

# Абсолютный энкодер угла поворота ACURO AD36

## Технические характеристики

По вопросам продаж и поддержки обращайтесь:

Алматы (727)345-47-04  
Ангарск (3955)60-70-56  
Архангельск (8182)63-90-72  
Астрахань (8512)99-46-04  
Барнаул (3852)73-04-60  
Белгород (4722)40-23-64  
Благовещенск (4162)22-76-07  
Брянск (4832)59-03-52  
Владивосток (423)249-28-31  
Владикавказ (8672)28-90-48  
Владимир (4922)49-43-18  
Волгоград (844)278-03-48  
Вологда (8172)26-41-59  
Воронеж (473)204-51-73  
Екатеринбург (343)384-55-89

Иваново (4932)77-34-06  
Ижевск (3412)26-03-58  
Иркутск (395)279-98-46  
Казань (843)206-01-48  
Калининград (4012)72-03-81  
Калуга (4842)92-23-67  
Кемерово (3842)65-04-62  
Киров (8332)68-02-04  
Коломна (4966)23-41-49  
Кострома (4942)77-07-48  
Краснодар (861)203-40-90  
Красноярск (391)204-63-61  
Курск (4712)77-13-04  
Курган (3522)50-90-47  
Липецк (4742)52-20-81

Магнитогорск (3519)55-03-13  
Москва (495)268-04-70  
Мурманск (8152)59-64-93  
Набережные Челны (8552)20-53-41  
Нижний Новгород (831)429-08-12  
Новокузнецк (3843)20-46-81  
Ноябрьск (3496)41-32-12  
Новосибирск (383)227-86-73  
Омск (3812)21-46-40  
Орел (4862)44-53-42  
Оренбург (3532)37-68-04  
Пенза (8412)22-31-16  
Петрозаводск (8142)55-98-37  
Псков (8112)59-10-37  
Пермь (342)205-81-47

Ростов-на-Дону (863)308-18-15  
Рязань (4912)46-61-64  
Самара (846)206-03-16  
Санкт-Петербург (812)309-46-40  
Саратов (845)249-38-78  
Севастополь (8692)22-31-93  
Саранск (8342)22-96-24  
Симферополь (3652)67-13-56  
Смоленск (4812)29-41-54  
Сочи (862)225-72-31  
Ставрополь (8652)20-65-13  
Сургут (3462)77-98-35  
Сыктывкар (8212)25-95-17  
Тамбов (4752)50-40-97  
Тверь (4822)63-31-35

Тольятти (8482)63-91-07  
Томск (3822)98-41-53  
Тула (4872)33-79-87  
Тюмень (3452)66-21-18  
Ульяновск (8422)24-23-59  
Улан-Удэ (3012)59-97-51  
Уфа (347)229-48-12  
Хабаровск (4212)92-98-04  
Чебоксары (8352)28-53-07  
Челябинск (351)202-03-61  
Череповец (8202)49-02-64  
Чита (3022)38-34-83  
Якутск (4112)23-90-97  
Ярославль (4852)69-52-93

Россия +7(495)268-04-70

Казахстан +(727)345-47-04

Беларусь +(375)257-127-884

Узбекистан +998(71)205-18-59

Киргизия +996(312)96-26-47

эл.почта: [hro@nt-rt.ru](mailto:hro@nt-rt.ru) || сайт: <https://hengstler.nt-rt.ru>

# TECHNICAL DATASHEET

## Absolute Motor Feedback Encoder AD36



- For brushless servo motors
- Resolver size 15 mounting compatible
- Through hollow shaft 8 mm
- Resolution: up to 22 Bit ST + 12 Bit MT
- Wide operating temperature range (-40°C ... +120°C)
- 10,000 rpm continuous operation
- Gear based multiturn
- Interfaces: SSI, BiSS-B or BiSS-C
- Sinewave 1 Vpp
- 500kHz Bandwidth
- Special version, suitable for Vacuum on request

ACURO®  
drive

BiSS  
INTERFACE

SSI

CE

UK  
CA

UL  
LISTED

RoHS

### GENERAL

The **AD 36** is an optical absolute encoder with multiturn gear and optical scanning in Size 36 mm. Unique in its class, it offers a through hollow shaft of 8 mm. This allows a resolver compatible mounting. The mechanical concept is based on a double ball bearing mounted shaft assembly with flexible torque support. The AD 36 complements the ACURO-DRIVE family and is suitable for installation in BLDC servo motors small axle heights.

#### Completely digital control loop

The novel, completely digital technology enables the transition to a real digital drive system. While the well-known conventional absolute encoders for motor feedback still using analog sine signals for the feedback of motor speed and position, the AD 36 provides fully digital position data with a resolution of up to 22Bit (singleturn) and 12 Bit (multiturn) via a bidirectional synchronous interface with a variable clock rate up to 10 MHz. This corresponds to a singleturn resolution of more than half a million measuring steps. Backwards compatibility is guaranteed via the SSI interface in connection with 2048 sine - cosine periods per revolution.

#### Diagnostic system integrated

The AD 36 is based on an OptoAsic of the well proven technology, with diagnostic concept. The internal signal processing is controlled by a single step test. subjected to a plausibility check for each individual increment. A code-check ensures that the encoder signal reflects the detected rotation bit by bit. Even the operating temperature of the encoder can be measured with 8 bit resolution (1°C), read and monitored via warning or alarm bit. For a maximum service life of the LED, it is operated in a controlled manner and simultaneously monitored. Possible faults are announced early by warning bit.

### TECHNICAL DATA mechanical

|                                                                        |                                                                                                       |
|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| Housing Diameter                                                       | 37.5 mm                                                                                               |
| Shaft diameter                                                         | 8 mm (through hollow shaft)<br>8 mm (hub shaft)<br>6 mm (hub shaft)<br>8 mm (tapered solid shaft 1:3) |
| Flange types<br>(housing mounting)                                     | Tether                                                                                                |
| Protection class shaft input<br>(EN 60529)                             | IP40                                                                                                  |
| Protection class housing<br>(EN 60529)                                 | IP40                                                                                                  |
| Permissible axial endplay of<br>mounting shaft<br>(hollow / hub shaft) | ± 0.5 mm                                                                                              |
| Permissible radial runout of<br>mating shaft<br>(hollow / hub shaft)   | ± 0.05 mm                                                                                             |

# TECHNICAL DATASHEET

## Absolute Motor Feedback Encoder AD36

### TECHNICAL DATA mechanical (continue)

|                                            |                                                                                |
|--------------------------------------------|--------------------------------------------------------------------------------|
| Max. speed                                 | 10,000 rpm (continuous), 12,000 rpm (short term)<br>(higher values on request) |
| Starting torque typ.                       | ≤ 1 Ncm                                                                        |
| Moment of inertia                          | ca. $2.5 \times 10^{-6}$ kgm <sup>2</sup>                                      |
| Vibration resistance<br>(DIN EN 60068-2-6) | 100 m/s <sup>2</sup> (10 ... 2000 Hz)<br>(higher value on request)             |
| Shock resistance<br>(DIN EN 60068-2-27)    | 1000 m/s <sup>2</sup> (6 ms)<br>(higher value on request)                      |
| Operating temperature                      | -40 °C ... +120 °C                                                             |
| Storage temperature <sup>1</sup>           | -15 °C ... +85 °C                                                              |
| Weight                                     | ca. 80 g (ST) / 130 g (MT)                                                     |
| Connection                                 | Cable, axial or tangential<br>PCB-connector, 12-pole                           |

<sup>1</sup> due to packaging

### TECHNICAL DATA electrical

|                          |                                                      |
|--------------------------|------------------------------------------------------|
| Power supply             | DC 5 V -5 % / +10 %<br>DC 7 - 30 V                   |
| Power consumption typ.   | 100 mA (ST), 150 mA (MT)                             |
| Resolution Singleturn    | 12 - 22 Bit                                          |
| Resolution Multiturn     | 12 Bit                                               |
| Interface                | SSI, Gray or Binary), BiSS-B, BiSS-C                 |
| Driver                   | Clock and Data / RS422                               |
| Incremental signals      | Sine-Cosine 1 Vpp                                    |
| Disc Numbers             | 2,048                                                |
| 3dB cut-off frequency    | 500 kHz                                              |
| Absolute accuracy (typ.) | ±35"                                                 |
| Alarm output             | Alarm bit (SSI-Option), Warning and alarm bit (BiSS) |

### PIN ASSIGNMENT PCB-connector, 12-pole

| Color                    | PIN | Signal                |
|--------------------------|-----|-----------------------|
| grey                     | 1a  | <u>Data</u>           |
| white/green <sup>1</sup> | 2a  | A +                   |
| black <sup>1</sup>       | 3a  | 0 V Sensor            |
| red/blue <sup>1</sup>    | 4a  | B +                   |
| green                    | 5a  | <u>Clock</u>          |
| violet <sup>1</sup>      | 6a  | 5 V Sensor            |
| white                    | 1b  | DC 5 V / 7-30 V       |
| yellow                   | 2b  | Clock                 |
| grey/pink <sup>1</sup>   | 3b  | B -                   |
| brown                    | 4b  | 0 V (U <sub>N</sub> ) |
| brown/green <sup>1</sup> | 5b  | A -                   |
| pink                     | 6b  | Data                  |

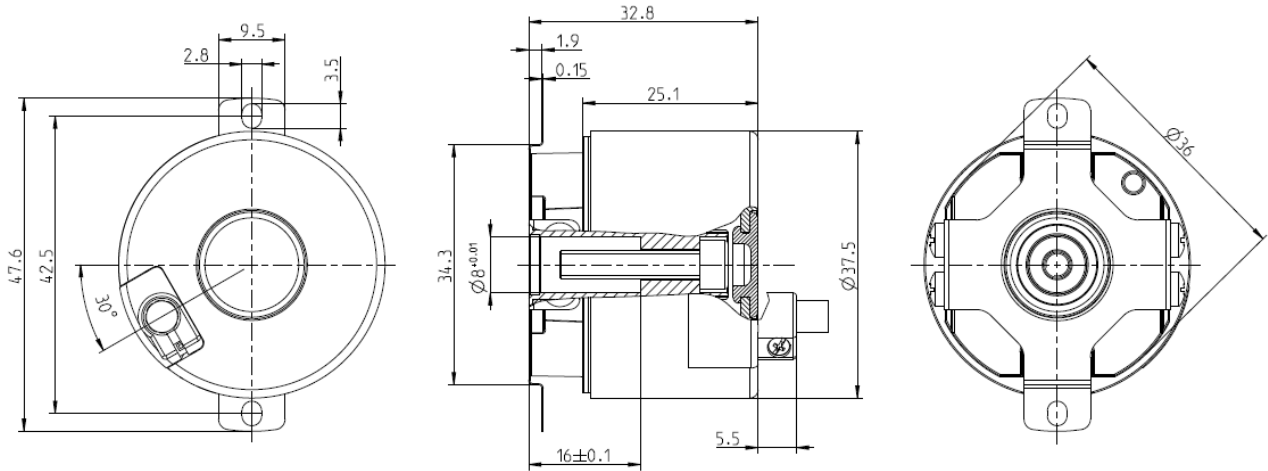
<sup>1</sup> Analog signals 1 Vpp on cable only available with interface SC (SSI Gray + 1 Vpp), SD (SSI Binary + 1 Vpp), BC (BiSS-B + 1 Vpp), BV (BiSS-C + 1 Vpp)

# TECHNICAL DATASHEET

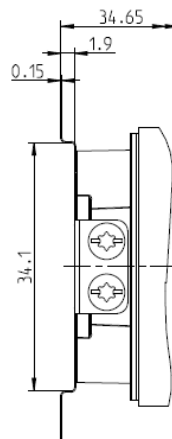
## Absolute Motor Feedback Encoder AD36

### DIMENSIONAL DRAWING

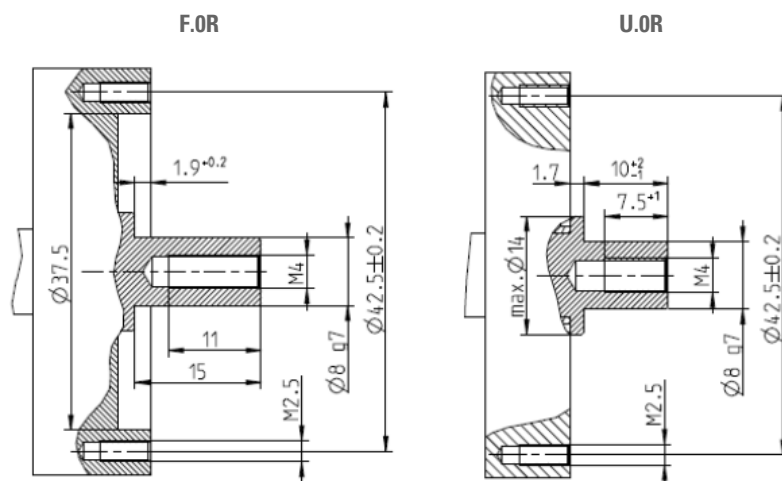
#### Hub Shaft (F.0R)



#### Alternative tether (U.0\_)



#### Connection dimensions example customer side



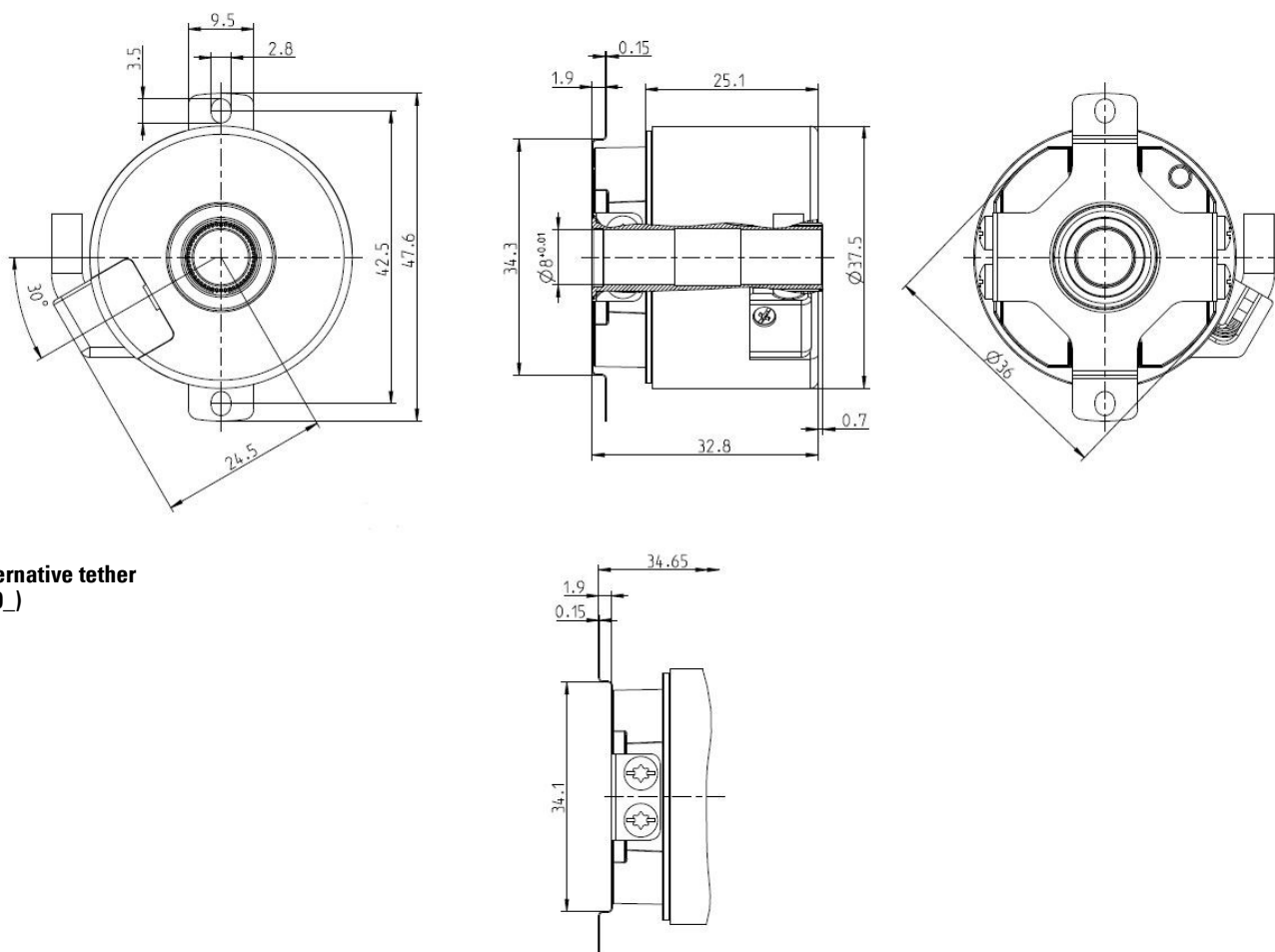
Dimension in mm

# TECHNICAL DATASHEET

## Absolute Motor Feedback Encoder AD36

### DIMENSIONAL DRAWING

#### Through Hollow shaft (F.0C)



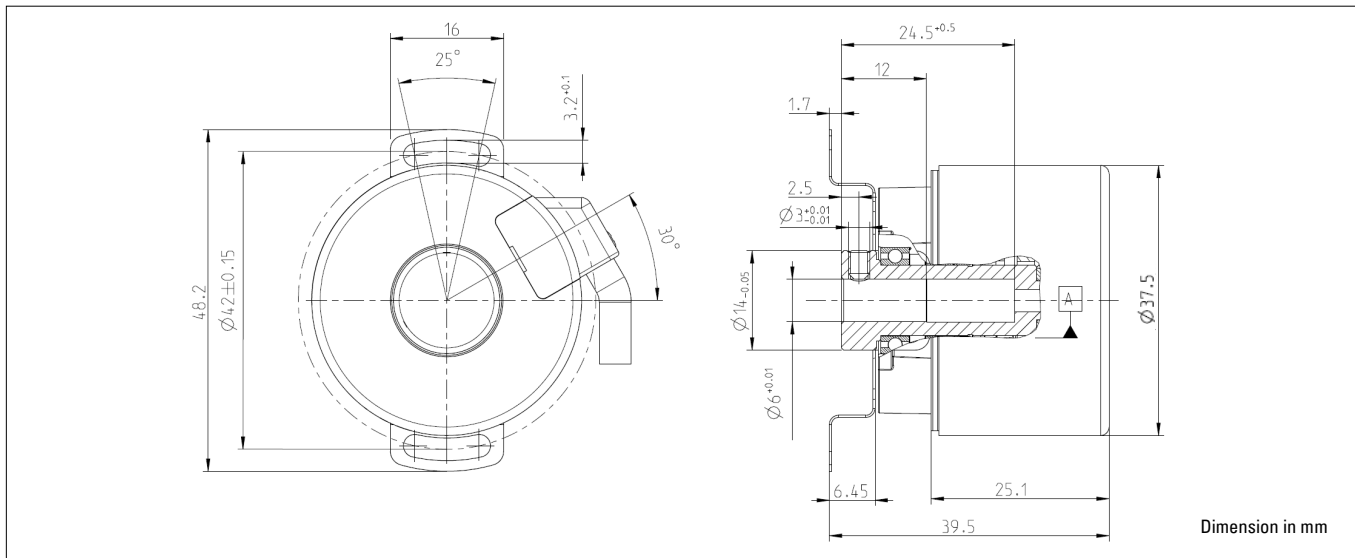
Dimension in mm

# TECHNICAL DATASHEET

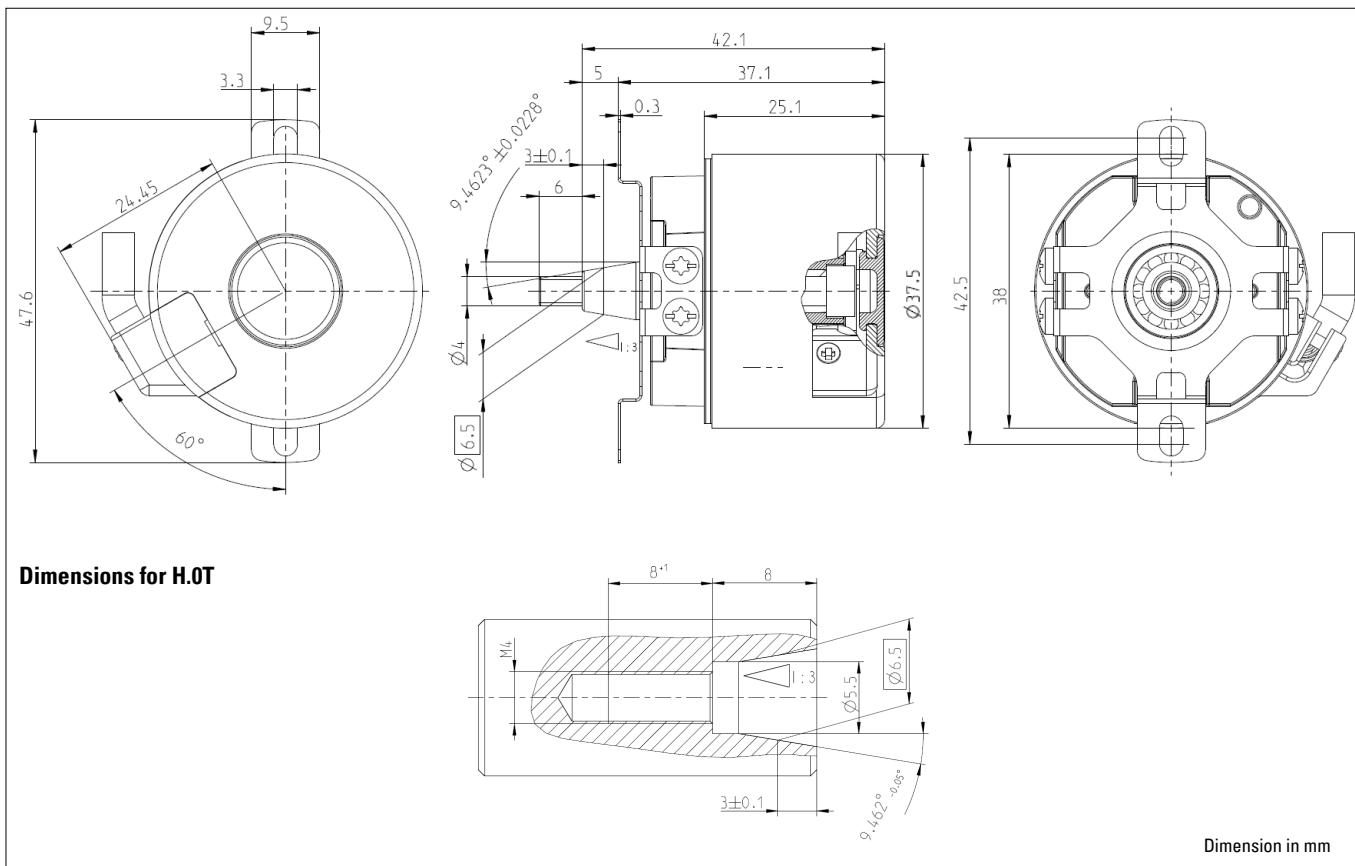
## Absolute Motor Feedback Encoder AD36

### DIMENSIONAL DRAWING

#### Hub Shaft (J.0G)



#### Cone Shaft 1:3 (H.0T)



# TECHNICAL DATASHEET

## Absolute Motor Feedback Encoder AD36

### ORDERING INFORMATION

| Type                 | Resolution                                                                                                                                                                                                                                                                                                                                                                                                    | Power Voltage <sup>1)</sup>                         | Flange, Protection, Shaft                                                                                                                                                                                                                                                                                                                                   | Interface                                                                                                                                                                                                                                        | Connection <sup>3), 4)</sup>                                                                                                                                                                                                                                                                                   |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="text"/> | <input type="text"/>                                                                                                                                                                                                                                                                                                                                                                                          | <input type="text"/>                                | <input type="text"/>                                                                                                                                                                                                                                                                                                                                        | <input type="text"/>                                                                                                                                                                                                                             | <input type="text"/>                                                                                                                                                                                                                                                                                           |
| <b>AD36</b>          | <b>0012</b> 12 Bit ST<br><b>0013</b> 13 Bit ST<br><b>0014</b> 14 Bit ST<br><b>0017</b> 17 Bit ST<br><b>0019</b> 19 Bit ST<br><b>0022</b> 22 Bit ST<br><br><b>1212</b> 12 Bit MT+12 Bit ST<br><b>1213</b> 12 Bit MT+13 Bit ST<br><b>1214</b> 12 Bit MT+14 Bit ST<br><b>1217</b> 12 Bit MT+17 Bit ST<br><b>1219</b> 12 Bit MT+19 Bit ST<br><b>1222</b> 12 Bit MT+22 Bit ST<br><br>Others available upon request | <b>A</b> DC 5 V <sup>2)</sup><br><b>E</b> DC 7-30 V | <b>F.0C</b> Spring tether, IP40, 8mm trough hollow shaft<br><br><b>F.0R</b> Spring tether, IP40, 8 mm hub shaft<br><br><b>U.0C</b> Spring tether, IP40, 8mm trough hollow shaft<br><br><b>U.0R</b> Spring tether, IP40, 8 mm hub shaft<br><br><b>J.0G</b> Spring tether, IP40, 6 mm hub shaft<br><br><b>H.0T</b> Spring tether, IP40 8 mm tapered shaft 1:3 | <b>BI</b> BiSS-B<br><b>BC</b> BiSS-B (+SinCos 1Vpp)<br><br><b>BE</b> BiSS-C<br><b>BV</b> BiSS-C (+SinCos 1Vpp)<br><br><b>SB</b> SSI Binary<br><b>SD</b> SSI Binary (+SinCos 1Vpp)<br><br><b>SG</b> SSI Gray<br><b>SC</b> SSI Gray (+SinCos 1Vpp) | <b>0</b> PCB connector 12 pole with pre-assembled axial cable clip<br><br><b>2</b> PCB connector 12 pole with pre-assembled tangential cable clip<br><br><b>A</b> PCB connector with mating connector and (0.5m) cable, axial<br><br><b>B</b> PCB connector with mating connector and (0.5m) cable, tangential |

<sup>1)</sup> The encoder is designed to be connected to a SELV power supply. A connection to a DC voltage network is only permitted with the appropriate protective circuit. A corresponding EMC protective circuit is generally required for cable lengths > 30 m.

<sup>2)</sup> With a 5V supply there is no reverse polarity protection

<sup>3)</sup> The cable outlet does not represent strain relief, the cable must be permanently installed near the encoder.

<sup>4)</sup> Connection „0“ and „2“ only with Interface BC, BV, SD and SC available. Interfaces always including SinCos 1Vpp

### ORDERING CODE cable

The variants with cable outlet (connection A, B) are available with different cable lengths. To get your desired cable length, please put the appropriate code at the end of the order key. Other lengths or plugs at the end of the cable on request

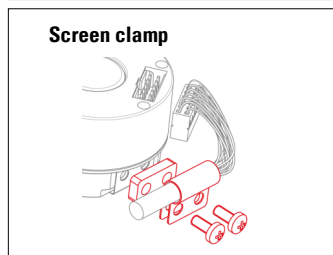
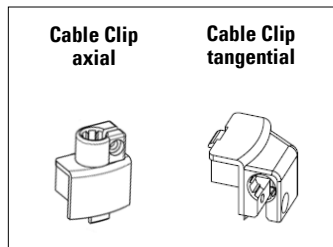
| Code         | Cable length |
|--------------|--------------|
| Without Code | 0,5 m        |
| -B5          | 1,5 m        |
| -D0          | 3 m          |
| -F0          | 5 m          |
| -K0          | 10 m         |
| -P0          | 15 m         |
| -U0          | 20 m         |
| -V0          | 25 m         |

Example:  
Cable with 3 m length: ... B - D0

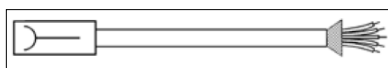
# TECHNICAL DATASHEET

## Absolute Motor Feedback Encoder AD36

### Accessoires



### CONNECTION CABLE



| Article                                    | Part Nr.   |
|--------------------------------------------|------------|
| SSI / BiSS-B Manual                        | 2 565 123  |
| BiSS-C Application Note                    | 2 547 138  |
| cable-Clip axial for cable (Ø 4,8 mm)      | E2 541 039 |
| cable-Clip tangential for cable (Ø 4,8 mm) | E2 541 034 |
| Screen clamp for screened cable            | 1 541 066  |

In standard encoders, the cable shield is isolated in the cable clip.  
In EMC-sensitive environments, the cable shield can be attached to the encoder housing using the shield clamp. To do this, the cable shield must be uncovered, folded back over the sheath and fastened in the clamp.

| <u>Cable 6 wire ( für BI, BE, SG, SB) for clip</u> |            |
|----------------------------------------------------|------------|
| Length                                             | Part Nr.   |
| 0,5 m                                              | E1 541 152 |
| 1,5 m                                              | E1 541 186 |
| 3,0 m                                              | E1 541 138 |
| 5,0 m                                              | E1 541 139 |
| 10,0 m                                             | E1 541 129 |

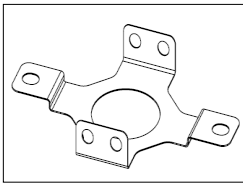
| <u>Cable 12 wire ( für BC, BV, SC, SD ) for clip</u> |            |
|------------------------------------------------------|------------|
| Length                                               | Part Nr.   |
| 0,5 m                                                | E1 541 048 |
| 1,5 m                                                | E1 541 059 |
| 3,0 m                                                | E1 541 061 |
| 5,0 m                                                | E1 541 110 |
| 10,0 m                                               | E1 541 089 |
| 15,0 m                                               | on request |

| <u>Cable 12 wire ( für BC, BV, SC, SD ) for screen clamp + clip</u> |            |
|---------------------------------------------------------------------|------------|
| Length                                                              | Part Nr.   |
| 0,5 m                                                               | E1 541 117 |
| 1,5 m                                                               | on request |
| 3,0 m                                                               | on request |
| 5,0 m                                                               | on request |
| 10,0 m                                                              | on request |
| 15,0 m                                                              | on request |

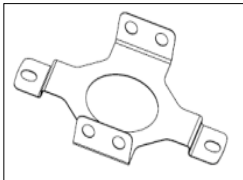
\* other lengths or connectors at the end of the cable on request

## OVERVIEW TETHERS

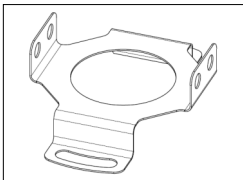
### TETHER „F“ Ordering Code E1 541 020



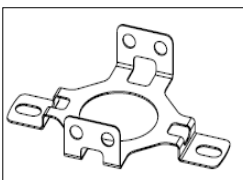
### Tether „U“ Ordering Code E1 541 077



### Tether „J“ Ordering Code E1 541 228

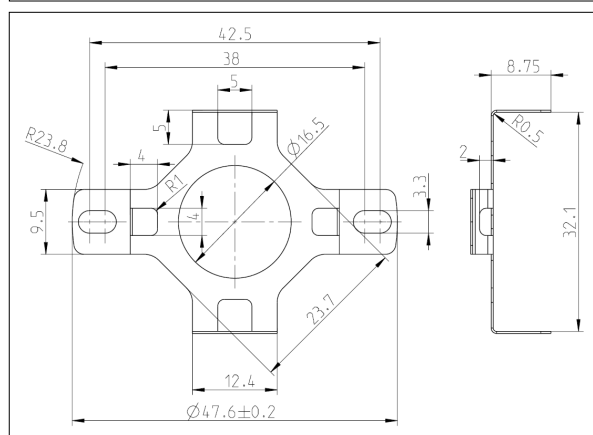
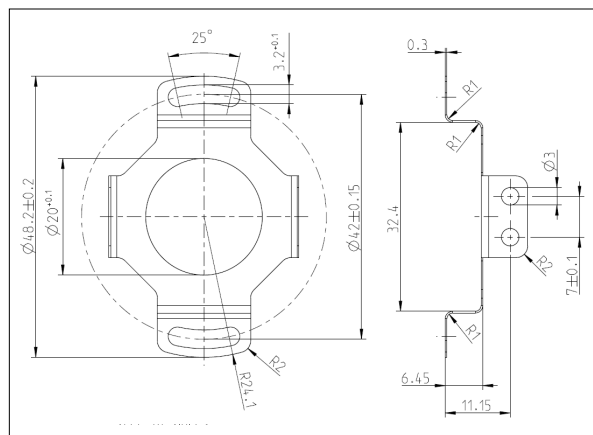
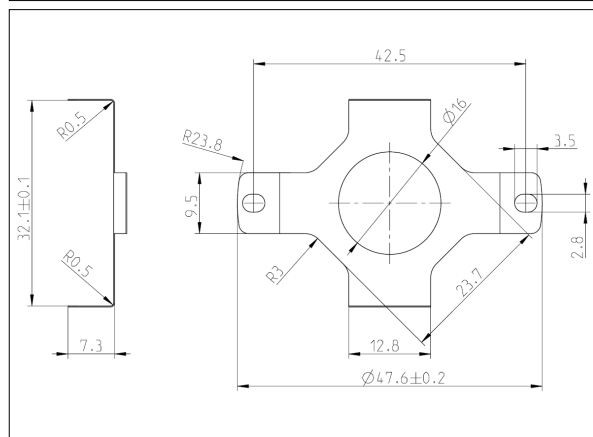
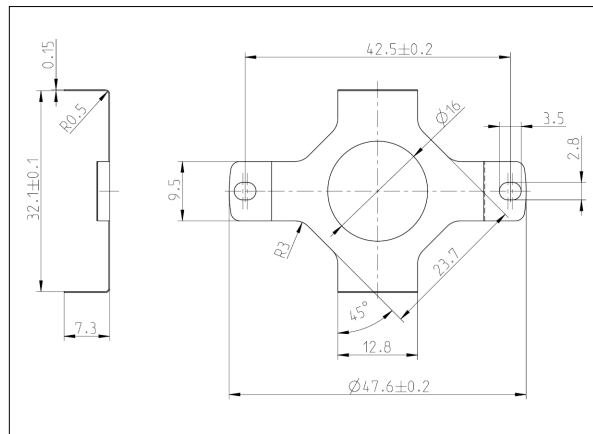


### Tether „H“ Ordering Code E1 541 172



## TECHNICAL DATASHEET

### Absolute Motor Feedback Encoder AD36



## По вопросам продаж и поддержки обращайтесь:

Алматы (727)345-47-04  
Ангарск (3955)60-70-56  
Архангельск (8182)63-90-72  
Астрахань (8512)99-46-04  
Барнаул (3852)73-04-60  
Белгород (4722)40-23-64  
Благовещенск (4162)22-76-07  
Брянск (4832)59-03-52  
Владивосток (423)249-28-31  
Владикавказ (8672)28-90-48  
Владимир (4922)49-43-18  
Волгоград (844)278-03-48  
Вологда (8172)26-41-59  
Воронеж (473)204-51-73  
Екатеринбург (343)384-55-89

Иваново (4932)77-34-06  
Ижевск (3412)26-03-58  
Иркутск (395)279-98-46  
Казань (843)206-01-48  
Калининград (4012)72-03-81  
Калуга (4842)92-23-67  
Кемерово (3842)65-04-62  
Киров (8332)68-02-04  
Коломна (4966)23-41-49  
Кострома (4942)77-07-48  
Краснодар (861)203-40-90  
Красноярск (391)204-63-61  
Курск (4712)77-13-04  
Курган (3522)50-90-47  
Липецк (4742)52-20-81

Магнитогорск (3519)55-03-13  
Москва (495)268-04-70  
Мурманск (8152)59-64-93  
Набережные Челны (8552)20-53-41  
Нижний Новгород (831)429-08-12  
Новокузнецк (3843)20-46-81  
Ноябрьск (3496)41-32-12  
Новосибирск (383)227-86-73  
Омск (3812)21-46-40  
Орел (4862)44-53-42  
Оренбург (3532)37-68-04  
Пенза (8412)22-31-16  
Петрозаводск (8142)55-98-37  
Псков (8112)59-10-37  
Пермь (342)205-81-47

Ростов-на-Дону (863)308-18-15  
Рязань (4912)46-61-64  
Самара (846)206-03-16  
Санкт-Петербург (812)309-46-40  
Саратов (845)249-38-78  
Севастополь (8692)22-31-93  
Саранск (8342)22-96-24  
Симферополь (3652)67-13-56  
Смоленск (4812)29-41-54  
Сочи (862)225-72-31  
Ставрополь (8652)20-65-13  
Сургут (3462)77-98-35  
Сыктывкар (8212)25-95-17  
Тамбов (4752)50-40-97  
Тверь (4822)63-31-35

Тольятти (8482)63-91-07  
Томск (3822)98-41-53  
Тула (4872)33-79-87  
Тюмень (3452)66-21-18  
Ульяновск (8422)24-23-59  
Улан-Удэ (3012)59-97-51  
Уфа (347)229-48-12  
Хабаровск (4212)92-98-04  
Чебоксары (8352)28-53-07  
Челябинск (351)202-03-61  
Череповец (8202)49-02-64  
Чита (3022)38-34-83  
Якутск (4112)23-90-97  
Ярославль (4852)69-52-93

**Россия** +7(495)268-04-70

**Казахстан** +(727)345-47-04

**Беларусь** +(375)257-127-884

**Узбекистан** +998(71)205-18-59

**Киргизия** +996(312)96-26-47

эл.почта: [hro@nt-rt.ru](mailto:hro@nt-rt.ru) || сайт: <https://hengstler.nt-rt.ru>