

# MiCOM Agile P346



## Generator Protection Relay

A number of protection functions are required to fully protect generators against adverse effects of different types of faults and abnormal operating conditions that might occur.

### Cost-Effective Solution

MiCOM Agile P346 is a cost-effective solution for comprehensive protection and management of generators and generator transformers.

Newly incorporated features and extensive functionalities provide a cost effective solution, taking care of the generator and GT installations as well.

Advanced features include vector correction facilities for check synchronization and dual redundant Ethernet on IEC-61850 along with the basic protection features essential for generator protection. Differential triple slope characteristics with ratio and vector group corrections can be used for overall differential applications (figure 1), 2<sup>nd</sup> and 5<sup>th</sup> harmonic blocking ensures stability during inrush and overfluxing conditions. High set elements ensure rapid clearance of heavy fault currents within a short duration.

In addition the built in check synchronization function ensures safe closing of the generator CB maintaining synchronism with system voltage. It also accounts for vector shift compensation across the transformer (figure 2).

The advanced loss of life monitoring feature maintains secure statistics related to ageing and operation of the transformer under elevated temperatures and frequent exceeding of the rated current which allows the estimation of life expectancy of the equipment. The through fault monitoring feature also tracks repetitive external fault occurrences which may have caused insulation heat degradation at winding hotspots, or mechanical forces to displace cores providing complete protection to the transformer.

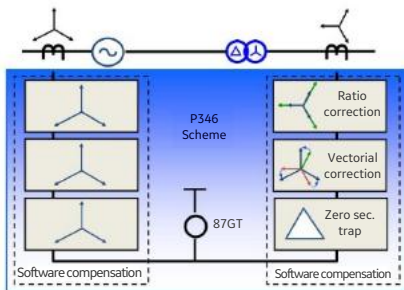


Figure 1 P346 for transformer differential protection

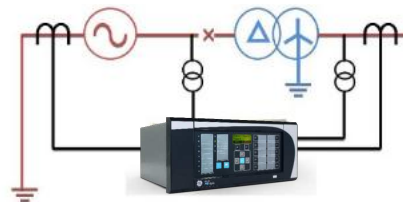


Figure 2 P346 for synchronization check

## Key Benefits

- Inbuilt check synchronising feature with vector shift compensation and ratio correction
- Turbine abnormal frequency protection to protect turbine blade from potential damage
- Redundant IEC 61850 Ethernet ports
- Harsh environment coating extends product life in corrosive environments
- High break output contacts for direct tripping of CB
- Programmable Scheme Logic to allow easy customization

## Protection Functions

- Generator/Transformer differential
- Interturn
- Overcurrent
- Ground fault
- Neutral voltage displacement
- Sensitive or restricted earth fault
- Voltage dependent overcurrent or under impedance
- Under and overvoltage
- Under and over frequency
- Reverse, low forward or overpower
- Field failure
- Negative phase sequence thermal
- Negative phase sequence overcurrent and overvoltage
- Turbine abnormal frequency
- Thermal and overfluxing
- Rotor ground fault
- VT and CT supervision

## Functional Overview

ANSI	IEC 61850	Features	Stages
87GT	DifHzd/LzdPDIF/XfrPDIF	Generator/Transformer differential	1
50DT	DifIntPDIF	Interturn (split Phase)	1
50/51/67	OcpTOC	Directional / Non-directional, instantaneous / time delayed overcurrent	4
50N/51N	EfmPTOC	Non-directional, instantaneous / time delayed phase ground fault	2
67N/67W	SenSefPTOC	Sensitive directional ground fault / wattmetric ground fault	1
64	SenRefPDIF	Restricted ground fault	1
51V	SbkOcpVOC	Voltage dependent overcurrent	1
21	SbkUzpPDIS	Underimpedance	2
59N	VtpResPTOV	Neutral voltage displacement/residual overvoltage, interturn-measured (M), derived (D)	2M/2D
27/59	VtpPhsPTUV/PTOV	Under/Over voltage	3/2
81U/81O/81R	FrqPTUF/PTOF/DfpPFRC	Under/Over frequency/ df/dt	4/2/4
81AB	TafPTAF	Turbine abnormal frequency	6
32R/32L/32O	PwrPPWR	Reverse/Low forward/Over power	4
40	ExcPDUP	Loss of field	2
46T	RtpTrpPTTR	Negative phase sequence thermal	2
46OC	NpsPTOC	Directional / non-directional, negative phase sequence overcurrent	4
47	NpsPTOV	Negative phase sequence overvoltage	1
49G/T	ThmPTTR, Hot/TopPTTR	Stator/Transformer thermal overload	2/3/3
24	VhzPVPH	Overfluxing	5
LoL/Thru	LoIMMTR/MMXU	Loss of life/Thru fault monitor	1/1
50BF	CbRRCFB	CB fail	2
	SvnRVCS	Current transformer supervision	2
	SvnRVCS	Voltage transformer supervision	1
25	AscRSYN	Check synchronising	2
64R	RtrLfIPEFI	Rotor ground fault (available with CLIO option and P391)	2
	RtfPTTR	RTDs x 10 PT100	Option
	CliAlm/TrpPTUC	CLIO (4 analogue inputs + 4 analogue outputs)	Option
		IRIG-B time synchronization (modulated/demodulated)	Option
		Front USB communications port	1
		2 <sup>nd</sup> rear communications port (COMM2/RP2)	Option

## Global Functions

The following global functions are available:

- 4 setting groups
- Metering
- Event recording
- Disturbance recording
- Fault recording
- Trip circuit supervision
- Breaker state and condition monitoring

For more information please contact  
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