mechanism	Front operating mechanism with high-speed closing feature ⁵⁾	§ 3WE13 24-1....	3WE13 14-1....	22	§ 3WE23 24-1....	3WE23 14-1....	22
	Front operating mechanism without high speed closing feature ⁵⁾	3WE13 26-2....	3WE13 16-2....	30	3WE23 26-2....	3WE23 16-2....	30
	Rear operating mechanism, without handle ³⁾	§ 3WE13 26-8....	3WE13 16-8....	29	§ 3WE23 26-8....	3WE23 16-8....	29
	Linkage lever operating mechanism ³⁾	3WE13 20-4....	3WE13 10-4....	24.4	3WE23 20-4....	3WE23 10-4....	24.4
	Motor operating mechanism ¹⁾²⁾	§ 3WE13 20-6....	3WE13 10-6....	22.2	§ 3WE23 20-6....	3WE23 10-6....	22.2
	110/125 V, 40 to 60 Hz or 110 V d.c.	3WE13 21-2....	3WE13 11-2....	26.5	3WE23 21-2....	3WE23 11-2....	26.5
	220/240 V, 40 to 60 Hz or 220 V d.c.	§ 3WE13 21-3....	3WE13 11-3....	26.5	§ 3WE23 21-3....	3WE23 11-3....	26.5
	24 V d.c.	3WE13 23-0....	3WE13 13-0....	26.5	3WE23 23-0....	3WE23 13-0....	26.5
	60 V d.c.	3WE13 23-2....	3WE13 13-2....	26.5	3WE23 23-2....	3WE23 13-2....	26.5
	Motorized stored-energy operating mechanism ¹⁾²⁾⁴⁾	3WE13 25-2....	3WE13 15-2....	33	3WE23 25-2....	3WE23 15-2....	33
	110/125 V, 40 to 60 Hz	3WE13 25-3....	3WE13 15-3....	33	3WE23 25-3....	3WE23 15-3....	33
	220/240 V, 40 to 60 Hz	3WE13 25-4....	3WE13 15-4....	33	3WE23 25-4....	3WE23 15-4....	33
Size II	Rated current	1250 A		1600 A			
		§ 3WE43 14-1....		61	§ 3WE53 14-1....		65
		3WE43 16-2....		66	3WE53 16-2....		70
		§ 3WE43 16-8....		65	§ 3WE53 16-8....		69
		3WE43 10-4....		66	3WE53 10-4....		70
		§ 3WE43 10-6....		63	§ 3WE53 10-6....		67
		3WE43 11-2....		73	3WE53 11-2....		77
		§ 3WE43 11-3....		73	§ 3WE53 11-3....		77
		3WE43 13-2....		73	3WE53 13-2....		77
		3WE43 15-2....		69	3WE53 15-2....		73
		3WE43 15-3....		69	3WE53 15-3....		73
		3WE43 15-4....		69	3WE53 15-4....		73
Size III	Rated current	2000 A		2500 A		3150 A	
		§ 3WE63 14-1....		70	§ 3WE73 14-1....		93
		3WE63 11-2....		80	3WE73 11-2....		101
		§ 3WE63 11-3....		80	§ 3WE73 11-3....		101
		3WE63 13-2....		80	3WE73 13-2....		101
		3WE63 15-2....		76	3WE73 15-2....		97
		3WE63 15-3....		76	3WE73 15-3....		97
		3WE63 15-4....		76	3WE73 15-4....		97
		3WE63 15-5....		76	3WE73 15-5....		97
		3WE63 15-6....		76	3WE73 15-6....		97
		3WE63 15-7....		76	3WE73 15-7....		97
		3WE63 15-8....		76	3WE73 15-8....		97

Circuit-breakers with forced cooling for rated currents up to 4000 A: "Fan mounting kit" refer to "Modules" (page 3/40), "Fan" refer to "Accessories" (page 3/41). "Thermostat for temperature monitoring" refer to "Special designs" (page 3/32) or "Modules" (page 3/40).

- For the tripping of the circuit-breaker an undervoltage or shunt release is always necessary (refer to the 2nd Order No. suffix on page 3/31).
 - For supply voltages exceeding 240 V, 50/60 Hz a transformer has to be used. For motor operating mechanisms special transformers are available. For motorized stored-energy operating mechanisms, standard transformers are available (refer to "Accessories" on page 3/41). Any other suitably rated transformer can be used.
 - For operating mechanism accessories (e.g. levers, linkages, door operating mechanisms) refer to the Cat. NV21.
- Circuit-breakers with motorized stored-energy operating mechanisms have to be ordered with two auxiliary contact blocks (refer to the 2nd Order No. suffix on page 3/31). For operating mechanisms with a detachable door coupling refer to page 3/43.

Selection and ordering data



Permanently installed circuit-breakers, 4-pole

* The circuit-breakers 3WE14 1, 3WE24 1, 3WE34 1 will be replaced by the circuit-breakers 3WE14 2, 3WE24 2, 3WE34 2 in the middle of 1982. For the differences see "Technical data".

Example for ordering:

Circuit-breaker 1600 A, open-type,
with motor operating mechanism 220 V/240 V, 40 to 60 Hz

Order No. 3WE54 11-3

With long-delay overcurrent release 900 A to 1600 A and
instantaneous electromagnetic overcurrent release 14000 A

1st Order No. suffix -DH..

With shunt release 220 V, 50 Hz, with 2 auxiliary contact blocks (4NO + 2NC)

2nd Order No. suffix -...41

When ordering state: 3WE54 11-3DH41

		Open-type, degree of protection IP 00, with operating mechanism, without releases					
		Order No. (Order No. suffixes from pages 3/28 to 3/31 required)		Weight approx. kg	Order No. (Order No. suffixes from pages 3/28 to 3/31 required)		Weight approx. kg
Size I	Rated current	630 A			800 A		1000 A
Circuit-breaker with: Vertical-throw handle mechanism		3WE14 24-1....	3WE14 14-1....	29.5	3WE24 24-1....	3WE24 14-1....	29.5
Front operating mechanism without high speed closing feature ⁴⁾		3WE14 26-8....	3WE14 16-8....	35.5	3WE24 26-8....	3WE24 16-8....	36.5
Rear operating mechanism, without handle ³⁾		3WE14 20-4....	3WE14 10-4....	32	3WE24 20-4....	3WE24 10-4....	32
Linkage lever operating mechanism ³⁾		3WE14 20-6....	3WE14 10-6....	30	3WE24 20-6....	3WE24 10-6....	30
Motor operating mechanism ^{1) 2)} 110/125 V, 40 to 60 Hz or 110 V d.c.		3WE14 21-2....	3WE14 11-2....	34	3WE24 21-2....	3WE24 11-2....	34
220/240 V, 40 to 60 Hz or 220 V d.c.		3WE14 21-3....	3WE14 11-3....	34	3WE24 21-3....	3WE24 11-3....	34
24 V d.c.		3WE14 23-0....	3WE14 13-0....	34	3WE24 23-0....	3WE24 13-0....	34
60 V d.c.		3WE14 23-2....	3WE14 13-2....	34	3WE24 23-2....	3WE24 13-2....	34
Size II	Rated current	1250 A			1600 A		
Circuit-breaker with: Vertical-throw handle mechanism		3WE44 14-1....		80	3WE54 14-1....		85
Rear operating mechanism, without handle ³⁾		3WE44 10-4....		85	3WE54 10-4....		90
Linkage lever operating mechanism ³⁾		3WE44 10-6....		82	3WE54 10-6....		87
Motor operating mechanism ^{1) 2)} 110/125 V, 40 to 60 Hz or 110 V d.c.		3WE44 11-2....		92	3WE54 11-2....		97
220/240 V, 40 to 60 Hz or 220 V d.c.		3WE44 11-3....		92	3WE54 11-3....		97
60 V d.c.		3WE44 13-2....		92	3WE54 13-2....		97

1) For the tripping of the circuit-breaker an undervoltage or shunt release is always necessary (refer to the 2nd Order No. suffix on page 3/31).

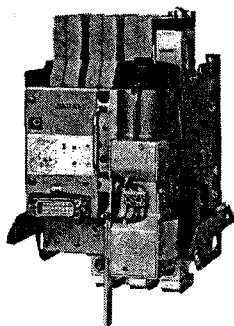
2) For supply voltages exceeding 240 V, 50/60 Hz a special transformer is available. (Refer to "Accessories" on page 3/41).

3) For operating mechanism accessories (e.g. levers, linkages, door operating mechanisms) refer to the Cat. NV 21.

4) For operating mechanisms with a detachable door coupling refer to page 3/43.

3WE circuit-breakers, rated current 630 to 1600 A

Selection and ordering data



Withdrawable circuit-breakers, 3-pole Guide frame without contact engagement spindle

With control lead (1.5 m long) with 25-pole plug⁵⁾
Circuit-breaker with motorized stored-energy operating mechanism with additional 12-pole plug⁵⁾

Example for ordering:

1. Withdrawable circuit-breaker 1600 A, open-type, with motor operating mechanism 220 V/240 V, 40 to 60 Hz
With long-delay overcurrent releases 900 A to 1600 A
and instantaneous overcurrent releases 14 000 A
With shunt release 220 V, 50 Hz, with 2 auxiliary contact blocks (4NO + 2NC)

2. Guide frame
3. Signalling switch for guide frame

§ Express supply program

Circuit-breakers with Order No. and Order No. suffixes marked with a § can be supplied in small quantities with a short delivery time.
Permanently installed: 2 weeks (ex-works)
Withdrawable: 4 weeks (ex-works)

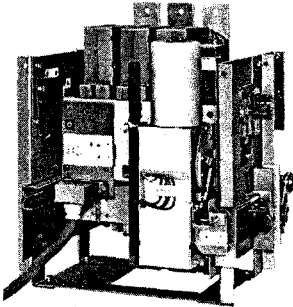
Order No. 3WE53 51-3....
1st Order No. suffix-DH..
2nd Order No. suffix-41
When ordering state: 3WE53 51-3DH41
3WX2 597
3WX2 586

		Open-type, degree of protection IP 00, with operating mechanism, without releases					
		Order No. (Order No. suffixes from pages 3/28 to 3/31 required)	Weight approx. kg	Order No. (Order No. suffixes from pages 3/28 to 3/31 required)	Weight approx. kg	Order No. (Order No. suffixes from pages 3/28 to 3/31 required)	Weight approx. kg
Size I	Rated current	630 A		800 A		1000 A	
Circuit-breaker (withdrawable, without guide frame)							
with: Vertical-throw handle mechanism ⁴⁾		§ 3WE13 54-1....	32.5	§ 3WE23 54-1....	32.5	§ 3WE33 54-1....	32.5
Vertical-throw handle mechanism with door bushing ⁴⁾		3WE13 50-1....	34.5	3WE23 50-1....	34.5	3WE33 50-1....	34.5
Front operating mechanism with high-speed closing feature ⁴⁾		3WE13 56-2....	41	3WE23 56-2....	41	3WE33 56-2....	41
Front operating mechanism without high-speed closing feature ⁴⁾		§ 3WE13 56-8....	40	§ 3WE23 56-8....	40	§ 3WE33 56-8....	40
Motor operating mechanism ¹⁾²⁾							
110/125 V, 40 to 60 Hz or 110 V d.c.		3WE13 51-2....	36	3WE23 51-2....	36	3WE33 51-2....	36
220/240 V, 40 to 60 Hz or 220 V d.c.		§ 3WE13 51-3....	36	§ 3WE23 51-3....	36	§ 3WE33 51-3....	36
24 V d.c.		3WE13 53-0....	36	3WE23 53-0....	36	3WE33 53-0....	36
60 V d.c.		3WE13 53-2....	36	3WE23 53-2....	36	3WE33 53-2....	36
Motorized stored-energy operating mechanism ¹⁾²⁾³⁾							
110/125 V, 40 to 60 Hz		3WE13 55-2....	42.5	3WE23 55-2....	42.5	3WE33 55-2....	42.5
220/240 V, 40 to 60 Hz		3WE13 55-3....	42.5	3WE23 55-3....	42.5	3WE33 55-3....	42.5
220 V d.c.		3WE13 55-4....	42.5	3WE23 55-4....	42.5	3WE33 55-4....	42.5
110 V d.c.		3WE13 55-5....	42.5	3WE23 55-5....	42.5	3WE33 55-5....	42.5
60 V d.c.		3WE13 55-6....	42.5	3WE23 55-6....	42.5	3WE33 55-6....	42.5
48 V d.c.		3WE13 55-7....	42.5	3WE23 55-7....	42.5	3WE33 55-7....	42.5
Guide frame without contact engagement spindle		3WX2 397	19.5	3WX2 397	19.5	3WX2 397	19.5
Signalling switches for guide frame (for connected position 1 NO + 2 NC and for test / disconnected position 1 NO + 1 NC)							
		3WX2 386	0.2	3WX2 386	0.2	3WX2 386	0.2
Size II	Rated current	1250 A		1600 A			
Circuit-breaker (withdrawable, without guide frame)							
ith: Vertical-throw handle mechanism ⁴⁾		§ 3WE43 54-1....	63	§ 3WE53 54-1....	67		
Vertical-throw handle mechanism ⁴⁾ with door bushing		3WE43 50-1....	64	3WE53 50-1....	68		
Front operating mechanism with high-speed closing feature ⁴⁾		3WE43 56-2....	68	3WE53 56-2....	72		
Front operating mechanism without high-speed closing feature ⁴⁾		§ 3WE43 56-8....	67	§ 3WE53 56-8....	71		
Motor operating mechanism ¹⁾²⁾							
110/125 V, 40 to 60 Hz or 110 V d.c.		3WE43 51-2....	75	3WE53 51-2....	79		
220/240 V, 40 to 60 Hz or 220 V d.c.		3WE43 51-3....	75	3WE53 51-3....	79		
60 V d.c.		3WE43 53-2....	75	3WE53 53-2....	79		
Motorized stored-energy operating mechanism ¹⁾²⁾³⁾							
110/125 V, 40 to 60 Hz		3WE43 55-2....	71	3WE53 55-2....	75		
220/240 V, 40 to 60 Hz		3WE43 55-3....	71	3WE53 55-3....	75		
220 V d.c.		3WE43 55-4....	71	3WE53 55-4....	75		
110 V d.c.		3WE43 55-5....	71	3WE53 55-5....	75		
60 V d.c.		3WE43 55-6....	71	3WE53 55-6....	75		
48 V d.c.		3WE43 55-7....	71	3WE53 55-7....	75		
Guide frame without contact engagement spindle		3WX2 597	22	3WX2 597	22		
Signalling switches for guide frame (for connected position 1 NO + 2 NC and for test / disconnected position 1 NO + 1 NC)							
		3WX2 586	0.2	3WX2 586	0.2		

- 1) For the tripping of the circuit-breaker an undervoltage or shunt release is always necessary (refer to the 2nd Order No. suffix on page 3/31).
- 2) For supply voltages exceeding 240 V, 50/60 Hz a transformer has to be used. For motor operating mechanisms special transformers are available. For motorized stored-energy operating mechanisms, standard transformers are available. (Refer to "Accessories" on page 3/41). Any other suitably rated transformer can be used.
- 3) Circuit-breakers with motorized stored-energy operating mechanisms have to be ordered with two auxiliary contact blocks (refer to the 2nd Order No. suffix on page 3/31).
- 4) For the installation in housings only the withdrawable circuit-breakers with motor or motorized stored-energy operating mechanisms should be used.
- 5) Circuit-breaker size III guide frame without contact engagement spindle
Circuit-breaker and guide frame with 16-pole plug
Circuit-breakers with motorized stored-energy operating mechanism without 12-pole plug } see Cat. NS 1E (NS 9)

3WE circuit-breakers, rated current 1250 to 2700 A (4000 A)

Selection and ordering data



Withdrawable circuit-breakers, 3-pole Guide frame with contact engagement spindle

With control lead (1.5 m long) with 25-pole plug
Circuit-breakers with motorized stored-energy operating mechanism with an additional 12 pole plug

For ordering, a similar example is shown on page 3/24.

Express supply program

Circuit-breakers with Order No. and Order No. suffixes marked with a § can be supplied in small quantities with a short delivery time.
Permanently installed: 2 weeks (ex-works)
Withdrawable: 4 weeks (ex-works)

Open-type, degree of protection IP 00, with operating mechanism, without releases					
Size I	Rated current	Order No. (Order No. suffixes from pages 3/28 to 3/31 required)	Weight approx. kg	Order No. (Order No. suffixes from pages 3/28 to 3/31 required)	Weight approx. kg
		630 A		800 A	
		1000 A			
Circuit-breaker (withdrawable, without guide frame)					
with: Vertical-throw handle mechanism ⁴⁾					
		§ 3WE13 84-1....	32.5	§ 3WE23 84-1....	32.5
Front operating mechanism with high-speed closing feature ⁴⁾		3WE13 86-2....	41	3WE23 86-2....	41
Front operating mechanism without high-speed closing feature ⁴⁾		§ 3WE13 86-8....	40	§ 3WE23 86-8....	40
Motor operating mechanism ¹⁾²⁾					
110/125 V, 40 to 60 Hz or 110 V d.c.		3WE13 81-2....	36	3WE23 81-2....	36
220/240 V, 40 to 60 Hz or 220 V d.c.		§ 3WE13 81-3....	36	§ 3WE23 81-3....	36
24 V d.c.		3WE13 83-0....	36	3WE23 83-0....	36
60 V d.c.		3WE13 83-2....	36	3WE23 83-2....	36
Motorized stored-energy operating mechanism ¹⁾²⁾³⁾					
110/125 V, 40 to 60 Hz		3WE13 85-2....	42.5	3WE23 85-2....	42.5
220/240 V, 40 to 60 Hz		3WE13 85-3....	42.5	3WE23 85-3....	42.5
220 V d.c.		3WE13 85-4....	42.5	3WE23 85-4....	42.5
110 V d.c.		3WE13 85-5....	42.5	3WE23 85-5....	42.5
60 V d.c.		3WE13 85-6....	42.5	3WE23 85-6....	42.5
48 V d.c.		3WE13 85-7....	42.5	3WE23 85-7....	42.5
Guide frame with contact engagement spindle ⁶⁾		§ 3WX2 393	19.5	§ 3WX2 393	19.5
Signalling switches for guide frame (for connected position 3 NO + 3 NC and for test / disconnected position 2 NO + 2 NC)		§ 3WX2 394	0.2	§ 3WX2 394	0.2
		1250 A		1600 A	
Circuit-breaker (withdrawable, without guide frame)					
with: Vertical-throw handle mechanism ⁴⁾					
		3WE43 84-1....	63	3WE53 84-1....	67
Front operating mechanism with high-speed closing feature ⁴⁾		3WE43 86-2....	68	3WE53 86-2....	72
Front operating mechanism without high-speed closing feature ⁴⁾		3WE43 86-8....	67	3WE53 86-8....	71
Motor operating mechanism ¹⁾²⁾					
110/125 V, 40 to 60 Hz or 110 V d.c.		3WE43 81-2....	75	3WE53 81-2....	79
220/240 V, 40 to 60 Hz or 220 V d.c.		§ 3WE43 81-3....	75	§ 3WE53 81-3....	79
60 V d.c.		3WE43 83-2....	75	3WE53 83-2....	79
Motorized stored-energy operating mechanism ¹⁾²⁾³⁾					
110/125 V, 40 to 60 Hz		3WE43 85-2....	71	3WE53 85-2....	75
220/240 V, 40 to 60 Hz		3WE43 85-3....	71	3WE53 85-3....	75
220 V d.c.		3WE43 85-4....	71	3WE53 85-4....	75
110 V d.c.		3WE43 85-5....	71	3WE53 85-5....	75
60 V d.c.		3WE43 85-6....	71	3WE53 85-6....	75
48 V d.c.		3WE43 85-7....	71	3WE53 85-7....	75
Guide frame with contact engagement spindle ⁶⁾		§ 3WX2 593	33	§ 3WX2 593	33
Signalling switches for guide frame (for connected position 3 NO + 3 NC and for test / disconnected position 2 NO + 2 NC)		§ 3WX2 394	0.2	§ 3WX2 394	0.2
		1900 A		2500 A	
		2700 A			
Circuit-breaker (withdrawable, without guide frame)					
with: Vertical-throw handle mechanism ⁴⁾					
		§ 3WE63 84-1....	80	§ 3WE73 84-1....	102
Motor operating mechanism ¹⁾²⁾		3WE63 81-2....	90	3WE73 81-2....	110
110/125 V, 40 to 60 Hz or 110 V d.c.		§ 3WE63 81-3....	90	§ 3WE73 81-3....	110
220/240 V, 40 to 60 Hz or 220 V d.c.		3WE63 83-2....	90	3WE73 83-2....	110
60 V d.c.					
Motorized stored-energy operating mechanism ¹⁾²⁾³⁾					
110/125 V, 40 to 60 Hz		3WE63 85-2....	80	3WE73 85-2....	100
220/240 V, 40 to 60 Hz		3WE63 85-3....	80	3WE73 85-3....	100
220 V d.c.		3WE63 85-4....	80	3WE73 85-4....	100
110 V d.c.		3WE63 85-5....	80	3WE73 85-5....	100
60 V d.c.		3WE63 85-6....	80	3WE73 85-6....	100
48 V d.c.		3WE63 85-7....	80	3WE73 85-7....	100
Guide frame with contact engagement spindle ⁶⁾		§ 3WX2 693	38	§ 3WX2 693	38
Signalling switches for guide frame (for connected position 3 NO + 3 NC and for test / disconnected position 2 NO + 2 NC)		§ 3WX2 794	0.2	§ 3WX2 794	0.2

Circuit-breakers with forced cooling for rated currents up to 4000 A: "Fan mounting kit" refer to "Modules" (page 3/40), "Fan" refer to "Accessories" (page 3/41). "Thermostat for temperature monitoring" refer to "Special designs" (page 3/32) or "Modules" (page 3/40).

6) Including crank. Door operating mechanism 8UC42 04 or lever 8UC93 08 for actuation of the mechanical position lock have to be ordered separately. For the other footnotes see page 3/24.

3WE circuit-breakers, rated current 630 A to 1000 A

Selection and ordering data

Withdrawable circuit-breaker, 4-pole Guide frame without contact engagement spindle

With control lead (1.5 m long) with 25-pole plug

Example for ordering:

1. Withdrawable circuit-breaker 1600 A, open-type, with motor operating mechanism 220 V/240 V, 40 to 60 Hz
With long-delay overcurrent releases 900 A to 1600 A and instantaneous overcurrent releases 14000 A
With shunt release 220 V, 50 Hz, with 2 auxiliary contact blocks (4 NO + 2 NC)

Order No. 3WE54 51-3
1st Order No. suffix -DH ..
2nd Order No. suffix -... 41
When ordering state: 3WE54 51-3DH41
3WX2 596
3WX2 586

2. Guide frame
3. Signalling switch for guide frame

		Open-type, degree of protection IP 00, with operating mechanism, without releases					
		Order No. (Order No. suffixes from pages 3/28 to 3/31 required)	Weight approx. kg	Order No. (Order No. suffixes from pages 3/28 to 3/31 required)	Weight approx. kg	Order No. (Order No. suffixes from pages 3/28 to 3/31 required)	Weight approx. kg
Size I	Rated current	630 A		800 A		1000 A	
Circuit-breaker (withdrawable, without guide frame)							
with: Vertical-throw handle mechanism		3WE14 54-1....	29.5	3WE24 54-1....	29.5	3WE34 54-1....	29.5
Front operating mechanism ¹⁾ without high speed closing feature		3WE14 56-8....	36.5	3WE24 56-8....	36.5	3WE34 56-8....	36.5
Motor operating mechanism ^{1) 2)} 110/125 V, 40 to 60 Hz or 110 V d.c.		3WE14 51-2....	34	3WE24 51-2....	34	3WE34 51-2....	34
220/240 V, 40 to 60 Hz or 220 V d.c.		3WE14 51-3....	34	3WE24 51-3....	34	3WE34 51-3....	34
24 V d.c.		3WE14 53-0....	34	3WE24 53-0....	34	3WE34 53-0....	34
60 V d.c.		3WE14 53-2....	34	3WE24 53-2....	34	3WE34 53-2....	34
Guide frame without contact engagement spindle		3WX2 396	22	3WX2 396	22	3WX2 396	22
Signalling switches for guide frame (for connected position 1 NO + 2 NC and for test / disconnected position 1 NO + 1 NC)							
		3WX2 386	0.2	3WX2 386	0.2	3WX2 386	0.2
Size II	Rated current	1250 A		1600 A			
Circuit-breaker (withdrawable, without guide frame)							
with: Vertical-throw handle mechanism		3WE44 54-1....	80	3WE54 54-1....	85		
Motor operating mechanism ^{1) 2)} 110/125 V, 40 to 60 Hz or 110 V d.c.		3WE44 51-2....	92	3WE54 51-2....	97		
220/240 V, 40 to 60 Hz or 220 V d.c.		3WE44 51-3....	92	3WE54 51-3....	97		
60 V d.c.		3WE44 53-2....	92	3WE54 53-2....	97		
Guide frame without contact engagement spindle		3WX2 596	25	3WX2 596	25		
Signalling switches for guide frame (for connected position 1 NO + 2 NC and for test / disconnected position 1 NO + 1 NC)							
		3WX2 586	0.2	3WX2 586	0.2		

¹⁾ For tripping the circuit-breaker an undervoltage release or shunt release must be used (refer to the 2nd Order No. suffix on page 3/31).
or supply voltages exceeding 240 V 50 to 60 Hz a special transformer is available (refer to page 3/41).
or the installation in housings only the withdrawable circuit-breakers with motor or motorized stored-energy operating mechanisms should be used.

Selection and ordering data

**Withdrawable circuit-breaker, 4-pole
Guide frame with contact engagement spindle**

With control lead (1.5 m long) with 25-pole plug

Example for ordering:

1. Withdrawable circuit-breaker 800 A, open-type, with motor operating mechanism 220 V/240 V, 40 to 60 Hz
 With long-delay overcurrent releases 450 A to 800 A and instantaneous overcurrent releases 8000 A
 With shunt release 220 V, 50 Hz, with 2 auxiliary contact blocks (4 NO + 2 NC)

Order No. 3WE24 81-3
 1st Order No. suffixDB . .
 2nd Order No. suffix41
 When ordering state: 3WE24 81-3DB41
 3WX2 392
 3WX2 394

2. Guide frame with contact engagement spindle
 3. Signalling switch for guide frame

		Open-type, degree of protection IP 00, with operating mechanism, without releases					
		Order No. (Order No. suffixes from pages 3/28 to 3/31 required)	Weight approx. kg	Order No. (Order No. suffixes from pages 3/28 to 3/31 required)	Weight approx. kg	Order No. (Order No. suffixes from pages 3/28 to 3/31 required)	Weight approx. kg
Size I	Rated current	630 A		800 A		1000 A	
Circuit-breaker (withdrawable, without guide frame)							
with: Vertical-throw handle mechanism ³⁾		3WE14 84-1....	29.5	3WE24 84-1....	29.5	3WE34 84-1....	29.5
Front operating mechanism ³⁾ without high speed closing feature		3WE14 86-8....	36.5	3WE24 86-8....	36.5	3WE34 86-8....	36.5
Motor operating mechanism ^{1) 2)} 110/125 V, 40 to 60 Hz or 110 V d.c.		3WE14 81-2....	34	3WE24 81-2....	34	3WE34 81-2....	34
220/240 V, 40 to 60 Hz or 220 V d.c.		3WE14 81-3....	34	3WE24 81-3....	34	3WE34 81-3....	34
24 V d.c.		3WE14 83-0....	34	3WE24 83-0....	34	3WE34 83-0....	34
60 V d.c.		3WE14 83-2....	34	3WE24 83-2....	34	3WE34 83-2....	34
Guide frame with contact engagement spindle⁴⁾		3WX2 392	22	3WX2 392	22	3WX2 392	22
Signalling switches for guide frame (for connected position 3 NO + 3 NC and for test / disconnected position 2 NO + 2 NC)							
		3WX2 394	0.2	3WX2 394	0.2	3WX2 394	0.2

1) For tripping the circuit-breaker an undervoltage release or shunt release must be used (refer to the 2nd Order No. suffix on page 3/31).

2) For supply voltages exceeding 240 V 50 to 60 Hz a special transformer is available (refer to "Accessories" on page 3/41).

3) For the installation in housings only the withdrawable circuit-breakers with motor or motorized stored-energy operating mechanisms should be used.

4) Including crank. Door operating mechanism 8UC42 04 or lever 8UC93 08 for actuation of the mechanical position lock have to be ordered separately.

Selection and ordering data

1st Order No. suffix:

Mechanical overcurrent releases¹⁾, for sizes I and II, for 50 Hz

Overcurrent releases

- for other frequencies (an-, az-, azn-releases for 16²/₃ Hz or 60 Hz, n-, z-, zn-releases for 400 Hz)
- with signalling switch "Overcurrent release has tripped"
- with mechanical reclosing lock-out

Refer to "Special designs" on page 3/32

Rated operating current I_n of the circuit-breaker for open installations and ambient temperatures up to +35°C ²⁾	Setting range of the long-delay overcurrent releases (a-releases)	Setting range of the short-delay overcurrent releases (z-releases)	Response current or setting range of instantaneous overcurrent releases (n-releases)	For circuit-breaker types 3WE13 ..-..□□.. 3WE23 ..-..□□.. 3WE33 ..-..□□.. 3WE14 ..-..□□.. 3WE24 ..-..□□.. 3WE34 ..-..□□.. Order No. suffix	3WE43 ..-..□□.. 3WE53 ..-..□□.. 3WE44 ..-..□□.. 3WE54 ..-..□□.. Order No. suffix	3WE13 ..-..□□.. 3WE23 ..-..□□.. 3WE33 ..-..□□.. 3WE14 ..-..□□.. 3WE24 ..-..□□.. 3WE34 ..-..□□.. Order No. suffix	3WE43 ..-..□□.. 3WE53 ..-..□□.. 3WE44 ..-..□□.. 3WE54 ..-..□□.. Order No. suffix	Approx. additional weight kg
A	A	A	A					

Without overcurrent releases, with bridging bars

ΔI_n of the breaker	-	-	-	§ AB	§ AB	-	-	1
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an-releases (long-delay and non-adjustable instantaneous overcurrent releases)

300	160-300	-	2500	DC	-	-	-	3.2
420	240-420	-	3500	DC	-	-	-	3.2
630	350-630	-	5500	DE	DE	-	-	3.2
800	450-800	-	8000	DB ³⁾	DB	-	-	3.2
1000	520-1000	-	8000	DF ⁴⁾	DF	-	-	3.2
1250	700-1250	-	10000	-	DG	-	-	3.2
1600	900-1600	-	14000	-	DH ⁵⁾	-	-	4

an-releases (long-delay and adjustable instantaneous overcurrent releases)

300	160-300	-	900-1800	DQ	-	-	-	3.2
420	240-420	-	1200-2500	DR	-	-	-	3.2
630	350-630	-	1800-3600	DS	DS	-	-	3.2
800	450-800	-	1800-3600	DY ³⁾	DY	-	-	3.2
1000	520-1000	-	3000-6000	DT ⁴⁾	DT	-	-	3.2
1250	700-1250	-	4000-8000	-	DU	-	-	3.2
1600	900-1600	-	6000-12000	-	DV ⁵⁾	-	-	4

n-releases (non-adjustable instantaneous overcurrent releases)

ΔI_n of the breaker	-	-	2500	CC	-	-	-	2.1
			3500	CD	CD	-	-	2.1
			5500	CE	CE	-	-	2.1
			8000	CF	CF	-	-	2.1
			10000	-	CG	-	-	2.1
			14000	-	CH	-	-	4

n-releases (adjustable instantaneous overcurrent releases)

420	-	-	900-1800	CQ	-	-	-	2.1
ΔI_n of the breaker			1200-2500	CR	-	-	-	2.1
			1800-3600	CS	CS	-	-	2.1
			3000-6000	CT	CT	-	-	2.1
			4000-8000	-	CU	-	-	2.1
			6000-12000	-	CV	-	-	4

Short-delay overcurrent (z-)releases with delay using time relay⁶⁾ retarding mechanism

az-releases (long-delay and short-delay overcurrent releases)

300	160-300	900-1800	-	FC	-	FQ	-	3.2
420	240-420	1800-3600	-	FH	-	FR	-	3.2
630	350-630	1800-3600	-	FJ	FJ	FS	FS	3.2
800	450-800	1800-3600	-	FL ³⁾	FL	FY ³⁾	FY	3.2
1000	520-1000	3000-6000	-	FK ⁴⁾	FK	FT	FT	3.2
1250	700-1250	4000-8000	-	-	FM	FU	FU	3.2
1600	900-1600	6000-12000	-	-	FN ⁵⁾	FV ⁵⁾	FV	4

zn-releases (short-delay and non-adjustable instantaneous overcurrent releases)

420	-	900-1800	10000	HC	-	HQ	-	2.1
ΔI_n of the breaker		1800-3600	20000	HD	HD	HR	HR	2.1
		3000-6000	20000	HF	HF	HT	HT	2.1
		4000-8000	20000	-	HG	-	HU	2.1
		6000-12000	20000	-	HH	-	HV	4

azn-releases (long-delay, short-delay and non-adjustable instantaneous overcurrent releases)

300	160-300	900-1800	10000	GB	-	GQ	-	3.2
420	240-420	1800-3600	20000	GC	-	GR	-	3.2
630	350-630	1800-3600	20000	GD	GD	GS	GS	3.2
800	450-800	1800-3600	20000	GE ³⁾	GE	GY ³⁾	GY	3.2
1000	520-1000	3000-6000	20000	GF ⁴⁾	GF	GT ⁴⁾	GT	3.2
1250	700-1250	4000-8000	20000	-	GG	-	GU	3.2
1600	900-1600	6000-12000	20000	-	GM ⁵⁾	-	GV ⁵⁾	4

z-releases (short-delay overcurrent releases)

420	-	900-1800	-	EC	-	EQ	-	2.1
ΔI_n of the breaker		1800-3600	-	ED	ED	ER	ER	2.1
		3000-6000	-	EF	EF	ET	ET	2.1
		4000-8000	-	-	EG	-	EU	2.1
		6000-12000	-	-	EH	-	EV	4

Circuit-breakers with short-delay overcurrent releases can be used as discriminative circuit-breakers

1) When using the circuit-breakers in circuits for individual motors the rush and starting currents should be taken into account, when selecting the overcurrent releases.

2) Rated operating currents for enclosed installation and/or higher ambient temperatures, refer to the "Technical data" on page 3/16.

3) Only for 3WE2 and 3WE3

4) Only for 3WE3

5) Only for 3WE5

6) With the z-release with delay using a time relay, the circuit-breaker has always to be fitted with an under-voltage or shunt release (refer to the 2nd Order No. suffix on page 3/31). The time relay has to be ordered separately.

Selection and ordering data

1st Order No. suffix:

Mechanical overcurrent releases¹⁾, for size III, for 50 Hz

Overcurrent release

- for other frequencies (an-, az-, azn-releases for 16^{2/3} or 60 Hz, n-, z-, zn-releases for 400 Hz)
- with signalling switch "Overcurrent releases has tripped"
- with mechanical reclosing lock-out

Refer to "Special designs" on page 3/32

Rated operating current I_n of the circuit-breaker for open installations and ambient temperatures up to +35°C ²⁾	Setting range of the long-delay overcurrent releases (a-releases)	Setting range of the short-delay overcurrent releases (z-releases)	Setting range of the instantaneous overcurrent releases (n-releases)	For circuit-breaker types 3WE63 ..-.□□.. 3WE73 ..-.□□.. Order No. suffix	Approx. additional weight kg	3WE83 ..-.□□.. Order No. suffix	Approx. additional weight kg
A	A	A	A				

Without overcurrent releases (bridging bars are fitted to the circuit-breaker)

ΔI_n of the circuit breaker	-	-	-	‡ AA	without	‡ AA	without
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an-releases (long-delay and adjustable instantaneous overcurrent releases)³⁾

1600	900-1600	-	3000-12000	DJ	5	-	
1600	900-1600	-	6000-24000	DK	5	-	
2000	1100-2000	-	3000-12000	‡ DL	5	-	
2000	1100-2000	-	6000-24000	‡ DP	5	-	
2500	1400-2500	-	3000-12000	‡ DM ⁴⁾	5	DM	5
2500	1400-2500	-	6000-24000	‡ DN ⁴⁾	5	DN	5
3150	1700-3150	-	3000-12000	-		‡ DW	5
3150	1700-3150	-	6000-24000	-		‡ DX	5
4000	2300-4000	-	6000-24000	-		‡ DA ⁵⁾	5

n-releases (adjustable instantaneous overcurrent releases)

ΔI_n of the circuit-breaker	-	-	3000-12000 6000-24000	CV CX	3 3	CV CX	3 3
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Short-delay overcurrent release (z-release) with delay using a time relay⁶⁾

az-releases (long-delay and short-delay overcurrent releases)^{3) 6)}

1600	900-1600	2000-18000	-	FD	5	-	
2000	1100-2000	2000-18000	-	FE	5	-	
2500	1400-2500	2000-18000	-	FF ⁴⁾	5	FF	5
3150	1700-3150	2000-18000	-	-		FG	5
4000	2300-4000	2000-18000	-	-		FA ⁵⁾	5

zn-releases (short-delay and adjustable instantaneous overcurrent releases)^{3) 6)}

ΔI_n of the circuit-breaker	-	2000-14000	8000-24000	HX	6	HX	6
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azn-releases (long-delay, short-delay and adjustable instantaneous overcurrent releases)^{3) 6)}

1600	900-1600	2000-14000	8000-24000	GH	8	-	
3000	1100-2000	2000-14000	8000-24000	GJ	8	-	
2500	1400-2500	2000-14000	8000-24000	GK ⁴⁾	8	GK	8
3150	1700-3150	2000-14000	8000-24000	-		GL	8
4000	2300-4000	2000-14000	8000-24000	-		GA ⁵⁾	8

z-releases (short-delay overcurrent releases)^{3) 6)}

ΔI_n of the circuit-breaker	-	2000-18000	-	EW	3	EW	3
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Circuit-breakers with short-delay overcurrent releases can be used as discriminative circuit-breakers

1) When using the circuit-breaker in circuits for individual motors the rush and starting currents must be taken into account, when selecting the overcurrent releases.

2) For rated operating currents for enclosed installations and/or higher ambient temperatures (refer to the "Technical data" on page 3/16).

3) The circuit-breaker must always be fitted with an undervoltage or shunt release (refer to the 2nd Order No. suffix on page 3/31).

4) Only for 3WE7

5) Only for 3WE83 with fan.

6) The time relay must be ordered separately.

3WE circuit-breakers, rated current 630 A to 4000 A

Selection and ordering data

1st Order No. suffix:

Electronic overcurrent releases¹⁾, for sizes I to III for 40 to 60 Hz (only with a.c.)

Overcurrent releases

- with signalling switch "Overcurrent release has tripped"

Refer to "Special designs" on page 3/32

(The signalling switch as module for supplementary fitting is detailed on page 3/40 under "Modules".)

Rated operating current I_n of the circuit-breaker for open installations and ambient temperatures up to +35°C ²⁾	Setting range of the long-delay overcurrent releases (a-releases)	Setting range of the short-delay overcurrent releases (z-releases)	Setting range of the instantaneous overcurrent releases (n-releases)	For circuit-breaker types 3WE13 ...-... 3WE23 ...-... 3WE33 ...-... 3WE14 ...-... 3WE24 ...-... 3WE34 ...-...	3WE43 ...-... 3WE53 ...-... 3WE44 ...-... 3WE54 ...-...	3WE63 ...-... 3WE73 ...-... 3WE83 ...-...	Approx. additional weight kg
A	A	I_r Set current of the long-delay release ³⁾		Order No. suffix	Order No. suffix	Order No. suffix	
an-releases (long-delay and instantaneous overcurrent releases)							
630	200–630	–	(3–14) I_r	RE	–	–	2.3
800	200–800	–	–	RF ⁴⁾	–	–	2.3
1000	200–1000	–	–	RG ⁵⁾	–	–	2.3
1250	320–1250	–	(3–14) I_r	–	RH	–	2.8
1600	320–1600	–	–	–	RJ ⁶⁾	–	2.8
2000	800–2000	–	(3–14) I_r	–	–	RK	4.8
2500	800–2500	–	–	–	–	RL ⁷⁾	4.8
3150	800–3150	–	–	–	–	RM ⁸⁾	4.8
4000	800–4000	–	–	–	–	RN ⁹⁾	4.8
az-releases (long-delay and short-delay overcurrent releases)							
630	200–630	(2–8) I_r	–	QE	–	–	2.3
800	200–800	–	–	QF ⁴⁾	–	–	2.3
1000	200–1000	–	–	QG ⁵⁾	–	–	2.3
1250	320–1250	(2–8) I_r	–	–	QH	–	2.8
1600	320–1600	–	–	–	QJ ⁶⁾	–	2.8
2000	800–2000	(2–8) I_r	–	–	–	QK	4.8
2500	800–2500	–	–	–	–	QL ⁷⁾	4.8
3150	800–3150	–	–	–	–	QM ⁸⁾	4.8
4000	800–4000	–	–	–	–	QN ⁹⁾	4.8
azn-releases (long-delay, short-delay and instantaneous overcurrent releases)							
630	200–630	(2–8) I_r	(3–14) I_r	TE	–	–	2.3
800	200–800	–	–	TF ⁴⁾	–	–	2.3
1000	200–1000	–	–	TG ⁵⁾	–	–	2.3
1250	320–1250	(2–8) I_r	(3–14) I_r	–	TH	–	2.8
1600	320–1600	–	–	–	TJ ⁶⁾	–	2.8
2000	800–2000	(2–8) I_r	(3–14) I_r	–	–	TK	4.8
2500	800–2500	–	–	–	–	TL ⁷⁾	4.8
3150	800–3150	–	–	–	–	TM ⁸⁾	4.8
4000	800–4000	–	–	–	–	TN ⁹⁾	4.8
zn-releases (short-delay and instantaneous overcurrent releases)							
Rated operating current I_n of the circuit-breaker for open installations and ambient temperatures up to +35°C ²⁾	Setting range of the "response current basic value"	Setting range of the short-delay releases (z-releases)	Setting range of the instantaneous releases (n-releases)	For circuit-breaker types 3WE13 ...-... 3WE23 ...-... 3WE33 ...-... 3WE14 ...-... 3WE24 ...-... 3WE34 ...-...	3WE43 ...-... 3WE53 ...-... 3WE44 ...-... 3WE54 ...-...	3WE63 ...-... 3WE73 ...-... 3WE83 ...-...	Approx. additional weight kg
A	A	I_r Set value of the "response current basic value" ¹⁰⁾		Order No. suffix	Order No. suffix	Order No. suffix	
630	200–1000	(2–8) I_r	(3–14) I_r	SG	–	–	2.3
800	–	–	–	–	–	–	2.3
1000	–	–	–	–	–	–	2.3
1250	320–1600	(2–8) I_r	(3–14) I_r	–	SJ	–	2.8
1600	–	–	–	–	–	–	2.8
2000	800–3150	(2–8) I_r	(3–14) I_r	–	–	SM	4.8
2500	–	–	–	–	–	–	4.8
3150	–	–	–	–	–	–	4.8
2500	800–4000	(2–8) I_r	(3–14) I_r	–	–	SN ⁷⁾	4.8
3150	–	–	–	–	–	–	4.8
4000	–	–	–	–	–	–	4.8

Circuit-breakers with short-delay overcurrent releases can be used as discriminative circuit-breakers

- When the circuit-breakers are used in circuits for individual motors the rush and starting currents must be taken into account when the overcurrent releases are selected.
- For the rated operating currents in enclosed installations and/or higher ambient temperatures refer to the "Technical data" on page 3/16.
- By multiplying the setting current of the long-delay release (I_r) with the setting factors for the z-release (adjustment knob "4", refer to page 3/8 Fig. 3/13) and the n-release (adjustment knob "6") the response currents of the z- and n-releases can be obtained.
- For 3WE2 and 3WE3 only.
- For 3WE3 only.
- For 3WE5 only.
- For 3WE7 and 3WE8 only.
- For 3WE8 only.
- Only for 3WE83 with fan.
- "Response current basic value" I_r :
The "response current basic value" I_r of the electronic zn-release must be adjusted with the adjustment knob "1" (refer to page 3/8 Fig. 3/13).
By multiplying the "response current basic value" I_r with the setting factors for the z-release (adjustment knob "4") and for the n-release (adjustment knob "6") the response currents of the z- and n-releases can be obtained.

Selection and ordering data

2nd Order No. suffix: Undervoltage or shunt releases, auxiliary switches

Example for ordering:

Circuit-breaker 2500 A, for permanent installation, with vertical-throw handle mechanism
With adjustable instantaneous overcurrent releases 3000 A to 12000 A
Without undervoltage or shunt releases, with 2 auxiliary contact blocks (4 NO + 2 NC)

Order No. 3WE73 14-1
1st Order No. suffix -CV..
2nd Order No. suffix -... 02

When ordering state: 3WE73 14-1CV02

Undervoltage and shunt release		Auxiliary switches		4 NO + 2 NC (2 blocks) ¹⁾	
Type of release	Rated operating voltage and frequency	2 NO + 1 NC (1 block) 3WE...-...□□ Order No. suffix	Approx. additional weight kg	Order No. suffix	Approx. additional weight kg
Without undervoltage or shunt releases	—	‡ 01	none	‡ 02	0.1
With 1 undervoltage release (r-release)	125 V, 50 Hz	10	1	20	1.1
	220/240 V, 50 Hz	‡ 11	1	‡ 21	1.1
	380 V, 50 Hz or 440 V, 60 Hz	‡ 12	1	‡ 22	1.1
	24 V d.c.	14	1	24	1.1
	110 V d.c.	15	1	25	1.1
With 1 undervoltage release with drop-off delay (rc-release) including the capacitor unit for 1 s ⁵⁾	220 V d.c.	‡ 16	1	‡ 26	1.1
	other a.c./d.c. ²⁾ available up to max. 500 V a.c., 600 V d.c. ³⁾	19	1	29	1.1
With 1 shunt release (f-release)	110/125 V, 40 to 60 Hz	61	2.5	62	2.6
	220/240 V, 40 to 60 Hz	‡ 55	2.5	‡ 56	2.6
	380 V, 40 to 60 Hz	‡ 57	2.5	‡ 58	2.6
	440 V, 40 to 60 Hz	50	2.5	60	2.6
	110 V d.c.	51	2.5	52	2.6
	220 V d.c.	53	2.5	54	2.6
With 1 protective network release (fc-release) including the capacitor unit	125 V, 50 Hz	30	1	40	1.1
	220/240 V, 50 Hz	‡ 31	1	‡ 41	1.1
	220 V, 60 Hz	38	1	48	1.1
	380 V, 50 Hz or 440 V, 60 Hz	‡ 32	1	‡ 42	1.1
	24 V d.c.	‡ 34	1	‡ 44	1.1
	60 V d.c.	37	1	47	1.1
	110 V d.c.	‡ 35	1	‡ 45	1.1
	220 V d.c.	‡ 36	1	‡ 46	1.1
	other a.c./d.c. ²⁾ available up to max. 500 V a.c., 220 V d.c.	39	1	49	1.1
With 1 undervoltage and 1 shunt release (rf-release) ● Undervoltage and shunt release for the same rated operating voltage and, where applicable, the same frequency:	220/240 V, 50 Hz	—		81	2.2
	380 V, 50 Hz or 440 V, 60 Hz	—		82	2.2
	24 V d.c.	—		84	2.2
	110 V d.c.	—		85	2.2
	220 V d.c.	—		86	2.2
	other a.c./d.c. ²⁾ available up to max. 500 V a.c., 220 V d.c.	—		89	2.2
With 1 undervoltage release with delay and 1 shunt release (rcf-release) ● Undervoltage release with drop-off delay and shunt release for the same and different rated operating voltages and, where applicable, frequencies:					
With 2 shunt releases (ff-releases) ● Both shunt releases for the same rated operating voltage and, where applicable, the same frequency:	220/240 V, 50 Hz	—		71	2.2
	380 V, 50 Hz or 440 V, 60 Hz	—		72	2.2
The shunt releases for different rated operating voltages and, where applicable, different frequencies:	24 V d.c.	—		74	2.2
	110 V d.c.	—		75	2.2
	220 V d.c.	—		76	2.2
	other a.c./d.c. ²⁾ available up to max. 500 V a.c., 220 V d.c.	—		79	2.2

For the undervoltage release: Use 2nd Order No. suffix as for "with 1 undervoltage release"

For the shunt release: Use the order code from "Special designs" on page 3/32

For the undervoltage release with delay including the capacitor unit for 1 s⁵⁾: Use the 2nd Order No. suffix as for "with 1 undervoltage release with delay"

For the shunt release: Use the order code from "Special designs" on page 3/32

For the 1st shunt release: Use the 2nd Order No. suffix as for "with 1 shunt release"

For the 2nd shunt release: Use the order code from "Special designs" on page 3/32

- 1) For contact arrangements 3 NO + 3 NC or 2 NO + 4 NC (i.e. 2nd auxiliary contact block 1 NO + 2 NC or 3 NC) refer to "Special designs" on page 3/32.
- 2) Additionally specify the required voltage and frequency (available for frequencies between 40 and 60 Hz). Note: The 25-pole plug can be used only up to 380 V a.c./440 V d.c.
- 3) For voltages exceeding 250 V d.c. a series resistor is required: for 440 V d.c. 15 kΩ, 13 W series resistor, for 600 V d.c. 22 kΩ, 13 W series resistor (for other voltages please enquire). The resistor has to be obtained by the customer.
- 4) Only size III: when using the undervoltage release in conjunction with the mechanical long-delay release only up to 220 V d.c.
- 5) For supplementary unit for extending the delay time to 2 s or 3 s refer to page 3/39.

3WE circuit-breakers, rated current 630 to 4000 A

Selection and ordering data

Special designs of the circuit-breakers

Additional ordering data: "-Z" with order code or plain text (If more order codes are used the sequence is irrelevant)

Example for ordering:

Withdrawable circuit-breaker 1600 A, open type, with motor operating mechanism 220 V/240 V, 40 to 60 Hz
 With mechanical long-delay overcurrent releases a = 900 A to 1600 A and instantaneous overcurrent releases n = 14000 A
 With shunt release 220 V, 50 Hz, with 2 auxiliary contact blocks (4 NO + 2 NC)
 Special designs:
 With mechanical reclosing lock-out fitted to the instantaneous overcurrent releases (n)
 Overcurrent release calibrated for 60 Hz

Order No. 3WE53 51-3
 1st Order No. suffix-DH..
 2nd Order No. suffix-41
 Identification code-Z
 Order code W10
 Order code F60
 When ordering state: 3WE53 51-3DH41-Z
 W10 + F60

Special design	For circuit-breaker sizes	Order code and/or plain text 3WE...-Z □□□ Permanently installed	Withdrawable
Mechanical reclosing lock-out with mechanical reclosing lock-out fitted to the mechanical instantaneous overcurrent release (n-release; also within an-releases) with mechanical reclosing lock-out fitted to the mechanical short-delay overcurrent release with retarding mechanism (z-releases; also within az-releases) ¹⁾ with mechanical reclosing lock-out fitted to the mechanical short-delay overcurrent release with retarding mechanism and also to the instantaneous overcurrent release (n-release; also within azn-releases) ¹⁾ with mechanical reclosing lock-out fitted to the instantaneous part of the "short-delay overcurrent release with delay via a time relay and instantaneous overcurrent release" (azn- and zn-releases) ¹⁾	I, II and III I and II I and II I, II and III	W10 W11 W12 W13	W10 W11 W12 W13
Signalling switches with signalling switch "Overcurrent release has tripped" fitted to the mechanical an-, az-, azn-, zn-, z-, n-, release with signalling switch "Overcurrent release has tripped" fitted to the mechanical n-release with signalling switch "Overcurrent release has tripped" fitted to the electronic a-, z-, and n-release	I and II III I, II and III	M10 M11 M30	M20 M21 M31
Auxiliary switches with 2nd auxiliary block 1NO + 2NC (i.e. total auxiliary contacts 3NO + 3NC) with 2nd auxiliary block 3NC (i.e. total auxiliary contacts 2NO + 4NC) with leading auxiliary switch on the front operating mechanism (1NO + 1NC) with lagging auxiliary switch on the front operating mechanism (1NO + 1NC) ³⁾ with wiring for fault indication via the lagging auxiliary switch on the front operating mechanism (Refer to Schematic diagram 3/40) with lagging auxiliary switch on the vertical throw-handle operating mechanism 1NO + 1NC 2NO + 1 NC with wiring for fault indication via the auxiliary switch on the vertical-throw handle operating mechanism. (Refer to Schematic diagram 3/42)	I, II and III I, II and III I and II I and II I and II I, II and III I, II and III	H10 H20 H12 H13 - H16 H18 -	H10 H20 H12 H13 H15 H16 - H17
Overcurrent releases with mechanical an-, az-, azn-releases calibrated for 16 ² /3 Hz calibrated for 60 Hz with mechanical n-, z-, and zn-, releases calibrated for 400 Hz (for available ranges please enquire)	I, II and III I, II and III I, II and III	F61 F60 F64	F61 F60 F64
Circuit-breaker 3WE83 with fan for circuit-breaker 3WE83 with fan: temperature monitoring thermostats	III, 3WE83	T10	T20
d release when rf-, rcf- or ff-releases have to be supplied for different rated operating voltages and, if applicable, frequencies, for the first and second release 2nd release (f-) rated operating voltage and frequency: 125 V, 50 Hz 220/240 V, 50 Hz 220 V, 60 Hz 380 V, 50 Hz or 440 V, 60 Hz 24 V d.c. 60 V d.c. 110 V d.c. 220 V d.c. other a.c./d.c., ⁴⁾ available up to 500 V a.c., 220 V d.c.	I, II and III	F10 F11 F12 F13 F15 F16 F17 F18 Y01	F10 F11 F12 F13 F15 F16 F17 F18 Y01
Motorized stored-energy operating mechanism when motorized stored-energy operating mechanisms have to be supplied for different rated operating voltages and, where applicable, frequencies, for the drive motors and the closing magnets <ul style="list-style-type: none"> Drive motor rated operating voltage and, where applicable, frequency, is coded in the Order No. (e.g. 3WE13 25-2...-Z for 220 V, 50 Hz) Closing magnet: Supplement the Order No. with "-Z" and add the order code from the following table (e.g. 3WE13 25-2...-Z A13) Closing magnet rated operating voltage: 110/125 V, 40 to 60 Hz 220/240 V, 40 to 60 Hz 48 V d.c. 60 V d.c. 110 V d.c. 220 V d.c.	I, II and III	A12 A13 A17 A16 A15 A14	A12 A13 A17 A16 A15 A14

For the short-delayed part of the overcurrent releases the lock-out can be achieved electrically.
 Only for the z-releases with a delay by a retarding mechanism.
 3) With withdrawable circuit-breaker only one NO contact is usable.
 4) State the voltages and/or frequencies required in addition to the order code.

Selection and ordering data

Modules (Refer also to page 3/14 "Modular system")

The basic circuit-breaker (without operating mechanisms) can be fitted with the following:

Operating mechanisms for circuit-breakers

Bridging bars for sizes I and II

(required only when no overcurrent releases are to be fitted)

Overcurrent releases for sizes I and II

for size III

see below

see below

refer to pages 3/34,
3/35, 3/37

refer to pages 3/36,
3/37

Undervoltage and/or shunt release

Mounting parts for undervoltage and shunt releases

Second auxiliary switch block

Auxiliary switch for the operating mechanism

"Overcurrent release has tripped" signalling switch for the mechanical n-releases (only for size III)

Mechanical reclosing lock-out (only for size III)

refer to page 3/39

refer to page 3/39

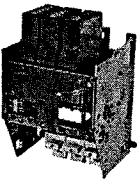
refer to page 3/40

refer to page 3/40







refer to page 3/40

refer to page 3/40


Basic circuit-breaker for permanent installation¹⁾

	Size	Rated current △ Continuous current I_n A	Basic circuit-breaker (without operating mechanism) with auxiliary switch block 2NO + 1NC, 3 arc chutes, sizes I and II without bridging bars	
			Order No.	Weight approx. kg
	I	630	3WE13 20-0AA01	21.6
		800	3WE23 20-0AA01	21.6
		1000	3WE33 20-0AA01	21.6
	II	1250	3WE43 20-0AA01	60.5
		1600	3WE53 20-0AA01	64.5
	III	2000	3WE63 20-0AA01	69
		2500	3WE73 20-0AA01	92
		3150	3WE83 20-0AA01	102

Operating mechanisms for basic circuit-breakers

	Size	I		II		III	
		Order No.	Weight approx. kg	Order No.	Weight approx. kg	Order No.	Weight approx. kg
	Vertical-throw handle mechanism	3WX2 301	0.4	3WX2 501	0.5	3WX2 701	0.5
	Front operating mechanism with high-speed closing feature, with handle	3WX2 332	4.7	3WX2 532	5.5	—	—
	Front operating mechanism without high-speed closing feature, with handle	3WX2 308	3.7	3WX2 508	4.5	—	—
	Rear operating mechanism ²⁾	3WX2 504	3	3WX2 504	3	—	—
	Linkage lever operating mechanism ²⁾	3WX2 306	0.6	3WX2 506	0.6	—	—
	Motor operating mechanism ³⁾ 110/125 V, 40 to 60 Hz, 110 V d.c. 220/240 V, 40 to 60 Hz, 220 V d.c.	3WX2 312	5	3WX2 512	13	3WX2 712	13
		3WX2 313	5	3WX2 513	13	3WX2 713	13
		3WX2 320	5	—	—	—	—
		3WX2 322	5	3WX2 522	13	3WX2 722	13

Bridging bars for the basic circuit-breakers used without an overcurrent release

	1 set (3 items) required for the circuit-breaker used without overcurrent release	3WX2 364	0.8	3WX2 464	0.95	not required
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1) Withdrawable circuit-breakers are not available in modular construction.

2) Accessories for the operating mechanisms (e.g. handles, levers, door operating mechanisms), refer to Cat. NV 21.

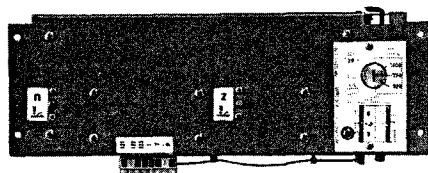
3) For the tripping of the circuit-breaker an undervoltage or shunt release is always required, see page 3/39.

3WE circuit-breakers, rated current 630 to 1600 A

Selection and ordering data

Modules

Mechanical overcurrent releases ¹⁾ for sizes I and II, for 50 Hz, including bridging bars



Overcurrent releases

- for other frequencies
(an-, az-, azn-releases for 16²/₃ or 60 Hz, n-, z-, zn-releases for 400 Hz)
- with signalling switch "Overcurrent release has tripped"
- with mechanical reclosing lockout

Refer to
"Special designs"
on page 3/38

Rated operating current I_n of the circuit-breaker for open installations and ambient temperatures up to +35°C ²⁾ A	Setting range of the long-delay overcurrent releases (a-releases) A	Setting range of the short-delay overcurrent releases (z-releases) A	Response current or setting range of the instantaneous overcurrent releases (n-releases) A	For circuit-breaker types 3WE1 630 A 3WE2 800 A 3WE3 1000 A Order No.	3WE4 1250 A 3WE5 1600 A Order No.	Weight approx. kg
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an-releases (long-delay and non-adjustable instantaneous overcurrent releases)

300	160-300	-	2500	3WX2 350-0DC00	-	3.2
420	240-420	-	3500	3WX2 350-0DD00	-	3.2
630	350-630	-	5500	3WX2 350-0DE00	3WX2 550-0DE00	3.2
800	450-800	-	8000	3WX2 350-0DB00 ³⁾	3WX2 550-0DB00	3.2
1000	520-1000	-	8000	3WX2 350-0DF00 ⁴⁾	3WX2 550-0DF00	3.2
1250	700-1250	-	10000	-	3WX2 550-0DG00	3.2
1600	900-1600	-	14000	-	3WX2 550-0DH00 ⁵⁾	4

an-releases (long-delay and adjustable instantaneous overcurrent releases)

300	160-300	-	900-1800	3WX2 350-0DQ00	-	3.2
420	240-420	-	1200-2500	3WX2 350-0DR00	-	3.2
630	350-630	-	1800-3600	3WX2 350-0DS00	3WX2 550-0DS00	3.2
800	450-800	-	1800-3600	3WX2 350-0DY00 ³⁾	3WX2 550-0DY00	3.2
1000	520-1000	-	3000-6000	3WX2 350-0DT00 ⁴⁾	3WX2 550-0DT00	3.2
1250	700-1250	-	4000-8000	-	3WX2 550-0DU00	3.2
1600	900-1600	-	6000-12000	-	3WX2 550-0DV00 ⁵⁾	4

n-releases (non-adjustable instantaneous overcurrent releases)

ΔI_n of the circuit-breaker	-	-	2500	3WX2 350-0CC00	-	2.1
	-	-	3500	3WX2 350-0CD00	3WX2 550-0CD00	2.1
	-	-	5500	3WX2 350-0CE00	3WX2 550-0CE00	2.1
	-	-	8000	3WX2 350-0CF00	3WX2 550-0CF00	2.1
	-	-	10000	-	3WX2 550-0CG00	2.1
	-	-	14000	-	3WX2 550-0CH00	4

n-releases (adjustable instantaneous overcurrent releases)

420	-	-	900-1800	3WX2 350-0CQ00	-	2.1
ΔI_n of the circuit-breaker	-	-	1200-2500	3WX2 350-0CR00	-	2.1
	-	-	1800-3600	3WX2 350-0CS00	3WX2 550-0CS00	2.1
	-	-	3000-6000	3WX2 350-0CT00	3WX2 550-0CT00	2.1
	-	-	4000-8000	-	3WX2 550-0CU00	2.1
	-	-	6000-12000	-	3WX2 550-0CV00	4

Short-delay overcurrent (z-) releases with delay using a time relay⁶⁾

az-releases (long-delay and short-delay overcurrent releases)⁶⁾

300	160-300	900-1800	-	3WX2 350-0FC00	-	3.2
420	240-420	1800-3600	-	3WX2 350-0FH00	-	3.2
630	350-630	1800-3600	-	3WX2 350-0FJ00	3WX2 550-0FJ00	3.2
800	450-800	1800-3600	-	3WX2 350-0FL00 ³⁾	3WX2 550-0FL00	3.2
1000	520-1000	3000-6000	-	3WX2 350-0FK00 ⁴⁾	3WX2 550-0FK00	3.2
1250	700-1250	4000-8000	-	-	3WX2 550-0FM00	3.2
1600	900-1600	6000-12000	-	-	3WX2 550-0FN00 ⁵⁾	4

zn-releases (short-delay and non-adjustable instantaneous overcurrent releases)⁶⁾

420	-	900-1800	10000	3WX2 350-0HC00	-	2.1
ΔI_n of the circuit-breaker	-	1800-3600	20000	3WX2 350-0HD00	3WX2 550-0HD00	2.1
	-	3000-6000	20000	3WX2 350-0HF00	3WX2 550-0HF00	2.1
	-	4000-8000	20000	-	3WX2 550-0HG00	2.1
	-	6000-12000	20000	-	3WX2 550-0HH00	4

azn-releases (long-delay, short-delay and non-adjustable instantaneous overcurrent releases)⁶⁾

300	160-300	900-1800	10000	3WX2 350-0GB00	-	3.2
420	240-420	1800-3600	20000	3WX2 350-0GC00	-	3.2
630	350-630	1800-3600	20000	3WX2 350-0GD00	3WX2 550-0GD00	3.2
800	450-800	1800-3600	20000	3WX2 350-0GE00 ³⁾	3WX2 550-0GE00	3.2
1000	520-1000	3000-6000	20000	3WX2 350-0GF00 ⁴⁾	3WX2 550-0GF00	3.2
1250	700-1250	4000-8000	20000	-	3WX2 550-0GG00	3.2
1600	900-1600	6000-12000	20000	-	3WX2 550-0GM00 ⁵⁾	4

z-releases (short-delay overcurrent releases)⁶⁾

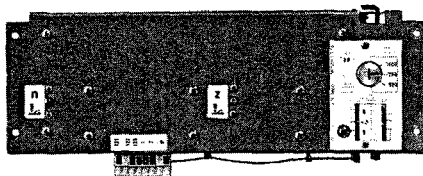
420	-	900-1800	-	3WX2 350-0EC00	-	2.1
ΔI_n of the circuit-breaker	-	1800-3600	-	3WX2 350-0ED00	3WX2 550-0ED00	2.1
	-	3000-6000	-	3WX2 350-0EF00	3WX2 550-0EF00	2.1
	-	4000-8000	-	-	3WX2 550-0EG00	2.1
	-	6000-12000	-	-	3WX2 550-0EH00	4

Circuit-breakers with short-delay overcurrent releases can be used as discriminative circuit-breakers

- 1) When using the circuit-breakers in circuits for individual motors the rush and starting currents should be taken into account when selecting the overcurrent releases.
- 2) Rated operating currents for enclosed installations and/or higher ambient temperatures refer to "Technical data" on page 3/16.
- 3) Only for 3WE2 and 3WE3
- 4) Only for 3WE3
- 5) Only for 3WE5
- 6) The time relay has to be ordered separately.

Selection and ordering data

Modules

Mechanical overcurrent releases ¹⁾ for sizes I and II, for 50 Hz, including bridging bars

Overcurrent releases

- for other frequencies
(an-, az-, azn-releases for 16²/3 or 60 Hz, n-, z-, zn-releases for 400 Hz)
- with signalling switch "Overcurrent release has tripped"
- with mechanical reclose lock-out

Refer to
"Special designs"
on page 3/38

Rated operating current I_n of the circuit-breaker for open installations and ambient temperatures up to +35°C ²⁾ A	Setting range of the long-delay overcurrent releases (a-releases) A	Setting range of the short-delay overcurrent releases (z-releases) A	Response current of the instantaneous overcurrent releases (n-releases) A	For circuit-breaker types 3WE1 630 A 3WE2 800 A 3WE3 1000 A Order No.	3WE4 1250 A 3WE5 1600 A Order No.	Weight approx. kg
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Short-delay overcurrent (z-) releases with delay using a retarding mechanism

az-releases (long-delay and short-delay overcurrent releases)

300	160–300	900–1800	–	3WX2 350–0FQ00	–	3.2
420	240–420	1800–3600	–	–0FR00	–	3.2
630	350–630	1800–3600	–	–0FS00	3WX2 550–0FS00	3.2
800	450–800	1800–3600	–	–0FY00 ³⁾	–0FY00	3.2
1000	520–1000	3000–6000	–	3WX2 350–0FT00 ⁴⁾	3WX2 550–0FT00	3.2
1250	700–1250	4000–8000	–	–	–0FU00	3.2
1600	900–1600	6000–12000	–	–	–0FV00 ⁵⁾	4

zn-releases (short-delay and non-adjustable instantaneous overcurrent releases)

420	–	900–1800	10000	3WX2 350–0HQ00	–	2.1
ΔI_n of the circuit-breaker	–	1800–3600	20000	3WX2 350–0HR00	3WX2 550–0HR00	2.1
		3000–6000	20000	–0HT00	–0HT00	2.1
		4000–8000	20000	–	–0HU00	2.1
		6000–12000	20000	–	–0HV00	4

azn-releases (long-delay, short-delay and non-adjustable instantaneous overcurrent releases)

300	160–300	900–1800	10000	3WX2 350–0GQ00	–	3.2
420	240–420	1800–3600	20000	–0GR00	–	3.2
630	350–630	1800–3600	20000	–0GS00	3WX2 550–0GS00	3.2
800	450–800	1800–3600	20000	–0GY00 ³⁾	–0GY00	3.2
1000	520–1000	3000–6000	20000	3WX2 350–0GT00 ⁴⁾	3WX2 550–0GT00	3.2
1250	700–1250	4000–8000	20000	–	–0GU00	3.2
1600	900–1600	6000–12000	20000	–	–0GV00 ⁵⁾	4

z-releases (short-delay overcurrent releases)

420	–	900–1800	–	3WX2 350–0EQ00	–	2.1
ΔI_n of the circuit-breaker	–	1800–3600	–	3WX2 350–0ER00	3WX2 550–0ER00	2.1
		3000–6000	–	–0ET00	–0ET00	2.1
		4000–8000	–	–	–0EU00	2.1
		6000–12000	–	–	–0EV00	4

Circuit-breakers with short-delay overcurrent releases can be used as discriminative circuit-breakers

- 1) When using the circuit-breakers in circuits for individual motors the rush and starting currents have to be taken into account when selecting the overcurrent releases.
- 2) For rated operating currents in enclosed installations and/or higher ambient temperatures refer to "Technical data" on page 3/16.
- 3) Only for 3WE2 and 3WE3
- 4) Only for 3WE3
- 5) Only for 3WE5

3WE circuit-breakers, rated current 2000 to 4000 A

Selection and ordering data

Modules

Mechanical overcurrent releases¹⁾ for size III, for 50 Hz

Overcurrent releases

- for other frequencies: Refer to "Special designs" on page 3/38.
(an-, az-, azn-releases for 16²/₃ or 60 Hz. n-, z-, zn-releases for 400 Hz)
- Signalling switch "Overcurrent release has tripped" } These are available as modules for subsequent installation: Refer to "Modules" on page 3/40.
- Mechanical reclosing lock-out

Rated operating current I_n of the circuit-breaker for open installations and ambient temperatures up to +35°C ²⁾	Setting range of the long-delay overcurrent releases (a-releases)	Setting range of the short-delay overcurrent releases (z-releases)	Setting range of the instantaneous overcurrent releases (n-releases)	For circuit-breaker types	Order No.	Weight approx. kg	Order No.	Weight approx. kg
A	A	A	A	3WE6 2000 A 3WE7 2500 A			3WE8 3150 A	

an-releases (long-delay and adjustable instantaneous overcurrent releases)³⁾

1600	900-1600	-	3000-12000	3WX2 650-0DJ00	5	-	-	-
1600	900-1600	-	6000-24000	-0DK00	-	-	-	-
2000	1100-2000	-	3000-12000	3WX2 650-0DL00	5	-	-	-
2000	1100-2000	-	6000-24000	-0DP00	-	-	-	-
2500	1400-2500	-	3000-12000	3WX2 650-0DM00 ⁴⁾	5	3WX2 750-0DM00	5	-
2500	1400-2500	-	6000-24000	-0DN00 ⁴⁾	-	-0DN00	-	-
3150	1700-3150	-	3000-12000	-	-	3WX2 750-0DW00	5	-
3150	1700-3150	-	6000-24000	-	-	-0DX00	-	-
4000	2300-4000	-	6000-24000	-	-	-0DA00 ⁵⁾	-	-

n-releases (adjustable instantaneous overcurrent releases)

ΔI_n of the circuit-breaker	-	-	3000-12000 6000-24000	3WX2 650-0CV00 -0CX00	3	3WX2 750-0CV00 -0CX00	3
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Short-delay overcurrent (z-) releases with delay using a time relay⁶⁾

az-releases (long-delay and short delay overcurrent releases)^{3) 6)}

1600	900-1600	2000-18000	-	3WX2 650-0FD00	5	-	-	-
2000	1100-2000	2000-18000	-	-0FE00	-	-	-	-
2500	1400-2500	2000-18000	-	-0FF00 ⁴⁾	-	3WX2 750-0FF00	5	-
3150	1700-3150	2000-18000	-	-	-	-0FG00	-	-
4000	2300-4000	2000-18000	-	-	-	-0FA00 ⁵⁾	-	-

zn-releases (short-delay and adjustable instantaneous overcurrent releases)^{3) 6)}

ΔI_n of the circuit-breaker	-	2000-14000	8000-24000	3WX2 650-0HX00	6	3WX2 750-0HX00	6
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zn-releases (long-delay, short-delay and adjustable instantaneous overcurrent releases)^{3) 6)}

1600	900-1600	2000-14000	8000-24000	3WX2 650-0GH00	8	-	-	-
2000	1100-2000	2000-14000	8000-24000	-0GJ00	-	-	-	-
2500	1400-2500	2000-14000	8000-24000	-0GK00 ⁴⁾	-	3WX2 750-0GK00	8	-
3150	1700-3150	2000-14000	8000-24000	-	-	-0GL00	-	-
4000	2300-4000	2000-14000	8000-24000	-	-	-0GA00 ⁵⁾	-	-

z-releases (short-delay overcurrent releases)^{3) 6)}

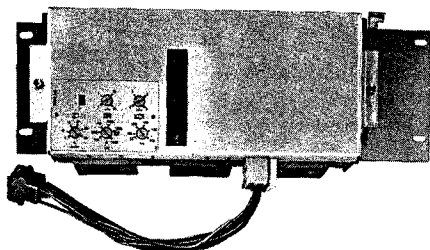
ΔI_n of the circuit-breaker	-	2000-18000	-	3WX2 650-0EW00	3	3WX2 750-0EW00	3
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Circuit-breakers with short-delay overcurrent releases can be used as discriminative circuit-breakers

- When using the circuit-breaker in circuits for individual motors the rush and starting currents have to be taken into account when selecting the overcurrent releases.
- For rated currents in enclosed installations and/or higher ambient temperatures refer to the "Technical data" on page 3/16.
- The circuit-breaker has to be fitted with an undervoltage or shunt release (refer to the 2nd order No. suffix). This has to be ordered separately.
Only for 3WE7
Only for 3WE83 with a fan.
- The time relay has to be ordered separately.

Selection and ordering data

Modules

Electronic overcurrent releases¹⁾ for sizes I to III, for 40 to 60 Hz (only for a.c.)

Signalling switch "Overcurrent release has tripped" is available as a module for subsequent installation, refer to "Modules" on page 3/40. The electronic overcurrent release modules of size III can only be used as replacements for already fitted electronic overcurrent releases. It is not possible to replace an already fitted mechanical overcurrent release with an electronic one.

Rated operating current I_n of the circuit-breaker for open installations and ambient temperatures up to 35°C ²⁾	Setting range of the long-delay releases (a-releases)	Setting range of the short-delay releases (z-releases)	Setting range of the instantaneous releases (n-releases)	For circuit-breaker types 3WE1 630 A 3WE2 800 A 3WE3 1000 A	3WE4 1250 A 3WE5 1600 A	3WE6 2000 A 3WE7 2500 A 3WE8 3150 A 3WE8 with fan 4000 A	Weight approx. kg
A	A	I_r Setting current of the long-delay release ³⁾		Order No.	Order No.	Order No.	
an-releases (long-delay and instantaneous overcurrent releases)							
630	200–630	–	(3–14) I_r	3WX2 340–ORE00	–	–	2.3
800	200–800	–	–	3WX2 340–ORF00 ⁴⁾	–	–	2.3
1000	200–1000	–	–	3WX2 340–ORG00 ⁵⁾	–	–	2.3
1250	320–1250	–	(3–14) I_r	–	3WX2 540–ORH00	–	2.8
1600	320–1600	–	–	–	3WX2 540–ORJ00 ⁵⁾	–	2.8
2000	800–2000	–	(3–14) I_r	–	–	3WX2 840–ORK00	4.8
2500	800–2500	–	–	–	–	3WX2 840–ORL00	4.8
3150	800–3150	–	–	–	–	3WX2 840–ORM00	4.8
4000	800–4000	–	–	–	–	3WX2 840–ORN00 ⁴⁾	4.8
az-releases (long-delay and short-delay overcurrent releases)							
630	200–630	(2–8) I_r	–	3WX2 340–OQF00	–	–	2.3
800	200–800	–	–	3WX2 340–OQF00	–	–	2.3
1000	200–1000	–	–	3WX2 340–OQG00	–	–	2.3
1250	320–1250	(2–8) I_r	–	–	3WX2 540–OQH00	–	2.8
1600	320–1600	–	–	–	3WX2 540–OQJ00	–	2.8
2000	800–2000	(2–8) I_r	–	–	–	3WX2 840–OQK00	4.8
2500	800–2500	–	–	–	–	3WX2 840–OQL00	4.8
3150	800–3150	–	–	–	–	3WX2 840–OQM00	4.8
4000	800–4000	–	–	–	–	3WX2 840–OQN00 ⁴⁾	4.8
azn-releases (long-delay, short-delay and instantaneous overcurrent releases)							
630	200–630	(2–8) I_r	(3–14) I_r	3WX2 340–OTE00	–	–	2.3
800	200–800	–	–	3WX2 340–OTF00	–	–	2.3
1000	200–1000	–	–	3WX2 340–OTG00	–	–	2.3
1250	320–1250	(2–8) I_r	(3–14) I_r	–	3WX2 540–OTH00	–	2.8
1600	320–1600	–	–	–	3WX2 540–OTJ00	–	2.8
2000	800–2000	(2–8) I_r	(3–14) I_r	–	–	3WX2 840–OTK00	4.8
2500	800–2500	–	–	–	–	3WX2 840–OTL00	4.8
3150	800–3150	–	–	–	–	3WX2 840–OTM00	4.8
4000	800–4000	–	–	–	–	3WX2 840–OTN00	4.8
zn-releases (short-delay and instantaneous overcurrent releases)							
Rated operating current I_n of the circuit-breaker for open installations and ambient temperatures up to +35°C ²⁾	Setting range of the response current basic value	Setting range of the short-delay release (z)	Setting range of the instantaneous release (n)	For circuit-breaker types 3WE1 630 A 3WE2 800 A 3WE3 1000 A	3WE4 1250 A 3WE5 1600 A	3WE6 2000 A 3WE7 2500 A 3WE8 3150 A 3WE8 with fan 4000 A	Weight approx. kg
A	A	I_r Set value of the response current basic value ³⁾		Order No.	Order No.	Order No.	
630	200–630	(2–8) I_r	(3–14) I_r	3WX2 340–OSE00	–	–	2.3
800	200–800	–	–	3WX2 340–OSF00	–	–	2.3
1000	200–1000	–	–	3WX2 340–OSG00	–	–	2.3
1250	320–1250	(2–8) I_r	(3–14) I_r	–	3WX2 540–OSH00	–	2.8
1600	320–1600	–	–	–	3WX2 540–OSJ00	–	2.8
2000	800–2000	(2–8) I_r	(3–14) I_r	–	–	3WX2 840–OSK00	4.8
2500	800–2500	–	–	–	–	3WX2 840–OSL00	4.8
3150	800–3150	–	–	–	–	3WX2 840–OSM00	4.8
4000	800–4000	–	–	–	–	3WX2 840–OSN00 ⁴⁾	4.8

1) When using the circuit-breakers in circuits for individual motors the rush and starting currents have to be taken into account when selecting the overcurrent releases.

2) For the rated operating currents in enclosed installations and/or higher ambient temperatures refer to "Technical Data" on page 3/18.

3) By multiplying the setting current of the long-delay release (I_r) with the setting factors for the z-release (adjustment knob "4", refer to page 3/8 Fig. 3/13) and the n-release (adjustment knob "6") the response currents of the z- and n-releases can be obtained.

4) Only for 3WE83 with fan.

5) "Response current basic value" I_r : The "response current basic value" I_r of the electronic zn-release must be adjusted with the adjustment knob "1" (refer to page 3/8 Fig. 3/13). By multiplying the "response current basic value" I_r with the setting factors for the z-release (adjustment knob "4") and for the n-release (adjustment knob "6") the response currents of the z- and n-releases can be obtained.

3WE circuit-breakers, rated current 630 to 4000 A

Selection and ordering data

Special designs of the overcurrent release modules

Additional ordering data: "-Z" with order code (If more order codes are used the sequence is irrelevant).

Example for ordering:

Mechanical an-release module with a-release, adjustable 350 A to 630 A,
n-release, adjustable 1800 A to 3600 A

Order No. 3WX2 350-0DS00

Special design Identification code-Z

With mechanical reclosing lock-out for n-release Order code W10
Releases calibrated for 60 Hz Order code F60

When ordering state: 3WX2 350-0DS00-Z
W10 + F60

Special design	For circuit-breaker sizes	Order code 3WX2 ..0-0.00 -Z □□□ + □□□	For permanently installed circuit-breakers	For withdrawable circuit-breakers
Mechanical reclosing lock-out				
With mechanical reclosing lock-out fitted to the mechanical instantaneous overcurrent release (n-release, also within an-release)	I and II III*	W 10		W 10
With mechanical reclosing lock-out fitted to the mechanical short-delay overcurrent release with retarding mechanisms ¹⁾ (z-release, also within az-releases)	I and II	W 11		W 11
With mechanical reclosing lock-out fitted to the mechanical short-delay overcurrent release with retarding mechanism and instantaneous overcurrent release (zn-release, also within azn-releases) ¹⁾	I and II	W 12		W 12
With mechanical reclosing lock-out fitted to the instantaneous part of a mechanical short-delay overcurrent release with delay by time relay and instantaneous overcurrent release (zn-release, also within azn-release) ¹⁾	I and II III*	W 13		W 13
Signalling switches				
With signalling switch "Overcurrent release has tripped" fitted to an-, az-, azn, zn, n- or z-releases ²⁾	I and II III**	M 10		M 20
With signalling switch "Overcurrent release has tripped" fitted to the mechanical instantaneous overcurrent release				
With signalling switch "Overcurrent release has tripped" fitted to the electronic a-, z-, n-releases	I, II and III***			
Overcurrent releases				
With mechanical an-, az-, azn-releases calibrated for 16 ² /3 Hz calibrated for 60 Hz	I, II and III I, II and III	F 61 F 60		F 61 F 60
With mechanical n-, z-, and zn-releases calibrated for 400 Hz (for available ranges please enquire)	I, II and III	F 64		F 64

* Use module 3WX2 775. Refer to page 3/40.

** Use module 3WX2 774. Refer to page 3/40.

*** Use module 3WX2 843 for permanently installed circuit-breakers and 3WX2 844 for withdrawable circuit-breakers. Refer to page 3/40.

1) For short-delay overcurrent releases with delay using a time relay, an electrically operated reclosing lock-out can be used (for circuit-breaker sizes I and II. For size III see the Schematic diagram 3/71).

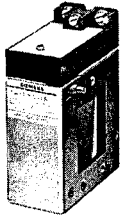
2) Only with z-releases having retarding mechanisms.

Selection and ordering data

Modules

Undervoltage and shunt releases for sizes I to III

(The required mounting parts are not included; for the mounting parts see below).



Shunt release



Undervoltage release



Mounting parts

3WX2 372 3WX2 772

Rated operating voltage and frequency	Order No.	Weight approx. kg	Order No.	Weight approx. kg	Order No.	Weight approx. kg
	Undervoltage release (r-release) (Unsuitable for rc-release)		Shunt release (f-release)			
125 V, 50 Hz 220/240 V, 50 Hz 380 V, 50 Hz or 440 V, 60 Hz	3WX2 951-0AA10 -0AA11 -0AA12	0.9	3WX2 955-0AA10 -0AA11 -0AA12	0.9		
24 V d.c. 110 V d.c. 220 V d.c.	3WX2 951-0AA14 -0AA15 -0AA16	0.9	3WX2 955-0AA14 -0AA15 -0AA16	0.9		
others a.c./d.c. ¹⁾	3WX2 951-0AA19	0.9	3WX2 955-0AA19	0.9		
r-release available up to 500 V a.c. 600 V d.c. ²⁾						
f-release available up to 500 V a.c. 220 V d.c.						
Rated operating voltage and frequency of the capacitor delay unit	Undervoltage release for "undervoltage release with delay (rc-release)"		Capacitor delay unit 1 s for "undervoltage release with delay (rc-release)"		Supplementary unit for increasing the delay time of the capacitor delay unit to 2 s or 3 s	
110/125 V, 40 to 60 Hz 220/240 V, 40 to 60 Hz 380 V, 40 to 60 Hz 440 V, 40 to 60 Hz	3WX2 953-0AA20 -0AA21 -0AA22 -0AA23	2.2	3WX9 910-0AA01 -0AB02 -0AB03 -0AB03	1.5	3WX9 214-0AA01 -0AA02 -0AA03 -0AA03	1.6
110 V d.c. 220 V d.c.	3WX2 953-0AA25 -0AA26	2.2	3WX9 910-0AA01 -0AB02	1.5	3WX9 214-0AA01 -0AA02	1.6
Rated operating voltage of the capacitor delay unit	Shunt release for "network protection release" (fc-release)		Capacitor delay unit for "network protection releases"			
220/240 V, 40 to 60 Hz	3WX2 955-0AA11	0.9	3WX9 921-0AA02	1.5		

Mounting parts for the undervoltage and shunt releases

	For circuit-breaker size	Order No.	Weight approx. kg
Mounting parts for the 1st release	I	3WX2 372	0.05
	II	3WX2 572	0.05
for the 2nd release	I and II	3WX2 573	0.05
for the 1st and 2nd releases	III	3WX2 772	0.08

1) Additionally specify the required voltage and for a.c. the required frequency (releases are available for frequencies between 40 and 60 Hz).

2) For voltages exceeding 220 V d.c. a series resistor is required: for 440 V d.c. 15 kΩ, 13 W series resistor; for 600 V d.c. 22 kΩ, 13 W series resistor. For other voltages please enquire. The resistor has to be obtained by the customer.

3) Only size III: Only up to 220 V d.c. when using the undervoltage release in conjunction with the mechanical long-delay overcurrent release.

3WE circuit-breakers, rated current 630 to 4000 A

Selection and ordering data

Modules

Auxiliary switches and signalling switches for sizes I to III

Mechanical reclosing lock-out

Modules for increasing the rated current of size III

(see also "Modular system" on page 3/14)



Auxiliary contact block

Modules	For circuit-breaker	Order No.	Weight approx. kg
2nd auxiliary contact block 2 NO + 1 NC 1 NO + 2 NC 3 NC	3WE1 to 3WE8	3WX2 961 3WX2 970 3WX2 971	0.1 0.1 0.1
Auxiliary switch for the operating mechanism			
For vertical-throw handle mechanism lagging auxiliary switch 1 NO + 1 NC	3WE1 to 3WE8	3WX2 962	0.05
lagging auxiliary switch 2 NO + 1 NC	3WE1 to 3WE8	3WX2 963	0.07
For front operating mechanism leading auxiliary switch 1 NO + 1 NC 1 NO + 1 NC	3WE1 to 3WE3 3WE4 and 3WE5	3WX2 365 3WX2 565	0.05 0.05
lagging auxiliary switch 1 NO + 1 NC	3WE1 to 3WE5	3WX2 968	0.05
Signalling switch "Overcurrent release has tripped"			
For mechanical overcurrent release (consisting of 1 set of 3 changeover switches)	3WE6 to 3WE8	3WX2 774	0.03
For the electronic overcurrent release (consisting of 1 changeover contact each) for the a-, z- and n-releases for permanently installed circuit-breakers for withdrawable circuit-breakers ¹⁾	3WE1 to 3WE8 3WE1 to 3WE8	3WX2 843 3WX2 844	0.1 0.3
Reclosing lock-out for the mechanical instantaneous overcurrent release (consisting of 1 set of 3 locks, i.e. one lock per phase)	3WE6 to 3WE8	3WX2 775	0.02
Modules for increasing the rated current of the circuit-breaker type 3WE83 up to 4000 A. (Refer to page 3/15.)			
Fan mounting kit (For fan refer to "Accessories")	for permanently installed circuit-breakers 3WE8 for withdrawable circuit-breakers 3WE8	3WX2 783 3WX2 788	0.6 0.6
Kit for temperature monitoring (Temperature monitoring thermostat can also be supplied factory mounted. Refer to the "Accessories" on page 3/41.)	for permanently installed and withdrawable circuit-breakers 3WE8	3WX2 798	1

¹⁾ The plug connection and the connection cable are supplied with the overcurrent release.

3WE circuit-breakers, rated current 630 to 4000 A

Selection and ordering data

Accessories

Item	For circuit-breaker Comments	Order No.	Weight approx. kg
Tool for the hexagon socket screws	For replacing the contacts of the 3WE1 to 3WE3 circuit-breakers	3WX2 367	0.12
	For replacing the contacts of the 3WE4 to 3WE8 circuit-breakers and fitting the overcurrent releases or bridging bars to 3WE1 to 3WE8 circuit-breakers	3WX2 566	0.12
Transformers for the motor operating mechanisms			
Special transformer¹⁾ Input: V a.c. 380/440/500	Output: matched to the drive motor for 220 V a.c. Rated power: matched to the drive motor for 220 V a.c.	3WE1 to 3WE3 3WE4 to 3WE8	4AM23 14–5CA 4AN18 20–2CA 4.2 14.5
Standard control-power transformer²⁾ Input: V 550/500/490/ 470/440/420/ 400/380/360/ 220/200	Output: V 220/110	Rated power: VA 630	3WE1 to 3WE3 4AM53 70–6AA ²⁾ 8.5
	220/110	2500	3WE4 to 3WE8 4AN43 50–5AA ²⁾ 23
Transformer for the stored-energy operating mechanisms			
Standard control-power transformer²⁾ Input: V 380 500	Output: V 220 220	Rated power: VA 500 500	3WE1 to 3WE8 3WE1 to 3WE8 4AM53 70–3AA ²⁾ 4AM53 70–4AA ²⁾ 7.5 7.5
	220/110	630	3WE1 to 3WE8 4AM53 70–6AA ²⁾ 8.5
Time relay for the z-release 220 V a.c./d.c. pick-up delay (for external voltage) drop-off delay (for mains-supply voltage) Other voltages pick-up delay (for external voltage) drop-off delay (for mains-supply voltage)			
3WE1 to 3WE8		7PV32 10–1GA 7PV34 11–1GA 7PV32 10–1.. 7PV34 11–1.. } see Cat. NS2	0.2 0.3 0.2 0.3
Functional test unit for electronic overcurrent releases rated supply voltage 220 V/50 Hz, 240 V/60 Hz		3WE1 to 3WE8	3WX2 841 2.5
Fan Motor single-phase 220 V/50 Hz; 0.16 kW three-phase 380 V/50 Hz; 0.12 kW single-phase 220/240 V, 60 Hz; 0.26 kW three-phase 440 V/60 Hz; 0.26 kW Fan mounting kit (refer to “Modules” on page 3/40) (For temperature monitoring, see “Special designs” on page 3/32)	permanently installed and withdrawable circuit-breakers 3WE8		2CC2 314–0AH2 2CC2 314–0AA2 2CC2 314–0AH8 2CC2 314–0AA8 } Refer to Cat. E or V 8.2 8.2 8.2 8.2

- 1) The transformer is a special version and is unsuitable for motorized stored-energy operating mechanisms or other equipment (e.g. contactors).
 2) Order numbers apply for class HKG. Control-power transformers of the application class HKD must be used when the service conditions call for it (e.g. moisture condenser).
 The transformers have been selected solely for the motor drives. If other loads (e.g. contactors) should simultaneously be supplied by the transformers, a transformer with high rated power must be used corresponding to the additional load.

3WE circuit-breakers, rated current 630 to 4000 A

Selection and ordering data

Spare parts

§ Express supply program

Spare parts marked with a § can be supplied in small quantities within approximately 2 weeks (ex-works)

Spare part	For circuit-breaker type	Required set/number per circuit-breaker	Order No.	Weight approx. kg
1 set of contacts (Ag) comprising 1 fixed and 1 moving main contact and the mounting parts	3WE13, 3WE23, 3WE33	3	3WY2 325	0.4
	3WE14, 3WE24, 3WE34	4	3WY2 325	0.4
	3WE43, 3WE53, 3WE63	3	3WY2 525	0.6
	3WE44, 3WE54	4	3WY2 525	0.6
	3WE73, 3WE83	6	3WY2 525	0.6
Arc chutes Made of plastic material (replace the arc chutes made of ceramic)	3WE13, 3WE23, 3WE33	3	3WY2 306	2.5
	3WE14, 3WE24, 3WE34	4	3WY2 306	2.5
	3WE43, 3WE53, 3WE63	3	3WY2 506	2.5
	3WE44, 3WE54	4	3WY2 506	2.5
	3WE73, 3WE83	6	3WY2 506	2.5
Made of ceramic (to be discontinued)	3WE43, 3WE53, 3WE63	3	3WY2 505	2.5
	3WE44, 3WE54	4	3WY2 505	2.5
	3WE73, 3WE83	6	3WY2 505	2.5
Coil for the shunt or undervoltage release 125 V, 50 Hz 220/240 V, 50 Hz 220 V, 50 Hz or 440 V, 60 Hz (other voltages up to a maximum of 500 V a.c. ¹⁾)	3WE1 to 3WE8	1	3WY9 901	0.15
			3WY9 902	0.15
			3WY9 903	0.15
			3WY9 909	0.15
Coil for the shunt release 24 V d.c. 110 V d.c. 220 V d.c. (other voltages up to 220 V d.c. ¹⁾)	3WE1 to 3WE8	1	3WY9 910	0.15
			3WY9 911	0.15
			3WY9 912	0.15
			3WY9 919	0.15
Coil for the undervoltage release²⁾ 24 V d.c. 110 V d.c. 220 V d.c. (other voltages up to 800 V d.c. ¹⁾)	3WE1 to 3WE8	1	3WY9 920	0.15
			3WY9 921	0.15
			3WY9 922	0.15
			3WY9 929	0.15
Coil for the undervoltage release with drop-off delay²⁾ 110/125 V, 40 to 60 Hz 220/240 V, 40 to 60 Hz 380 V, 40 to 60 Hz 440 V, 40 to 60 Hz 110 V d.c. 220 V d.c.	3WE1 to 3WE8	1	3WY9 931	0.15
			3WY9 932	0.15
			3WY9 933	0.15
			3WY9 934	0.15
			3WY9 941	0.15
			3WY9 942	0.15
Auxiliary contact block 2 NO + 1 NC (Suitable as 1st or 2nd auxiliary contact block) ³⁾ 1 NO + 2 NC } (2nd auxiliary contact block) 3 NC }	3WE1 to 3WE8	1	3WX2 961	0.10
			3WX2 970	0.10
			3WX2 971	0.10
Signalling switches for guide frames without contact engagement spindle (without mounting parts) Connected position 1 NO + 2 NC Test/disconnected position 1 NO + 1 NC	3WE1 to 3WE5	1	3SE3 023-0A	(Refer to Cat. NS 2) 0.08
	3WE1 to 3WE5	1	3SE3 020-0A	(Refer to Cat. NS 2) 0.035
Contact block for the lagging auxiliary switch for the vertical-throw handle mechanism 1 NO + 1 NC 2 NO + 1 NC	3WE1 to 3WE8	1	3SE3 020-0A	(Refer to Cat. NS 2) 0.035
	3WE1 to 3WE8	1	3SE3 023-1A	(Refer to Cat. NS 2) 0.035
Handle for "Front operating mechanisms"	3WE1 to 3WE5	1	8UC93 42	(Refer to Cat. NV 21) 0.25
	3WE4 to 3WE5	1	8UC93 46	0.25

For other spare parts refer to "Modules" on pages 3/33 and 3/40.

¹⁾ Additionally specify the required voltage and for a.c. the required frequency. Coils are available for 40 to 60 Hz.
²⁾ Spare coils cannot be used in existing releases with other coil voltages.
³⁾ Delivered with stick-on labels for use as 2nd auxiliary contact block. Labels for the use as 1st auxiliary contact block are also enclosed.

Selection and ordering data

Detachable operating mechanisms (door operating mechanisms) for "3WE circuit-breakers with front operating mechanism"

Degree of protection IP 65

The circuit-breakers with rear-operating mechanism can use the operating mechanism 8UC as a fixed operating mechanism.

Door coupling without shaft extension						
	not lockable, without door interlock			lockable via padlocks, without door interlock (door interlock see below)		
	Front plate mm	Order No.	Weight approx. kg	Front plate mm	Order No.	Weight approx. kg
3WE13 3WE 23 3WE 33	96 □	8UC54 04-0AB01	0.83	96 × 124	8UC54 08-1AB01	0.94
3WE43 3WE53		8UC54 24-0AB01	0.83		8UC54 28-1AB01	0.94

can be used for breakers with torque up to
Nm

Door coupling with shaft extension						
	not lockable, without door interlock			lockable via padlocks, without door interlock (door interlock see below)		
	Front plate mm	Order No.	Weight approx. kg	Front plate mm	Order No.	Weight approx. kg
3WE13 3WE23 3WE53	96 □	8UC54 54-0AB01	1.17	96 × 124	8UC54 58-1AB01	1.28
3WE43 3WE53		8UC54 64-0AB01	1.17		8UC54 68-1AB01	1.28

can be used for breakers with torque up to
Nm

Door interlock kit for 8UC5 operating mechanisms

		Order No.	Weight approx. kg
Door interlock kit	The operating mechanism is interlocked in the "On" position and prevents the door from being opened	8UC97 50	0.05

Possible depth of installation "a" of the switch units

Type	Dimension "a" (mm)	
	door coupling without shaft extension	door coupling with shaft extension
8UC5	13 to 27	67 to 247

