MOBIL
ELEKTRONIK
GMBH

AGRI TRAILER STEERING

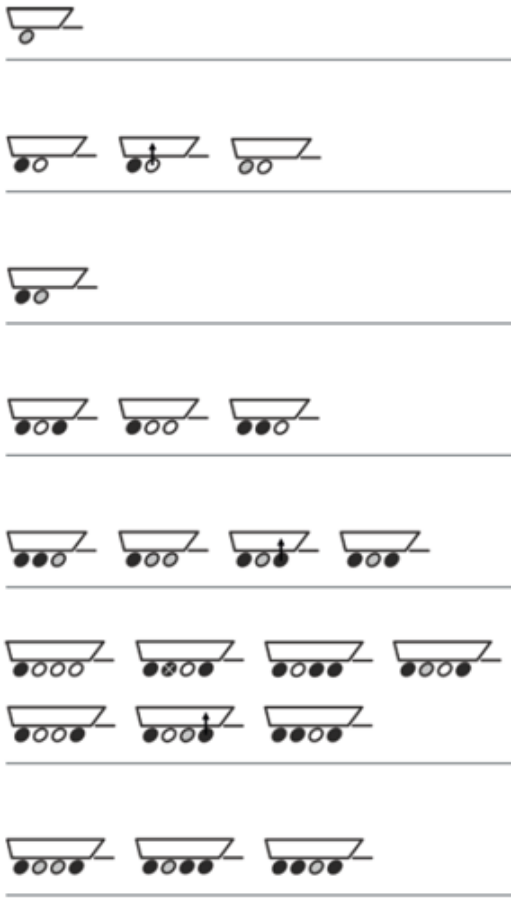
EHLA®

DTS

granning
axle and suspension solutions

EHLA® AGRI-TRAILER SYSTEM VARIANTS *)

- **1-axle trailer**
  - Field mode: 1
  - Road mode: axle blocked in 0° position
- **Tandem trailer**
  - Field mode: 1
  - Road mode: 1
- **Tandem multi trailer**
  - Field mode: 2
  - Road mode: 1; other axis blocked in 0° position
- **Tridem trailer**
  - Field mode: 2
  - Road mode: 2
- **Tridem multi trailer**
  - Field mode: 3
  - Road mode: 2; other axis blocked in 0° position
- **Quattro trailer**
  - Field mode: customized
  - Road mode: customized
- **Quattro multi trailer**
  - Field mode: 4
  - Road mode: customized



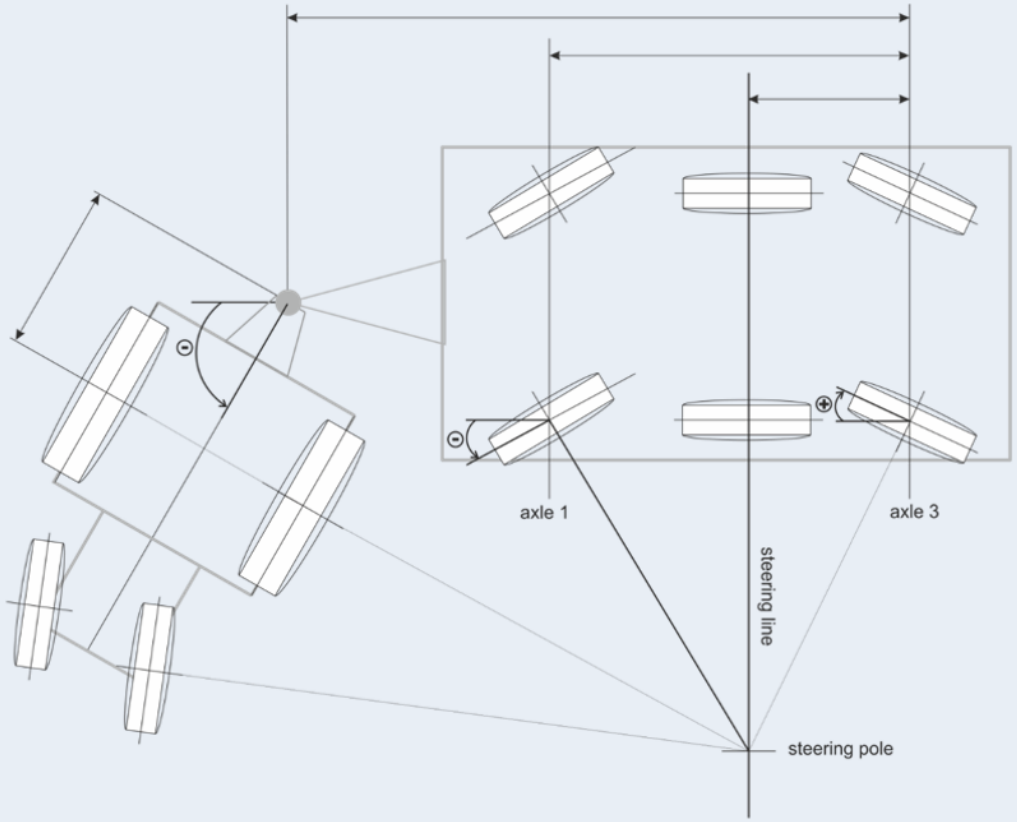
- ● Black wheel: self tracking tag axle (failsafe mode)
- ● Grey wheel: axle with check valves
- ○ White wheel: rigid axle

*) For tridem and quattro configurations, the applicability of DTS must be checked.

EHLA® AGRI-TRAILER SYSTEM

FUNCTIONAL ADVANTAGES OF EHLA®

- Decoupling the steered axles from the movement of the drawbar
- Significantly reduced tire wear on tractor unit and trailer
- Steering geometry is calculated and checked depending on the steering program
- Quick and easy adjustment of steering line and steering pole via parameters



DRIVING COMFORT AND MANEUVERABILITY

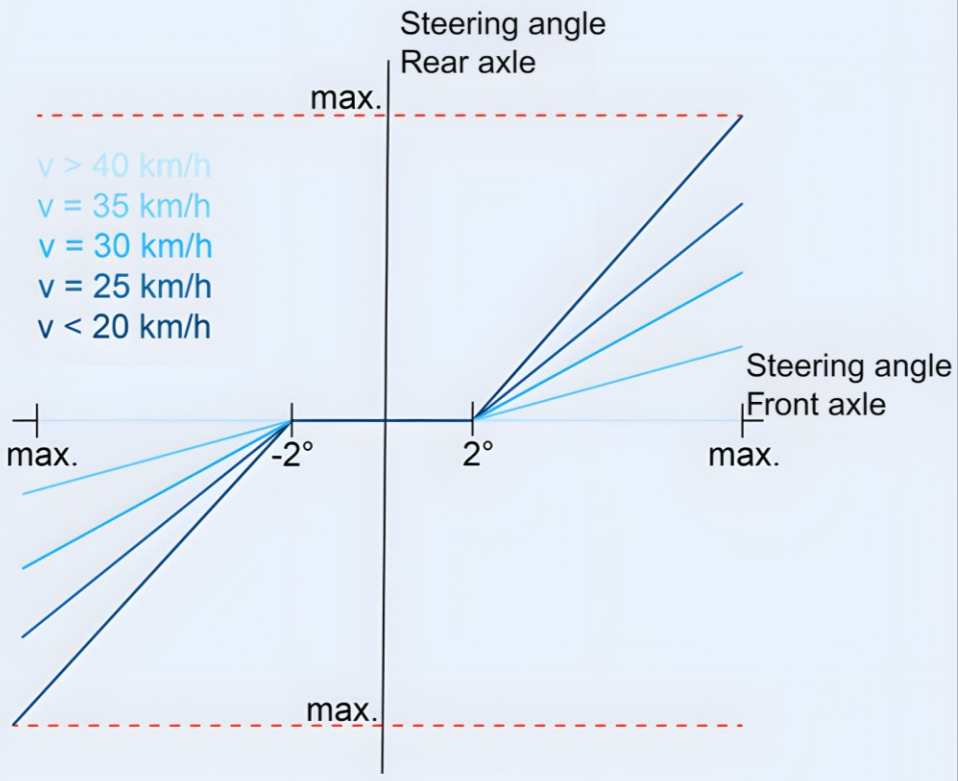
FUNCTIONAL ADVANTAGES OF EHLA®

- Optimized axle centering at high speed for improved directional stability
- Steerable when driving in reverse
- No force feedback on the tractor (compared to displacement cylinders)
- Wide range of steering programs such as manual steering or crab steering
- Reduced wear of the clutch elements
- Ackermann geometry can also be implemented at very low speeds and at standstill (after synchronization) using a drawbar sensor
- Significant reduction in tire wear on tractor unit and trailer
- Increased maneuverability due to the elimination of shifting cylinders or coupling rods on the drawbar

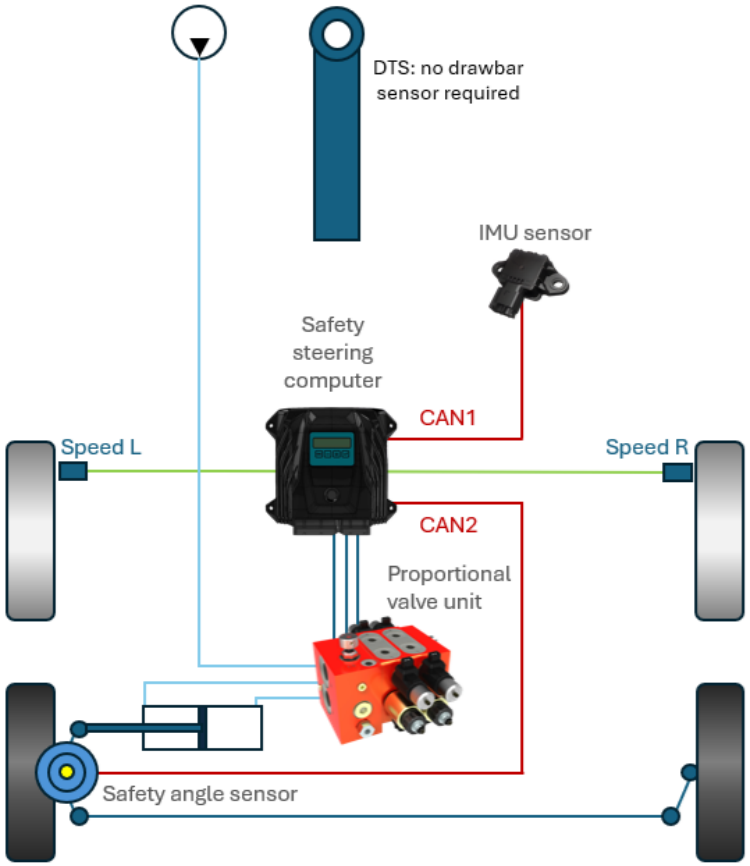
SPEED DEPENDENT STEERING ANGLE REDUCTION

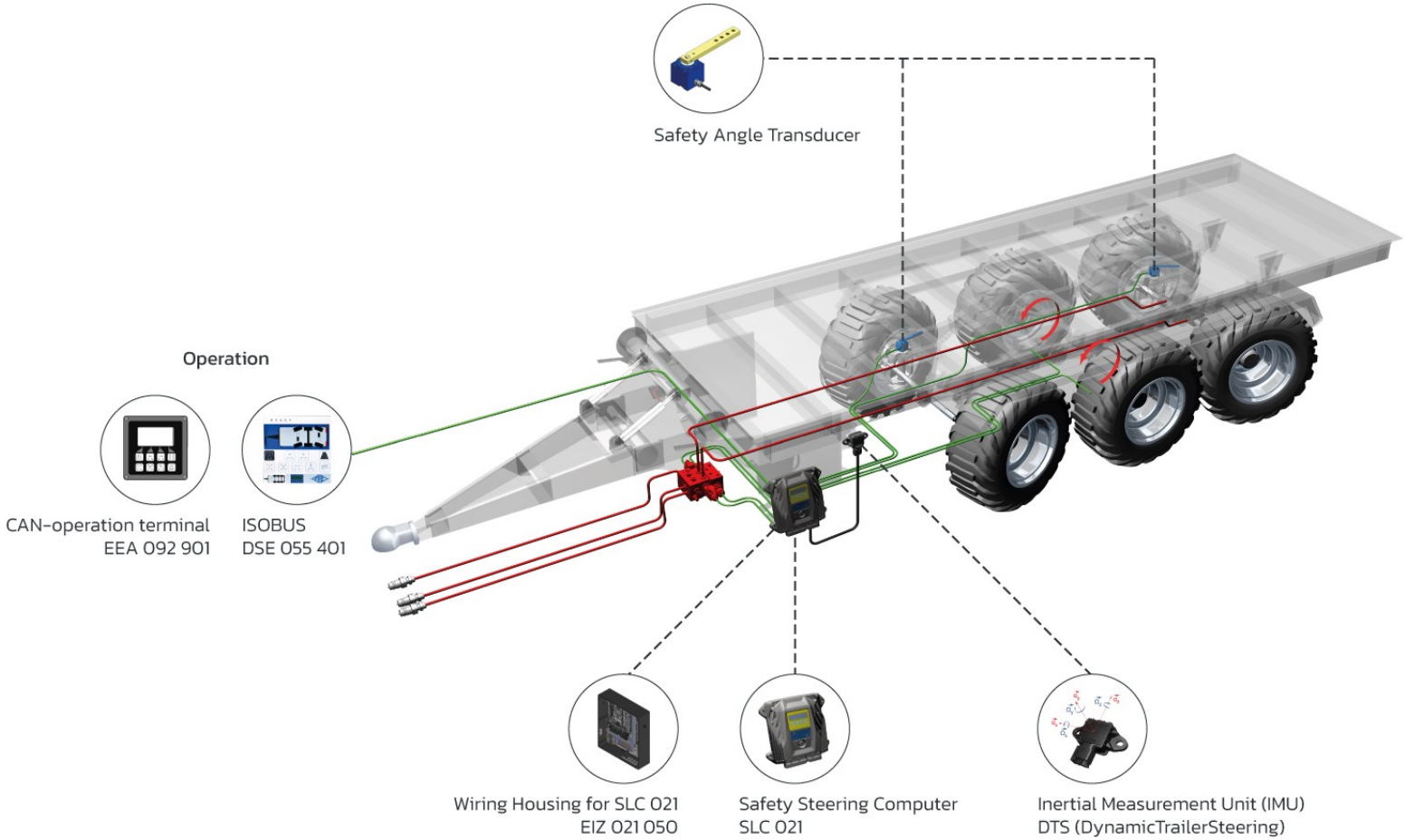
FUNCTIONAL ADVANTAGES OF EHLA®

- Reduction of the maximum steering angle with an increase in driving speed
- Automatic centering above a certain speed
- High driving stability



EHLA® AGRI-TRAILER ARCHITECTURE



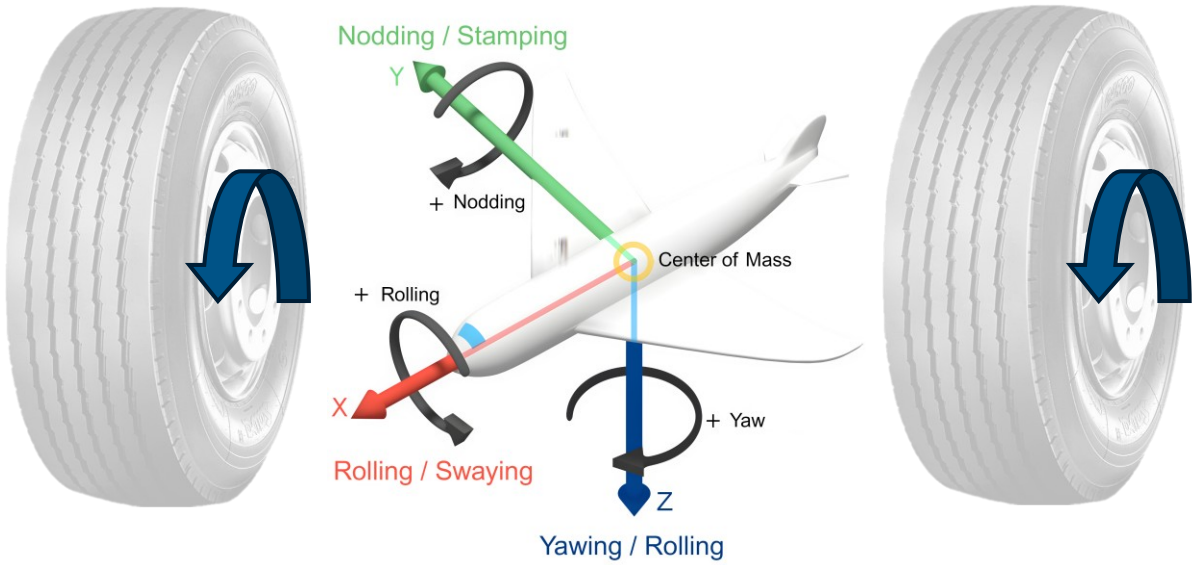


DTS® BASICS

- **D**ynamic**T**railer**S**teering
- Drawbar angle sensor-free steering system from MOBIL ELEKTRONIK
- Great usability
- Pioneering technology
- Elimination of all mechanical connections between towing vehicle and trailer for the purpose of articulation angle detection
- Determining the articulation angle from the dynamic driving state of the vehicle
- Use of a special algorithm developed and proven by MOBIL ELEKTRONIK
- Use of an IMU module and two speed and direction signals

DTS® ALGORITHM

- Inertial measurement unit (IMU) records all 6 kinematic degrees of freedom in the x, y and z axes
- Detection of acceleration and rotation rate
- Complete recording of the driving dynamics of the trailer vehicle using the IMU module combined with driving speed and direction
- The articulation angle between the towing vehicle and trailer is calculated from the above-mentioned measured variables and thus the target steering angle of the steering axles



FEATURES OF DTS®

Elimination of mechanical linkage for articulation angle detection

No need for standard forced steering components (K80 ball)

Larger articulation angle between towing and trailer vehicle possible

Optimum wear behavior for tires and vehicle components

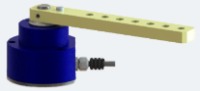
No calibration required on the drawbar

Replacement of the towing vehicle without adjustment work on the forced steering system

EHLA® DTS COMPONENTS

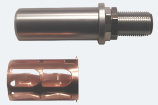
SAFETY STEERING COMPUTER

IMU (INERTIAL MEASUREMENT UNIT)



ANGLE TRANSDUCER ON STEERED AXLES

AXLE-INTEGRATED ANGLE TRANSDUCER



SPEED SENSORS

EIZ WIRING ENCLOSURE

PROPORTIONAL HYDRAULIC UNIT

MEMBRANE PRESSURE SWITCH

ERROR LAMP AND BUZZER

GRAPHIC OPERATOR TERMINAL

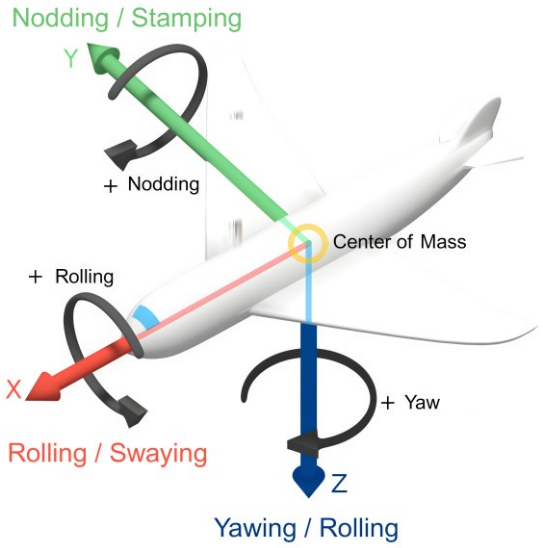
ISOBUS OPERATION VIA GATEWAY

SAFETY STEERING COMPUTER

- New Generation – SLC 021
- Redundant CPU
- Developed in accordance with automotive Guideline ISO 26262 ASIL D
- Full diagnostics on all outputs
- Easy connectivity to PCSnext diagnostics software
- Integrated display and keypad for diagnostics and alignment without any external tools
- Highest protection class IP6K9K

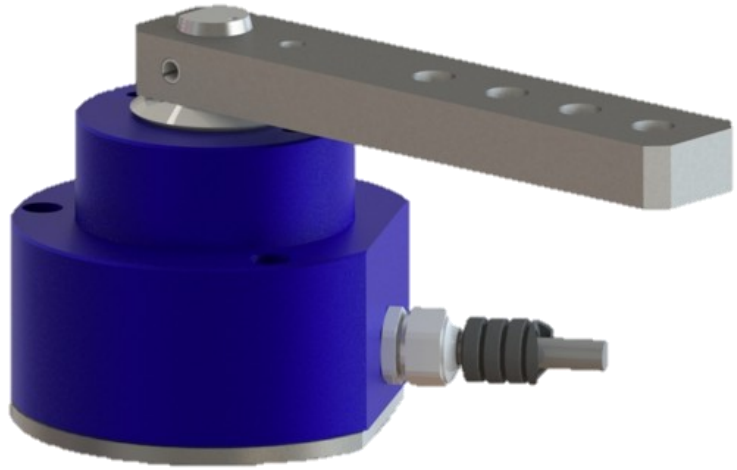
IMU MODULE

- IMU = Inertial Measurement Unit
- The inertial measurement unit (IMU) records all 6 kinematic degrees of freedom in the x, y and z axes
  - Translational movement (acceleration)
  - Rotational movement (rotation rate)
  - CAN output signal
  - Supply voltage 8....16V



SAFETY ANGLE TRANSDUCER

- Universal angle sensor for retrofit and special vehicles
- Safety standard according ISO 26262 ASIL D
- CANopen interface for highest signal reliability and improved diagnostics compared to analog signals
- 360° measurement range – no mechanical alignment necessary
- Assembly with lever and coupling rod
- Customized version available on request

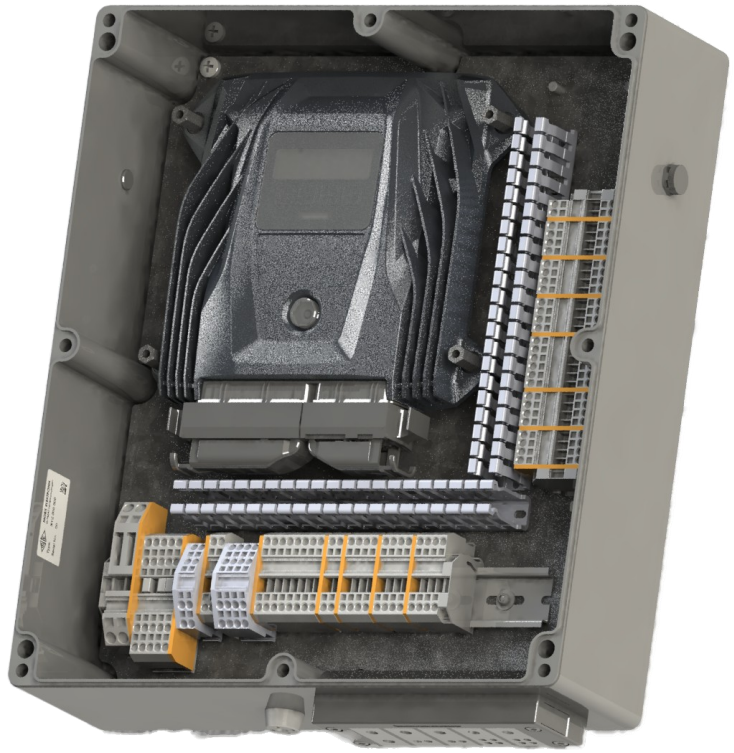


SAFETY ANGLE TRANSDUCER

- King-pin integrated sensor
- Safety standard according ISO 26262 ASIL D
- CANopen interface for highest signal reliability and improved diagnostics compared to analog signals
- 360° measurement range – no mechanical alignment necessary
- Customized version available on request

EIZ WIRING CABINET

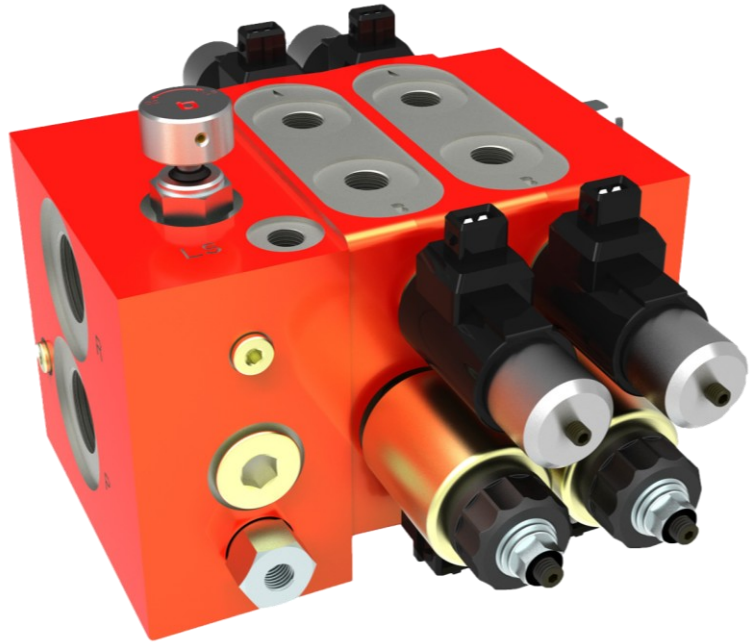
- Plastic housing with base plate
- Central connector for the safety steering computer
- WAGO terminal strips
- 2 separate 9-pin D-Sub connectors for RS232 and CAN bus interface
- Several PG coupling holes in the housing



PHY PROPORTIONAL HYDRAULIC UNIT

- Disc valve technology
- Integrated control valves with manual override
- Integrated single pressure compensator
- Connection plate for LS pump and constant pump system
- With and without pressure forwarding for other work functions
- Superior quality from

BUCHER hydraulics

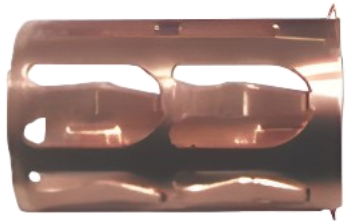


MEMBRANE PRESSURE SWITCH

- Preset to 10 bar
- Digital output signal

SPEED SENSORS

- 2 speed signals are required (redundancy)
- For DTS system
  - 2 speed sensors with direction of rotation detection
- For articulation angle detection with safety angle sensor
  - 1x ABS / 1x speed sensor **or**
  - 2x speed sensor



ERROR LAMP AND BUZZER

- Minimum requirement
- Provided by the customer
- System alarms are displayed
  - The warning buzzer sounds once with every new alarm and every time you start driving as long as the alarms are displayed
  - The red warning light or the LEDs on the operating terminal flash continuously
  - The alarm code also appears on the display of the control terminal and on the steering computer

GRAPHIC OPERATING TERMINAL

- EEA 092 901
- 8 buttons for operating the steering modes
- CAN bus interface to safety steering computer
- Robust aluminum housing with magnetic holders
- Road mode
  - Steering mode "on the road"
  - Optimized for reduced tire wear with maximum manoeuvrability
  - Max. 60 km/h
- Field mode
  - Special steering types
  - Manual steering
  - Diagonal steering (crab steering)
  - Offset steering (driving on slopes)

ISOBUS OPERATION VIA GATEWAY

- EHLA® steering is a separate ISOBUS participant
- GUI / operation created by MOBIL ELEKTRONIK
- Dimensions: 104 x 29 x 72 mm
- 8...32 V DC
- AUX functionality
- IP67 protection class
- Status LEDs
- AEF-certified

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