



TC41-DG DIESEL ENGINE GOVERNOR

Micro-processor based diesel governor

Low-cost digital governor system to replace ageing mechanical and electronic equipment.



Turbine Controls Limited

TC41-DG diesel engine governor

Governor control system for diesel engines

TC41-DG Diesel Governor system

TCL have developed a governor system for diesel engine plant. The TC41-DG includes the necessary inputs and outputs to interface with standard plant devices. The TC41-DG can be configured to control existing plant using setpoint changes only.

A wide range of input and output modules provides interface with plant devices and options for alternative or additional functionality.

Obsolete and unreliable equipment is replaced with modern digital electronics having high reliability and accuracy and is an affordable alternative to a full control system retrofit.

Communication facilities provide interface with other diagnostic and control equipment.

Control functions

The following control functions are provided:

- 1) **Start-up ramp control**
Increases the fuel demand at a controlled ramp rate until engine speed control takes over.
- 2) **Engine speed control**
Controls the engine speed to enable synchronising. Provides droop or isochronous control of speed whilst on load. The speed measuring algorithms include digital filtering to remove once per rev fluctuations found on many diesel engines. Droop linearisation functions are provided to ensure consistent reaction to frequency changes.
- 3) **MW limit control**
Limits the maximum electrical load as measured by an external transducer.
- 4) **Maximum fuel demand signal**
Limits the maximum setting of fuel demand.
- 5) **Start fuel limiter**
Limits the maximum fuel demand during start-up to prevent over-fueling.
- 6) **Shutdown fuel limiter**
Limits the minimum fuel demand.
- 7) **Exhaust temperature monitoring**
Monitoring of individual exhaust thermocouples to detect high temperatures and monitor deviation spread.
- 8) **Linearisation functions**
Linearisation functions for throttle actuation.

Operator interface

Backlit VGA (120x90mm) graphic monochrome LCD display with keypad to enable the operator to make quick and informed decisions on the status of the turbine.

- Logic I/O status
- Bar graph and digital display of analogue values
- Alarm and trip alphanumeric message, time and date stamped
- Trend plot to view analogues
- Commissioning modes to ease fault finding and set up
- Allow forcing of outputs adjustment of control parameters (gains, setpoints, etc.)



TC41-DG

TC41-DG specification:

Hardware Features

- 700 kB SRAM, 4 MB FlashPROM
- 0.4 micro second instruction time (typical)
- 24 Vdc operation max 20 W
- All inputs, outputs and power supply are protected
- Operating temperature 0-50 deg C. Storage -20 to +60 deg C
- 3U (132mm) high 19" rack sub assembly, 162mm deep

I/O capability

- 10 x 24 Vdc sinking logic inputs
- 8 x 24 Vdc sourcing outputs
- 1 x clean contact output (used for trip contact) 0.5 A max
- RS232 and CAN bus interface ports
- 6 input modules for:
 - 4 x frequency/speed inputs
 - 4 x 4-20 mA signals
 - 4 x thermocouple input with built in cold junction compensation
 - 4 x analogue outputs
 - 4 x RTD inputs
 - Additional logic I/O
 - RVDT, LVDT and throttle actuator drives

Quality control

TCL have the following quality control accreditations:

- ISO 9001:2008
- TickIT Guide Issue 5 software production
- CSA Z299.2-85 Quality control developed for CANDU plant.

The system software is produced using rigorous quality control procedures developed during TCL's experience with developing software for nuclear power plants.

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