TYRE PRESSURE CONTROL SYSTEMS (TPC-D)
Central Tyre Inflation System (Dynamic)
TYRE PRESSURE CONTROL SYSTEM (TPC-D) DYNAMIC

LED DISPLAY CONTROLLER OPTION

OR

LCD DISPLAY CONTROLLER OPTION

INDIVIDUAL WHEEL VALVES

PNEUMATIC CONTROL UNIT

TPC TYRE PRESSURE CONTROL SYSTEMS
PRODUCT DESCRIPTION:

This Tyre Pressure Control (TPC-D) system is used to control and monitor tyre pressure and is suitable for all types of vehicles. The TPC-D consists of two primary sub-systems, TPC-D MMI - Man Machine Interface and the TPC-D HUB – Control Unit. It is possible to configure the TPC-D for many different applications and vehicle types as per the client’s specific requirements.

APPLICATIONS:

- Military
- Mining
- Commercial Transport
- Agriculture

BENEFITS:

<table>
<thead>
<tr>
<th>VEHICLE MOBILITY</th>
<th>COMFORT &amp; SAFETY</th>
<th>BENEFITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct pressure for various speeds.</td>
<td>Improved passenger comfort on rough terrain.</td>
<td>Increase tyre life.</td>
</tr>
<tr>
<td>Correct pressure for various loads.</td>
<td></td>
<td>Optimises all-terrain tyres at a low pressure</td>
</tr>
<tr>
<td>Improved handling.</td>
<td></td>
<td>Decreases drive-line wear.</td>
</tr>
</tbody>
</table>

MODE FUNCTIONS:

- **Terrain Mode**: ROAD, OFF ROAD, SAND and EMERGENCY. Each of these pressures are software adjustable to suit customer’s requirements.

- **Load Mode**: FULL, HALF, QUARTER, EMPTY. Each of these selections are also software adjustable to compensate for vehicle loading.

- **Over Speed Mode**: There are two selections: 1. PASSIVE where an alarm is indicated when a preset vehicle speed is exceeded while operating on a low tyre pressure. 2. ACTIVE mode will automatically increase tyre pressures as the vehicle speed increases without a driver’s input.

VARYING TYRE FOOTPRINT:

<table>
<thead>
<tr>
<th>Mode</th>
<th>Road</th>
<th>Off-Road</th>
<th>Sand</th>
<th>Emergency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure</td>
<td>500 kPa</td>
<td>400 kPa</td>
<td>200 kPa</td>
<td>100 kPa</td>
</tr>
</tbody>
</table>

**ROAD**

- **500 kPa**: Suitable for smooth, dry roads.
- **400 kPa**: A good balance between traction and fuel efficiency.
- **200 kPa**: Optimal for off-road conditions with high traction and fuel efficiency.
- **100 kPa**: Best for extreme off-road conditions, ensuring maximum traction and payload capacity.

**OFF-ROAD**

- **500 kPa**: Maximum traction in adverse conditions.
- **400 kPa**: Balanced for general off-road use.
- **200 kPa**: Optimal for low-speed, rough terrains.
- **100 kPa**: Suitable for high-speed, smooth terrains.

**SAND**

- **500 kPa**: Maximum traction for hard-packed sand.
- **400 kPa**: Balanced for smooth sand.
- **200 kPa**: Optimal for soft, shifting sand.
- **100 kPa**: Suitable for hard, dry sand.

**EMERGENCY**

- **500 kPa**: Maximum traction in emergency situations.
- **400 kPa**: Balanced for general emergency use.
- **200 kPa**: Optimal for low-speed, rough terrains.
- **100 kPa**: Suitable for high-speed, smooth terrains.
TPC-D ELECTRO PNEUMATIC CONTROLLER - HUB:

1. FEATURES:
   - Rugged Design: Designed for harsh environments
   - Console Options: Multi-colour LED interface OR 70 x 35 LCD interface
   - Short-Circuit Protection: Each output has short-circuit protection
   - CAN BUS Interface: CAN SAE J1939 HUB and 3rd party devices
   - Inflate/Deflate Options: Control tyre pressures according to terrain and load selections
   - Status Indication: Communication state / error state / system mode state
   - Configurable System Modes: Operating, terrain, load, self-teach, black-out, over-speed, flat-tyre
   - USB Interface Port: Firmware updates, parameter updates, data logs download
   - Diagnostic Port: RS-232 PC Diagnostic interface
   - Automatic inflation of tyres depending on vehicle speed (Optional)
   - Basic 4x4 Systems, may be directly controlled via the MMI without using a CAN BUS HUB

2. SPECIFICATIONS:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage Range</td>
<td>9-32VDC</td>
</tr>
<tr>
<td>Outputs</td>
<td>12 Channel (Short-circuit protected) - Amp Rating</td>
</tr>
<tr>
<td>External Inputs</td>
<td>8 Channel (Opto-isolated - Trigger) - 24 VDC</td>
</tr>
<tr>
<td>CPU</td>
<td>ARM Processor</td>
</tr>
<tr>
<td>CAN BUS</td>
<td>1X SAE J1939 CAN interface</td>
</tr>
<tr>
<td>RS-232</td>
<td>Real-time Diagnostic interface</td>
</tr>
</tbody>
</table>

TPC-D MMI AND TPC-D HUB ENVIRONMENTAL CONDITIONS:

<table>
<thead>
<tr>
<th>Condition</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature Range</td>
<td>-20°C to 60°C</td>
</tr>
<tr>
<td>Storage Temperature Range</td>
<td>-20°C to 70°C</td>
</tr>
<tr>
<td>Vibration</td>
<td>2G Peak</td>
</tr>
<tr>
<td>Humidity</td>
<td>100% Humidity</td>
</tr>
<tr>
<td>Protection Rating</td>
<td>IP 67</td>
</tr>
</tbody>
</table>
OPERATING PRINCIPLE:

The TPC-D system functions on two basic principles:

- Pressure during the inflation and measurement phases
- Negative pressure during the deflation phase.

Pressure is only asserted on the rotating joints and pipes during these phases. Any break in the pipe-line between the rotating joint and the wheel valve does not cause leakage on the tyres. Inversely, a puncture does not prevent the system’s use on the other tyres.

The standard system controls tyre pressures between 0.8 bar and 9 bar. The TPC-D system is made up of four main components which are listed below, linked together by electric and/or pneumatic connections:

- A control panel (MMI), in the cab.
- A pneumatic and electronic distribution unit (HUB).
- Wheel valves, with one or more valves per wheel.
- The other components are recommended and supplied as additional components on request.

![Diagram of TPC-D system components](image-url)
TYRE PRESSURE CONTROL SYSTEM (TPC-D)

SYSTEM FEATURES:

MAN MACHINE INTERFACE (MMI)
- Outputs 8 Channel
  - Short-circuit protected
- Inputs 3 Channel
  - Opto-isolated
- Interface buttons
  - 5 Buttons
- Rugged Enclosure

ELECTRO/PNEUMATIC CONTROLLER (HUB)
- Outputs 12 Channel
  - Short-circuit protected
- Inputs 8 Channel
  - Opto-isolated
- RS-232 Diagnostic Interface
- USB Data Download Interface
- CAN BUS

Commercial Option
- 70 x 35 LCD MMI – Driver’s Console

Military Option
- OR
- LED MMI– Driver’s Console