ReStart with Autotest

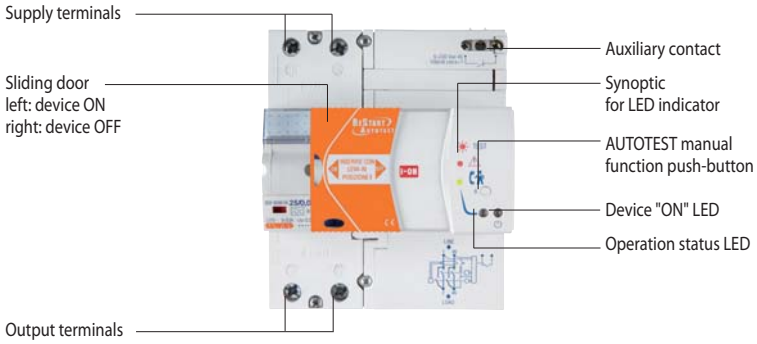
Technical data

TYPE		ReStart with Autotest 2P	ReStart with Autotest PRO 2P	ReStart with Autotest PRO 4P
				
Electrical characteristics				
Standards:		EN 50557, EN 61008-1		
Distribution system:		TT - TN		
Rated operational voltage (Ue):	(V)	230 AC (1)		400 AC
Minimum operating voltage (min Ue)	(V)	85% Ue		
Maximum operating voltage (max Ue):	(V)	110% Ue		
Rated insulation voltage (Ui):	(V)	500		
Dielectric strength test voltage between pole and earth:	(V)	2500 AC for 1 minute		
Rated impulse withstand voltage (Uimp):	(kV)	4		
Rated frequency:	(Hz)	50		
Residual making and breaking capacity (IΔm):	(A)	630		
Rated conditional residual short-circuit current with fuse (IΔc):	(A)	10000 (gL 80A)		
Number of poles:		2		4
Type of associated residual current circuit breaker:		A[IR]		
Rated current (In):	(A)	25 - 40	25 - 40 - 63	
Rated residual operating current (IΔn):	(mA)	30		30 - 300
Rated non-operating resistance between live parts and earth (Rdo):	(kΩ)	20	8	8 (30mA) - 2.5 (300mA)
Rated operating resistance between live parts and earth (Rd):	(kΩ)	70	16	16 (30mA) - 5 (300mA)
Power loss at In:	(W)	2.2 (25A) - 5.4 (40A) - 6.2 (63A)		3.5 (25A) - 6 (40A) - 12 (63A)
Off-load absorbed power:	(VA)	4 (cosφ=0)		
Power absorbed during automatic reclosing:	(VA)	49 (cosφ=0,55)		
Reclosing control:		automatic		
Power supply:		from above		
Mechanical characteristics				
Width in DIN modules:		5		7
Reclosing time:	(s)	10		
Autotest cycle time:	(s)	7		
Maximum operational frequency:	(oper./h)	30		
Max mechanical endurance (total no. operations):		4000		
Maximum no. of consecutive automatic reclosure operations (2):		3		
Counter reset time no. of consecutive automatic reclosure operations:	(s)	60		
Section of circuit breaker terminals:	(mm^2)	≤ 35 flexible cable - ≤ 35 rigid cable		
Rated tightening torque:	(Nm)	2		
Degree of protection:		IP20 (terminals) - IP40 (front)		
Operating temperature:	(°C)	-25 +60 (3)		
Tropicalization:		55°C - RH 95%		
Auxiliary contact characteristics				
Type of contact:		Photomos		
Operating voltage:	(V)	5-230 AC/DC		
Maximum operating current:	(mA)	100 (cosφ=1)		
Minimum operating current:	(mA)	0.6		
Operating frequency:	(Hz)	50		
Category of use:		AC12		
Operating mode:		NO / NC / NC + impulse		
Terminal section:	(mm^2)	≤ 2.5		
Rated tightening torque:	(Nm)	0.4		
Autotest function				
Regular and automatic RCCB test:		•	•	•
Light signalling for autotest cycle in progress:		•	•	•
Light signalling for any device anomaly:		•	•	•
ReStart function				
Automatic reclosure for untimely tripping:		•	•	•
Earth leakage check:		•	•	•
Continuous system check:			•	•
Interruption of reclosure operation in the event of a fault:		•	•	•
Signalling of reclosure operation in progress:		•	•	•
Light signalling of failure:		•	•	•
Activation / exclusion of ReStart function:		•	•	•
Auxiliary contact for remote operating status access:		•	•	•
Internal electrical protection:		PTC	PTC	PTC

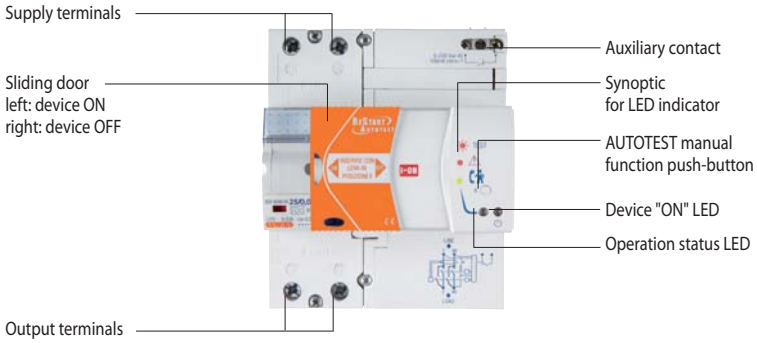
(1) Power supply 230V phase-neutral (2) In the absence of a system fault (3) Average daily temperature ≤ +35°C

Device description

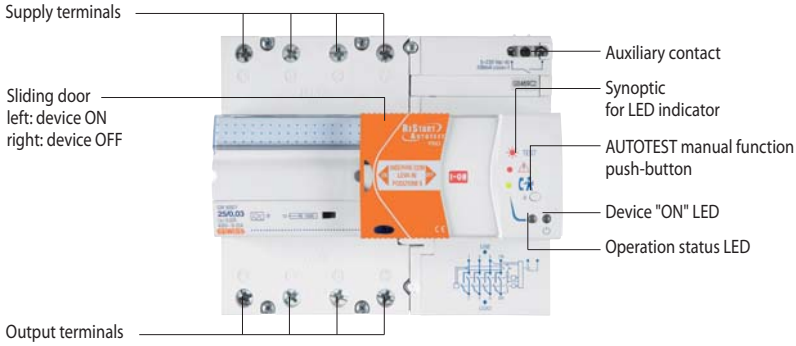
ReStart with Autotest 2P



ReStart with Autotest PRO 2P



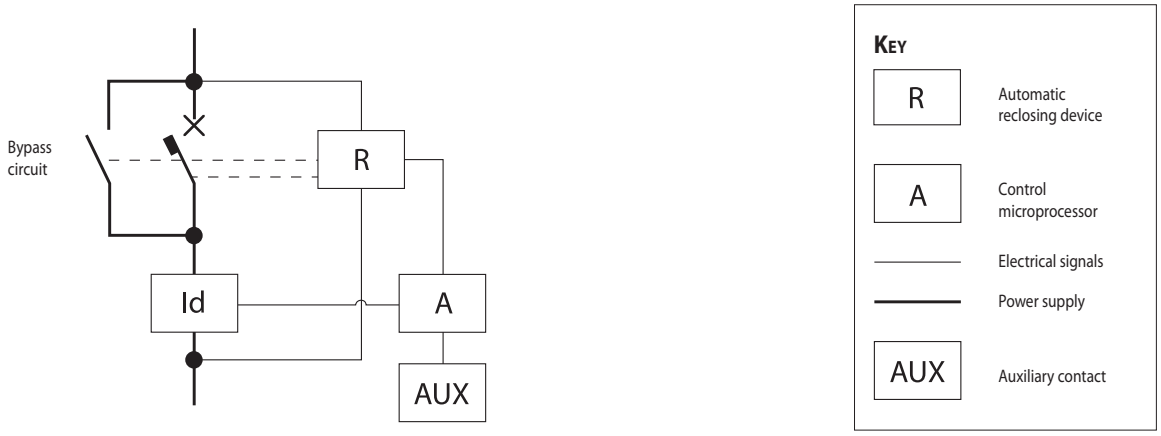
ReStart with Autotest PRO 4P



Autotest function

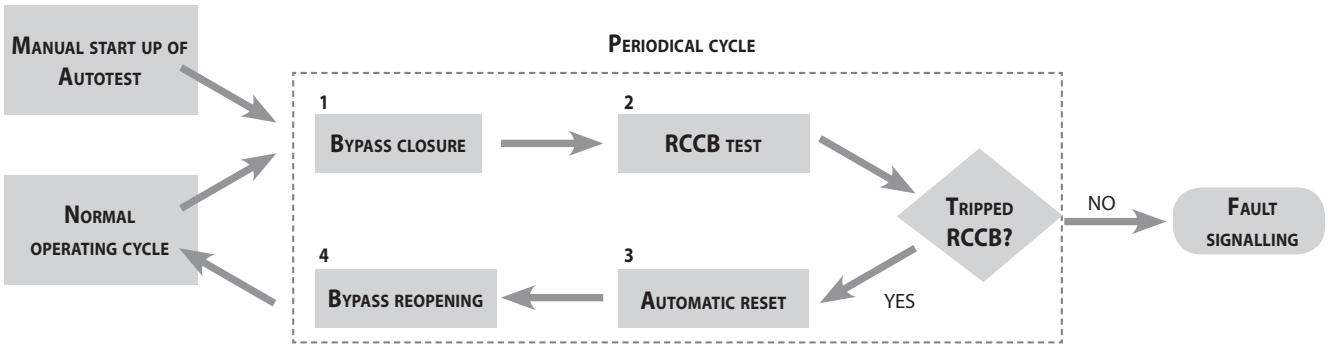
The Autotest function periodically tests the working of the residual current circuit breaker protection. During the test, a bypass circuit ensures electrical continuity meanwhile an additional RCCB protection device guarantees system safety. The automatic reclosing device ensures the automatic resetting of the lever of circuit breaker in ON position. Moreover, pressing the button on the front of the device at any time, Autotest immediately carries out an automatic test on the RCCB without interupting the power supply. This means test can be carried out during normal day-to-day operations without any inconvenience.

Electrical diagram



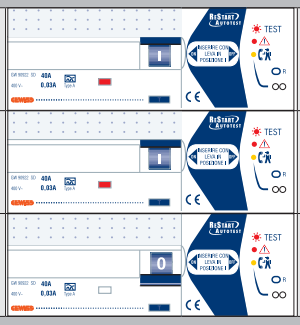
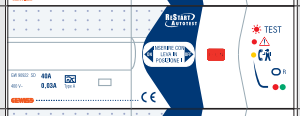
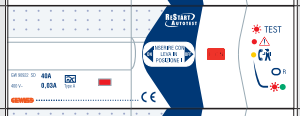
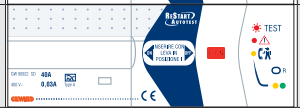
Periodical test function

After installation, it is possible to start up the Autotest function manually (pressing the appropriate button) in order to check if the wiring is correct and to synchronise the periodical test function.



ReStart with Autotest light signalling

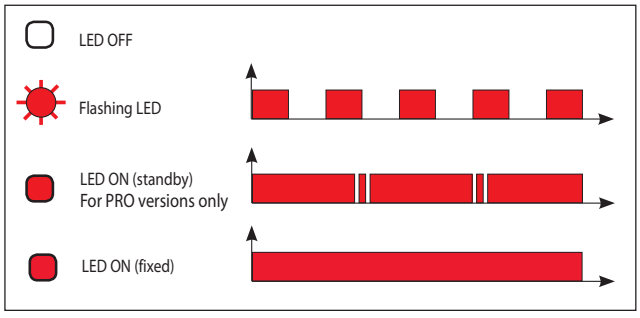
ReStart with Autotest is equipped with two LEDs on the front which show the operation conditions of device. Precisely, the right LED is switched on when the device is activated whereas the left LED shows the operation conditions.

ReStart conditions	ReStart front	Lever position	LED indicators			Description
			Left LED	Right LED	Aux contact	
MANUAL OPERATION						
Deactivated		I	○	○	OFF	Reset and autotest device **OFF**
Deactivated for over 15 minutes		I	○	○	ON	Reset and autotest device **OFF**
Deactivated		0	○	○	OFF	Reset and autotest device **OFF**
AUTOMATIC OPERATING CYCLE (*)						
Normal operation		I	○	●	OFF	Reset and autotest device ON Automatic functions ON
Electric circuit check		0	✳	●	OFF	Reset and autotest device in **electric system insulation check condition**
System failure		0	●	●	ON	Reset and autotest device in **block condition** due to system fault **For PRO versions** only, reset and autotest device in **standby condition** due to system fault
Periodic Autotest		I/0	✳	●	OFF	**Electric circuit check in progress** **Electric system supplied**
Device failure		I	●	●	ON	Reset and autotest device **not working** Call a technician for replacement
Device failure		0	●	●	ON	Reset and autotest device **not working** Call a technician for replacement

(*) before sliding the plastic cover to the left to activate the device, it is necessary to set the circuit breaker in the "I" position.

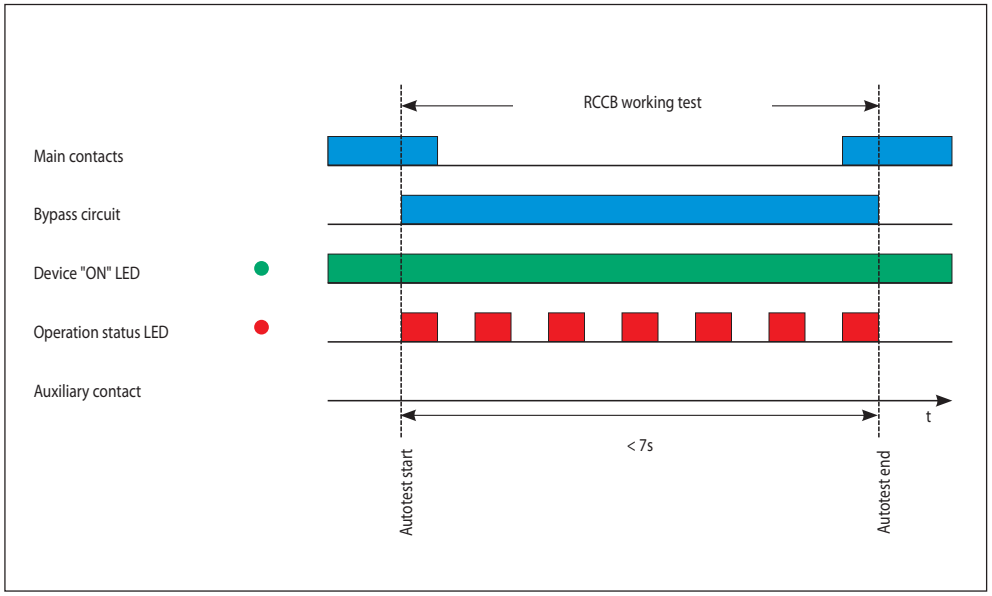
NOTE: ReStart device can be in block condition (red led fixed) after 4 following trips too (t≤60s after previous trip).

Key

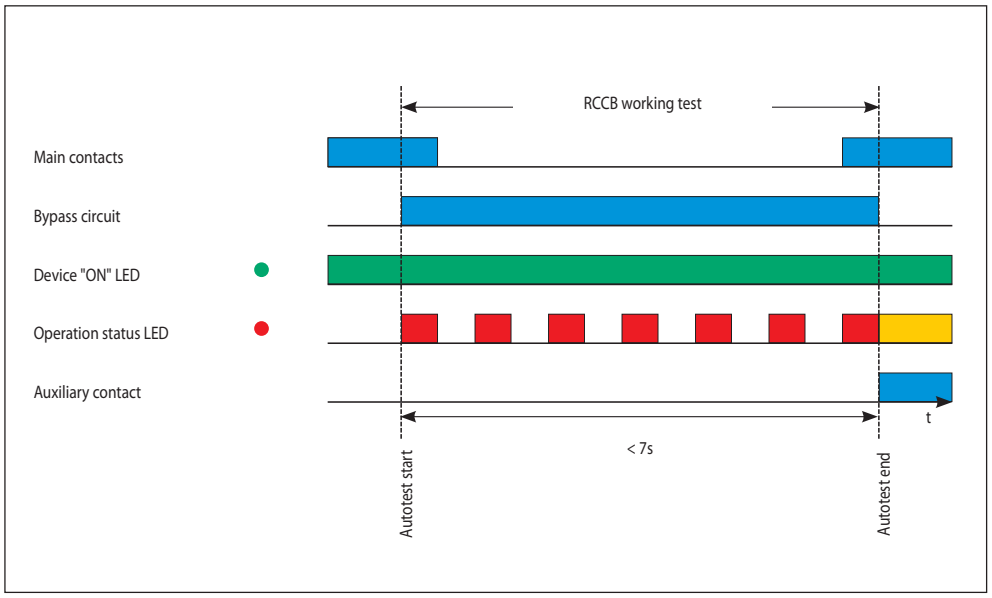


ReStart with Autotest operation conditions

Autotest function with positive result



Autotest function with negative result



Key

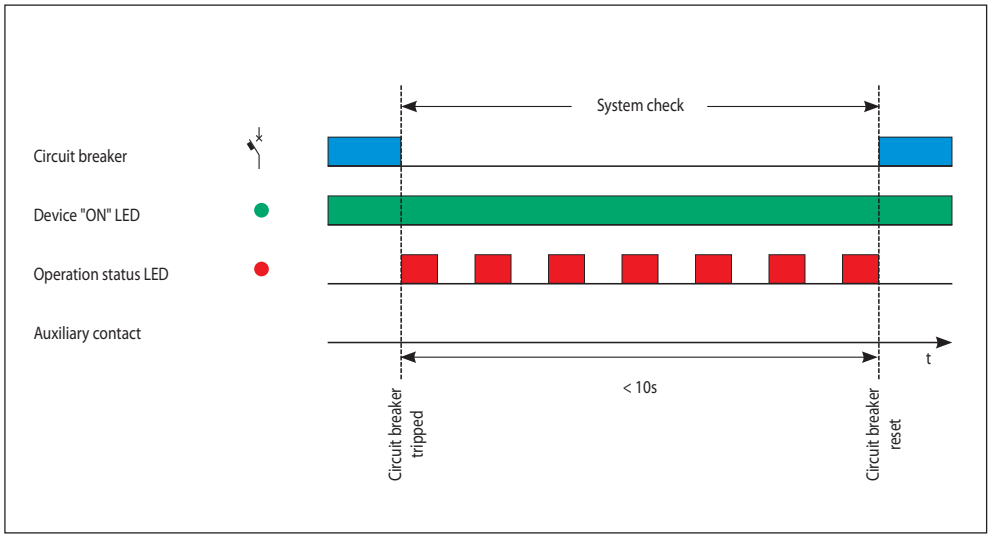
Closed circuit

Device ON

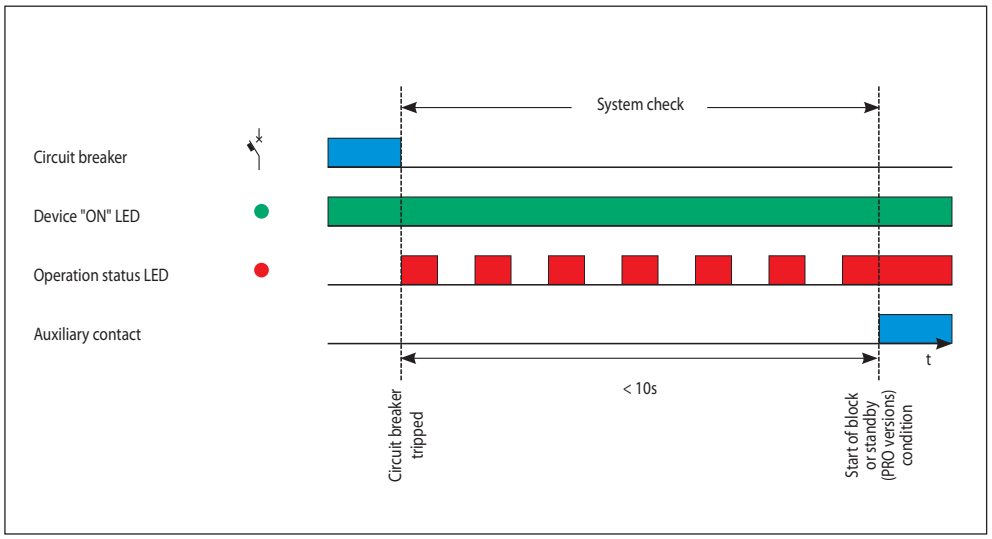
Test in progress

Anomaly of device

ReStart function with positive result



ReStart function with negative result



Key

Closed circuit

Device ON

System check in progress

Device block

ReStart Rd

Technical data

TYPE		ReStart Rd 2P	ReStart Rd PRO 2P	ReStart Rd PRO 4P
				
Electrical characteristics				
Standards:		EN 50557, EN 61008-1		EN 50557
Distribution system:		TT - TN		
Rated operational voltage (Ue):	**(V)**	230 AC (1)		
Minimum operating voltage (min Ue)	**(V)**	85% Ue		
Maximum operating voltage (max Ue):	**(V)**	110% Ue		
Rated insulation voltage (Ui):	**(V)**	500		
Dielectric strength test voltage between pole and earth:	**(V)**	2500 AC for 1 minute		
Rated impulse withstand voltage (Uimp):	**(kV)**	4		
Rated frequency:	**(Hz)**	50		
Residual making and breaking capacity (IΔm):	**(A)**	IΔm of the associated circuit breaker		
Rated conditional residual short-circuit current with fuse (IΔc):	**(A)**	IΔc of the associated circuit breaker		
Number of poles:		2		4
Type of SD RCCB:		A - A[IR]	A - A[IR] - A[S]	AC - A - A[IR] - A[S]
Rated current (In):	**(A)**	25 - 40 - 63	25 - 40 - 63 - 80	25 - 40 - 63 - 80 - 100
Rated residual operating current (IΔn):	**(mA)**	30	30 - 300 - 500	30 - 100 - 300 - 500
Rated non-operating resistance between live parts and earth (Rdo):	**(kΩ)**	20	8 (30mA) - 2.5 (300/500mA)	8 (30mA) - 2.5 (100/300/500mA)
Rated operating resistance between live parts and earth (Rd):	**(kΩ)**	70	16 (30mA) - 5 (300/500mA)	16 (30mA) - 5 (100/300/500mA)
Power loss at In:	**(W)**	Power loss of the associated circuit breaker		
Off-load absorbed power:	**(VA)**	0	17 (cosφ=0)	4 (cosφ=0)
automatic reclosing:	**(VA)**	18 (cosφ=0.46)		45 (cosφ=0.55)
Reclosing control:		automatic		
Mechanical characteristics				
Width in DIN modules:		2 (ARD) + 2 (RCCB)		3 (ARD)
Reclosing time:	**(s)**	90		10
Maximum operational frequency:	**(oper./h)**	15		30
Max mechanical endurance (total no. operations):		1000		4000
Maximum no. of consecutive automatic reclosure operations (2):		3		
Counter reset time no. of consecutive automatic reclosure operations:	**(s)**	180		60
Section of circuit breaker terminals:	**(mm²)**	≤ 35 flexible cable (3) - ≤ 35 rigid cable		
Rated tightening torque:	**(Nm)**	2		
Degree of protection:		IP20 (terminals) - IP40 (front)		
Operating temperature:	**(°C)**	-5 +40		-25 +60 (4)
Tropicalization:		55°C - RH 95%		
Auxiliary contact characteristics				
Type of contact:		-	Photomos	
Operating voltage:	**(V)**	-	5-230 AC/DC	
Maximum operating current:	**(mA)**	-	100 (cosφ=1)	
Minimum operating current:	**(mA)**	-	0.6	
Operating frequency:	**(Hz)**	-	50	
Category of use:		-	AC12	
Operating mode:		-	NO/NC/INTERMITTENT	
Terminal section:	**(mm²)**	-	≤ 2.5	
Rated tightening torque:	**(Nm)**	-	0,4	
ReStart function				
Automatic reclosure for untimely tripping:		•	•	•
Earth failure test:		•	•	•
Earth leakage check:			•	•
Interruption of reclosure operation in the event of a fault:		•	•	•
Signalling of reclosure operation in progress:		•	•	•
Light signalling of failure:		•	•	•
Activation / exclusion of ReStart function:		•	•	•
Auxiliary contact for remote operating status access:			•	•
Internal electrical protection:		PTC	PTC	PTC

(1) Power supply 230V phase-neutral (2) In the absence of a system fault (3) ≤ 35mm² for 4-pole versions in 3 modules (4) Average daily temperature ≤ +35°C

ReStart Rm

Technical data

TYPE		ReStart Rm 2P	ReStart Rm PRO 2P	ReStart Rm PRO 4P	Rm TOP	CM
						
Electrical characteristics						
Standards:		EN 50557, EN 61009-1		EN 50557	-	-
Distribution system:		TT - TN			TT - TN - IT (1)	TT-TN-IT
Rated operational voltage (Ue):	(V)	230 AC (2)				
Minimum operating voltage (min Ue)	(V)	85% Ue				
Maximum operating voltage (max Ue):	(V)	110% Ue				
Rated insulation voltage (Ui):	(V)	500				
Dielectric strength test voltage between pole and earth:	(V)	2500 AC for 1 minute				
Rated impulse withstand voltage (Uimp):	(kV)	4				
Rated frequency:	(Hz)	50				
Residual making and breaking capacity (IΔm):	(A)	IΔm of the associated circuit breaker				
Number of poles:		2		4		
Type of MDC RCBO:		A - A[IR]	A - A[S]	AC - A - A[IR] - A[S]		
Type of MT+BD RCBO:		-	-	-	AC - A - A[IR] - A[S]	
Rated current (In):	(A)	from 6 to 32			from 1 to 63	
Rated residual operating current (IΔn):	(mA)	30	30 - 300		30 - 300 - 500 - 1000	
Rated non-operating resistance between live parts and earth (Rdo):	(kΩ)	20	8 (30mA) - 2.5 (300mA)		8 (30mA) - 2.5 (300/500/1000mA)	-
Rated operating resistance between live parts and earth (Rd):	(kΩ)	70	16 (30mA) - 5 (300mA)		16 (30mA) - 5 (300/500/1000mA)	-
Rated non-operating resistance between live parts (Rcco):	(Ω)	0.8		0.3		-
Rated operating resistance between live parts (Rcc):	(Ω)	1.3		1.8		-
Power loss at In:	(W)	Power loss of the associated circuit breaker				
Off-load absorbed power:	(VA)	0	17 (cosφ=0)	16 (cosφ=0)	15 (cosφ=0.06)	0 (cosφ=0)
automatic reclosing:	(VA)	18 (cosφ=0.46)		34 (cosφ=0.67)	30 (cosφ=0.64)	30 (cosφ=0.64)
Reclosing control:		automatic			automatic / remote (3)	remote (3)
Mechanical characteristics						
Width in DIN modules:		2 (ARD) + 2 (RCBO)		3 (ARD)	4 (ARD)	2 (ARD)
Reclosing time:	(s)	90		10	3 (without system test) 10 (with system test)	3
Remote control opening time:	(s)	-	-	-	2	
Maximum operational frequency:	(oper./h)	15		30		
Max mechanical endurance (total no. operations):		1000		4000	10000	
Maximum no. of consecutive automatic reclosure operations (4):		3				-
Counter reset time no. of consecutive automatic reclosure operations:	(s)	180		60		-
Section of circuit breaker terminals:	(mm^2)	≤ 35 flexible cable - ≤ 35 rigid cable				
Rated tightening torque:	(Nm)	2				
Degree of protection:		IP20 (terminals) - IP40 (front)				
Operating temperature:	(°C)	-5 +40		-25 +60 (5)		
Tropicalization:		55°C - RH 95%				
Auxiliary contact characteristics						
Type of contact:		-	Photomos		Changeover	Photomos	Changeover
Operating voltage:	(V)	-	5-230 AC/DC		230 AC/ 30 DC	5-230 AC/DC	230 AC/ 30 DC
Maximum operating current:	(mA)	-	100 (cosφ=1)		1.5 AC / 0.8 DC	100 (cosφ=1)	1.5 AC / 0.8 DC
Minimum operating current:	(mA)	-	0.6		-	0.6	-
Operating frequency:	(Hz)	-	50				
Category of use:		-	AC12				
Operating mode:		-	NO/NC/INTERMITTENT		CO	NO/NC/INTERMITTENT	CO
Terminal section:	(mm^2)	-	≤ 2.5				
Rated tightening torque:	(Nm)	-	0,4				
ReStart function						
Automatic reclosure for untimely tripping:		•	•	•	•	
Earth leakage check:		•	•	•	•	
Short-circuit check:		•	•	•	•	
Adjustable insulation threshold:					•	
Continuous system check:			•	•	•	
Adjustable reset standby time (6):					•	
Adjustable reclosing mode:					•	
Interruption of reclosure operation in the event of a fault:		•	•	•	•	
Signalling of reclosure operation in progress:		•	•	•	•	
Light signalling of failure:		•	•	•	•	
Activation / exclusion of ReStart function:		•	•	•	•	•
Auxiliary contact for remote operating status access:			•	•	•	•
Internal electrical protection:		PTC	PTC	PTC	PTC	PTC

(1) For IT system reclosing without fault check (2) Power supply 230V phase-neutral (3) Impulse duration ≥ 200ms (4) In the absence of a system fault
(5) Average daily temperature ≤ +35°C (6) Automatic reclosure delay time: 0-1h

Device description

ReStart Rd 2P

ReStart Rm 2P

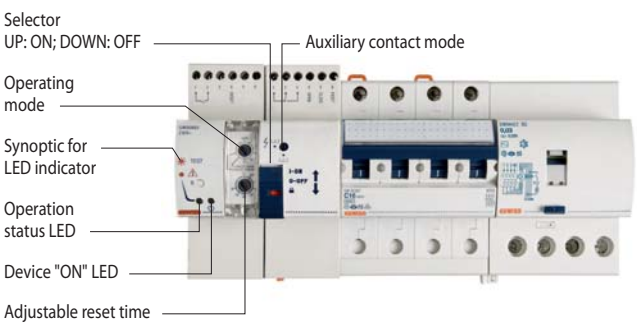
ReStart Rd PRO 2P

ReStart Rm PRO 2P

ReStart Rd PRO 4P

ReStart Rm PRO 4P

ReStart Rm TOP 4P

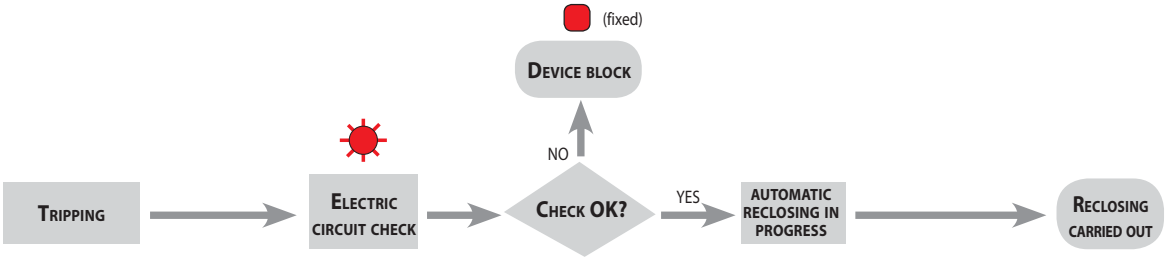


ReStart Cm

Automatic reclosing function

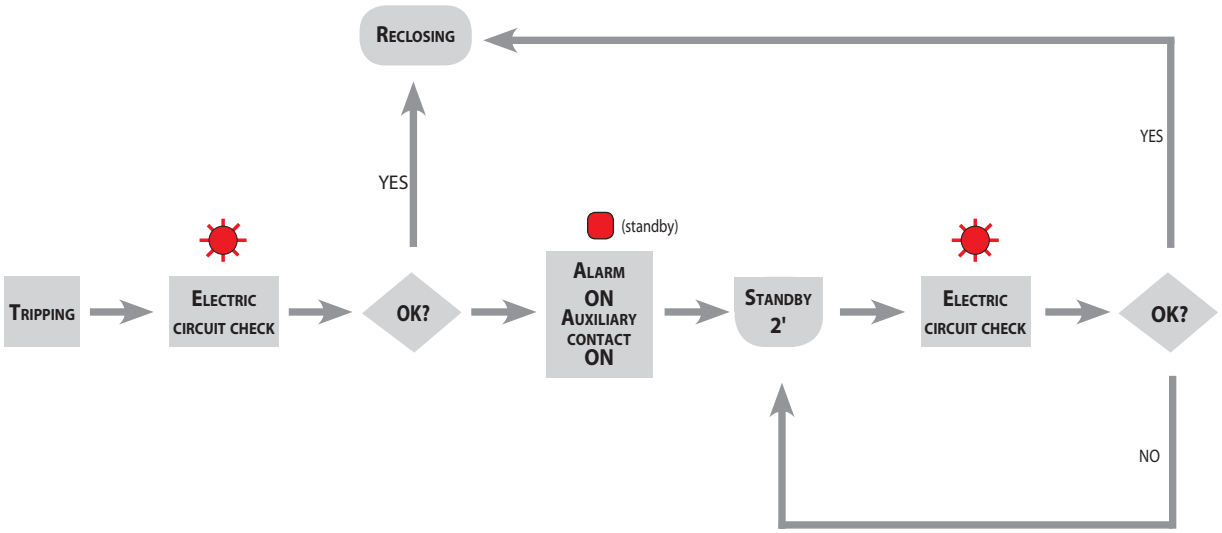
ReStart with Autotest, Rd and Rm

The automatic reclosing is carried out after an untimely tripping of the circuit breaker but only after an electrical circuit check. If a fault is found, the device sets itself on block condition and signals the fault by means of the front LED indicator.

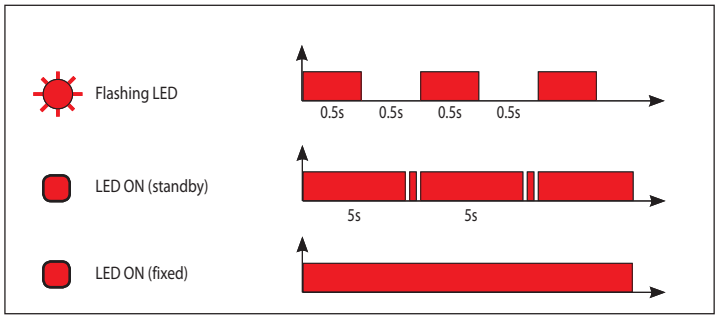


ReStart with Autotest, Rd and Rm PRO version

The circuit breaker is reclosed after an untimely tripping of the circuit breaker but only after a system check.
When the system check gives a negative result, the device goes into standby and signals this condition by means of the frontal LED indicator. System checks will then be carried out at 2' intervals, and the device will only reclose when the result of the test is positive. If no positive result is obtained, the device will remain in standby until the next test, or until a manual reset. The auxiliary contact signals the system fault.



Key



System fault check

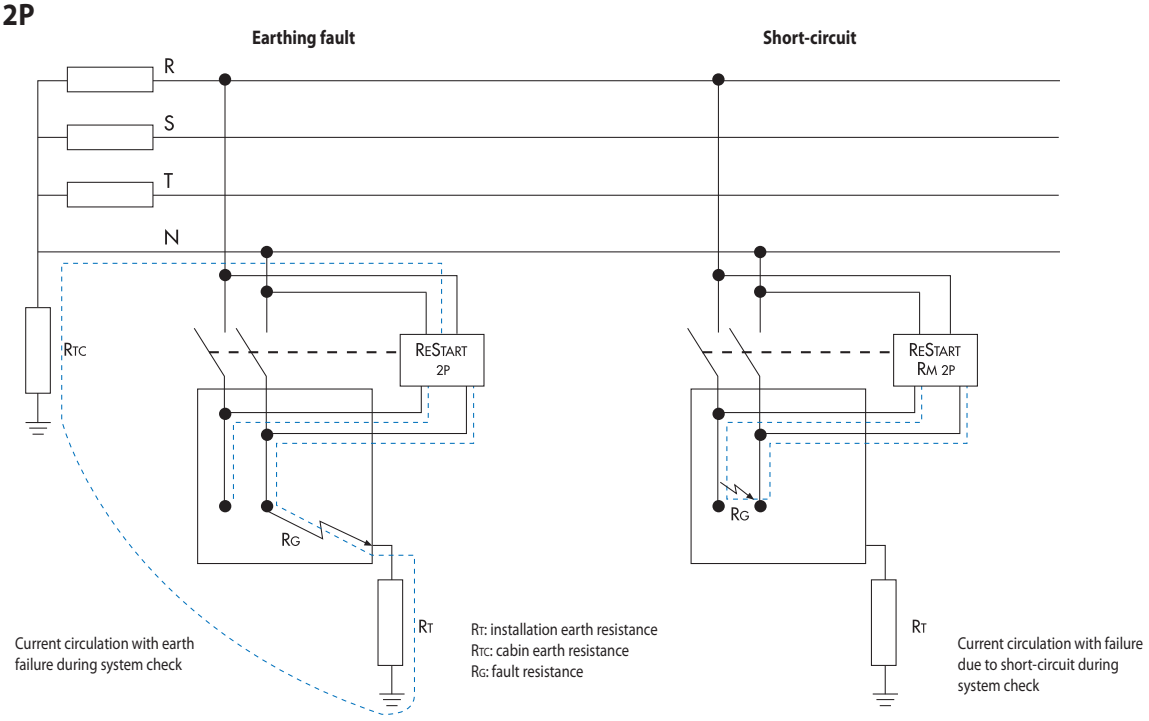
Every device belonging to ReStart range is equipped with internal electronic circuit which is able to check the system and then to carry out the automatic reclosing of the circuit breaker if the value of the insulation resistance measured by the electronic circuit is compatible with the predefined safety values.

During the system check ReStart injects a pulsant unidirectional current type in order to check the status of the system. The intensity of this current is extremely low in order to guarantee always the people safety. The figures below are given as an example to show the route taken by the current during system check for TT distribution systems both single and three phase.

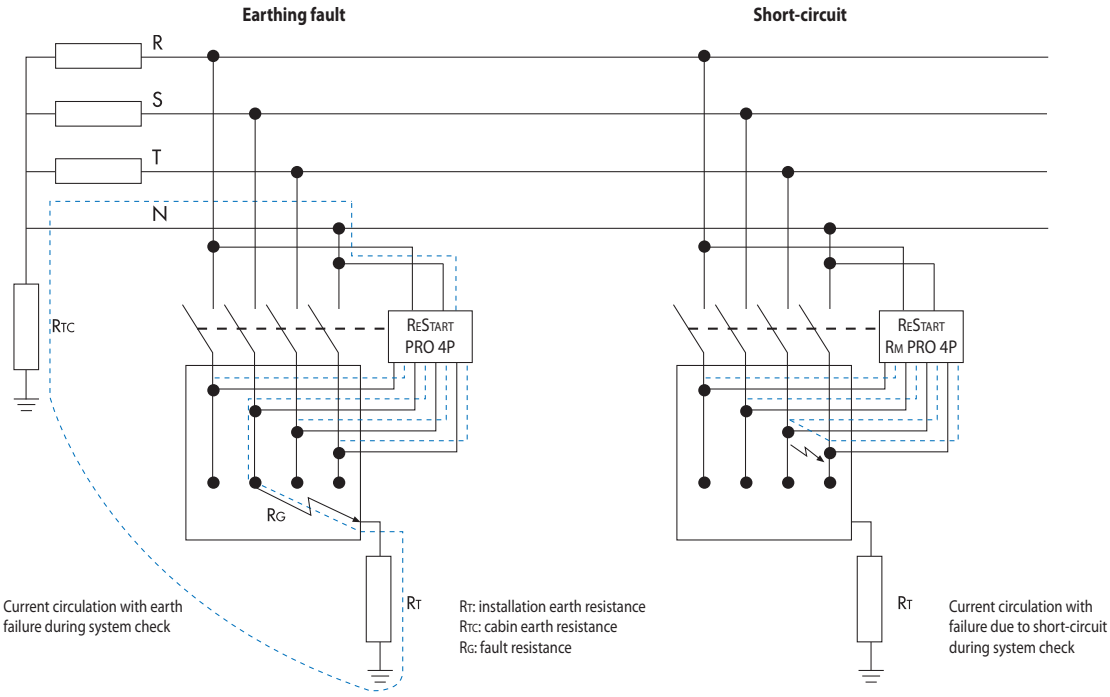
ReStart RM, in addition to the check of the insulation resistance, carries out a system short circuit check.

All Restart devices are able to detect a fault even in case of installations without grounding system.

ReStart 2P



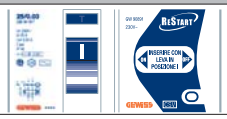
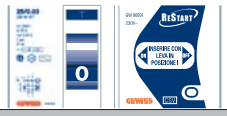
ReStart 4P



ReStart Rd and Rm light signalling

ReStart Rd and Rm are equipped with one LED on the front which shows the operation conditions of the device.

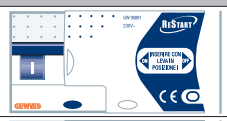
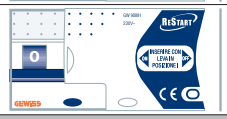
ReStart Rd

ReStart conditions	ReStart front	Lever position	Indicator LED	Description
MANUAL OPERATION				
Deactivated		I	○	Reset device **OFF**
Deactivated		0	○	Reset device **OFF**
AUTOMATIC OPERATING CYCLE (*)				
Normal operation		I	○	Reset device **ON**
Electric circuit check		0	☀	Reset device in **electric system insulation check condition.**
System failure		0	●	Reset device in **block** condition due to low insulation of downstream electric system.

(*) before sliding the plastic cover to the left to activate the device, it is necessary to set the associated circuit breaker in the "I" position.

NOTE: ReStart device can be in block condition (red led fixed) after 4 following trips too (t≤180s after previous trip).

ReStart Rm

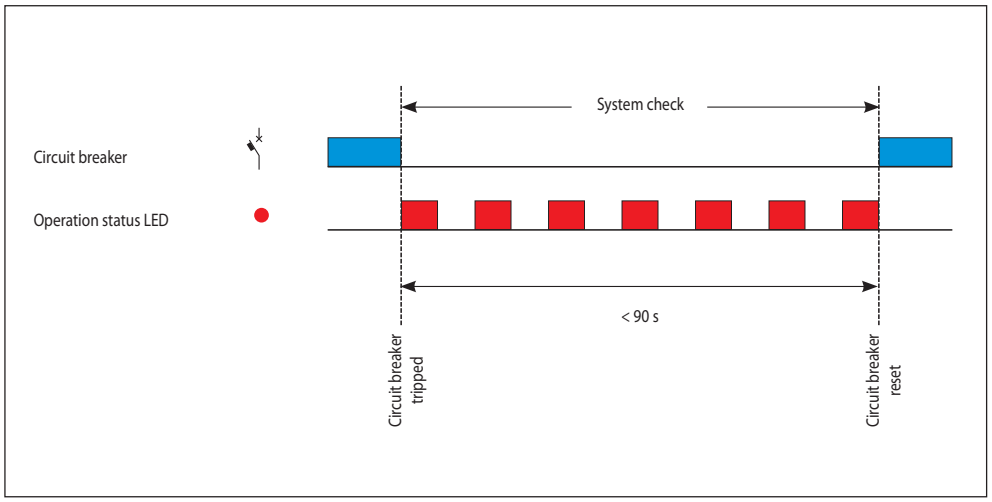
ReStart conditions	ReStart front	Lever position	Indicator LED	Description
MANUAL OPERATION				
Deactivated		I	○	Reset device **OFF**
Deactivated		0	○	Reset device **OFF**
AUTOMATIC OPERATING CYCLE (*)				
Normal operation		I	○	Reset device **ON**
Electric circuit check		0	☀	Reset device in **electric system insulation and short-circuit check conditions.**
System failure		0	●	Reset device in **block** condition due to low insulation or short-circuiting fault of downstream electric system

(*) before sliding the plastic cover to the left to activate the device, it is necessary to set the associated circuit breaker in the "I" position.

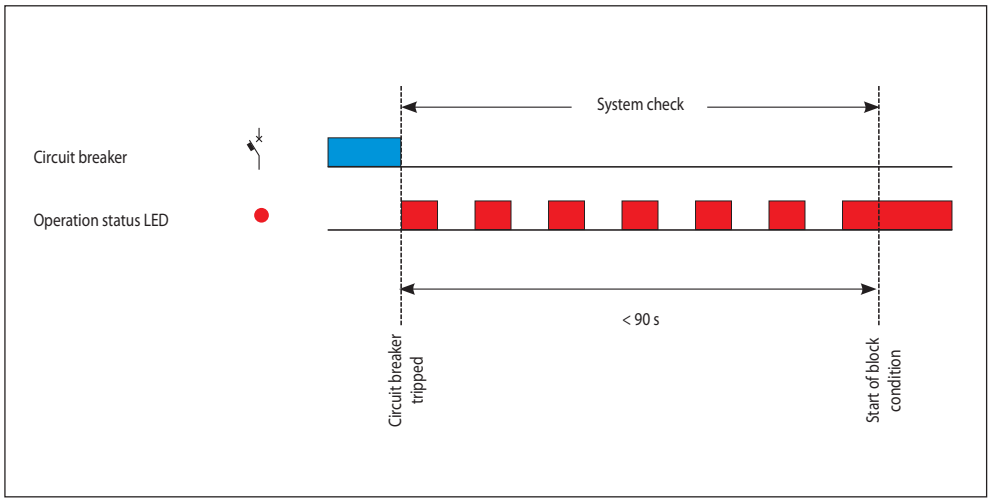
NOTE: ReStart device can be in block condition (red led fixed) after 4 following trips too (t≤180s after previous trip).

ResStart Rd and Rm operation conditions

ReStart function with positive result



ReStart function with negative result



Key

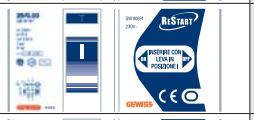
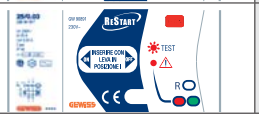
Closed circuit

System check in progress

Device block

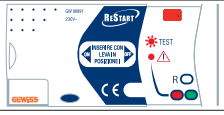
ReStart Rd and Rm PRO light signalling

ReStart PRO is equipped with two LEDs on the front which show the operation conditions of device.
The right-hand LED is switched on when the device is activated, and the left-hand LED shows the operation conditions.

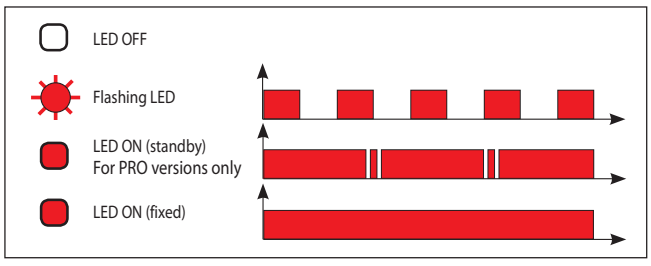
ReStart conditions	ReStart front	Lever position	LED indicators			Description
			Left LED	Right LED	Aux contact	
MANUAL OPERATION						
Deactivated		I	○	○	**OFF**	Reset device **OFF**
Deactivated for over 15 minutes (*)		I	○	○	**ON** (*)	Reset device **OFF**
Deactivated		0	○	○	**OFF**	Reset device **OFF**
AUTOMATIC OPERATING CYCLE (**)						
Normal operation		I	○	●	**OFF**	Reset device ON
Electric circuit check		0	✳	●	**OFF**	Reset device in **system check condition.**
System insulation fault		0	● (standby)	●	**ON**	Reset device in **standby** conditions due to insulation fault of downstream electric system

(*) Available for 4pole versions only
(**) before sliding the plastic cover to the left to activate the device, it is necessary to set the associated circuit breaker in the "I" position.
NOTE: ReStart device can be in block condition (red led fixed) after 4 following trips too (t≤180s after previous trip for 2pole versions or t≤60s after previous trip for 4pole versions)

Specifically, ReStart Rm PRO may have the following operation condition:

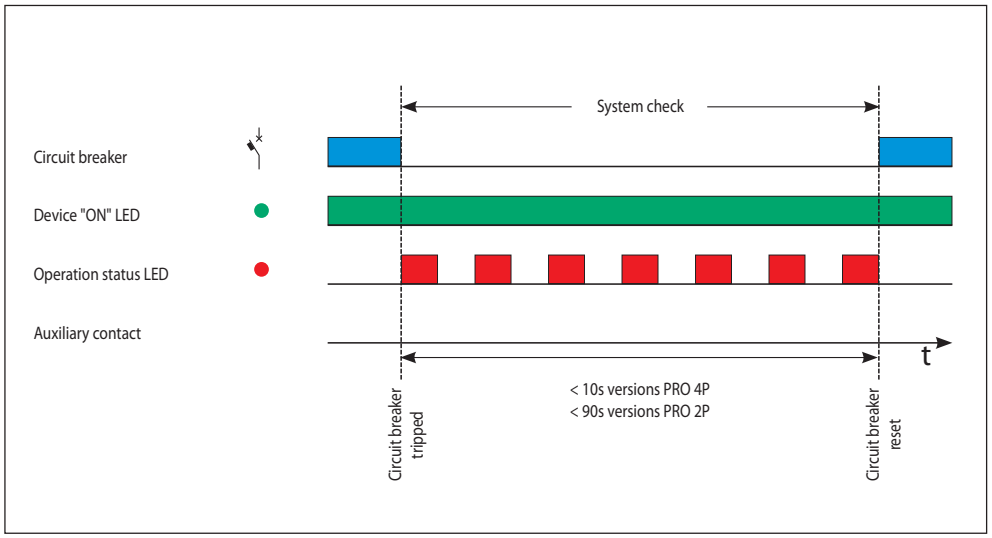
ReStart conditions	ReStart front	Lever position	LED indicators			Description
			Left LED	Right LED	Aux contact	
AUTOMATIC OPERATION						
System short-circuit fault		0	● (fixed)	●	**ON**	Reset device in **block** condition due to short-circuit fault of downstream electric system

Key

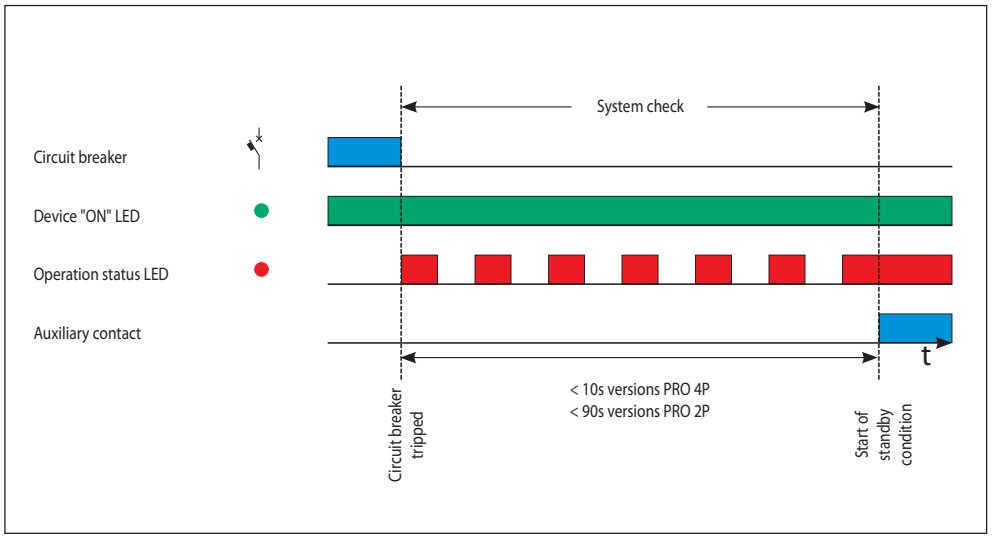


Restart Rd and Rm PRO operation conditions

ReStart function with positive result



ReStart function with negative result



Key

Closed circuit

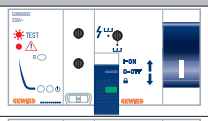
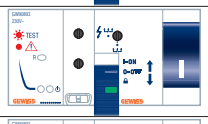
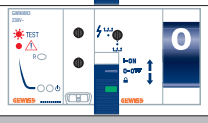
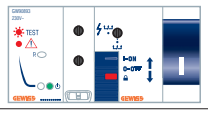
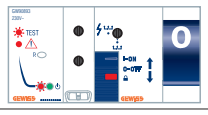
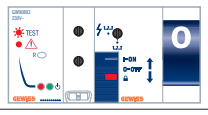
Device ON

System check in progress

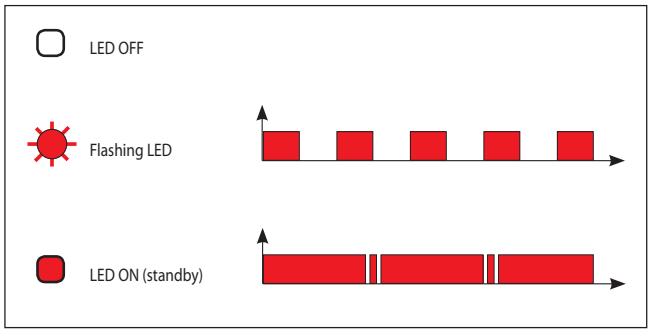
Device standby

ReStart Rm TOP light signalling

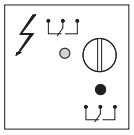
ReStart Rm TOP is equipped with two LEDs on the front which show the operation conditions of the device. In addition, by adjusting the two trimmers you can select the operation mode.

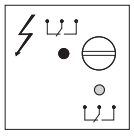
ReStart conditions	ReStart front	Lever position	LED indicators				Description
			Left LED	Right LED	Aux contact 1	Aux contact 2	
MANUAL OPERATION							
Short-circuit in the system		I	○	○	OFF	ON	Device OFF
Deactivated for over 15 minutes		I	○	○	ON	ON	Device OFF
Deactivated		0	○	○	OFF	OFF	Device OFF
AUTOMATIC OPERATING CYCLE							
Normal operation		I	○	●	OFF	ON	Device ON
Electric circuit check		0	✳	●	OFF	OFF	Device in **system check condition**
System failure		0	●	●	ON	OFF	Device in **standby** due to system fault

Key



Setting of Aux contact 2

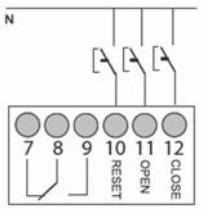

Auxiliary switch


Fault indicator switch

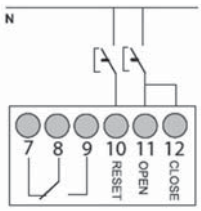
NOTE: to change the function of Aux contact 2, from auxiliary switch to fault indicator switch and viceversa, it's required to turn the selector by screwdriver and to make an automatic reclosing cycle.

Setting as motor operating

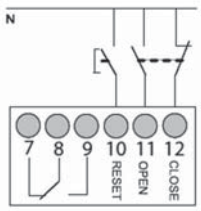
Push-button command



Cyclical command



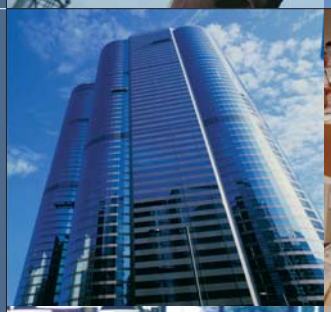
Held command



Application examples

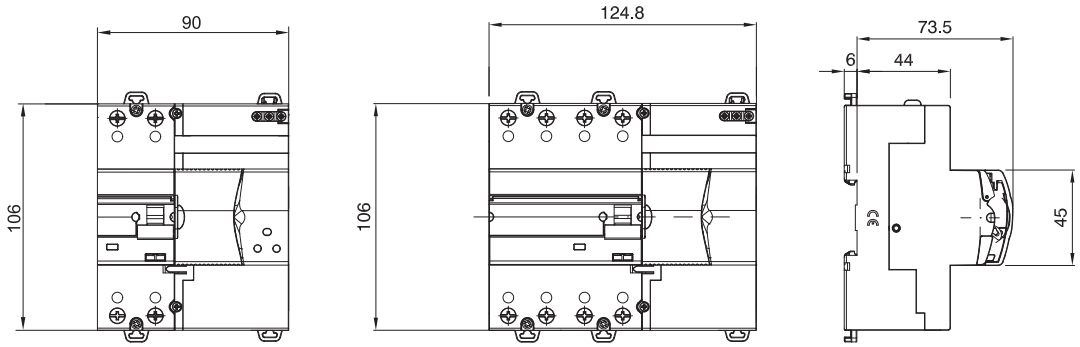
ReStart PRO

With Restart PRO it is possible to monitor the insulation level after tripping for an indefinite period of time (until acceptable values are obtained and the automatic reset operation is performed). This control system is indispensable where the system's insulation level can suddenly drop, due to weather conditions, and then rise thus allowing reset operations once optimal conditions are re-established.

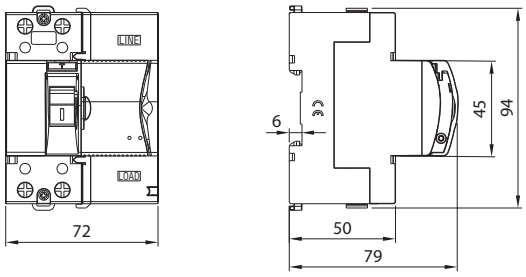
		SPECIFICATIONS	TYPICAL SYSTEMS
OUTDOOR SYSTEMS	   	- Exposure to atmospheric disturbance - Insulation levels depending on weather conditions (temperature and humidity) - Presence of electronic power supplies - Extensive damage due to blackout - Difficult accessibility of electrical circuit	- Lighting in public places - Outdoor lighting in gardens and squares - Sporting facilities - Traffic lights - Signalling - Pollution control stations - Telecommunication installations - Radio links - Traffic-information panels - Advertising hoardings
INDOOR SYSTEMS	   	- Strong presence of electronic power supplies - Extensive damage due to blackout - Need for guaranteed service continuity - Sensitivity to disturbance induced by mains supply and by atmospheric conditions - Insulation levels depending on weather and operating conditions	- Small, medium, and large tertiary sector - Industrial plants - Data processing centres - Garages - Pumping systems - Catering - Supermarkets - Ice-cream shops - Alarm system protection - CCTV system protection - Access monitoring system protection - Door and automatic gate protection

Dimension tables

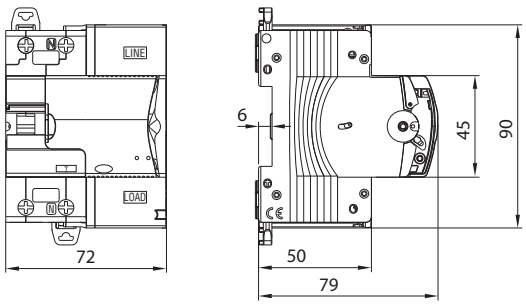
ReStart with Autotest 2P



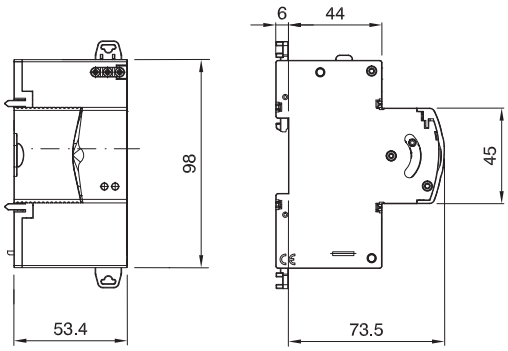
ReStart with Autotest PRO 4P



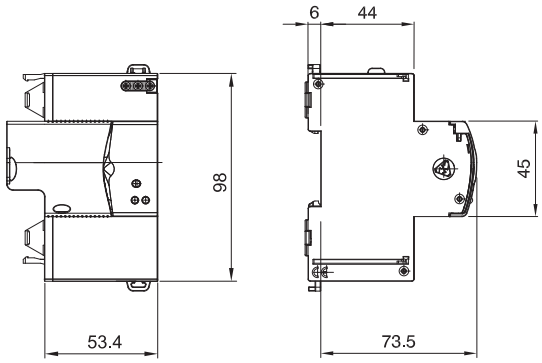
ReStart Rd/Rd PRO / Rm / Rm PRO 2P



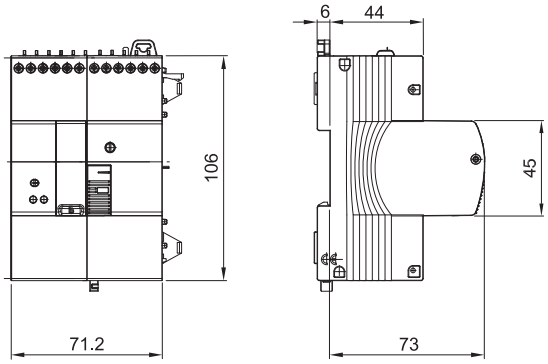
ReStart Rd PRO 4P



ReStart Rm PRO 4P



ReStart Rm TOP 4P



ReStart Cm