



# HEIDENHAIN

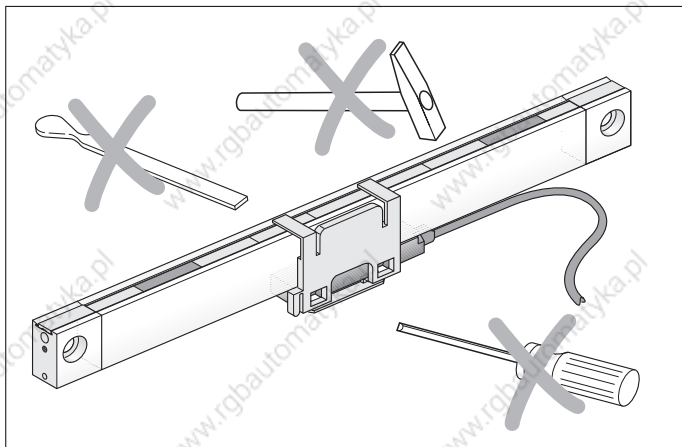
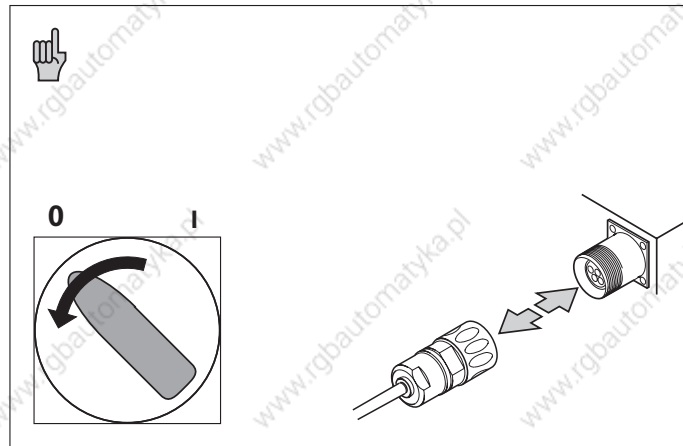
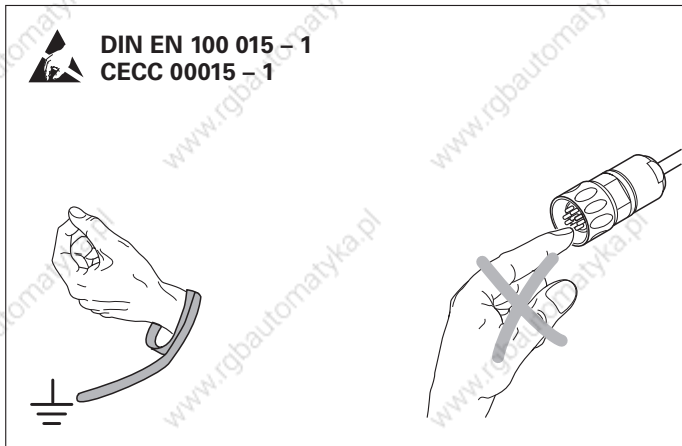
Montageanleitung  
*Mounting Instructions*  
Instructions de montage  
*Istruzioni di montaggio*  
Instrucciones de montaje

**LS 406**  
**LS 476**  
**LS 486**

10/2003

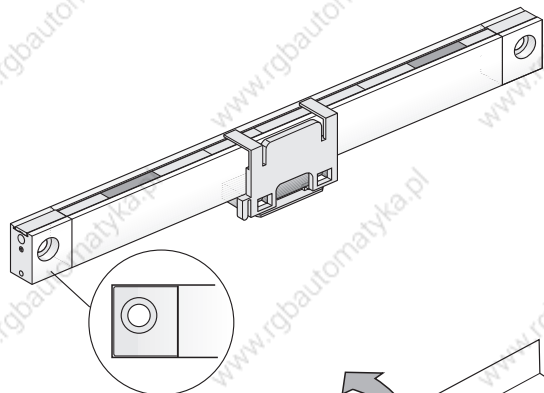


Warnhinweise · Warnings · Recommendations · Avvertenze · Advertencias



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

Lieferumfang · Items Supplied · Contenu de la fourniture · Standard di fornitura · Elementos suministrados

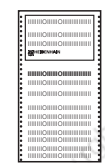
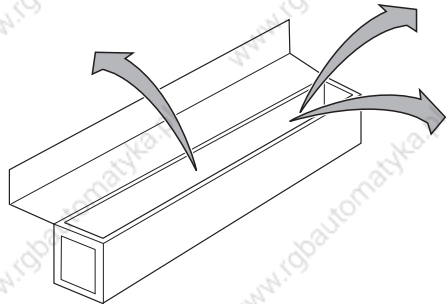


LS 406 (C)  
LS 476 (C)  
LS 486 (C)

LS 476 (C)  
LS 486 (C)

2x M8x25 DIN 6912  
2x M8x25 ISO 4762

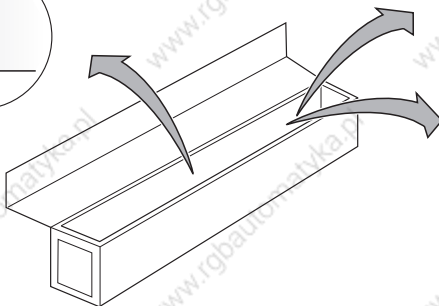
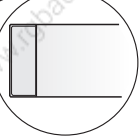
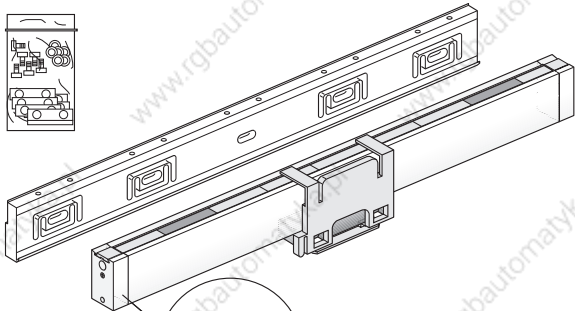
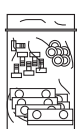
2x D13.0/8.4  
3x D7.0/4.3



Separat bestellen  
Order separately  
A commander séparément  
Ordinare a parte  
Para pedir por separado



Bei Montage bitte Geräteschild-Aufkleber anbringen (Schaltschrank, Maschinen-Handbuch usw.)  
Apply the encoder ID label to an appropriate surface, e.g. the electrical cabinet or machine manual  
lors du montage, accoler S.V.P. l'étiquette signalétique de l'appareil (armoire électrique, manuel de la machine, etc.)  
completato il montaggio, ricordarsi di applicare l'etichetta (manuale della macchina, quadro elettrico)  
por favor, durante el montaje, colocar el adhesivo del letrero del aparato (armario eléctrico, modo de empleo de la máquina, etc.)



19

LS 406 (C)  
LS 476 (C)  
LS 486 (C)



LS 476 (C)  
LS 486 (C)

3x  
D7.0/4.3



Separat bestellen  
Order separately  
A commander séparément  
Ordinare a parte  
Para pedir por separado



Bei Montage bitte Geräteschild-Aufkleber anbringen (Schaltschrank, Maschinen-Handbuch usw.)

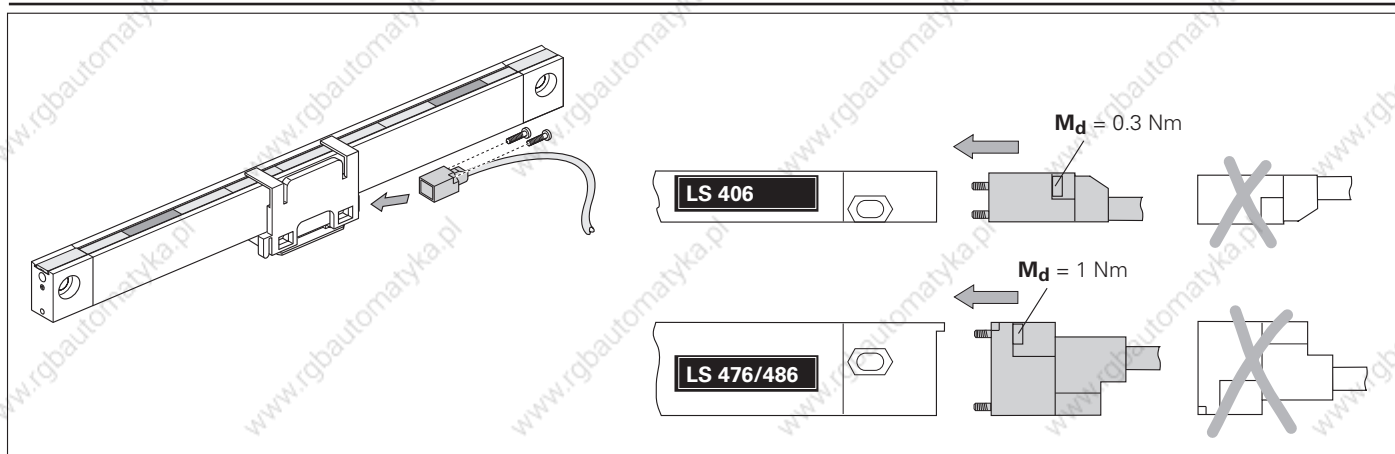
Apply the encoder ID label to an appropriate surface, e.g. the electrical cabinet or machine manual

lors du montage, accoler S.V.P. l'étiquette signalétique de l'appareil (armoire électrique, manuel de la machine, etc.)

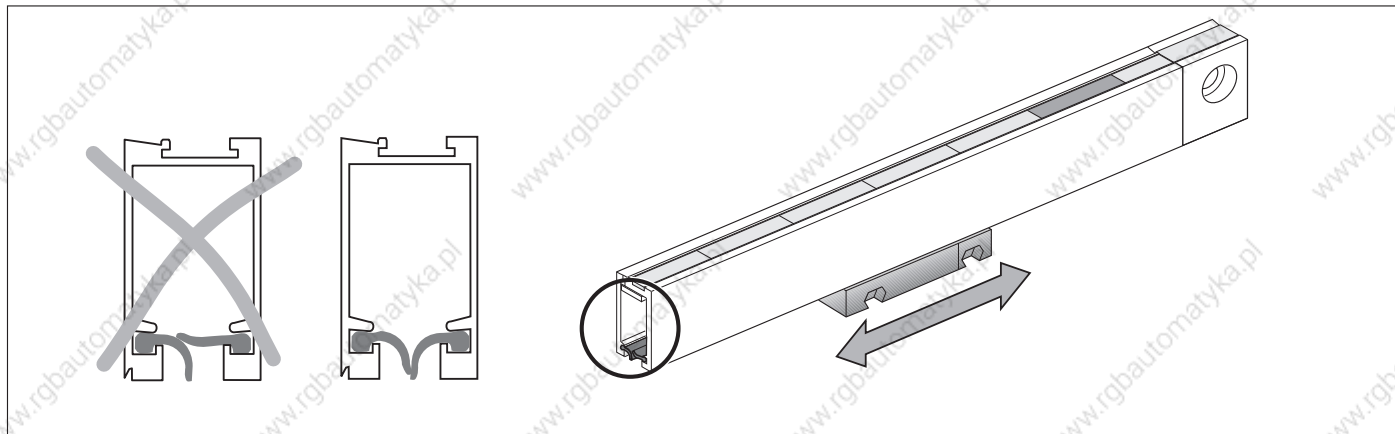
completato il montaggio, ricordarsi di applicare l'etichetta (manuale della macchina, quadro elettrico)

por favor, durante el montaje, colocar el adhesivo del letrero del aparato (armario eléctrico, modo de empleo de la máquina, etc.)

**Kabelanschluss · Cable Connection · Raccordement du cable · Cavo di colleganto · Conexión de cable**



**Dichtlippen überprüfen · Inspect Sealing Lips · Contrôler les lèvres d'étanchéité · Controllo delle guarnizioni · Verificar labios**



Referenzmarken-  
Auswahl

· *Reference Mark  
Selection*

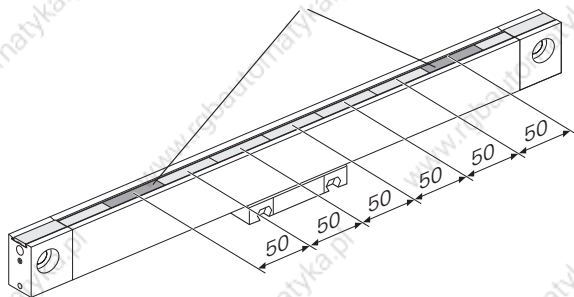
· *Sélection marques  
de référence*

· *Selezione indici  
di riferimento*

· *Selección marca  
de referencia*

## LS 4x6

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

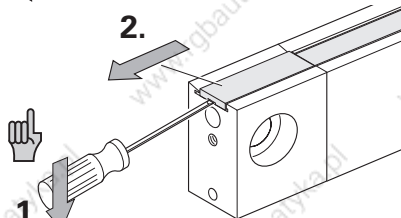


Id.-Nr. 295 795-01

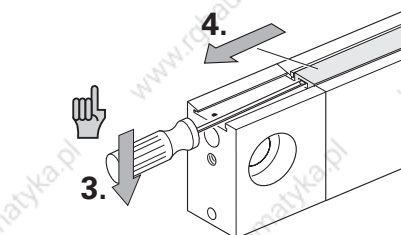
Id.-Nr. 294 336-01



2.



1.

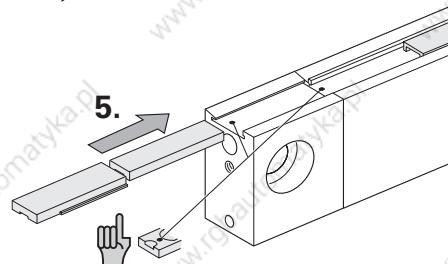


3.

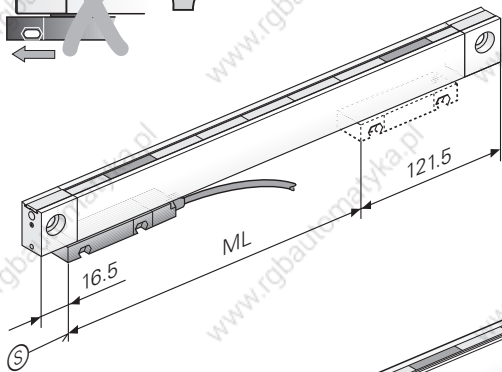
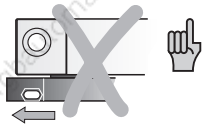
4.



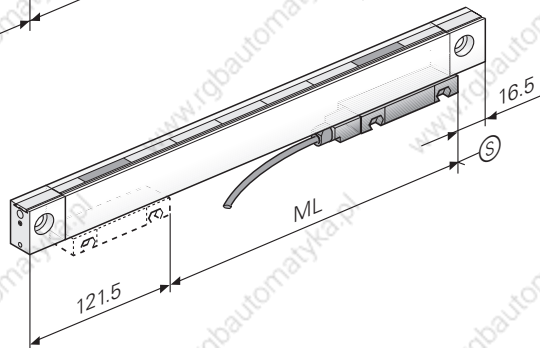
5.



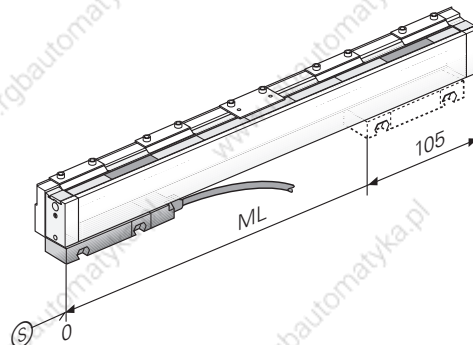
## Hinweise zur Montage · Mounting Procedure · Procédures pour le montage



180° gedreht angebaut  
Mounted rotated by 180°  
Montage avec rotation de 180°  
Montaggio ruotato di 180°  
Montado girado 180°

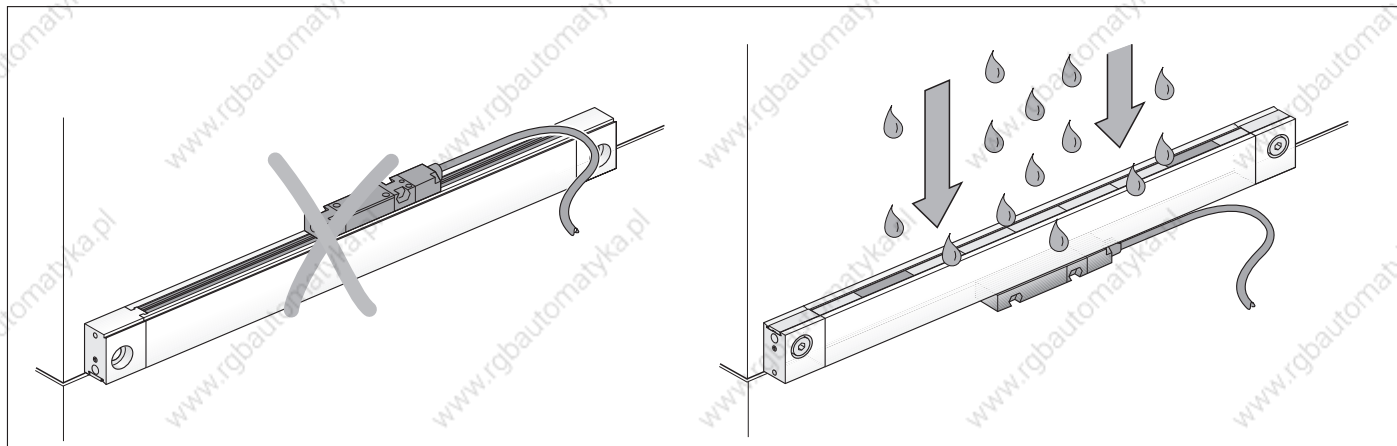


Ⓢ = Beginn der Messlänge ML  
Begin. of meas. length ML  
début longueur utile ML  
inizio lunghezza di misura ML  
comienzo longitud útil ML





**Avvertenze per il montaggio · Indicaciones para el montaje**



Abmessungen  
ohne Montageseiene

· Dimensions without  
Mounting Spar

· Dimensions  
sans rail de guidage

· Dimensioni  
senza guida

· Dimensiones  
sin guía de montaje

## LS 406 ( C )

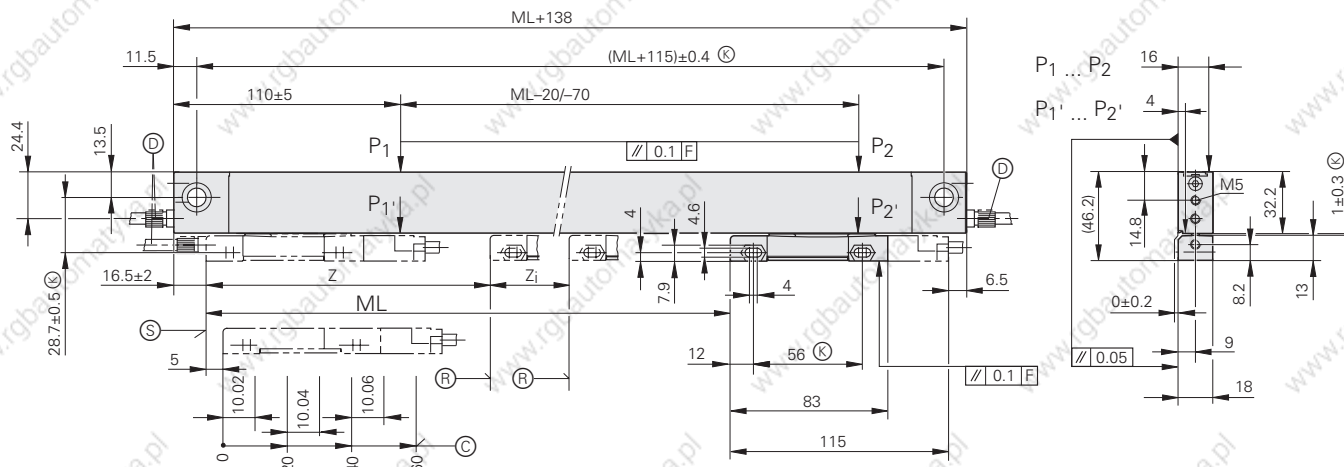
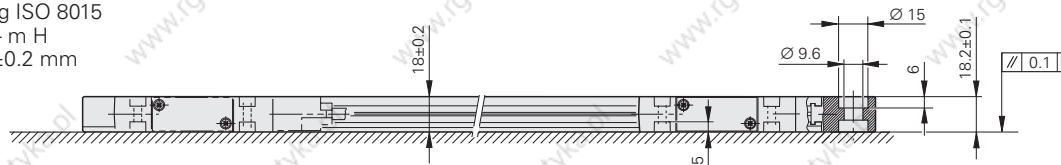
mm



Tolerancing ISO 8015

ISO 2768 - m H

< 6 mm: ±0.2 mm



ML 70 ... 1020

ML 1140 ... 1240

z = 35 mm

z = 45 mm

z<sub>1</sub> = ML - 70 mm

z<sub>1</sub> = ML - 90 mm

P = Messpunkte zum Ausrichten  
Gauging points for alignment  
points de mesure pour dégauchissage  
punti di misura per allineamento  
puntos medición alineamiento

Ⓢ = Beginn der Messlänge ML  
Begin. of meas. length ML  
début longueur utile ML  
inizio lunghezza di misura ML  
comienzo longitud útil ML

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

Abmessungen  
mit Montageschiene

· Dimensions with  
Mounting Spar

· Dimensions  
avec rail de guidage

· Dimensioni  
con guida

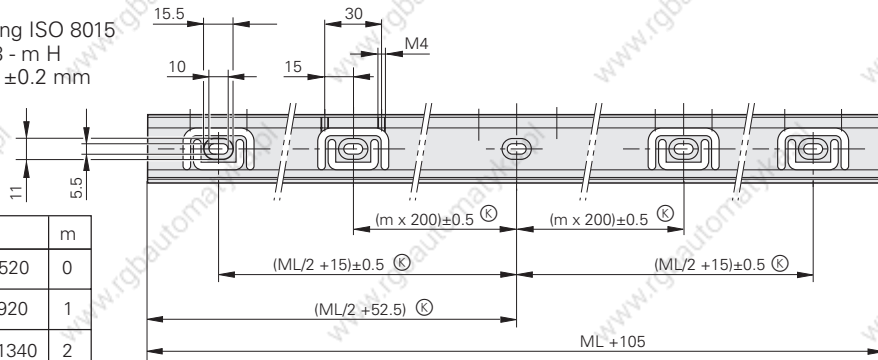
· Dimensiones  
con guía de montaje

## LS 406 (C)

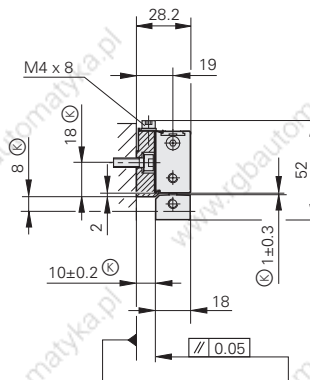
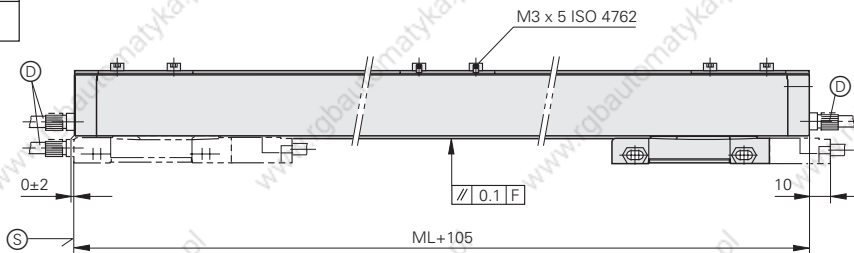
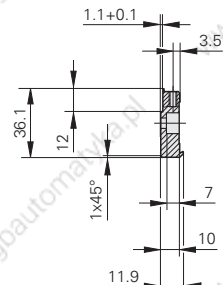
mm



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



ML	m
70 ... 520	0
570 ... 920	1
1020 ... 1340	2
1440 ... 1740	3
1840 ... 2040	4



Ⓚ = Kundenseitige Anschlussmaße  
Required mating dimensions  
conditions requises pour le montage  
dimensioni di collegamento lato cliente  
cotas de montaje requeridas

F = Maschinenführung  
Machine guideway  
guidage de la machine  
guida della macchina  
guía de la máquina

Ⓛ = Druckluftanschluss  
Compressed air inlet  
raccordement d'air comprimé  
ingresso per pressurizzazione  
conexión de aire comprimido

Abmessungen  
ohne Montageschiene

· Dimensions without  
Mounting Spar

· Dimensions  
sans rail de guidage

· Dimensioni  
senza guida

· Dimensiones  
sin guía de montaje

## LS 476/LS 486 (C)

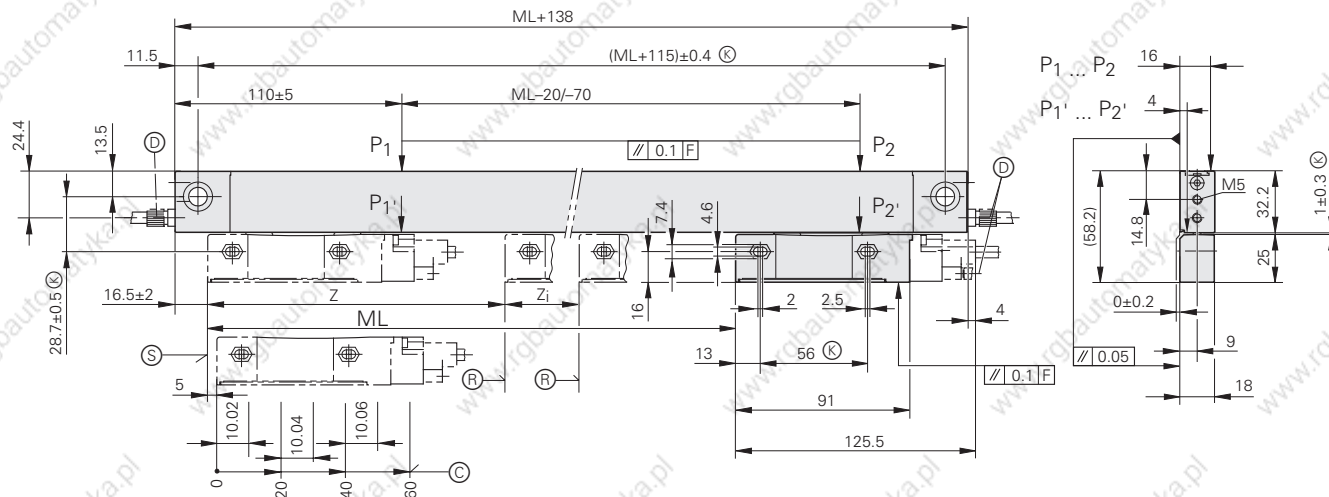
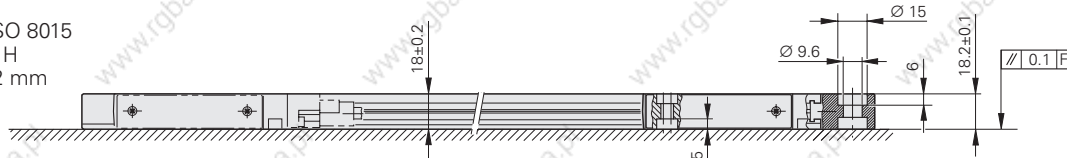
mm



Tolerancing ISO 8015

ISO 2768 - m H

< 6 mm: ±0.2 mm



ML 70 ... 1020

ML 1140 ... 1240

z = 35 mm

z = 45 mm

z<sub>i</sub> = ML - 70 mm

z<sub>i</sub> = ML - 90 mm

P = Messpunkte zum Ausrichten  
Gauging points for alignment  
points de mesure pour dé gauchissage  
punti di misura per allineamento  
puntos medición alineamiento

Ⓢ = Beginn der Messlänge ML  
Begin. of meas. length ML  
début longueur utile ML  
inizio lunghezza di misura ML  
comienzo longitud útil ML

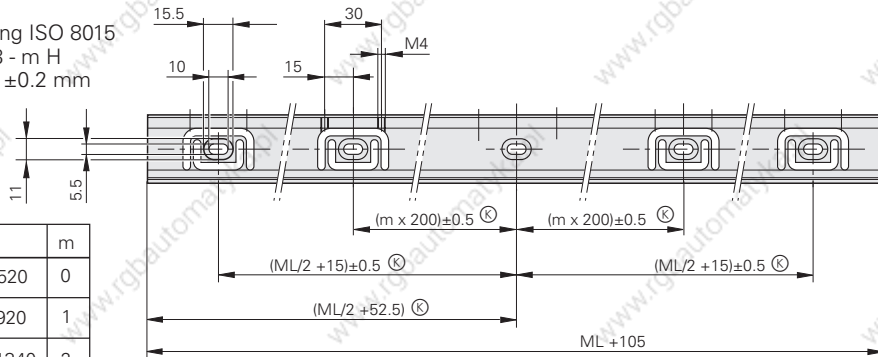
Ⓡ = Referenzmarken-Lage  
Reference mark  
marque de référence  
indici di riferimento  
marca de referencia

# LS 476/LS 486 (C)

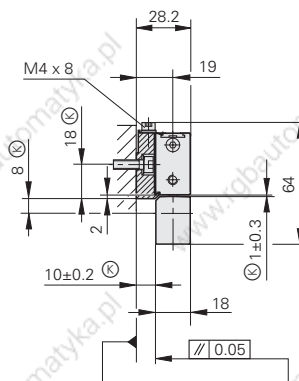
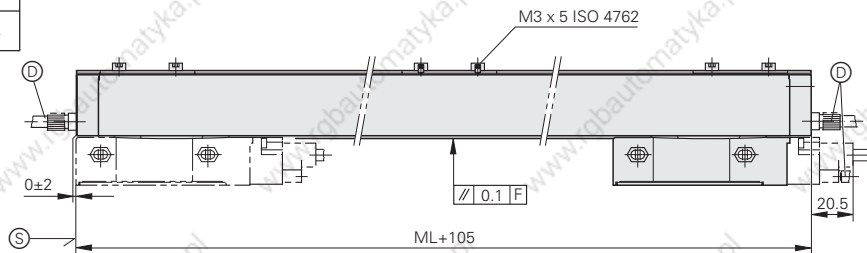
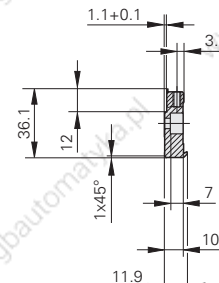
mm



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



ML	m
70 ... 520	0
570 ... 920	1
1020 ... 1340	2
1440 ... 1740	3
1840 ... 2040	4

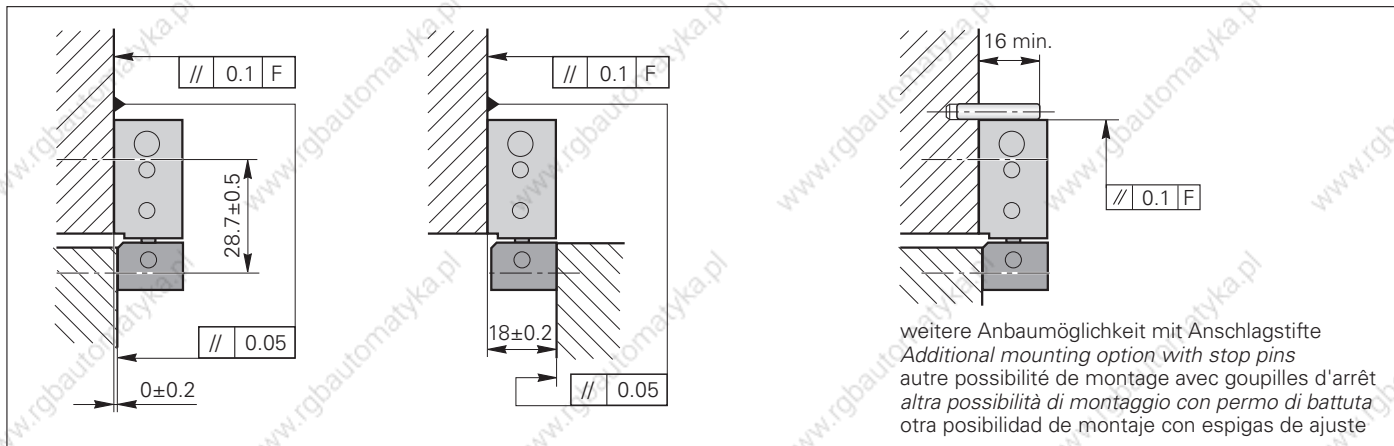
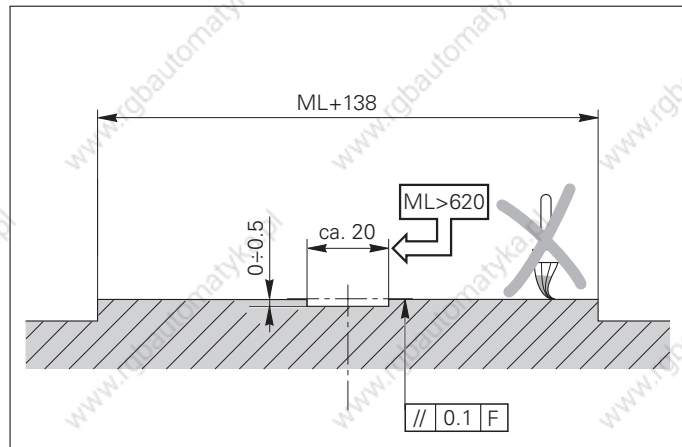
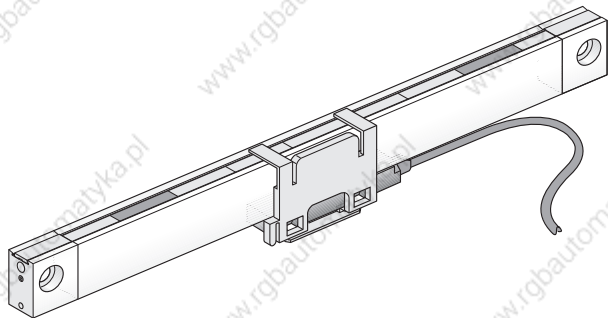


Ⓚ = Kundenseitige Anschlussmaße  
 Required mating dimensions  
 conditions requises pour le montage  
 dimensioni di collegamento lato cliente  
 cotas de montaje requeridas

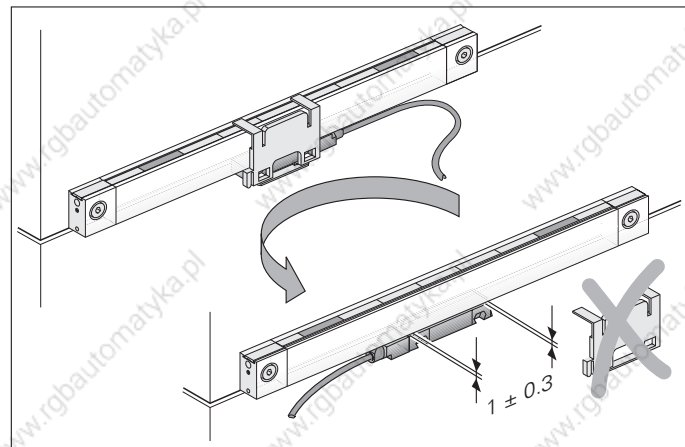
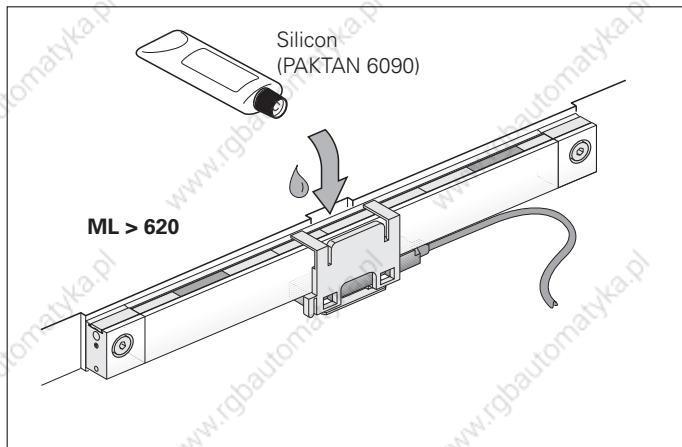
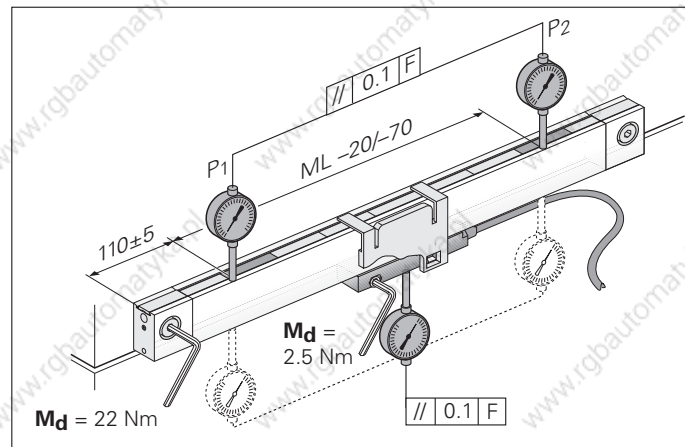
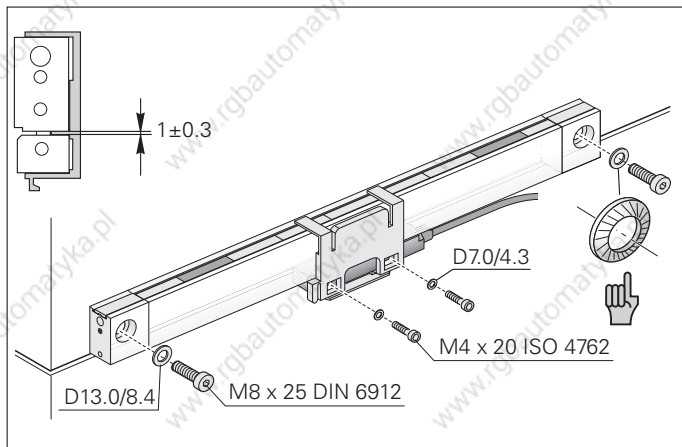
F = Maschinenführung  
 Machine guideway  
 guidage de la machine  
 guida della macchina  
 guía de la máquina

Ⓧ = Druckluftanschluss  
 Compressed air inlet  
 raccordement d'air comprimé  
 ingresso per pressurizzazione  
 conexión de aire comprimido

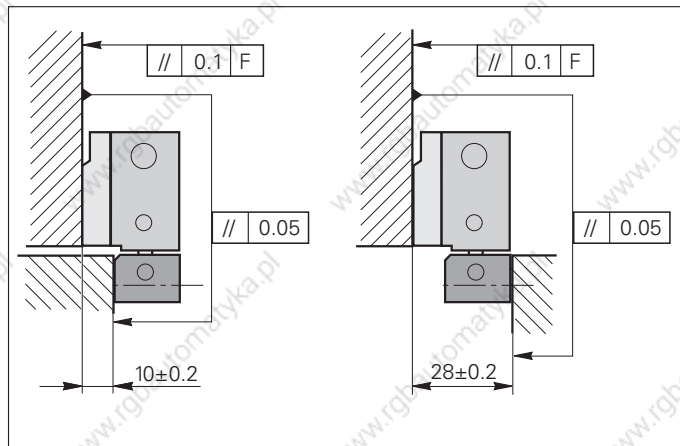
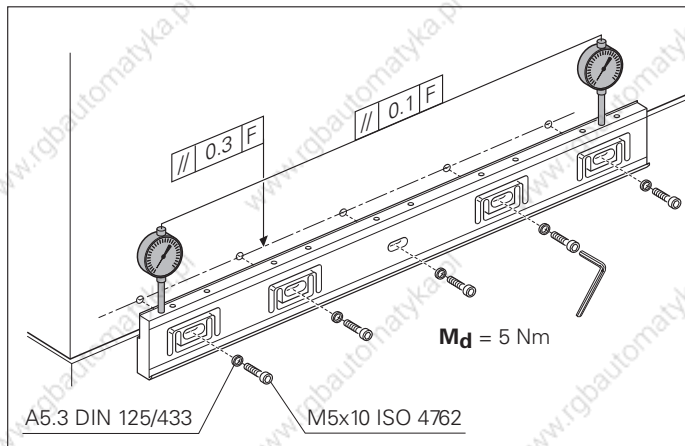
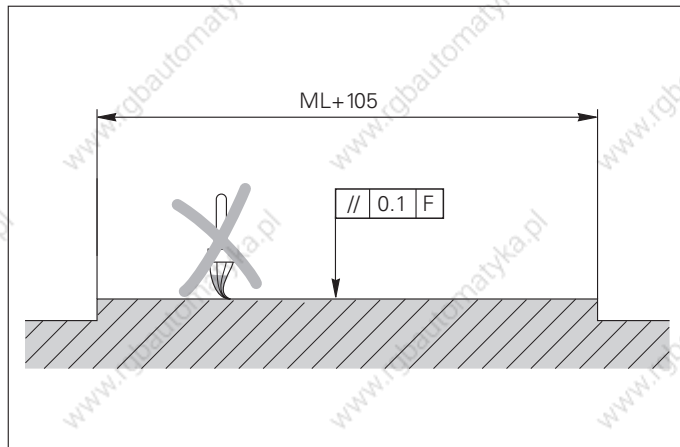
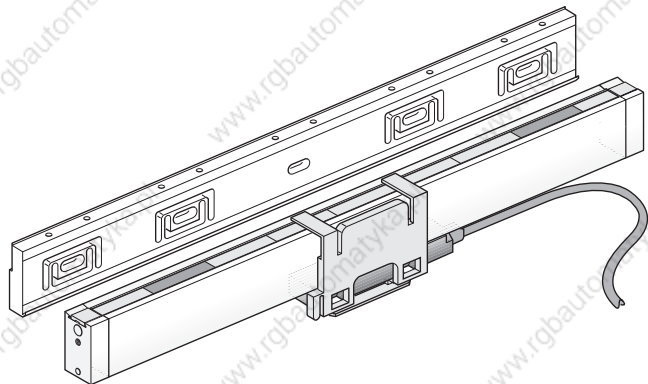
# Anbau ohne Montageschiene · Mounting without Mounting Spar · Montage sans rail de guidage



# Montaggio senza guida · Instalación sin guía de montaje

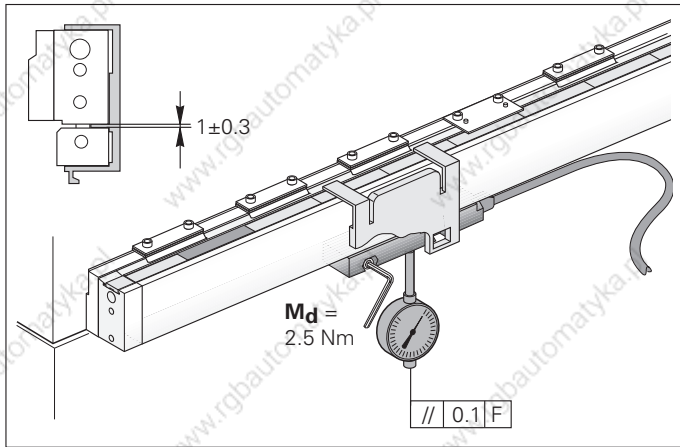
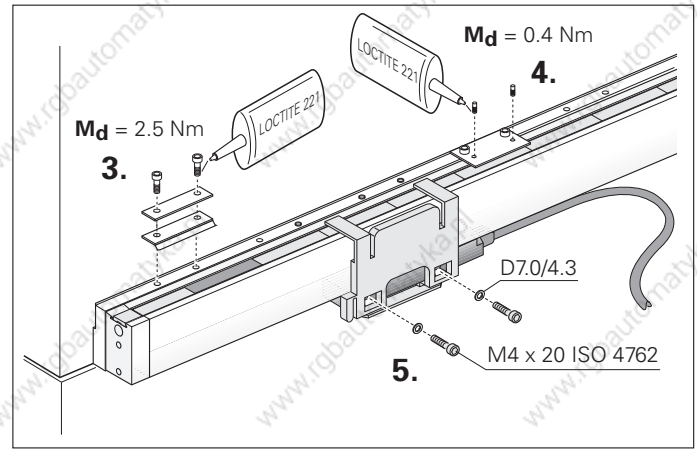
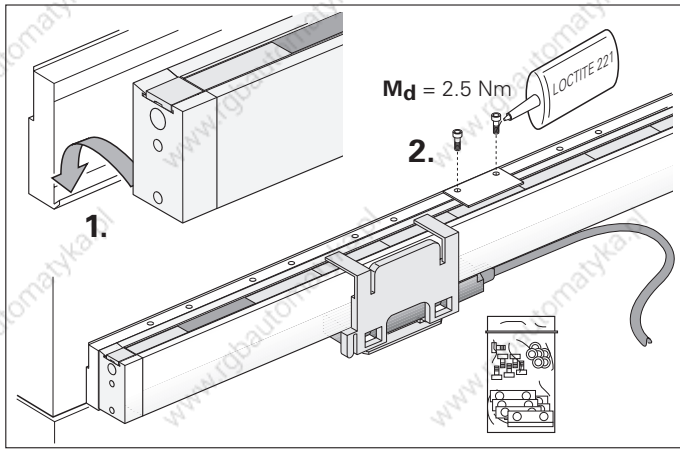


# Anbau mit Montageschiene · *Mounting with Mounting Spar* · Montage avec rail de guidage

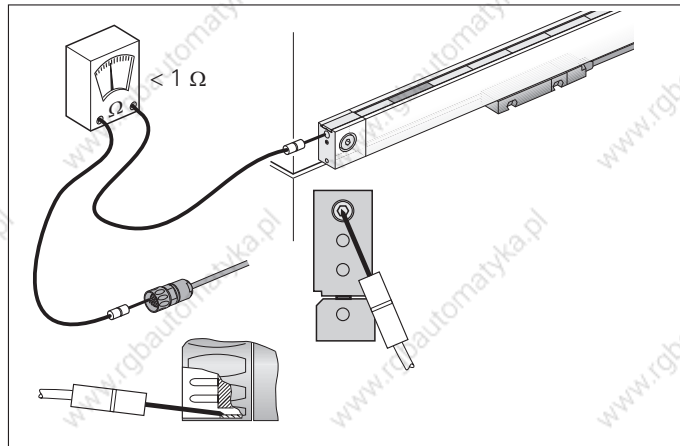
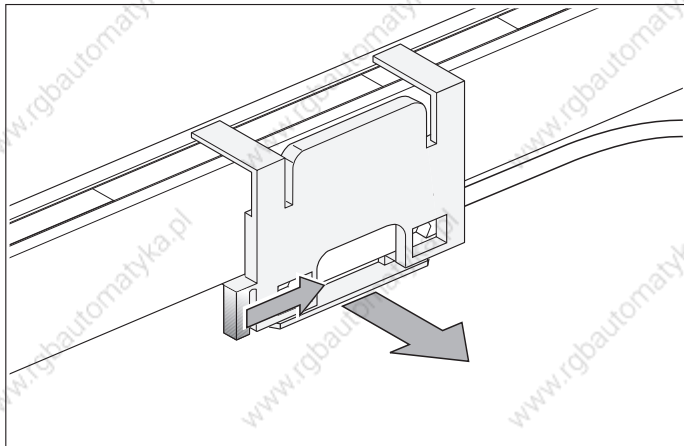




# Montaggio con guida · Instalación con guía de montaje



**Abschließende Arbeiten · Final Steps · Opérations finales · Operazioni finali · Trabajos finales**



Bei Erdungsproblemen zusätzlich Endstück oder Montageschiene erden!

*If grounding problems occur, ground also the end piece or mounting spar!*

En cas de problèmes de mise à la terre, mettre aussi l'embout ou le rail de montage à la terre!

*Nel caso di problemi di messa a terra, mettere a terra anche il blocchetto terminale o la guida di montaggio!*

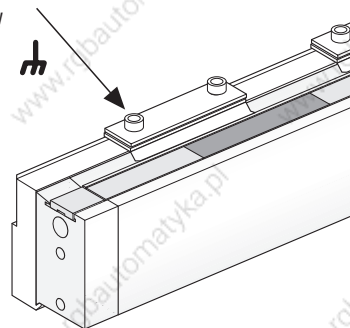
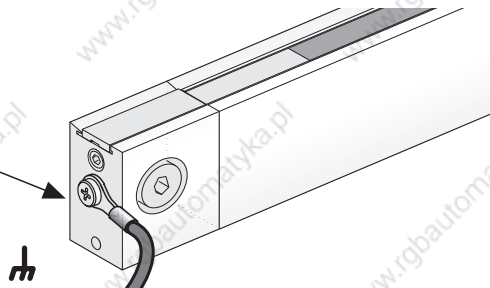
¡En caso de problemas de tierras, poner a tierra adicionalmente la pieza final o la guía de montaje!

5.3 DIN EN ISO 7092

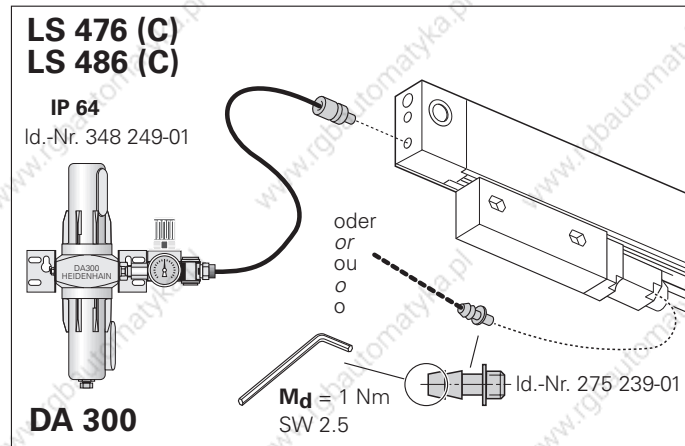
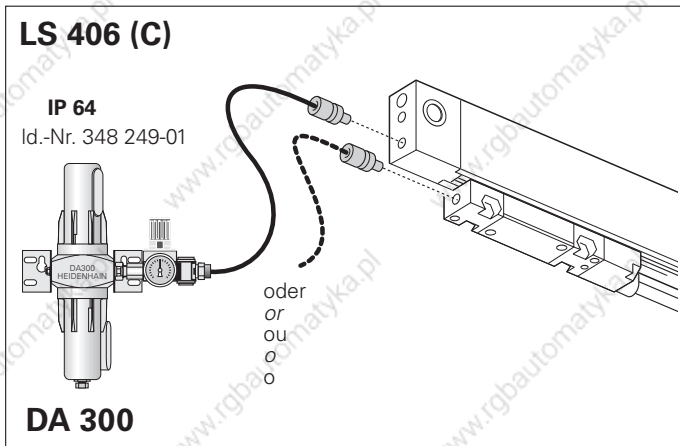
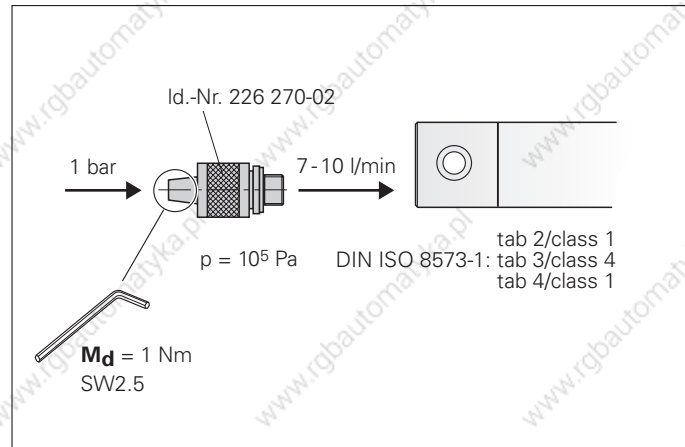
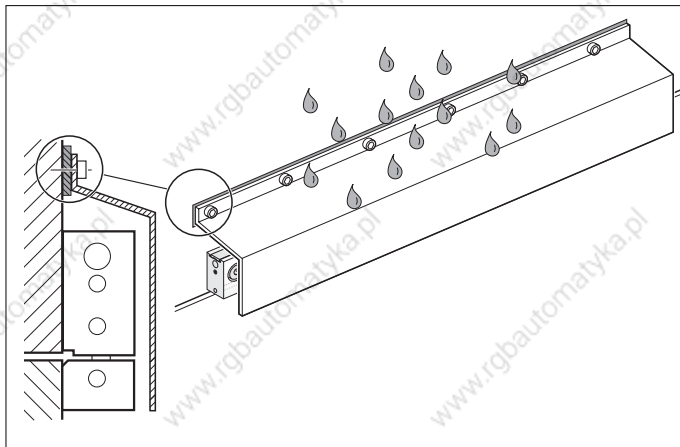
J 5.3 x 0.6

M5 x 6

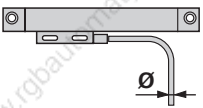

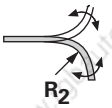

$\varnothing \geq 4 \text{ mm}^2$

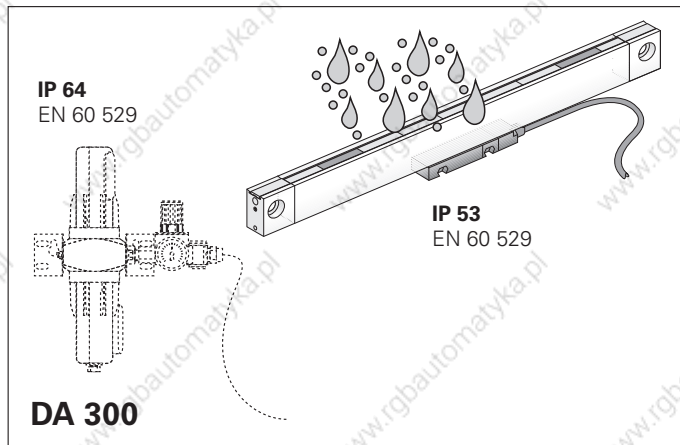
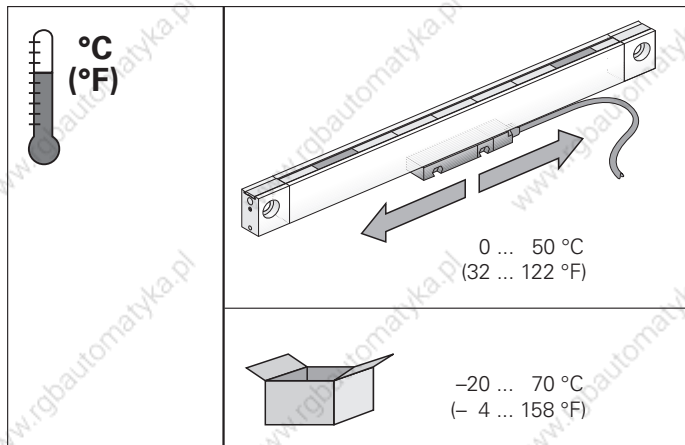
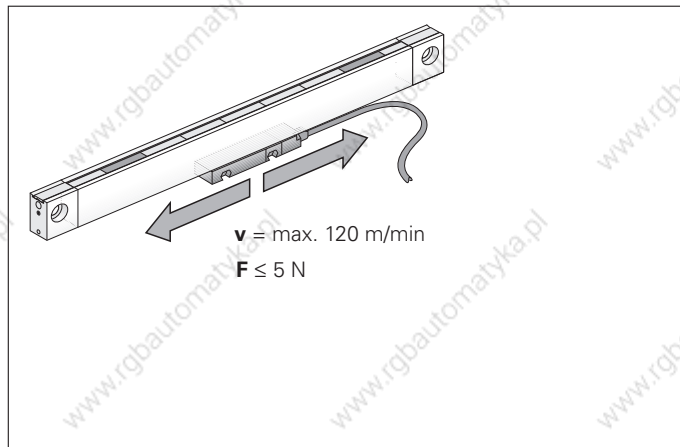


**Schutzmaßnahmen · Protective Measures · Mesures préventives · Precauzioni · Medidas de protección**

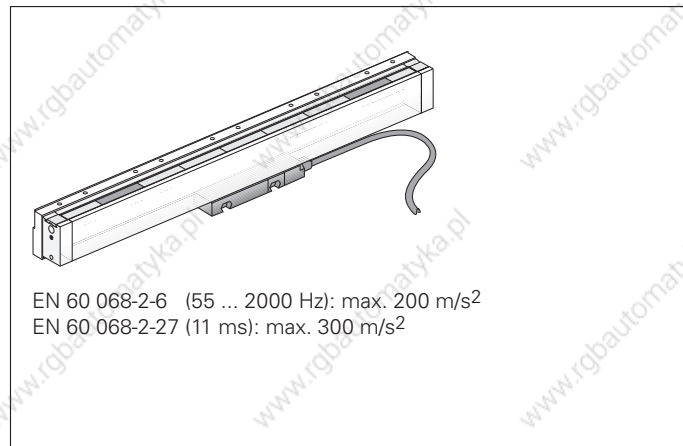
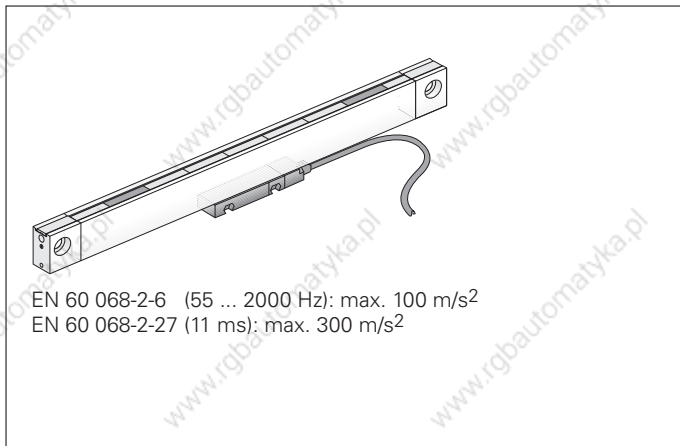


Technische Kennwerte · Specifications · Caractéristiques techniques · Dati tecnici · Datos técnicos

		
<b>Ø 6 mm</b>	$R_1 \geq 20 \text{ mm}$	$R_2 \geq 75 \text{ mm}$
<b>Ø 10 mm</b>	$R_1 \geq 35 \text{ mm}$	$R_2 \geq 75 \text{ mm}$
	$R_1 \geq 40 \text{ mm}$	$R_2 \geq 100 \text{ mm}$



Vibration/Schock · *Vibration/Shock* · Vibrations/Chocs · *Vibrazioni/Shock* · Vibración/Choque



Elektrische Kennwerte · *Electrical Data* · Caractéristiques électriques · *Dati elettrici* · Datos eléctricos

**LS 406 (C)**

**U<sub>p</sub> = 5 V ± 5 %**  
 (max. 70 mA)

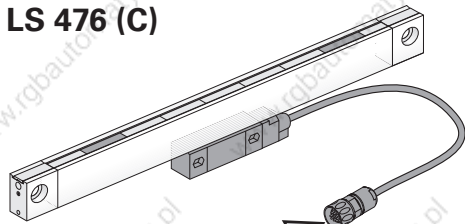
**I<sub>1</sub>: 7 ... 16 μAss**  
**I<sub>2</sub>: 7 ... 16 μAss**  
**I<sub>0</sub>: 2 ... 8 μA**

360° el.  
 90° el.


I<sub>1</sub>  
 I<sub>2</sub>  
 I<sub>0</sub>

IEC 50 178/4.98; 5.2.9.5  
 IEC 364-4-41: 1992; 411 (PELV/SELV)  
 (siehe, see, voir, vedi, véase  
 HEIDENHAIN D 231 929)

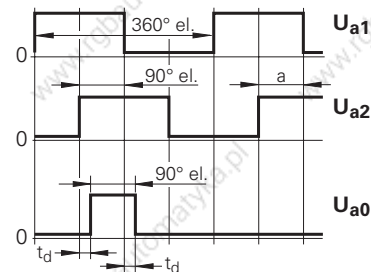
### LS 476 (C)



$U_P = 5V \pm 5\%$   
(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 D 231 929)

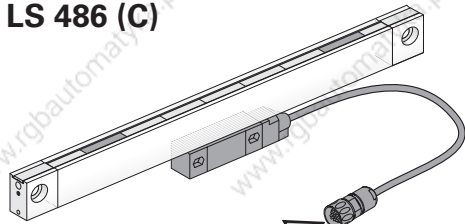
$U_{a1}, U_{a2}, U_{a0}$   
 $\overline{U_{a1}}, \overline{U_{a2}}, \overline{U_{a0}}, \overline{U_{aS}}$




$|t_d| \leq 0.1 \mu s$

$a \geq 0.5 \mu s$

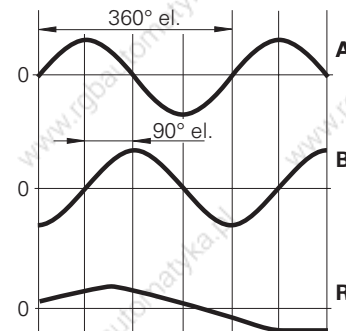
### LS 486 (C)



$U_P = 5V \pm 5\%$   
(max. 150 mA)

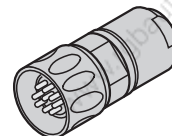
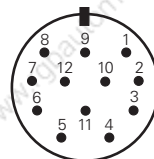
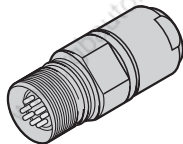
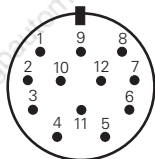
 EN 50 178/4.98; 5.2.9.5  
IEC 364-4-41: 1992; 411(PELV/SELV)  
(siehe, see, voir, vedi, véase  
HEIDENHAIN D 231 929)

**A: 0.6 ... 1.2 V<sub>SS</sub>**  
**B: 0.6 ... 1.2 V<sub>SS</sub>**  
**R: 0.2 ... 0.85 V**



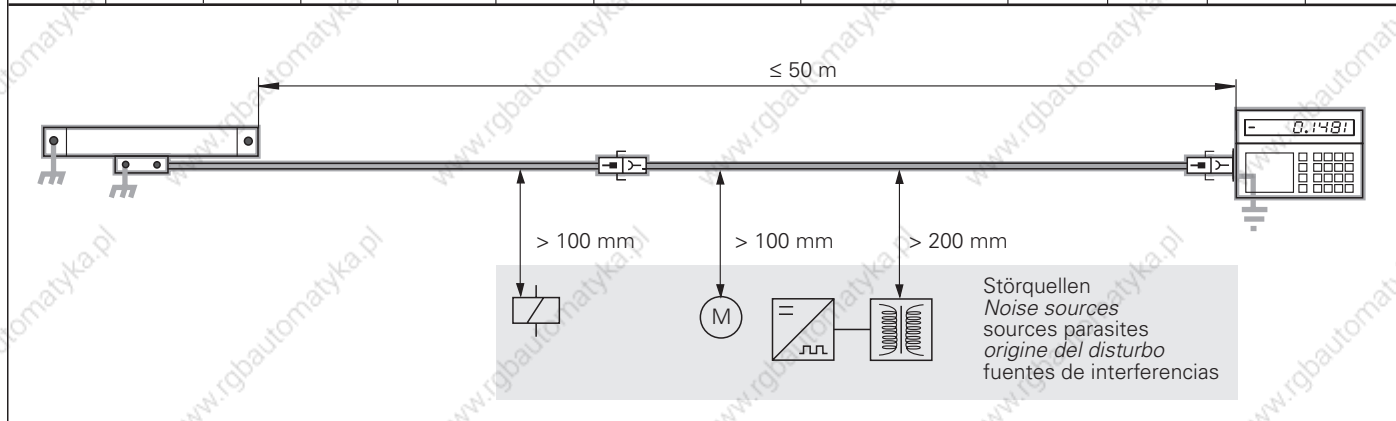
Elektrischer Anschluss · *Electrical Connection* · Raccordement électrique · *Collegamento elettrico* · Conexión eléctrica

LS 476 (C)



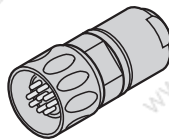
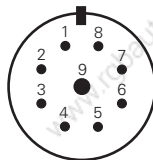
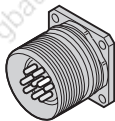
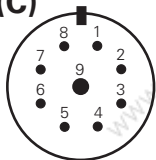
Schirm auf Gehäuse  
Shield on housing  
blindage sur boîtier  
schermo sulla carcassa  
blindaje a carcasa

5	6	8	1	3	4	12	10	2	11	7	/
$U_{a1}$	$\overline{U_{a1}}$	$U_{a2}$	$\overline{U_{a2}}$	$U_{a0}$	$\overline{U_{a0}}$	5V $U_P$	0V $U_N$	5V sensor	0V sensor	$\overline{U_{aS}}$	/
braun <i>brown</i> brun marrone marrón	grün <i>green</i> vert verde verde	grau <i>gray</i> gris grigio gris	rosa <i>pink</i> rose rosa rosa	rot <i>red</i> rouge rosso rojo	schwarz <i>black</i> noir nero negro	braun/grün <i>brown/green</i> brun/vert marrone/verde marron/verde	weiß/grün <i>white/green</i> blanc/vert bianco/verde blanco/verde	blau <i>blue</i> bleu azzurro azul	weiß <i>white</i> blanc bianco blanco	violett <i>violet</i> violet violet violeta	gelb <i>yellow</i> jaune giallo amarillo



Elektrischer Anschluss · *Electrical Connection* · Raccordement électrique · *Collegamento elettrico* · Conexión eléctrica

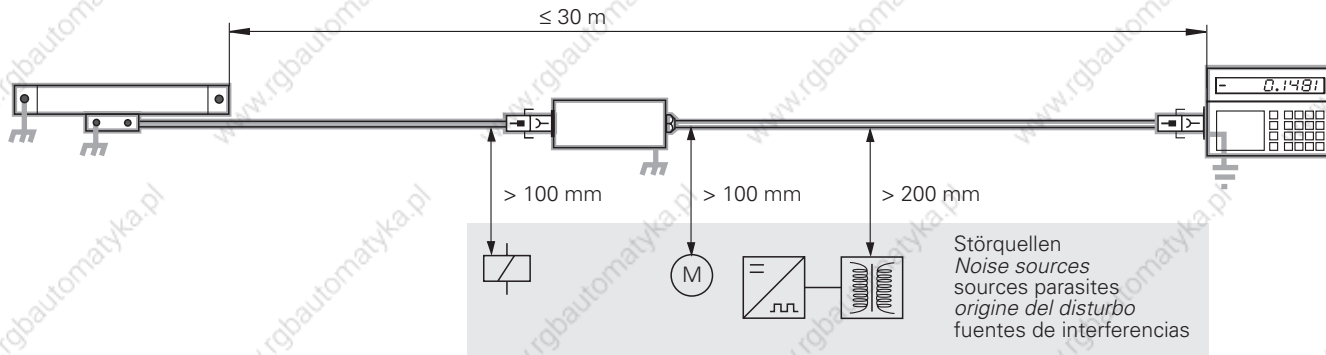
LS 406 (C)



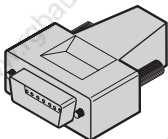
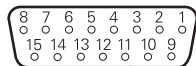
1) Außenschirm auf Gehäuse  
*External shield on housing*  
 blindage externe sur boîtier  
 schermo esterno sulla carcassa  
 blindaje externo a carcasa

2) Innenschirm Pin 9  
*Internal shield pin 9*  
 blindage interne pin 9  
 schermo interno pin 9  
 blindaje interno pin 9

1	2	5	6	7	8	3	4	1)	9	
I <sub>1</sub>		I <sub>2</sub>		I <sub>0</sub>		5 V U <sub>P</sub>	0 V U <sub>N</sub>		2)	
+	-	+	-	+	-					
grün <i>green</i> vert <i>verde</i> verde	gelb <i>yellow</i> jaune <i>giallo</i> amarillo	blau <i>blue</i> bleu <i>azzurro</i> azul	rot <i>red</i> rouge <i>rosso</i> rojo	grau <i>gray</i> gris <i>grigio</i> gris	rosa <i>pink</i> rose <i>rosa</i> rosa	braun <i>brown</i> brun <i>marrone</i> marrón	weiß <i>white</i> blanc <i>bianco</i> blanco		weiß/braun <i>white/brown</i> blanc/brun <i>bianco/marrone</i> blanco/marrón	







1) Außenschild auf Gehäuse  
*External shield on housing*  
 blindage externe sur boîtier  
*schermo esterno sulla carcassa*  
 blindaje externo a carcasa

2) Innenschild Pin 13  
*Internal shield pin 13*  
 blindage interne pin 13  
*schermo interno pin 13*  
 blindaje interno pin 13

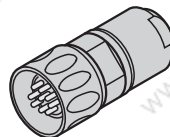
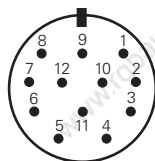
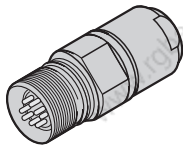
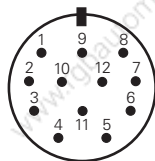
3	4	6	7	10	12	1	2	1)	13
I <sub>1</sub>		I <sub>2</sub>		I <sub>0</sub>		5V U <sub>P</sub>	0V U <sub>N</sub>		2)
+	-	+	-	+	-				
grün <i>green</i> vert verde verde	gelb <i>yellow</i> jaune giallo amarillo	blau <i>blue</i> bleu azzurro azul	röt <i>red</i> rouge rosso rojo	grau <i>gray</i> gris grigio gris	rosa <i>pink</i> rose rosa rosa	braun <i>brown</i> brun marrone marrón	weiß <i>white</i> blanc bianco blanco		weiß/braun <i>white/brown</i> blanc/brun bianco/marrone blanco/marrón



IK 220  
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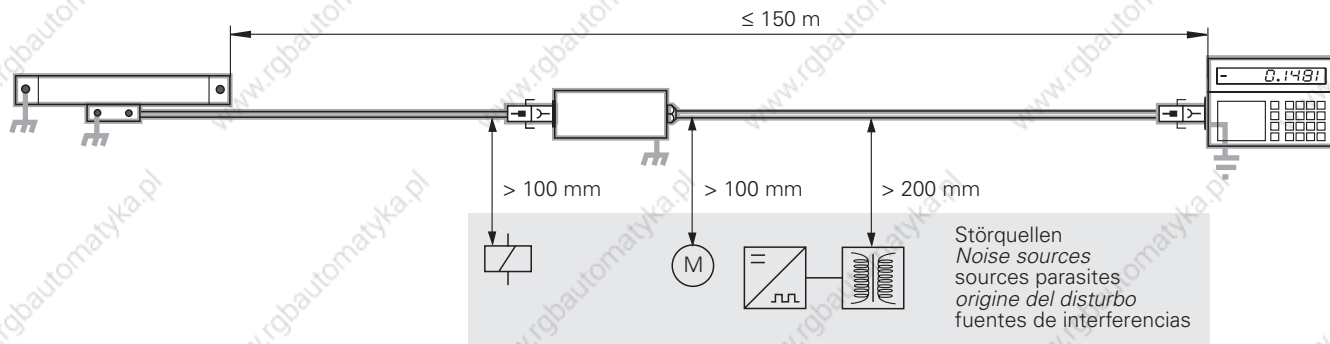
Elektrischer Anschluss · *Electrical Connection* · Raccordement électrique · *Collegamento elettrico* · Conexión eléctrica

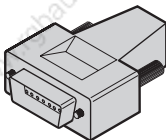
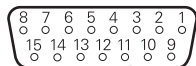
LS 486 (C)



Shield auf Gehäuse  
 blindage sur boîtier  
 schermo sulla carcassa  
 blindaje a carcasa

5	6	8	1	3	4	12	10	2	11	7	/
A		B		R		5V U <sub>P</sub>	0V U <sub>N</sub>	5V sensor	0V sensor	/	/
+	-	+	-	+	-						
braun <i>brown</i> brun marrone marrón	grün <i>green</i> vert verde verde	grau <i>gray</i> gris grigio gris	rosa <i>pink</i> rose rosa rosa	rot <i>red</i> rouge rosso rojo	schwarz <i>black</i> noir nero negro	braun/grün <i>brown/green</i> brun/vert marrone/verde marron/verde	weiß/grün <i>white/green</i> blanc/vert bianco/verde blanco/verde	blau <i>blue</i> bleu azzurro azul	weiß <i>white</i> blanc bianco blanco	violett <i>violet</i> violet viola violeta	gelb <i>yellow</i> jaune giallo amarillo





Schirm auf Gehäuse  
*Shield on housing*  
 blindage sur boîtier  
*schermo sulla carcassa*  
 blindaje a carcasa

3	4	6	7	10	12	1	2	9	11	14	/
A		B		R		5V U <sub>P</sub>	0V U <sub>N</sub>	5V sensor	0V sensor	/	/
+	-	+	-	+	-						
braun <i>brown</i> brun <i>marrone</i> marrón	grün <i>green</i> vert <i>verde</i> verde	grau <i>gray</i> gris <i>grigio</i> gris	rosa <i>pink</i> rose <i>rosa</i> rosa	rot <i>red</i> rouge <i>rosso</i> rojo	schwarz <i>black</i> noir <i>nero</i> negro	braun/grün <i>brown/green</i> brun/vert <i>marrone/verde</i> marron/verde	weiß/grün <i>white/green</i> blanc/vert <i>bianco/verde</i> blanco/verde	blau <i>blue</i> bleu <i>azzurro</i> azul	weiß <i>white</i> blanc <i>bianco</i> blanco	violett <i>violet</i> violet <i>viola</i> violeta	gelb <i>yellow</i> jaune <i>giallo</i> amarillo



IK 220  
TNC

# HEIDENHAIN

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## DR. JOHANNES HEIDENHAIN GmbH

Dr.-Johannes-Heidenhain-Straße 5

**83301 Traunreut, Germany**

☎ +49 (86 69) 31-0

FAX +49 (86 69) 50 61

E-Mail: [info@heidenhain.de](mailto:info@heidenhain.de)

---

**Technical support** FAX +49 (86 69) 31-1000

**Measuring systems** ☎ +49 (86 69) 31-3104

E-Mail: [service.ms-support@heidenhain.de](mailto:service.ms-support@heidenhain.de)

**TNC support** ☎ +49 (86 69) 31-3101

E-Mail: [service.nc-support@heidenhain.de](mailto:service.nc-support@heidenhain.de)

**NC programming** ☎ +49 (86 69) 31-3103

E-Mail: [service.nc-pgm@heidenhain.de](mailto:service.nc-pgm@heidenhain.de)

**PLC programming** ☎ +49 (86 69) 31-3102

E-Mail: [service.plc@heidenhain.de](mailto:service.plc@heidenhain.de)

**Lathe controls** ☎ +49 (7 11) 95 2803-0

E-Mail: [service.hsf@heidenhain.de](mailto:service.hsf@heidenhain.de)

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[www.heidenhain.de](http://www.heidenhain.de)



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