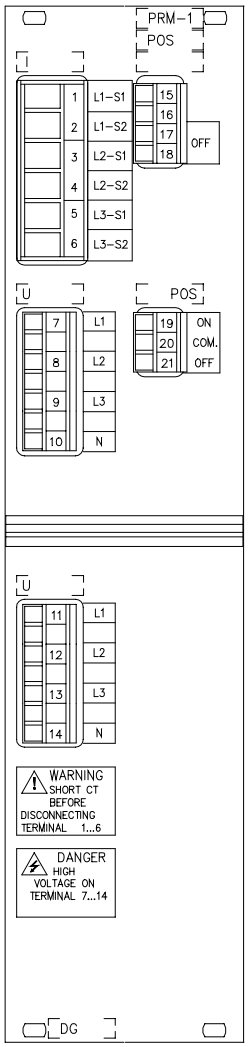
Delomatic – Multi-function system

Data PRM-1, Protective Relay Module

4921240060E



PRM-1, Protective Relay Module:

- ***Designed for protection of generator and/or mains breakers where gen-set runs in parallel with the mains***

DEIF A/S

Protective Relaying Module (PRM-1)

The Protective Relaying Module (PRM) is a multi-function module consisting of a multi-transducer unit and a protection unit. In short, the PRM enables implementation of a wide number of mains protective functions by installing the interactive PRM module in the Delomatic system. The PRM is designed for protection of e.g. generator sets and mains breakers against fatal mains faults in applications comprising generator(s) running in parallel with the mains e.g. power stations, electrical co-generation plants and combined heat and power plants.

The mains protection unit

The protective functions operate according to limits and timers. The set-points for limits and timers are received from the Control Module (CM) and compared with the corresponding measured values (measured by the integrated multi-transducer unit).

The multi-transducer unit measures AC-values such as:

- U_{MAINS} U_{L1-L2}, U_{L1-L3} and U_{L2-L3} (Δ-connection) ** note 1*
- U_{MAINS} U_{L1-N}, U_{L2-N} and U_{L3-N} (Y-connection) ** note 1*
- I_{MAINS} I_{L1}, I_{L2} and I_{L3}
- f_{MAINS} Mains frequency

Breaker OFF control

The breaker OFF control is an integrated part of the protection unit, but operates in coherence with OFF commands transmitted from the application program as well.

The breaker position is supervised by a two-terminal feedback input signal from the breaker.

The breaker OFF signal is a potential-free relay output.

Technical specifications for the breaker OFF control:

TRIPPING signal: Potential-free contact set:

Max. ratings: AC: 250V – 5A – 1000VA
DC: 250V – 1A – 50W

Pos. feedback: Binary inputs: Potential-free contacts.

**note 1* *The multi-transducer may be adapted to both 3 and 4 wire grids. If the PRM module is to operate in a 4 wire grid, the voltages are measured as in a Y-connection (phase – neutral values). If the grid is a 3 wire system, the voltages are measured as in a Δ-connection (phase – phase values).*

Based on the measurements made by the multi-transducer unit, the PRM module enables the DELOMATIC system to implement a number of mains protective functions such as:

STANDARD PROGRAMMABLE SET-POINTS	RANGE %	DELAY sec.	ANSI no.
Mains overvoltage protection, U_{MAINS} >	90...130	1...99	59
Mains undervoltage protection, U_{MAINS} <	70...99	1...99	27
Mains overfrequency, f_{MAINS} >	100...140	0.2...99	81O
Mains negative sequence voltage high, $U_{NEG.\ SEQ}$ >	0...30	1.999	60U
Generator negative sequence current high, $I_{NEG.\ SEQ}$ >	1...99	1...99	46
Generator overcurrent, I_{GEN} >	25...250	0.3...99	51

FAST PROGRAMMABLE SET-POINTS	RANGE %	DELAY periods	ANSI no.
Mains overvoltage protection, U_{MAINS} >>	90...130	3...5	59
Mains positive sequence voltage low, $U_{POS.\ SEQ}$ <	0...30	2...5	60

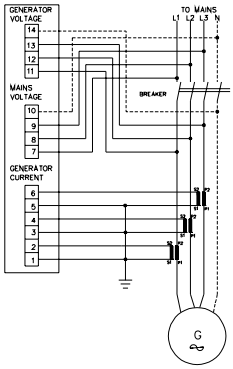
FAST PROGRAMMABLE SET-POINTS	RANGE Hz/s	DELAY periods	ANSI no.
Mains freq. positive rate of change, Mains +df/dt >	+0.6...+6.0	3...5	81R
Mains freq. negative rate of change, Mains –df/dt >	-6.0...-0.6	3...5	81R

All above mentioned functions are controlled according to programmable set-points and delays.

AC measuring inputs

Please note: Max input voltage is 690V AC. Higher voltages require voltage measuring transformers.

Wiring shown is for 4-wire with neutral. If wiring is 3-wire without neutral, terminals 10 and 14 are left unused.



Specifications for the multi-transducer unit

Technical specifications for the multi-transducer unit in the PRM:

Measurement:	Accuracy:	Class 1 according to IEC 688 (-10..15..30..+55°C)
	Frequency range:	40...70Hz
	Harmonics:	Max. 500Hz are measured and included in the results and calculations.
Current:	3-phase current:	-/1 or -/5A. Crest factor: Max. 6. The internal current transformers have a burden of typ. 0.3VA for each phase. Selection of CT ratio (-/1A or -/5A) of the internal current transformer are made in the application program.
	Overload ratings:	10A continuously. ≤ 75A for 10 s, ≤ 300A for 1 s.
Voltage:	Voltage range:	Low: 100...200V AC ± 20% (phase-phase) Med.: 201...379V AC ± 20% (phase-phase) High: 380...690V AC ± 20% (phase-phase) Crest factor: Max. 1.5. The internal voltage measuring circuit has a burden of max. 0.5VA for each phase. Selection of Low, Medium or High voltage range are made by means of jumpers on the PCB.
	External fuse:	Max. 2A. Slow blow fuse.
	Overload ratings:	2 x UN for 10 s.
Supply:	From PSM via the back plane.	
Galvanic separation:	Test voltage:	2.5kV/2.0kV – 50Hz – 1 min. According to GL, LR and DNV.
Power consumption:	Typ. 2.0W. Max. 3W.	
Dimension:	Width:	60.96 mm (12 TE)
	Weight:	0.85 kg (1.9 lb)
Screw terminals:	Current input: All others:	4 mm2 (single/multi-stranded) 2.5 mm2 (single/multi-stranded)
Flammability:	Plastic parts:	Self-extinguishing according to UL94-VO.
Environment:	Temperature:	Reference: +15...+30°C Nominal: -10...+55°C Operational: -25...+70°C Storage: -40...+70°C
	Climate:	Class HSE, according to DIN 40040.
Protection:	IP20 when mounted in a DELOMATIC rack.	
Approvals:	The DELOMATIC system is CE marked and type approved by ABS and BV.	

Errors and changes excepted.

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