



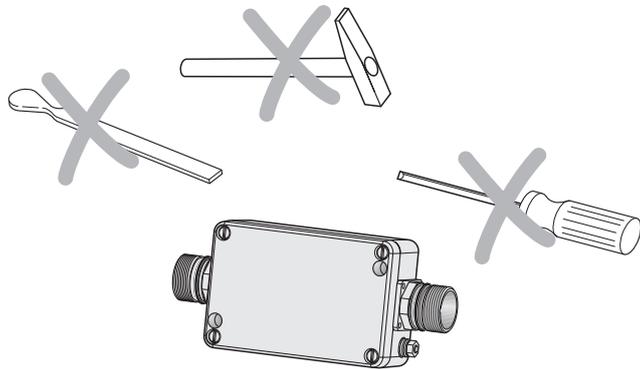
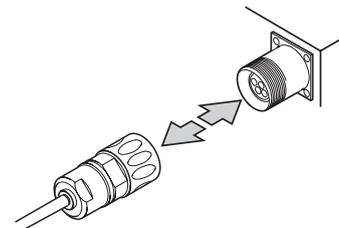
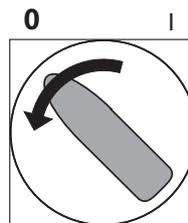
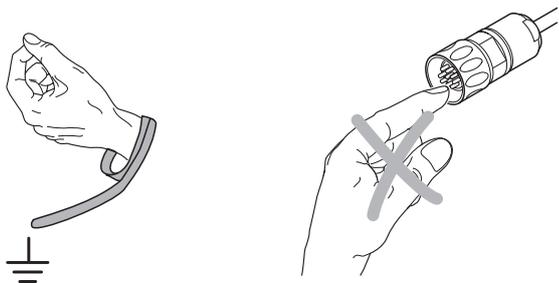
HEIDENHAIN

Betriebsanleitung
Operating Instructions
Mode d'emploi
Manuale operativo
Modo de empleo

IBV/EXE 101
IBV/EXE 102

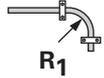
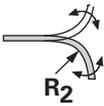
6/2005

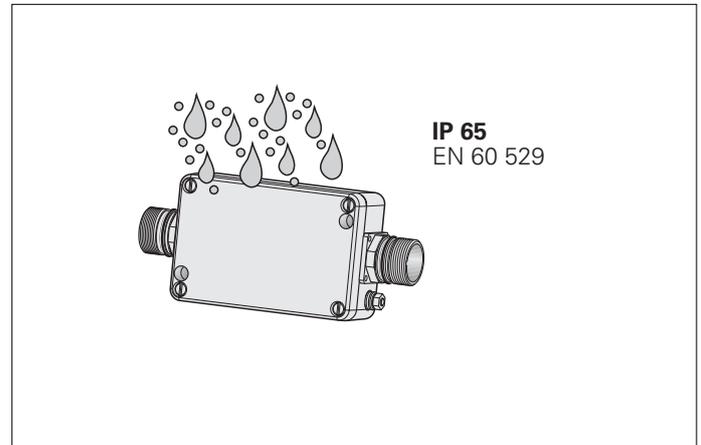
 **DIN EN 100 015 – 1**
CECC 00015 – 1

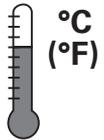
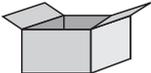


Maße in mm
Dimensions in mm
Cotes en mm
Dimensioni in mm
Dimensiones en mm

Technische Kennwerte · Specifications · Caractéristiques techniques · Dati tecnici · Datos técnicos

| | | |
|---|---|---|
|  |  |  |
| Ø 6 mm | $R_1 \geq 20 \text{ mm}$ | $R_2 \geq 75 \text{ mm}$ |
| Ø 8 mm | $R_1 \geq 40 \text{ mm}$ | $R_2 \geq 100 \text{ mm}$ |



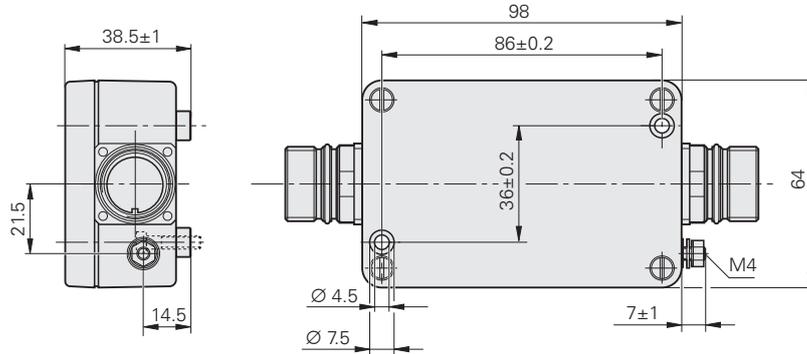
| | |
|---|---|
|  |  <p>-30 ... 80 °C (-22 ... 176 °F)</p> |
|---|---|

Abmessungen · Dimensions · Dimensions · Dimensioni · Dimensiones

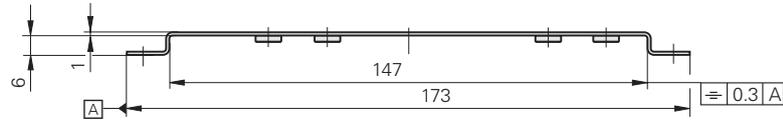
mm



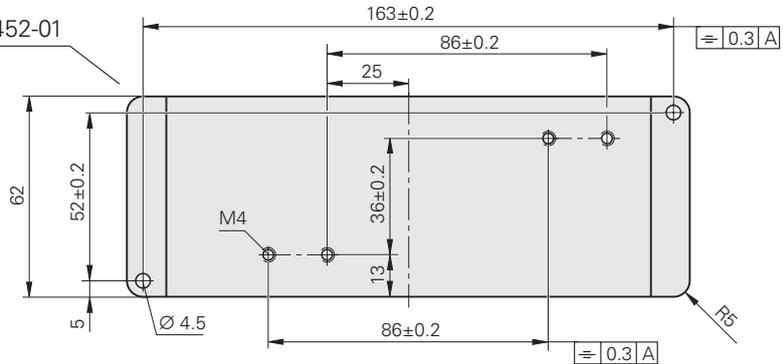
Tolerancing ISO 8015
ISO 2768 - m H
< 6 mm: ±0.2 mm

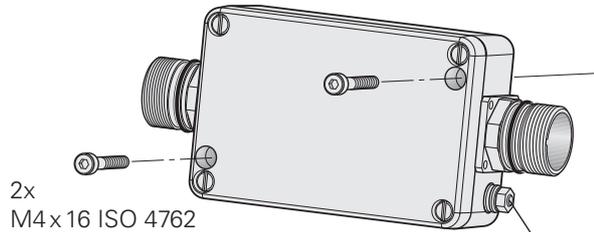


Zubehör: Befestigungsatz
Accessory: *Mounting set*
Accessoire: kit de fixation
Accessori, *minuteria di fissaggio*
Accesorios: Juego de fijaciones

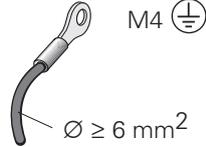


Id.-Nr. 536 452-01

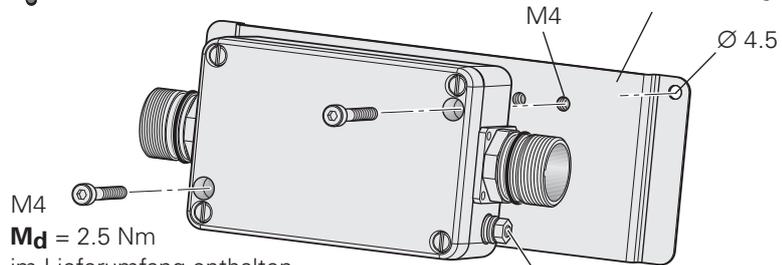




M_d = 2.5 Nm



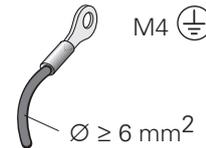
Zubehör: Befestigungssatz
Accessory: *Mounting set*
Accessoire: kit de fixation
Accessori, *minuteria di fissaggio*
Accesorios: Juego de fijaciones



M4

M_d = 2.5 Nm

im Lieferumfang enthalten
Included in delivery
Contenu dans la fourniture
Nello standard di fornitura
Incluido en el suministro



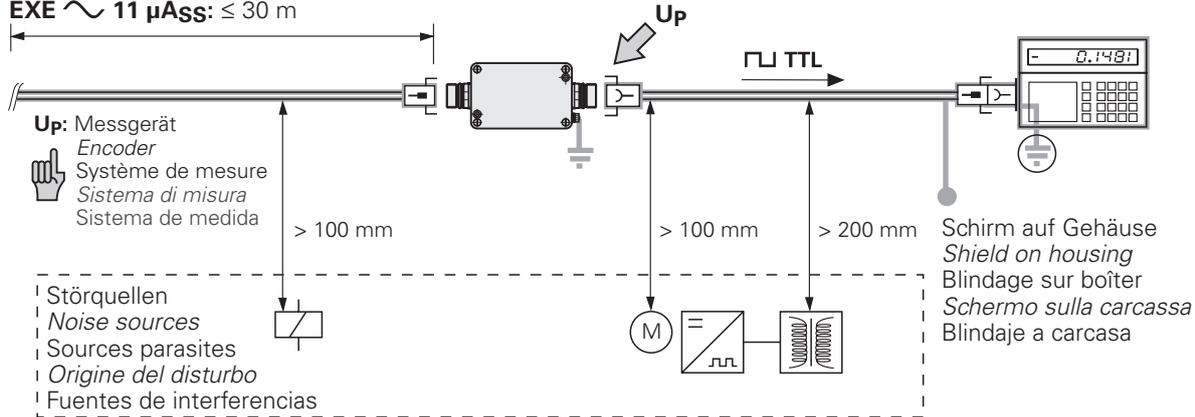
U_P = Spannungsversorgung
Power supply
 Tension d'alimentation
Alimentazione tensione
 Tensión de alimentación

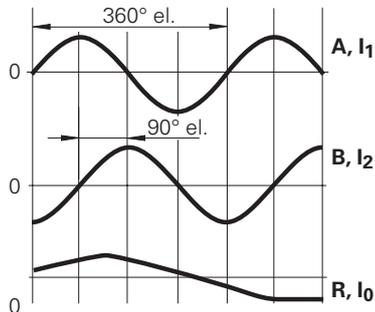
U_P = 5 V ± 5 %
 IBV 101: (max. 120 mA)
 IBV 102: (max. 130 mA)
 EXE 101: (max. 120 mA)
 EXE 102: (max. 140 mA)

☞ EN 50 178/4.98; 5.2.9.5
 IEC 364-4-41: 1992; 411(PELV/SELV)
 (siehe, see, voir, vedi, véase
 HEIDENHAIN D231 929)

IBV ~ 1 V_{SS}: ≤ 30 m (≤ 60 m; U_P > 4.9 V)

EXE ~ 11 μA_{SS}: ≤ 30 m



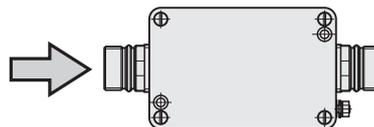


IBV

A: 0.6 ... 1.2 V_{SS}
 B: 0.6 ... 1.2 V_{SS}
 R: 0.2 ... 0.85 V

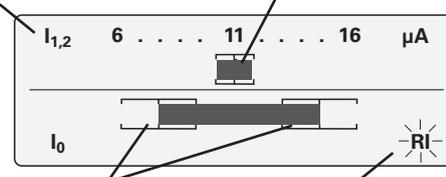
EXE

I₁: 7 ... 16 μA_{SS}
 I₂: 7 ... 16 μA_{SS}
 I₀: 2 ... 8.5 μA



Signalamplitude
Signal amplitude
 Amplitude du signal
 Ampiezza del segnale
 Amplitud de señales

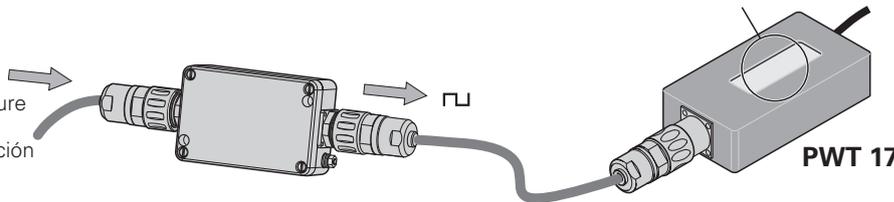
Signalqualität
Signal quality
 Qualité du signal
 Qualità del segnale
 Calidad de la señal



Toleranz des Nulldurchganges der Referenzmarke
Tolerance of zero crossover of the reference mark
 Tolérance de passage à zéro de la marque de référence
 Tolleranza di posizione dell'indice di riferimento
 Tolerancia de paso por cero de la marca de referencia

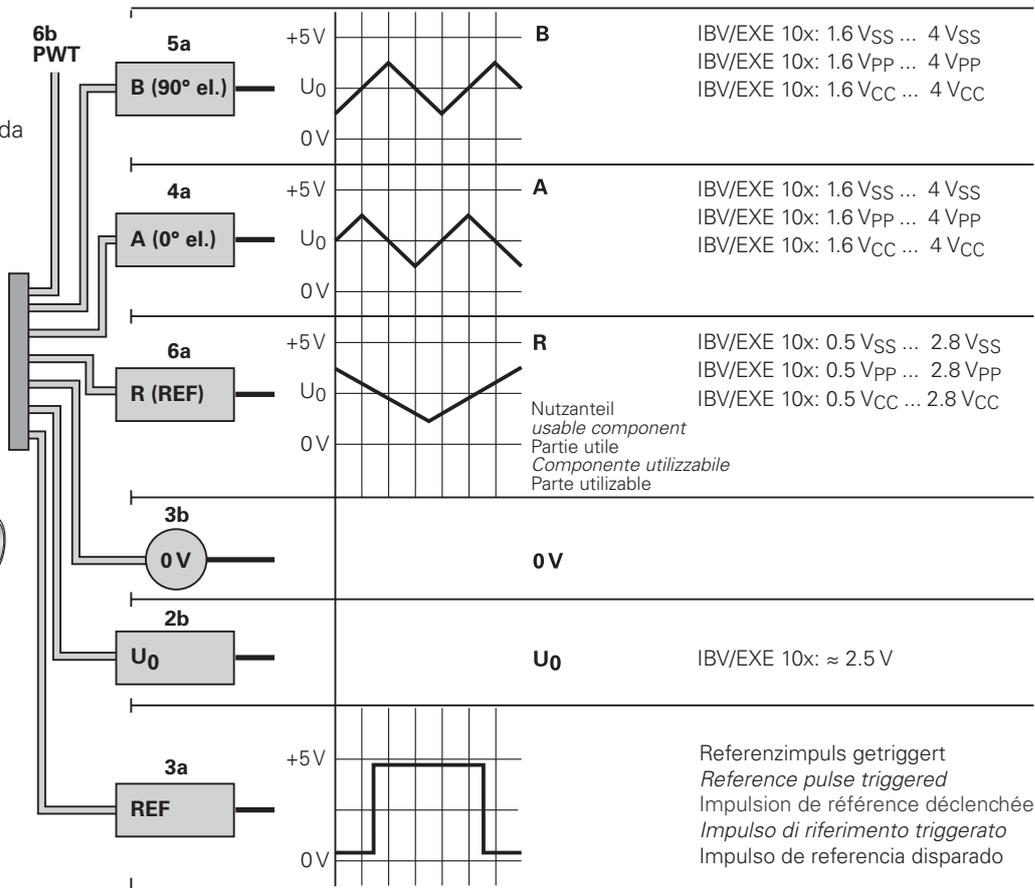
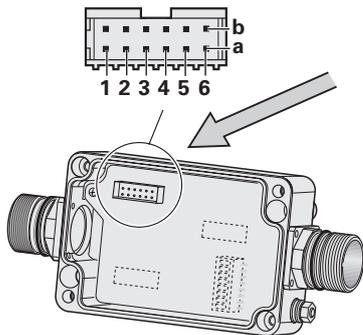
Messung der Referenzmarke
Reference mark measurement
 Mesure de la marque de référence
 Rilevazione dell'indice
 Medición de la marca de referencia

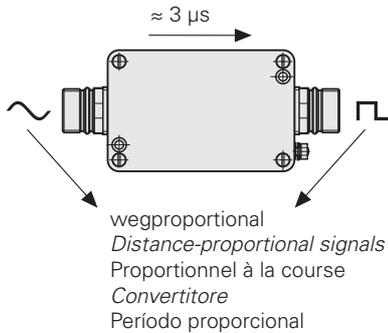
Messgerät
Encoder
 Système de mesure
 Encoder
 Sistema de medición



PWT 17

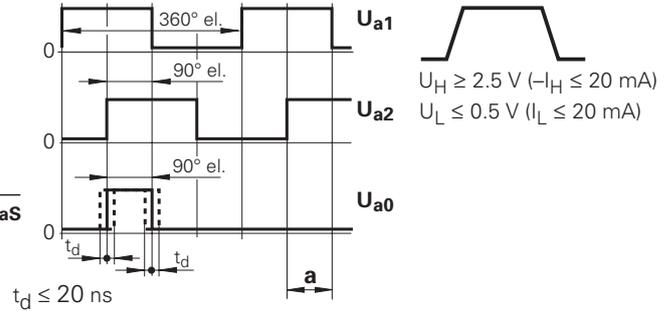
Eingangssignale prüfen
 Check the input signals
 Vérifier les signaux d'entrée
 Verificare impulsi in ingresso
 Comprobar las señales de entrada





TTL

$\overline{U_{a1}}, \overline{U_{a2}}, \overline{U_{a0}}$
 $\overline{U_{a1}}, \overline{U_{a2}}, \overline{U_{a0}}, \overline{U_{aS}}$



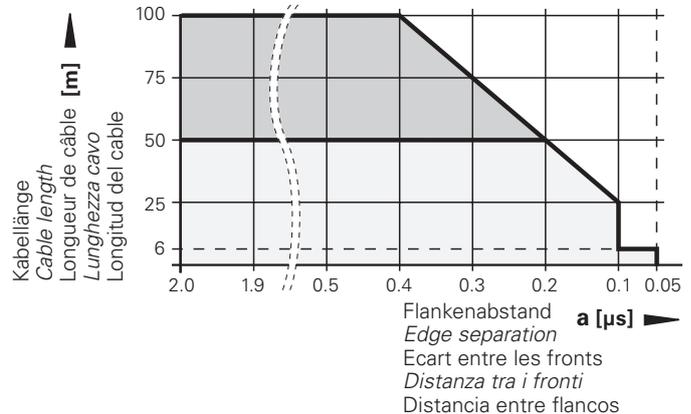
$\overline{U_{aS}}$: Störungssignal
Fault detection signal
Signal de perturbation
Segnale di malfunzionamento
Señal de avería

$\overline{U_{aS}} = \text{High}$: ✓

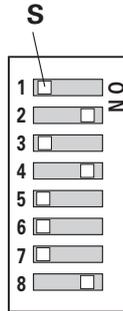
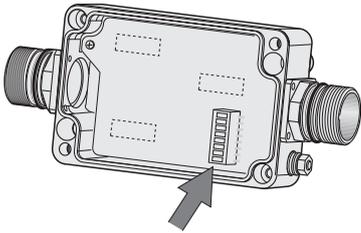
$\overline{U_{aS}} = \text{Low}$: ⚠

ohne $\overline{U_{aS}}$
Without $\overline{U_{aS}}$
sans $\overline{U_{aS}}$
senza $\overline{U_{aS}}$
sin $\overline{U_{aS}}$

mit $\overline{U_{aS}}$
With $\overline{U_{aS}}$
avec $\overline{U_{aS}}$
con $\overline{U_{aS}}$
con $\overline{U_{aS}}$



IBV 101



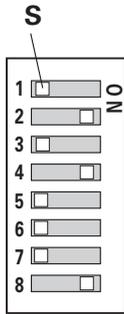
Funktionseinstellung
Function selection
 Réglage de la fonction
Selezione funzioni
 Selección de funciones

S1 = reserviert
 (immer auf off)
Reserved
 (always set to off)
 Réservé
 (toujours sur off)
Riservato
 (sempre su off)
 Reservado
 (siempre en off)

| | | |
|--|-----------|-----------|
| Interpolation <i>Interpolation</i> Interpolation <i>Interpolazione</i> Interpolación | | |
| | S3 | S4 |
| TTL x 5 | off | off |
| TTL x 10 | off | on |

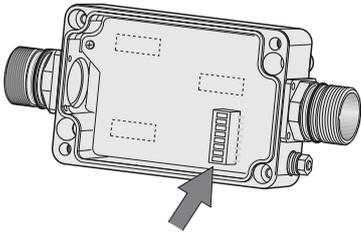
| | |
|--|-----------|
| Referenzimpuls-Breite <i>Reference pulse width</i> Largeur impulsion de référence <i>Ampiezza impulso di riferimento</i> Ancho del impulso de referencia | S2 |
| 270° | on |
| 90° | off |

| | |
|---|-----------|
| $\overline{U_{a1}}, \overline{U_{a1}}, \overline{U_{a2}}, \overline{U_{a2}}, \blacktriangleright \overline{U_{aS}} = \text{low}$ | S5 |
| hochohmig (Three State) <i>High impedance (three-state)</i> à haute impédance (tristate) <i>alta impedenza (tristate)</i> alta impedancia (Three State) | on |
| nicht hochohmig <i>Low impedance</i> à basse impédance <i>bassa impedenza</i> sin alta impedancia | off |

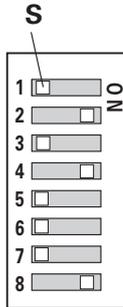


| min. Flankenabstand <i>Min. edge separation</i> écart min. entre les fronts <i>min. distanza tra i fronti</i> distancia mín. entre flancos | S6 | S7 | S8 | max. Eingangs-Frequenz <i>Max. input frequency</i> fréquence d'entrée max. <i>max frequenza ingresso</i> frecuencia máx. de entrada | |
|--|-----------|-----------|-----------|---|-----------------|
| | | | | TTL x 5 | TTL x 10 |
| 0.100 μ s | off | off | on | 200 kHz | 200 kHz |
| 0.220 μ s | off | on | off | 200 kHz | 100 kHz |
| 0.345 μ s | off | on | on | 133 kHz | 66 kHz |
| 0.465 μ s | on | off | off | 100 kHz | 50 kHz |
| 0.585 μ s | on | off | on | 80 kHz | 40 kHz |
| 0.950 μ s | on | on | off | 50 kHz | 25 kHz |
| 1.925 μ s | on | on | on | 25 kHz | 12.5 kHz |

IBV 102



Funktionseinstellung
Function selection
 Réglage de la fonction
Selezione funzioni
 Selección de funciones

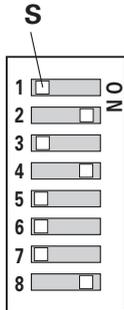


| | | |
|--|-----------|-----------|
| Interpolation <i>Interpolation</i> Interpolation <i>Interpolazione</i> Interpolación | S3 | S4 |
| TTL x 20 | off | off |
| TTL x 25 | off | on |
| TTL x 50 | on | off |
| TTL x 100 | on | on |

| | |
|--|-----------|
| Referenzimpuls-Breite <i>Reference pulse width</i> Largeur impulsion de référence <i>Ampiezza impulso di riferimento</i> Ancho del impulso de referencia | S2 |
| 270° | on |
| 90° | off |

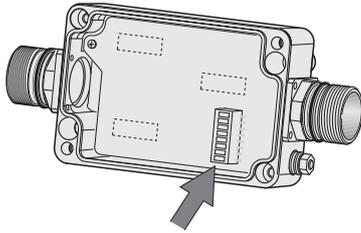
S1 = reserviert
 (immer auf off)
Reserved
 (always set to off)
 Réservé
 (toujours sur off)
Riservato
 (sempre su off)
 Reservado
 (siempre en off)

| | |
|---|-----------|
| $U_{a1}, \overline{U_{a1}}, U_{a2}, \overline{U_{a2}}, \blacktriangleright \overline{U_{aS}} = \text{low}$ | S5 |
| hochohmig (Three State) <i>High impedance (three-state)</i> à haute impédance (tristate) <i>alta impedenza (tristate)</i> alta impedancia (Three State) | on |
| nicht hochohmig <i>Low impedance</i> à basse impédance <i>bassa impedenza</i> sin alta impedancia | off |



| | | | | max. Eingangs-Frequenz <i>Max. input frequency</i> fréquence d'entrée max. <i>max frequenza ingresso</i> frecuencia máx. de entrada | | | |
|--|-----------|-----------|-----------|---|-----------------|-----------------|------------------|
| | S6 | S7 | S8 | TTL x 20 | TTL x 25 | TTL x 50 | TTL x 100 |
| min. Flankenabstand <i>Min. edge separation</i> écart min. entre les fronts <i>min. distanza tra i fronti</i> distancia mín. entre flancos | | | | | | | |
| 0.100 μ s | off | off | on | 100 kHz | 80 kHz | 40 kHz | 20 kHz |
| 0.220 μ s | off | on | off | 50 kHz | 40 kHz | 20 kHz | 10 kHz |
| 0.345 μ s | off | on | on | 33 kHz | 26 kHz | 13 kHz | 6.6 kHz |
| 0.465 μ s | on | off | off | 25 kHz | 20 kHz | 10 kHz | 5 kHz |
| 0.585 μ s | on | off | on | 20 kHz | 16 kHz | 8 kHz | 4 kHz |
| 0.950 μ s | on | on | off | 12.5 kHz | 10 kHz | 5 kHz | 2.5 kHz |
| 1.925 μ s | on | on | on | 6.25 kHz | 5 kHz | 2.5 kHz | 1.25 kHz |

EXE 101



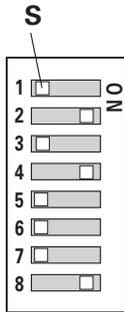
Funktionseinstellung
Function selection
 Réglage de la fonction
Selezione funzioni
 Selección de funciones

S1 = reserviert
 (immer auf off)
Reserved
 (always set to off)
 Réservé
 (toujours sur off)
Riservato
 (sempre su off)
 Reservado
 (siempre en off)

| | | |
|--|-----|-----|
| Interpolation <i>Interpolation</i> Interpolation <i>Interpolazione</i> Interpolación | | |
| TTL x 5 | off | off |
| TTL x 10 | off | on |

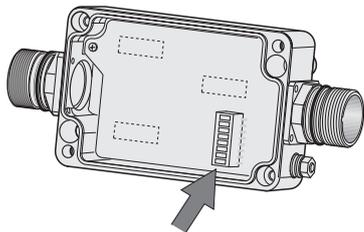
| | |
|--|-----------|
| Referenzimpuls-Breite <i>Reference pulse width</i> Largeur impulsion de référence <i>Ampiezza impulso di riferimento</i> Ancho del impulso de referencia | S2 |
| 270° | on |
| 90° | off |

| | |
|---|-----------|
| $\overline{U_{a1}}, \overline{U_{a1}}, \overline{U_{a2}}, \overline{U_{a2}}, \blacktriangleright \overline{U_{aS}} = \text{low}$ | S5 |
| hochohmig (Three State) <i>High impedance (three-state)</i> à haute impédance (tristate) <i>alta impedenza (tristate)</i> alta impedancia (Three State) | on |
| nicht hochohmig <i>Low impedance</i> à basse impédance <i>bassa impedenza</i> sin alta impedancia | off |

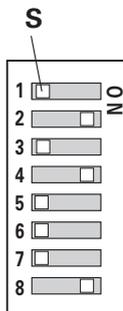


| min. Flankenabstand <i>Min. edge separation</i> écart min. entre les fronts <i>min. distanza tra i fronti</i> distancia mín. entre flancos | | | | max. Eingangs-Frequenz <i>Max. input frequency</i> fréquence d'entrée max. <i>max frequenza ingresso</i> frecuencia máx. de entrada | |
|--|-----------|-----------|-----------|---|-----------------|
| | S6 | S7 | S8 | TTL x 5 | TTL x 10 |
| 0.100 μ s | off | off | on | 100 kHz | 100 kHz |
| 0.220 μ s | off | on | off | 100 kHz | 100 kHz |
| 0.345 μ s | off | on | on | 100 kHz | 66 kHz |
| 0.465 μ s | on | off | off | 100 kHz | 50 kHz |
| 0.585 μ s | on | off | on | 80 kHz | 40 kHz |
| 0.950 μ s | on | on | off | 50 kHz | 25 kHz |
| 1.925 μ s | on | on | on | 25 kHz | 12.5 kHz |

EXE 102



Funktionseinstellung
 Function selection
 Réglage de la fonction
 Selezione funzioni
 Selección de funciones



| | | |
|--|-----------|-----------|
| Interpolation <i>Interpolation</i> Interpolation <i>Interpolazione</i> Interpolación | S3 | S4 |
| TTL x 20 | off | off |
| TTL x 25 | off | on |
| TTL x 50 | on | off |
| TTL x 100 | on | on |

| | |
|--|-----------|
| Referenzimpuls-Breite <i>Reference pulse width</i> Largeur impulsion de référence <i>Ampiezza impulso di riferimento</i> Ancho del impulso de referencia | S2 |
| 270° | on |
| 90° | off |

S1 = reserviert
 (immer auf off)
Reserved
(always set to off)
 Réservé
 (toujours sur off)
Riservato
(sempre su off)
 Reservado
 (siempre en off)

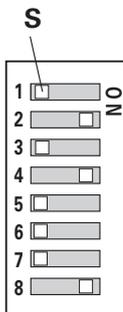
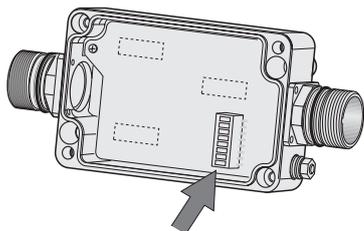
| | |
|---|-----------|
| $U_{a1}, \overline{U_{a1}}, U_{a2}, \overline{U_{a2}} \rightarrow \overline{U_{aS}} = \text{low}$ | S5 |
| hochohmig (Three State) <i>High impedance (three-state)</i> à haute impédance (tristate) <i>alta impedenza (tristate)</i> alta impedancia (Three State) | on |
| nicht hochohmig <i>Low impedance</i> à basse impédance <i>bassa impedenza</i> sin alta impedancia | off |

S

| | | |
|---|--------------------------|-----------|
| 1 | <input type="checkbox"/> | NO |
| 2 | <input type="checkbox"/> | |
| 3 | <input type="checkbox"/> | |
| 4 | <input type="checkbox"/> | |
| 5 | <input type="checkbox"/> | |
| 6 | <input type="checkbox"/> | |
| 7 | <input type="checkbox"/> | |
| 8 | <input type="checkbox"/> | |

| | | | | max. Eingangs-Frequenz Max. input frequency fréquence d'entrée max. max frequenza ingresso frecuencia máx. de entrada | | | |
|--|-----------|-----------|-----------|---|-----------------|-----------------|------------------|
| | S6 | S7 | S8 | TTL x 20 | TTL x 25 | TTL x 50 | TTL x 100 |
| min. Flankenabstand <i>Min. edge separation</i> écart min. entre les fronts <i>min. distanza tra i fronti</i> distancia mín. entre flancos | | | | | | | |
| 0.100 μ s | off | off | on | 60 kHz | 60 kHz | 40 kHz | 20 kHz |
| 0.220 μ s | off | on | off | 50 kHz | 40 kHz | 20 kHz | 10 kHz |
| 0.345 μ s | off | on | on | 33 kHz | 26 kHz | 13 kHz | 6.6 kHz |
| 0.465 μ s | on | off | off | 25 kHz | 20 kHz | 10 kHz | 5 kHz |
| 0.585 μ s | on | off | on | 20 kHz | 16 kHz | 8 kHz | 4 kHz |
| 0.950 μ s | on | on | off | 12.5 kHz | 10 kHz | 5 kHz | 2.5 kHz |
| 1.925 μ s | on | on | on | 6.25 kHz | 5 kHz | 2.5 kHz | 1.25 kHz |

EXE 102 Id.-Nr. 536 421-41
Id.-Nr. 536 421-51



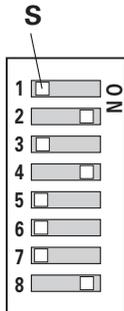
Funktionseinstellung
Function selection
Réglage de la fonction
Selezione funzioni
Selección de funciones

S1 = reserviert
(immer auf off)
Reserved
(always set to off)
Réservé
(toujours sur off)
Riservato
(sempre su off)
Reservado
(siempre en off)

| | | |
|--|-----------|-----------|
| Interpolation <i>Interpolation</i> Interpolation <i>Interpolazione</i> Interpolación | S3 | S4 |
| TTL x 20 | off | off |
| TTL x 25 | off | on |
| TTL x 50 | on | off |
| TTL x 100 | on | on |

| | |
|--|-----------|
| Referenzimpuls-Breite <i>Reference pulse width</i> Largeur impulsion de référence <i>Ampiezza impulso di riferimento</i> Ancho del impulso de referencia | S2 |
| 270° | on |
| 90° | off |

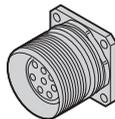
| | |
|---|-----------|
| $U_{a1}, \overline{U_{a1}}, U_{a2}, \overline{U_{a2}}, \triangleright \overline{U_{aS}} = \text{low}$ | S5 |
| hochohmig (Three State) <i>High impedance (three-state)</i> à haute impédance (tristate) <i>alta impedenza (tristate)</i> alta impedancia (Three State) | on |
| nicht hochohmig <i>Low impedance</i> à basse impédance <i>bassa impedenza</i> sin alta impedancia | off |



| | | | | max. Eingangs-Frequenz Max. input frequency fréquence d'entrée max. max frequenza ingresso frecuencia máx. de entrada | | | |
|---|-----------|-----------|-----------|---|-----------------|-----------------|------------------|
| | S6 | S7 | S8 | TTL x 20 | TTL x 25 | TTL x 50 | TTL x 100 |
| min. Flankenabstand <i>Min. edge separation</i> écart min. entre les fronts <i>min. distancia tra i fronti</i> distancia mín. entre flancos | | | | | | | |
| 0.080 μ s | off | off | on | 60 kHz | 60 kHz | 50 kHz | 25 kHz |
| 0.175 μ s | off | on | off | 50 kHz | 50 kHz | 25 kHz | 12.5 kHz |
| 0.275 μ s | off | on | on | 41.67 kHz | 33.33 kHz | 16.67 kHz | 8.33 kHz |
| 0.370 μ s | on | off | off | 31.25 kHz | 25 kHz | 12.5 kHz | 6.25 kHz |
| 0.465 μ s | on | off | on | 25 kHz | 20 kHz | 10 kHz | 5 kHz |
| 0.760 μ s | on | on | off | 15.63 kHz | 12.5 kHz | 6.25 kHz | 3.13 kHz |
| 1.540 μ s | on | on | on | 7.81 kHz | 6.25 kHz | 3.13 kHz | 1.56 kHz |

IBV 101/IBV 102

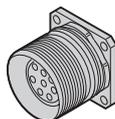
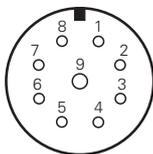
Eingangssignale 1 V_{SS}
Input signals 1 V_{PP}
 Signaux d'entrée 1 V_{CC}
Segnali in ingresso 1 V_{PP}
 Señales de entrada 1 V_{PP}



| 12 | 2 | 10 | 11 | 5 | 6 | 8 | 1 | 3 | 4 | 7 | 9 | |
|-----------------------------------|----------------------------|-----------------------------------|----------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|---|-----------------|
| 5V U_P | 5V sensor | 0V U_N | 0V sensor | A+ | A- | B+ | B- | R+ | R- | / | / | / |
| br/gn <i>BN/GN</i> | bl <i>BL</i> | ws/gn <i>WH/GN</i> | ws <i>WH</i> | br <i>BN</i> | gn <i>GN</i> | gr <i>GY</i> | rs <i>PK</i> | rt <i>RD</i> | sw <i>WH</i> | vio <i>VI</i> | | ge <i>YL</i> |

EXE 101/EXE 102

Eingangssignale 11 µA_{SS}
Input signals 11 µA_{PP}
 Signaux d'entrée 11 µA_{CC}
Segnali in ingresso 11 µA_{PP}
 Señales de entrada 11 µA_{PP}



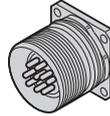
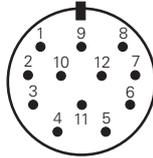
1) Außenschirm auf Gehäuse
External shield on housing
 Blindage externe sur boîtier
Schermo esterno sulla carcassa
 Blindaje externo a carcasa

2) Innenschirm
Internal shield
 Blindage interne
Schermo interno
 Blindaje interno

| 3 | 4 | | 9 | 1 | 2 | 5 | 6 | 7 | 8 |
|-----------------------------------|-----------------------------------|----|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 5V U_P | 0V U_N | 1) | 2) | I₁₊ | I₁₋ | I₂₊ | I₂₋ | I₀₊ | I₀₋ |
| br <i>BN</i> | ws <i>WH</i> | / | ws/br <i>WH/BN</i> | gn <i>GN</i> | ge <i>YL</i> | bl <i>BL</i> | rt <i>RD</i> | gr <i>GY</i> | rs <i>PK</i> |

IBV 10x/EXE 10x

Ausgangssignale TTL
Output signals TTL
 Signaux de sortie TTL
Segnali in uscita TTL
 Señales de salida TTL



| 12 | 2 | 10 | 11 | 5 | 6 | 8 | 1 | 3 | 4 | 7 | 9 |
|------------------|-------------------|------------------|-------------------|----------|---------------------|----------|---------------------|----------|---------------------|---------------------|----------|
| 5V U_P ● | 5V sensor ● | 0V U_N ● | 0V sensor ● | U_{a1} | $\overline{U_{a1}}$ | U_{a2} | $\overline{U_{a2}}$ | U_{a0} | $\overline{U_{a0}}$ | $\overline{U_{aS}}$ | 1) |
| br/gn BN/GN | bl BL | ws/gn WH/GN | ws WH | br BN | gn GN | gr GY | rs PK | rt RD | sw WH | vio VI | ge YL |

1) Im Normalbetrieb mit 0 V der Folgeelektronik verbinden.

Bei Anlegen von 5 V Umschaltung TTL/11 μ ASS.

In normal operation, connect with the 0 V line of the subsequent electronics.

Apply 5 V and switch to TTL/11 μ App.

En fonctionnement normal, relier au 0 V de l'électronique consécutive.

Avec application de 5 V commutation TTL/11 μ ACC.

In funzionamento normale collegare con 0 V alla elettronica successiva.

Per applicare 5 V commutazione TTL/11 μ ASS.

En funcionamiento normal conectar con 0 V de la electrónica subsiguiente.

Al aplicar 5 V conmutación TTL/11 μ App.

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