Robot Shifter
SA-RAPID
for shift operations testing
HIGH DYNAMIC Shifting capability

- For automatic transmission and manual transmission floor shifter
- Gear shift knob force measurement (optional)
- Shift force and shift velocity monitoring and control
- Very high accuracy and repeatability
- Designed for millions of shift operations
- Complete custom software with test cycle editor
**Descriptions**

The robot shifter SA-RAPID consists of two closed loop position and force controlled servo-electric actuators for moving a shift lever through a transmission shift position for both, manual transmission and automatic transmission. While in gear the shift lever also can be “loaded” against its gate stop, simulating a driver pulling or pushing on the lever.

- Complete custom software interface package with WINDOWS User Interface (GUI) to execute user-definable test cycles
- Remote control unit (handy terminal) for single operator teach-in of gear positions
- Teach in procedure to learn the gear positions with the handy terminal
- Limitation of the shift torque by limiting the motor current
- Different parameter sets with definitions of shift arm velocities and forces
- Shift error repetitions with strategies to solve „tooth-on-tooth“ conditions of the transmission
- Synchro force limitation with automatically synch. point detection
- Manual shift operation mode via handy terminal
- Manual transmission: max. 8 gears + neutral + reverse gear
- Automatic transmission: P / R / N / D / 6 / 5 / 4 / 3 / 2 / 1 / M / + / - in any sequence
- Auto-gear detection with manual transmissions (force measurement required)

**Specifications**

- **Actuator system**: electrically
- **Motion**: spherical
- **Shift stroke (X-axis lateral)**: max. ± 30 ° (± 150 mm with gear stick length of 300 mm)
- **Shift stroke (Y-axis longitudinal)**: max. ± 50 ° (± 230 mm with gear stick length of 300 mm)
- **Shift Force**: max. 560 N
- **Nom. Force**: 280 N @ 3 m/sec
- **Nom. Velocity**: 3.0 m/sec
- **Position measuring**: conductive plastic potentiometer
- **Force Measurement**: DMS sensor knob with analog scaling circuitry (option)
- **Measurement accuracy**: 0.09mm
- **Motor voltage**: 320 VDC
- **Motor type**: Brush-less AC drive with resolver position loop
- **Positioning resolution**: 360 / (4095 x 35) ° = 0.0025 °
- **Operating temperature**: -40°C ... +80°C

**Options**

- Other force & speed configurations
- Gear shift release mechanism
- Custom shift unlock devices
- Throttle or clutch actuators
- Host computer interfaces
  - Serial or TCP/IP: Extended AK protocol
  - TCP/IP: OPC Server / Client
  - Hybrid bit - parallel & analog interface
- Shift force measurement knob P-A521.00
- Fieldbus Interfaces

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