6.1 Analytical instruments

Our analytical instruments include conductivity transmitters, that are highly accurate, PEEK and stainless steel devices that measure the ability of process liquids to carry electrical currents. Ideal for use in the brewery, food, beverage, and biopharm industries for example to measure separation in a tank or media in the piping of a CIP system.

The conductivity sensor for hygienic use

Alfa Laval Conductivity Transmitter

Application

The Alfa Laval conductivity transmitter is designed to fulfill the demands of conductivity transmitters in hygienic production. The main features are:

- Wetted parts in PEEK
- Compact, food compatible, hygienic design
- Process temperature -20 to 140°C
- 4 configurable measuring ranges
- Adjustable, active and very fast temperature compensation
- Insensitive to polarization, adhesion and solids
- Built-in graphical display and touch screen
- Compatible with Alfa Laval In-line instrumentation system
- 4-20 mA output for conductivity and temperature

TECHNICAL DATA

Conductivity

Messuring range: . . . . . 50 µS/cm to 1 S/cm
Accuracy:
0-500 µS/cm . . . . . ≤ 1.5 %
0-1/0-500 µS/cm . . . . . ≤ 1.0 %
0-1 µS/cm . . . . . ≤ 1.5 %

Temperature

Measuring range: . . . . . -20 to 140°C (150°C up to 1 hour)
Resolution: . . . . . 0.1°C
Accuracy: . . . . . < 0.4 %
Repeateability: . . . . . 0.2% of FS
Protection class: IP67
Max media pressure: . . . . . 10 bar

Electrical data

Power supply: . . . . . 15-35 Vdc
Power consumption max: . . . . 180 mA
Output conductivity: . . . . . 4-20 mA, max. load 500 Ohm,
Output temperature: . . . . . 4-20 mA, max. load 500 Ohm,
Connection: . . . . . M12 plug or M16 cable gland
Response time: . . . . . <3 ms

Ambient temperature

Without display . . . . . -40 - 85°C
With display . . . . . -30 - 80°C

Authorized to carry the 3A symbol

CE

PHYSICAL DATA

Sensor lenght (L): . . . . . Short or Long
Housing (ø): . . . . . 80 mm

Materials

Wetted parts (Short): . . . . . PEEK
Wetted parts (Long): . . . . . PEEK
Fieldhouse: . . . . . AISI 304
Surface finish: . . . . . Ra < 0.8 µm

Operating temperature

Wetted parts: . . . . . -20 to 140°C (150°C < 1 hour)
Field house: . . . . . -20 to 80°C

Weight

Conductivity sensor: . . . . . Approx. 1500 gr.

Process connection

- Clamp DN38 (ISO2852)/clamp DN40 (DIN32676)
- Clamp DN50 (ISO2852)/clamp DN51 (DIN32676)
- G1" (ISO228)
- DN32 (DIN11851)
- DN40 (DIN11851)
- DN50 (DIN11851)
- HTC Connection 1½”
- HTC Connection 2”
- HTC Connection 2½”
- HTC Connection 3”
- HTC Connection 4”

Certificates

-3.1 (Option) (FDA conformity declaration for Peek materials included)

-Calibration certificate (Option)

Conductivity resolution

Range		Resolution	
0 to 0.5	mS/cm	0.001	mS/cm
0 to 1	mS/cm	0.001	mS/cm
0 to 2	mS/cm	0.010	mS/cm
0 to 3	mS/cm	0.010	mS/cm
0 to 5	mS/cm	0.010	mS/cm
0 to 10	mS/cm	0.100	mS/cm
0 to 20	mS/cm	0.100	mS/cm
0 to 30	mS/cm	0.100	mS/cm
0 to 50	mS/cm	0.100	mS/cm
0 to 100	mS/cm	1.000	mS/cm
0 to 200	mS/cm	1.000	mS/cm
0 to 300	mS/cm	1.000	mS/cm
0 to 500	mS/cm	1.000	mS/cm
0 to 999	mS/cm	1.000	mS/cm

Standard range

The Alfa Laval conductivity transmitter is a transmitter for inductive measurement of conductivity. Precise, configurable temperature compensation and remote setting of the four pre-configured measuring ranges make the Alfa Laval conductivity transmitter ideal for a wide range of conductivity measurements. The integrated graphical display and touch screen offers the user instant local supervision, which is an advantage e.g. in manually operated cleaning systems.

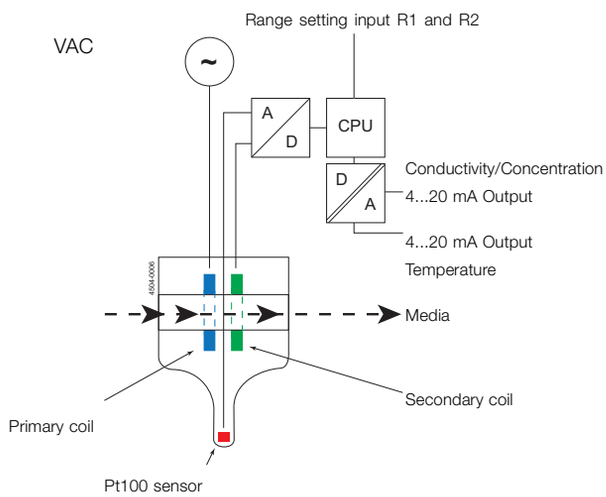
A high operating temperature limit is an advantage in SIP systems. The optimized flow geometry and the fast response time make the Alfa Laval conductivity sensor particularly suitable in applications for separation of medias and measurements of cleaning agents in CIP equipment. The accuracy is excellent even at very low conductivity and flow rates.

Working principle

Inductive conductivity measurement is based on the principle of a transformer. The primary side of the transformer is controlled by an AC voltage generator. The liquid flowing through the channel bore in the measuring head and forms a conductor loop, which links between the primary side of the transformer and the secondary side of the transformer .

The output current is proportional with the conductivity of the media. Signal conditioning, amplification and conversion provide a 4-20 mA signal output from the galvanically isolated D/A converter.

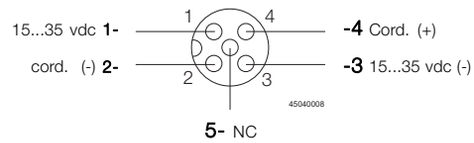
The fast-response temperature sensor in the tip compensates for the temperature in the liquid resulting in maximum accuracy and reliability.



Electrical data and connections

Both output signals are as standard galvanicaliy isolated from the power supply. Adjustment of measuring range and local readout of conductivity and temperature is done on the touch screen. Range selection can also be done remotely.

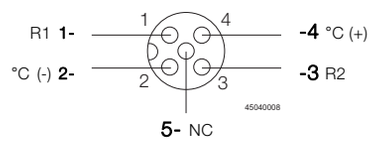
Left side electriccal connection (Front view)



Left side M12, 5 pin connector

1. Brown	Supply(+)	(15 ... 35 vdc)
2.White	Cond. (-)	(4 ... 20 rnA)
3. Blue	Supply(-)	(15 ... 35 vdc)
4. Black	Cond. (+)	(4 ... 20 rnA)
5. NC	Not connected	

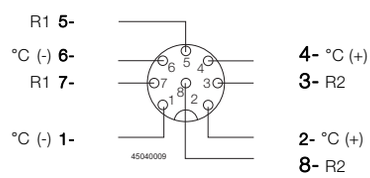
Right side connection (front view)



Right side M12, 5 pin connector

1. Brown	R1	(external input)
2.White	Temp. (-)	(4 ... 20 rnA)
3. Blue	R2	(external input)
4. Black	Temp. (+)	(4 ... 20 rnA)
5. NC	Not connected	

Right side electrical connection with relay output

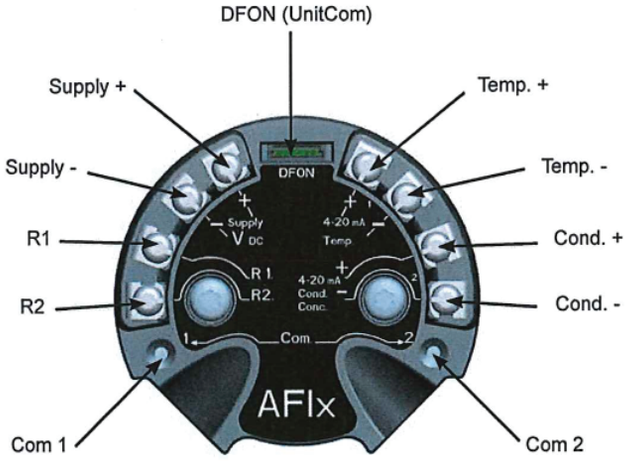


Left side M12, 5 pin connector

1. White	R1	(external input)
2. Brown	Temp. (+)	(4 ... 20 rnA)
3. Green	Relay 2	
4. Yellow	Relay 2	
5. Grey	Relay 1	
6. Light red	Relay 1	
7. Blue	Temp. (+-)	(4 ... 20 rnA)
8, Red	R2	(external input)

To set the external input for range selection

Range	R1	R2	Range	R1	R2
1	N.C	N.C.	3	N.C.	24 VDC
2	24 VDC	N.C.	4	24 VDC	24 VDC



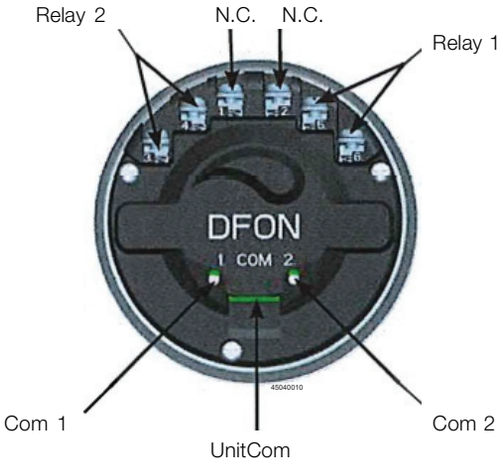
Electrical connection on the display with relay output

1. Not connected
2. Not connected
3. Green Relay 2
4. Yellow Relay 2
5. Grey Relay 1
6. Light red Relay 1

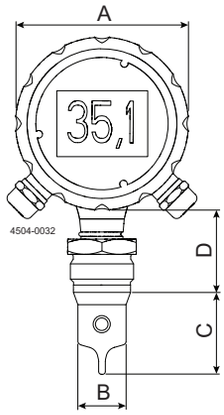
(3 + 5 can be connected common)

UnitCom Ribbon cable to transmitter

To connect the Flexprogrammer
COM 1 Red clip
COM 2 Black clip

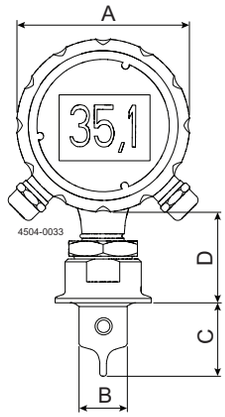


Dimensions



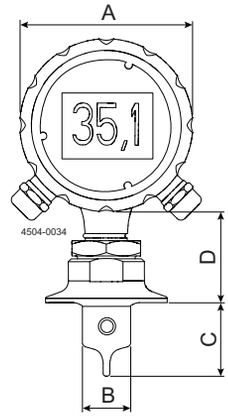
G1” Short neck
TE67K161111140

A	B	C	D
Ø 80	Ø25	37	50



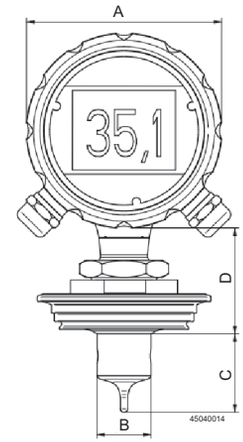
Clamp DN38
TE67K121111140

A	B	C	D
Ø 80	Ø25	39	48



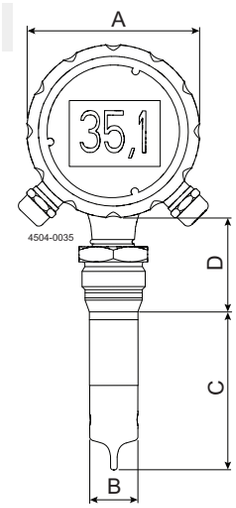
Clamp DN51
TE67K171111140

A	B	C	D
Ø 80	Ø25	39	48



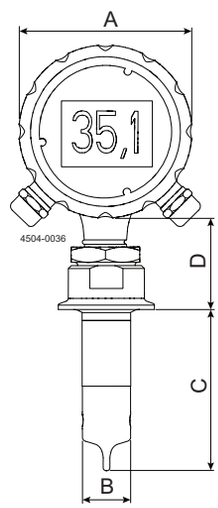
HTC Connection 2”
TE67K1H1111140 (See table)

A	B	C	D
Ø 80	Ø25	37	50



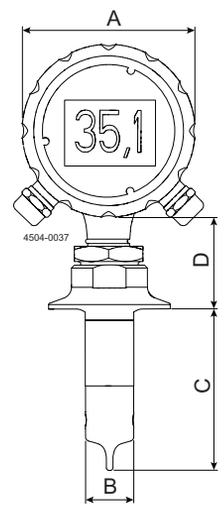
G1” Long neck
TE67K151111140

A	B	C	D
Ø 80	Ø25	83	49



Clamp DN38
TE67K131111140

A	B	C	D
Ø 80	Ø25	87	48

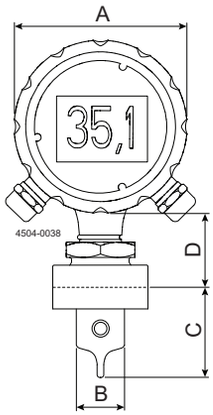


Clamp DN51
TE67K181111140

A	B	C	D
Ø 80	Ø25	87	48

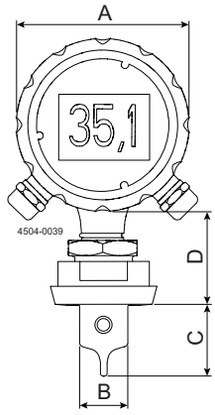
HTC Connections

Size:	Type:
Hygienic Tank Connection HTC 1-1½”	TE67K1G1111160
Hygienic Tank Connection HTC 2”	TE67K1H1111160
Hygienic Tank Connection HTC 2½”	TE67K1J1111160
Hygienic Tank Connection HTC 3”	TE67K1K1111160
Hygienic Tank Connection HTC 4”	TE67K1L1111160



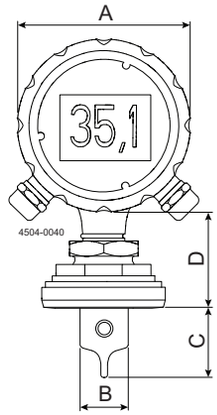
DN 32 (DIN11851)
TE67K1A1111140

A	B	C	D
Ø 80	Ø25	36	50



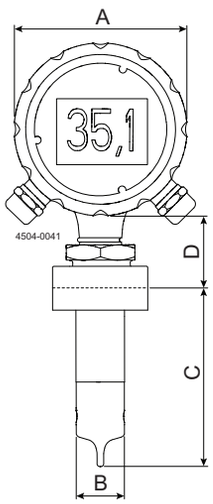
DN 40 (DIN11851)
TE67K1B1111140

A	B	C	D
Ø 80	Ø25	37	49



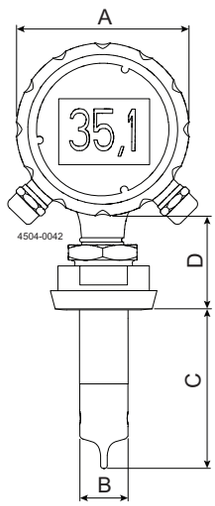
DN 50 (DIN11851)
TE67K1C1111140

A	B	C	D
Ø 80	Ø25	36	50



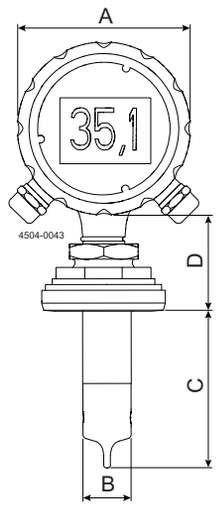
DN 32 (DIN11851)
TE67K1A1111140

A	B	C	D
Ø 80	Ø25	83	50



DN 40 (DIN11851)
TE67K1B1111140

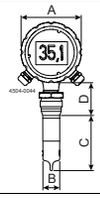
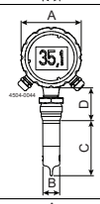
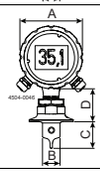
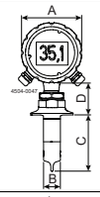
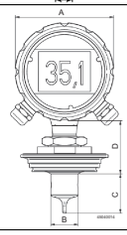
A	B	C	D
Ø 80	Ø25	83	49



DN 50 (DIN11851)
TE67K1C1111140

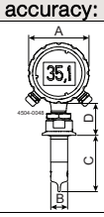
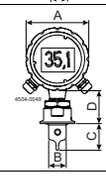
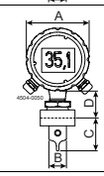
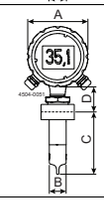
A	B	C	D
Ø 80	Ø25	83	50

Product code: 5628

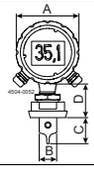
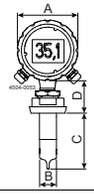
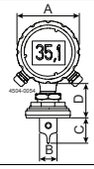
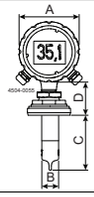
Item No.	PPL EUR	Description	Dimensions A	B	C	D	
Conductivity sensor, measuring range: 0.05 to 999 mS/cm, electrical connection: 2 x M16 Cable gland, Plastic, accuracy: <1.5% FS							
TE67K151111140	2578	G1" - Long	Ø 80	Ø 25	83	49	
TE67K161111140	2494	G1" - Short	Ø 80	Ø 25	37	50	
TE67K171111140	2701	Clamp 2" (ISO2852/DIN32676) - Short	Ø 80	Ø 25	39	48	
TE67K181111140	2785	Clamp 2" (ISO2852/DIN32676) - Long	Ø 80	Ø 25	87	48	
TE67K1H1111140	2569	HTC connection 2” - Short	Ø 80	Ø 25	37	50	

Conductivity Transmitter

Product code: 5628

Item No.	PPL EUR	Description	Dimensions A	B	C	D	
Conductivity sensor, measuring range: 0.05 to 999 mS/cm, electrical connection: 2 x M16 Cable gland, Plastic, accuracy: <1.5% FS							
TE67K131111140	2785	Clamp 1 ½" (ISO2852/DIN32676) - Long	Ø 80	Ø 25	87	48	
TE67K121111140	2701	Clamp 1 ½" (ISO2852/DIN32676) - Short	Ø 80	Ø 25	39	48	
TE67K1A1111140	2689	DN32 (DIN11851) - Short	Ø 80	Ø 25	36	50	
TE67K1D1111140	2692	DN32 (DIN11851) - Long	Ø 80	Ø 25	83	50	

Product code: 5628

Item No.	PPL EUR	Description	Dimensions A	B	C	D	
Conductivity sensor, measuring range: 0.05 to 999 mS/cm, electrical connection: 2 x M16 Cable gland, Plastic, accuracy: <1.5% FS							
TE67K1B1111140	2689	DN40 (DIN11851) - Short	Ø 80	Ø 25	37	49	
TE67K1E1111140	2773	DN40 (DIN11851) - Long	Ø 80	Ø 25	83	49	
TE67K1C1111140	2661	DN50 (DIN11851) - Short	Ø 80	Ø 25	36	50	
TE67K1F1111140	2690	DN50 (DIN11851) - Long	Ø 80	Ø 25	83	50	

Product code: 5628

Item No.	PPL EUR	Description
		Add-on prices
TE67Kxxxxxxxx0	0	(see table) No Certificates
TE67Kxxxxxxxx1	150	Calibration certificate
TE67Kxxxxxxxx2	87	3.1 Material certificate
TE67Kxxxxxxxx6	239	Calibration certificate + 3.1 Material certificate
TE67Kxxxxxxx2x	37	1 x M12 Connector 5 wire + 1 x M12 Connector 8 wire, Stainless Steel with relays
TE67Kxxxxxxx3x	30	2 x M12 Connector 5 wire, Stainless Steel w.o. relays
TE67Kxxxxxxx4x	0	(see table) 2 x M16 Cable gland, Plastic
TE67Kxxxxxxx5x	26	2 x M16 Cable gland, Stainless Steel
TE67Kxxxxxxx6x	58	1 x M16 + 1 x M20 Cable Gland, Stainless Steel
TE67Kxxxxxxx7x	87	2 x M20 Cable gland, Stainless Steel
TE67Kx2xxxxxxx	0	(see table) Clamp DN 38 (ISO2852) / Clamp DN 40 (DIN32676) with Short sensor shaft length
TE67Kx3xxxxxxx	0	(see table) Clamp DN 38 (ISO2852) / Clamp DN 40 (DIN32676) with Long sensor shaft length
TE67Kx5xxxxxxx	0	(see table) G1" (ISO228) with Long sensor shaft length
TE67Kx6xxxxxxx	0	(see table) G1" (ISO228) with Short sensor shaft length
TE67Kx7xxxxxxx	0	(see table) Clamp DN 50 (ISO2852) / Clamp DN 51 (DIN32676) with Short sensor shaft length
TE67Kx8xxxxxxx	0	(see table) Clamp DN 50 (ISO2852) / Clamp DN 51 (DIN32676) with Long sensor shaft lengh
TE67KxAxxxxxxx	0	(see table) Union DN 32 (Din11851) with Short sensor shaft length
TE67KxBxxxxxxx	0	(see table) Union DN 40 (Din11851) with Short sensor shaft length
TE67KxCxxxxxxx	0	(see table) Union DN 50 (Din11851) with Short sensor shaft length
TE67KxDxxxxxxx	0	(see table) Union DN 32 (Din11851) with Long sensor shaft length
TE67KxExxxxxxx	0	(see table) Union DN 40 (Din11851) with Long sensor shaft length
TE67KxFxxxxxxx	0	(see table) Union DN 50 (Din11851) with Long sensor shaft length
TE67KxGxxxxxxx	0	HTC Connection Clamp 1½" with Short sensor shaft length
TE67KxHxxxxxxx	0	(see table) HTC Connection Clamp 2" with Short sensor shaft length
TE67KxJxxxxxxx	54	HTC Connection Clamp 2½" with Short sensor shaft length
TE67KxKxxxxxxx	73	HTC Connection Clamp 3" with Short sensor shaft length
TE67KxLxxxxxxx	99	HTC Connection Clamp 4" with Short sensor shaft length

Item No.	PPL EUR	Description
		Accessories to HTC connection
9614059422	122	O-ring set to HTC connection 1½” EPDM (10 pcs)
9614059425	136	O-ring set to HTC connection 2” EPDM (10 pcs)
9614059428	156	O-ring set to HTC connection 2½” EPDM (10 pcs)
9614059431	167	O-ring set to HTC connection 3” EPDM (10 pcs)
9614059434	181	O-ring set to HTC connection 4” EPDM (10 pcs)