



# HEIDENHAIN

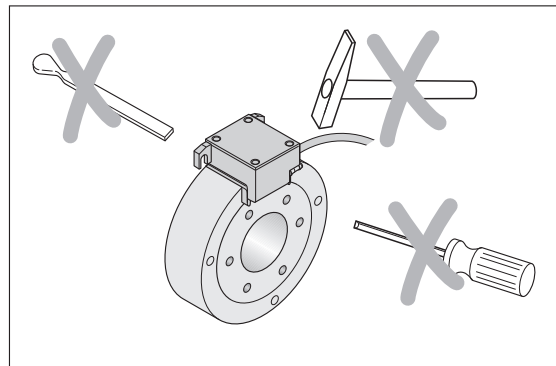
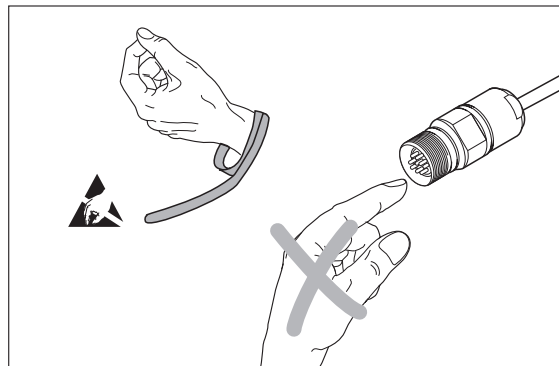
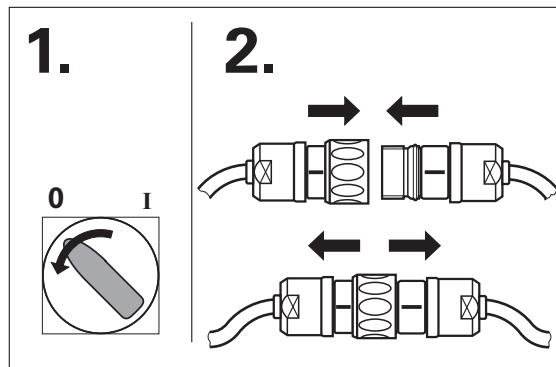
Montageanleitung  
*Mounting Instructions*  
Instructions de montage  
*Istruzioni di montaggio*  
Instrucciones de montaje

**ERA 180**  
**AK ERA 180**

5/2006



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





Der direkte Kontakt von Flüssigkeiten mit Messgerät und Steckverbinder ist zu vermeiden!

*Avoid direct contact of fluids with the encoder and connector!*

Eviter le contact direct de liquides sur le système de mesure et le connecteur!

*Evitare che lo strumento di misura e il connettore vengano a contatto con liquidi*

¡Evitar el contacto directo de líquidos con el sistema de medida y el conector!





Angegebene Wellentoleranzen müssen eingehalten werden.

Die Teilungstrommel ist mit allen vorgesehenen Schrauben und Scheiben zu befestigen.

Die Schrauben sind abwechselnd, kreuzweise mit dem angegebenen Anzugsdrehmoment festzuschrauben und gegen unbeabsichtigtes Lösen zu sichern.

*The specified shaft tolerances must be complied with.*

*The grating drum is to be fastened with all provided screws and washers.*

*The screws must be tightened alternately (crosswise) with the tightening torque, and secured against unintentional loosening.*

Les tolérances indiquées pour l'arbre doivent être respectées.

Le tambour gradué doit être fixé à l'aide des vis et rondelles prévues à cet effet.

Les vis doivent être serrées alternativement, en croix, en utilisant le couple de serrage et sécurisées pour ne pas être desserrées malencontreusement.

*Le tolleranze di montaggio devono essere rispettate.*

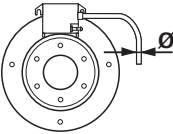
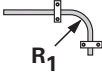
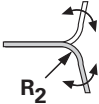

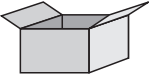

*Fissare il tamburo graduato con tutte le viti e le rondelle previste.*

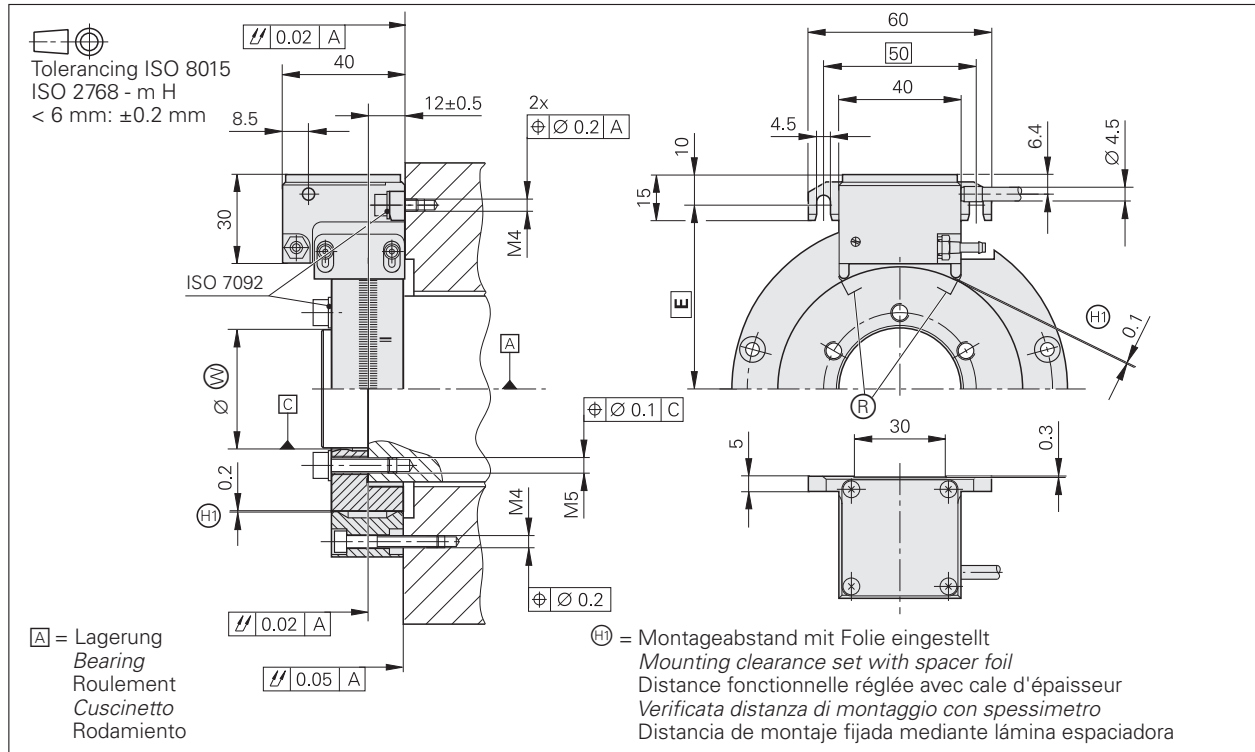
*Le viti sono da stringere alternativamente a croce con chiave dinamometrica e da assicurare contro il rischio di allentamento.*

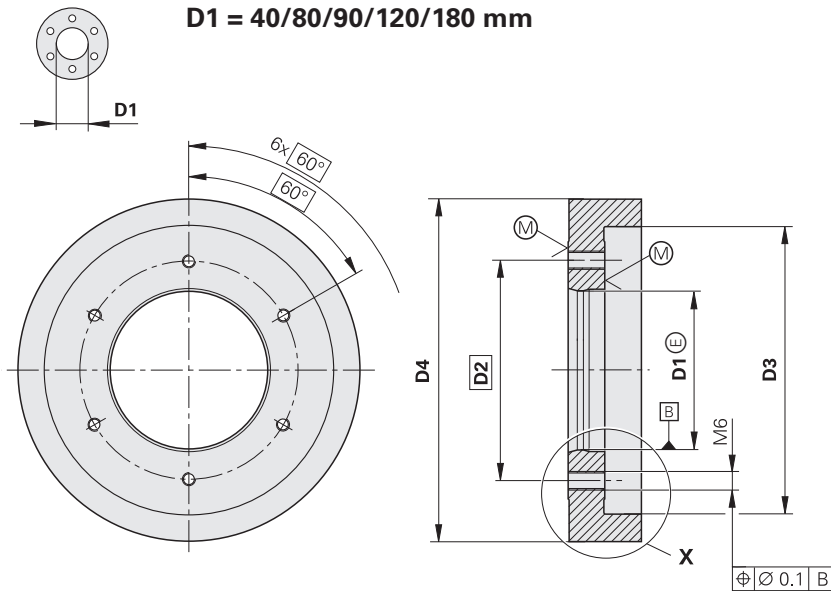
Las tolerancias de eje indicadas deben ser respetadas.

El tambor graduado debe ser fijado con todos los tornillos y arandelas previstos para ello.

Fijar los tornillos alternativamente en cruz con el par de apriete y asegurarlos para que no se suelten involuntariamente.

	 <p><math>T \geq -40\text{ °C}</math> (<math>-40\text{ °F}</math>)</p>	 <p><math>T \geq -10\text{ °C}</math> (<math>14\text{ °F}</math>)</p>	 <p><b>°C</b> <b>(°F)</b></p>	 <p><math>-30 \dots 80\text{ °C}</math> (<math>-22 \dots 176\text{ °F}</math>)</p>
<p><b>Ø 4.5 mm</b></p>	<p><math>R_1 \geq 10\text{ mm}</math></p>	<p><math>R_2 \geq 50\text{ mm}</math></p>		
<p><b>Ø 8 mm</b></p> 	<p><math>R_1 \geq 40\text{ mm}</math></p>	<p><math>R_2 \geq 100\text{ mm}</math></p>		



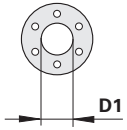


Ⓡ = Referenzmarken-Lage  
 Reference mark  
 marque de référence  
 indici di riferimento  
 marca de referencia

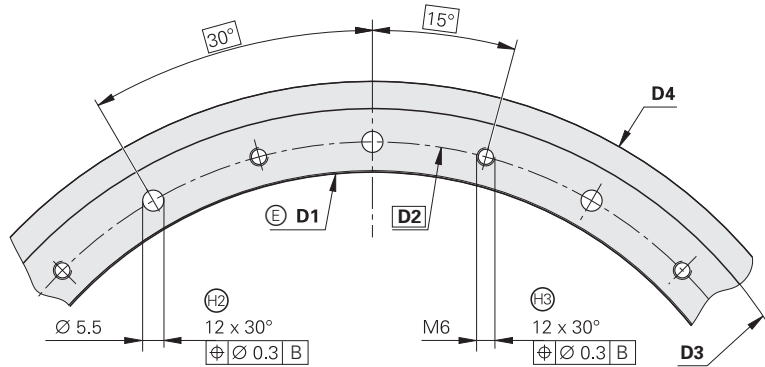
Ⓜ = Montagefläche  
 Mounting face  
 Surface de montage  
 Superficie di montaggio  
 Superficie de montaje

**E, D1, D2, D3, D4, Ⓜ**

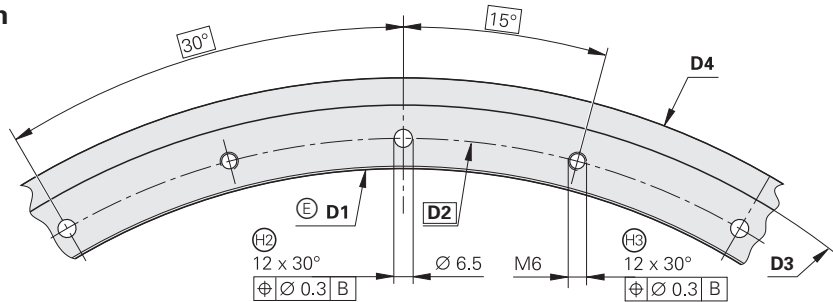




**D1 = 270 mm**

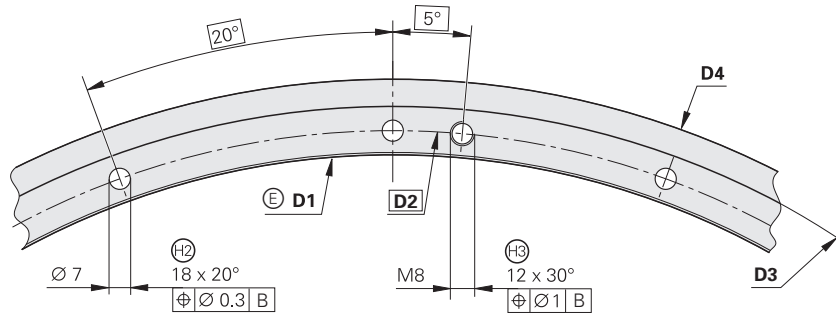


**D1 = 425 mm**





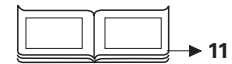
**D1 = 512 mm**



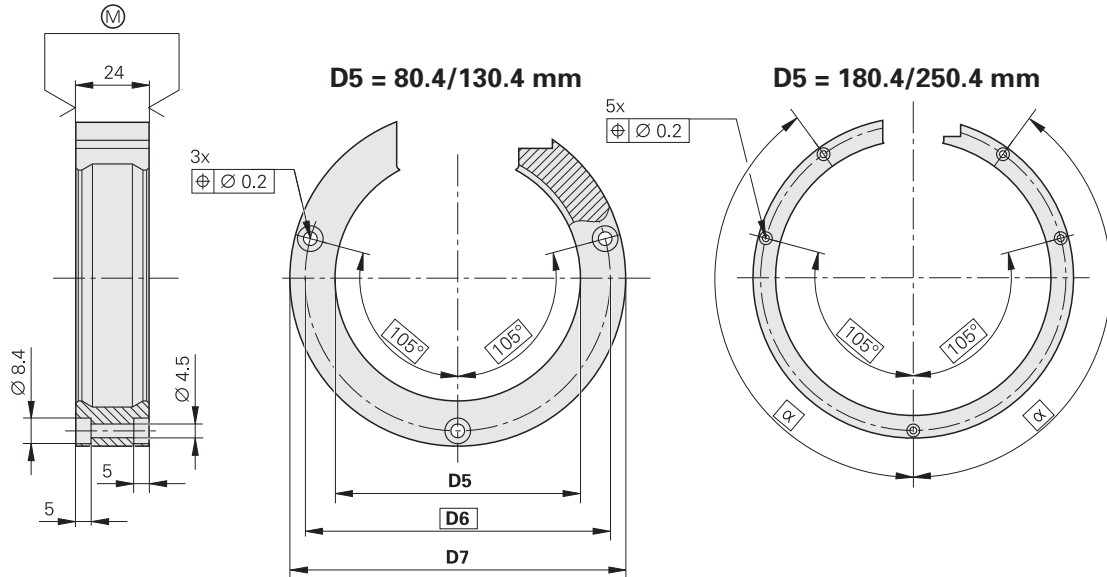
Ⓜ2 = Befestigungsbohrung  
Mounting hole  
Trou de fixation  
Fori di fissaggio  
Taladro de sujeción

Ⓜ3 = Abdrückgewinde  
Back-off thread  
Filetage de dégagement  
Fori di estrazione  
Rosca de desmontaje

**D1, D2, D3, D4**

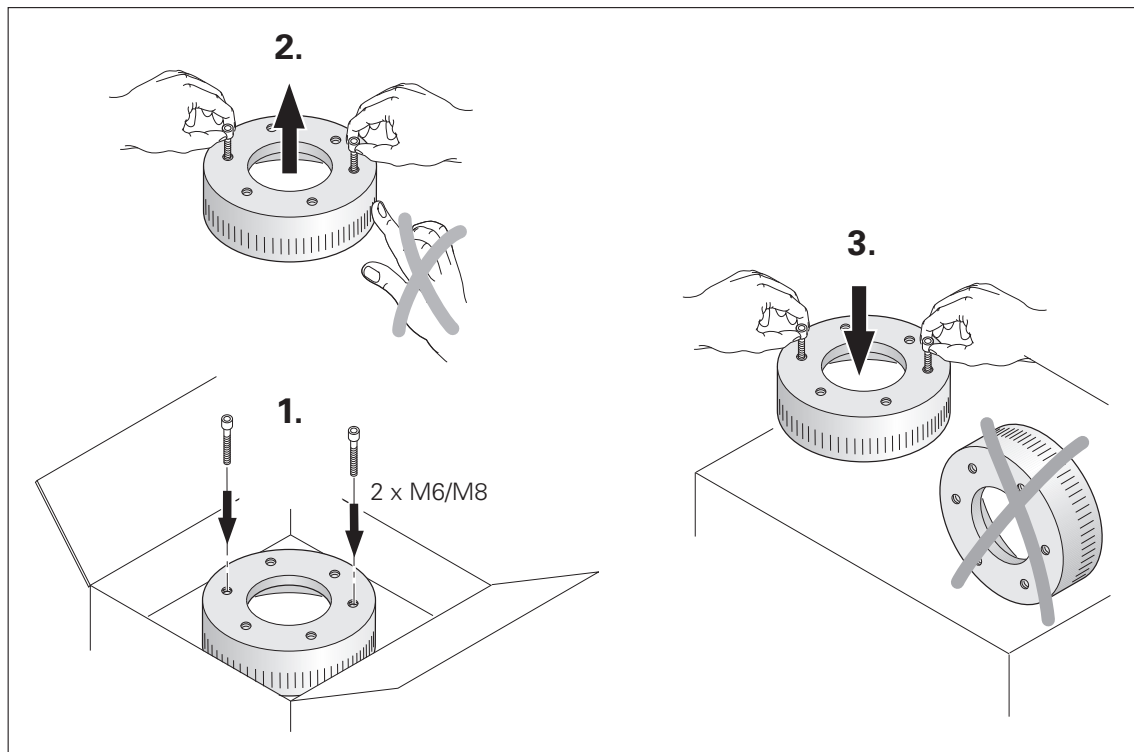


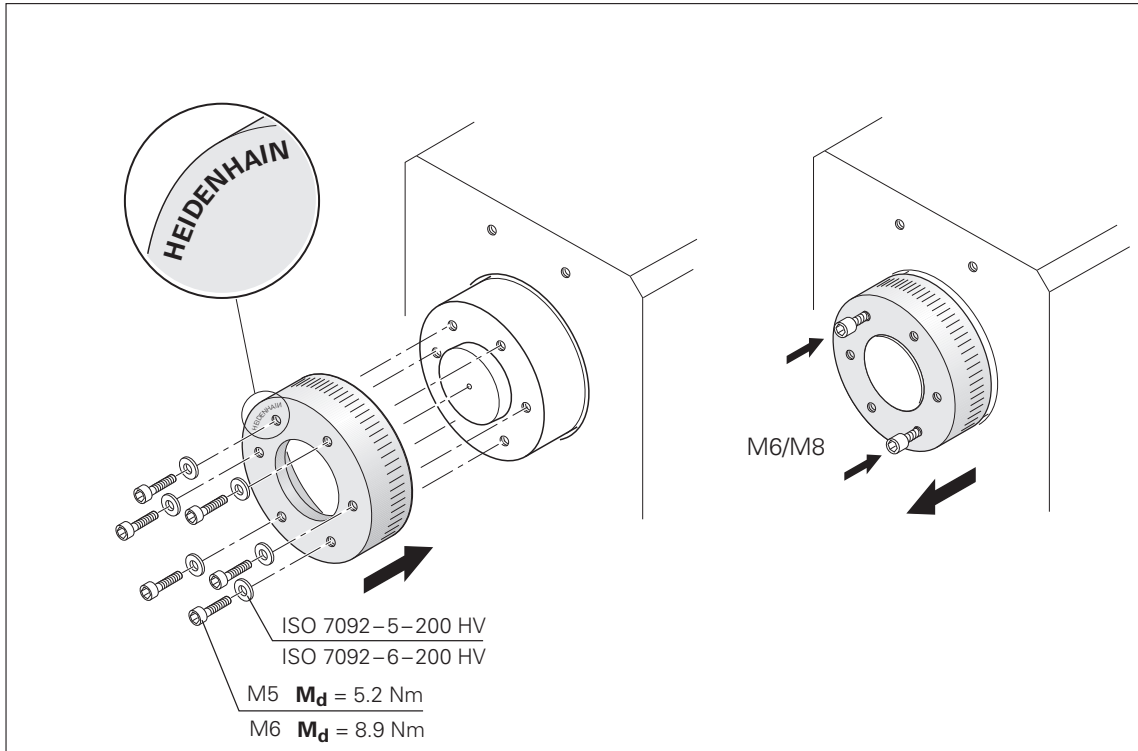
Sperrluftabdeckung · Protective cover · Capot de protection · Coperchio protettivo · Tapa protectora

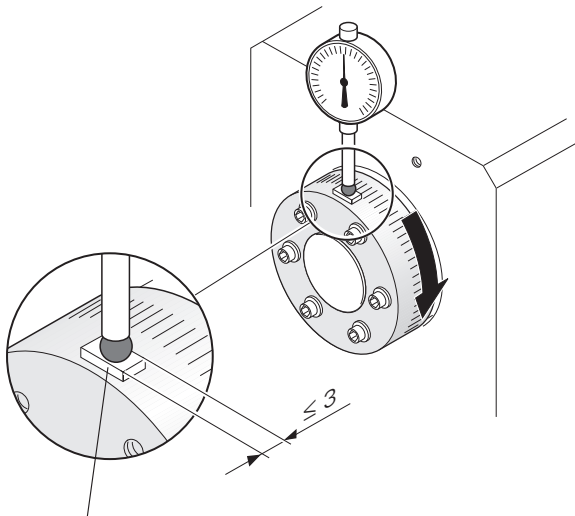


Ⓜ = Montagefläche  
 Mounting face  
 Surface de montage  
 Superficie di montaggio  
 Superficie de montaje

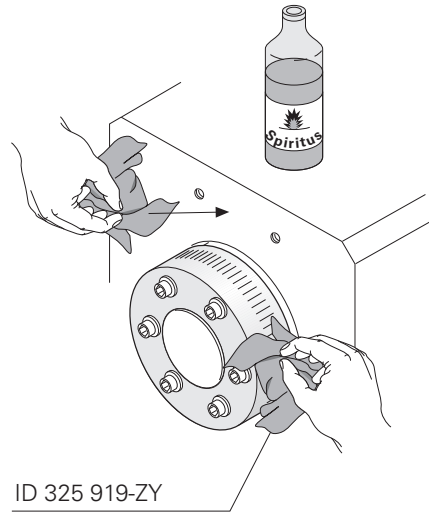
<b>D1</b>	<b>⊗</b>	<b>D2</b>	<b>D3</b>	<b>D4</b>	<b>D5</b>	<b>D6</b>	<b>D7</b>	<b>α</b>	<b>E</b>
∅ 40 $\begin{matrix} -0.001 \\ -0.005 \end{matrix}$	∅ 40 $\begin{matrix} +0.009 \\ +0.002 \end{matrix}$	∅ 50	∅ 64	∅ 80	∅ 80.4	∅ 100	∅ 110	-	60
∅ 80 $\begin{matrix} -0.001 \\ -0.005 \end{matrix}$	∅ 80 $\begin{matrix} +0.013 \\ +0.003 \end{matrix}$	∅ 95	∅ 112	∅ 130	∅ 130.4	∅ 150	∅ 160	-	85
∅ 90 $\begin{matrix} -0.001 \\ -0.005 \end{matrix}$	∅ 90 $\begin{matrix} +0.013 \\ +0.003 \end{matrix}$	∅ 105	∅ 117	∅ 130	∅ 130.4	∅ 150	∅ 160	-	85
∅ 120 $\begin{matrix} -0.001 \\ -0.008 \end{matrix}$	∅ 120 $\begin{matrix} +0.015 \\ +0.003 \end{matrix}$	∅ 140	∅ 162	∅ 180	∅ 180.4	∅ 200	∅ 210	144°	110
∅ 180 $\begin{matrix} -0.001 \\ -0.008 \end{matrix}$	∅ 180 $\begin{matrix} +0.018 \\ +0.004 \end{matrix}$	∅ 200	∅ 232	∅ 250	∅ 250.4	∅ 270	∅ 280	150°	145
∅ 270 $\begin{matrix} 0 \\ -0.010 \end{matrix}$	∅ 270 $\begin{matrix} +0.020 \\ +0.004 \end{matrix}$	∅ 290	∅ 312	∅ 330	-	-	-	-	185
∅ 425 $\begin{matrix} 0 \\ -0.010 \end{matrix}$	∅ 425 $\begin{matrix} +0.020 \\ +0.004 \end{matrix}$	∅ 445	∅ 467	∅ 485	-	-	-	-	262.5
∅ 512 $\begin{matrix} 0 \\ -0.015 \end{matrix}$	∅ 512 $\begin{matrix} +0.025 \\ +0.005 \end{matrix}$	∅ 528	∅ 544	∅ 562	-	-	-	-	301







Kunststoff wird empfohlen!  
*Plastic is recommended.*  
Matériau synthétique conseillé!  
*Consigliata plastica!*  
¡Se recomienda plástico!



**Systemgenauigkeit  $\Delta f$**   
**System accuracy  $\Delta f$**   
**Précision du système  $\Delta f$**   
**Accuratezza del sistema  $\Delta f$**   
**Precisión del sistema  $\Delta f$**

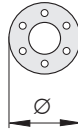
**Worst case:**  $\Delta\varphi_{wc} = \Delta\varphi_t + \Delta\varphi_e + \Delta\varphi_u$

**2 $\sigma$  (Sigma):**  $\Delta\varphi_{2\sigma} = \sqrt{(\Delta\varphi_t + \Delta\varphi_e)^2 + (\Delta\varphi_u)^2}$

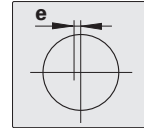
$\Delta\varphi_t$  = Genauigkeit der Teilung  
*Accuracy of the graduation*  
 Précision de la gravure  
*Accuratezza del nastro*  
 Precisión de la graduación

$\Delta\varphi_e$  = Abweichung durch Exzentrizität **e** (Montage)  
*Error due to eccentricity e (mounting)*  
 Ecart dû à l'excentricité **e** (montage)  
*Errore dovuto ad eccentricità e (montaggio)*  
 Desviación debida a excentricidad **e** (montaje)

$\Delta\varphi_u$  = Abweichung innerhalb einer Signalperiode  
*Error within one signal period*  
 Ecart à l'intérieur d'une période de signal  
*Errore minore di un periodo*  
 Desviación dentro de un periodo de señal



**Z** = Strichzahl  
*Line count*  
 Nombre de traits  
*Numero di linee*  
 Número de impulsos



	Z	$\Delta\varphi_{wc}$ (e=1 $\mu$ m)	$\Delta\varphi_{2\sigma}$ (e=1 $\mu$ m)	$\Delta\varphi_t$	$\Delta\varphi_e$ (e=1 $\mu$ m)	$\Delta\varphi_u$
Ø 80	6 000	12.7"	10.5"	5"	5.2"	2.5"
Ø 130	9 000	8.2"	6.5"	3"	3.2"	2"
Ø 180	9 000	7.3"	5.7"	3"	2.3"	2"
Ø 250	18 000	5.6"	4.8"	3"	1.6"	1"
Ø 330	18 000	5.2"	4.4"	3"	1.2"	1"
Ø 485	36 000	3.3"	2.9"	2"	0.8"	0.5"
Ø 562	36 000	3.2"	2.7"	2"	0.7"	0.5"



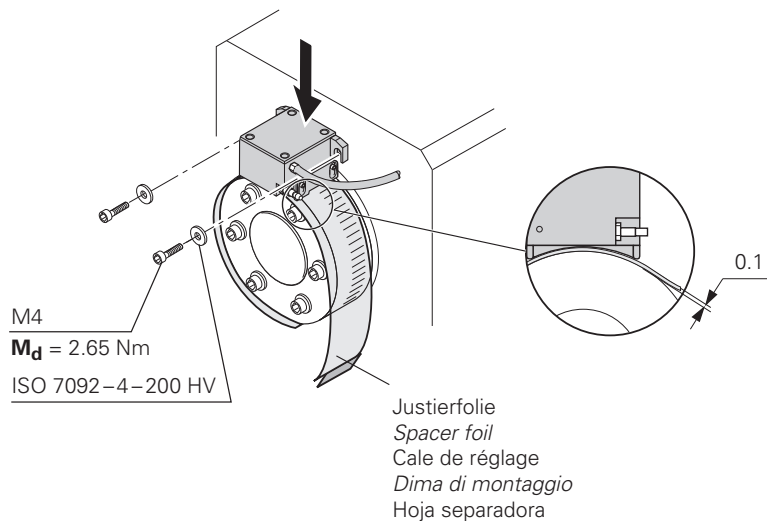
Justierfolienaufdruck "**Abtastkopf**" im Montagebereich des Abtastkopfes verwenden

Place the spacer foil text "**scanning head**" in the mounting area of the scanning head

l'inscription "**tête caprice**" sur la cale de réglage doit être située dans la zone de montage de la tête caprice

Posizionare la parte di spessimetro con la scritta "**unità di scansione**" nella zona di montaggio della testina

Utilizar la impresión "**cabezal**" de la lámina de ajuste en el área de montaje del cabezal







Überlappte Justierfolie im Montagebereich der Sperrluftabdeckung verwenden

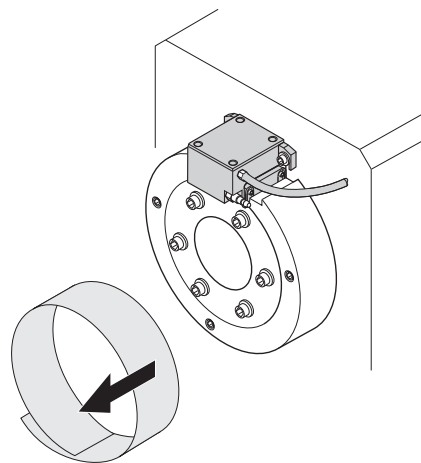
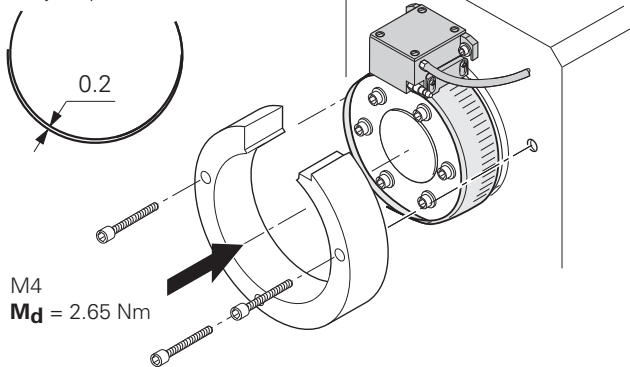
*Place overlapped spacer foil in the mounting area of the protective cover*

*La cale de réglage recouverte doit être située dans la zone de montage du capot de protection*

*Posizionare spessimetro sovrapposto nella zona di montaggio del coperchio protettivo*

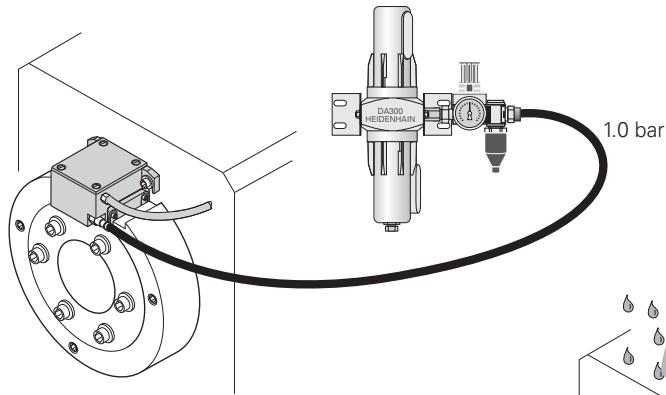
*Utilizar la lámina de ajuste solapada en el área de montaje de la tapa protectora*

Justierfolie  
Spacer foil  
Cale de réglage  
Dima di montaggio  
Hoja separadora

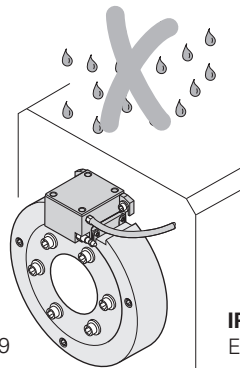


# DA 300

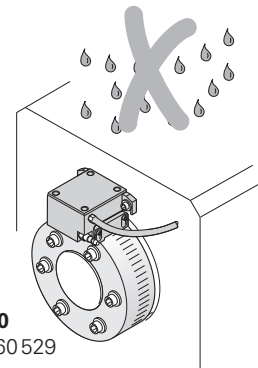
ID 348 249-01



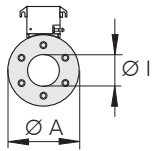
ISO 8573-1: 1995  
tab 2/class 1  
tab 3/class 4  
tab 4/class 1



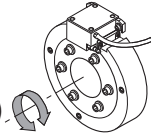
**IP 40**  
EN 60 529



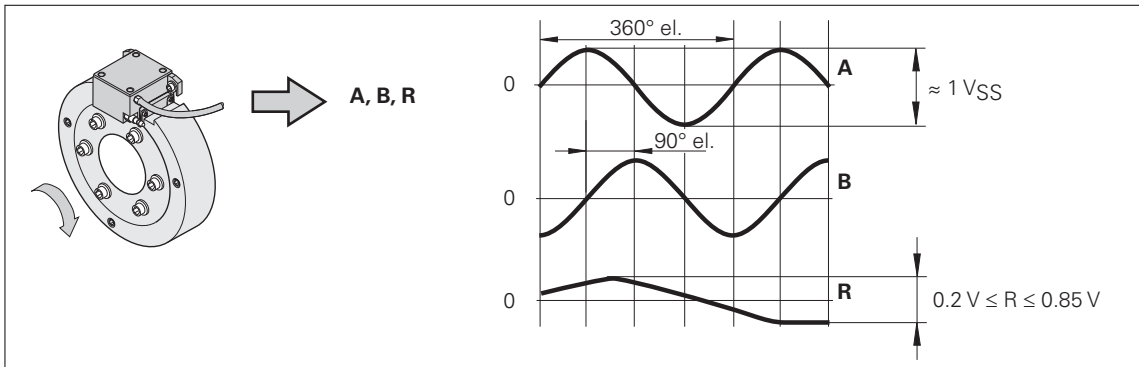
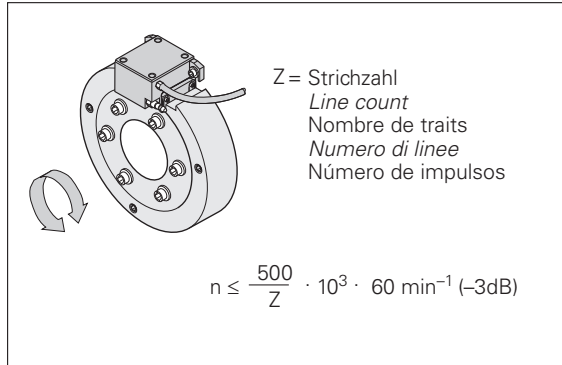
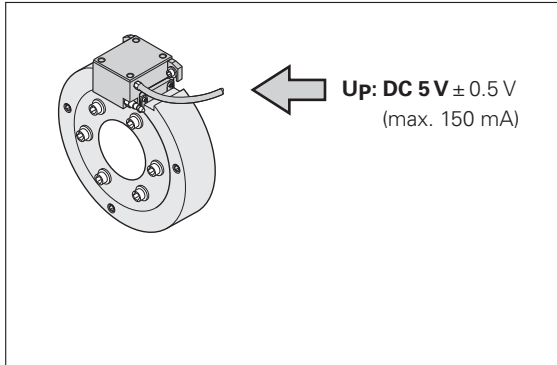
**IP 00**  
EN 60 529

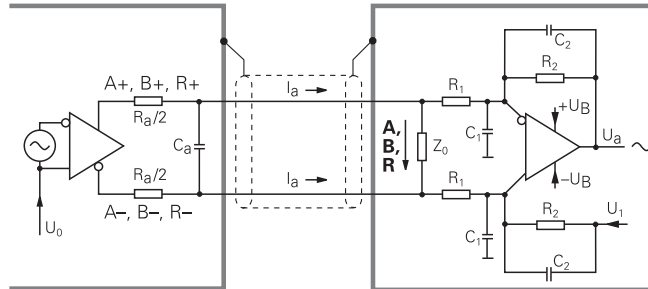
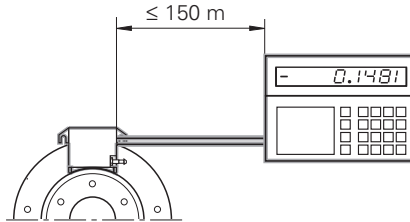


\*) Dauerfestigkeit ( $10^7$  Lastwechsel) nach FKM-Richtlinie  
*Fatigue strength ( $10^7$  load change) according to the FKM-Guideline*  
 Tenue à la durée (variation de charge  $10^7$ ) selon directive FKM  
*Resistenza alla fatica ( $10^7$  cambi di carico) secondo la direttiva FKM*  
 Resistencia a la fatiga ( $10^7$  variación de carga) según directive alemana FKM



$\varnothing I$	$\varnothing A$	n *)
$\varnothing 40$	$\varnothing 80$	$n \leq 20\,000 \text{ min}^{-1}$
$\varnothing 80$	$\varnothing 130$	$n \leq 14\,500 \text{ min}^{-1}$
$\varnothing 90$	$\varnothing 130$	$n \leq 14\,000 \text{ min}^{-1}$
$\varnothing 120$	$\varnothing 180$	$n \leq 11\,000 \text{ min}^{-1}$
$\varnothing 180$	$\varnothing 250$	$n \leq 7\,500 \text{ min}^{-1}$
$\varnothing 270$	$\varnothing 330$	$n \leq 5\,500 \text{ min}^{-1}$
$\varnothing 425$	$\varnothing 485$	$n \leq 3\,500 \text{ min}^{-1}$
$\varnothing 512$	$\varnothing 562$	$n \leq 3\,000 \text{ min}^{-1}$





$R_a < 100 \Omega$   
 $C_a < 50 \text{ pF}$   
 $\Sigma I_a < 1 \text{ mA}$   
 $U_0 = 2.5 \text{ V} \pm 0.5 \text{ V}$

$Z_0 = 120 \Omega$   
 $U_1 \approx U_0$   
 $R_1 = 10 \text{ k}\Omega, C_1 = 100 \text{ pF}$   
 $R_2 = 34.8 \text{ k}\Omega, C_2 = 10 \text{ pF}$

Elektrischen Widerstand zwischen Steckergehäuse und Maschine prüfen.

**Sollwert: 1  $\Omega$  max.**

*Check the resistance between the connector housing and the machine.*

**Desired value: 1  $\Omega$  max.**

Tester la résistance électrique entre le carter de la prise et la machine.

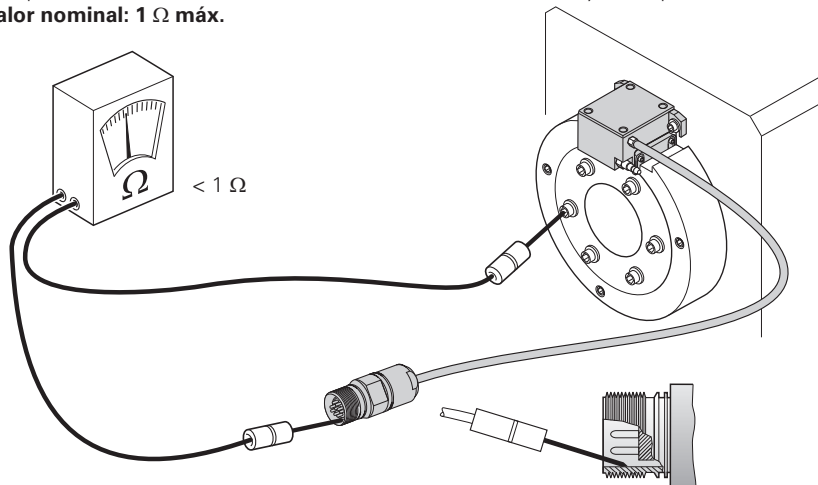
**Valeur nominale: 1  $\Omega$  max.**

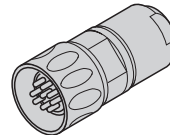
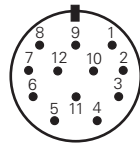
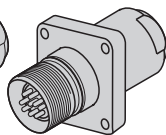
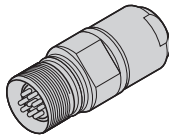
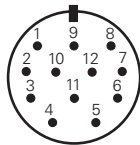
*Controllare la resistenza elettrica tra l'alloggiamento del connettore e la macchina.*

**Valore nominale: 1  $\Omega$  max.**

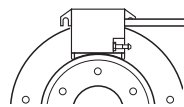
Comprobar la resistencia eléctrica entre la carcasa del conector y la máquina.

**Valor nominal: 1  $\Omega$  máx.**

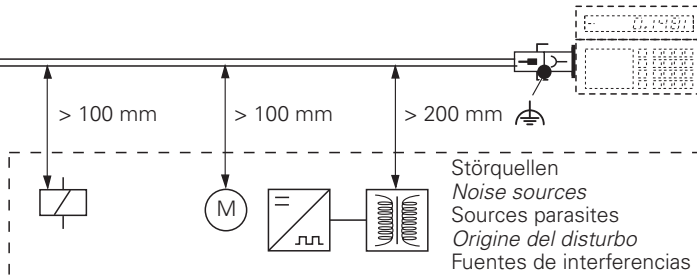




<b>12</b>	<b>2</b>	<b>10</b>	<b>11</b>	<b>5</b>	<b>6</b>	<b>8</b>	<b>1</b>	<b>3</b>	<b>4</b>	<b>7</b>	<b>/</b>	<b>9</b>
<b>Up</b>	<b>Sensor</b> U <sub>P</sub>	<b>0V</b>	<b>Sensor</b> 0V	<b>A+</b>	<b>A-</b>	<b>B+</b>	<b>B-</b>	<b>R+</b>	<b>R-</b>	<b>/</b>	<b>/</b>	<b>/</b>
BNGN	BU	WHGN	WH	BN	GN	GY	PK	RD	BK	VT	YE	/



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



Störquellen  
 Noise sources  
 Sources parasites  
 Origine del disturbo  
 Fuentes de interferencias

# HEIDENHAIN

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