

## Features

- Number of reclosing attempts selectable from one to four
- High-speed or delayed automatic reclosing
- Automatic reclosing with or without the use of the synchrocheck and energizing check functions

## Application

The majority of power line faults are transient in nature, i.e. they do not recur when the line is re-energized following disconnection. The main purpose of the AR automatic reclosing

function is to automatically return power lines to service following their disconnection for fault conditions.

## Design

The AR function is a logical function built up from logical elements. It operates in conjunction with the trip output signals from the line protection functions, the OK to close output signals from the synchrocheck and energizing

check function, and binary input signals. The binary input signals can be for circuit breaker position/status or from other external protection functions.

## Function block

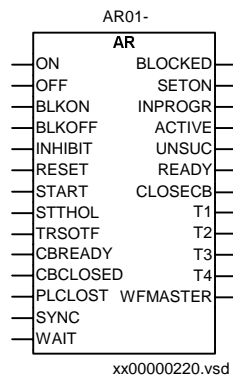


Figure 1: AR Function block

## Input and output signals

**Table 1: Input signals for the AR (ARnn-) function block**

Signal	Description
ON	Enables automatic reclosing operation
OFF	Disables automatic reclosing operation
BLKON	Sets automatic recloser to blocked state
BLKOFF	Releases automatic recloser from blocked state
INHIBIT	Inhibits automatic reclosing cycle

Signal	Description
RESET	Resets automatic recloser
START	Starts automatic reclosing cycle
STTHOL	Blocks automatic reclosing from thermal overload protection
TRSOFT	Provides for start of automatic reclosing cycle from switch-on-to-fault
CBREADY	Circuit breaker ready for operation
CBCLOSED	Circuit breaker closed
PLCLOST	Permissive communication channel out of service
SYNC	OK to close from synchronizing / energizing function
WAIT	Wait from Master for sequential reclosing

Path in local HMI: ServiceReport/Functions/AutoReclosernn/Counters/ClearCounters/FuncOutputs

**Table 2: Output signals for the AR (ARnn-) function block**

Signal	Description
BLOCKED	Automatic recloser in blocked state
SETON	Automatic recloser switched on
INPROGR	Automatic reclosing attempt in progress
ACTIVE	Automatic reclosing cycle in progress
UNSUC	Automatic reclosing unsuccessful
READY	Automatic recloser prepared for reclosing cycle
CLOSECB	Close command to circuit breaker
T1	Three-pole reclosing, shot 1 in progress
T2	Three-pole reclosing, shot 2 in progress
T3	Three-pole reclosing, shot 3 in progress
T4	Three-pole reclosing, shot 4 in progress
WFMASTER	Wait from Master for sequential reclosing

### Autorecloser counter values

**Table 3: Autorecloser counter values AR (AR---)**

Viewed data (default labels used, data is example values)	Counter value
3ph-Shot1= nnn	Recorded number of first three-pole reclosing attempts
3ph-Shot2= nnn	Recorded number of second three-pole reclosing attempts
3ph-Shot3= nnn	Recorded number of third three-pole reclosing attempts
3ph-Shot4= nnn	Recorded number of fourth three-pole reclosing attempts
NoOfReclosings= nnn	Recorded number of all reclosing attempts

## Technical data

Table 4: AR - Automatic reclosing function

Parameter	Setting range	Accuracy
Automatic reclosing open time: shot 1 - t1	0.000-60.000 s in steps of 1 ms	+/- 0.5% +/- 10 ms
shot 2 - t2	0-90000.0 s in steps of 0.1 s	+/- 0.5% +/- 10 ms
shot 3 - t3	0-90000.0 s in steps of 0.1 s	+/- 0.5% +/- 10 ms
shot 4 - t4	0-90000.0 s in steps of 0.1 s	+/- 0.5% +/- 10 ms
Maximum wait time for OK to close from synchronizing function tSync	0-90000.0 s in steps of 0.1 s	+/- 0.5% +/- 10 ms
Duration of close pulse to circuit breaker tPulse	0.000-60.000 s in steps of 1 ms	+/- 0.5% +/- 10 ms
Duration of reclaim time tReclaim	0-90000.0 s in steps of 0.1 s	+/- 0.5% +/- 10 ms
Inhibit reclosing reset time tInhibit	0.000-60.000 s in steps of 1 ms	+/- 0.5% +/- 10 ms
Maximum trip pulse duration tTrip (longer trip pulse durations will either extend the dead time or interrupt the reclosing sequence)	0.000-60.000 s in steps of 1 ms	+/- 0.5% +/- 10 ms
Maximum wait time for release from Master tWaitForMaster	0-9000.0 s in steps of 0.1 s	+/- 0.5% +/- 10 ms
Wait time following close command before continuing with further reclosing attempts without new start signal if circuit breaker does not close tAutoWait	0.000-60.000 s in steps of 1 ms	+/- 0.5% +/- 10 ms
Time delay before indicating reclosing unsuccessful tUnsuc	0-9000.0 s in steps of 0.1 s	+/- 0.5% +/- 10 ms
Time CB must be closed before AR becomes ready for a reclosing cycle tCBClosed	0.000-60.000 s in steps of 1 ms	+/- 0.5% +/- 10 ms

Table 5: Automatic reclosing function

Parameter	Value
Reclosing shots	1-4
Breaker closed before start	5 s

## Manufacturer

**ABB Automation Technology Products AB**

Control & Force Measurement

Substation Automation

SE-721 59 Västerås

Sweden

Tel: +46 (0) 21 34 20 00

Fax: +46 (0) 21 14 69 18