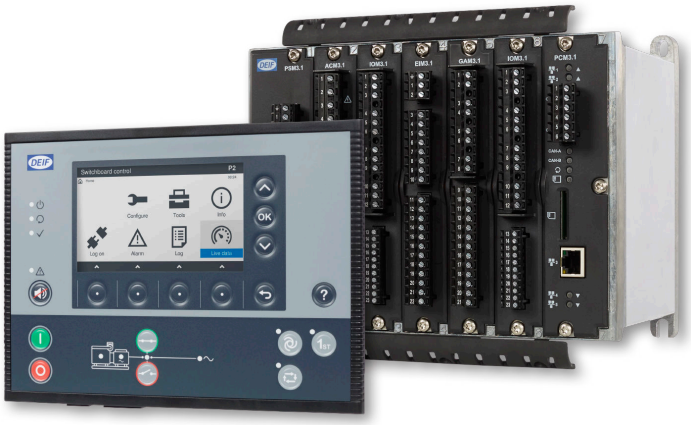
Product sheet

PPM 300 Protection and Power Management controller



About the PPM 300

The PPM 300 is an intelligent controller platform made for applications in the marine and offshore industry. The controller design is modular and you can replace or add hardware modules.

The PPM 300 has a range of control, protection, and supervision functions. Each controller can protect and control a genset, an inverter with a power source, a shaft generator, a shore connection and a bus tie breaker.

Use the PPM 300 power management system to control the system. The controller makes sure that the operation is stable and that the necessary power is always available.

The PPM 300 controllers work together in a multi-master system. Each PPM 300 controller is a master controller. If there is a controller failure, the other controllers in the system continue to operate. Redundant communication between the controllers is also possible. If there is a communication link failure, the system continues to operate.

The controller display is a 5” colour graphic screen that shows status and information messages. You can also see live data and alarms on the display. The operator can change the parameter settings with the correct permission level.

Controller types

GENSET controller: Controls and protects an engine, a generator, and the generator breaker.

EMERGENCY genset controller: Controls and protects an emergency genset, the generator breaker, and the emergency tie breaker on the busbar.

HYBRID controller: Controls and protects an inverter with a power source, and the inverter breaker.

SHAFT generator controller: Controls and protects a system that includes a shaft generator.

SHORE connection controller: Controls and protects a system that includes a shore connection and a shore connection breaker.

BUS TIE breaker controller: Each BUS TIE breaker controller controls one bus tie breaker.

Controller functions

Power management

- PMS with ring communication
- A fast load reduction of less than 100 ms

Engine and breaker control

- Automatic synchronisation and deloading
- Fuel optimisation
- Idle run start and stop. You can configure the warm-up and cooling down periods.

Software

- PC software tool that is easy to use (PICUS)
- Broadcast of software
- Emulation and supervision
- Logic configuration tool
- Protection against a network storm

Configurable controller

- Configurable hardware modules
- Configurable input and output functions
- Automatic configuration of network and I/O modules

Communication

- 5 x RJ45 ports
- Access all controllers on a network through one Ethernet connection

Settings and parameter functions

- Event and alarm log with real-time clock
- Programmed control settings
- Password-protected controller. You can configure the permission levels.
- Alarm handling with latch and shelve functions

General functions

- Heavy consumer control
- Blackout prevention and recovery
- 3-phase AC measurement a maximum of 690 V AC directly, class 0.5

Display

- 5" colour graphic display with push-buttons

PPM 300 functions

Configurable controller
- A maximum of 4 sets of nominal settings
- Configurable parameters for controller functions
- The operator can use different procedures to start controller sequences

Easy to use
- Default parameter, and input and output configuration
- Automatic date and time synchronisation of controllers in a system
- NTP time synchronisation with NTP servers

Display
- A maximum of 2 display units (with interlock) for each controller
- Supports many languages

Software (PICUS)
- Single-line diagram tool. You can use it for design, configuration and broadcast
- Flexible application drawing
- I/O status
- You can record operational values
- Maintenance of software for the controller and display
- Supports many languages

CustomLogic
- A maximum of 20 input events and 20 output commands for each controller
- Communication between the controllers. A maximum of 16 inputs and 16 outputs for each controller
- A maximum of 20 Modbus signals (inputs and/or outputs) for each controller

Communication
- Static Internet Protocol version 6 (IPv6)
- Configurable Internet Protocol version 4 (IPv4)
- Configurable Ethernet port settings on PCM3.1
- CAN bus communication to an Engine Control Unit (ECU)
- DEIF network
- Internal communication (extension racks)
- Network (PICUS and Modbus)
- The controllers are connected in a ring for communication redundancy
- Authentication (other equipment cannot disrupt communication)

Modbus
- Convert data units and scaling
- Configure Modbus server settings

Breaker control
- De-load before opening
- The operator can start synchronisation and de-loading
- Breaker types: Pulse breaker, Compact breaker, Continuous breaker
- Breaker position detection
- Breaker alarms

Blackout prevention
- Operate with a closed bus tie breaker during critical operations
- If there is a genset governor or AVR failure, the bus tie breaker trips and disconnects the genset

Redundancy
- Ring connections (busbar, DEIF network, and internal communication)
- Use the display, inputs, PICUS or Modbus to operate the controller
- Redundant breaker feedback on bus tie breakers and externally controlled breakers

AC measurement averaging
- Use averaging filters (200 ms and 800 ms) to decrease the value fluctuations from the high performance of the measurement cards
- You can select which measurements to average

Safety shutdown for the engine interface
- You can use the EIM3.1 as a safety shutdown module and it can operate the engine in stand-alone mode

Engine interface communication
- Generic J1939 protocol

General functions
- Diode offset to correct the values for the power supply voltage
- Relay configuration (function, coil state)
- Sensor for analogue input failure (less than and more than the limits)
- Configured curves for the analogue inputs and outputs. A maximum of 20 curves

Power management

Makes sure that there is power
- Blackout prevention
- Configurable recovery after blackout

Satisfactory operation
- Calculates the load
- Calculates load-dependent start and stop
- Asymmetrical load sharing
- Secured operation (power reservation)

Can control the load
- Load transfer (for synchronisation, de-loading and load sharing)
- Load-dependent start and stop (there are two sets of parameters available)
- The power management system calculates the control set points
- You can use external analogue inputs as control set points

Select the genset priority
- Manual
- Dynamic (the first genset to connect has the highest priority)
- Running hours

Heavy consumer
- A maximum of 4 fixed or variable heavy consumers for each controller
- Programmed sequence for heavy consumer management (with configurable parameters)
- Digital or analogue feedback from the heavy consumer

Busbar section
- Configurable power management rules for each section
- A maximum of 4 breakers controlled externally for each controller (bus tie breakers and/or shore connection breakers)
- It is possible to have many ring busbars

Load sharing
- Load sharing (GOV) of active power (kW)
- Reactive power (kvar) sharing (AVR)
- Load sharing between gensets (over the DEIF network)
- There are these load sharing options for each busbar section:
  - Equal load sharing (symmetrical)
  - Asymmetric load sharing

AC protections for the source

2 x Over-voltage..... ANSI 59
2 x Under-voltage..... ANSI 27
1 x Voltage unbalance..... ANSI 47
1 x Negative sequence voltage..... ANSI 47
1 x Zero sequence voltage..... ANSI 59N
2 x Over-current..... ANSI 51
2 x Fast over-current (short circuit)..... ANSI 50/51
2 x Current unbalance..... ANSI 46
1 x Inverse time over-current..... ANSI 51
2 x Directional over-current..... ANSI 67
1 x Negative sequence current..... ANSI 46
1 x Zero sequence current..... ANSI 51N
2 x Over-frequency..... ANSI 81O
2 x Under-frequency..... ANSI 81U
2 x Overload..... ANSI 32
2 x Reverse power..... ANSI 32R
1 x Overload reverse power *..... ANSI 32R
2 x Over-excitation (Reactive power export)..... ANSI 40O
2 x Under-excitation..... ANSI 40U
(Reactive power import/loss of excitation)
1 x Stabilised differential current protection **..... ANSI 87G
1 x High set differential current protection **..... ANSI 87G
Synchronisation check (including blackout close)..... ANSI 25

** Only for the HYBRID controller when it operates in PTI mode*
*** Available with Differential Current module ACM3.2*

AC protections for the busbar

2 x Over-voltage..... ANSI 59
2 x Under-voltage..... ANSI 27
1 x Voltage unbalance..... ANSI 47
2 x Over-frequency..... ANSI 81O
2 x Under-frequency..... ANSI 81U

Other AC protections

1 x Lockout relay..... ANSI 86
1 x Earth inverse time over-current..... ANSI 51G
1 x Neutral inverse time over-current..... ANSI 51N

About the specifications

More information
See the **PPM 300 Data sheet** for the full technical specifications. You can find the data sheet here: www.deif.com/documentation/ppm-300/

Electrical specifications

Safety

- EN 61010-1, CAT III, 600V, pollution degree 2
- IEC/EN 60255-27, CAT III, 600V, pollution degree 2
- UL508
- UL6200
- CSA C22.2 No. 14-13
- CSA C22.2 No. 142 M1987

Electromagnetic compatibility (EMC)

- EN 61000-6-3 Residential, commercial and light-industrial environments
- EN 61000-6-2 Industrial environments
- IEC/EN 60255-26
- IEC 60533 power distribution zone
- IACS UR E10 power distribution zone for controller rack
- IEC 60945 for display unit

Load dump

- ISO 7637-2 pulse 5a

Environmental specifications

Humidity

- 97 % relative humidity, to IEC 60068-2-30

Operating temperature

- Rack and modules: -40 to 70 °C (-40 to 158 °F)
- Display unit: -20 to 70 °C (-4 to 158 °F)
- UL/cUL Listed: max. surrounding air temp.: 55 °C (131 °F)

Storage temperature

- Rack and modules: -40 to 80 °C (-40 to 176 °F)
- Display unit: -30 to 80 °C (-22 to 176 °F)

Operating altitude

- 0 to 4000 m (13,123 ft).
- Refer to the module specifications for information on altitude derating above 2,000 m (6,562 ft).

Mechanical specifications

Vibration

- Operation:
  - 3 to 8 Hz: 17 mm peak-to-peak
  - 8 to 100 Hz: 4 *g*
  - 100 to 500 Hz: 2 *g*
- Response:
  - 10 to 58.1 Hz: 0.15 mm peak-to-peak
  - 58.1 to 150 Hz: 1 *g*
- Endurance:
  - 58 to 150 Hz: 2 *g*
- Seismic:
  - 3 to 8.15 Hz: 15 mm peak-to-peak
  - 8.15 to 35 Hz: 2 *g*
- IEC 60068-2-6, IACS UR E10, IEC 60255-21-1 (class 2), IEC60255-21-3 (class 2)

Shock (base mounted)

- 10 *g*, 11 ms, half sine IEC 60255-21-2 Response (class 2)
- 30 *g*, 11 ms, half sine IEC 60255-21-2 Endurance (class 2)
- 50 *g*, 11 ms, half sine IEC 60068-2-27

Bump

- 20 *g*, 16 ms, half sine IEC 60255-21-2 (class 2)

Material

- All plastic materials are self-extinguishing as specified by UL94 (V0)

NOTE *g* refers to gravitational force (g-force).

Approvals

- CE
- UL/cUL Listed to UL508 - Industrial Control Equipment, and CSA C22.2 No. 142 M1987 - Process Control Equipment
- UL/cUL Recognised to UL6200 - Controls for stationary engine driven assemblies, and CSA C22.2 No. 14-13 - Industrial Control Equipment

Maritime classification societies approvals

More information
See www.deif.com for the newest approvals.

For more information:
DEIF A/S
Frisenborgvej 33, 7800 Skive, Denmark
Tel.: +45 9614 9614, info@deif.com
www.deif.com