Digital Dual Driver Governor

### HT-D³100

#### Benefits
- Dual Actuator Driver
- Speedcontrol integrated
- IP65
- USB PnP communication
- Multiple PID settings
- Variable chopper frequency
- 3 fixed speed and 1 variable speed
- Overspeed protection
- AUX input for synch/load sharing
- RPM adjustment via digital signal
- Current limitation for actuator
- Adjustable via Keypad and PC software
- Programmable Fuel Ramping Timing for black smoke minimisation
- Display with good visibility under extreme temperature and lighting conditions
- Simple user interface with 3 push buttons
- Intuitive PC application software for configuring all features.
- Differential Input for thermocouple sensors for better noise immunity
- Digital Control of Dual dual fuel pumps or throttle body actuators within the same unit

#### Smart Governing with Dual Driver

The **HT-D³100** is a Digital Dual Driver Governor for controlling motor rotation speed on single engines that require dual fuel pumps or throttle body actuators. The governor features fast and precise reaction to load changes.

**HT-D³100** utilizes feedback from the Master and Slave Actuators and also the EGT (Exhaust Gas Temperature) via thermocouple to achieve optimum fuel equalization in each cylinder bank. The feedback from the Actuators allows the **HT-D³100** to know if there is any fuel supply imbalance to each of the cylinder banks. The EGT feedback provides an indication of the power produced from each cylinder, which further eliminates any possibility of fuel supply imbalance resulting from mechanical tolerances and friction. Any fuel imbalance will be compensated by the **HT-D³100** intelligent software algorithm to ensure that fuel supplies to each cylinder banks are always identical and balanced.

A closed control circuit using two actuators (Master and Slave), two temperature sensors (Master and Slave) and magnetic RPM sensor can be operated for a large number of motors in both an isochronous and static fashion. High precision and robust construction makes it possible to use in the harshest motor use conditions.

The microcontroller design provides precise and user-specific performance and functionality. The **HT-D³100** enables exact (<0.25%) isochronous rotation speed control. The permanent memory saves the settings even if the power supply is interrupted and thanks to a wide voltage range of 12-24VDC.

The **HT-D³100** digital dual driver governor is robust enough to be placed in a control cabinet with other operating control devices or installed on the motor. If water, mist or condensation can come into contact with the controller, it should be mounted vertically, allowing the liquid to flow away from the controller. Extremes of heat should be avoided.
Digital Dual Driver Governor

HT-D³100

Technical Specification

Human Interface

Easy to use software for tuning.

Dimensions
Digital Dual Driver Governor

HT-D³100

Configurable parameters, values in [ ] = factory settings

<table>
<thead>
<tr>
<th>Connection terminal</th>
<th>Description</th>
<th>Definition</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>FEED BACK1</td>
<td>Master Actuator position feedback</td>
<td>Speed Setting 2</td>
</tr>
<tr>
<td>B</td>
<td>GND</td>
<td>Ground</td>
<td>Speed Setting 3</td>
</tr>
<tr>
<td>C</td>
<td>FEED BACK2</td>
<td>Slave Actuator position feedback</td>
<td>Idle</td>
</tr>
<tr>
<td>D</td>
<td>+5VDC</td>
<td>Master and Slave actuator feedback sensor supply</td>
<td>Input Common</td>
</tr>
<tr>
<td>E</td>
<td>EXT SPEED</td>
<td>Load distribution / synchronisation</td>
<td>Speed Setting 3</td>
</tr>
<tr>
<td>F</td>
<td>T/C 1+</td>
<td>Master EGT input + (Thermocouple input+)</td>
<td>Digital I/O Supply</td>
</tr>
<tr>
<td>G</td>
<td>T/C 1-</td>
<td>Master EGT input - (Thermocouple input-)</td>
<td>Digital I/O Ground</td>
</tr>
<tr>
<td>H</td>
<td>T/C 2+</td>
<td>Slave EGT input (Thermocouple input+)</td>
<td>Digital Output 1</td>
</tr>
<tr>
<td>I</td>
<td>T/C 2-</td>
<td>Slave EGT input (Thermocouple input-)</td>
<td>Digital Output 2</td>
</tr>
<tr>
<td>J</td>
<td>RTD+</td>
<td>CJC temperature input +</td>
<td>0 – (Speed Trim FS -10) [1500]</td>
</tr>
<tr>
<td>K</td>
<td>RTD-</td>
<td>CJC temperature input -</td>
<td>0 – Overspeed rpm</td>
</tr>
<tr>
<td>L</td>
<td>SPEED2</td>
<td>Speed Setting 2</td>
<td>Feedback Sensor Input</td>
</tr>
<tr>
<td>M</td>
<td>SPEED3</td>
<td>Speed Setting 3</td>
<td>0 – 1500 ms</td>
</tr>
<tr>
<td>N</td>
<td>GND</td>
<td>Ground</td>
<td>+5VDC Supply</td>
</tr>
<tr>
<td>O</td>
<td>GAIN</td>
<td>GAIN parameter set 1 or 2</td>
<td>0 – (Speed MAX -10)</td>
</tr>
<tr>
<td>P</td>
<td>IDLE</td>
<td>Idle speed selection</td>
<td>Ground</td>
</tr>
<tr>
<td>Q</td>
<td>HI</td>
<td>CAN bus high</td>
<td>0 – Overspeed rpm</td>
</tr>
<tr>
<td>R</td>
<td>LOW</td>
<td>CAN bus low</td>
<td>Ground</td>
</tr>
<tr>
<td>S</td>
<td>S+</td>
<td>Master Actuator (Plus)</td>
<td>0 – 3000 rpm</td>
</tr>
<tr>
<td>T</td>
<td>T-</td>
<td>Master Actuator (Minus)</td>
<td>Actuator (Minus)</td>
</tr>
<tr>
<td>U</td>
<td>U-</td>
<td>Battery (Minus)</td>
<td>0 – 255 ms [10]</td>
</tr>
<tr>
<td>V</td>
<td>V+</td>
<td>Battery (Plus)</td>
<td>50 – 300 [120]</td>
</tr>
<tr>
<td>W</td>
<td>W+</td>
<td>Slave Actuator (Plus)</td>
<td>0 – 100,</td>
</tr>
<tr>
<td>X</td>
<td>X-</td>
<td>Slave Actuator (Minus)</td>
<td>Pickup (Plus)</td>
</tr>
<tr>
<td>Y</td>
<td>Y-</td>
<td>Pickup (Ground) (Mass)</td>
<td>CAN Low</td>
</tr>
<tr>
<td>Z</td>
<td>Z+</td>
<td>Pickup (Plus)</td>
<td>CAN High</td>
</tr>
</tbody>
</table>
**Technical Data**

**Performance**
- Isochronous/stability: ±0.25%
- RPM range: 300 - 8 KHz (112-4000 RPM for flywheel with 160 teeth)
- RPM variation with temperature: ±0.25% max.
- Idle adjustment: Full Range
- Speed Trim: Programmable 0-100%, (default = 5%)

**Surroundings**
- Temperature range: -40° to 85°C (-40 to +180°F)
- Relative humidity: up to 95%
- Surface finish: Fungus Proof and Corrosion Resistant
- CE certificate: EN55011, EN50081-2, EN50082-2

**Input/output parameters**
- Supply voltage: 12 or 24 VDC Battery, (6.5 VDC to 33 VDC)
- Polarity: Negative Mass (housing insulated)
- Current Consumption: 100 mA max. continuous, (Excluding actuator drawn current)
- Max permitted actuator current: 8 A continuous
- Engine speed sensor signal: 1 – 120 V RMS +5VDC Output (Terminal D): up to 20 mA
- Load Share/Synchronizer Input: 0-10 VDC (5V nominal, reversed, 5 rpm/V)
- Reverse Power Protection: Yes
- Transient Voltage Protection: 60V

**Norms/standards**
- Authorising office: CE and RoHS requirements
- Communication: SAE J1939 (Option)

**Reliability**
- Vibration: 7G, 20-100 Hz
- Shock: 20G Peak
- Inspection: 100% functionality inspection

**Mass and weight**
- Dimensions: 223 x 136 x 36 mm
- Weight: 1.000 kg
- Installation: direct on motor chassis, preferably vertical, with rubber shock absorbers, insulated, or in control cabinet

**Configuration parameters**
- Number of flywheel teeth, range: 50 - 250 teeth
- Overspeed protection: 4000 rpm
- Starter cut-out speed: 50 - 1000 Hz
- Fixed RPM: 400 – 8 000 Hz
- Variable RPM: 400 – 8 000 Hz
- Prescribed start quantity: 0 - 100 %
- Start ramp: 0 – 20 secs.
- Speed ramp: 0 - 100 secs.