

## Draw-wire system SZG81



- Exceptionally rugged length sensor
- Measuring range 0 mm up to 2500 mm to 0 mm up to 6250 mm
- Output: incremental signals
- IP65 encoder ready-mounted

[www.wachendorff-automation.com/szg81wdginc](http://www.wachendorff-automation.com/szg81wdginc)

The draw-wire encoder SZG 81 was developed for use in harsh environments. With its 4 different lengths, it can be put into service very economically. The various methods of installation mean high flexibility. It can be used even where space is tight, thanks to its compact dimensions.

The SZG 81 can be mounted quickly and with its highly precise mechanics provides reliable accurate length measurement. The intelligent spring-suspension and the nylon-coated stainless-steel wire cable guarantee long-service life, even in difficult operating conditions. The mechanics have been perfectly matched to the encoder model WDG158A. The encoder is already installed.

### Typical areas of application include:

lifts/elevators, lifting platforms, theatre stages, fork lifts and cranes.

### Measurement ranges:

0 - 2500 mm, 0 - 3500 mm, 0 - 5000 mm and 0 - 6250 mm.  
Greater lengths up to 42000 mm on enquiry

### Resolution Measurement ranges:

Various, depending on encoder up to 100 pulses/mm at 4 x edge evaluation  
WDGI 58A with 1000 PPR = Resolution: 5 pulses/mm  
WDGI 58A with 2000 PPR = Resolution: 10 pulses/mm  
WDGI 58A with 5000 PPR = Resolution: 25 pulses/mm

### Electrical Output:

2 channels (AB) are shifted by 90°. Pulses 10 Volt up to 30 Volt, push-pull, 40 mA and zero pulse per rotation = G24

2 channels (AB) are shifted by 90°. Pulses 4.75 Volt up to 5.5 Volt, push-pull, 40 mA and zero pulse per rotation + inverted signals = I05

**Deviation:** Less than 0.02 % of the final value.

### Measuring wire:

0.86 mm of thick nylon coated high-grade steel wire.

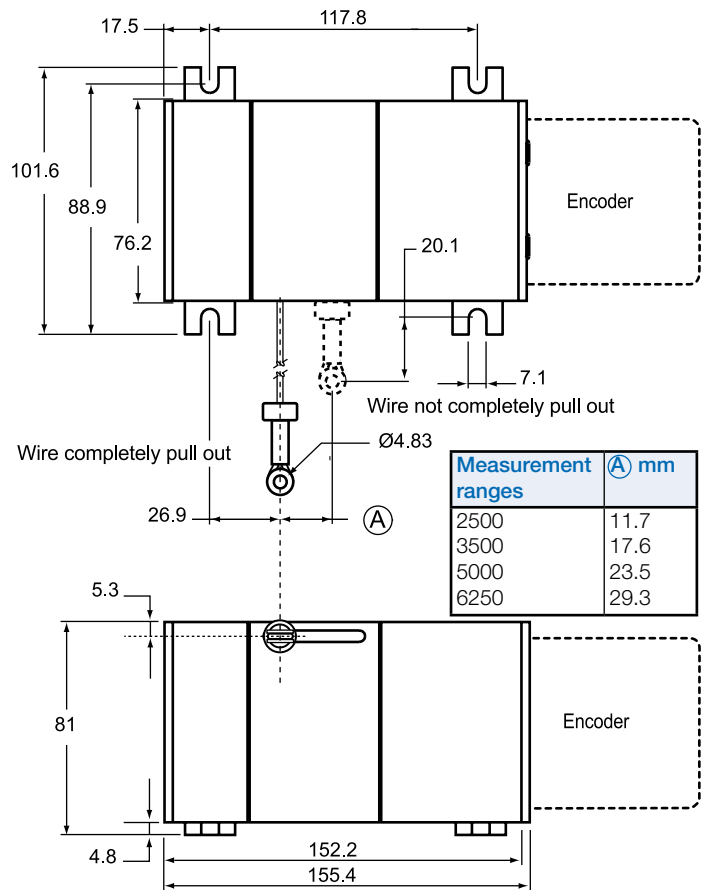
Wire connection: eye  
max. wire speed: 7.5 m/sec.  
Pull out strength: approx. 0.5 kg

**System-unit housing:** anodised aluminum

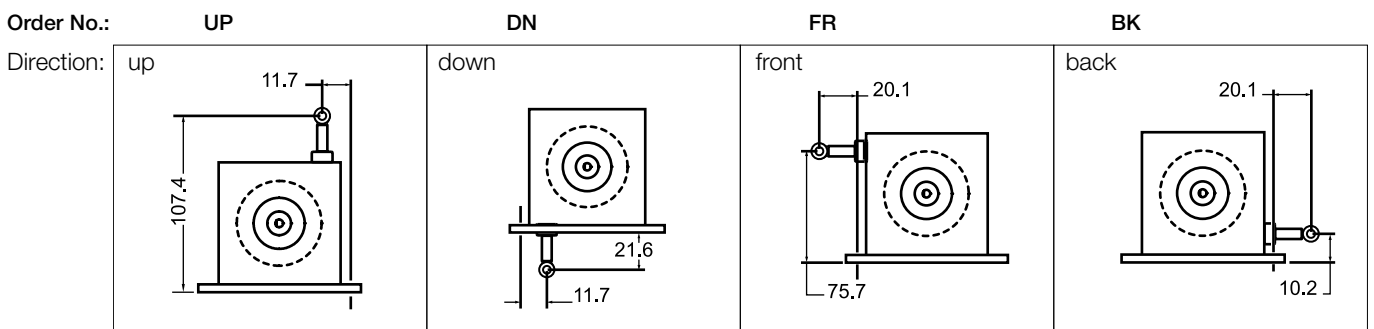
**Weight:** SZG incl. encoder max. 2.5 kg

**Life expectancy:** At least 10 million cycles

Operating temperature: -20 °C up to +80 °C  
Storage temperature: -30 °C up to +80 °C



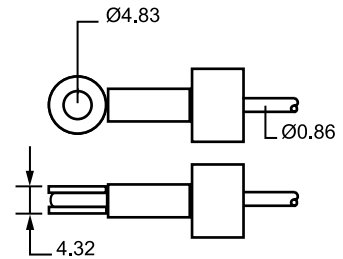
All details in mm and dependent on the encoder configuration.



**Example of the order of a Draw-wire system:**

SZG81 - 5.000 - N - UP - G24 - 25

- 5.000: Draw wire system with 5.000 mm measurement range;
- N: nylon coated high-grade steel wire
- UP: Wire exit up
- G24: Incl. incremental encoder WDGI 58A with channels  
ABN, signal output G24
- Connections: Connector 7-pin, radial
- 25: Resolution 25 pulses/mm



**Order number:** SZG81 - 5.000 - N - UP - G24 - 25  
**Position:** 1 2 3 x yyy zz

| Short description             | Position | Part of order number                                                        | Description                                                                                                                                                       |
|-------------------------------|----------|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Type</b>                   | 1        | SZG81                                                                       | Draw wire system, housing 81 mm.                                                                                                                                  |
| <b>Measurement range (MB)</b> | 2        | 2500<br>3500<br>5000<br>6250                                                | Measurement range 2500 mm<br>Measurement range 3500 mm<br>Measurement range 5000 mm<br>Measurement range 6250 mm                                                  |
| <b>Measurement wire</b>       | 3        | N                                                                           | 0.86 mm of thick nylon coated high-grade steel wire                                                                                                               |
| <b>Mounting direction</b>     | xx       | UP<br>DN<br>FR<br>BK                                                        | Wire exit up<br>Wire exit down<br>Wire exit front<br>Wire exit back                                                                                               |
| <b>Output</b>                 | yyy      | G24 = 10 VDC - 30 VDC, HTL<br>I05 = 4.75 VDC - 5.5 VDC,<br>TTL, RS422 comp. | Channels: ABN, signal output<br>Channels: ABN, $\overline{ABN}$ , signal output                                                                                   |
| <b>Solution *1</b>            | zz       | 05<br>10<br>25<br>zz*                                                       | 5 pulses/mm<br>10 pulses/mm<br>25 pulses/mm<br>You specify another encoder, please, use the order number of the WDGI 58 A type<br>This encoder is assembled by us |

zz\* mounted Encoder WDGI 58A - 06 - zzzz - ABN - yyy - S3/5 (ppr):

For resolution of 5 pulses/mm = 1000, 10 pulses/mm = 2000 und 25 pulses/mm = 5000, with the following qualities:

Channels: ABN: 2 channels shifted by 90° plus inverted signals

Output: G24: 10-30 Volt, 40 mA push-pull. I05: 5 VDC, 40 mA push-pull.

Connections: Connector 7-pin, radial = S3 (PIN-arrangement: A=3, B=4, N=5, 0V=1, 10-30VDC=2)

Connector 12-pin, radial = S5 (PIN-arrangement: A=5, B=8, N=3, A inv.=6, B inv.=1, N inv.=4, 0V=10, 5 VDC=12)

If you like to specify your individual encoder, please enter at the order number zz and define from the data sheet WDGI 58 your special encoder.

**Ordering information:**

**Mounting direction**

Wire exit up = UP  
Wire exit down = DN  
Wire exit front = FR  
Wire exit back = BK

**Measuring wire:**

0.86 mm of thick nylon coated high-grade steel wire = N

**Measurement range:**

2500 mm = 2500  
3500 mm = 3500  
5000 mm = 5000  
6250 mm = 6250

**Output circuit:**

G24 = 10 VDC up to 30 VDC, HTL  
I05 = 4.75 VDC up to 5.5 VDC, TTL, RS422 comp.

**Resolution:**

05 = 5 pulses/mm  
10 = 10 pulses/mm  
25 = 25 pulses/mm

You specify another encoder, please use the order number of the WDGI 58 A type = zz

Example      SZG81   2500   N   UP   G24   05

Your system   SZG81

**Montageanleitung Vollwellengeber,**

Assembly instructions shaft encoder, Notice de montage codeur rotatif à arbre plein, Instrucciones de montaje encoder ad albero pieno, istruzioni di montaggio encoders de eje saliente.

|                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|                                                                                                                                                                                                                                                                                                  | <b>WDGI (Stecker, connector, connecteur, conector, spina):</b><br>-40 °C ... +85 °C (-4 °F ... +176 °F)<br><b>WDG* + WDGI (Kabel, cable, Câble, Cable, cavo)**:</b><br>-20 °C ... +80 °C (-4 °F ... +176 °F)<br>Option: * -40 °C ... +80 °C (-40 °F ... +176 °F)<br>** -40 °C ... +85 °C (-40 °F ... +185 °F)<br>1Vss (1Vpp): -10 °C ... +70 °C (14 °F ... +158 °F)<br>58T: -10 °C ... +70 °C (58T: +14 °F ... +158 °F) |  |
|                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
| <b>Montage nur qualifiziertes Personal, Assembly only qualified personnel,</b><br>Montage par qualifié personnel, Montaggio solo personale qualificato,<br>Montaje solamente personal cualificado                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
| <b>Sicherheitsmassnahmen/safety instructions:</b> Die Produkte dürfen nur in industrieller Umgebung und im NICHT sicherheitsrelevanten Bereich eingesetzt werden. The products are only designed and produced for use in industrial environments and NOT for use in safety related applications. |                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
|                                                                                                                                                                                                                                                                                                  | 1                                                                                                                                                                                                                                                                                                                                                                                                                       |  |
|                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                         |  |

| Kabel ø<br>cable, Câble,<br>Cable, cavo | R1      | R2       | Temperatur<br>Temperature, Température,<br>Temperatura, Temperatura |
|-----------------------------------------|---------|----------|---------------------------------------------------------------------|
| ≤ 7 mm                                  | 31,5 mm | 94,5 mm  | T > -20 °C (-4 °F)                                                  |
| > 7 mm                                  | 41,5 mm | 124,5 mm | T > -20 °C (-4 °F)                                                  |
| ≤ 7 mm                                  | 46,5 mm | 139,5 mm | T > -40 °C (-40 °F)                                                 |
| > 7 mm                                  | 62,3 mm | 186,9 mm | T > -40 °C (-40 °F)                                                 |

58B  
58D  
58K  
58S  
58T  
58V  
63B  
70B  
90B

40A  
50B  
58A  
58B  
58C  
58D  
58K  
58T  
63B

24A 58V  
24C 63B  
40A 70B  
50B 90B  
58A  
58B  
58C  
58D  
58K  
58S  
58T

40S  
53S  
53V

40A  
58B  
58D  
58K  
58S  
58T  
58V

63Q  
67Q  
115T  
115M

58A + MG58A

| Standard (no IP67) | F <sub>r</sub> max. | F <sub>a</sub> max. |
|--------------------|---------------------|---------------------|
| 24A/C, 40A/S, 58K  | 80 N                | 50 N                |
| 50B                | 120 N               | 70 N                |
| 53S, 53V           | 20 N                | 10 N                |
| 58A                | 125 N               | 70 N                |
| 58B, 58T, 63B/Q    | 220 N               | 120 N               |
| WDG58D             | 400 N               | 400 N               |
| WDGI58D            | 500 N               | 500 N               |
| 70B, 90B           | 200 N               | 150 N               |
| 115T/M, 58C        | 200 N               | 120 N               |
| 58S, 58V           | 100 N               | 100 N               |

| Gewinde (8.8)<br>Screw thread, Filet, Rosca, filetto | Empfohlenes Anzugsdrehmoment<br>Recommended starting torque<br>Moment de rotation recommandé appliqué à l'écrou<br>Par de apriete recomendado<br>coppia di spunto consigliata |
|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| M3                                                   | 1 Nm                                                                                                                                                                          |
| M4                                                   | 2 Nm                                                                                                                                                                          |
| M5                                                   | 3 Nm                                                                                                                                                                          |
| M6                                                   | 6 Nm                                                                                                                                                                          |
| Mutter, Screw nut, écrou, Tuerca, dado, M20x1,5      | 8 Nm                                                                                                                                                                          |

| Frühwarnausgang<br>Early-warning output<br>Sortie d'alerte<br>Salida de advertencia prematura<br>uscita di preavvertimento | IRLED                   | IRLED    |
|----------------------------------------------------------------------------------------------------------------------------|-------------------------|----------|
|                                                                                                                            |                         |          |
| Schaltung<br>Circuit<br>Couplage<br>Commutación<br>collegamento                                                            | G24, I24, G05, I05, 524 | high low |

**Abstand zu Störquellen!**  
Distance to sources of interference!  
Distance aux source des parasites!  
Distancia a las fuentes de interferencias!  
Distanza dalle fonti di disturbo!

\*Nur, only, seulement, solamente, soltanto G24, H24, I24, R24, F24, P24, R30: hat Verpolschutz, ist kurzschlussfest; Protection against polarity reversal, short circuit protection; Protección contro l'inversione di polarità Protection court-circuit; Protegido contra inversión de polaridad, protección contra cortocircuito; protezione contro inversione di polarità, protezione contro corto circuito

|  | L <sub>MAX</sub> |
|--|------------------|
|  | 100m             |
|  | 150m             |

| Schaltung<br>Circuit<br>Couplage<br>Commutación<br>collegamento | Stecker, connector, Fiche, Connector, spina |                                    |                                  |                                   |                                              |                                                          |                           |                        |                                               |                                    | Kabel, cable, Câble, Cable, cavo |                                               |                                              |                                       |                                        |                                                |                                   |                                                |                                                |   |
|-----------------------------------------------------------------|---------------------------------------------|------------------------------------|----------------------------------|-----------------------------------|----------------------------------------------|----------------------------------------------------------|---------------------------|------------------------|-----------------------------------------------|------------------------------------|----------------------------------|-----------------------------------------------|----------------------------------------------|---------------------------------------|----------------------------------------|------------------------------------------------|-----------------------------------|------------------------------------------------|------------------------------------------------|---|
|                                                                 | S15 axial,<br>SH5 radial,<br>5-pin          | S16 axial,<br>SH6 radial,<br>6-pin | S2 axial,<br>S3 radial,<br>7-pin | S8 axial,<br>SH8 radial,<br>8-pin | S12 axial,<br>SH12 radial,<br>12-pin         | S4 axial, S4R axial,<br>S5 radial, S5R radial,<br>12-pin | S6 radial,<br>6-pin       | S7 axial,<br>4-pin     | SK6 axial,<br>6-pin                           | SB4 axial,<br>SC4 radial,<br>4-pin | F/H/05<br>F/H24<br>H30           | SB5 axial,<br>SC5 radial,<br>5-pin            | SB8 axial,<br>SC8 radial,<br>8-pin           | SB12 axial,<br>SC12 radial,<br>12-pin | K1/K7/L7<br>T3 tangential              | ACA:<br>24C<br>40A/S<br>40E                    | ACA:<br>58, 63,<br>67, 70,<br>115 | 58SV                                           |                                                |   |
| F/H/05<br>F/H24<br>H30                                          | G/F/H/05<br>G/F/H24<br>H30                  | G/F/H/05<br>G/F/H24<br>H30         | F/H05<br>F/H24<br>H30            | P/R05<br>P/R24<br>SIN<br>R30      | G/F/H05<br>G/F/H24<br>H30<br>SIN, SIF<br>R30 | I/P/R05<br>I/P/R24<br>245, 524<br>645<br>SIN, SIF<br>R30 | G/F/H05<br>G/F/H24<br>H30 | F/H/05<br>F/H24<br>H30 | F05<br>H05<br>P24<br>H24<br>R24<br>H30<br>R30 | F/H/05<br>F/H24<br>H30             | F/H/05<br>F/H24<br>H30           | F05<br>H05<br>P24<br>H24<br>R24<br>H30<br>R30 | G/F05/<br>H05<br>G/F24/<br>H24<br>H30<br>R30 | G/F/H05<br>G/F/H24<br>H30<br>N30      | R30<br>M05<br>M30<br>H24<br>R24<br>N30 | I/R/P05<br>I/R/P24<br>245<br>524<br>645<br>R30 | SIN<br>SIF                        | I/R/P05<br>I/R/P24<br>245<br>524<br>645<br>R30 | I/R/P05<br>I/R/P24<br>245<br>524<br>645<br>R30 |   |
| Minus U-                                                        | 1                                           | 6                                  | 1                                | 1                                 | K/L                                          | 10                                                       | A                         | 1                      | 3                                             | 3                                  | 3                                | 1                                             | 1                                            | 3                                     | 3                                      | 3                                              | 3                                 | 3                                              | 3                                              | 3 |
| Plus U+                                                         | 2                                           | 1                                  | 2                                | 2                                 | M/B                                          | 12                                                       | F                         | 2                      | 1                                             | 1                                  | 1                                | 2                                             | 2                                            | 1                                     | 1                                      | 1                                              | 1                                 | 1                                              | 1                                              | 1 |
| A                                                               | 3                                           | 2                                  | 3                                | 3                                 | E                                            | 5                                                        | C                         | 3                      | 4                                             | 3                                  | 4                                | 3                                             | 3                                            | 4                                     | 4                                      | 4                                              | 4                                 | 4                                              | 4                                              | 4 |
| B                                                               | 4                                           | 4                                  | 4                                | 4                                 | H                                            | 8                                                        | B                         | 4                      | 4                                             | 4                                  | 4                                | 4                                             | 4                                            | 4                                     | 4                                      | 4                                              | 4                                 | 4                                              | 4                                              | 4 |
| N                                                               | 5                                           | 3                                  | 5                                | 5                                 | C                                            | 3                                                        | D                         | -                      | 5                                             | 5                                  | 5                                | 5                                             | 5                                            | 5                                     | 5                                      | 5                                              | 5                                 | 5                                              | 5                                              | 5 |
| Frühwam-<br>ausgang*1                                           | -                                           | 5                                  | 6                                | -                                 | G                                            | 11                                                       | E                         | -                      | -                                             | -                                  | -                                | -                                             | -                                            | 5                                     | -                                      | -                                              | -                                 | -                                              | -                                              | - |
| A inv.                                                          | -                                           | -                                  | -                                | 6                                 | F                                            | 6                                                        | -                         | -                      | -                                             | -                                  | -                                | -                                             | -                                            | 6                                     | -                                      | -                                              | -                                 | -                                              | -                                              | - |
| B inv.                                                          | -                                           | -                                  | -                                | 7                                 | A                                            | -                                                        | -                         | -                      | -                                             | -                                  | -                                | -                                             | -                                            | 7                                     | -                                      | -                                              | -                                 | -                                              | -                                              | - |
| N inv.                                                          | -                                           | -                                  | -                                | 8                                 | D                                            | 4                                                        | -                         | -                      | -                                             | -                                  | -                                | -                                             | -                                            | 8                                     | -                                      | -                                              | -                                 | -                                              | -                                              | - |
| n. c.                                                           | -                                           | 6, 7, 8                            | 7                                | -                                 | J                                            | 1, 2, 4,<br>6, 7, 9                                      | -                         | -                      | 6                                             | 6                                  | 6                                | 6                                             | 6                                            | 6                                     | 6                                      | 6                                              | 6                                 | 6                                              | 6                                              | 6 |
| Schirm*2                                                        | -                                           | -                                  | -                                | -                                 | -                                            | 2, 7, 9<br>SINUS<br>2, 9, 11                             | -                         | -                      | -                                             | -                                  | -                                | -                                             | -                                            | 2, 7, 9,<br>10, 11,<br>11, 12<br>12   | -                                      | -                                              | -                                 | -                                              | -                                              | - |

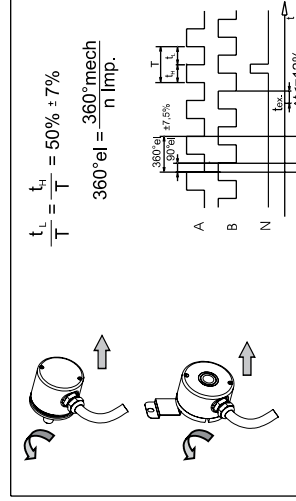
**\*1 Frühwamausgang nur bei**  
Early-warning output only for  
Sortie d'alerte précoce  
Salida de advertencia prematura  
uscita di preavvertimento  
**G24, I24, G05, I05, 524, SIF (80H/100H/G/I/K)**

**Steckergehäuse aus Kunststoff (S7)**  
Plastic connector housing (S7)  
Boîtier de connexion en matière plastique (S7)  
Caja de conector de plástico (S7)  
scatola prese in plastica (S7)

**\*2 Schirm**  
Shield  
Ecran  
Malla  
Schermo

**WH: weiss, white, bianco, bianco, bianco**  
**BN: braun, brown, brun, marron, marrone**  
**GN: grün, green, vert, verde, verde**  
**YE: gelb, yellow, jaune, amarillo, giallo**  
**GY: grau, grey, gris, gris, grigio**  
**PK: rosa, pink, rose, rosa, rosa**  
**RD: rot, red, rouge, rojo, rosso**  
**BK: schwarz, black, noir, negro, nero**  
**BU: blau, blue, bleu, azul, blu**  
**VT: violett, violet, violet, violeta, violetto**  
**Litze: Litze, Flex, Toron, Cordón, Cavetto**

| U <sub>B</sub>                                        | I <sub>supply</sub>                                                                 | Output                                                | I <sub>outmax</sub>                                              |
|-------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------|------------------------------------------------------------------|
| R30, H30, M30, M30                                    | ≤ 70 mA                                                                             | H > U <sub>B</sub> - 10% U <sub>B</sub><br>L < 2.5VDC | 40 mA                                                            |
| G24, H24, F24, I24, R24, N24, M24, P24                | N05, N24, N30, M05, M24, M30                                                        | H > U <sub>B</sub> - 2.5VDC<br>L < 2.5VDC             | N05, N24, N30, M05, M24, M30 = 30 mA                             |
| 245, 524, 645                                         | ≤ 40 mA                                                                             | H > 2.5VDC<br>L < 1.2VDC                              |                                                                  |
| G05, H05, F05, I05, R05, N05, M05, P05                | P05, P24, F05, F24, 645                                                             | H > 2.5VDC<br>L < 0.5VDC                              |                                                                  |
| Bemerkungen<br>Notas<br>Observaciones<br>osservazioni | Ohne Last<br>Without load<br>resistance<br>Sans charge<br>Sin carga<br>senza carico |                                                       | Pro Kanal<br>Per channel<br>Par canal<br>Por canal<br>Per canale |



**Steckergehäuse/Schirm mit Gebergehäuse leitend verbunden. (Nicht S7, K1, K2, K3)**  
Connector housing/shield electrically connected to encoder housing (not S7, K1, K2, K3, T3)  
Boîtier de connexion/Ecran avec boîtier d'émetteur liés de manière conductrice (No S7, K1, K2, K3)  
Caja de conector/Malla conectada en conductancia con caja de transmisor (No S7, K1, K2, K3)  
Scatola prese/Schermo con scatola trasmettitore collegata da condurre (No S7, K1, K2, K3)

**www.wachendorff-automation.de**  
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Other countries, please contact your distributor.  
Autres pays, veuillez contacter votre distributeur.  
Otros países, rogamos contactar a su distribuidor.  
Per gli altri paesi si prega di contattare il vostro distributore.

