



## Angle sensor 424S

Angle sensor 424S has a redundant design and, as a result, is suitable for safety-critical measurement tasks. The sensor measures angles between 30° and 120°. Angle sensor 424S is based on the contactless Hall measurement principle, which is extremely reliable and ensures a long service life. The sensor can be used for angle determination in telescopic arms of telescopic handlers and lifting platforms as well as for many other challenging off-highway applications.

- Long lifetime and extremely reliable from contactless measurement with Hall principle
- IP67 protection class for harsh environmental conditions
- High temperature resistance from -40 °C to +85 °C
- Resolution 0.1°
- Current or voltage output signal available
- Switching output (push-pull / high-side / low-side) up to 1.5A
- Available with AMP plug (Micro Quadlock System) or Deutsch plug DT04-6P



IMAGE 2/4

# 424S...

## Deutsch DT06-6S male

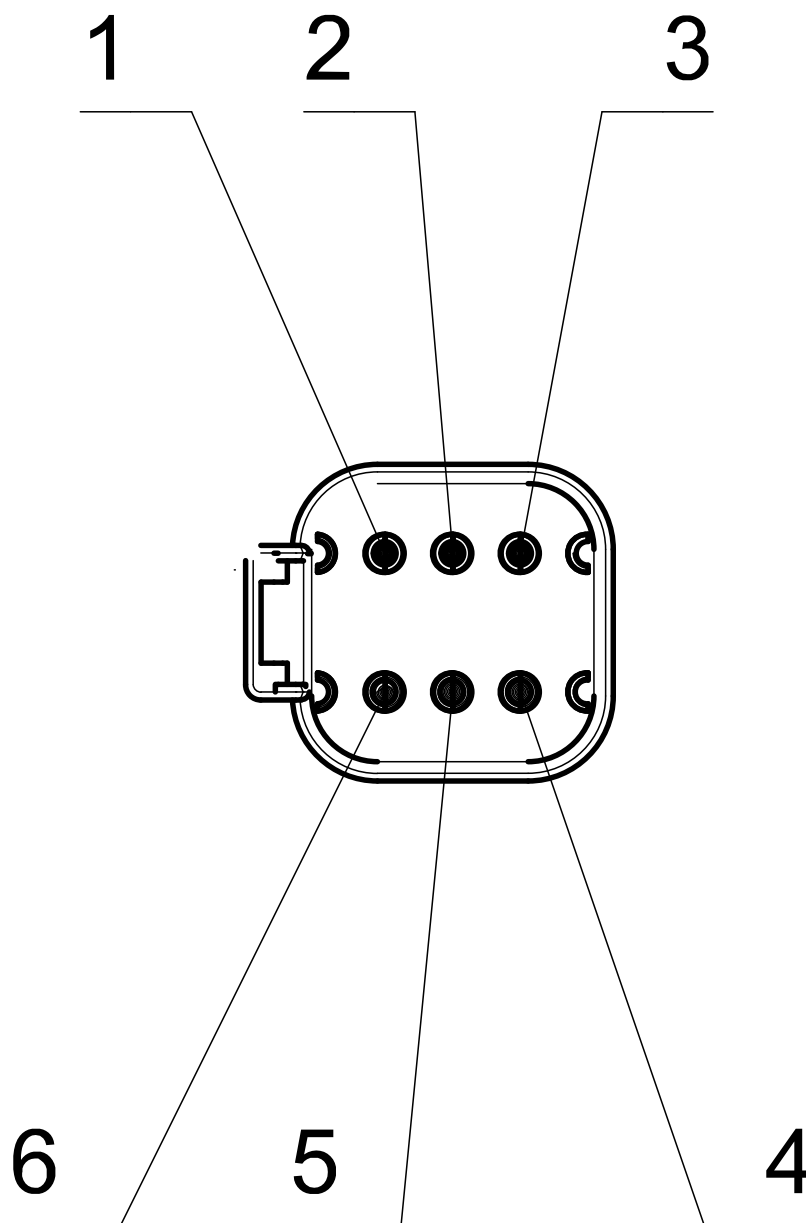


IMAGE 3/4

# 424S...

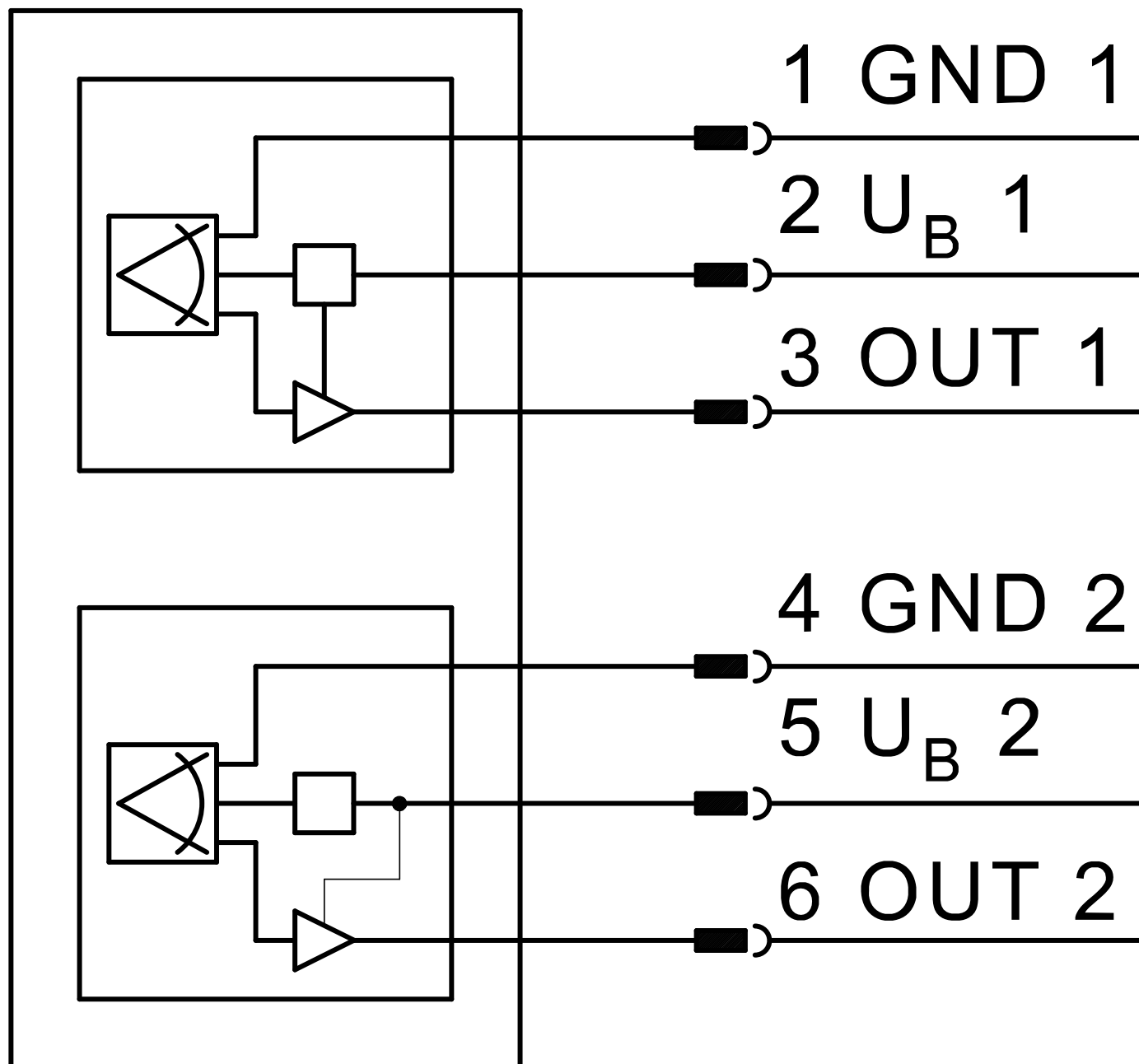
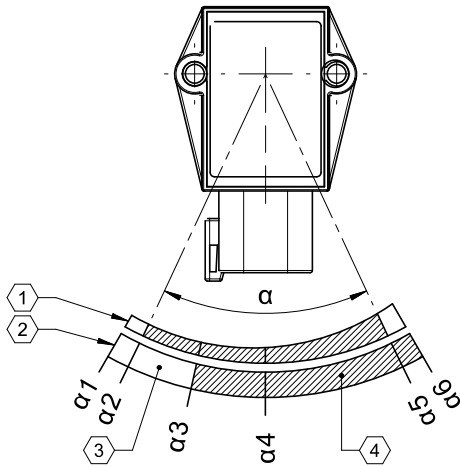


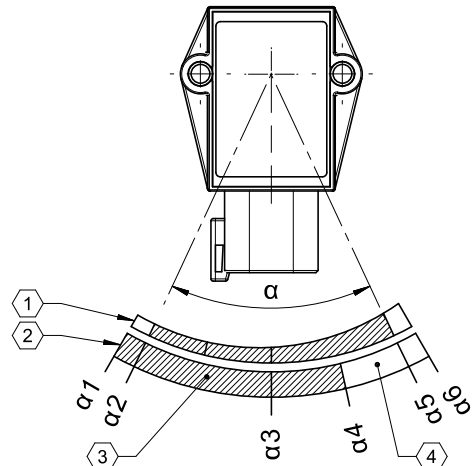
IMAGE 4/4

424S...



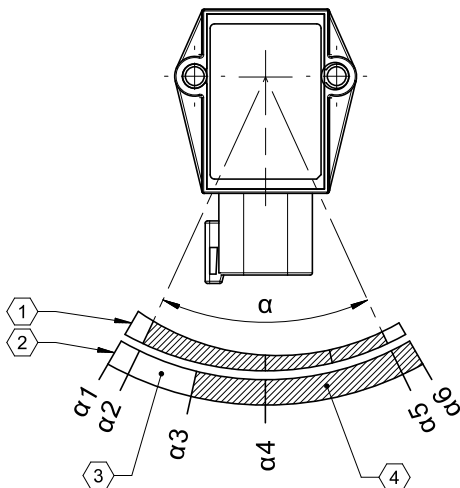
- ① OUT 1: analogue CCW (counter clock wise)
- ② OUT 2: digital output - push pull / high side
- ③ low
- ④ high

424S...



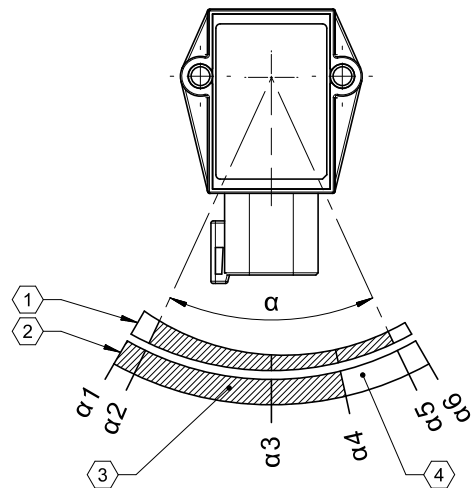
- ① OUT 1: analogue CCW (counter clock wise)
- ② OUT 2: digital output - push pull / low side
- ③ high
- ④ low

424S...



- ① OUT 1: analogue CW (clock wise)
- ② OUT 2: digital output - push pull / high side
- ③ low
- ④ high

424S...



- ① OUT 1: analogue CW (clock wise)
- ② OUT 2: digital output - push pull / low side
- ③ high
- ④ low

## Product options

IMAGE 1/1

### ORDERING KEY

| 424S |   |  |    |  |    |     |   | Angle sensor 120°, analogue/switching output   |
|------|---|--|----|--|----|-----|---|--|
|      |   |  |    |  |    |     |   |  |
|      |   |  |    |  |    |     |   | <b>Connection</b>  |
|      | A |  |    |  |    |     |   | AMP connector  |
|      | D |  |    |  |    |     |   | Deutsch connector  |
|      |   |  |    |  |    |     |   | <b>Analogue output</b>   |
|      |   |  | 10 |  |    |     |   | 1 - 5 V  |
|      |   |  | 11 |  |    |     |   | 4 - 20 mA  |
|      |   |  | 16 |  |    |     |   | 0.5 - 4.5 V ratiometric  |
|      |   |  | 17 |  |    |     |   | 0.5 - 4.5 V  |
|      |   |  |    |  |    |     |   | <b>Switching output</b>  |
|      |   |  |    |  | DH |     |   | High-side switch   |
|      |   |  |    |  | DL |     |   | Low-side switch  |
|      |   |  |    |  | DS |     |   | Push-pull  |
|      |   |  |    |  |    |     |   | <b>Code number (specified by elobau)</b>   |
|      |   |  |    |  |    | 001 |   | 3-digit code number  |
|      |   |  |    |  |    |     |   | <b>Accessories</b>   |
|      |   |  |    |  |    |     | B | Operating lever mounted  |
|      |   |  |    |  |    |     |   |  |
|      |   |  |    |  |    |     |   | <b>Selection of angle measuring range <sup>1</sup> (selectable in 5° increments)</b><br>between 30° and 120° |
|      |   |  |    |  |    |     |   | xxx°   |
|      |   |  |    |  |    |     |   | <b>Selection of switching point <sup>1</sup> (selectable in 5° increments)</b><br>between 0° and 120°        |
|      |   |  |    |  |    |     |   | xxx°   |
|      |   |  |    |  |    |     |   |  |
|      |   |  |    |  |    |     |   | <sup>1</sup> Please specify when ordering.   |

#### Standard

Optional (on request)

#### Options (on request)

Customer-specific shaft end

Special characteristic curve for output signal

Customised connection

Selection of direction of rotation CCW/CW

Switching output without analogue output

Special angle between 30°-120° (0-120°) ex-works

## Article characteristics

| Attribute   | 424SD11D....  | 424SD16D....   | 424SD17D....  |
|---|---|--|---|
| Polarity reversal protection                                | yes   |  |   |
| Output signal min.  | -   | 0.5 V DC   |   |
| Output signal max.  | -   | 4.5 V DC   |   |
| Output signal min.  | 4 mA  | -  |   |
| Output signal max.  | 20 mA   | -  |   |
| Output signal - centre position/zero position               | -   | 2.5 V DC   |   |
| Output signal - centre position/zero position               | 12 mA   | -  |   |
| Output signal - switching point                             | Selectable (Highside, Lowside, Push-Pull)   |  |   |
| Resolution  | 0.1 °   |  |   |
| EMC Agricultural and forestry machines (Norm)               | EN ISO 14982<br>pulse 5b: max. voltage 54V (absolute),<br>functional status C for pulse 1 and 4 | EN ISO 14982<br>conducted disturbance not applicable<br>for 5V supply                  | EN ISO 14982<br>pulse 5b: max. voltage 54V (absolute),<br>functional status C for pulse 1 and 4 |
| EMC Earth-moving and building construction machinery (Norm) | DIN EN ISO 13766-1<br>pulse "load dump": max. voltage 54V<br>(absolute)                         | DIN EN ISO 13766-1<br>conducted disturbance not applicable<br>for 5V supply            | DIN EN ISO 13766-1<br>pulse "load dump": max. voltage 54V<br>(absolute)                         |
| EMC Industrial trucks (Norm)                                | DIN EN 12895  |  |   |
| Operating voltage min.                                      | 9 V DC  | 4.5 V DC   | 9 V DC  |
| Operating voltage max.                                      | 32 V DC   | 5.5 V DC   | 32 V DC   |
| Max. overvoltage  | (5min @ 25°C) 36 V DC   | 5.5 V DC   | (5min @ 25°C) 36 V DC   |
| Current consumption   | 424SD11D.: 17.00 mA<br>424SD1.DH: 9.00 mA<br>424SD1.DL: 15.00 mA<br>424SD1.DS: 15.00 mA         | 424SD16D.: 9.00 mA<br>424SD1.DH: 9.00 mA<br>424SD1.DL: 15.00 mA<br>424SD1.DS: 15.00 mA | 424SD17D.: 17.00 mA<br>424SD1.DH: 9.00 mA<br>424SD1.DL: 15.00 mA<br>424SD1.DS: 15.00 mA         |
| Load resistance min.  | -   | 20000 Ohm  | 10000 Ohm   |
| Load resistance max.  | 9V: 150 Ohm<br>> 12V: 350 Ohm   | -  |   |
| Temperature coefficient                                     | typ. +- 250 ppm/K   |  |   |
| Typical linearity error                                     | = ±15°:±0,2°<br>= ±25°:±0,4°<br>= ±35°:±1,0°<br>= ±45°:±2,0°<br>= ±60°:±5,0°                    |  |   |
| Signal sequence   | CCW (CW on request)   |  |   |
| Signal update rate  | 2000 Hz   |  |   |
| Outputs (quantity, type)                                    | 2   |  |   |
| Max. switching current                                      | Highside / Lowside: 1500 mA<br>Push-Pull: 0,25 mA   |  |   |

| Attribute                               | 424SD11D....  | 424SD16D....   | 424SD17D....  |
|---|---|--|---|
| Technology                              | Hall  |  |   |
| Angle measuring range - analogue output | 30° - 120° (selectable in 5° increments)  |  |   |
| Angle range - switching output          | 0° - 120° (Selectable in 5° increments)   |  |   |
| Outputs                                 | 4...20mA + switching output   | 0,5...4,5V ratiometric + Switching output  | 0,5...4,5V + Switching output   |
| MTTF                                    | 424SD11D.: 72.2 a<br>424SD1.DH: 78.4 a<br>424SD1.DL: 87.1 a<br>424SD1.DS: 113.0 a | 424SD16D.: 111.9 a<br>424SD1.DH: 78.4 a<br>424SD1.DL: 87.1 a<br>424SD1.DS: 113.0 a | 424SD17D.: 79.6 a<br>424SD1.DH: 78.4 a<br>424SD1.DL: 87.1 a<br>424SD1.DS: 113.0 a |
| Max. shaft load, axial                  | 50 N  |  |   |
| Max. shaft load, radial                 | 100 N   |  |   |
| Bearing                                 | Ball bearing  |  |   |
| Mechanical stop                         | Optional  |  |   |
| Actuating lever                         | Optional (Accessories: 350210)  |  |   |
| Protection class                        | IP67 DIN EN 60529 / IPX9K ISO 20653   |  |   |
| Operating temperature min.              | -40 °C  |  |   |
| Max. operating temperature              | 85 °C   |  |   |
| Min. storage temperature                | -40 °C  |  |   |
| Max. storage temperature                | 105 °C  |  |   |
| Torque for fastening screws             | 2.5 N m   |  |   |
| Connector type                          | Deutsch DT04-6P   |  |   |