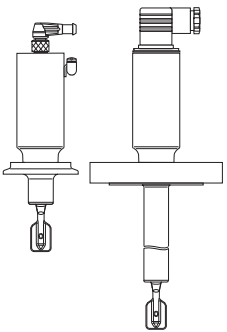

Bruksanvisning
Liquiphant M FTL5x (H)-# ### ## # #3 #

SV - Nivåvakt med kompakt hus

Endress+Hauser
People for Process Automation

SV – Innehåll

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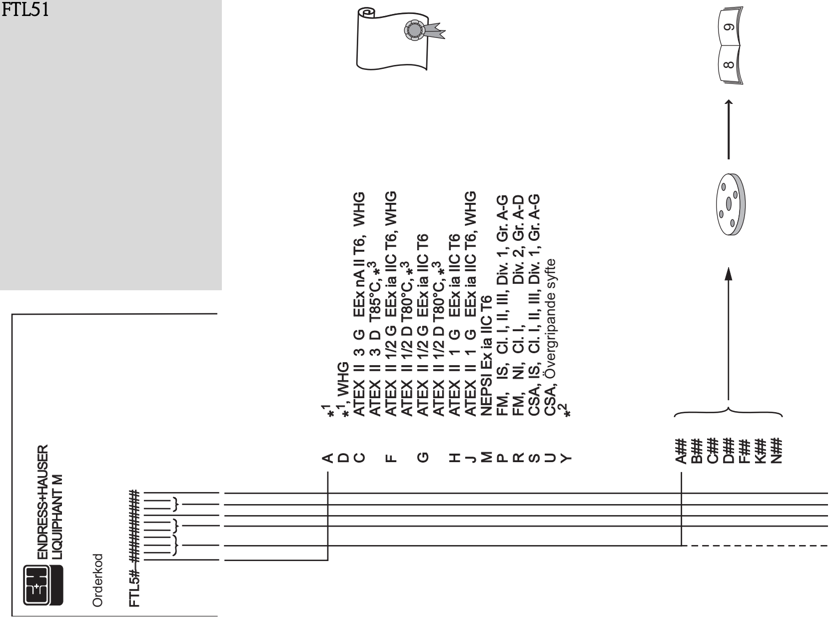
Var försiktig!
= förbjudet:
Leder till felaktig drift
eller förstörelse.

SV – Säkerhetsinformation

Liquiphant M FTL50, FTL51, FTL50H, FTL51H med kompakt hus är konstruerad för att nivågränsdetektering i vätskor. Om den används på fel sätt är det möjligt att risker relaterade till applikationen uppstår.
Enheten får endast installeras, anslutas, styras, drivas och underhållas **av kvalificerad och auktoriserad personal** och under strikt efterlevnad av denna bruksanvisning, eventuella relevanta standarder, rättsliga krav, och, om tillämpligt, certifikaten.
Installera en lättåtkomlig strömbrytare i närheten av enheten. Markera strömbrytaren som avstängningsmekanism för enheten.

SV – Enhetsbeteckning
FTL50, FTL51



GE2	R ¾, DIN 2999, 316L	max. 100 bar, 150 °C
GE5	R ¾, DIN 2999, AlloyC4	
GF2	R 1, DIN 2999, 316L	
GF5	R 1, DIN 2999, AlloyC4	
GM2	NPT ¾, ANSI, 316L	
GM5	NPT ¾, ANSI, AlloyC4	
GN2	NPT 1, ANSI, 316L	
GN5	NPT 1, ANSI, AlloyC4	
GQ2	G ¾, ISO 228, 316L	max. 100 bar, 150 °C
GQ5	G ¾, ISO 228, AlloyC4	
GR2	G 1, ISO 228, 316L	
GR5	G 1, ISO 228, AlloyC4	
GW2	G 1, ISO 228, 316L	max. 40 bar, 100 °C max. 25 bar, 150 °C
TC2	DN 25-38 (1...1½"), ISO 2852, 316L treklämma	max. 16 bar, 120 °C
TE2	DN 40-51 (2"), ISO 2852, 316L treklämma	max. 2 bar, 150 °C
YY9	*2	

6 7

*1 utan

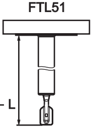
*2 andra

*3 ogiltigt för PBT

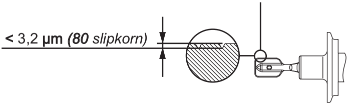
ENDRESS+HAUSER
LIQUIPHANT M

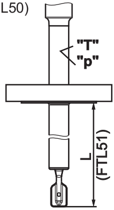
Orderkod

FTL5#-######### #### **mm**
tum



AA	$*^2$		**Ra <** 3,2 **µm/80** slipkorn (FTL50)
BB	.... **mm, 316L,**		**Ra <** 3,2 **µm/80** slipkorn
BE	.... **mm, AlloyC4,**		**Ra <** 3,2 **µm/80** slipkorn
CB	.... tum, **316L,**		**Ra <** 3,2 **µm/80** slipkorn
CE	.... tum, **AlloyC4,**		**Ra <** 3,2 **µm/80** slipkorn
DB	**"L II",**	**316L,**	**Ra <** 3,2 **µm/80** slipkorn
DE	**"L II",**	**AlloyC4,**	**Ra <** 3,2 **µm/80** slipkorn





IA	$*^2$		**+ "T"** (FTL50)
JB	.... **mm, 316L**		**+ "T"**
JE	.... **mm, AlloyC4**		**+ "T"**
KB	.... tum, **316L**		**+ "T"**
KE	.... tum, **AlloyC4**		**+ "T"**
LB	**"L II",**	**316L**	**+ "T"**
LE	**"L II",**	**AlloyC4**	**+ "T"**
QA	$*^2$		**+ "p"** (FTL50)
RB	.... **mm, 316L**		**+ "p"**
RE	.... **mm, AlloyC4**		**+ "p"**
SB	.... tum, **316L**		**+ "p"**
SE	.... tum, **AlloyC4**		**+ "p"**
TB	**"L II",**	**316L**	**+ "p"**
TE	**"L II",**	**AlloyC4**	**+ "p"**
YY	$*^2$		

1	FEL51, 19…253 V AC	30. . . .45
2	FEL52, 10… 55 V DC, PNP	
8	FEL58, NAMUR, H-L	
9	*2	

C3	316L, IP66/68, 5 m
D3	316L, IP65, Pg11, ISO 4400
E3	316L, NEMA 4x, NPT ½, ISO 4400
N3	316L, IP66/68, M12
Y9	*2

A	*1
C	EN 10204-3.1, 316L
N	EN 10204-3.1, NACE MR0175, 316L
P	100 bar (FTL51)
R	100 bar, EN 10204-3.1, NACE MR0175 (FTL51)
S	GL/ABS marincertifikat (FTL51: max. 1600 mm)
Y	*2

*1 utan

*2 andra

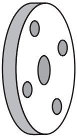
"L II" Omkopplingspunkt

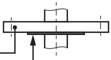
Liquiphant II FTL360/365, FDL30/35

"T" Temperaturdistans

"p" Trycktätning

SV – Flänsar





ANSI B 16.5			
AA2	1¼",	150 lbs,	RF, 316/316L
AB2	1¼",	300 lbs,	RF, 316/316L (FTL51)
AC2	1½",	150 lbs,	RF, 316/316L
AD2	1½",	300 lbs,	RF, 316/316L (FTL51)
AE2	2",	150 lbs,	RF, 316/316L
AE5	2",	150 lbs,	AlloyC4 >316/316L
AF2	2",	300 lbs,	RF, 316/316L
AG2	2",	600 lbs,	RF, 316/316L (FTL51)
AJ2	2½",	300 lbs,	RF, 316/316L (FTL51)
AL2	3",	150 lbs,	RF, 316/316L
AM2	3",	300 lbs,	RF, 316/316L (FTL51)
AN2	3",	600 lbs,	RF, 316/316L (FTL51)
AP2	4",	150 lbs,	RF, 316/316L
AQ2	4",	300 lbs,	RF, 316/316L (FTL51)
AR2	4",	600 lbs,	RF, 316/316L (FTL51)
A82	1",	150 lbs,	RF, 316/316L

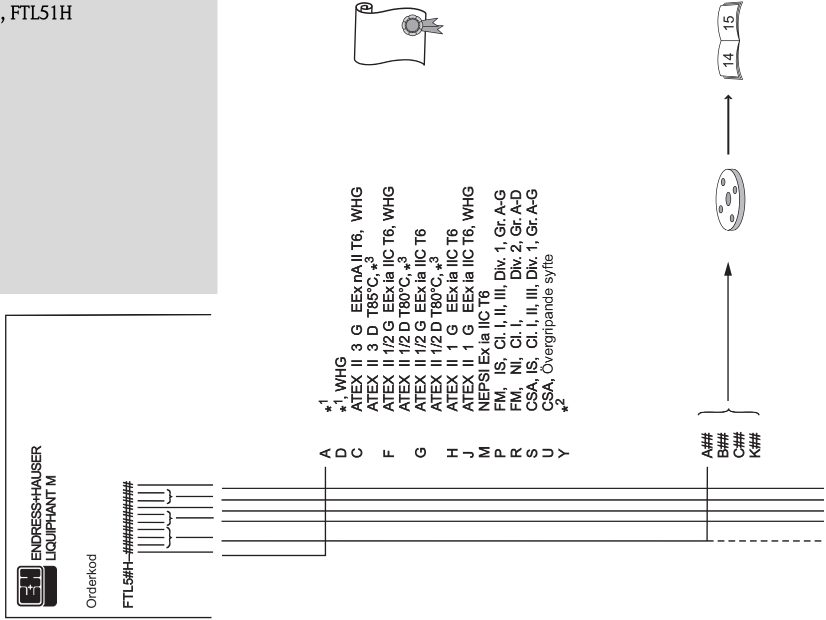
EN 1092-1			
BA2	DN32,	PN6 A,	316L
BB2	DN32,	PN25/40 A,	316L
BC2	DN40,	PN6 A,	316L
BD2	DN40,	PN25/40 A,	316L
BE2	DN50,	PN6 A,	316L
BG2	DN50,	PN25/40 A,	316L
BH2	DN65,	PN6 A,	316L
BJ2	DN50,	PN100 A,	316L (FTL51)
BK2	DN65,	PN25/40 A,	316L
BM2	DN80,	PN10/16 A,	316L
BN2	DN80,	PN25/40 A,	316L
BQ2	DN100,	PN10/16 A,	316L
BR2	DN100,	PN25/40 A,	316L
B12	DN80,	PN100 A,	316L (FTL51)
B82	DN25,	PN25/40 A,	316L

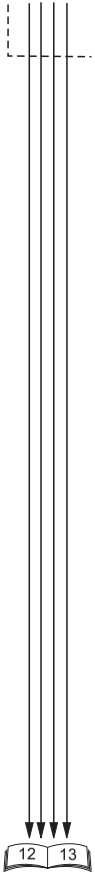
CA2	DN32,	PN6 B1,	316L
CA5	DN32,	PN6,	AlloyC4 >316L
CE2	DN50,	PN6 B1,	316L
CE5	DN50,	PN6,	AlloyC4 >316L
CG2	DN50,	PN25/40 B1,	316L
CG5	DN50,	PN25/40,	AlloyC4 >316L
CJ2	DN50,	PN100 B2,	316L (FTL51)
CN2	DN80,	PN25/40 B1,	316L
CN5	DN80,	PN25/40,	AlloyC4 >316L
CQ2	DN100,	PN10/16 B1,	316L
CQ5	DN100,	PN10/16,	AlloyC4 >316L
C12	DN80,	PN100 B2,	316L (FTL51)
C82	DN25,	PN25/40 B1,	316L
C85	DN25,	PN25/40,	AlloyC4 >316L
DG2	DN50,	PN40 B1,	316L
DN2	DN80,	PN40 B1,	316L
D82	DN25,	PN40 B1,	316L
FG2	DN50,	PN40 C,	316L
NG2	DN50,	PN40 D,	316L

JIS B2220

KA2	10K 25,	RF,	316L
KC2	10K 40,	RF,	316L
KE2	10K 50,	RF,	316L
KE5	10K 50,		AlloyC4 >316L
KL2	10K 80,	RF,	316L
KP2	10K 100,	RF,	316L

SV – Enhetsbeteckning
FTL50H, FTL51H





EE2	1", 316L	max. 40 bar, 100 °C max. 25 bar, 150 °C
GQ2	G ¾, ISO 228, 316L (FTL50H)	max. 100 bar, 150 °C
GW2	G 1, ISO 228, 316L	max. 40 bar, 100 °C max. 25 bar, 150 °C
HE2	DIN 11864-1 A, DN50, 316L	max. 25 bar, 140 °C
MA2	DIN 11851, DN32 PN25, 316L	DN32/40: max. 40 bar, 100 °C DN32/40, DN50: max. 25 bar, 140 °C
MC2	DIN 11851, DN40 PN25, 316L	
ME2	DIN 11851, DN50 PN25, 316L	
PE2	DRD, 65 mm, 316L	max. 40 bar, 100 °C max. 25 bar, 150 °C
TC2	DN25-38 (1...1½"), ISO 2852, 316L treklämma	max. 16 bar, 120 °C max. 2 bar, 150 °C
TE2	DN40-51 (2"), ISO 2852, 316L treklämma	
UE2	SMS 2", PN25, 316L	max. 25 bar, 140 °C
WE2	Varivent®, DN65-162 PN10, 316L	max. 64 bar, 150 °C
YY9	*2	

*1 utan

*2 andra

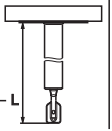
*3 ogiltigt för PBT

ENDRESS+HAUSER
LIQUIPHANT M

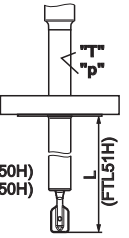
Orderkod

FTL51H

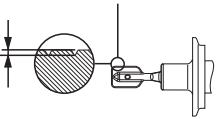
FTL5#H-########## #### mm
tum



AC	*2	**Ra <** 1,5 **µm/120** slipkorn (FTL50H)
AD	*2	**Ra <** 0,3 **µm/320** slipkorn 3A (FTL50H)
BC	..... mm,	**Ra <** 1,5 **µm/120** slipkorn
BD	..... mm,	**Ra <** 0,3 **µm/320** slipkorn 3A
CC	..... tum,	**Ra <** 1,5 **µm/120** slipkorn
CD	..... tum,	**Ra <** 0,3 **µm/320** slipkorn 3A
DC	"L II",	**Ra <** 1,5 **µm/120** slipkorn
DD	"L II",	**Ra <** 0,3 **µm/320** slipkorn 3A
IC	*2	**Ra <** 1,5 **µm/120** slipkorn + **"T" (FTL50H)**
ID	*2	**Ra <** 0,3 **µm/320** slipkorn 3A + **"T" (FTL50H)**
JC	..... mm,	**Ra <** 1,5 **µm/120** slipkorn + **"T"**
JD	..... mm,	**Ra <** 0,3 **µm/320** slipkorn + **"T"**
KC	..... tum,	**Ra <** 1,5 **µm/120** slipkorn + **"T"**
KD	..... tum,	**Ra <** 0,3 **µm/320** slipkorn + **"T"**
LC	"L II",	**Ra <** 1,5 **µm/120** slipkorn + **"T"**
LD	"L II",	**Ra <** 0,3 **µm/320** slipkorn + **"T"**
QC	*2	**Ra <** 1,5 **µm/120** slipkorn + **"p" (FTL50H)**
QD	*2	**Ra <** 0,3 **µm/320** slipkorn 3A + **"p" (FTL50H)**
RC	..... mm,	**Ra <** 1,5 **µm/120** slipkorn + **"p"**
RD	..... mm,	**Ra <** 0,3 **µm/320** slipkorn + **"p"**
SC	..... tum,	**Ra <** 1,5 **µm/120** slipkorn + **"p"**
SD	..... tum,	**Ra <** 0,3 **µm/320** slipkorn + **"p"**
TC	"L II",	**Ra <** 1,5 **µm/120** slipkorn + **"p"**
TD	"L II",	**Ra <** 0,3 **µm/320** slipkorn + **"p"**



< 1,5 **µm** ***(120** slipkorn)*
< 0,3 **µm** ***(320** slipkorn)*



YY *2

30...45

1	FEL51, 19…253 V AC
2	FEL52, 10… 55 V DC, PNP
8	FEL58, NAMUR, H-L
9	*2

C3	316L, IP66/68, 5 m
D3	316L, IP65, Pg11, ISO 4400
E3	316L, NEMA 4x, NPT ½, ISO 4400
N3	316L, IP66/68, M12
Y9	*2

A	*1
B	EN 10204-3.1, CoC
C	EN 10204-3.1, 316L
S	GL/ABS marincertifikat **(FTL51H: max. 1600 mm)**
Y	*2

*1 utan

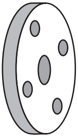
*2 andra

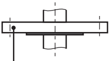
"L II" Omkopplingspunkt

Liquiphant II FTL360/365, FDL30/35

"T" Temperaturdistans

"p" Trycktätning





ANSI B 16.5

AA2	1¼",	150 lbs, RF, 316/316L
AC2	1½",	150 lbs, RF, 316/316L
AE2	2",	150 lbs, RF, 316/316L
AF2	2",	300 lbs, RF, 316/316L
AJ2	2½",	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
AQ2	4",	300 lbs, RF, 316/316L (FTL51H)
A82	1",	150 lbs, RF, 316/316L

EN 1092-1

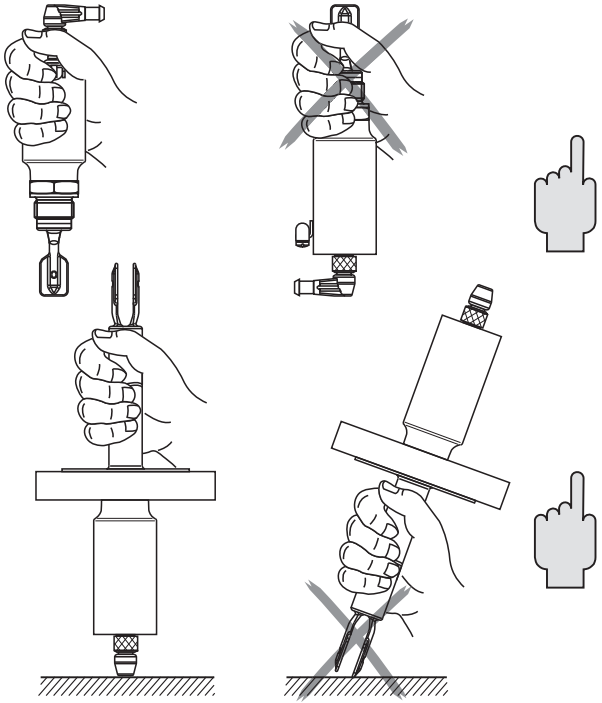
BA2	DN32,	PN6 A,	316L
BB2	DN32,	PN25/40 A,	316L
BC2	DN40,	PN6 A,	316L
BD2	DN40,	PN25/40 A,	316L
BE2	DN50,	PN6 A,	316L
BG2	DN50,	PN25/40 A,	316L
BH2	DN65,	PN6 A,	316L
BK2	DN65,	PN25/40 A,	316L
BM2	DN80,	PN10/16 A,	316L
BN2	DN80,	PN25/40 A,	316L
BQ2	DN100,	PN10/16 A,	316L
BR2	DN100,	PN25/40 A,	316L
B82	DN25,	PN25/40 A,	316L
CG2	DN50,	PN25/40 B1,	316L
CN2	DN80,	PN25/40 B1,	316L
CQ2	DN100,	PN10/16 B1,	316L

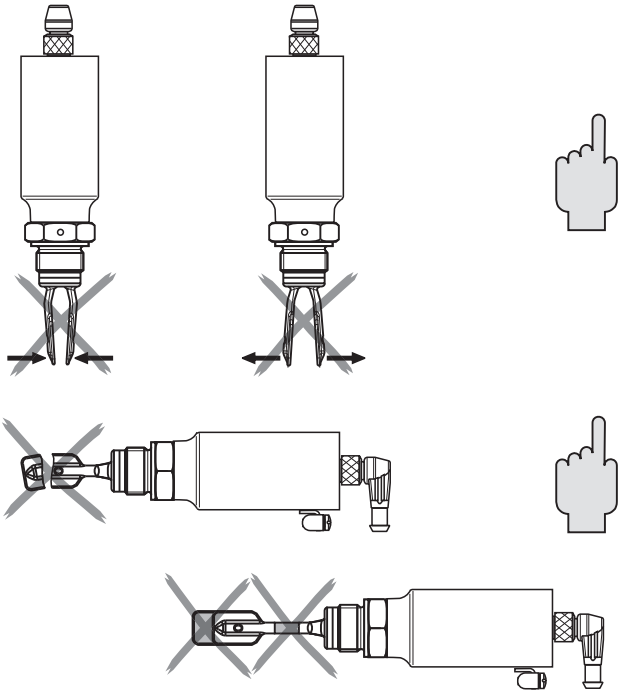
JIS B2220

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

SV – Handhavande

Håll den i huset, flänsen eller förlängningstuben

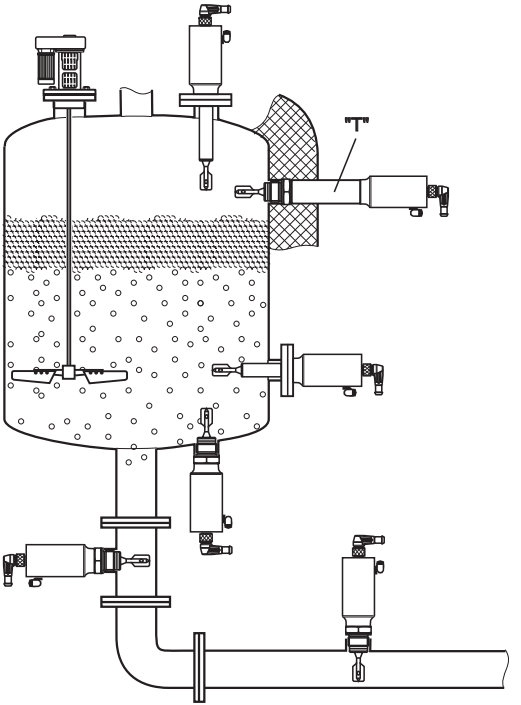


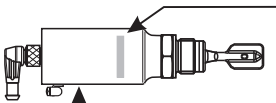


SV – Böj den **inte**
Bryt **inte** av den
Förläng den **inte**

SV – Applikation

Nivådetektering i vätskor

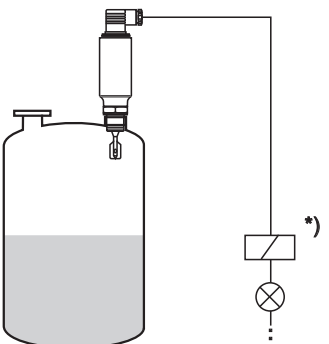




Orderkod:
FTL5#(H) - # ### ## # ## #

Elektronisk

FEL51
FEL52
FEL58

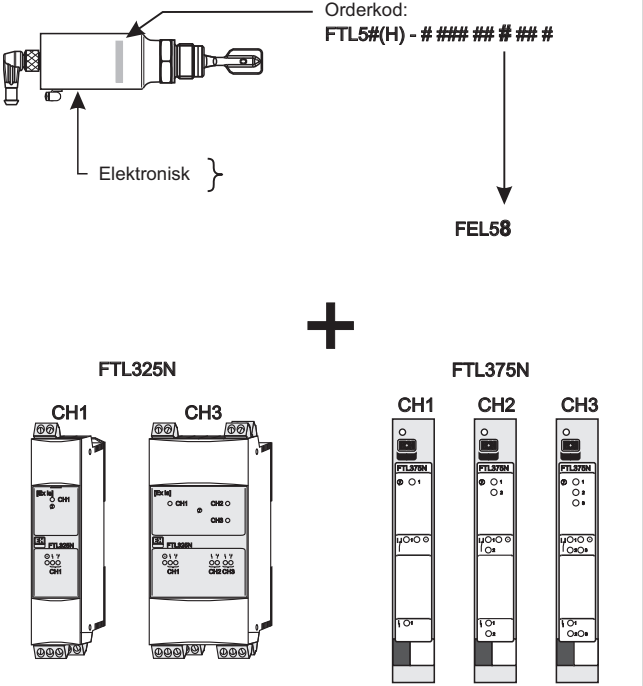


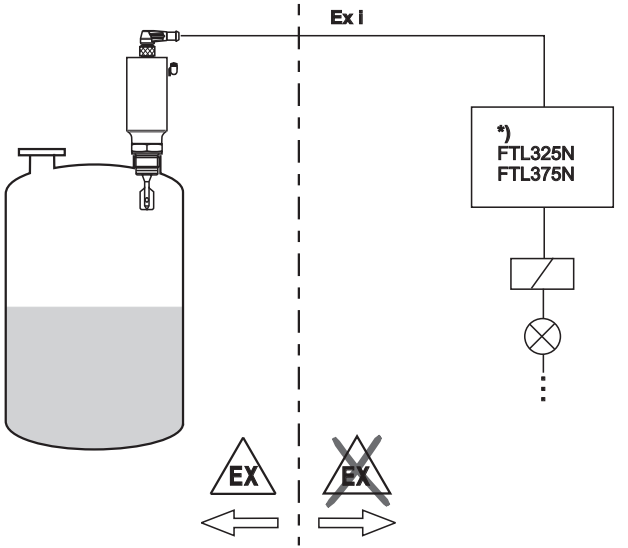
*) Extern last

SV – Mätsystem
för direktanslutning

SV – Mätsystem

för anslutning via omkomplingsenhet

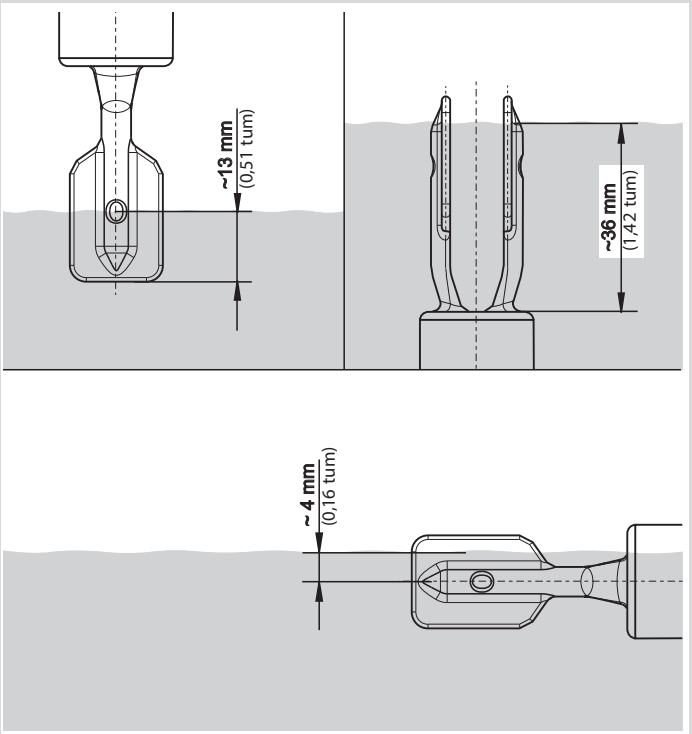




*) Omkopplingsenhet, PLC, isoleringsförstärkare

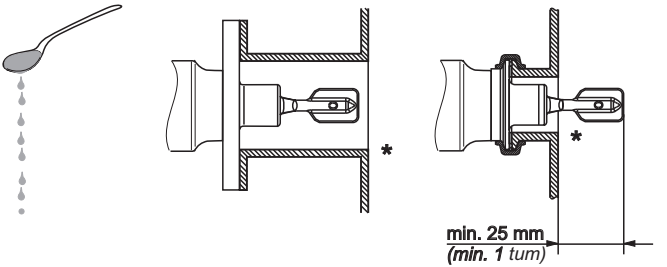
SV – Montering

Omkopplingspunkten beror på monteringspositionen



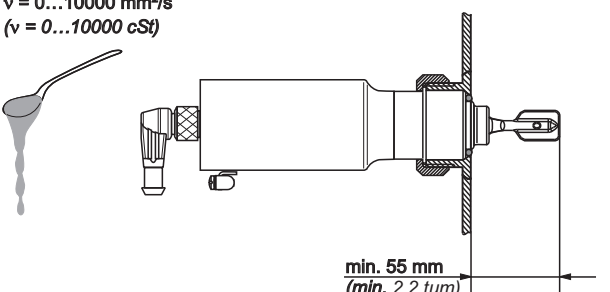
SV – Monteringsexempel som en funktion av vätskeviskositet ν

ν = 0…2000 mm²/s
(ν = 0…2000 cSt)

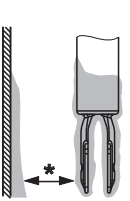


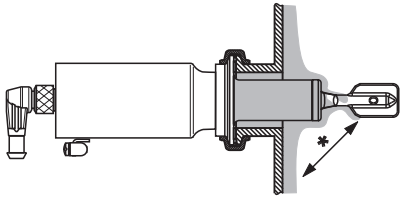
* grada av

ν = 0…10000 mm²/s
(ν = 0…10000 cSt)

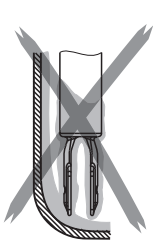


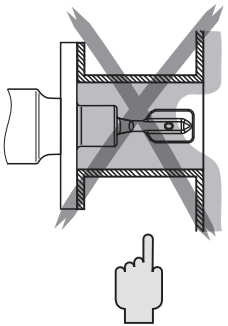
SV – Tänk på avlagringarna.
Gaffeln får inte vara i kontakt med avlagringarna

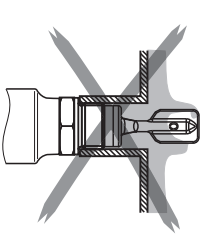


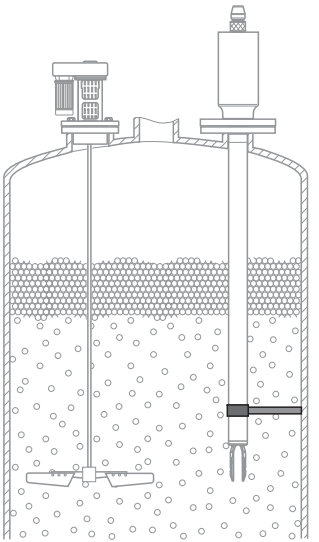


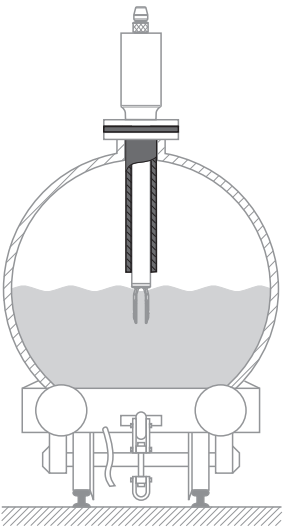
* Avstånd!





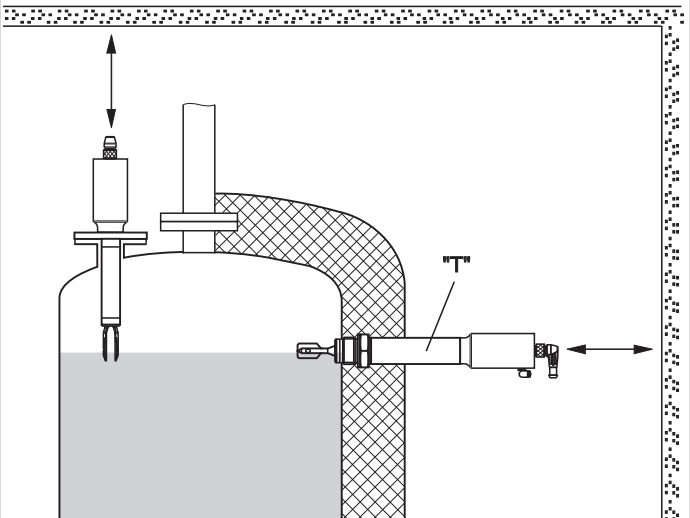


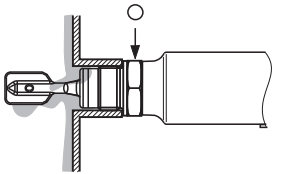


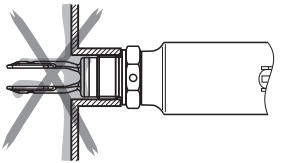


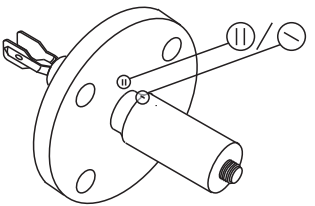
SV – Ge extra stöd vid dynamiska krafter

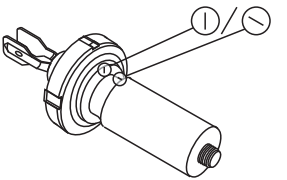
"T" = med temperaturdistans för isolerade tankar

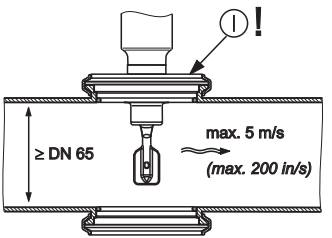


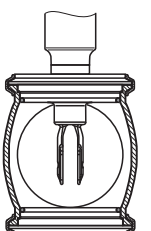








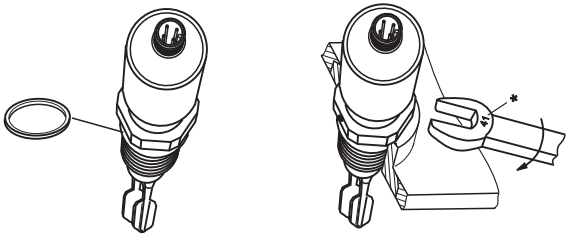




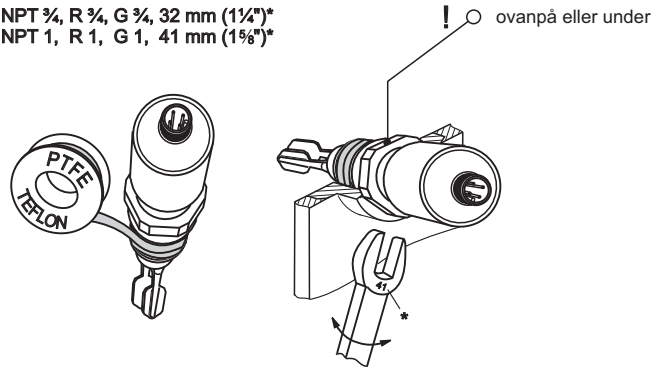
SV – Rikta in gaffelklorna:
Markering ovanpå eller under
Riktning i rören:
Markering i flödesriktningen

SV – Skruva fast Liquiphant på processanslutningen.
Använd inte huset för att skruva fast den.

G ¾, 32 mm (1¼")*
G 1, 41 mm (1⅝")*



NPT ¾, R ¾, G ¾, 32 mm (1¼")*
NPT 1, R 1, G 1, 41 mm (1⅝")*

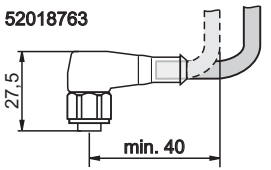


SV – Anslutningar

Mått i mm

Antal = Färg

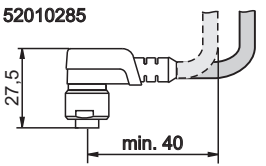
52018763



1 = BN
2 = WT
3 = BU
4 = BK

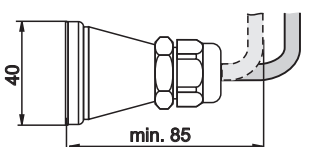
FTL5#(H) #######N3# (M12x1)

52010285



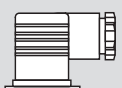
1 = BN
2 = WT
3 = BU
4 = BK

FTL5#(H) - #######C3#



1 = BU
2 = BK
3 = BN
4 = GNYE

FTL5#(H)-#######D3# (PG11)
FTL5#(H)-#######E3# (NPT1/2")

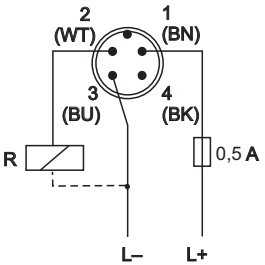


-30°C ≤ TA ≤ +70°C

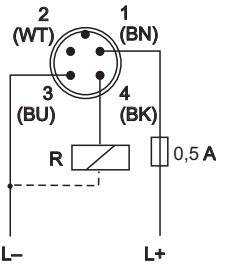
100 mm = 3,94 tum

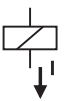
SV – Anslutningar M12x1
FEL52 DC-PNP

MAX



MIN



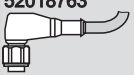


R = extern last

Imax. 350 mA
U = 10...55 V

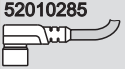
Strömförsörjning med galvanisk isolering enligt t.ex. EN 61558-1

52018763

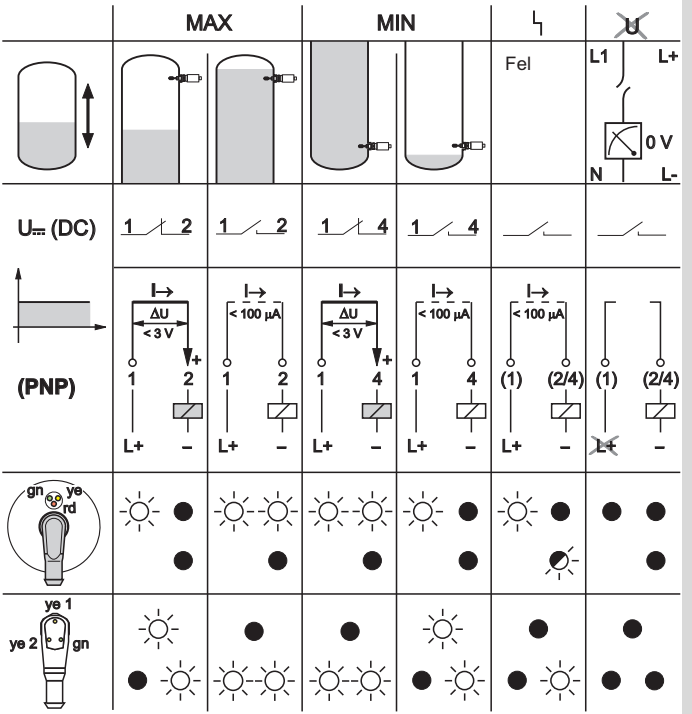


FTL5#(H)-#######N3# (M12x1)

52010285



FTL5#(H)-#######N3# (M12x1)



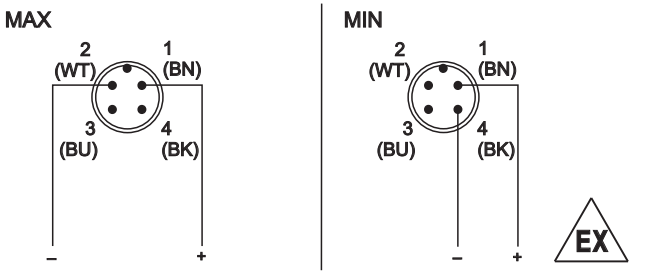
SV – Funktion
FEL52 DC-PNP

lyser

blinkar

av

SV – Anslutningar M12x1
FEL58 NAMUR



H 2,2…3,5 **mA**

L 0,6…1,0 **mA**

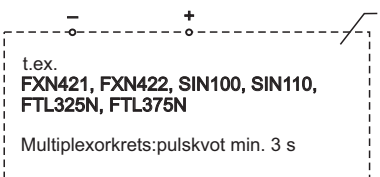
Strömförsörjning
Likström: 8,2 V +/- 20 %

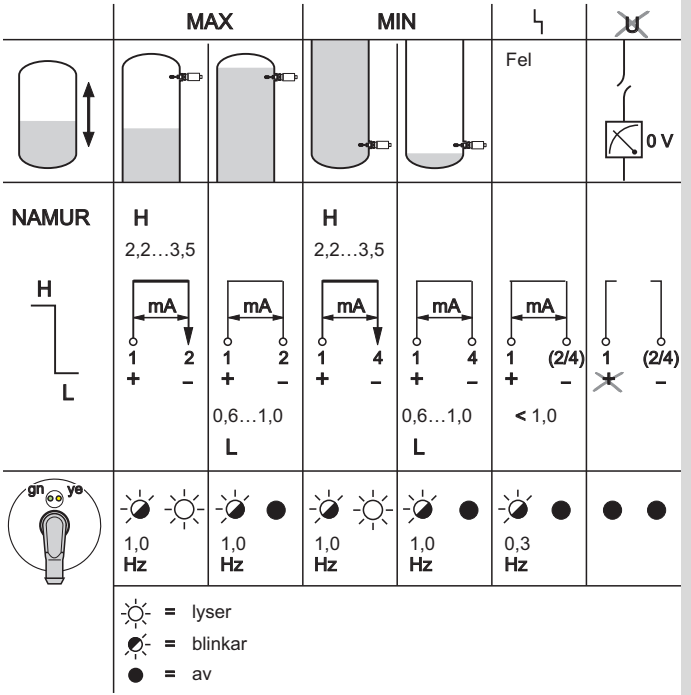
52018763

FTL5#(H)-#######N3# (M12x1)

52010285

FTL5#(H)-#######N3# (M12x1)

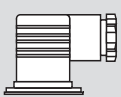




SV – Funktion
FEL58 NAMUR

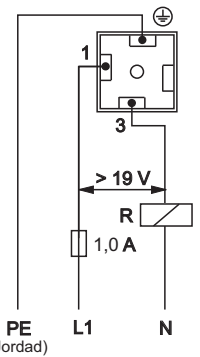
SV – Anslutning ventilkontakt
FEL51 AC

FTL5#(H)-#######D3# (PG11)
FTL5#(H)-#######E3# (NPT1/2")

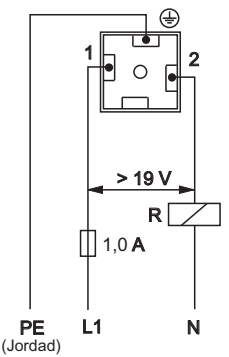


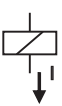
-30°C ≤ TA ≤ +70°C

MAX



MIN

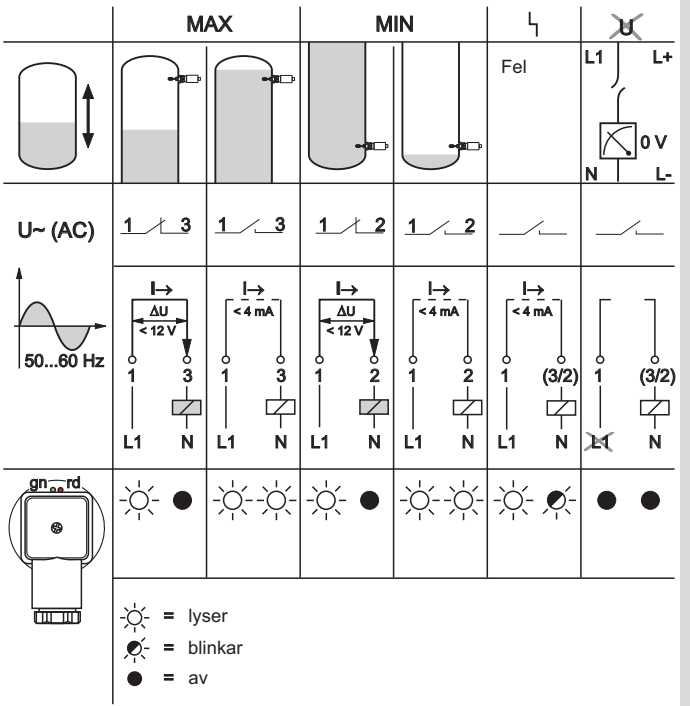




R = extern last

I max. 350 mA
U ≈ 19...253 V AC

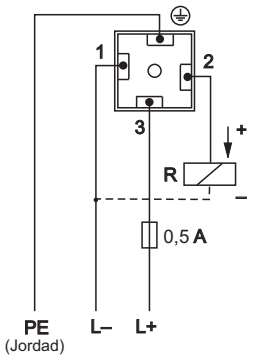
min. 2,5 VA / 253 V (10 mA)
min. 0,5 VA / 24 V (20 mA)



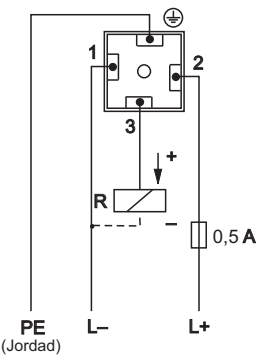
SV – Funktion
FEL51 AC

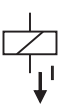
SV – Anslutning ventilkontakt
FEL52 DC-PNP

MAX



MIN

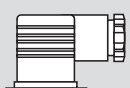




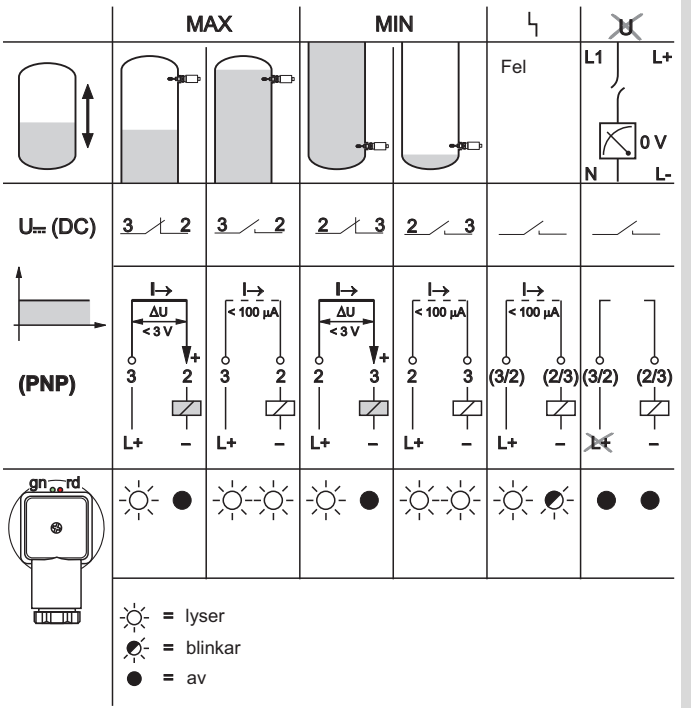
R = extern last

Imax. 350 mA
U = 10...55 V

FTL5#(H)-#######D3# (PG11)
FTL5#(H)-#######E3# (NPT1/2")

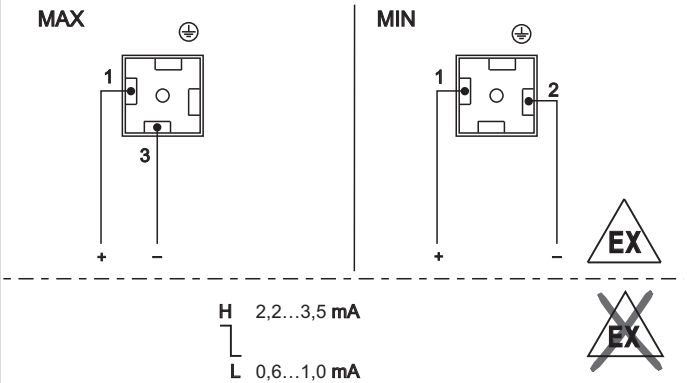


-30°C ≤ TA ≤ +70°C



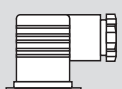
SV – Funktion
FEL52 DC-PNP

SV – Anslutning ventilkontakt
FEL58 NAMUR

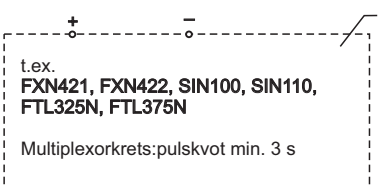


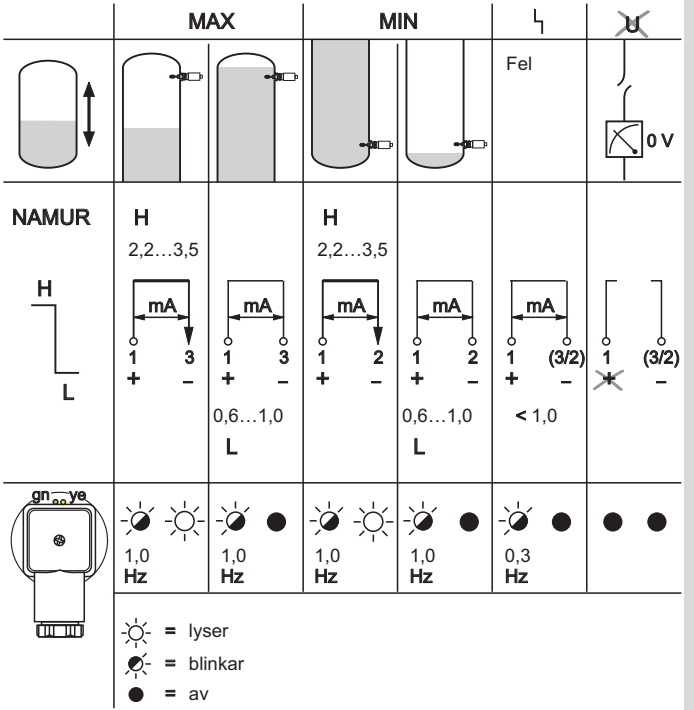
Strömförsörjning
Likström: 8,2 V +/- 20 %

FTL5#(H)-#######D3# (PG11)
FTL5#(H)-#######E3# (NPT1/2")



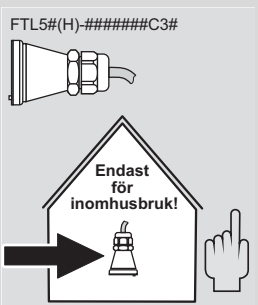
-30°C ≤ TA ≤ +70°C

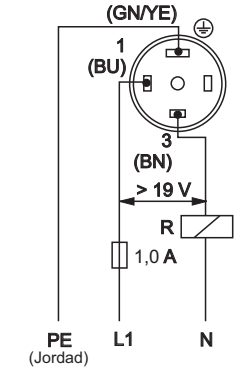


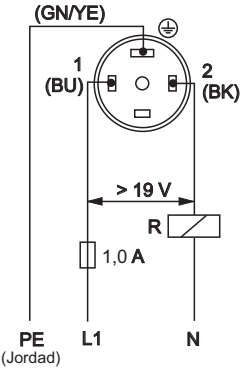


SV – Funktion
FEL58 NAMUR

SV – Anslutning
ej ansluten kabeländе
FEL51 AC



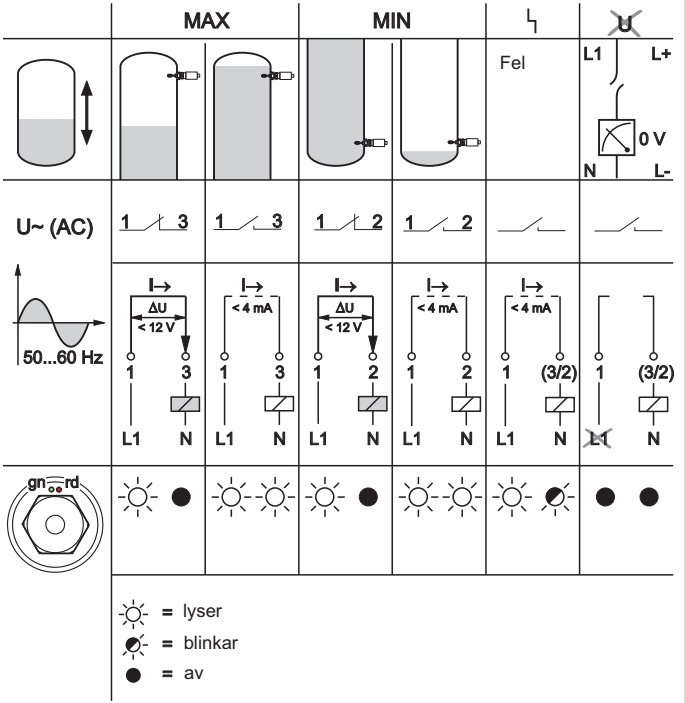




R = extern last

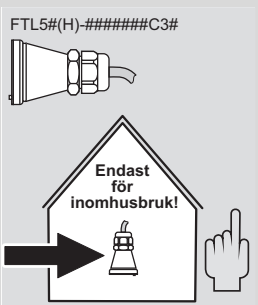
Imax. 350 mA
U ≈ 19…253 V AC

min. 2,5 **VA / 253 V (10 mA)**
min. 0,5 **VA / 24 V (20 mA)**

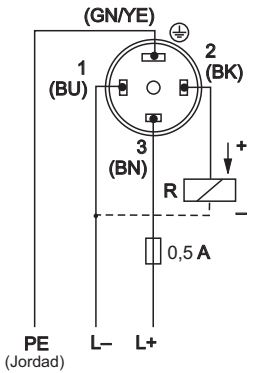


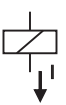
SV – Funktion
FEL51 AC

SV – Anslutning
ej ansluten kabeländ
FEL52 DC-PNP



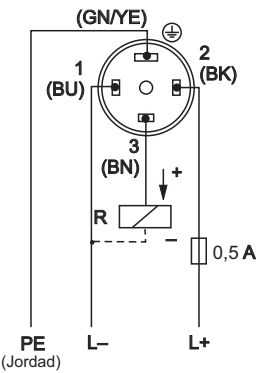
MAX



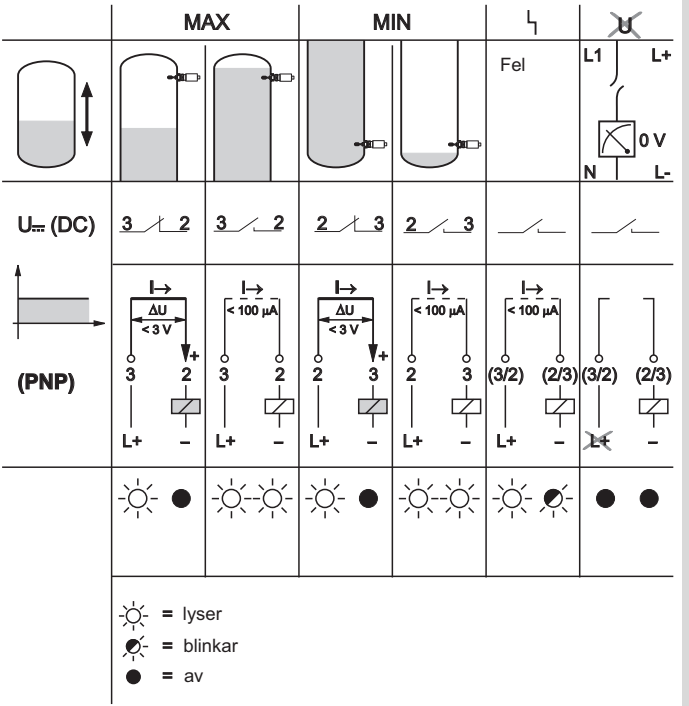


R = extern last

MIN

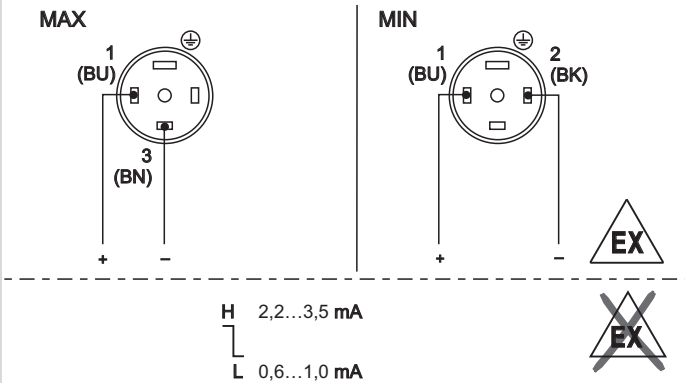


Imax. 350 mA
U = 10...55 V

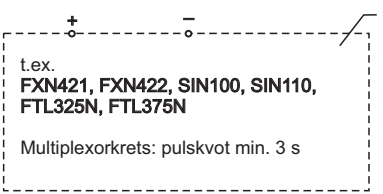


SV – Funktion
FEL52 DC-PNP

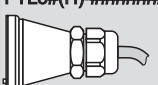
SV – Anslutning
ej ansluten kabelände
FEL58 NAMUR

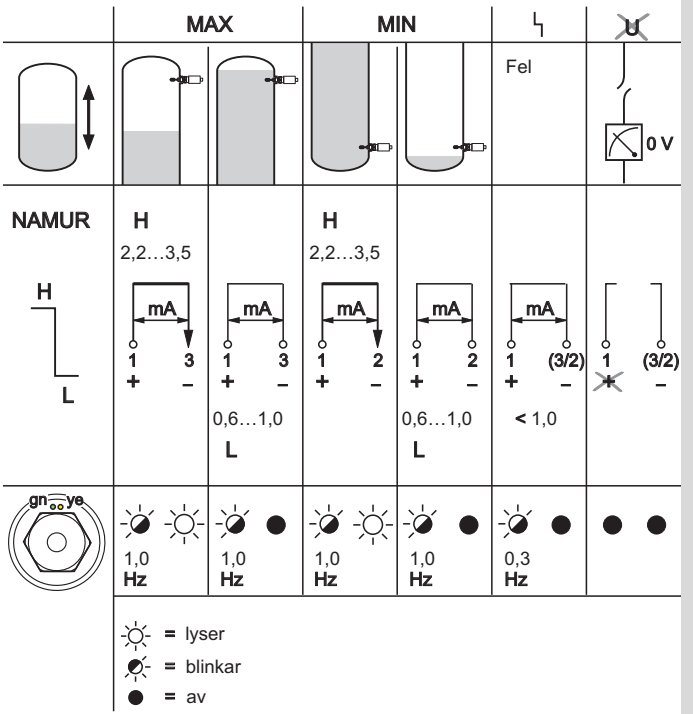


Strömförsörjning
Likström: 8,2 V +/- 20 %



FTL5#(H)-#######C3#



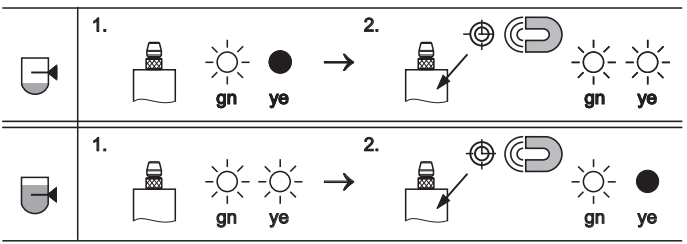


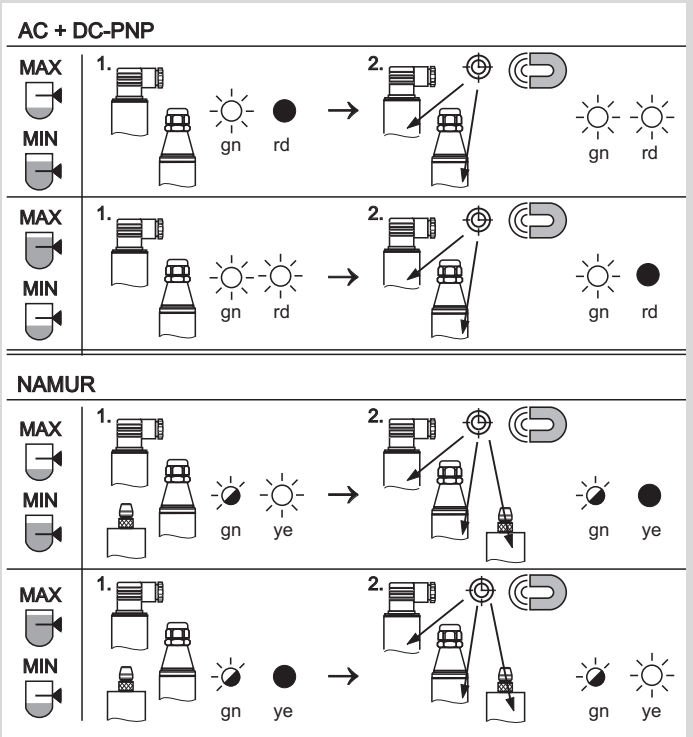
SV – Funktion
FEL58 NAMUR

SV – Test med testmagnet

Du måste se till att inga farliga processer i systemet sätts igång

DC-PNP + M12x1




AC + DC-PNP
MAX
MIN
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2.
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MAX
MIN
1.
2.
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rd
NAMUR
MAX
MIN
1.
2.
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MAX
MIN
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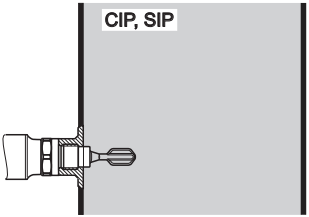
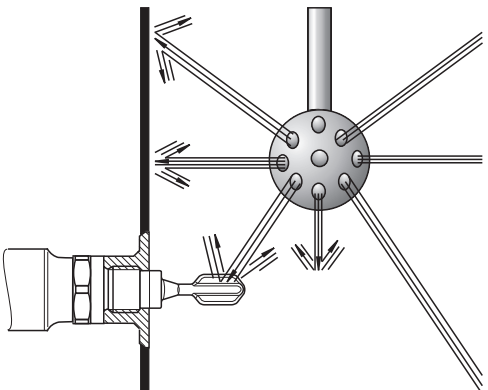
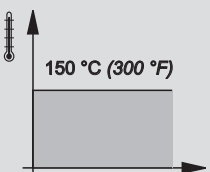
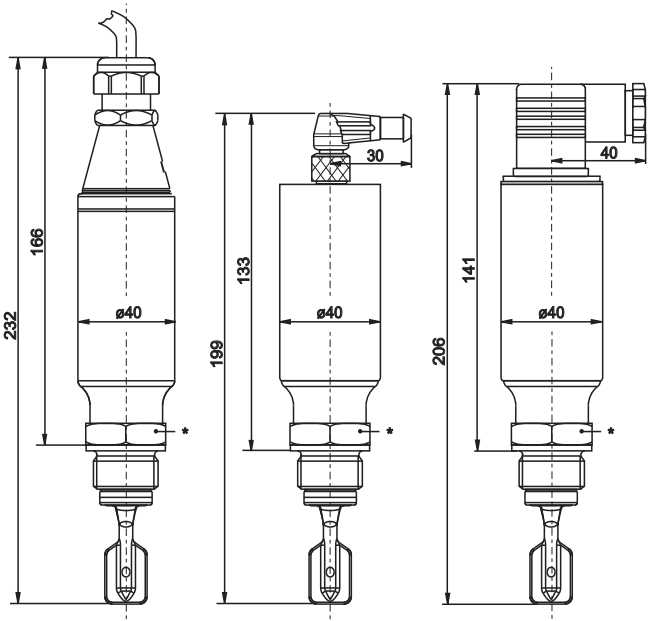
ye


CIP, SIP




150 °C (300 °F)



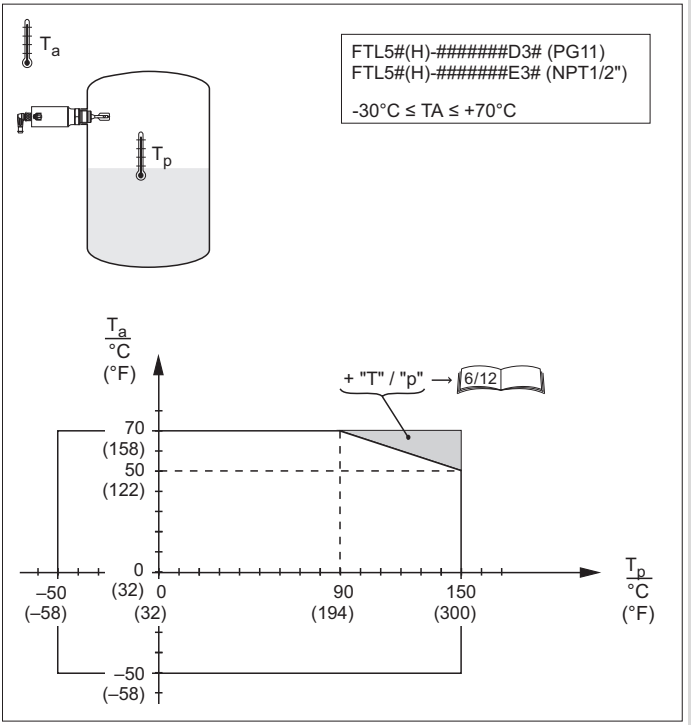
* SW 32 / 32 AF

SV – Teknisk information

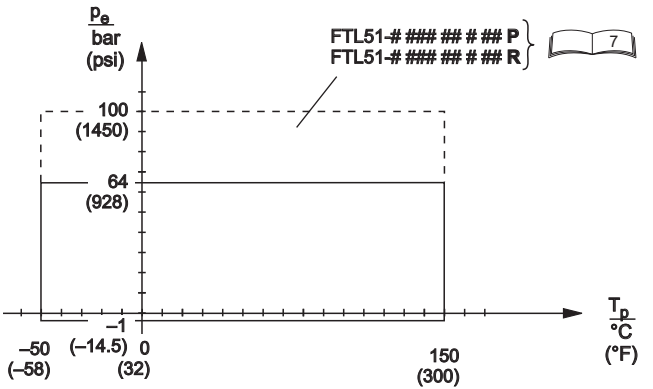
Mått i mm

100 mm = 3, 94 tum

SV – Omgivningstemperatur T_a
Processtemperatur T_p

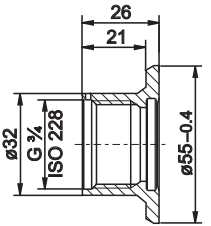


SV – Processtryck p_e
Processtemperatur T_p



SV – Tillbehör, reservdelar

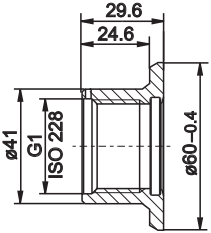
Mått i mm



G ¾

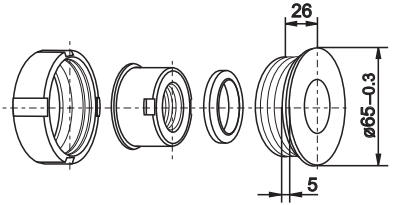
52001052

Svetsad fattning



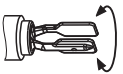
G 1

52001051

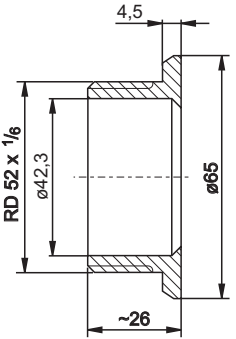


G 1

52001221



100 mm = 3, 94 tum



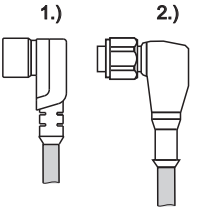
Svetsad fattning

SV – Mått i mm

Kabel
4 x 0,34

1.) M12, vinklad
52010285

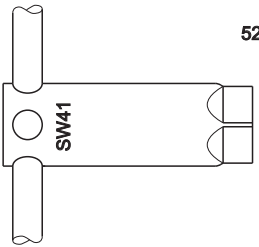
2.) med M12-uttag (+LED)
52018763



1.)
Kabel – fast position:
–25...+70 °C (-13 till +158 °F)
Kabel – flexibel:
–5...+70 °C (23 till +158 °F)
Inte för Ex-nA-applikationer!

100 mm = 3, 94 tum

Uttagets mätomfång 41 AF för processanslutning



52010156

52013204 Testmagnet

AC- och DC-PNP-versioner med ventilkontakt

Funktionsfel	Orsak	Åtgärd
Grön lampa lyser inte	Ingen strömförsörjning	Kontrollera kontakt, kabel och strömförsörjning
Röd lampa blinkar	Överbelastning eller kortslutning i laddströmkretsen	Likrikta kortslutningen
		Reducera den maximala belastnings-strömmen till under 350 mA
	Internt sensorfel eller korroderad sensor	Byt ut enheten

DC-PNP-versioner med M12x1-kontakt

Funktionsfel	Orsak	Åtgärd
Röd lampa lyser (DC-PNP)	Överbelastning eller kortslutning i laddströmkretsen	Likrikta kortslutningen
		Reducera den maximala belastnings-strömmen till under 250 mA
Grön lampa lyser inte	Ingen strömförsörjning	Kontrollera kontakt, kabel och strömförsörjning
Röd lampa blinkar (2 Hz)	Internt sensorfel eller korroderad sensor	Byt ut enheten

NAMUR

Funktionsfel	Orsak	Åtgärd
Grön lampa blinkar inte	Ingen strömförsörjning från byte av förstärkaren	Kontrollera kontakt, kabel och strömförsörjning
Röd lampa blinkar (0,3 Hz)	Internt sensorfel eller korroderad sensor	Byt ut enheten

SV – Tilläggsdokumentation

Teknisk information

TI00328F Liquiphant FTL50, FTL50H, FTL51, FTL51H

Driftinstruktion

BA00141F FEL50A, PROFIBUS PA

Säkerhetsinformation

XA00031F	CE ⟨Ex⟩	II 1/2 G,	Ex d	IIC/IIB
XA00063F	CE ⟨Ex⟩	II 1/2 G,	Ex ia/ib	IIC/IIB
XA00064F	CE ⟨Ex⟩	II 1 G,	Ex ia	IIC/IIB
XA00154F	CE ⟨Ex⟩	II 1/2 G/D,	Ex ia/ib	IIC/IIB
XA00159F	CE ⟨Ex⟩	II 1 G,	Ex ia	IIC/IIB

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