CUSTOMER

Club Car

Vehicle: Electric golf cart and light utility vehicle

Driveline layout: Rear wheel drive, rear transversal electric motor coupled with transaxle

Product: Transaxle

Motor features: 3 kW, 105 Nm @ 3200 rpm, max. speed 6000 rpm

Gearbox features: Two step reduction
Total reduction ratio 1:12.315 (other ratios available on demand)
Gross axle weight 950 kg
Gross vehicle weight 1280 kg
Pininfarina Bolloré

Vehicle: Bluecar

Driveline layout: Front wheel drive, front transversal electric motor coupled with gearbox

Product: Transaxle

Motor features: 50 kW, max. speed 12000 rpm, max. torque 140 Nm

Gearbox features: Double stage reduction
Total reduction ratio 1:9.995
<table>
<thead>
<tr>
<th><strong>Vehicle:</strong></th>
<th>Electric heavy utility vehicle</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Driveline layout:</strong></td>
<td>Rear wheel drive, rear longitudinal electric motor coupled with transaxle</td>
</tr>
<tr>
<td><strong>Product:</strong></td>
<td>Transaxle</td>
</tr>
<tr>
<td><strong>Motor features:</strong></td>
<td>12 kW, 48 volt DC, max. speed 6250 rpm</td>
</tr>
</tbody>
</table>
| **Gearbox features:** | Spur gear drop box coupled with hypoid bevel set on differential  
Total reduction ratios 1:12.05-1:15.04-1:18.29  
1:24.49-1:29.85  
Gross axle weight 2365 kg  
Gross vehicle weight 3100 kg |
### CUSTOMER

**Zytek**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vehicle:</strong></td>
<td>Electric light commercial vehicle</td>
</tr>
<tr>
<td><strong>Driveline layout:</strong></td>
<td>Front wheel drive, front transversal electric motor coupled with gearbox</td>
</tr>
<tr>
<td><strong>Product:</strong></td>
<td>Transaxle</td>
</tr>
<tr>
<td><strong>Motor features:</strong></td>
<td>Zytek 70 kW, max. speed 8000 rpm, max. torque 300 Nm</td>
</tr>
<tr>
<td><strong>Gearbox features:</strong></td>
<td>Double stage reduction</td>
</tr>
<tr>
<td></td>
<td>Total reduction ratio 1:8.29</td>
</tr>
</tbody>
</table>
4 Speed seamless shift transaxle

Vehicle: High Performance electric GT
Driveline layout: Rear wheel drive, 2 rear transversal electric motors coupled with gearbox
Product: 4 Speed seamless shift transaxle
Motor features: 2 x 125 kW, max. speed 10000 rpm, max. torque 480 Nm (total 2 x 240 Nm)
Ratios: I=2.483, II=1.659, III=1.178, IV=0.894, FDR=4.000
Gearbox features: Clutch and synchroniser-less with seamless shift
## Transaxle or inline transmission

<table>
<thead>
<tr>
<th>Vehicle:</th>
<th>High Performance electric GT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driveline layout:</td>
<td>Rear wheel drive, 2 rear transversal electric motors coupled with gearboxes</td>
</tr>
<tr>
<td>Product:</td>
<td>Transaxle or inline transmission</td>
</tr>
<tr>
<td>Motor features:</td>
<td>2 x 140 kW, max. speed 12000 rpm, max. torque 410 Nm</td>
</tr>
<tr>
<td>Gearbox features:</td>
<td>Compact planetary gearset Integral motor / transmission water cooling Total reduction ratio 1:6</td>
</tr>
</tbody>
</table>
## 2 Speed transaxle

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vehicle:</strong></td>
<td>Scalable size from passenger car to light commercial vehicle</td>
</tr>
<tr>
<td><strong>Driveline layout:</strong></td>
<td>Transversal electric motor coupled with gearbox, for front or rear full electric axle</td>
</tr>
<tr>
<td><strong>Product:</strong></td>
<td>Transaxle</td>
</tr>
<tr>
<td><strong>Motor features:</strong></td>
<td>Max. power from 70 to 110 kW, max. torque from 250 to 300 Nm, max. speed from 8000 to 12000 rpm</td>
</tr>
<tr>
<td><strong>Ratios:</strong></td>
<td>First total reduction ratio 1:10.1 to 1:11.36</td>
</tr>
<tr>
<td></td>
<td>Second total reduction ratio 1:4.46 to 1:5.51</td>
</tr>
<tr>
<td><strong>Gearbox features:</strong></td>
<td>Double stage reduction</td>
</tr>
<tr>
<td></td>
<td>2 speeds with seamless gearshift</td>
</tr>
<tr>
<td></td>
<td>Park lock function available</td>
</tr>
</tbody>
</table>
# Transaxle

<table>
<thead>
<tr>
<th>Vehicle:</th>
<th>Electric passenger vehicle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driveline layout:</td>
<td>Rear wheel drive, rear transversal electric motor coupled with gearbox</td>
</tr>
<tr>
<td>Product:</td>
<td>Transaxle</td>
</tr>
<tr>
<td>Motor features:</td>
<td>Zytek 25 kW, max. speed 14000 rpm, max. torque 65 Nm</td>
</tr>
<tr>
<td>Gearbox features:</td>
<td>Double stage reduction</td>
</tr>
<tr>
<td></td>
<td>Total reduction ratio 1:14.103</td>
</tr>
</tbody>
</table>
Vehicle: Electric light commercial vehicle

Driveline layout: Rear wheel drive, longitudinal electric motor coupled with gearbox

Product: Inline epicyclic transmission

Motor features: 70 kW, max. speed 8000 rpm, max. torque 300 Nm

Gearbox features: Compact planetary gearset
    Integral motor / transmission water cooling
    Total reduction ratio 1:3.1

Vocis Driveline Controls
American Barns, Banbury Road
Lighthorne, Warwick, CV35 0AE
Phone +44 (0) 1926 650308
Fax +44 (0) 1926 652829
www.vocis.co.uk
TMS 20 Transmission and Driveline Controller

Electrical
• Supply Voltage 6.5V to 24VDC
• Modular, Expandable, and Future-proof hardware architecture

Mechanical
• Rugged hard anodised aluminium case
• Ambient operating temp -30C to +105C
• Sealing IP6K6
• Weight 1150g

Connection
• Industry standard 121-way connector

Other Features
• Supports rapid-prototyping software tools
• Resident O/S kernel boot-loader
• Support for CCP/XCP CAN-based calibration and data-logging tools
• Full access to all hardware features for your control methods
• High-Level algorithms can be developed using MATLAB/SIMULINKTM or ETAS ASCET

16 analogue inputs
13 switch/speed inputs
8 Hall Effect/Current Source Input
2 Hall Effect/Switch/Power-up Input
2 VR/Hall Effect/Switch Input
1 Ignition switch input

Outputs
6 x low current low-side drives
8 x high current high-side drives
12 x high current high-side PWM drives
6 x high current low-side PWM drives
1 x Bipolar Stepper Motor Drive
1 x H-Bridge DC Motor Drive

Communications
2 x CAN bus (up to 1Mbit/s)
1 x Serial Communication
ISO14230
LIN
J1708
J1850

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