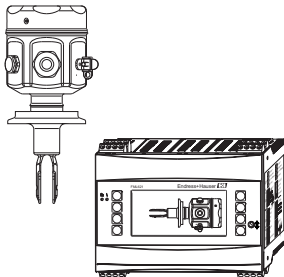


## Operating Instructions

### Liquiphant M Density FTL50H, FTL51H



**DE-** Dichte- & Konzentrationsmessung

**EN-** Density & Concentration measurement

**FR-** Mesure de densité & de concentration

**ES-** Medición de densidad y concentración

**IT-** Misura di densità e concentrazione

**NL-** Dichtheids- & concentratiemeting

## DE- Inhalt

|                                 |    |
|---------------------------------|----|
| Sicherheitshinweise             | 4  |
| Behandlung                      | 6  |
| Geräte-Identifikation           | 8  |
| Messeinrichtung                 | 14 |
| Einbau                          | 16 |
| Korrektur, Flussgeschwindigkeit | 21 |
| Schwinggabel ausrichten         | 28 |
| Anschluss                       | 31 |
| Lichtsignale                    | 33 |
| Wartung, Reinigung              | 34 |
| Technische Daten                | 35 |
| Zubehör                         | 37 |
| Fehlersuche                     | 42 |
| Ersatzteile                     | 49 |
| Reparatur                       | 51 |
| Ergänzende Dokumentation        | 52 |

## EN -Contents

|                                  |    |
|----------------------------------|----|
| Notes on Safety                  | 4  |
| Handling                         | 6  |
| Device Identification            | 8  |
| Measuring system                 | 14 |
| Installation                     | 16 |
| Correction factor, Flow velocity | 21 |
| Orientation of fork tines        | 28 |
| Connections                      | 31 |
| Light signals                    | 33 |
| Maintenance, Cleaning            | 34 |
| Technical Data                   | 35 |
| Accessories                      | 37 |
| Troubleshooting                  | 43 |
| Spare parts                      | 49 |
| Repair                           | 51 |
| Supplementary Documentation      | 52 |

## FR - Sommaire

|  |    |
|--|----|
| CConseils de sécurité                  | 4  |
| Manipulation                           | 6  |
| Dénomination                           | 8  |
| Dispositif de mesure                   | 14 |
| Montage                                | 16 |
| Facteur de correction, Vitesse de flux | 21 |
| Orientation des lames vibrantes        | 28 |
| Raccordement                           | 31 |
| Signaux lumineux                       | 33 |
| Entretien, Nettoyage                   | 34 |
| Caractéristiques techniques            | 35 |
| Accessoires                            | 37 |
| Recherche de défauts                   | 44 |
| Pièces de rechange                     | 49 |
| Réparations                            | 51 |
| Documentation complémentaire           | 52 |



### Achtung!

= verboten;  
führt zu fehlerhaftem Betrieb  
oder Zerstörung.



### Caution!

= forbidden;  
leads to incorrect operation  
or destruction.



### Attention!

= interdit; peut provoquer  
des dysfonctionnements  
ou la destruction.

## ES - Índice

|                             |    |
|-----------------------------|----|
| Notas sobre seguridad       | 5  |
| Modo de empleo              | 6  |
| Identificación del equipo   | 8  |
| Dispositivo de medición     | 15 |
| Instalación                 | 16 |
| Factor de corrección,       |    |
| Velocidad de flujo          | 22 |
| Orientación de la horquilla | 28 |
| Conexiones                  | 31 |
| Señales luminosas           | 33 |
| Mantenimiento, Limpieza     | 34 |
| Datos técnicos              | 35 |
| Accesorios                  | 37 |
| Localización de errores     | 42 |
| Repuestos                   | 47 |
| Reparaciones                | 49 |
| Documentación suplementaria | 50 |

## IT - Índice

|                                 |    |
|---------------------------------|----|
| Note sulla sicurezza            | 5  |
| Accorgimenti                    | 6  |
| Identificazione dello strumento | 8  |
| Sistema di misura               | 15 |
| Installazione                   | 16 |
| Fattoredi correzione,           |    |
| Velocità di deflusso            | 22 |
| Allineamento della forcella     | 28 |
| Collegamenti elettrici          | 31 |
| Segnali luminosi                | 33 |
| Manutenzione, Pulizia           | 34 |
| Dati tecnici                    | 35 |
| Accessori                       | 37 |
| Ricerca guasti                  | 43 |
| Ricambi                         | 47 |
| Riparare                        | 49 |
| Documentazione supplementare    | 50 |

## NL- Inhoud

|                           |    |
|---------------------------|----|
| Veiligheidsinstructies    | 5  |
| Behandeling               | 6  |
| Instrument- identificatie | 8  |
| Meetsysteem               | 15 |
| Montage                   | 16 |
| Correctiefactor,          |    |
| Stroomsnelheid            | 22 |
| Vork uitrichten           | 28 |
| Aansluiting               | 31 |
| Lichtsignalen             | 33 |
| Onderhoud, Reiniging      | 34 |
| Technische gegevens       | 35 |
| Toebehoren                | 37 |
| Fout zoeken               | 44 |
| Reserve-onderdelen        | 47 |
| Reparatie                 | 49 |
| Aanvullende documentatie  | 50 |



### Atención!

= Prohibido; peligro de mal funcionamiento o de destrucción.



### Attenzione!

= Vietato; pericolo di malfunzionamento o di distruzione.



### Opgelet!

= verboden; leidt tot foutieve werking of storing.

## DE- Sicherheitshinweise

Der Liquiphant M Dichte FTL50, FTL51 darf nur zur Dichte und Konzentrationsmessungen von Flüssigkeiten verwendet werden.

Bei unsachgemäßem Einsatz kann das Messergebnis beeinträchtigt werden.

Das Gerät darf **nur von qualifiziertem und autorisiertem Fachpersonal** unter strenger Beachtung dieser Betriebsanleitung, der einschlägigen Normen, der gesetzlichen Vorschriften und der Zertifikate (je nach Anwendung) eingebaut, angeschlossen, in Betrieb genommen und gewartet werden.

## EN- Notes on Safety

The Liquiphant M density FTL50, FTL51 may only be used to measure the density and concentration of liquids. Improper use can have a negative impact on the measurement result.

The level limit switch Liquiphant M FTL50, FTL51 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.

## FR- Conseils de sécurité

L'appareil Liquiphant M Dichte FTL50, FTL51 doit uniquement être utilisé pour les mesures de densité et de concentration de liquides. En cas d'utilisation inappropriée, le résultat de mesure peut être faussé.

L'appareil ne doit être installé, raccordé, mise en service et entretenu **que par un personnel qualifié et autorisé**, qui tiendra compte des indications contenues dans la présente mise en service, des normes en vigueur et des certificats disponibles (selon l'application).

## ES - Notas sobre seguridad

Liquiphant M Dichte FTL50, FTL51 debe emplearse únicamente para medir la densidad y la concentración de fluidos. Un uso indebido puede perjudicar el resultado de la medición. 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).

## IT - Note sulla sicurezza

Il dispositivo Liquiphant M Densità FTL50, FTL51 può essere impiegato solo per misurare la densità e la concentrazione di prodotti liquidi. L'uso improprio può pregiudicare il risultato di misura..  
Lo strumento può essere montato **solamente da personale qualificato ed autorizzato**.  
La messa in esercizio e la manutenzione devono rispettare le indicazioni di collegamento, le norme e i certificati di seguito riportati.

## NL- Veiligheidsinstructies

De Liquiphant M Dichte FTL50, FTL51 mag alleen worden toegepast voor de dichtheids- en concentratiemeting van vloeistoffen. Bij ondeskundig gebruik kan het meetresultaat negatief worden beïnvloed. Het instrument **alleen door gekwalificeerd en geautoriseerd personeel** laten inbouwen, aansluiten, in bedrijf nemen en onderhouden. Neem de instructies in deze Inbedrijfstellingsvoorschriften, de desbetreffende normen, de wettelijke voorschriften en eventuele certificaten in acht.

### DE- Behandlung

Am Gehäuse, Flansch oder Verlängerungsrohr anfassen.

### EN- Handling

Hold by housing, flange or extension tube.

### FR- Manipulation

Tenir par le boîtier, la bride ou le tube prolongateur.

### ES - Modo de empleo

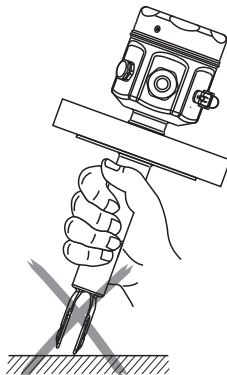
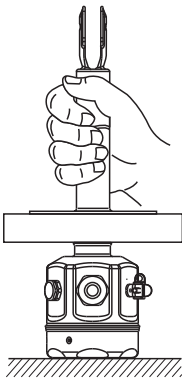
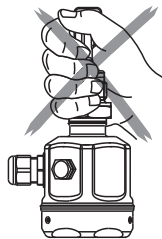
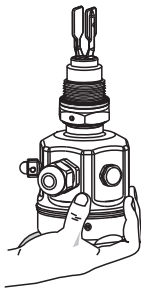
Coger por el cabezal, brida o tubo de extensión.

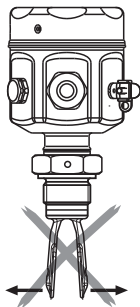
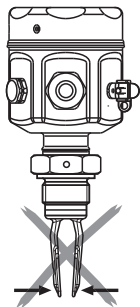
### IT - Accorgimenti

Afferrare la custodia, per la flangia o per il tubo di estensione.

### NL- Behandeling

Vastpakken via behuizing, flens of verlengbuis.





DE- **Nicht** verbiegen  
**Nicht** kürzen  
**Nicht** verlängern

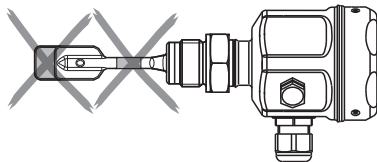
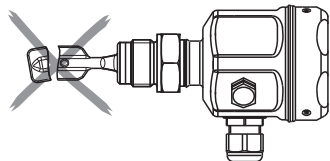
EN- Do **not** bend  
Do **not** shorten  
Do **not** lengthen

FR- **Ne pas** déformer  
**Ne pas** raccourcir  
**Ne pas** rallonger

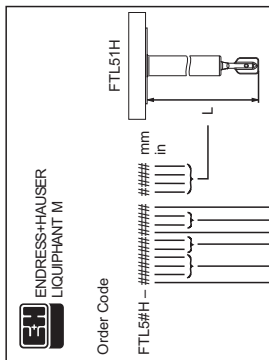
ES - **No** torcer  
**No** acortar  
**No** alargar

IT - **Non** stringere o allargare  
**Non** accorciare o allungare  
**Non** piegare

NL- **Niet** verbuigen  
**Niet** inkorten  
**Niet** verlengen

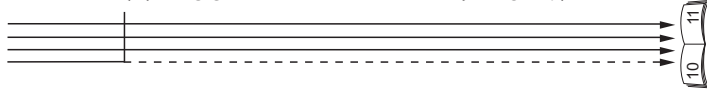


DE- Geräte-Identifikation  
 EN- Device Identification  
 FR- Dénomination  
 ES- Identificación del equipo  
 IT - Identificazione dello strumento  
 NL- Instrument-identificatie



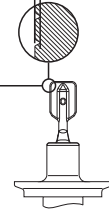
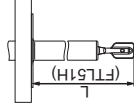
|     |   |                                  |   |       |
|-----|---|----------------------------------|---|-------|
| A   | ATEX II 3 G   | EEx nC II T6, WHG                | ↑ | KA164 |
| B   | ATEX II 3 D   | T 85°C <sup>*3</sup>             |   |       |
| C   | ATEX II 3 G   | EEx nA II T6, WHG                | ↑ | KA164 |
| D   | ATEX II 3 D   | T 85°C <sup>*3</sup>             |   |       |
| E   | A <sup>*1</sup> , WHG                                 | ATEX II 1/2 G EEx de IIC T6, WHG | ↑ | KA164 |
| G   | ATEX II 1/2 D   | T 80°C <sup>*3</sup>             |   |       |
| H   | ATEX II 1/2 D   | T 80°C <sup>*3</sup>             | ↑ | KA164 |
| I   | ATEX II 1 G   | EEx ia IIC T6                    |   |       |
| J   | ATEX II 1 G   | EEx de IIC T6                    | ↑ | KA164 |
| K   | ATEX II 1 G   | EEx ia IIC T6, WHG               |   |       |
| L   | ATEX II 1/2 G   | EEx d IIC T6                     | ↑ | KA164 |
| P   | ATEX II 1/2 G   | EEx d IIC T6, WHG                |   |       |
| Q   | FM, IS, Cl. I, II, III, Div. 1, Gr. A-G               |                                  | ↑ | KA164 |
| R   | FM, XP, Cl. I, II, III, Div. 1, Gr. B-G E5 => Gr. A-G |                                  |   |       |
| S   | FM, NI, Cl. I, Div. 2, Gr. A-D                        |                                  | ↑ | KA164 |
| T   | CSA, IS, Cl. I, II, III, Div. 1, Gr. A-G              |                                  |   |       |
| U   | CSA, XP, Cl. I, II, III, Div. 1, Gr. A-G              |                                  | ↑ | KA164 |
| V   | CSA, General purpose                                  |                                  |   |       |
| W   | TIIS Ex ia IIC T3                                     |                                  | ↑ | KA164 |
| X   | TIIS Ex d IIB T3                                      |                                  |   |       |
| 7   | TIIS Ex ia IIC T6                                     |                                  | ↑ | KA164 |
| 8   | TIIS Ex d IIC T3                                      |                                  |   |       |
| Y   | TIIS Ex d IIC T6                                      |                                  | ↑ | KA164 |
| ### |   |                                  |   |       |



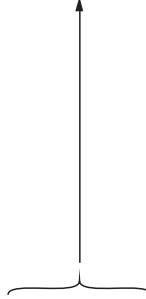


AC \*<sup>2</sup>  
 AD \*<sup>2</sup>  
 BC ..... mm,  
 BD ..... mm,  
 CC ..... in,  
 CD ..... in,  
 DC ..... in,  
 DD "L II",  
 "L II"

Ra < 1.5 µm/120 grit (FTL50H)  
 Ra < 0.3 µm/320 grit / A3 (FTL50H)  
 Ra < 1.5 µm/120 grit  
 Ra < 0.3 µm/320 grit / A3  
 Ra < 1.5 µm/120 grit  
 Ra < 0.3 µm/320 grit / A3  
 Ra < 1.5 µm/120 grit  
 Ra < 0.3 µm/320 grit / A3



I#  
 J#  
 K#  
 L#  
 Q#  
 R#  
 S#  
 T#



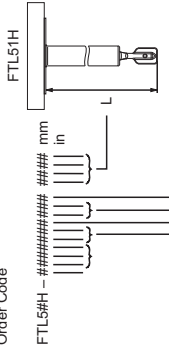
\*<sup>1</sup>  
 \*<sup>2</sup>  
 \*<sup>3</sup>

ohne / without / sans / sin / senza / zonder  
 andere / others / autres / otros / altri / andere  
 nicht gültig für PBT / not valid for PBT / non valable pour PBT /  
 no es válido para PBT / non válido per PBT / niet geldig voor PBT



ENDRESS+HAUSER  
LIQUIPHANT M

Order Code



IC  $\overset{*2}{\text{---}}$

ID  $\overset{*2}{\text{---}}$

JC ..... mm,

JD ..... in,

KC ..... mm,

KD ..... in,

LC "L II",

LD "L II",

QC  $\overset{*2}{\text{---}}$

QD  $\overset{*2}{\text{---}}$

RC ..... mm,

RD ..... in,

SC ..... mm,

SD ..... in,

TC "L II",

TD "L II",

YY  $\overset{*2}{\text{---}}$

Ra < 1.5  $\mu\text{m}$ /120 grit

Ra < 0.3  $\mu\text{m}$ /320 grit / A3 + "T" (FTL50H)

..... mm, Ra < 1.5  $\mu\text{m}$ /120 grit

..... in, Ra < 0.3  $\mu\text{m}$ /320 grit

..... mm, Ra < 1.5  $\mu\text{m}$ /120 grit

..... in, Ra < 0.3  $\mu\text{m}$ /320 grit

..... mm, Ra < 1.5  $\mu\text{m}$ /120 grit

..... in, Ra < 0.3  $\mu\text{m}$ /320 grit

Ra < 1.5  $\mu\text{m}$ /120 grit + "p" (FTL50H)

Ra < 0.3  $\mu\text{m}$ /320 grit / A3 + "p" (FTL50H)

..... mm, Ra < 1.5  $\mu\text{m}$ /120 grit

..... in, Ra < 0.3  $\mu\text{m}$ /320 grit

..... mm, Ra < 1.5  $\mu\text{m}$ /120 grit

..... in, Ra < 0.3  $\mu\text{m}$ /320 grit

..... mm, Ra < 1.5  $\mu\text{m}$ /120 grit

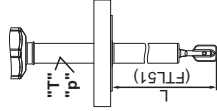
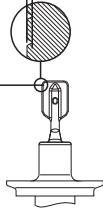
..... in, Ra < 0.3  $\mu\text{m}$ /320 grit

..... mm, Ra < 1.5  $\mu\text{m}$ /120 grit

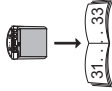
..... in, Ra < 0.3  $\mu\text{m}$ /320 grit

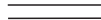
< 1,5  $\mu\text{m}$  (> 120 grit)

< 0,3  $\mu\text{m}$  (> 320 grit)



D FEL50D, Density/Concentration





E4 F-16, NEMA4X, NPT ½  
 E5 F13/17, NEMA4X, NPT ¾  
 E6 F15, NEMA4X, NPT ½  
 F4 F16, IP66, G ½  
 F5 F13/17, IP66, G ½  
 F6 F15, IP66, G ½  
 G4 F16, IP66, M20  
 G5 F13/17, IP66, M20  
 G6 F15, IP66, M20  
 N4 F16, IP66, M12  
 N5 F13/17, IP66, M12  
 N6 F15, IP66, M12  
 Y9 \*

F16  
PBT



F13/17  
Alu



F15  
316 L



#7 Alu/sep. →



A \*1  
 C EN 10204 - 3.1, 316L  
 P EN 10204 - 3.1, CoC, 316L  
 S GL/ABS marine certificate (FTL51H: max. 1600 mm)  
 Y \*2  
 K Special adjustment density H20  
 L Special adjustment density H20, EN 10204 - 3.1

\*1 ohne / without / sans / sin / senza / zonder  
 \*2 andere / others / autres / otros / altri / andere

"L I": Schaltpunkt / Switchpoint / Point de commutation /  
 Punto de conmutación / Punto di commutazione / Schakelpunt

Liquiphant II FTL 360/365, FDL 30/35

"T" Temperaturdistanzstück / Temperature spacer /  
 Élément de refroidissement / Tramo disipador detemperatura /  
 Distanziale per temperatura / Temperatuurreductiestuk

"p" Druckdichte Durchführung / Pressure sealed bushing /  
 Entrée résistante à la pression / Extensión resistente a la presión /  
 Passacavo a tenuta di pressione / Gasdichte doorvoering

**DE-** Flanche, Prozessanschlüsse  
**EN-** Flanges, Process connections  
**FR-** Brides, Raccords process  
**ES-** Brida, Conexiones a proceso  
**IT-** Flangia, Attacchi al processo  
**NL-** Flens, Procesaanting



ENDRESS+HAUSER  
LIQUIPHANT M

Order Code

FTL5#H - #####



Flansche / Flanges / Brides / Bride / Flangia / Flens

**ANSI B 16.5**

|     |  |
|-----|--|
| AA2 | 1/4", 150 lbs, RF, 316/316L            |
| AC2 | 1/2", 150 lbs, RF, 316/316L            |
| AE2 | 2", 150 lbs, RF, 316/316L              |
| AF2 | 2", 300 lbs, RF, 316/316L              |
| AJ2 | 2 1/2", 300 lbs, RF, 316/316L (FTL51H) |
| AL2 | 3", 150 lbs, RF, 316/316L              |
| AM2 | 3", 300 lbs, RF, 316/316L (FTL51H)     |
| AP2 | 4", 150 lbs, RF, 316/316L              |
| AO2 | 4", 300 lbs, RF, 316/316L (FTL51H)     |
| A82 | 1", 150 lbs, RF, 316/316L              |













**EN 1092-1**

|     |        |             |      |
|-----|--------|-------------|------|
| BA2 | DN32,  | PN6 A,      | 316L |
| BB2 | DN32,  | PN25/40 A,  | 316L |
| BC2 | DN40,  | PN6 A,      | 316L |
| BD2 | DN40,  | PN25/40 A,  | 316L |
| BE2 | DN50,  | PN6 A,      | 316L |
| BG2 | DN50,  | PN25/40 A,  | 316L |
| BH2 | DN65,  | PN6 A,      | 316L |
| BK2 | DN65,  | PN25/40 A,  | 316L |
| BM2 | DN80,  | PN10/16 A,  | 316L |
| BN2 | DN80,  | PN25/40 A,  | 316L |
| BQ2 | DN100, | PN10/16 A,  | 316L |
| BR2 | DN100, | PN25/40 A,  | 316L |
| B82 | DN25,  | PN25/40 A,  | 316L |
| CG2 | DN50,  | PN25/40 B1, | 316L |
| CN2 | DN80,  | PN25/40 B1, | 316L |
| CO2 | DN100, | PN10/16 B1, | 316L |

**JIS B2220**

|     |              |      |
|-----|--------------|------|
| KA2 | 10K 25, RF,  | 316L |
| KC2 | 10K 40, RF,  | 316L |
| KE2 | 10K 50, RF,  | 316L |
| KL2 | 10K 80, RF,  | 316L |
| KP2 | 10K 100, RF, | 316L |

Prozessanschlüsse / Process connections / Raccord process /  
 Conexiones a proceso / Attachi al processo / Processaansluiting

|   |     |   | max. p <sub>e</sub> , max. T     |
|---|-----|---|----------------------------------|
|    | EE2 | 1", 316L                                    | 40 bar, 100 °C<br>25 bar, 150 °C |
|    | GQ2 | G ¾, ISO 228, 316L (FTL50H)                 | 40 bar, 100 °C<br>25 bar, 150 °C |
|    | GW2 | G 1, ISO 228, 316L                          | 40 bar, 100 °C<br>25 bar, 150 °C |
|    | HE2 | DN50, DIN 11864-1 A, 316L                   | 25 bar, 140 °C                   |
|    | MA2 | DN32, PN25, DIN 11851, 316L                 | 40 bar, 100 °C<br>25 bar, 140 °C |
|    | MC2 | DN40, PN25, DIN 11851, 316L                 | 40 bar, 100 °C<br>25 bar, 140 °C |
|    | ME2 | DN50 PN25, DIN 11851, 316L                  | 25 bar, 140 °C                   |
|    | PE2 | DRD, 65 mm, 316L                            | 40 bar, 100 °C<br>25 bar, 150 °C |
|    | TC2 | DN25-38 (1...1½"), ISO 2852, 316L           | 16 bar, 120 °C<br>2 bar, 150 °C  |
|   | TE2 | DN40-51 (2"), ISO 2852, 316L                | 16 bar, 120 °C<br>2 bar, 150 °C  |
|   | UE2 | SMS 2", PN25, 316L                          | 25 bar, 140 °C                   |
|  | WE2 | DN65-162 PN10, Varivent <sup>®</sup> , 316L | 10 bar, 120 °C                   |
|   | YY9 | ∗2  |                                  |

∗2 andere / others / autres / otros / altri / andere

## DE- Messeinrichtung

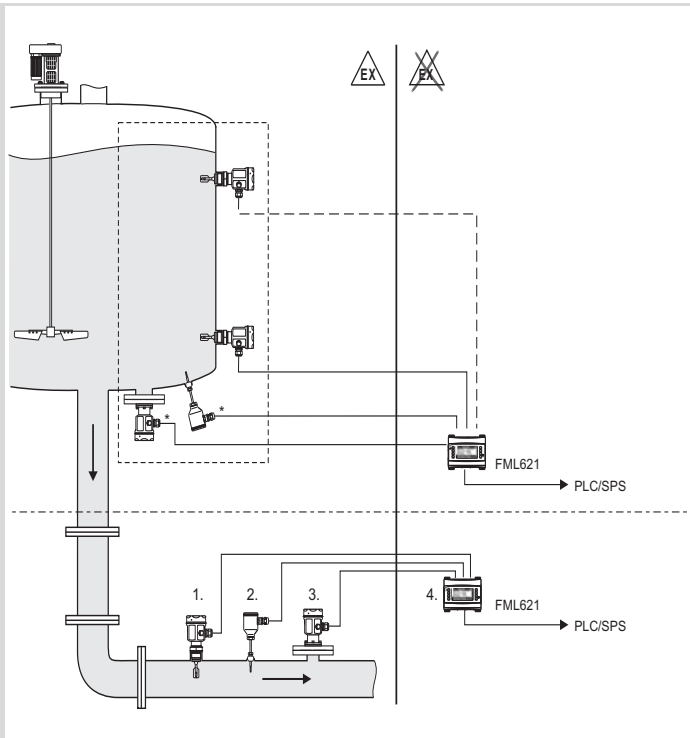
1. Liquiphant M Dichte
2. Temperatursensor
3. Drucksensor (optional)
4. Dichterechner FML621

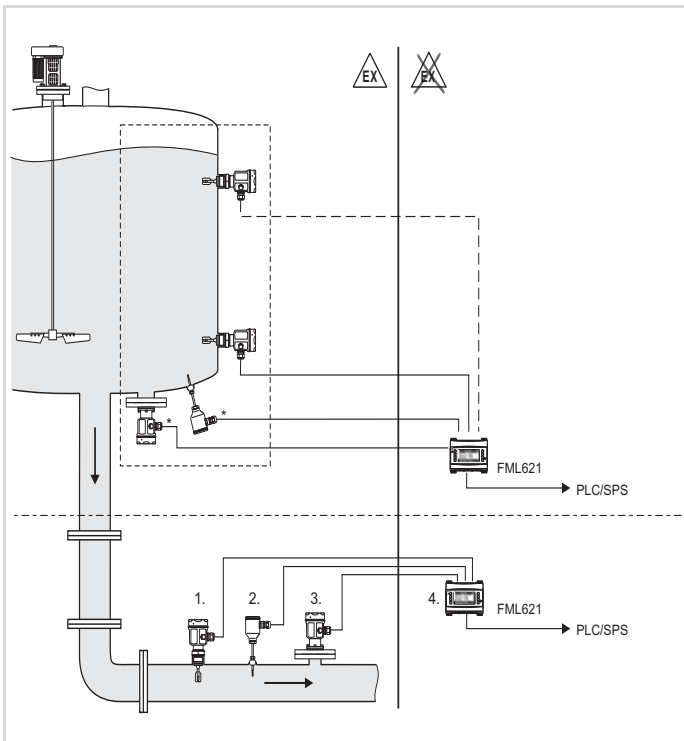
## EN- Measuring system

1. Liquiphant M density
2. Temperature sensor
3. Pressure sensor (optional)
4. FML621 density computer

## FR- Dispositif de mesure

1. Liquiphant M Dichte
2. Sonde de température
3. Capteur de pression (option)
4. Calculateur de densité FML621





## ES - Dispositivo de medición

1. Liquiphant M Dichte
2. Sensor de temperatura
3. Sensor de presión (opcional)
4. Medidor de densidad FML621

## IT - Sistema di misura

1. Liquiphant M Densità
2. Sensore di temperatur
3. Sensore di pressione (opzionale)
4. Sistema per il calcolo della densità FML621

## NL- Meetsystem

1. Liquiphant M Dichte
2. Temperatuursensor
3. Druksensor (optie)
4. Dichtheidscomputer FML621

**DE- Einbau**

Dichtemessung ist nur im komplett eingetauchten Zustand gültig

**EN- Installation**

The density measurement is only valid if the unit is in a fully immersed state.

**FR- Montage**

La mesure de densité est uniquement valable à l'état entièrement immergé.

**ES - Instalación**

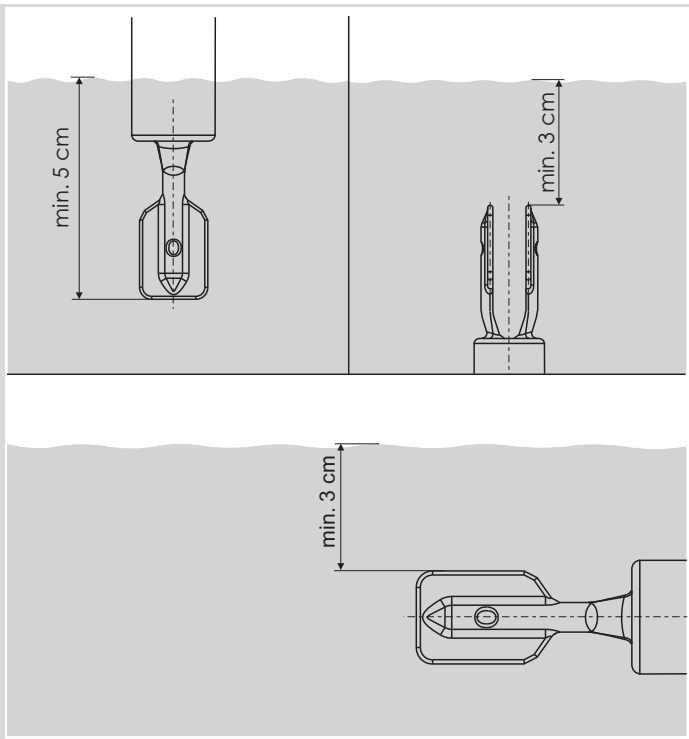
La medición de densidad sólo es válida si el medidor está completamente sumergido.

**IT - Installazione**

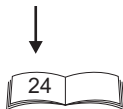
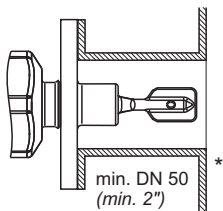
La misura di densità è consentita solo in stato di completa immersione.

**NL- Montage**

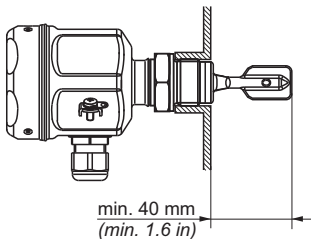
De dichtheidsmeting geldt alleen bij compleet ondergedompelde toestand.







\* entgraten / deburr / ébarber / libre / sbavare / ontbramen



**DE-** Einbaubeispiele  
in Abhängigkeit von der  
Viskosität v der Flüssigkeit

**EN-** Mounting examples  
as a function of liquid viscosity v

**FR-** Exemples d'implantation  
dépendant de la viscosité v  
du liquide

**ES-** Ejemplos de montaje  
dependiendo de la viscosidad v  
del líquido

**IT-** Esempi di montaggio  
come funzione di viscosità v  
del liquido

**NL-** Inbouwvoorbeelden  
afhankelijk van de viscositeit v  
van de vloeistof

**DE-** Ansatz und Korrosion beeinflussen das Messergebnis!  
(Wartungsintervall vorsehen!)

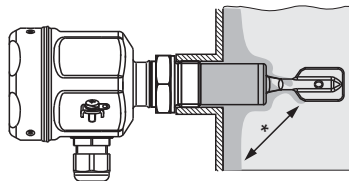
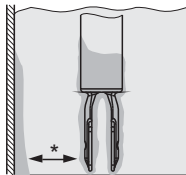
**EN-** Buildup and corrosion affect the measurement result! (Provide for maintenance interval)

**FR-** Le colmatage et la corrosion influencent le résultat de mesure!  
(prévoir un intervalle de maintenance)

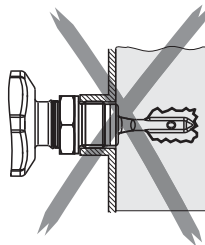
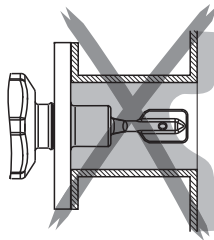
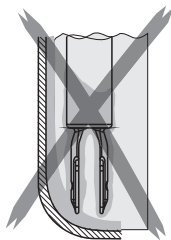
**ES -** La sedimentación y la corrosión influyen en el resultado de la medición.  
(observar los intervalos de mantenimiento)

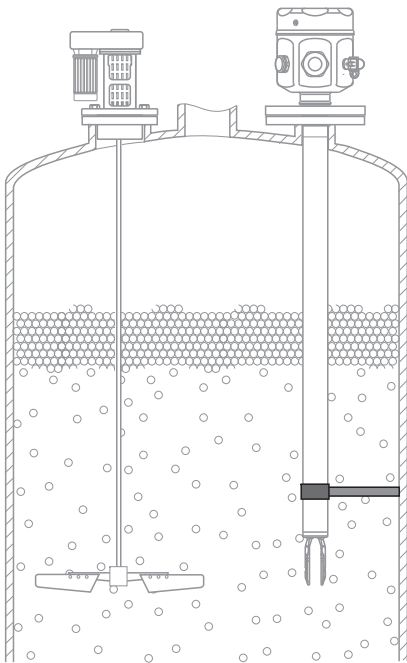
**IT -** Depositi e corrosione influenzano il risultato di misura!  
(prevedere un intervallo di manutenzione)

**NL-** Aanhechting en corrosie beïnvloeden het meetresultaat!  
(onderhoudsinterval aanhouden)



\* Abstand! / Distance! / Distance! / ¡Distancia! / Distanza! / Afstand!





**DE-** Bei dynamischer Belastung abstützen

**EN-** In cases of dynamic forces support

**FR-** En cas de contraintes dynamiques, étayer le tube

**ES-** En caso de cargas dinámicas altas debe ser apoyado

**IT-** In caso di carichi dinamici, rinforzare con un supporto meccanico

**NL-** Bij mechanische belasting verstevigen

**DE-** Freiraum für den Einbau beachten!

**EN-** Observe clearance for the installation!

**FR-** Respecter l'espace libre pour le montage !

**ES-** Observar que haya suficiente espacio libre para la instalación.

**IT-** Rispettare le distanze di installazione!

**NL-** Vrije ruimte voor de inbouw aanhouden!

"T" = mit Temperaturdistanzstück für isolierten Tank

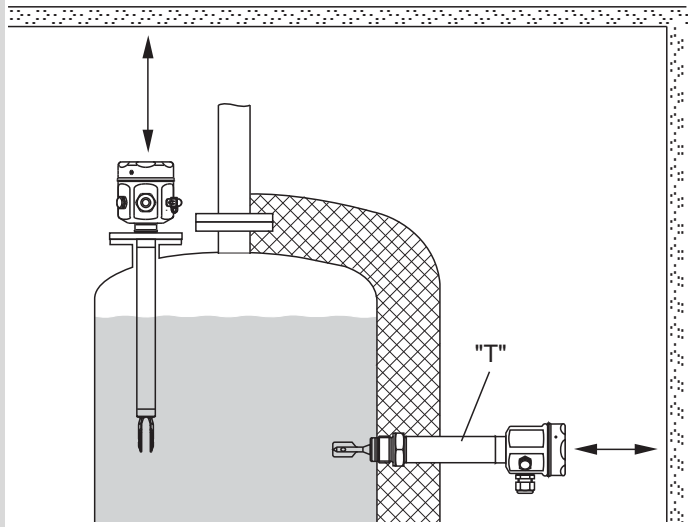
"T" = with temperature spacer for insulated tanks

"T" = avec élément de refroidissement pour réservoir isolé

"T" = con tramo dissipador de temperatura para tanques aislados

"T" = con distanziale di temperatura per serbatoi isolati

"T" = met temperatuurreductiestuk voor geïsoleerde tanks



### **DE- Korrekturfaktor**

Wird die Vibration der Gabelzinken durch die Bedingungen am Einbauort beeinflusst, kann das Messergebnis mithilfe eines Korrekturfaktors (Korrektur r) ausgeglichen werden. Siehe auch Dichterechner FML621 und ReadWin.

### **Flussgeschwindigkeit**

Wenn die Gabelzinken im direkten Medienstrom eingebaut sind, darf die Flussgeschwindigkeit des Mediums  $> 2$  m/s nicht überschreiten. Höhere Flussgeschwindigkeiten liefern kein sicheres Messergebnis.

### **EN- Correction factor**

If the vibration of the tines is affected by the conditions at the mounting location, the measurement result can be compensated with the aid of a correction factor (Correction r). See also FML621 density computer and ReadWin

### **Flow velocity**

If the tines are installed directly in the medium flow, the flow velocity of the medium may not exceed  $> 2$  m/s. Higher flow velocities do not return a reliable measurement result.

### **FR- Facteur de correction**

Si la vibration des bras de fourche est influencée par les conditions au point d'implantation, le résultat de mesure peut être compensé à l'aide d'un facteur de correction (Correction r). Voir également calculateur de densité FML621 et ReadWin.

### **Vitesse de flux**

Si les bras de fourche sont montés directement au niveau du flux du produit, la vitesse de flux du produit ne doit pas dépasser  $> 2$  m/s. En cas de vitesses de flux plus élevées, le résultat de mesure n'est pas sûr.

### **ES - Factor de corrección**

Si la vibración del brazo de horquilla se ve influida por las condiciones del lugar de instalación, el resultado de la medición podría compensarse con ayuda de un factor de corrección (Corrección r). Véanse también los medidores de densidad FML621 y ReadWin.

### **Velocidad de flujo**

Si los brazos de horquilla están instalados en una corriente de flujo directa, la velocidad del flujo no debe sobrepasar los  $> 2$  m/s. Una mayor velocidad de flujo no aporta un resultado de medición seguro.

### **IT - Fattore di correzione**

Se la vibrazione dei rebbi è influenzata dalle condizioni del punto di installazione, il risultato di misura può essere compensato mediante un fattore di correzione (Correzione r). Vedi anche il sistema per il calcolo della densità FML621 e il software ReadWin.

### **Velocità di deflusso**

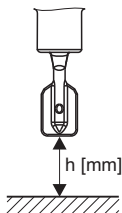
Se i rebbi sono installati nella corrente di liquido diretta, la velocità di deflusso non deve essere  $> 2$  m/s. Velocità di deflusso superiori non forniscono misure affidabili.

### **NL- Correctiefactor**

Wanneer de trilling van de vorkpoten door de lokale omstandigheden wordt beïnvloed, dan kan het meetresultaat met behulp van een correctiefactor (Correctie r) worden gecompenseerd. Zie ook dichtheidscomputer FML621 en ReadWin.

### **Stroomsnelheid**

Wanneer de vorkpoten in de mediumstroom zijn ingebouwd, mag de doorstroomsnelheid van het medium niet hoger zijn dan  $> 2$  m/s. Hogere doorstroomsnelheden leveren geen betrouwbaar meetresultaat.



| h [mm] | *      |
|--------|--------|
| 12     | 1,0026 |
| 14     | 1,0016 |
| 16     | 1,0011 |
| 18     | 1,0008 |
| 20     | 1,0006 |
| 22     | 1,0005 |
| 24     | 1,0004 |
| 26     | 1,0004 |
| 28     | 1,0004 |
| 30     | 1,0003 |
| 32     | 1,0003 |
| 34     | 1,0002 |
| 36     | 1,0001 |
| 38     | 1,0001 |
| 40     | 1,0000 |

#### **DE- Korrekturfaktor**

(\*Korrektur r) „h“

Zur Eingabe in den Dichterechner FML621 oder ReadWin2000.

#### **EN- Correction factor**

(\*Correction r) "h"

For entering in the FML621 density computer or ReadWin2000

#### **FR - Facteur de correction**

(\*Correction r) "h". Pour entrée dans le calculeur de densité FML621 ou ReadWin2000

#### **ES - Factor de corrección**

(\*Corrección r) "h". Para la introducción en el medidor de densidad FML621 ó ReadWin2000

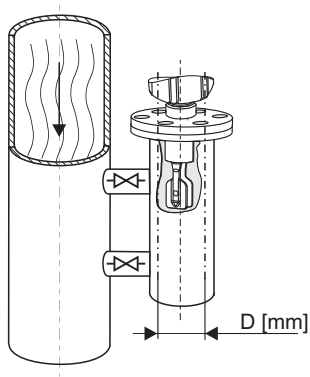
#### **IT - Fattore di correzione**

(\*Correzione r) "h". Immissione nel sistema per il calcolo di densità FML621 o in ReadWin2000

#### **NL- Correctiefactor**

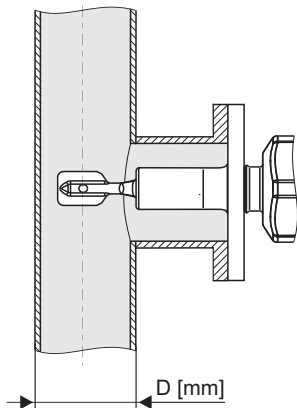
(Correctie r) „h“. Voor invoer in de dichtheidscomputer FML621 of ReadWin2000

- DE-** \*Korrekturfaktor (Korrektur r) „D“  
Zur Eingabe in den Dichtrechner  
FML621 oder ReadWin2000.
- EN-** \*Correction factor (Correction r)  
"D". For entering in the FML621  
density computer or ReadWin2000
- FR-** \*Facteur de correction  
(Correction r) "D". Pour entrée  
dans le calculateur de densité  
FML621 ou ReadWin2000
- ES-** \*Factor de corrección  
(Corrección r) "D". Para la  
introducción en el medidor de  
densidad FML621 ó ReadWin2000
- IT -** \*Fattore di correzione  
(Correzione r) "D". Immissione nel  
sistema per il calcolo di densità  
FML621 o in ReadWin2000
- NL-** \*Correctiefactor (Correctie r) „D“  
Voor invoer in de  
dichtheidscomputer FML621 of  
ReadWin2000



| D [mm] | *      |
|--------|--------|
| <44    | —      |
| 44     | 1,0191 |
| 46     | 1,0162 |
| 48     | 1,0137 |
| 50     | 1,0116 |
| 52     | 1,0098 |
| 54     | 1,0083 |
| 56     | 1,0070 |
| 58     | 1,0059 |
| 60     | 1,0050 |
| 62     | 1,0042 |
| 64     | 1,0035 |
| 66     | 1,0030 |
| 68     | 1,0025 |
| 70     | 1,0021 |
| 72     | 1,0017 |
| 74     | 1,0014 |
| 76     | 1,0012 |
| 78     | 1,0010 |
| 80     | 1,0008 |
| 82     | 1,0006 |
| 84     | 1,0005 |
| 86     | 1,0004 |
| 88     | 1,0003 |
| 90     | 1,0003 |
| 92     | 1,0002 |
| 94     | 1,0002 |
| 96     | 1,0001 |
| 98     | 1,0001 |
| 100    | 1,0001 |
| >100   | 1,0000 |





| D [mm] | *      |
|--------|--------|
| <44    | –      |
| 44     | 1,0225 |
| 46     | 1,0167 |
| 48     | 1,0125 |
| 50     | 1,0096 |
| 52     | 1,0075 |
| 54     | 1,0061 |
| 56     | 1,0051 |
| 58     | 1,0044 |
| 60     | 1,0039 |
| 62     | 1,0035 |
| 64     | 1,0032 |
| 66     | 1,0028 |
| 68     | 1,0025 |
| 70     | 1,0022 |
| 72     | 1,0020 |
| 74     | 1,0017 |
| 76     | 1,0015 |
| 78     | 1,0012 |
| 80     | 1,0009 |
| 82     | 1,0007 |
| 84     | 1,0005 |
| 86     | 1,0004 |
| 88     | 1,0003 |
| 90     | 1,0002 |
| 92     | 1,0002 |
| 94     | 1,0001 |
| 96     | 1,0001 |
| 98     | 1,0001 |
| 100    | 1,0001 |
| >100   | 1,0000 |

**DE-** \*Korrekturfaktor (Korrektur r) „D“  
Zur Eingabe in den Dichtechner  
FML621 oder ReadWin2000.

**EN-** \*Correction factor (Correction r)  
"D". For entering in the FML621  
density computer or ReadWin2000

**FR-** \*Facteur de correction  
(Correction r) "D". Pour entrée  
dans le calculateur de densité  
FML621 ou ReadWin2000

**ES-** \*Factor de corrección  
(Corrección r) "D". Para la  
introducción en el medidor de  
densidad FML621 ó ReadWin2000

**IT-** \*Fattore di correzione  
(Correzione r) "D". Immissione nel  
sistema per il calcolo di densità  
FML621 o in ReadWin2000

**NL-** \*Correctiefactor (Correctie r) „D“  
Voor invoer in de  
dichtheidscomputer FML621 of  
ReadWin2000

## DE- Flussgeschwindigkeit

Einbau in Rohrleitungen

\* keine Luftblasen!

Flussgeschwindigkeit < 2 m/s

## EN- Flow velocity

Installation in pipes

No air bubbles!

Flow velocity: < 2m/s

## FR- Vitesse de flux

Montage dans des conduites

Pas de bulle d'air !

Vitesse de flux : < à 2 m/s

## ES - Velocidad de flujo

Instalación en tuberías

Sin burbujas de aire.

Velocidad de flujo: < 2 m/s

## IT - Velocità di deflusso

Installazione in tubazioni

Evitare bolle d'aria!

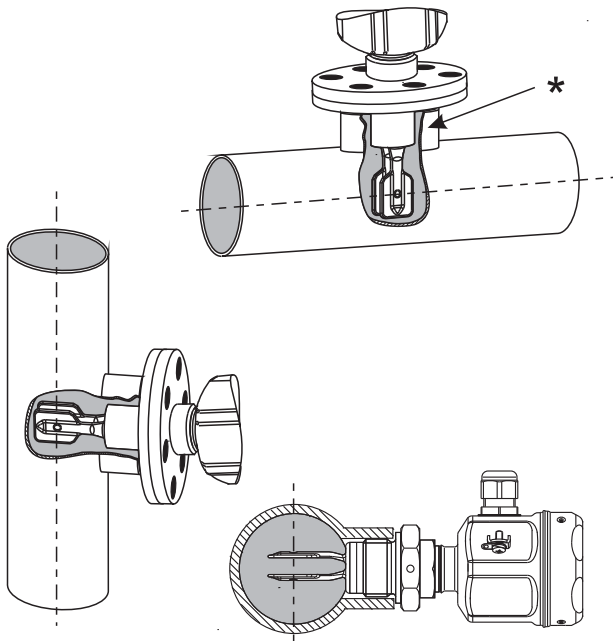
Velocità di deflusso: < 2m/s

## NL- Doorstroomsnelheid

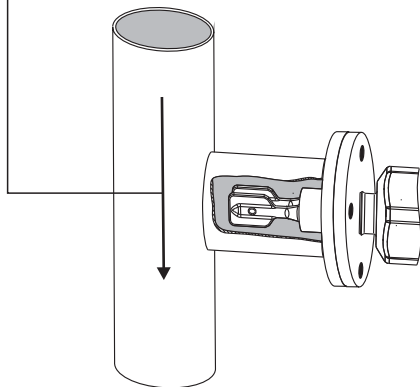
Inbouw in leidingen

Geen luchtbelllen!

Doorstroomsnelheid: < 2m/s



> 2 m/s ... < 5 m/s



- DE**- Schwinggabel nicht in direktem Medienstrom  
Flussgeschwindigkeit  
> 2 m/s ... < 5 m/s
- EN**- Tuning fork outside the direct medium flow  
Flow velocity:  
> 2m/s to < 5m/s
- FR**- Fourche oscillante en dehors du flux direct du produit  
Vitesse de flux :  
> à 2 m/s...< à 5 m/s
- ES**- Horquilla oscilante fuera de la corriente de flujo directa  
Velocidad de flujo:  
> 2 m/s...< 5 m/s
- IT**- Forcella vibrante fuori dalla corrente di liquido diretta  
Velocità di deflusso:  
> 2m/s...< 5m/s
- NL**- Trilvork buiten de directe mediumstroom  
Doorstromsnelheid:  
> 2m/s...< 5m/s

**DE- Schwinggabel ausrichten:**

Markierung oben oder unten

**EN- Orientation of fork tines:**

Marking above or below

**FR- Orientation des lames vibrantes:**

Repères en haut ou en bas

**ES - Orientación de la horquilla:**

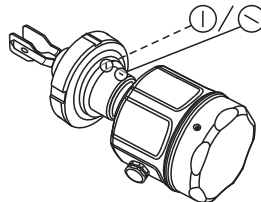
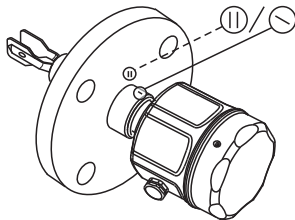
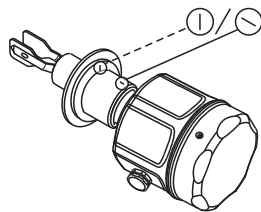
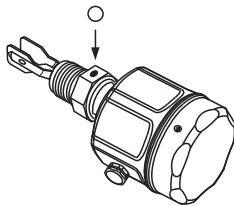
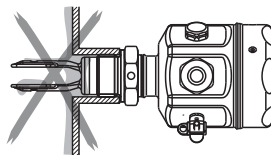
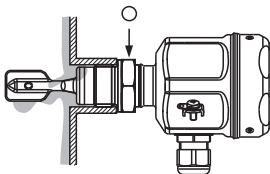
Marca arriba o abajo

**IT - Allineamento della forcella:**

Marchatura in alto o in basso

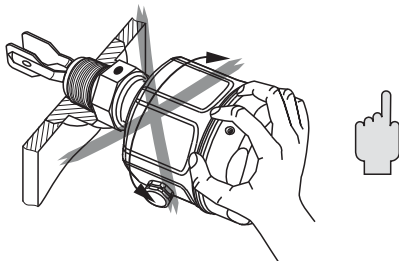
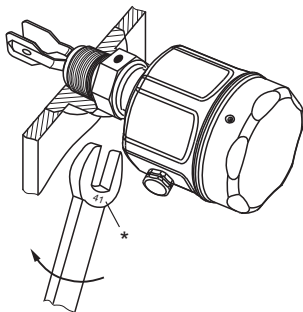
**NL- Vork uitrichten:**

Markering boven of onder



G ¾, 32 mm (1¼")\*  
G 1, 41 mm (1½")\*

in Einschweißmuffe  
in welding-neck  
dans manchon à souder  
en casquillo soldado  
manicotto saldato  
in inlassok



**DE**- Liquiphant einschrauben.  
**Nicht** am Gehäuse drehen.

**EN**- Screw Liquiphant into  
process connection.  
**Don't** use housing to turn.

**FR**- Visser le Liquiphant.  
**Ne pas** se servir du boîtier.

**ES**- Roscar el Liquiphant a la conexión  
a proceso.  
**No** girar el cabezal.

**IT**- Avvitare il Liquiphant all'attacco  
di processo.  
Allo scopo **non** utilizzare la  
custodia.

**NL**- Schroef de Liquiphant in  
de procesaansluiting.  
Draai hierbij niet aan de behuizing.

**DE-** Kabeleinführung ausrichten

F1x = Gehäusetypp

**EN-** Cable gland orientation

F1x = Type of housing

**FR-** Positionnement de l'entrée de câble

F1x = Type de logement

**ES-** Ajuste del prensaestopa

F1x = Tipo de cubierta

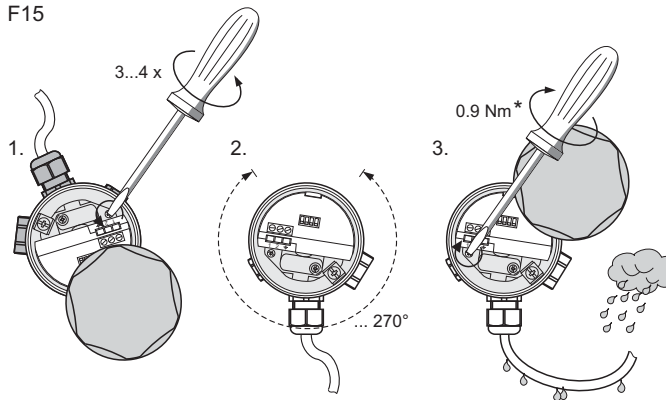
**IT-** Posizionamento del passacavo

F1x = Tipo di alloggiamento

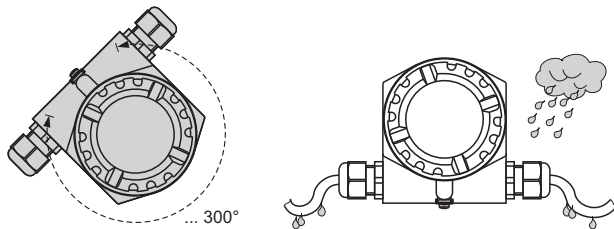
**NL-** Kabelinvoer uitrichten

F1x = Type van huisvesting

F15



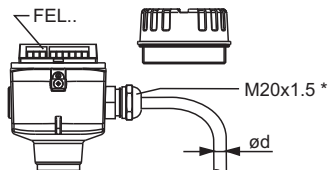
F16, F13, F17



\* Anzugsdrehmoment /  
Torque /  
Couple de serrage /  
Esfuerzo de torsión /  
Coppia di torsione /  
Aandraaimoment

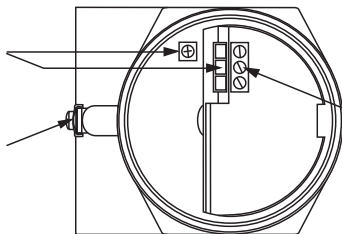


Nationale Normen und Vorschriften beachten!  
Note national regulations!  
Respecter les lois et règles locales en vigueur!  
Considere reglamentaciones nacionales  
Osservare le norme nazionali!  
Nationale voorschriften in acht nemen!



max. 2.5 mm<sup>2</sup>  
(max. AWG 14)

max. 4 mm<sup>2</sup>  
(max. AWG 12)



3 mm  
(1/8 in)

DE- Anschluss  
EN- Connections  
FR - Raccordement  
ES - Conexiones  
IT - Collegamenti elettrici  
NL- Aansluiting

### \*Cable entry

Nickel-plated brass:

$\varnothing d = 7 \dots 10,5 \text{ mm}$  (0,28...0,41 in)

Plastic:

$\varnothing d = 5 \dots 10 \text{ mm}$  (0,2...0,38 in)

Stainless steel:

$\varnothing d = 7 \dots 12 \text{ mm}$  (0,28...0,47 in)

**DE- Zweileiter-Anschluss**

Impuls

**EN- Two-wire connection**

Pulse

**FR- Connexion deux fils**

Impulsion

**ES- Conexión de dos conductores**

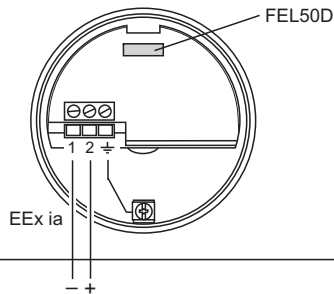
Impulso

**IT - Connessione bifilare**

Impulsi

**IT - Tweedraadsaansluiting**

Impuls



A E

- +

10 82

110 83

B C D

- +




112 182

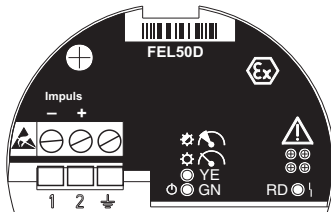
113 183









de - Eingangskarten A – E  
B, C, D (optional)es - Tarjetas de entrada A – E  
B, C, D (opcional)en - Input cards A – E  
B, C, D (optional)it - Schede di ingresso A – E  
B, C, D (in opzione)fr - Cartes d'entrée A – E  
B, C, D (option)nl - Ingangskarten A – E  
B, C, D (optie)



Leuchtdioden / LEDs / DEL / LEDs / LED / LED's

-  leuchtet, on, allumée, iluminado, on, aan
-  blinkt, flashes, clignote, parpadea, lampeggia, knippert
-  aus, off, éteinte, apagado, off, uit



|           |   |  |
|-----------|---|--|
| <b>YE</b> |  | Messung gültig, Measurement valid, Mesure valable, Medición válida, Misura valida, Meting geldig   |
|           |  | Prozesssituation instabil, Process situation unstable, Situation de process instable, Situación de proceso inestable, Condizione di processo instabile, Processituatie instabil, |
|           |  | Wartungsbedarf, Maintenance required, Maintenance nécessaire, Necesidad de mantenimiento, Necessità di manutenzione, Onderhoud nodig   |
| <b>GN</b> |  | Versorgung an, Power on, Alimentation "ON", Alimentación encendida, Alimentazione presente, Voeding aan  |
|           |  | Versorgung Aus, Power off, Alimentation "OFF", Alimentación apagada, Alimentazione assente, Voeding uit  |
| <b>RD</b> |  | Keine Störung, No fault, Pas de dérangement, Ningún fallo, Nessun guasto, Geen storing,  |
|           |  | Wartungsbedarf, Maintenance required, Maintenance nécessaire, Necesidad de mantenimiento, Necessità di manutenzione, Onderhoud nodig   |
|           |  | Geräteausfall, Device failure, Panne de l'appareil, Avería en la unidad, Guasto die dispositivi, Uitval instrument   |

DE- Lichtsignale  
 EN- Light signals  
 FR - Signaux lumineux  
 ES - Señales luminosas  
 IT - Segnali luminosi  
 NL- Lichtsignalen

**DE- Wartung, Reinigung**

Anbackungen entfernen

**EN- Maintenance, Cleaning**

Removal of encrustation

**FR- Entretien, Nettoyage**

Enlever les incrustations

**ES - Mantenimiento, Limpieza**

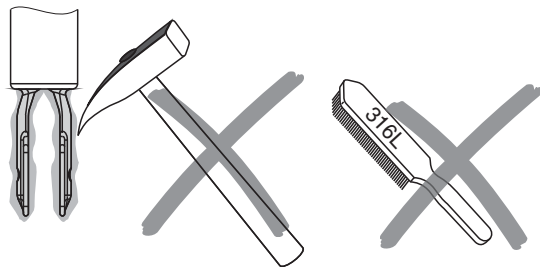
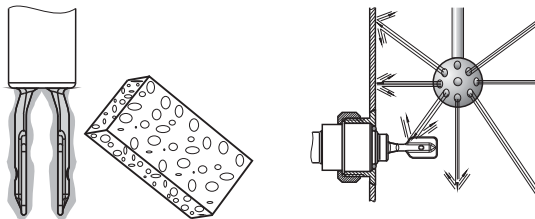
Eliminación de adherencias

**IT - Manutenzione, Pulizia**

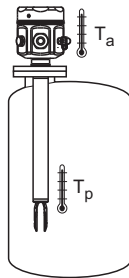
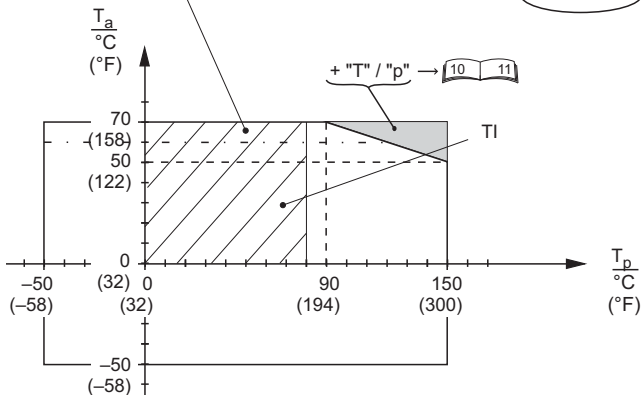
Rimozione dei depositi

**NL- Onderhoud, Reiniging**

Aangroei verwijderen



**EX**  $T_a < 60\text{ °C}$



### DE- Technische Daten

Umgebungstemperatur  $T_a$

Betriebstemperatur  $T_p$

### EN- Technical Data

Ambient temperature  $T_a$

Process temperature  $T_p$

### FR- Caractéristiques techniques

Température ambiante  $T_a$

Température de service  $T_p$

### ES- Datos técnicos

Temperatura ambiente  $T_a$

Temperatura de servicio  $T_p$

### IT - Dati tecnici

Temperatura ambiente  $T_a$

Temperatura di servizio  $T_p$

### NL- Technische gegevens

Omgevingstemperatuur  $T_a$

Procestemperatuur  $T_p$

**DE-** Prozessdruck  $p_e$   
Prozesstemperatur  $T_p$   
x optimaler Arbeitsbereich

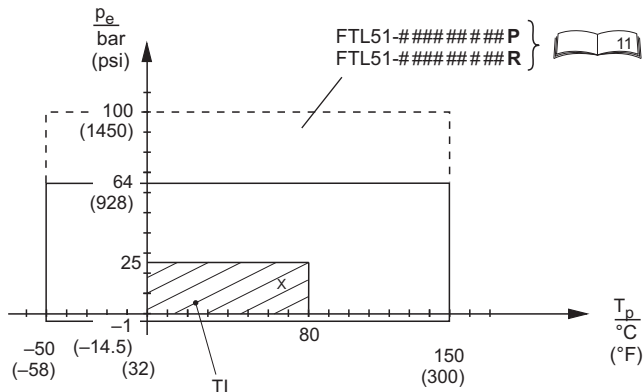
**EN-** Process pressure  $p_e$   
Process temperature  $T_p$   
x Optimum operational range

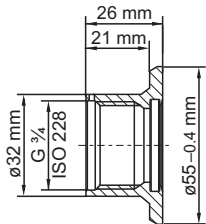
**FR-** Pression de process  $p_e$   
Température de process  $T_p$   
x Plage de travail optimale

**ES-** Presión del proceso  $p_e$   
Temperatura del proceso  $T_p$   
x Área óptima de trabajo

**IT-** Pressione di processo  $p_e$   
Temperatura di processo  $T_p$   
x Campo operativo ottimale

**NL-** Procesdruk  $p_e$   
Procestemperatuur  $T_p$   
x Optimaal werkgebied

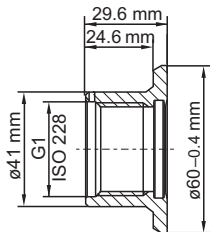




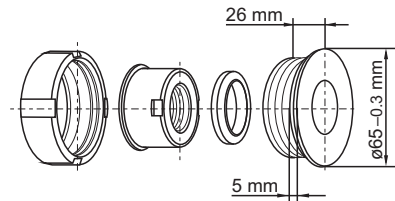
**G 3/4**  
52001052

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

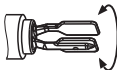
max. 40 bar / 100 °C  
(max 580 psi / 210 °F)



**G 1**  
52001051



**G 1**  
52001221



**DE- Zubehör**  
Einschweißadapter

**EN- Accessories**  
Welding neck

**FR- Accessoires**  
Adaptateur à souder

**ES- Accesorios**  
Adaptador para soldar

**IT - Accessori**  
Adattatore saldato

**NL- Toebehoren**  
Inlasadapter

1.4435 (AISI 316L)

100 mm = 3.94 in

**DE-** Einschweißadapter;  
Deckel mit Sichtscheibe

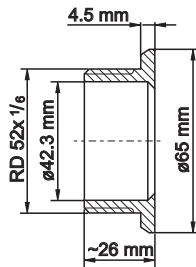
**EN-** Welding neck;  
Covers with window

**FR-** Adaptateur à souder;  
Couvercles avec fenêtre

**ES-** Adaptador para soldar;  
Cubierta con ventana

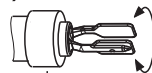
**IT-** Adattatore saldato;  
Coperchio con finestra

**NL-** Inlasadapter;  
Deksel met venster

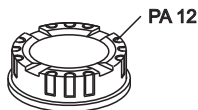


1"  
52001047  
1.4435  
(AISI 316L)

max. 40 bar / 100 °C  
(max. 580 psi / 210 °F)  
max. 25 bar / 150 °C  
(max. 360 psi / 300 °F)

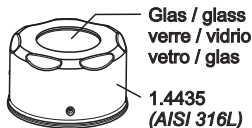


FTL5#H - #EE2.....



PA 12

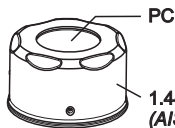
für PBT-Gehäuse / for PBT housing /  
pour boîtier PBT / para caja PBT /  
per custodia PBT / voor PBT behuizing  
943461-0001



Glas / glass  
verre / vidrio  
vetro / glas

1.4435  
(AISI 316L)

für Stahlgehäuse / for steel housing /  
pour boîtier inox / para caja de acero /  
per custodia in acciaio /  
voor R. V. stalen behuizing  
943301-1000







PC

1.4435  
(AISI 316L)





für Stahlgehäuse / for steel housing /  
pour boîtier inox / para caja de acero /  
per custodia in acciaio /  
voor R. V. stalen behuizing  
52001403

100 mm = 3.94 in

## Fehlersuche





| Ursache                            | Anzeige<br>Versorgung / Aus   | Anzeige<br>Prozesssituation instabil  | Anzeige<br>Wartungsbedarf  | Anzeige<br>Geräteausfall  |
|------------------------------------|---|---|--|---|
|                                    |  |  |  |  |
| Keine Versorgungsspannung          | Versorgungsspannung prüfen  |   |  |   |
| Verpolung                          | Anschlussbelegung prüfen  |   |  |   |
| Signalleitung defekt               | Signalleitung prüfen  |   |  |   |
| Fehlerhafte Klemmenbelegung am FML | Klemmenkonfiguration am FML621 überprüfen   |   |  |   |
| Extreme Fremdvibration             |   | Messstelle Schwingungsentkoppeln  |  |   |
| Extrem turbulente Strömung         |   | Beruhigungsstrecke vorsehen   |  |   |
| Durchfluss > 2 m/s                 |   | Schwinggabel vom direkten Medienstrom absetzen                                    |  |   |
| Ansatzbildung                      |   | Ansatz entfernen Reinigungsintervall vorsehen.                                    |  |   |
| Schwinggabel blockiert             |   |   | Einbauposition ändern  |   |
| Elektronikeinsatz defekt           |   |   |  | Elektronikeinsatz wechseln  |





## Troubleshooting

| Cause                                | Display<br>Power supply/off   | Display<br>Process situation unstable   | Display<br>Maintenance required  | Display<br>Device failure   |
|--------------------------------------|---|---|--|---|
|                                      |  |  |  |  |
| No supply voltage                    | Check supply voltage  |   |  |   |
| Reverse polarity                     | Check connection assignment   |   |  |   |
| Signal line defective                | Check signal line   |   |  |   |
| Incorrect terminal assignment at FML | Check terminal configuration at FML621  |   |  |   |
| Extreme external vibration           |   | Measuring point vibration isolation   |  |   |
| Extremely turbulent flow             |   | Provide settling section  |  |   |
| Flow > 2 m/s                         |   | Remove tuning fork from direct medium flow  |  |   |
| Buildup                              |   | Remove buildup, provide cleaning interval.  |  |   |
| Tuning fork blocked                  |   |   | Change installation position   |   |
| Electronic insert defective          |   |   |  | Replace electronic insert   |
| No connection to sensor              |   |   |  | Replace sensor  |







## Recherche de défauts





| Cause   | Affichage Alimentation / OFF  | Affichage Situation de process instable   | Affichage Maintenance nécessaire   | Affichage Panne de l'appareil   |
|---|---|---|--|---|
|   |  |  |  |  |
| Pas de tension d'alimentation                                 | Contrôler la tension d'alimentation   |   |  |   |
| Inversion de polarité   | Contrôler l'affectation des broches   |   |  |   |
| Câble de signal défectueux                                    | Contrôler le câble de signal  |   |  |   |
| Affectation des bornes incorrecte au niveau de l'appareil FML | Contrôler la configuration des bornes sur l'appareil FML621                       |   |  |   |
| Vibrations extérieures extrêmes                               |   | Point de mesure découplage oscillation  |  |   |
| Flux extrêmement turbulent                                    |   | Prévoir une section d'accalmie  |  |   |
| Débit > à 2 m/s   |   | Décaler la fourche oscillante hors du flux direct du produit                      |  |   |
| Formation de dépôt  |   | Eliminer les dépôts, prévoir un intervalle de nettoyage. .                        |  |   |
| Fourche oscillante bloquée                                    |   |   | Modifier la position de montage  |   |
| Module électronique défectueux                                |   |   |  | Remplacer le module électronique  |
| Pas de connexion avec le capteur                              |   |   |  | Remplacer le capteur  |

| Localización de errores                      |   |   |  |   |
|--|---|---|--|---|
| Causa  | Indicador Alimentación /Apagado   | Indicador Situación de proceso inestable  | Indicador Necesidad de mantenimiento   | Indicador Avería en la unidad   |
|  |  |  |  |  |
| Sin tensión de alimentación                  | Comprobar la tensión de alimentación  |   |  |   |
| Inversión de polaridad                       | Comprobar la asignación de conexiones   |   |  |   |
| Línea de señal defectuosa                    | Comprobar la línea de señal   |   |  |   |
| Distribución errónea de los bornes en el FML | Comprobar la configuración de los bornes en el FML621                             |   |  |   |
| Vibración externa extrema                    |   | Punto de medición desacoplamiento de oscilaciones                                 |  |   |
| Corriente turbulenta extrema                 |   | Observar la distancia de estabilización   |  |   |
| Caudal > 2 m/s                               |   | Retirar la horquilla oscilante de la corriente de flujo directa                   |  |   |
| Ansatzbildung                                |   | Eliminar los sedimentos, observar el intervalo de limpieza.                       |  |   |
| Horquilla oscilante bloqueada                |   |   | Cambiar la posición de instalación   |   |
| Inserto electrónico defectuoso               |   |   |  | Cambiar el inserto electrónico  |
| Sin conexión con el sensor                   |   |   |  | Cambiar el sensor   |

## Ricerca guasti

| Causa   | Visualizzazione Alimentazione/assente   | Visualizzazione Condizione di processo instabile                                  | Visualizzazione Necessità di manutenzione  | Visualizzazione Guasto dei dispositivi  |
|---|---|---|--|---|
|   |  |  |  |  |
| Mancanza di tensione di alimentazione         | Verificare la tensione di alimentazione   |   |  |   |
| Inversione di polarità                        | Verificare l'assegnazione delle connessioni                                       |   |  |   |
| Cavo del segnale difettoso                    | Verificare il cavo del segnale  |   |  |   |
| Assegnazione dei morsetti non corretta su FML | Controllare la configurazione dei morsetti su FML621                              |   |  |   |
| Forti vibrazioni esterne                      |   | Disaccoppiamento delle vibrazioni del punto di misura                             |  |   |
| Flusso molto turbolento                       |   | Prevedere un tratto di calma  |  |   |
| Portata > 2 m/s                               |   | Togliere la forcella vibrante dalla corrente di liquido diretta                   |  |   |
| Formazione di depositi                        |   | Eliminare i depositi; prevedere un intervallo di pulizia.                         |  |   |
| Forcella vibrante bloccata                    |   |   | Modificare la posizione di installazione   |   |
| Insero elettronico difettoso                  |   |   |  | Sostituire l'insero elettronico   |
| Assenza di connessione con il sensore         |   |   |  | Sostituire il sensore   |

## Fout zoeken

| Oorzaak                       | Weergave Voeding/uit  | Weergave Processituatie instabiel   | Weergave Onderhoud nodig   | Weergave Uitval instrument  |
|-------------------------------|---|---|--|---|
|                               |  |  |  |  |
| Geen voedingsspanning         | Voedingsspanning controleren  |   |  |   |
| Ompoling                      | Aansluitbezetting controleren   |   |  |   |
| Signaalkabel defect           | Signaalkabel controleren  |   |  |   |
| Foutieve klembezetting op FML | Klemconfiguratie op FML621 controleren  |   |  |   |
| Extreme externe trillingen    |   | Meetplaats qua trillingen ontkoppelen   |  |   |
| Extrem turbulente stroming    |   | Stabilisatietraject voorzien  |  |   |
| Doorstroming > 2 m/s          |   | Trilvork uit directe mediumstroming plaatsen                                      |  |   |
| Vormen van aanhechting        |   | Aanhechting verwijderen, reinigingsinterval aanhouden.                            |  |   |
| Trilvork blokkeert            |   |   | Inbouwpositie veranderen   |   |
| Oscillatorunit defect         |   |   |  | Oscillatorunit vervangen  |
| Geen verbinding met sensor    |   |   |  | Sensor vervangen  |

**DE-** Ergänzung Fehlersuche

Ist das Schaltverhalten der Gabel ungewöhnlich, kann an PIN 4 der Diagnosebuchse die Gabelfrequenz gemessen werden.

Bei den Elektronikeinsätzen

Bei dem Elektronikeinsatz

FEL50D ist dies eine Schwingung die einen Rückschluss auf den Gabelzustand bzw. auf die Messung zulässt.

**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 el inserto electrónico FEL50D, se trata de una oscilación que admite un reflujos en el estado de la horquilla y/o en la medición.

**EN-** 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 regard to the electronic insert FEL50D, this is a vibration which provides information on the fork state or the measurement.

**IT -** Suplemento alla ricerca dei malfunzionamenti

Se le condizioni di commutazione dei rebbi non è normale la frequenza di vibrazione può essere misurata al PIN 4 del connettore per la diagnosi.

Nel caso dell'inserto elettronico FEL50D, si tratta di una vibrazione, che provoca una deviazione dello stato della forcilla e della misura.

**FR-** Additif recherche de défauts

Si la commutation de la fourche est inhabituelle, il est possible de mesurer la fréquence de cette dernière au PIN 4 de la prise diagnostic.

Dans le cas du module électronique FEL50D, il s'agit d'une oscillation permettant de déduire l'état de la fourche ou la mesure..

**NL-** Bijlage problemen oplossen

Indien het schakelgedrag van de trilvork niet normaal verloopt kan de frequentie van de vork gemeten worden op pen 4 van de diagnoseconnector.

Bij de oscillatorunit FEL50D is dit een trilling die een conclusie met betrekking tot de vorktoestand resp. de meting mogelijk maakt.

**DE- Ersatzteile**

Elektronikeinsätze

**EN- Spare parts**

Electronic inserts

**FR- Pièces de rechange**

Electroniques

**ES - Repuestos**

Electrónicas

**IT - Ricambi**

Inserti elettronici

**NL- Reserve-onderdelen**

Elektronica inserts



FEL50D 71027201

**Installationsregel:** Bei der Installation ist zu beachten, dass elektrische Betriebsmittel (Elektronikeinsätze) die mit nichteigensicheren Stromkreisen gespeist wurden, grundsätzlich **nicht** mehr mit eigensicheren Stromkreisen zusammenschaltet werden dürfen.

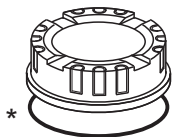
**Installation specification:** During installation, please keep in mind that electrical resources (electronic inserts) which are powered by non-intrinsically-safe circuits may **no** longer be interconnected with intrinsically-safe circuits.

**Directive d'installation :** Lors de l'installation, tenir compte du fait que les matériels électriques (électroniques) alimentés par des circuits sans sécurité intrinsèque **ne** doivent plus être connectés à des circuits à sécurité intrinsèque.

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

**Specifiche di installazione:** Durante l'installazione è necessario tenere presente che gli impianti elettrici (inserti elettronici) alimentati da circuiti elettrici non a sicurezza intrinseca **non** possono più essere collegati con circuiti elettrici a sicurezza intrinseca.

**Installatievoorschrift:** Bij de installatie moet erop worden gelet, dat elektrisch materieel (elektronica-units) die via niet-intrinsiekveilige circuits worden gevoed, in principe **niet** meer met intrinsiekveilige circuits mogen worden samengeschakeld.

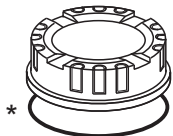


Alu

EPDM

Alu  
Alu (Ex d)

52002699  
52002698



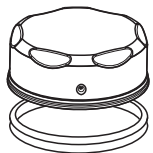
PBT-FR

EPDM

943461-0000

017717-0003

\* Mit Silikonfett schmieren  
Lubricate with silicone grease  
Lubrifier avec de la graisse silicone  
Lubricar con grasa de silicona  
Lubrificare con olio di silicone  
Met siliconenvet insmeren



1.4301 / 1.4435  
(AISI 304 / 316L)

MVQ

943301-0000

943304-0000

**DE-** Gehäusedeckel,  
Dichtungen

**EN-** Housing covers,  
seals

**FR-** Couvertres de boîtier,  
joints

**ES-** Cubiertas del cabezal,  
juntas

**IT-** Coperture custodia,  
guarnizioni

**NL-** Behuizing deksels,  
dichtingen

**DE- Reparatur**

bei Endress+Hauser

**EN- Repair**

at Endress+Hauser

**FR- Réparations**

chez Endress+Hauser

**ES - Reparaciones**

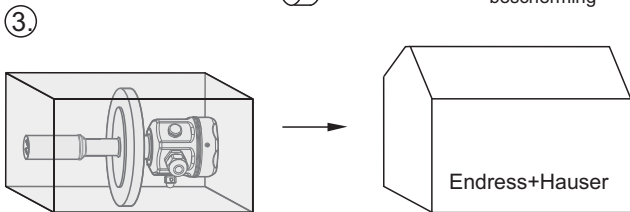
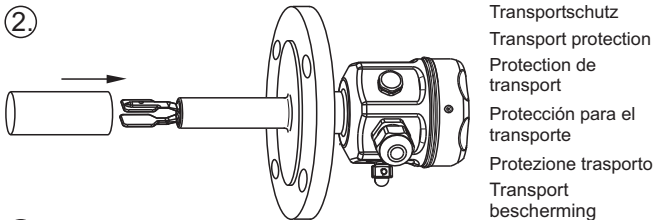
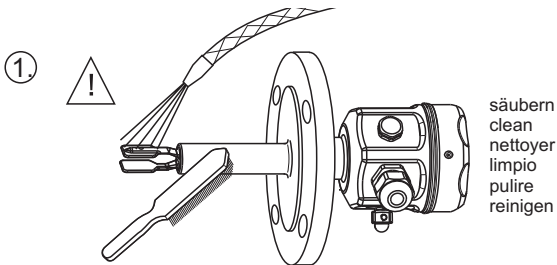
en Endress+Hauser

**IT - Riparare**

presso la Endress+Hauser

**NL- Reparatie**

bij Endress+Hauser





Technische Information / Technical Information / Information technique /  
Información técnica / Informazioni tecniche / Technische Informatie

TI00420F Dichterechner FML621

Betriebsanleitung / Operating Instruction / Mise en service /  
Instrucciones de funcionamiento / Istruzioni operative / Inbedrijfstellingsvoorschrift

BA00335F FEL50D, Dichterechner FML621

Sicherheitshinweise / Notes on Safety / Conseils de sécurité /  
Notas sobre seguridad / Note sulla sicurezza / Veiligheidsinstructies

|          |    |                    |           |          |
|----------|----|--------------------|-----------|----------|
| XA00031F | CE | II 1/2 G           | EEx d     | IIC/IIB  |
| XA00063F | CE | II 1/2 G, II 1/2 D | EEx ia/ib | IIC/IIB  |
| XA00064F | CE | II 1 G             | EEx ia    | IIC/IIB  |
| XA00108F | CE | II 1/2 G           | EEx de    | IIC/IIB  |
| XA00113F | CE | II 1/2 G           | EEx ia/ib | IIC      |
| XA00114F | CE | II 1/2 G           | EEx d     | IIC      |
| XA00115F | CE | II 1/2 G           | EEx de    | IIC      |
| XA00182F | CE | II 3 G, II 3 D,    | EEx nA/nC | IIC/IIIC |

**DE- Ergänzende  
Dokumentation**

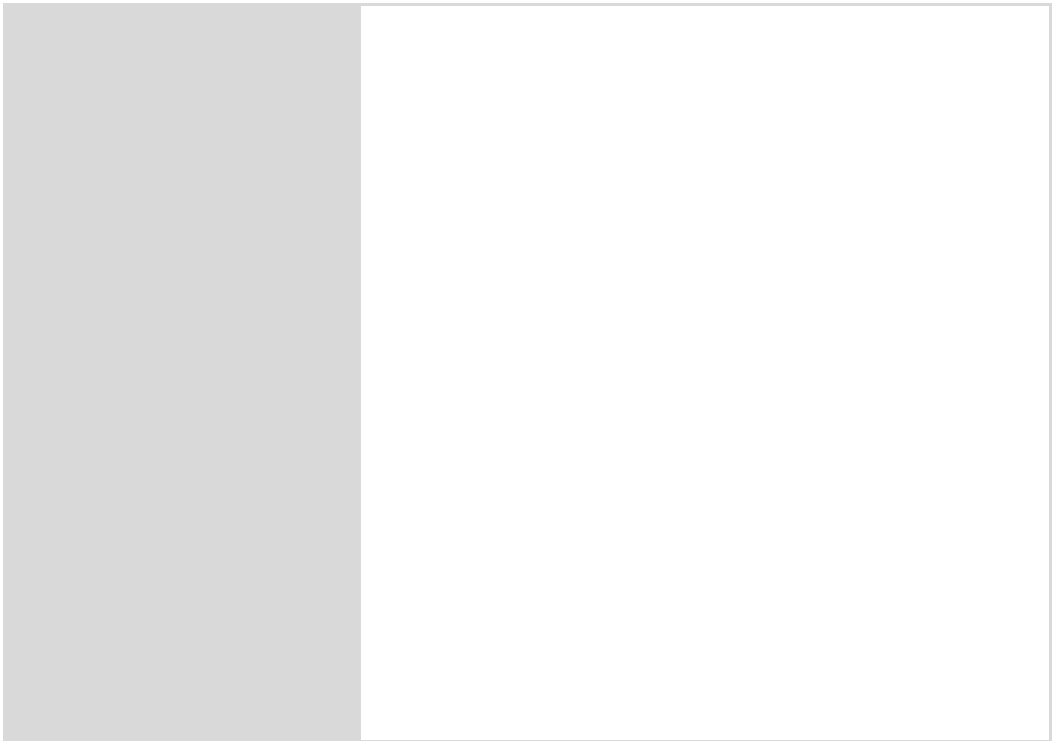
**EN- Supplementary  
Documentation**

**FR- Documentation  
complémentaire**

**ES - Documentación  
adicional**

**IT - Documentazione  
supplementare**

**NL- Aanvullende  
documentati**







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