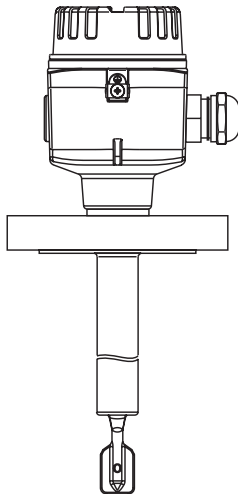
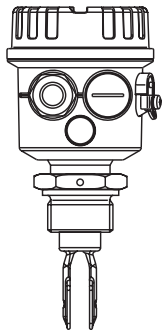


liquiphant M

FTL 50, FTL 51



pt Chave de nível

e Level Limit Switch

es Detector de nível

pt Índice

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!! X Cuidado!
 = proibido;
 leva a mau-funcionamento
 ou destruição.

!! X Caution!
 = forbidden;
 leads to incorrect
 operation or destruction.

!! X Atención!
 = Prohibido; peligro
 de mal funcionamiento
 o de destrucción.

pt **Informações sobre segurança**

O Liquiphant M FTL 50/51 foi desenvolvido para detecção do nível de fluídos.

Se usado incorretamente, é possível que ocorram transtornos perigosos relacionados à aplicação.

A chave de nível Liquiphant M FTL 50/51 pode ser instalada, conectada, operada e manuseada **somente por equipe qualificada e autorizada**, sob observações rigorosas das instruções operacionais, quaisquer padrões relevantes, requerimentos legais, e, quando adequado, o certificado.

Instale uma chave de força de fácil acesso próximo ao aparelho.

Marque a chave de força como desconector para o aparelho

e **Notes on Safety**

The Liquiphant M FTL 50/51 is designed for level limit detection in liquids.

If used incorrectly it is possible that application-related dangers may arise.

The level limit switch Liquiphant M FTL 50/51 may be installed, connected, commissioned, operated and maintained **by qualified and authorised personnel only**, under strict observance of these operating instructions, any relevant standards, legal requirements, and, where appropriate, the certificate. Install an easily accessible power switch in the proximity of the device.

Mark the power switch as a disconnecter for the device.

es **Notas sobre seguridad**

El detector de nivel Liquiphant M FTL 50/51 ha sido diseñado para la detección de límite en fluidos. Su empleo inapropiado puede resultar peligroso.

El equipo deberá ser montado, conectado, instalado y mantenido **única y exclusivamente por personal cualificado y autorizado**, bajo rigurosa observación de las presentes instrucciones de servicio, de las normativas y legislaciones vigentes, así como de los certificados (dependiendo de la aplicación). Instalar un interruptor de fácil acceso en las proximidades del equipo.

Identificar el interruptor como desconector del equipo.

pt

Manuseio

Segure pelo alojamento, flange ou tubo de extensão.

e

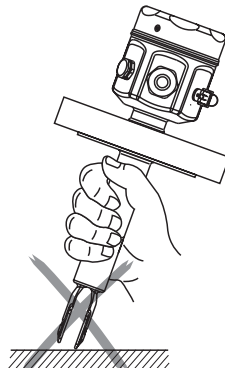
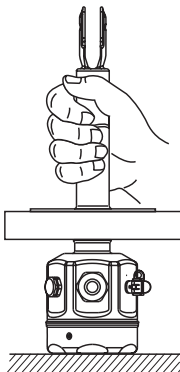
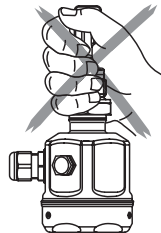
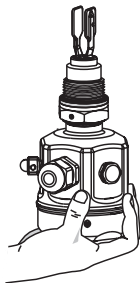
Handling

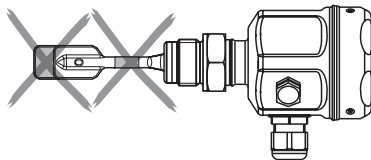
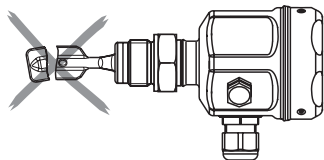
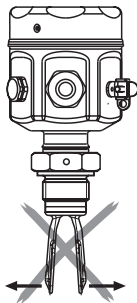
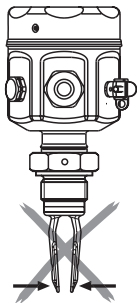
Hold by housing, flange or extension tube.

es

Modo de empleo

Coger por el cabezal, brida o tubo de extensión.



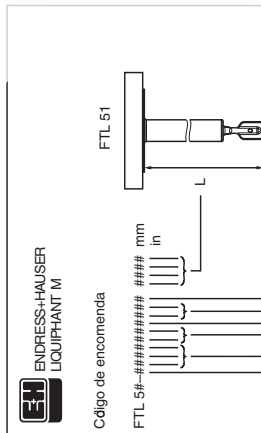


- pt** Não dobre
 Não encurte
 Não alargue
- e** Do **not** bend
 Do **not** shorten
 Do **not** lengthen
- es** No torcer
 No acortar
 No alargar

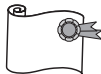
pt Identificação do equipamento
Flanges

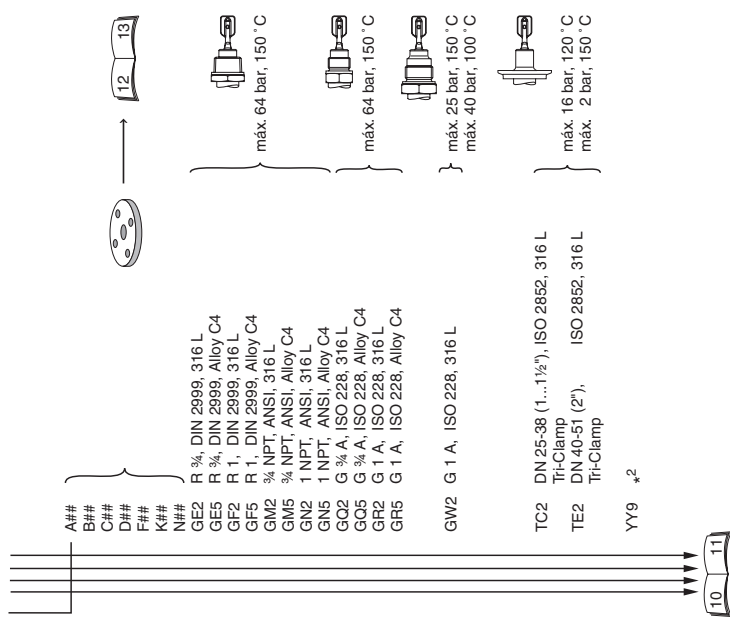
e Device Identification

es Identificación del equipo



A	* ¹	ATEX II 3 G	EEx nC II	T6, WHG
B		ATEX II 3 G	EEx nA II	T6, WHG
C		ATEX II 3 D	T 85°C,* ³	
D		* ¹ WHG		
F		ATEX II 1/2 G	EEx ia IIC T6,	WHG
		ATEX II 1/2 D	T 80°C,* ³	
G		ATEX II 1/2 G	EEx ia IIC T6	
		ATEX II 1/2 D	T 80°C,* ³	
H		ATEX II 1 G	EEx ia IIC T6	
J		ATEX II 1 G	EEx ia IIC T6, WHG	
L		ATEX II 1/2 G	EEx d IIC T6	
		ATEX II 1/2 G	EEx d IIC T6, WHG	
P		FM IS, Cl. I, II, III,	Div. 1, Gr. A-G	
Q		FM XP, Cl. I, II, III,	Div. 1, Gr. B-G	
			E5 => Gr. A-G	
R		FM NI, Cl. I,	Div. 2, Gr. A-D	
S		CSA IS, Cl. I, II, III,	Div. 1, Gr. A-G	
T		CSA XP, Cl. I, II, III,	Div. 1, Gr. A-G	
U		CSA Uso Geral		
V		TIIS Ex ia IIC T3		
W		TIIS Ex d IIB T3		
X		TIIS Ex ia IIC T6		
Y		* ²		
7		TIIS Ex d IIC T3		
8		TIIS Ex d IIC T6		
E		ATEX II 1/2 G	EEx de IIC T6,	WHG
I		ATEX II 1/2 G	EEx de IIC T6	





*1 sem / without / sin

*2 outros / others / otros

*3 não válido para PBT / not valid for PBT / no es válido para PBT



ENDRESS+HAUSER
LIQUIPHANT M

Código de encomenda

FTL 51

FTL 5#-##### mm

pol



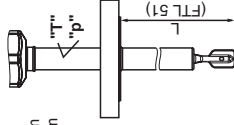
L

AA *², Ra < 3,2 µm / 80 grit (FTL 50)
 BB mm (148 mm...3000 mm), 316 L, Ra < 3,2 µm
 BE mm (148 mm...3000 mm), Alloy C4, Ra < 3,2 µm
 CB pol (6 pol ...115 pol), 316 L, Ra < 3,2 µm
 CE pol (6 pol ...115 pol), Alloy C4, Ra < 3,2 µm
 DB "L II", 316 L, Ra < 3,2 µm
 DE "L II", Alloy C4, Ra < 3,2 µm

IA 66 mm, 2,6" + "T" (FTL 50)
 JB mm (148 mm...3000 mm), 316 L + "T"
 JE mm (148 mm...3000 mm), Alloy C4 + "T"
 KB pol (6 pol ...115 pol), 316 L + "T"
 KE pol (6 pol ...115 pol), Alloy C4 + "T"
 LB "L II", 316 L + "T"
 LE "L II", Alloy C4 + "T"

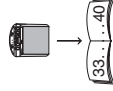
QA 66 mm, 2,6" + "p" (FTL 50)
 RB mm (148 mm...3000 mm), 316 L + "p"
 RE mm (148 mm...3000 mm), Alloy C4 + "p"
 SB pol (6 pol ...115 pol), 316 L + "p"
 SE pol (6 pol ...115 pol), Alloy C4 + "p"
 TB "L II", 316 L + "p"
 TE "L II", Alloy C4 + "p"

YY *²



A FEL 50 A, PROFIBUS PA

1 FEL 51, 19...253 V AC
 2 FEL 52, 10... 55 V DC, PNP
 4 FEL 54, 19...253 V AC, 19...55 V DC, DPDT
 5 FEL 55, 11... 36 V DC, 8/16 mA
 6 FEL 56, NAMUR, L-H
 7 FEL 57, PFM
 8 FEL 58, NAMUR, H-L
 9 *²



E4 F16, Nema 4x, NPT ½
 E5 F13/17, Nema 4x, NPT ¾
 E6 F15, Nema 4x, NPT ½
 F4 F16, IP66, G ½ A
 F5 F13/17, IP66, G ½ A
 F6 F15, IP66, G ½ A
 G4 F16, IP66, M20
 G5 F13/17, IP66, M20
 G6 F15, IP66, M20
 N4 F16, IP66, M12, PA
 N5 F13/17, IP66, M12, PA
 N6 F15, IP66, M12, PA
 Y9 *²



F16
PBT



F13/17
Alu



F15
316 L

#3 Alojamento compacto / compact housing /
 cabezal compacto



#7 Alu/sep.



A *¹
 C 316L (EN 10204), 3.1.B
 N 316L (EN 10204), NACE MR 0175/3.1.B
 S GL (German Lloyd) marine certificate
 Y *²

*¹ sem / without / sin

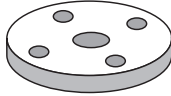
*² outros / others / otros

"L II" Ponto de comutação / Switchpoint / Punto de conmutació

Liquiphant II FTL 360/365, FDL 30/35

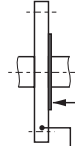
"T" Dissipador de calor / Temperature spacer / ramo dissipador
 de temperatura

"p" Extensão resistente à pressão / Pressure sealed bushing /
 Extensió resistente a la pressió



ANSI B 16.5

AA2 1¼", 150 lbs,	RF, 316/316 L
AB2 1¼", 300 lbs,	RF, 316/316 L (FTL 51)
AC2 1½", 150 lbs,	RF, 316/316 L
AD2 1½", 300 lbs,	RF, 316/316 L (FTL 51)
AE2 2", 150 lbs,	RF, 316/316 L
AE5 2", 150 lbs,	Alloy C4 >316/316 L
AF2 2", 300 lbs,	RF, 316/316 L
AG2 2", 400/600 lbs,	RF, 316/316 L (FTL 51)
AJ2 2½", 300 lbs,	RF, 316/316 L (FTL 51)
AL2 3", 150 lbs,	RF, 316/316 L
AM2 3", 300 lbs,	RF, 316/316 L (FTL 51)
AP2 4", 150 lbs,	RF, 316/316 L
AQ2 4", 300 lbs,	RF, 316/316 L (FTL 51)
AR2 4", 400/600 lbs,	RF, 316/316 L (FTL 51)
A82 1", 150 lbs,	RF, 316/316 L



EN 1092-1

BA2 DN 32, PN 6 A,	316 L
BB2 DN 32, PN 25/40 A,	316 L
BC2 DN 40, PN 6 A,	316 L
BD2 DN 40, PN 25/40 A,	316 L
BE2 DN 50, PN 6 A,	316 L
BG2 DN 50, PN 25/40 A,	316 L
BH2 DN 65, PN 6 A,	316 L
BK2 DN 65, PN 25/40 A,	316 L
BM2 DN 80, PN 10/16 A,	316 L
BN2 DN 80, PN 25/40 A,	316 L
BQ2 DN 100, PN 10/16 A,	316 L
BR2 DN 100, PN 25/40 A,	316 L
B82 DN 25, PN 25/40 A,	316 L

CA2	DN 32,	PN 6 B1,	316 L
CA5	DN 32,	PN 6,	Alloy C4 >316 L
CE2	DN 50,	PN 6 B1,	316 L
CE5	DN 50,	PN 6,	Alloy C4 >316 L
CG2	DN 50,	PN 25/40 B1,	316 L
CG5	DN 50,	PN 25/40,	Alloy C4 >316 L
CN2	DN 80,	PN 25/40 B1,	316 L
CN5	DN 80,	PN 25/40,	Alloy C4 >316 L
CQ2	DN 100,	PN 10/16 B1,	316 L
CQ5	DN 100,	PN 10/16,	Alloy C4 >316 L
C82	DN 25,	PN 25/40 B1,	316 L
C85	DN 25,	PN 25/40,	Alloy C4 >316 L
FG2	DN 50,	PN 40 C,	316 L
NG2	DN 50,	PN 40 N,	316 L

JIS B 2210 / DIN

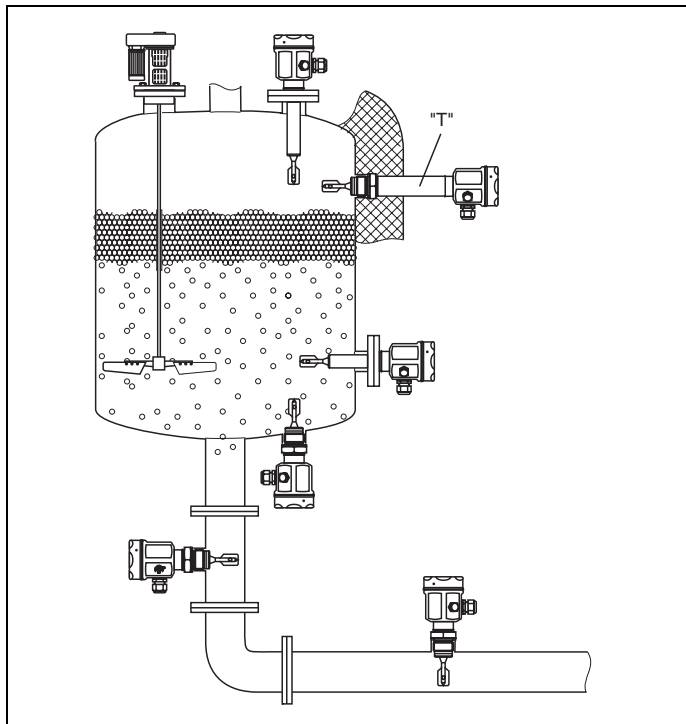
KE2	10K 50A, RF,	316 L
KE5	10K 50A,	Alloy C4 >316 L

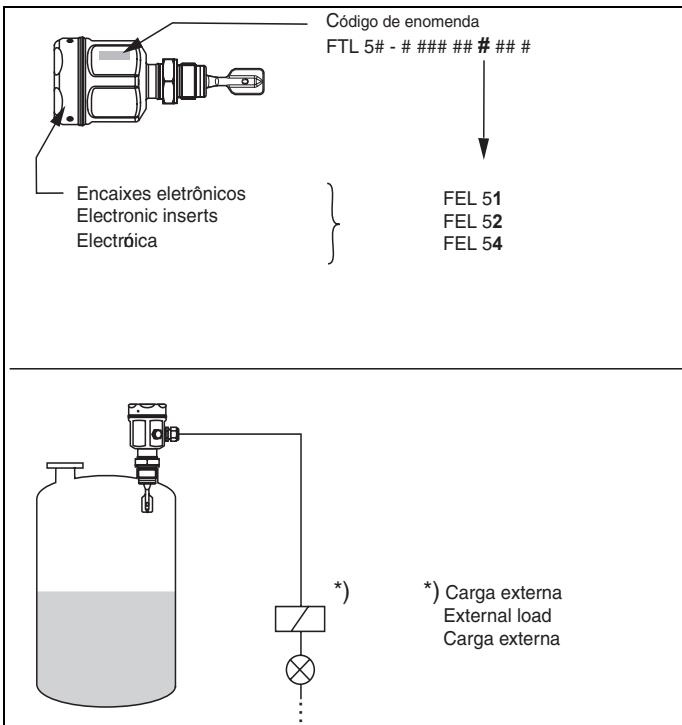
pt Detecção de nível de líquidos

Sistema de medição

e **Application**
Level limit detection in liquids

es **Aplicación**
Detección de nivel en líquidos





pt para conexão direta

Sistema de medição

e **Measuring system**
for direct connection

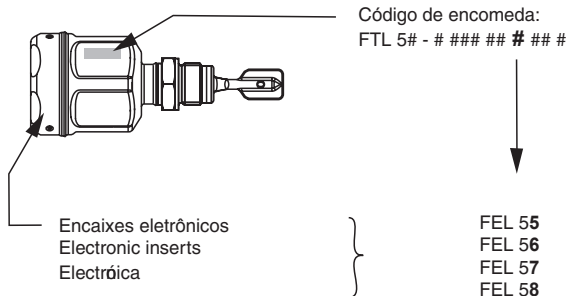
es **Sistema de medida**
para conexión directa

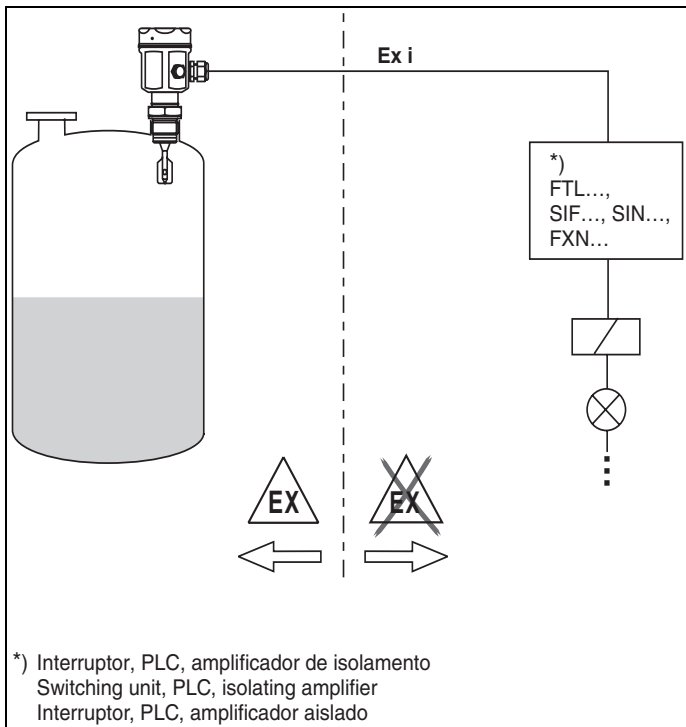
pt para conexão da chaves

Sistema de medição

e **Measuring system**
for connection via
switching unit

es **Sistema de medida**
para conexión vía interruptores



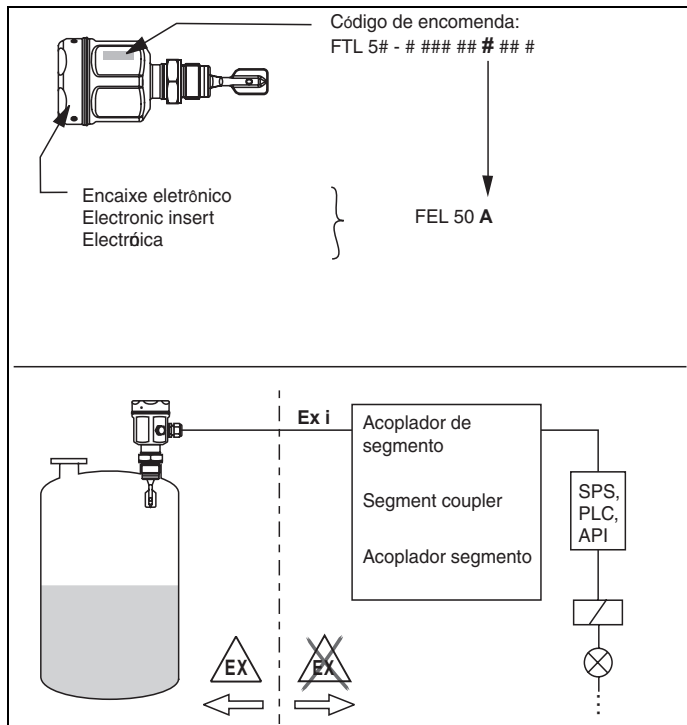


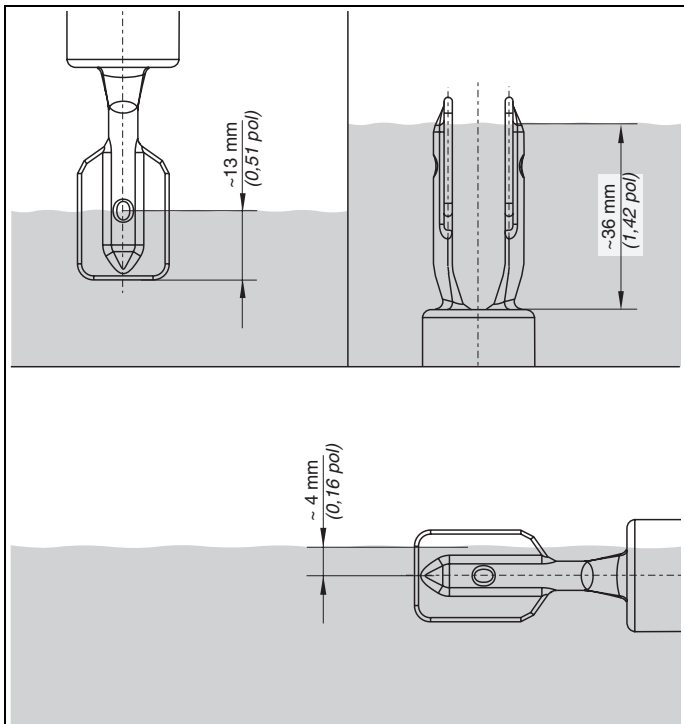
pt para conexão ao
PROFIBUS PA

Instalação

e **Measuring system**
for connection to
PROFIBUS PA

es **Sistema de medida**
para conexão a
PROFIBUS PA





pt Exemplos de montagem em

e Installation

es Montaje

Ponto de comutação depende da posição de montagem

Switchpoint depends on mounting position

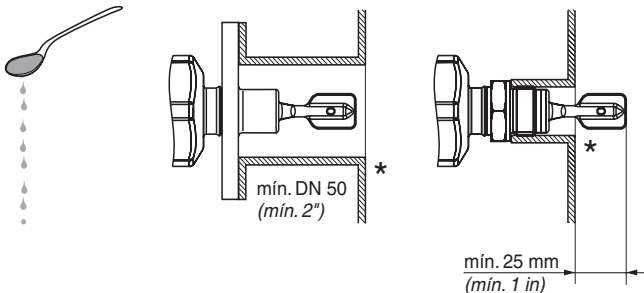
Punto de conmutación dependiendo de la posición de montaje

pt razão da viscosidade ν do líquido

e Mounting examples
as a function of liquid
viscosity ν

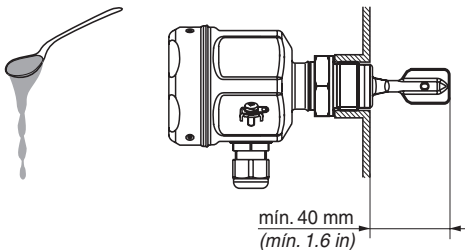
es Ejemplos de montaje
dependiendo de la
viscosidad ν del líquido

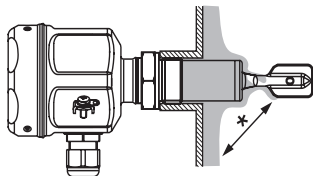
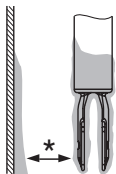
$= 0 \dots 2000 \text{ mm}^2/\text{s}$
($= 0 \dots 2000 \text{ cSt}$)



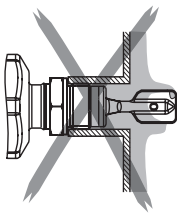
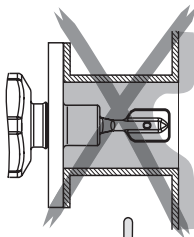
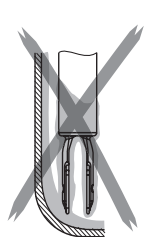
* rebarba / deburr / libre

$= 0 \dots 10000 \text{ mm}^2/\text{s}$
($= 0 \dots 10000 \text{ cSt}$)





* Distância! / Distance! / ¡Distancia!

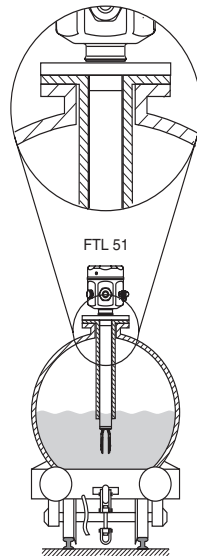


pt Considerar aderência do produto, às quais o garfo não pode entrar em contato.

e Consider build-up.
Fork may not contact the build-up.

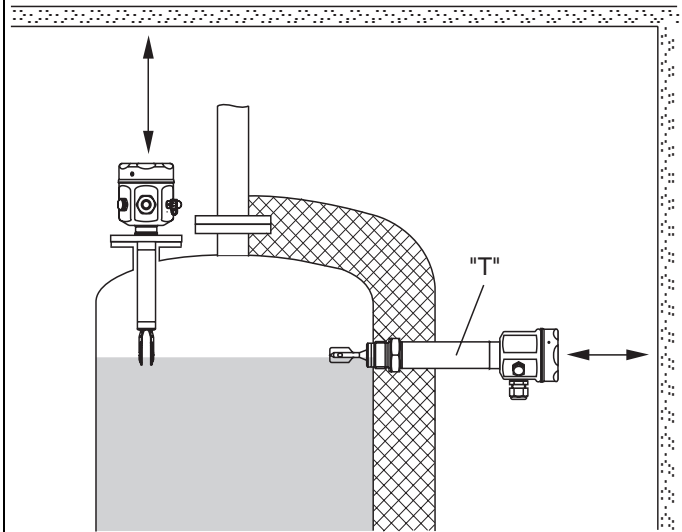
es Tener en cuenta las adherencias. Las horquillas no deben estar en contacto con las adherencias.

- pt** Em caso de altas cargas dinâmicas, o aparelho deve estar apoiado
- e** In cases of dynamic forces support
- es** En caso de cargas dinámicas altas debe ser apoyado



"T" = com dissipador de temperatura para tanques isolados
 "T" = with temperature spacer for insulated tanks
 "T" = con tramo dissipador de temperatura para tanques aislados

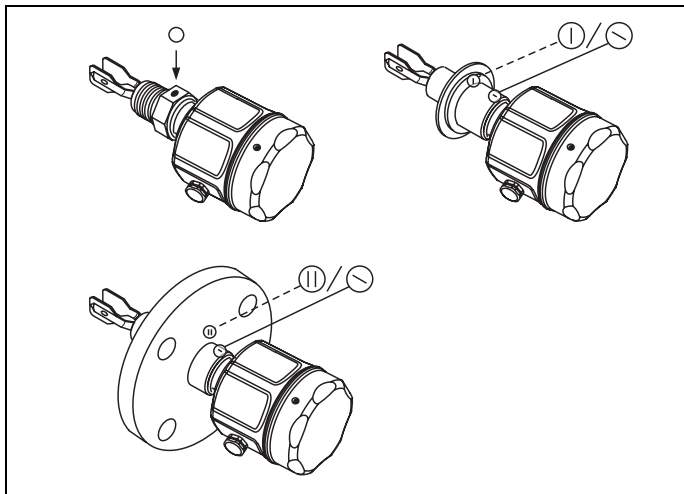
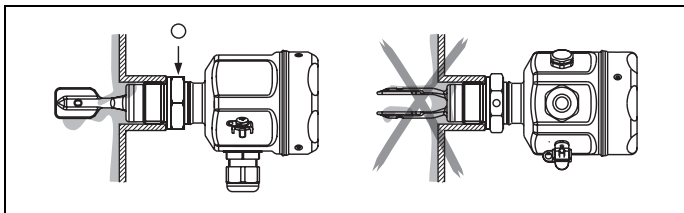
- pt** Dar folga
- e** Allow clearance
- es** Prever espacio



pt Orientação do garfo vibratório:
Marcas acima ou abaixo

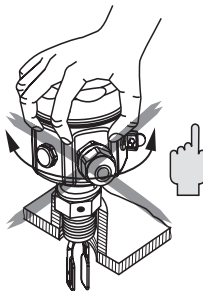
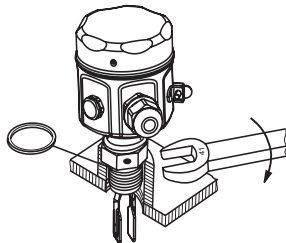
e Orientation of fork tines:
Marking above or below

es Orientación de la horquilla:
Marca arriba o abajo



G ¾ A, SW 32 mm (1¼")

G 1 A, SW 41 mm (1⅝")



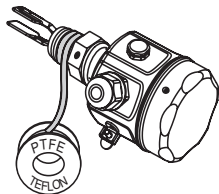
pt Aparafusar o Liquiphant à conexão de processo
Não gire o alojamento.

e Screw Liquiphant into process connection.
Don't use housing to turn.

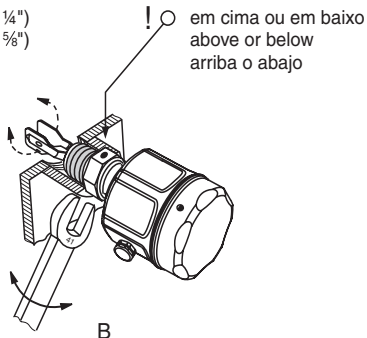
es Roscar el Liquiphant a la conexión a proceso.
No girar el cabezal.

¾ NPT, R ¾, G ¾ A, SW 32 mm (1¼")

1 NPT, R 1, G 1 A, SW 41 mm (1⅝")

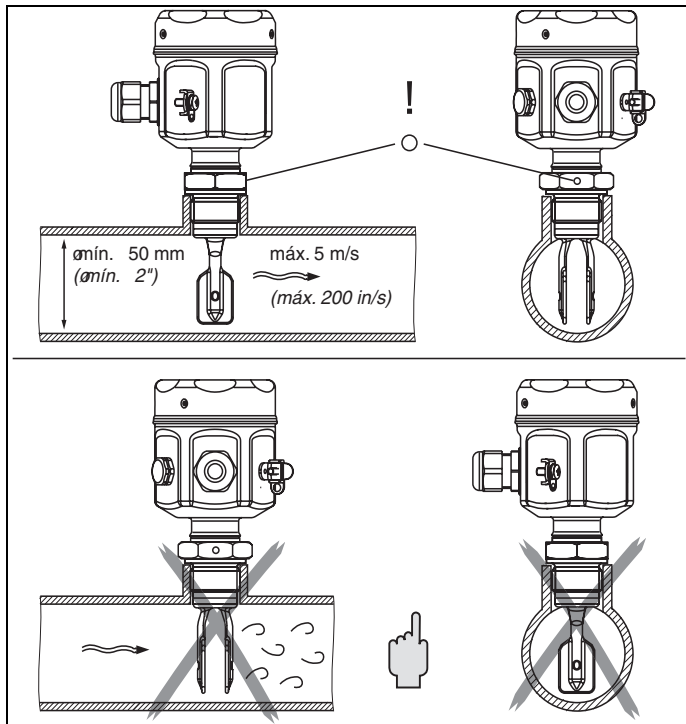


A



B

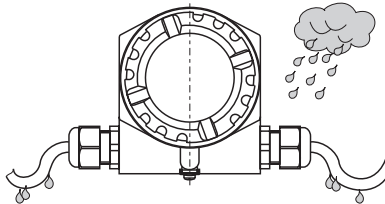
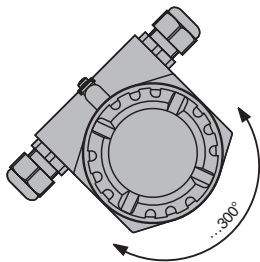
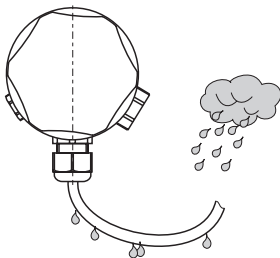
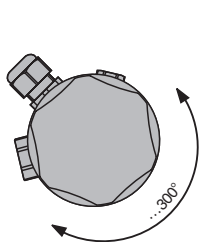
- pt** Orientação no interior da tubulação: Marcas direccionadas junto ao fluxo
- e** Orientation in pipes:
Marking in direction of flow
- es** Montaje y orientación dentro de tuberías:
Marca en dirección del caudal



pt Ajuste do prensa cabo

e Cable gland orientation

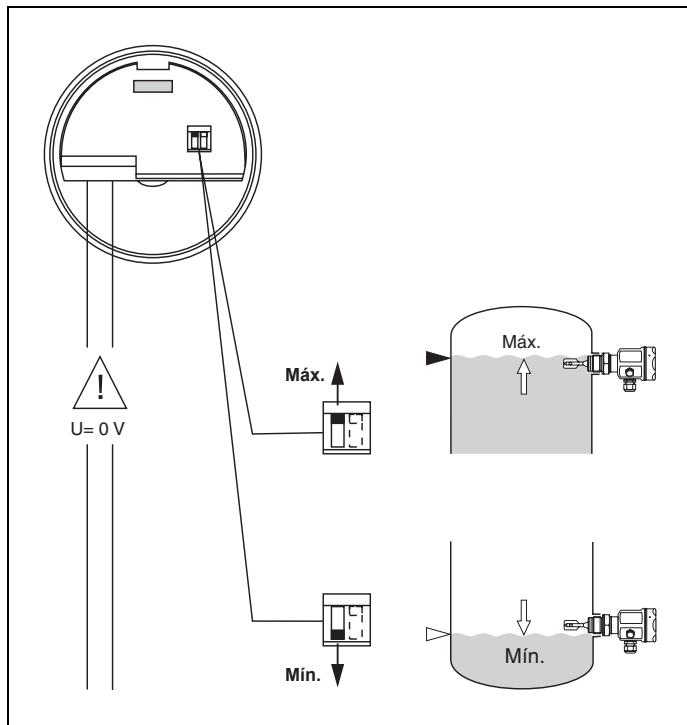
e Ajuste del prensaestopa

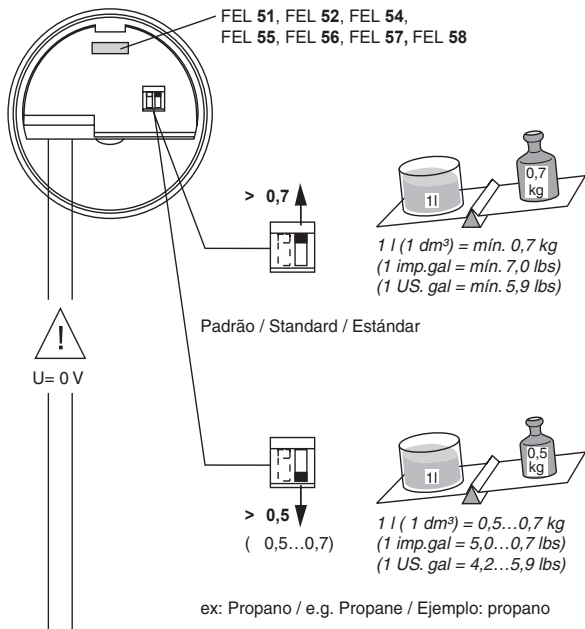


Módulo de segurança máximo /
mínimo

Minimum/maximum
fail-safe mode

Conmutador de seguridad
mín./máx.



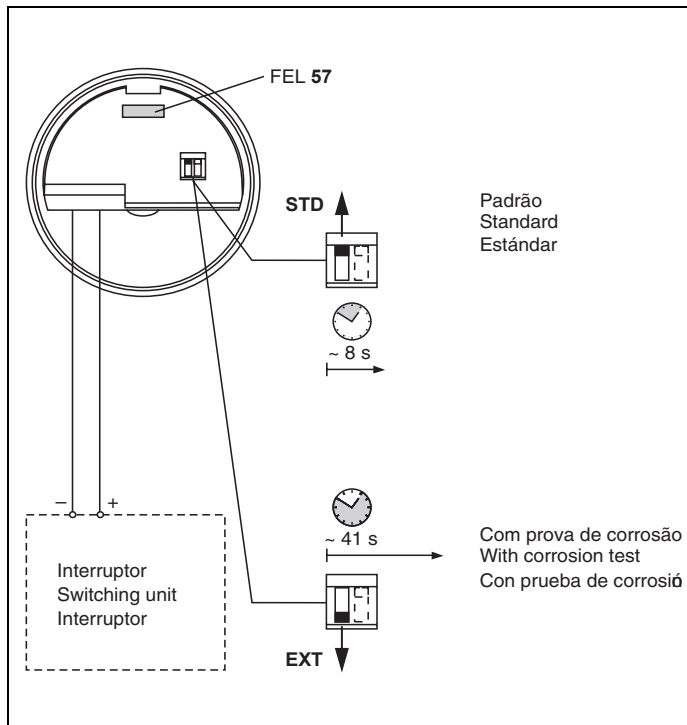


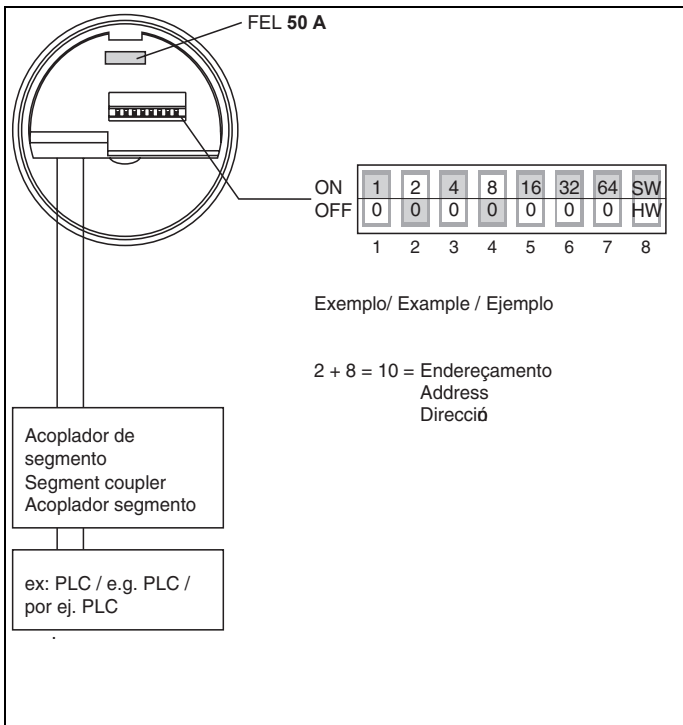
- pt** Densidade do líquido.
Densidade ρ medida em g/cm³ ou kg/l
- e** Liquid density.
Density ρ measured in g/cm³ or in kg/l.
- es** Densidad de líquidos.
Densidad ρ medida en g/cm³ o en kg/l.

pt Teste de funcionamento
Fase de teste ao acionar (ver
pág. 46,47 e interruptor para
segurança)

e Functional test
Test phase on switch-on
(see page 46, 47 and
switching unit for sequence)

es Prueba de funcionamiento
Prueba de conexión
(ver pág. 46, 47 e interruptor
para secuencia)

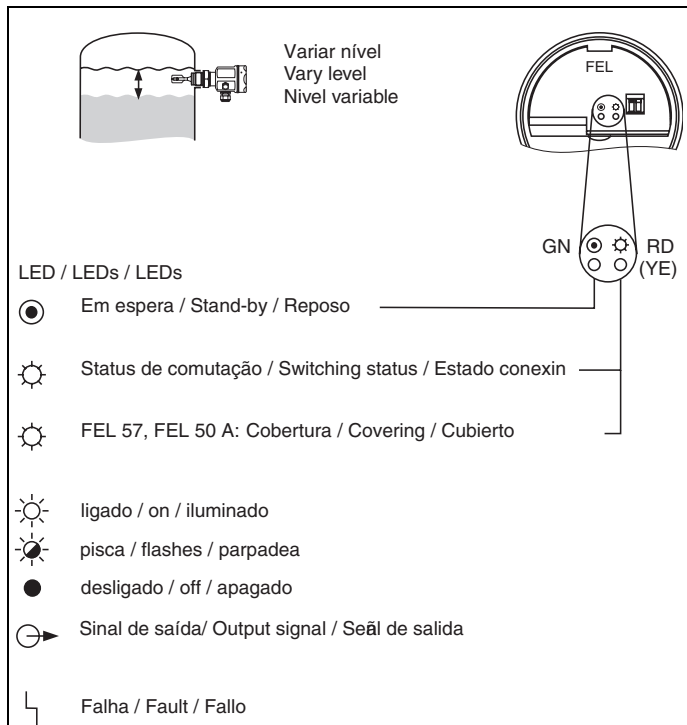




pt Ajuste do endereçamento do aparelho
 (para ajuste de parâmetros, ver BA 141F)

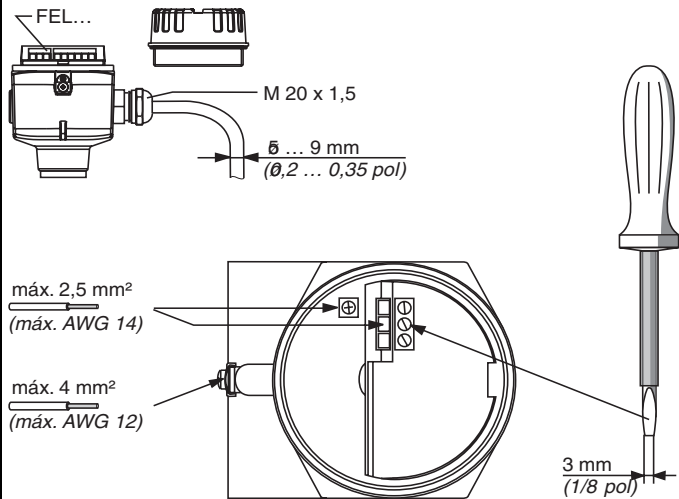
e Setting Device Address
 (Setting the parameters, see BA 141F)

es Configuración de la dirección del equipo
 (Ver configuración parámetros en BA 141F)





Atenção aos regulamentos nacionais!!
Note national regulations!
Considere reglamentaciones nacionales

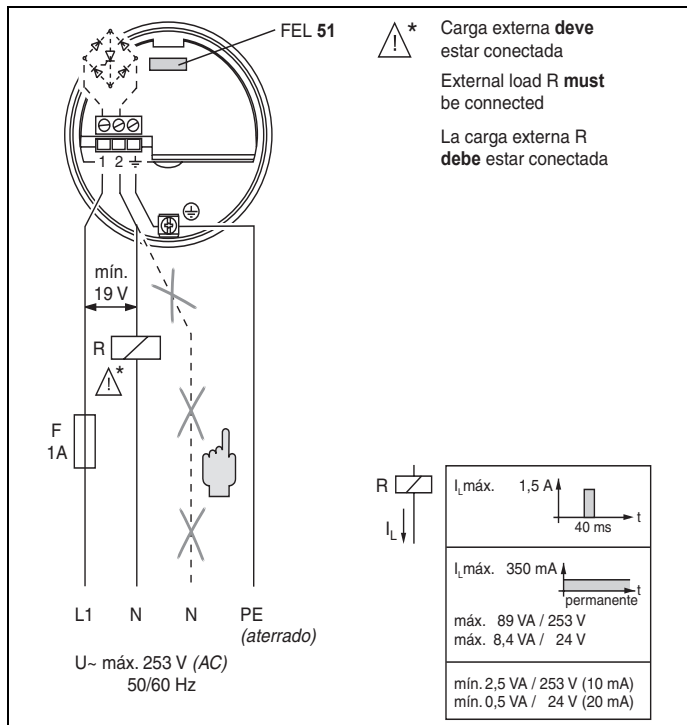


pt Conexões
e Connections
es Conexiones

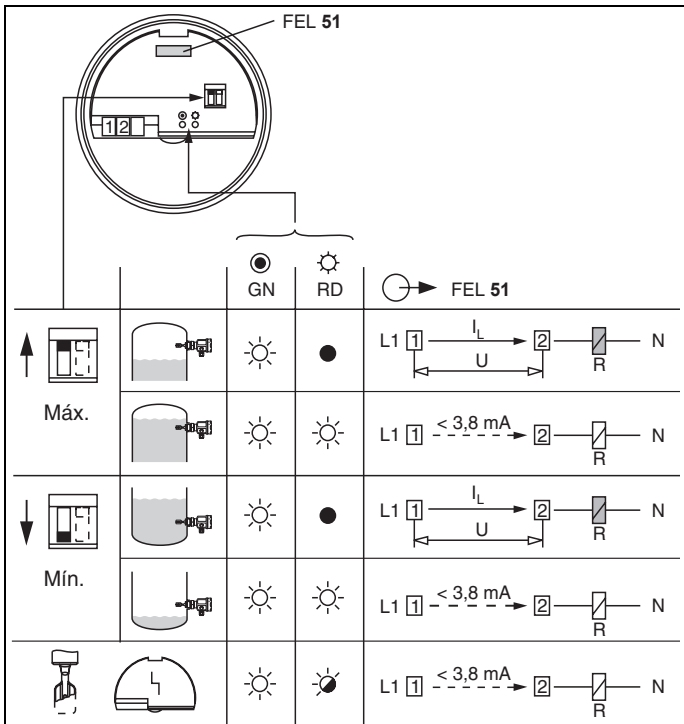
pt Conexões FEL 51
Conexão AC de dois fios

e Connections FEL 51
Two-wire AC connection

es Conexiones FEL 51
Conexión a corriente alterna a dos hilos



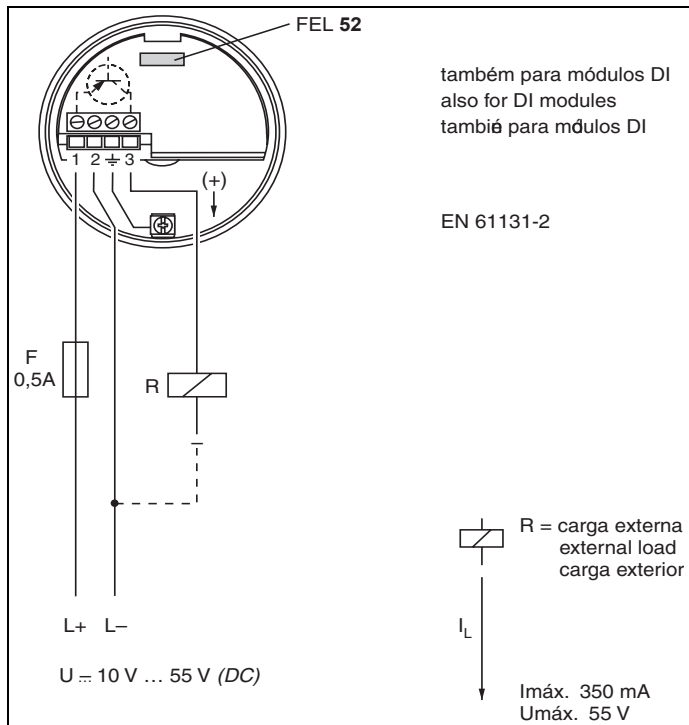
!! Destruição
Destruction
Destrucción

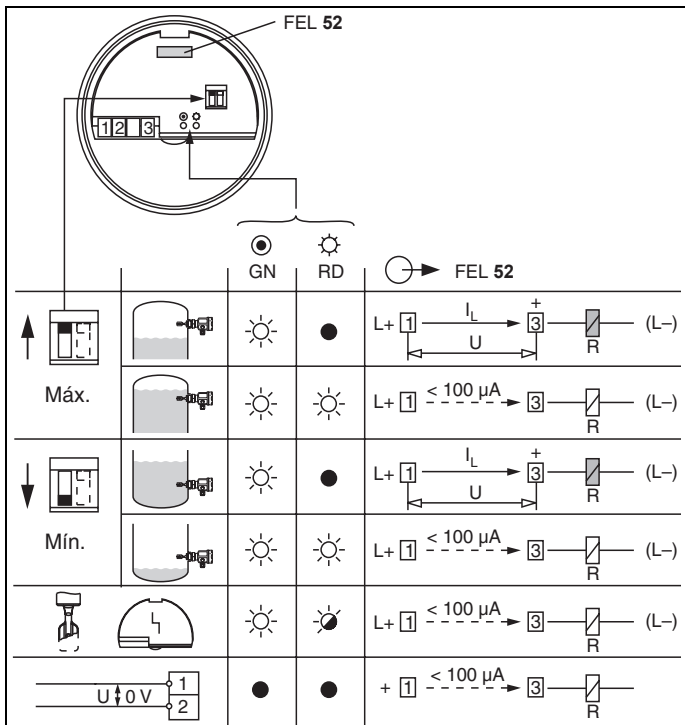


- pt** Funcionamento FEL 51
- e** Function FEL 51
- es** Funcionamiento FEL 51

$\Delta U_{\text{FEL 51}}$ máx. 12 V

- pt** Conexões FEL 52
Conexão DC (PNP)
- e** Connections FEL 52
DC connection (PNP)
- es** Conexiones FEL 52
Alimentación CC (PNP)





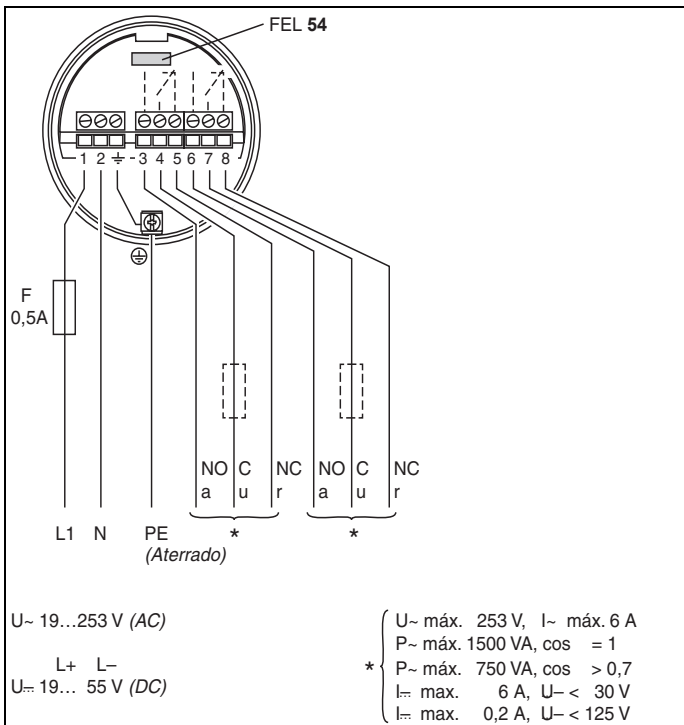
- pt** Teste de funcionamento FEL52
- e** Function FEL 52
- es** Funcionamiento FEL 52

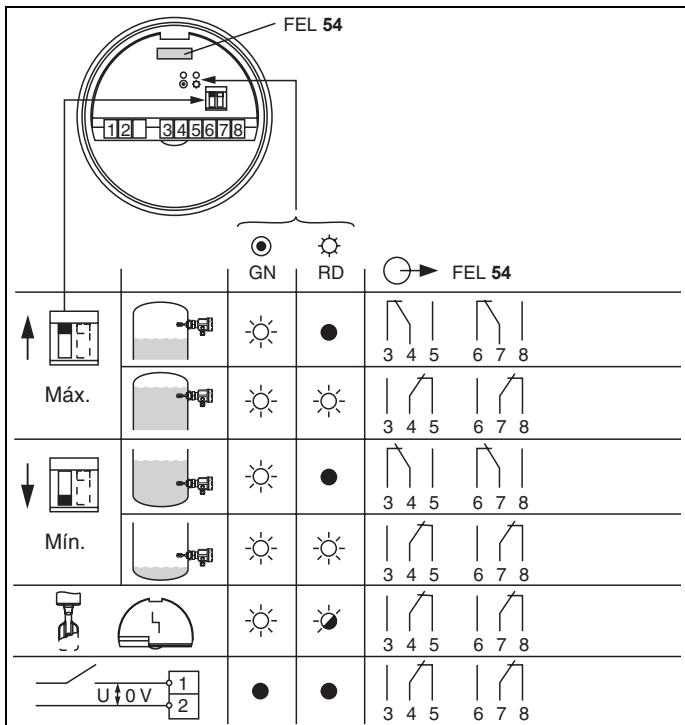
$\Delta U_{FEL 52}$ máx. 3 V

pt Conexões FEL 54
 Conexão universal
 Saída por relé

e Connections FEL 54
 Universal connection
 Relay output

es Conexiones FEL 54
 Conexión universal
 Salida por relé



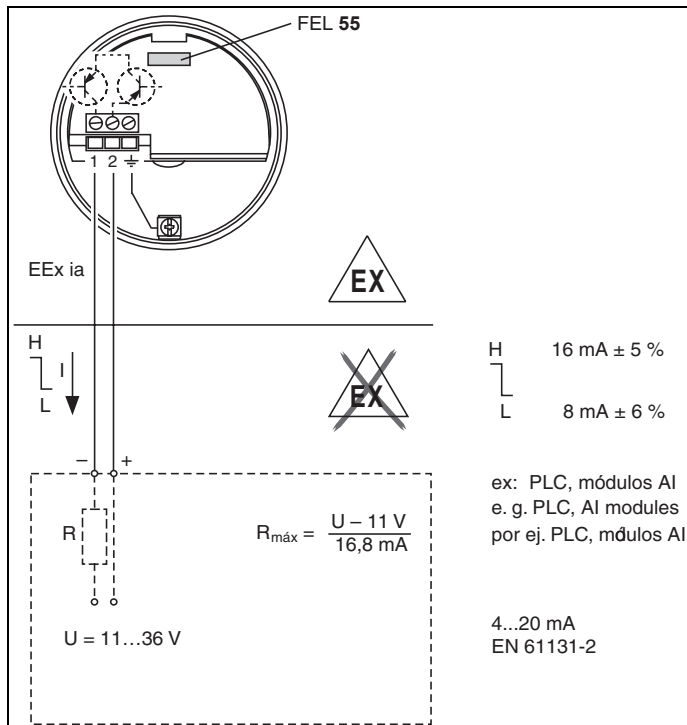


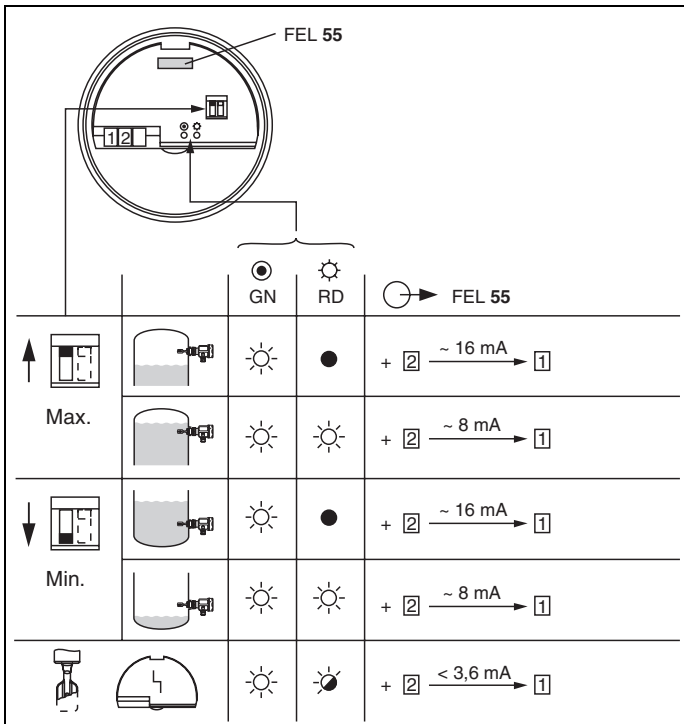
pt Funcionamento FEL54

e Function FEL 54

es Funcionamiento FEL 54

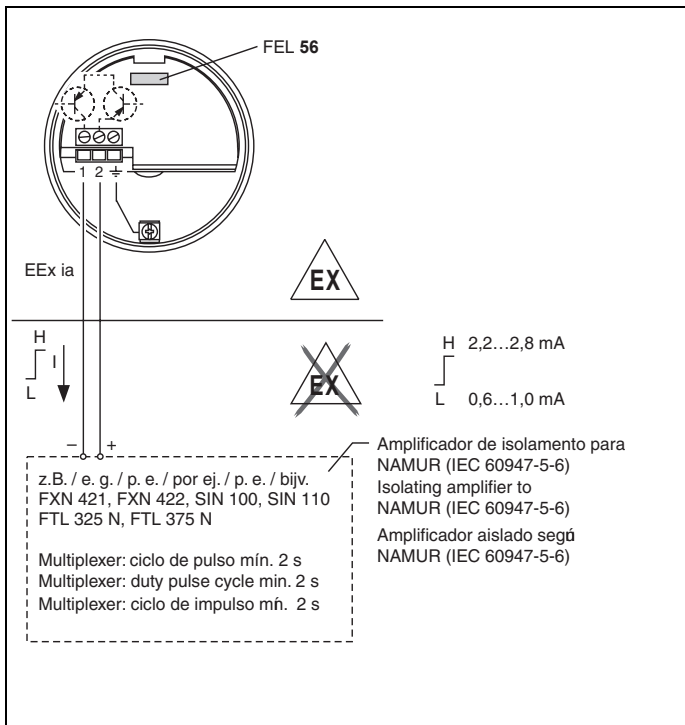
- pt** Conexões FEL 55
Saída
16/8 mA
- e** Connections FEL 55
Output
16/8 mA
- es** Conexiones FEL 55
Salida
16/8 mA

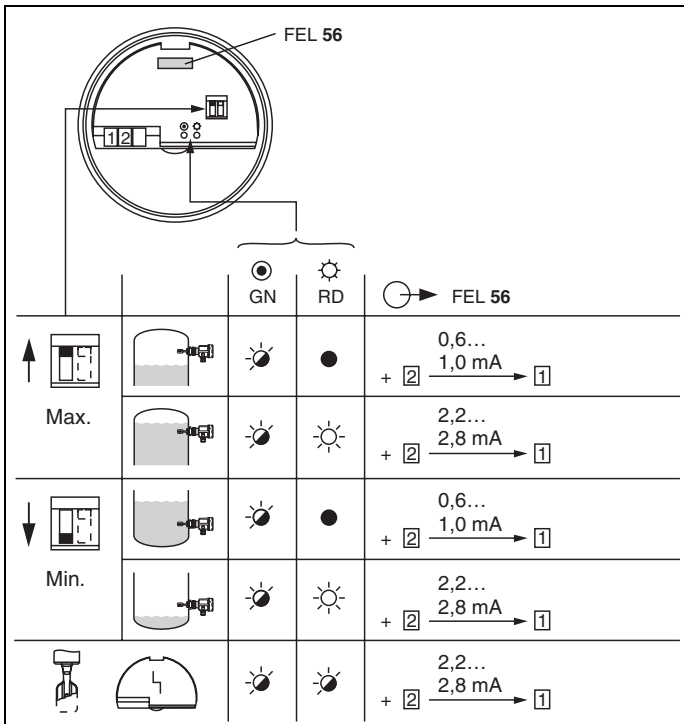




- pt** Funcionamento FEL55
- e** Function FEL 55
- es** Funcionamiento FEL 55

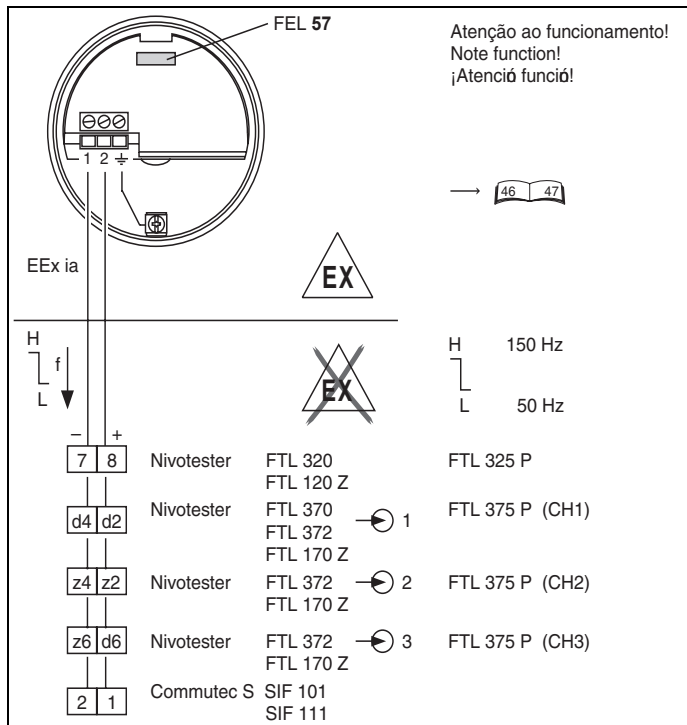
- pt** Conexões FEL 56
Saída NAMUR L-H
<1,0 mA / >2,2 mA
- e** Connections FEL 56
NAMUR output L-H
<1,0 mA / >2,2 mA
- es** Conexiones FEL 56
Salida NAMUR L-H
<1,0 mA / >2,2 mA

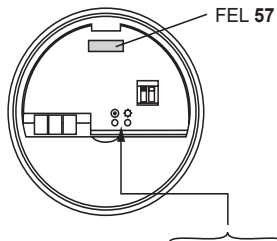




- pt** Funcionamento FEL56
- e** Function FEL 56
- es** Funcionamiento FEL 56

- pt** Conexões FEL 57
Saída PFM
150 Hz / 50 Hz
- e** Connections FEL 57
PFM output
150 Hz / 50 Hz
- es** Conexiones FEL 57
Salida PFM
150 Hz / 50 Hz





		● GN	☀ YE	⊖ → FEL 57
			●	
	●	●		

* Comportamento da chave ao acionar / Switch-on behaviour /
Comportamiento del cambio de estado



pt Funcionamento FEL57

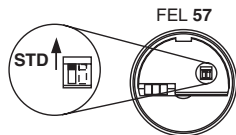
e Function FEL 57

es Funcionamiento FEL 57

pt Funcionamento FEL 57
Comportamento de mudança
de estado STD
(Testphase*)

e Function FEL 57
Switch-on behaviour STD
(Test phase*)

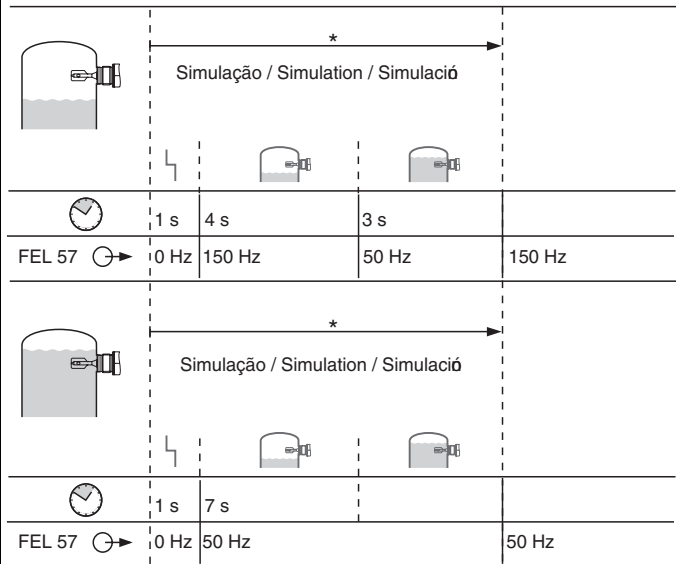
es Funcionamiento FEL 57
Comportamiento del cambio de
estado STD (Fase de prueba*)



Corrente de alimentação / Supply current / Corrente di alimentazione

0 mA

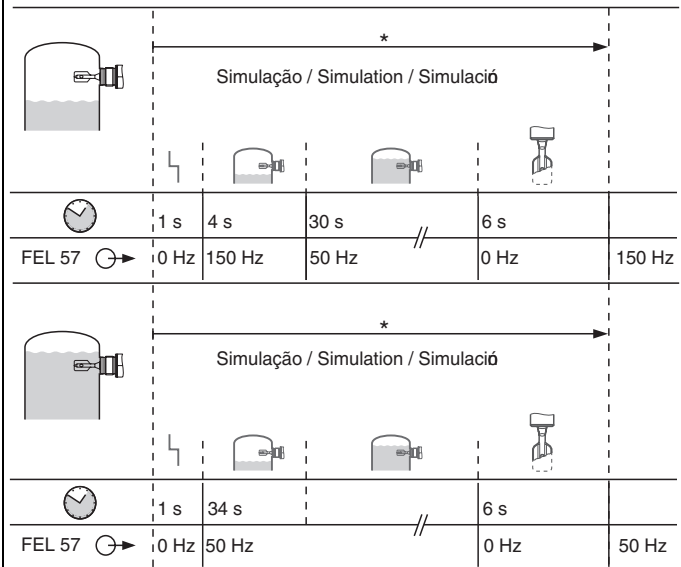
Lig. / On / On



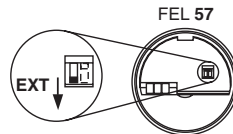
Corrente de alimentação / Supply current / Corrente di alimentazione

0 mA

Lig. / On / On



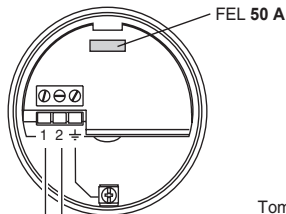
- pt** Função FEL 57
Comportamento de mudança de estado EXT (Testphase*)
- e** Function FEL 57
Switch-on behaviour EXT (Test phase*)
- es** Funcionamiento FEL 57
Comportamiento del cambio de estado EXT (Fase de prueba*)



pt Conexões FEL 50 A

e Connections FEL 50 A

es Conexiones FEL 50 A

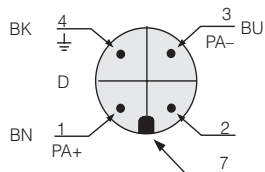


Tomada M12 / M12 Plug / M12 Conector

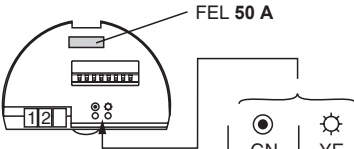
PA- PA+
U... 9 V...32 V (DC)

Acoplador de
segmento
Segment coupler
Acoplador segmento

ex: PLC / e.g. PLC /
por ej. PLC

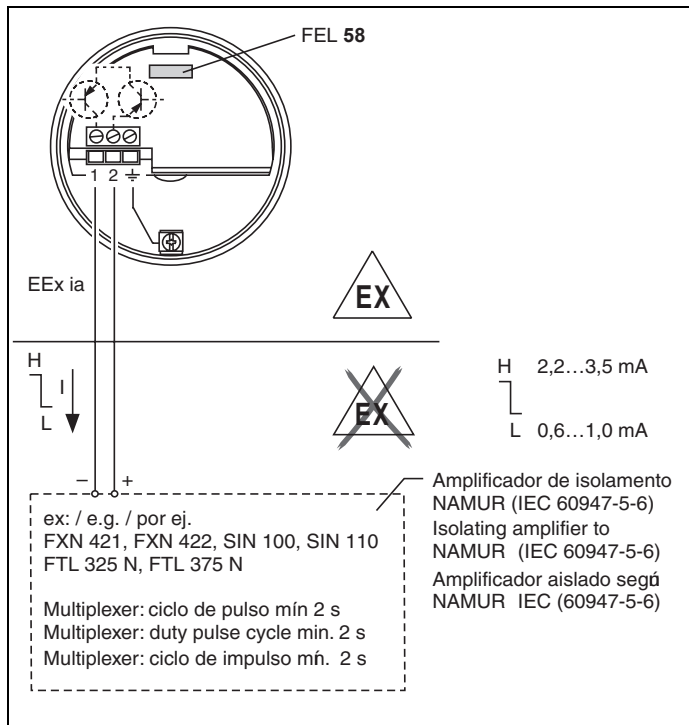


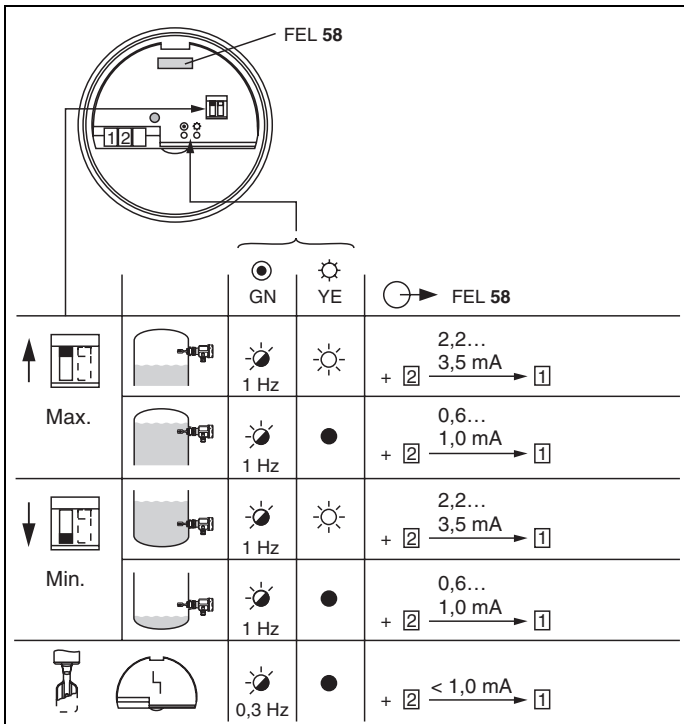
Tomada de conexão do equipamento
ao cabeçal (macho)
Device plug on housing (male)
Conector del equipo en cabezal (macho)

				 FEL 50 A PA - Sinal de Rede / PA Bus Signal / Seal Bus PA
não invertido not inverted no invertido				OUT_D = 0
				OUT_D = 1
invertido inverted invertido				OUT_D = 0
				OUT_D = 1
 ↔ SPS Commuwin II			–	Comunicação / Communication / Comunicación
 		–		Status ver BA 141F Status, see BA 141F Estado, ver BA 141F
 				../..

- pt** Funcionamento FEL 50 A
- e** Function FEL 50 A
- es** Funcionamiento FEL 50 A

- pt** Conexões FEL 58
Saída NAMUR H-L
>2,2 mA / <1,0 mA
- e** Connections FEL 58
NAMUR output H-L
>2,2 mA / <1,0 mA
- es** Conexiones FEL 58
Salida NAMUR H-L
>2,2 mA / <1,0 mA



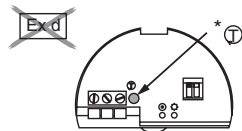


- pt** Funcionamento FEL 58
- e** Function 58
- es** Funcionamiento FEL 58

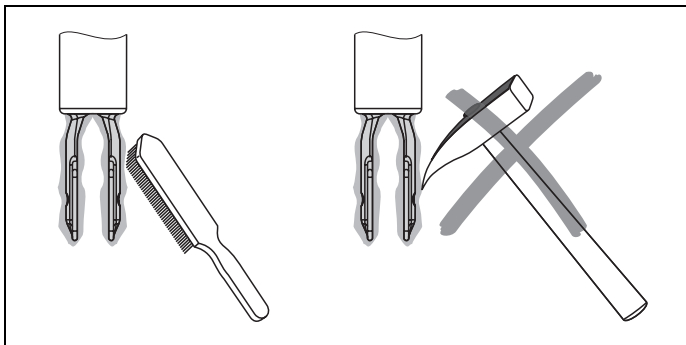
pt Funcionamento FEL 58
Botão de teste*

e Function FEL 58
Test button*

es Funcionamiento FEL 58
Botón de prueba*



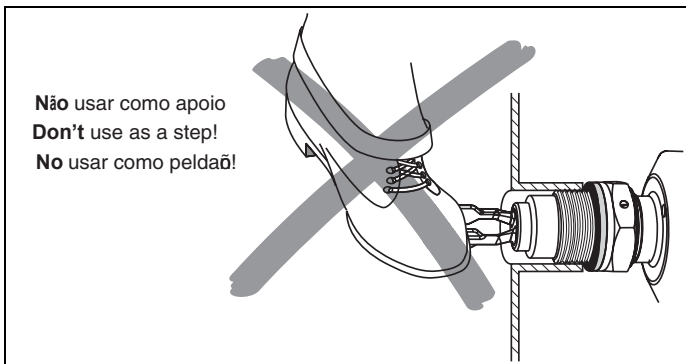
Operação normal Normal operation Funcionamiento normal		Botão de teste Test button Botón de prueba		Operação Operation Funcionamiento	
Máx. Mín		 GN YE 1 2 3	 ① min. 3 s	 ②	~ 2 s depois ~ 2 s later ~ 2 s mástarde
↑ Máx.		GN 1 Hz YE 	GN 	YE 	GN 1 Hz YE
↓ Mín.		2,2... 3,5 mA +2 → 1	0 mA +2 ---→ 1	2,2... 3,5 mA +2 → 1	
↑ Máx.		GN 1 Hz YE 	GN 	YE 	GN 1 Hz YE
↓ Mín.		0,6... 1,0 mA +2 → 1	0 mA +2 ---→ 1	0,6... 1,0 mA +2 → 1	



pt **Manutenção**
Remoção de encrustações

e **Maintenance**
Removal of thick encrustation

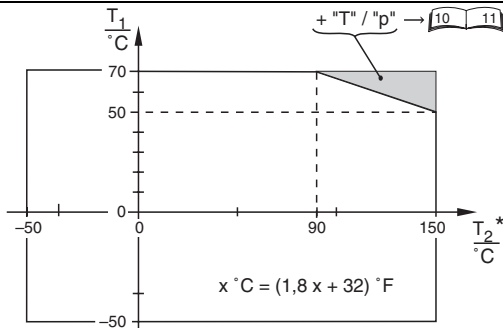
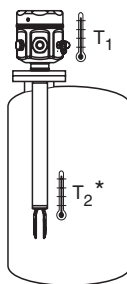
es **Mantenimiento**
Eliminación de adherencias



pt Dados técnicos
 Temperatura ambiente T1
 Temperatura de processo T2

e Technical Data
 Ambient temperature T1
 Process temperature T2

es Datos técnicos
 Temperatura ambiente T1
 Temperatura de servicio T2



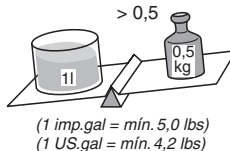
Pressão de processo
 Process pressure
 Presiô de ser vicio

p_e
 T_2^*

Conexão de processo / acessórios
 Process connection / accessories
 Conexiô a proceso / accesor ios

$p_e = \text{máx. 64 bar (930 psi)}^*$

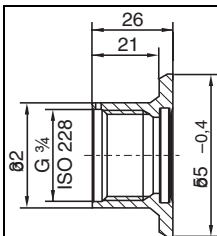
Densidade
 Density
 Densidad



Viscosidade
 Viscosity
 Viscosidad



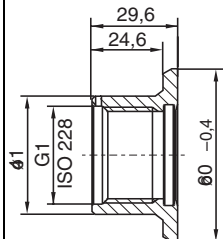
máx. 10000 mm²/s
 (máx. 10000 cSt)



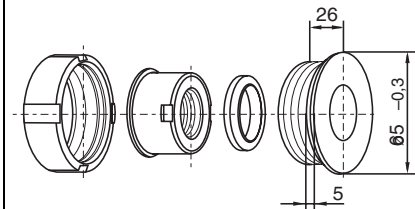
G
E+H 52001052

máx. 25 bar / 150 °C
(máx. 360 psi / 300 °F)

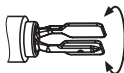
máx. 40 bar / 100 °C
(máx. 580 psi / 210 °F)



G 1
E+H 52001051



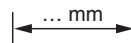
G 1
E+H 52001221



pt Acessórios

e Accessories

es Accesorios



100 mm = 3,94 pol.

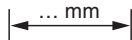
Soquetes soldados
Weld-in sockets
Manguito soldable

1,4435 (AISI 316 L)

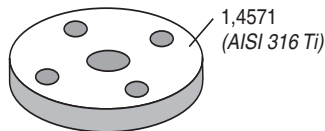
pt Flanges com ressalto com
rosca BSP 1 (G1)
Tampa transparente

e Lap joint flanges with
BSP 1 (G1) thread;
Covers with window

es Bridas con resalte y rosca
BSP 1 (G1);
Cubierta con ventana

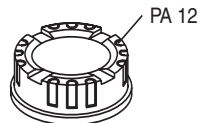


100 mm = 3,94 pol.

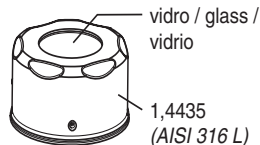


DN 50, PN 40, DIN 2527 B
E+H 918143-0000

2", 150 psi, RF, ANSI B 16.5
E+H 918144-0000

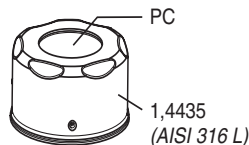


para alojamento PBT /
for PBT housing /
para caja PBT
E+H 943461-0001



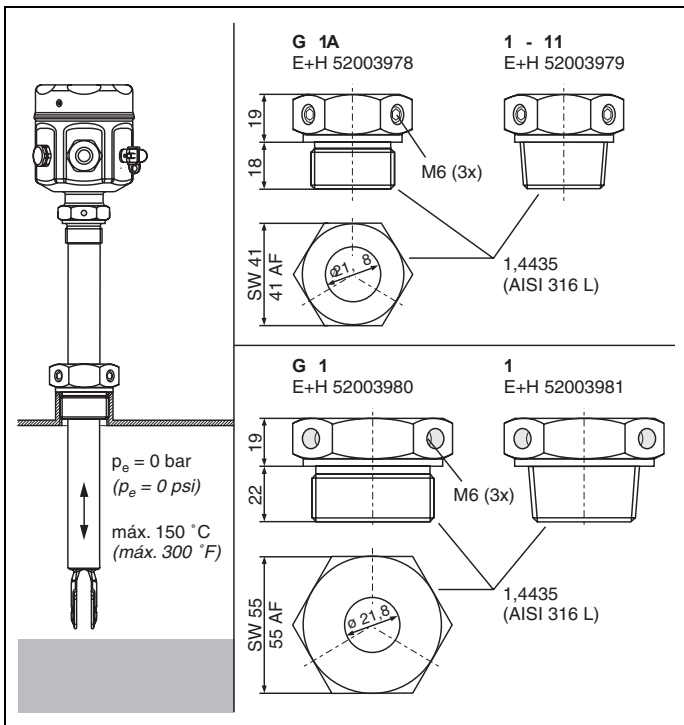
para alojamento de aço /
for steel housing /
para caja de acero

E+H 943301-1000



para alojamento de aço /
for steel housing /
para caja de acero

E+H 52001403



pt Bucim para baixa pressão

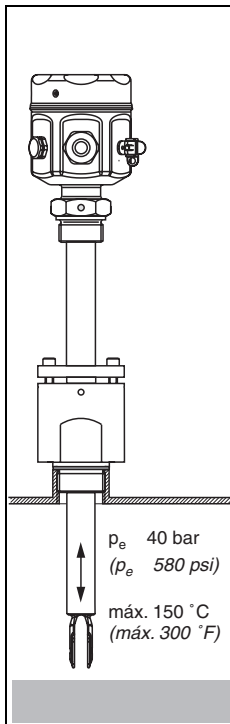
e Sliding sleeves
for unpressurised operation

es Manguitos deslizantes
para operación sin presión

... mm

100 mm = 3,94 pol.

- pt** Bucim para alta pressão
- e** High pressure sliding sleeves
- es** Manguitos deslizantes para alta presión



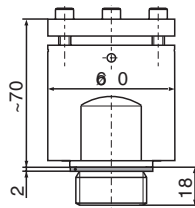
G 1A

1,4435 (AISI 316 L)

E+H 52003663

Alloy C4

E+H 52003664



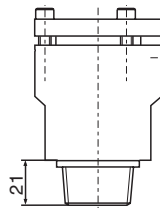
1 - 11

1,4435 (AISI 316 L)

E+H 52003667

Alloy C4

E+H 52003668



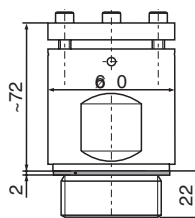
G 1

1,4435 (AISI 316 L)

E+H 52003665

Alloy C4

E+H 52003666



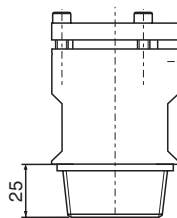
1

1,4435 (AISI 316 L)

E+H 52003669

Alloy C4

E+H 52003670



Falha	Causa	Solução
Não liga / não aciona	Não há energia	Verificar fornecimento de energia
	Linha de sinal defeituosa	Verificar linha de sinal
	Entrada elétrica defeituosa – FEL 51 conectado diretamente ao L1 e N	Substituir - sempre conecte o FEL 51 via uma carga externa
	Densidade do líquido muito baixa	Ajustar densidade para > 0,5 na entrada elétrica
	Garfo vibratório com aderências	Lavar garfo vibratório
	Garfo vibratório corroído (Indicador do FEL: sinal piscando vermelho/amarelo, no FEL 58: sinal de luz verde a 0,3 Hz)	Trocar garfo vibratório e conexão de processo
	FEL 51: Resistência interna do relé muito alta	Conectar um relé adequado
	FEL 51: O relé retem muito pouca corrente	Resistência conectada paralelamente a um relé
	FEL 54: Contatos soldados juntos (após curto circuito)	Trocar FEL 54; conectar fusível à corrente
Liga / aciona incorretamente	Módulo a prova de falhas mínimo / máximo ajustado incorretamente	Ajustar módulo correto para entrada eletrônica
Liga / aciona incorretamente, mas esporadicamente	Espuma espessa, condições turbulentas, líquido espumoso	Montar Liquiphant dentro do bypass.
	RFI extremo	Usar cabo vedado
	Vibrações extremas	Desacoplar, umedecer, girar forquilha a 90°
	Água no alojamento	Aparafusar cobertura e cabo de vedação firmemente
	FEL 52: saída sobrecarregada	Reduzir carga e capacidade (cabo)
Liga / aciona incorretamente após falha de fornecimento	FEL 57, Comportamento durante teste funcional	Observar comportamento , bloquear controle da fábrica por aproximadamente 45 s.

Fault	Reason	Remedy
Does not switch	No power	Check power
	Faulty signal line	Check signal line
	Faulty electronic insert – FEL 51 connected directly to L1 and N	Exchange – always connect FEL 51 via external load
	Density of liquid too low	Set density to > 0.5 at electronic insert
	Fork encrusted	Clean fork
	Fork corroded (Indication on FEL: red/yellow flashes, FEL 58: green flashes 0.3 Hz)	Exchange fork and process connection
	FEL 51: Internal resistance of connected relay too large	Connect suitable relay
	FEL 51: Holding current of connected relay too low	Connected resistor in parallel with relay
	FEL 54: Contacts welded together (after short-circuit)	Exchange FEL 54; put fuse in contact circuit
Switches incorrectly	Min-/Max-fail-safe mode set wrongly	Set correct mode at electronic insert
Sporadic faulty switching	Thick heavy foam, very turbulent conditions, foaming liquid	Mount Liquiphant in bypass
	Extreme RFI	Use screened cable
	Extreme vibration	Decouple, damp, turn fork 90°
	Water in housing	Screw cover and cable gland tight
	FEL 52: Output overloaded	Reduce load, (cable) capacitance
Switches incorrectly after power failure	FEL 57, Behaviour during switch-on test (functional test)	Observe switching behaviour of FEL 57; After power failure block plant control for up to 45 s

Défaut	Cause	Mesure
Ne commute pas	Tension d'alimentation manquante	Vérifier la tension d'alimentation
	Câble de signal défectueux	Vérifier le câble de signal
	Electronique défectueuse – FEL 51 relié directement à L1 et N	Remplacer – Relier FEL 51 toujours via la charge externe
	Densité du liquide trop faible	Régler la densité sur > 0,5 sur l'électronique
	Lames vibrantes encroûtées	Nettoyer les lames vibrantes
	Lames vibrantes corrodées (Sur FEL: rouge/ jaune clignote, FEL 58: vert clignote 0,3 Hz)	Remplacer les lames vibrantes ainsi que le raccord process
	FEL 51: relais avec résistance interne trop élevée	Raccorder un relais approprié
	FEL 51: relais avec courant de maintien trop faible	Raccorder une résistance en parallèle au relais
Mauvaise commutation	FEL 54: contacts soudés (après un court-circuit)	Remplacer FEL 54; fusible dans le circuit courant
	Sécurité min / max inversée	Régler correctement le circuit de sécurité sur l'électronique
Mauvaise commutation, sporadique	Mousse dense et lourde, fortes turbulences, liquide émulsionné	Monter le Liquiphant en bypass
	Parasites puissants	Blinder le câble de liaison
	Vibrations importantes	Découpler, amortir, tourner la fourche de 90°
	Eau dans le boîtier	Visser fermement le couvercle et les entrées de câble
Mauvaise commutation après coupure	FEL 52: surcharge de la sortie	Réduire la charge et la capacité (de ligne)
	FEL 57, comportement lors du test de mise sous tension (test cyclique)	Observer le comportement du FEL 57 à la mise sous tension; bloquer la commande de l'installation après coupure de courant pendant max. 45 s

pt Anexo à solução de problemas

Se o procedimento de comutação do garfo vibratório for anormal, a frequência do garfo pode ser medida em PIN 4 no soquete de diagnose.

Com as eentradas eletrônicas FEL 51, 52, 54, 55, 56, 57, 58 essa é uma vibração sinusoidal à qual amplitude possibilita determinar as condições da forquilha.

Com o FEL 50 A, só é possível a medição da frequência da forquilha devido a um sinal de pulsação retangular.

e Trouble-shooting Supplement

If the switching behaviour of the fork is abnormal, the fork frequency can be measured at PIN 4 of the diagnosis socket.

With electronic inserts FEL 51, 52, 54, 55, 56, 57, 58 this is a sinusoidal vibration whose amplitude makes it possible to determine the condition of the fork.

With FEL 50 A, only the fork frequency measurement is possible due to a rectangular pulse signal.

es Suplemento para la identificación de fallos

Si el comportamiento de conmutación de la horquilla es anormal, puede medir la frecuencia de la misma en el PIN 4 del interruptor de diagnosis.

Con las electrónicas FEL 51, 52, 54, 55, 56, 57, 58 se consigue una vibración sinusoidal cuya amplitud hace posible determinar la condición de la horquilla.

Con FEL 50 A, sólo es posible medir la frecuencia de la horquilla debido a una señal de impulsos rectangular.



FEL 51	E+H 52002304
FEL 52	E+H 52002305
FEL 54	E+H 52002306
FEL 55	E+H 52002307
FEL 56	E+H 52002308
FEL 57	E+H 52002309
FEL 58	E+H 52006454
FEL 50 A	E+H 52010527

Normas de instalação: Durante a instalação, leve em conta que os elementos elétricos (entradas elétricas) que são alimentadas por circuitos não intrinsecamente seguros **não** podem estar interconectados a circuitos intrinsecamente seguros.

Installation specification: During installation, please keep in mind that electrical resources (electronic inserts) which are powered by non-intrinsically-safe circuits may **no** longer be interconnected with intrinsically-safe circuits.

Normas de instalación: Durante la instalación, tenga en cuenta que los elementos eléctricos (eléctricas) alimentadas por circuitos no intrínsecamente seguros, **no** podrán estar interconectadas con circuitos intrínsecamente seguros.

pt Peças sobressalentes
Entradas eletrônicas

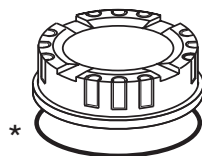
e Spare parts
Electronic inserts

es Repuestos
Electrónicas

pt Proteções para alojamentos,
juntas

e Housing covers,
seals

es Cubiertas del cabezal,
juntas



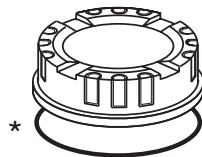
Alu

EPDM

Alu
Alu (Ex d)

E+H 52002699

E+H 52002698

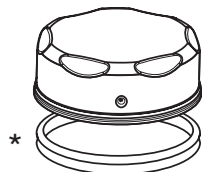


PBT-FR

E+H 943461-0000

EPDM

E+H 017717-0003



1.4301 / 1.4435
(*ISI 304 / 316 L*)

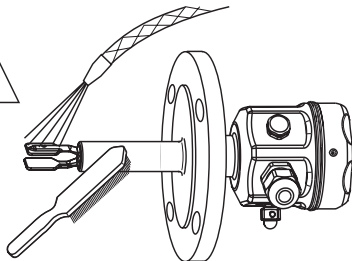
E+H 943301-0000

MVQ

E+H 943304-0000

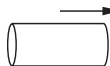
★ Lubrificar com graxa de silicone ou grafite
Lubricate with silicone grease or graphite
Lubricar con grasa de silicona o grafito

1.



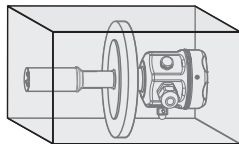
limpo
clean
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2.



Proteção para transporte
Transport protection
Protecció par a el
transporte

3.



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TI 328F Liquiphant FTL 50, 50 H, 51, 51 H

Instruções operacionais / Operating Instruction / Instrucciones de
funcionamiento

BA 141F FEL 50 A, PROFIBUS PA

Informações sobre segurança / Notes on Safety / Notas sobre seguridad

XA 031F	4 0 II 1/2 G,	EEx d	IIC/IIB
XA 063F	4 0 II 1/2 G,	EEx ia/ib	IIC/IIB
XA 064F	4 0 II 1 G,	EEx ia	IIC/IIB
XA 154F	4 0 II 1/2 G/D,	EEx ia/ib	IIC/IIB
XA 159F	4 0 II 1 G,	EEx ia	IIC/IIB

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