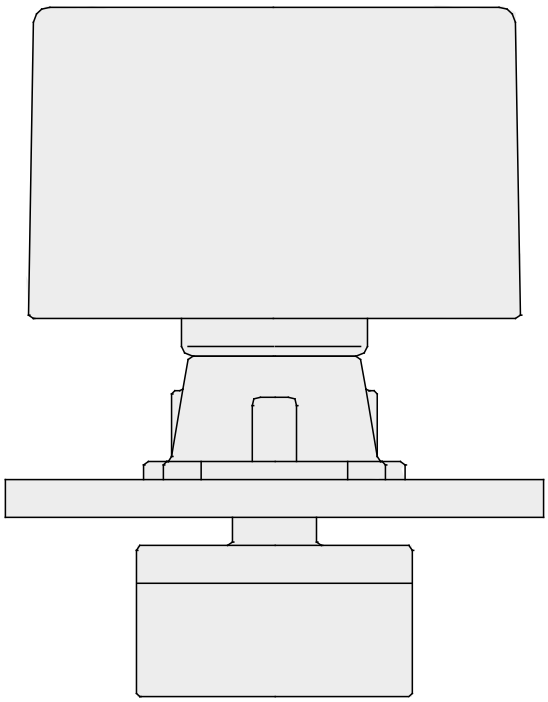
VEGASON 83 … 87
ECHOFOX®

TIB • Technical Information • Operating Instructions



Pulse-echo sensors

Digital transmission of measuring data

Approvals for
- dust-Ex areas StEx
- hazardous areas acc. to
  - CENELEC
  - ElexV Zone 0

Compact instrument

Current output 0 … 20 mA

Approval for
- dust-Ex areas StEx

VEGA Grieshaber KG
Am Hohenstein 113
D-77761 Schiltach
Phone 0 78 36 / 50 - 0
Fax 0 78 36 / 50 201

Contents

1 Introduction

1.1 Contents of the instruction manual

The **Technical Information / Operating Instructions** is called TIB. It contains all necessary information for correct
- installation
- connection
- set-up
- optimization

of the pulse-echo-sensors VEGASON …. V… or pulse-echo compact instrument VEGASON … K….

VEGA regularly revises the contents of TIBs as technical improvements are made to the instruments.

1.2 Safety information

The described module must only be inserted and operated as described in this TIB. Please note that other action can cause damage for which VEGA does not take responsibility.

2 Product description

2.1 Function and configuration

Function

The VEGASON … sensor systems or compact instruments are used for continuous and non-contact level measurement.

Short sound impulse packets are emitted by the transducer of the pulse-echo sensor. The combined emitter and receiver system detects the pulses reflected by the product.

The running period of the ultrasonic pulses is directly proportional to the distance between sensor and measured product.

The signal processing ECHOFOX® uses modern methods of signal analysis to process the reflected ultrasonic pulses.

The signal-to noise ratio is optimized by digital signal processing methods with mathematic algorithms (DSP).

The automatic configuration of a user specific data base enables an optimum adaption to the respective application.

The use of fuzzy-logic for echo evaluation ensures a reliable determination of the level. False echoes, e.g. from stirrers or other installations are detected and are not included in the generation of the measured value.

These measuring data are transmitted digitally to respective signal conditioning instruments or processing systems and processed.

The operation of the sensors is made via the signal conditioning instrument VEGAMET or via a PC (VEGACONNECT necessary).

Compact instruments are additionally equipped with an integral output of the measuring data and make a current output 0 … 20 mA available.

The operation of the compact instrument is only possible with PC via VEGACONNECT.

Configuration

Flange version
The sensor or compact instruments consist of a housing, integrated therein the above electronics and all required terminals, a mounting flange and a transducer.

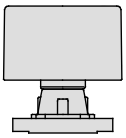
Housing, flange and transducer are designed acc. to the type.

Separate version
The separate version consists of a housing with integral electronics and all necessary terminal and mounting plate.

Transducer with mounting tube and connection cable as separate modular unit. The transducers differ acc. to the various types.

2.2 Types and versions

VEGASON 83 FK
VEGASON 83 FV

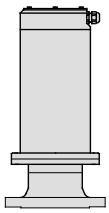


Flange version with flange size DN 100, transducer integral in flange, plastic housing with integral ECHOFOX®-sensor electronics.

Suitable for a number of applications and mounting positions,
- mounting directly on the vessel ceiling (tank, silo) or on existing sockets
- positioning on fix points above the vessels etc.

Measuring range 0,7 m … 10 m
(see section 3 Evironment).

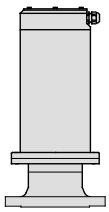
VEGASON 83 FV Ex, 83 FV Ex 0



as VEGASON 83 FV, however housing of sensor electronics and transducer made of stainless steel 1.4305

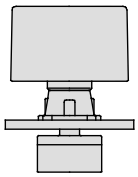
Suitable for the use in hazardous areas (see section 2.11 Approvals).

VEGASON 83 FV Ex B, 83 FV Ex0 B



as VEGASON 83 FV Ex or FV Ex 0, however with integral overvoltage arrester of sensor electronics.

VEGASON 84 FK
VEGASON 84 FV

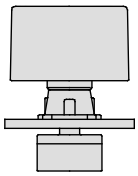


Flange version with flange size DN 150, transducer below the flanges, plastic housing with integral ECHOFOX®-sensor electronics.

Suitable for a number of applications and mounting positions,
- mounting directly on the vessel ceiling (tank, silo) or on existing sockets
- positioning on fix points above the vessel etc.

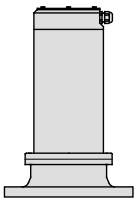
Measuring range 0,7 m … 20 m
(see section 3 Environment).

VEGASON 84 FK StEx
VEGASON 84 FV StEx



as VEGASON 84 FK or FV, however additionally approved for the use in dust-Ex areas StEx (see section 2.11 Approvals).

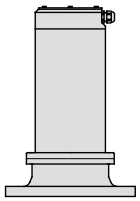
VEGASON 84 FV Ex, 84 FV Ex 0



Flange version with flange size DN 150, transducer integral in flange, housing of sensor electronics and transducer made of stainless steel 1.4305.

Suitable for the use in hazardous areas (see section 2.11 Approvals).

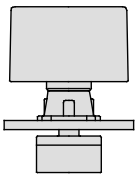
VEGASON 84 FV Ex B, 84 FV Ex0 B



as VEGASON 84 FV Ex or FV Ex 0, however with integral overvoltage arrester of sensor electronics.

Compact instrument

VEGASON 85 FK
VEGASON 85 FV

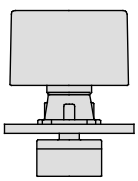


Flange version with flange size DN 150, transducer below the flanges, plastic housing with integral ECHOFOX®-sensor electronics.

Suitable for a number of applications and mounting positions,
- mounting directly on the vessel ceiling (tank, silo) or on existing sockets
- positioning on fix points above the vessels etc.

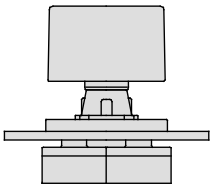
Measuring range 1,0 m … 30 m
(see section 3 Environment).

VEGASON 85 FK StEx
VEGASON 85 FV StEx



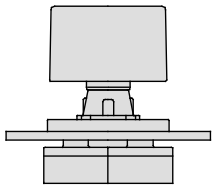
as VEGASON 85 FK or FV, however additionally approved for the use in dust-Ex areas StEx (see section 2.11 Approvals).

VEGASON 87 FK
VEGASON 87 FV



Flange version, flange size ø 450 mm, triple transducer divided into emission and receipt unit, reset as described under VEGASON 85 FV.
Measuring range 0,4 m … 60 m
(see section 3 Environment).

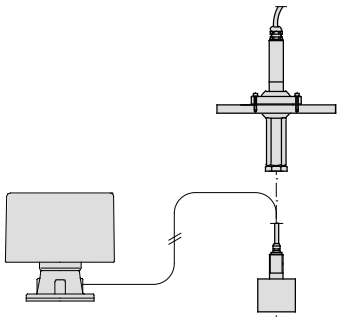
VEGASON 87 FK StEx
VEGASON 87 FV StEx



as VEGASON 87 FK or FV, however additionally approved for the use in dust-Ex areas StEx (see section 2.11 Approvals).

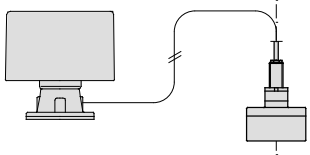
VEGASON 83 GK
VEGASON 83 GV

Separate version, transducer and housing are separated. An ECHOFOX®-sensor electronics is integrated in the housing. The transducer is provided with a fixing tube (thread G 1). It can be mounted in a small hole (ø 35 mm) at the vessel ceiling (tank/silo).
As option the transducer can be screwed with a swivelling holder (DN 150) and can be optimally adapted to the installation conditions.
Measuring range 0,7 m … 10 m
(see section 3 Environment).



VEGASON 84 GK
VEGASON 84 GV

as VEGASON 83 GKor GV, however
measuring range 0,7 m … 20 m

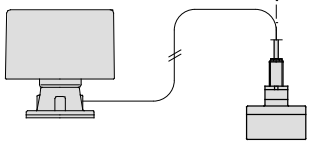


VEGASON 84 GK StEx
VEGASON 84 GV StEx

as above, however additionally approved for the use in dust-Ex areas StEx (see section 2.11 Approvals).

VEGASON 85 GK
VEGASON 85 GV

as VEGASON 83 GK or GV, however
measuring range 1,0 m … 30 m

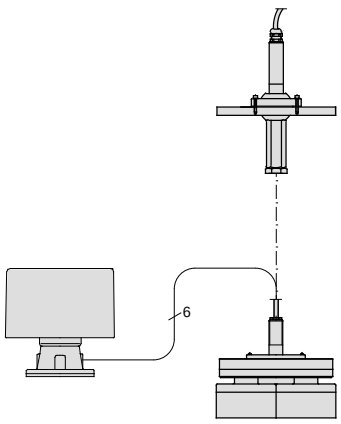


VEGASON 85 GK StEx
VEGASON 85 GV StEx

as above, however additionally approved for the use in dust-Ex areas StEx (see section 2.11 Approvals).

VEGASON 87 GK
VEGASON 87 GV

as VEGASON 83 GK or GV, however triple transducer divided into emission and receipt unit, rest as described under
measuring range 0,4 m … 60 m



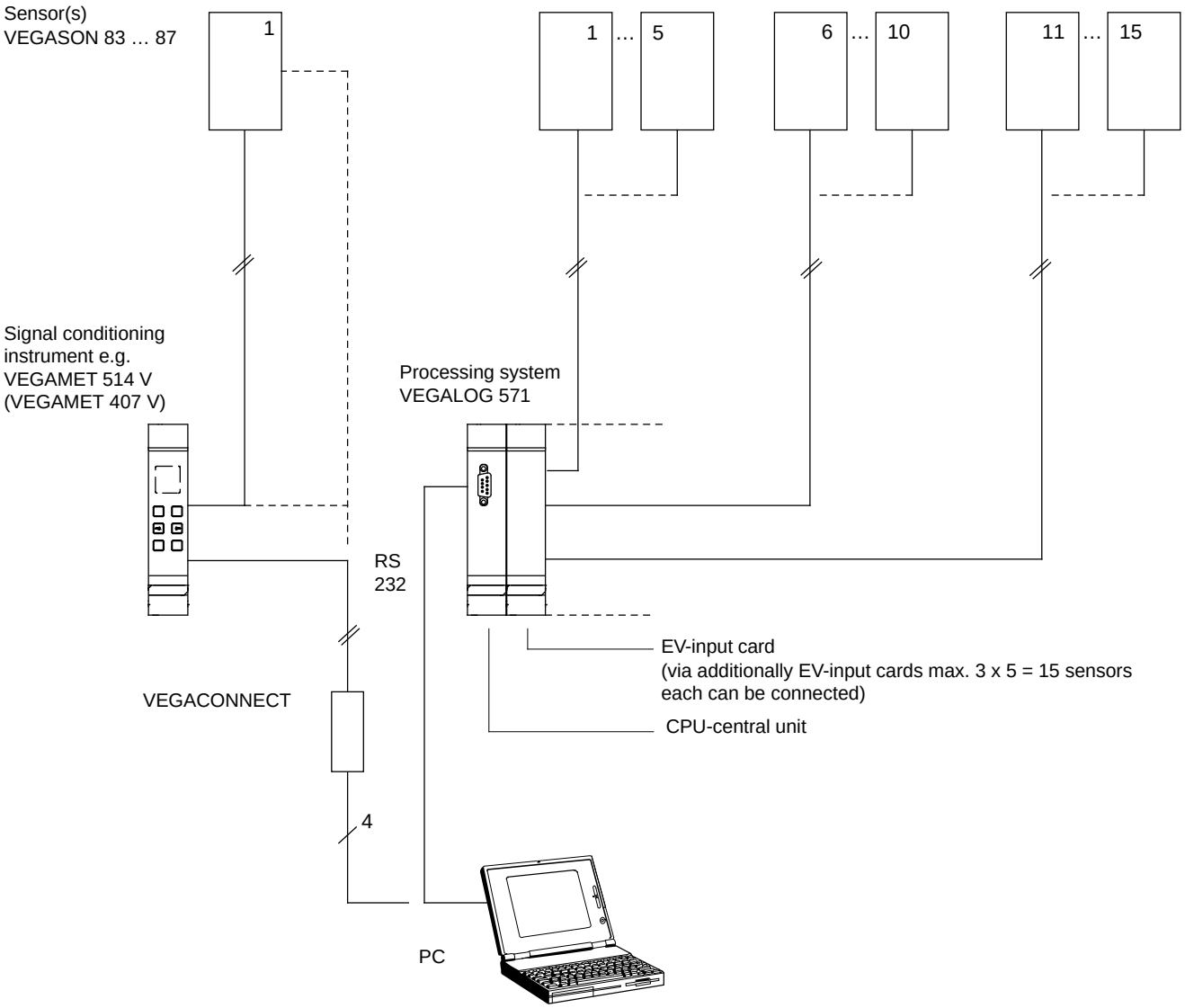
VEGASON 87 GK StEx
VEGASON 87 GV StEx

as above, however additionally approved for the use in dust-Ex areas StEx (see section 2.11 Approvals).

2.3 Configuration of a measuring system, sensor in not-Ex-area

Generally a measuring system consists of two components
- a local sensor and
- a signal conditioning instrument or processing system

The kind of signal conditioning instrument or processing system depends on the installation conditions.



Sensor(s) and signal conditioning instrument or processing system are connected via a two-wire line. The power supply of the sensor or the sensors is ensured via this line and the measuring data are transmitted digitally to the signal conditioning instrument or processing system.

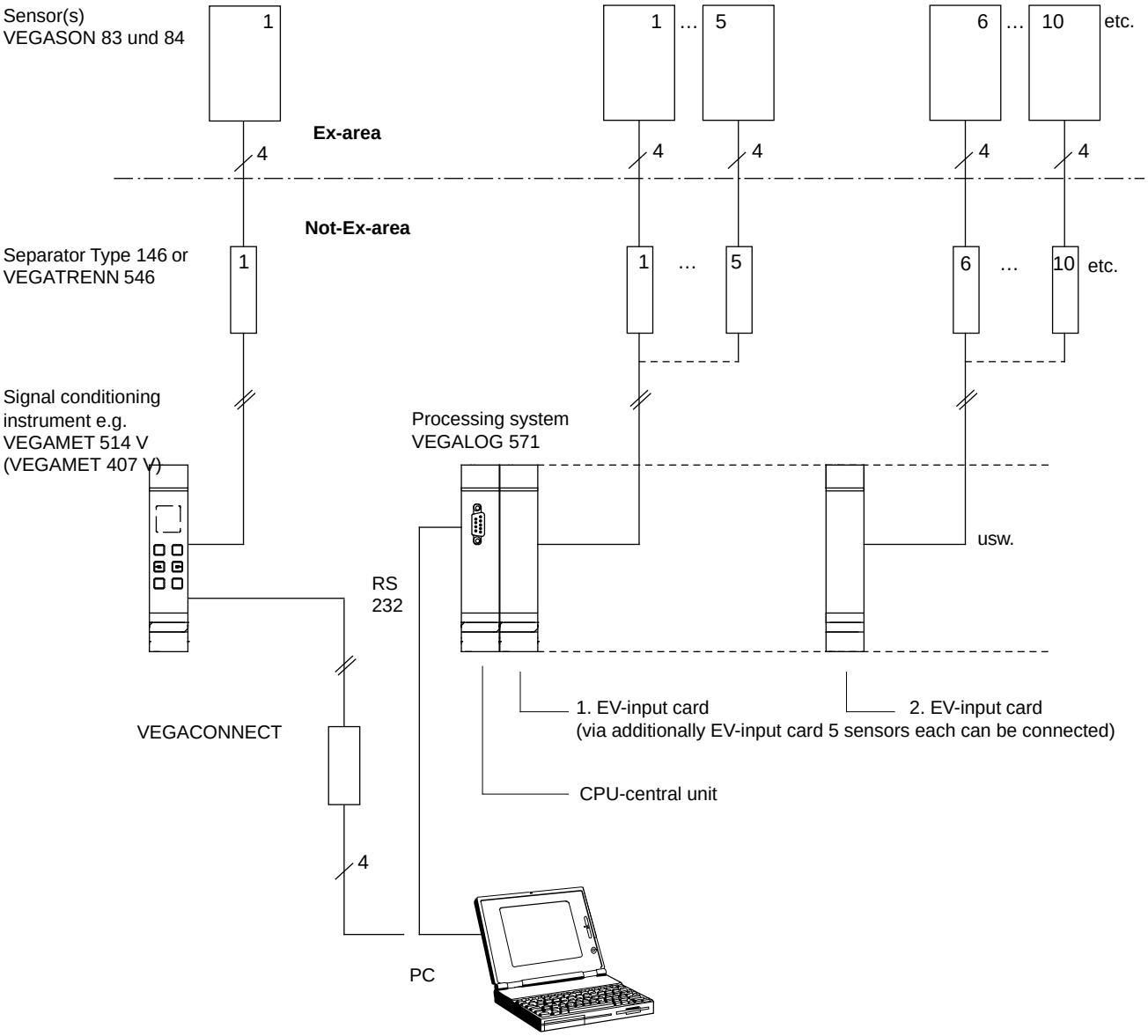
The indicating and operating surface VEGA Visual Operating, installed on a PC ensures a simple and comfortable configuration and parameter adjustment of the respective measuring system.

VEGACONNECT can be connected to respective sockets of the signal conditioning instrument or the sensor. If necessary, it is possible to connect VEGACONNECT directly to the two-wire line (signal conditioning instrument … sensor).

2.4 Configuration of a measuring system, sensor in Ex-area

In this application a measuring system consists of three components
- a local Ex-sensor in the Ex-area
- a safety barrier and
- a signal conditioning instrument or processing system in the not-Ex-area

The kind of signal conditioning instrument or processing system mainly depends on the control and process technical requirements.



Each sensor is connected to the respective signal conditioning instrument or processing system via a separator type 146 or VEGATRENN 546. The separator provides two intrinsically safe circuits. These circuits provide the power supply of the sensor and the digital transmission of measuring data to the signal conditioning instrument or processing system.

The indicating and operating surface VEGA Visual Operating, installed on a PC ensures a simple and comfortable configuration and parameter adjustment of the respective measuring system.

2.5 Order code for sensors

2.5.1 VEGASON …V / …V StEx

Type **Measuring range**
8 3 ..... 0,7 … 10 m
8 4 ..... 0,7 … 20 m
8 5 ..... 1,0 … 30 m
8 7 ..... 0,4 … 60 m

Version
F Flange version
G Separate version

Approvals
. X without
E X S . X StEx for Zone 10 (only for VEGASON 84 … 87)

Flange size
E DN 100 PN 16 (for VEGASON 83)
F DN 150 PN 16 (for VEGASON 84 and 85)
U ø 450 (for VEGASON 87)
Y Others

Flange material
A Aluminium (for StEx-version)
P PPh
Y Others

S O N			V		E Z		

Order no. for VEGASON … V

2.5.2 VEGASON … FV Ex…

Type **Measuring range**
8 3 F V E X CENELEC EEx d e ia IIB T6 ..... 0,7 … 10 m
8 3 F V E X 0 PTB Zone 0 EEx d e ia IIB T6 ..... 0,7 … 10 m
8 4 F V E X CENELEC EEx d e ia IIB T6 ..... 1,1 … 20 m
8 4 F V E X 0 PTB Zone 0 EEx d e ia IIB T6 ..... 1,1 … 20 m

Options
X without
B with overvoltage arrester

S O N			.	X	V	V	V

Order no. for VEGASON … FV Ex…

2.6 Technical data of the sensors

2.6.1 VEGASON 83 … 87 FV, 84 … 87 FV StEx
VEGASON 83 … 87 GV, 84 … 87 GV StEx

Approvals

see section 2.11 Approvals

Power supply

via signal conditioning instrument	VEGAMET … with digital transmission of measuring data
via processing system	VEGALOG 571 with EV-input cards
Operating voltage	max. 36 V DC
Power consumption	max. 200 mA

Measuring range

VEGASON			83 FV	83 GV	84 …	85 …	87 …
Min. distance for	liquids and solids	granulation ≥ 5 mm	0,7 m	0,5 m	0,7 m	1,0 m	0,4 m
		granulation ≤ 5 mm	0,8 m	0,6 m	1,0 m	1,2 m	0,4 m
Max. distance dependent on product and process			10 m	10 m	20 m	30 m	60 m

Measuring data

Measuring resolution	1 mm	1 mm	1 mm	1 mm	1 mm
Measuring frequency	33 kHz	33 kHz	22 kHz	16 kHz	16 kHz
Measuring rate	0,6 sec.	0,6 sec.	0,7 sec.	1,0 sec.	1,5 sec.
Radiation angle related to –3 dB	12°	12°	12°	15°	3,5°

Error limits

Linearity error relating to the adjustment	< 0,1 % of measuring range
Temperature error of the electronics	0,015 %/10 K of measuring range

Materials

VEGASON		FV	GV	StEx
Housing and cover of electronics		PBT	PBT	PBT
Flange		PPh	——	St 37 galv. or Alu
Transducer housing		PVDF	PVDF	PVDF
Impedance adapter		PE	PE	PE
Transducer fixing tube				
	- Type83	——	PVDF	St 37 galvanized
	- Type 84 and 85	——	RCH 1000	St 37 galvanized
	- Type 87	——	St 37 galvanized	St 37 galvanized

Dimensions and weights

Flange size	- Type 83	DN 100 PN 16	——	DN 100 PN 16
	- Type 84 and 85	DN 150 PN 16	——	DN 150 PN 16
	- Type 87	ø 450	——	ø 450
Thread of the fixing tube		——	G 1 A	——
Total weight of sensors				
	- Type 83 … 85	appr. 6 kg	appr. 6 kg	appr. 6 kg
	- Type 87	appr. 12 kg	appr. 12 kg	appr. 12 kg

Temperature reaction

VEGASON … StEx-version	
At an ambient temperature	40°C the max. temperature to be adjusted
- on the transducer in Zone 10	45°C is reached and
- on the housing (electronics) in Zone 11	55°C is reached

Ambient conditions

VEGASON	FV	GV	StEx
Ambient temperature related to			
- transducer in Zone 10	-20°C … +80°C	-20°C … +80°C	-20°C … +75°C
- housing (electronics) in Zone 11	-20°C … +60°C	-20°C … +60°C	-20°C … +60°C
Storage and transport temperature	-20°C … +80°C	-20°C … +80°C	-20°C … +80°C
Protection			
- of transducer	IP 67	IP 67	IP 65
- the housing (electronics) generally	IP 67	IP 67	IP 65
certified			
- transducer	——	——	IP 65
- housing	——	——	IP 54
Overvoltage class	III	III	III
Protection class	II	II	II
Max. vessel pressure related to			
- Type 83	0,5 bar	1,0 bar	——
- Type 84 and 85	0,5 bar	0,5 bar	0,5 bar
- Type 87	0,3 bar	0,5 bar	0,5 bar

Connection line

VEGASON … FV-version

Sensor to signal conditioning instrument / processing system: 2 pole, maximal 20 Ohm/line

VEGASON … GV-version

Transducer to sensor electronics

- Type 83 … 85: standard coax cable type RG 58, standard length 5 m, max. length 300 m
- Type 87: 4 x 0,38 mm², 1 screened wire, standard length 5 m, max. length 35 m, cable diameter 8 mm

Sensor electronics to signal conditioning instrument / processing system: 2 pole, max. 20 Ohm/line

Temperature sensor: each integrated in the transmitter, with GV-version via connected connection line above connection line

Electrical connection

Terminals for the connection lines: for max. 1,5 mm²

Terminals for the earth connection: for max. 4,0 mm²

Cable entry: 1 x Pg 13,5 for all FV-versions, 2 x Pg 13,5 for all GV-versions

2.6.2 VEGASON 83 and 84 Ex, Ex0
VEGASON 83 and 84 Ex B, Ex0 B

Approvals

see section 2.11 Approvals

Power supply

via separator	Type 146 or VEGATRENN 546
Supply via	2 intrinsically safe circuits of category ib IIB
Flame proofing	EEx de ia IIB T6 (see also section 2.11)

Measuring range

VEGASON	83	84
Min. distance of liquids	0,7 m	1,1 m
Max. distance dependent on product and process	10 m	20 m

Measuring data

Measuring resolution	1 mm	1 mm
Measuring frequency	33 kHz	22 kHz
Measuring rate	1,1 sec.	1,5 sec
Radiation angle related to –3 dB	12°	12°

Error limits

Linearity error relating to the adjustment	< 0,1 % of measuring range
Temperature error of the electronics	0,015 %/10 K of measuring range

Materials

Housing of electronics	1.4305
Flange	1.4305
Diaphragm	1.4531
Flange sealing	Viton

Dimensions and weights

Flange size	- Type 83	DN 100 PN 16
	- Type 84	DN 150 PN 16
Total weight of the sensors		at DN 100 approx. 17 kg at DN 150 approx. 21 kg

Ambient conditions

Max. permissible ambient temperature	
- on the transducer	+80°C
- on the housing (electronics)	+60°C
Storage and transport temperature	-20°C … +80°C
Protection	IP 67
Max. vessel pressure	
- Type 83	2 bar
- Type 84	1 bar
Vessel pressures and ambient temperature under Ex-conditions	see respective conformity certificate

Connection line

Sensor … separator	2 x 2 pole
Resistance per conductor	max. 7,5 Ohm
Temperature sensor and its connection	integrated int he respective sensor

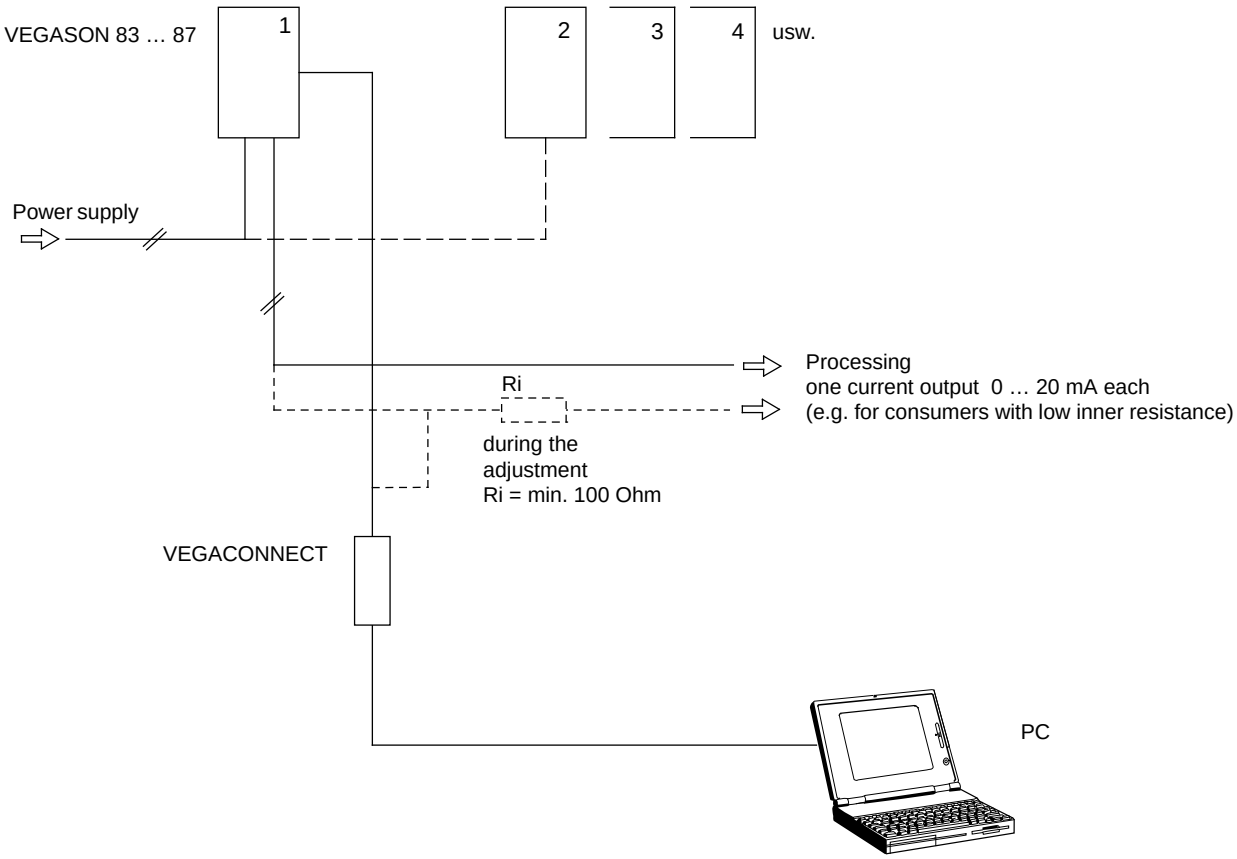
Electrical connection

Terminals for the connection line	max. 1,5 mm^2
Terminals for earth connection	max. 4,0 mm^2
Cable entry	1 x Pg 13,5

2.7 Configuration with compact instrument

As described under "2 Product description" the compact instruments are equipped with an integral processing of measuring data. A current output 0 … 20 mA is available.

First of all each compact instrument must have a voltage supply. The current output can be directly connected to indicators or process control systems.



The indicating and operating surface VEGA Visual Operating, installed on a PC ensures a simple and comfortable configuration as well as operator supporting parameter adjustment of the compact instruments.

Therefore it is necessary to connect the computer via VEGACONNECT directly with the respective compact instruments.

A digital signal is superimposed to the current output. The adjustment of the sensor can be also carried out via the current output. For indication and processing systems with an inner resistance of less than 100 Ohm a respective series resistor must be connected for the time of adjustment.

2.8 Order code for compact instrument

2.8.1 VEGASON …K / …K StEx

Type — **Measuring range**

8 3 ..... 0,7 … 10 m
8 4 ..... 0,7 … 20 m
8 5 ..... 1,0 … 30 m
8 7 ..... 0,4 … 60 m

Version
F Flange version
G Separate version

Approvals
. X without
E X S . X StEx for Zone 10 (only for VEGASON 84 … 87)

Power supply
E 110 V AC
A 230 V AC
I 24 V AC, 16 … 36 V DC
X Others

Flange size
E DN 100 PN 16 (for VEGASON 83)
F DN 150 PN 16 (for VEGASON 84 and 85)
U ø 450 (for VEGASON 87)
Y Others

Flange material
A Aluminium (for StEx-version)
P PPh
Y Others

S	O	N			K		E			

Order no. for VEGASON … K

2.9 Technical data of compact instruments

2.9.1 VEGASON 83 … 87 FK, 84 … 87 FK StEx
VEGASON 83 … 87 GK, 84 … 87 GK StEx

Approvals

see section 2.11 Approvals

Power supply

Standard	U_{nenn}	24 V AC (–15 %, +10 %), 50/60 Hz, 10 VA 24 V DC (16 … 36 V), 8 W
Option	U_{nenn}	230 V AC, (–10 %, +5 %), 50/60 Hz, 10 VA 110 V, 130 V, 240 V AC (–15 %, +10 %), 50/60 Hz, 10 VA

Measuring range

VEGASON		83 FK	83 GK	84 …	85 …	87 …
Min. distance of liquids						
and solids	granulation ≥ 5 mm	0,7 m	0,5 m	0,7 m	1,0 m	0,4 m
	granulation ≤ 5 mm	0,8 m	0,6 m	1,0 m	1,2 m	0,4 m
Max. distance dependent on product and process		10 m	10 m	20 m	30 m	60 m

Measuring data

Measuring resolution	1 mm	1 mm	1 mm	1 mm	1 mm
Measuring frequency	33 kHz	33 kHz	22 kHz	16 kHz	16 kHz
Measuring rate	0,6 sec.	0,6 sec.	0,7 sec.	1,0 sec.	1,5 sec.
Radiation angle related to –3 dB	12°	12°	12°	15°	3,5°

Current output

Range	0 … 20 mA
Load	max. 400 Ohm
Resolution of D/A-conversion	0,025 % of adjustment

Error limits

Linearity error relating to the adjustment	< 0,1 % of measuring range
Temperature error of the electronics	0,015 %/10 K of measuring range

Materials

VEGASON		FK	GK	StEx
Housing and cover of the electronics		PBTP	PBTP	PBTP
Flange		PPh	——	St 37 galv. or Alu
Transducer housing		PVDF	PVDF	PVDF
Impedance adapter		PE	PE	PE
Transducer fixing tube				
	- Type 83	——	PVDF	St 37 galvanized
	- Type 84 and 85	——	RCH 1000	St 37 galvanized
	- Type 87	——	St 37 galvanized	St 37 galvanized

Dimensions and weights

Flange size	- Type 83	DN 100 PN 16	——	DN 100 PN 16
	- Type 84 and 85	DN 150 PN 16	——	DN 150 PN 16
	- Type 87	ø 450	——	ø 450
Thread of the fixing tube		——	G 1 A	——
Total weight of the sensor				
	- Type 83 … 85	appr. 6 kg	appr. 6 kg	appr. 6 kg
	- Type 87	appr. 12 kg	appr. 12 kg	appr. 12 kg

Temperature reaction

VEGASON … StEx-version	
At an ambient temperature of	40°C the max. temperature to be adjusted
- transducer in Zone 10 of	45°C is reached and
- housing (electronics) in Zone 11 of	55°C is reached

Ambient conditions

VEGASON	FK	GK	StEx
Ambient temperatures related to			
- transducer in Zone 10	-20°C … +80°C	-20°C … +80°C	-20°C … +75°C
- housing (electronics) in Zone 11	-20°C … +60°C	-20°C … +60°C	-20°C … +60°C
Storage and transport temperature	-20°C … +80°C	-20°C … +80°C	-20°C … +80°C
Protection			
- of the transducer	IP 67	IP 67	IP 65
- of the housing (electronics) generally	IP 67	IP 67	IP 65
certified			
- transducer	–––	–––	IP 65
- housing	–––	–––	IP 54
Overvoltage class	III	III	III
Protection class	II	II	II
Max. vessel pressure related to			
- Type 83	0,5 bar	1,0 bar	–––
- Type 84 and 85	0,5 bar	0,5 bar	0,5 bar
- Type 87	0,3 bar	0,5 bar	0,5 bar

Connection line

VEGASON … FK-versions

Power supply: 2/3 pole, standard cable

VEGASON … GK-versions

Transducer to sensor electronics

- Type 83 … 85: standard coax cable type RG 58
standard length 5 m
max. length 300 m
- Type 87: 4 x 0,38 mm^2, 1 screened wire
standard length 5 m, max. length 35 m
cable diameter 8 mm

Temperature sensor: each integrated in the transmitter
with GK-version connected via above
connection line

Electrical connection

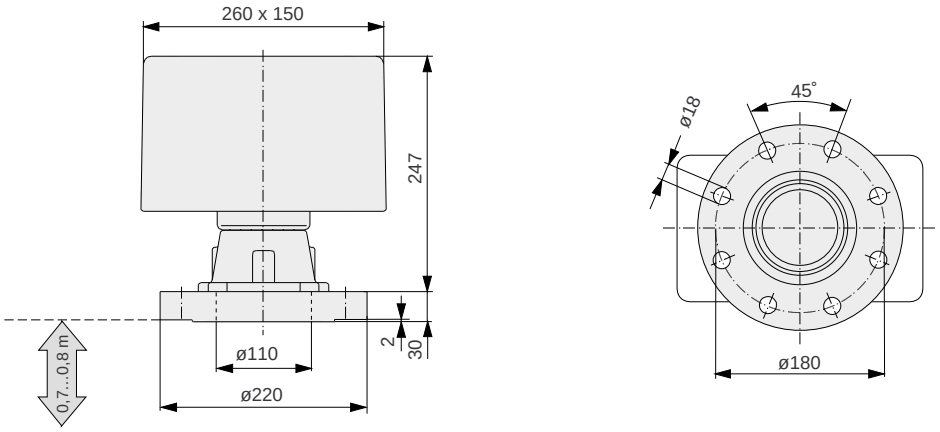
Terminals for the connection lines	for max. 1,5 mm^2
Terminals for earth connection	for max. 4,0 mm^2
Cable entry	2 x Pg 13,5 for all FK-versions 3 x Pg 13,5 for all GK-versions

2.10 Dimensional drawings

Standard- and StEx-versions

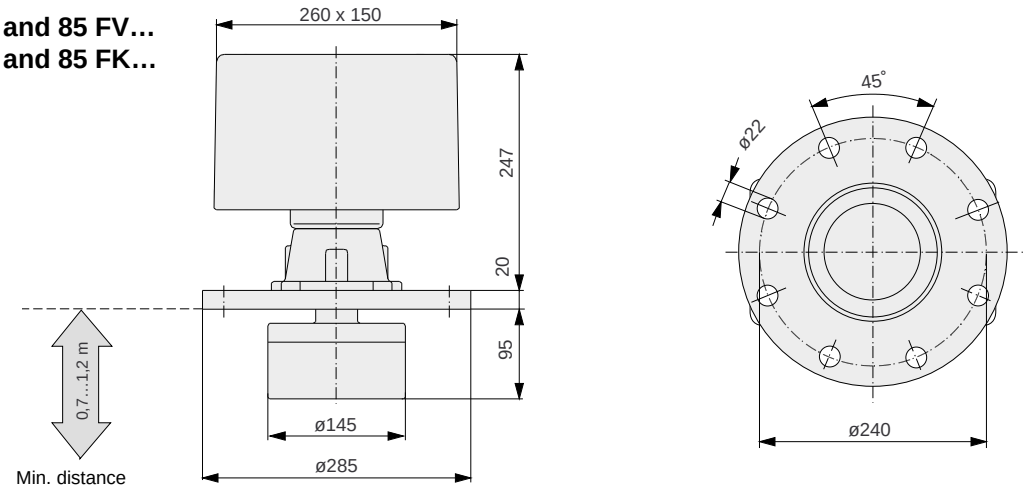
(Dimensions in mm)

VEGASON 83 FV
VEGASON 83 FK



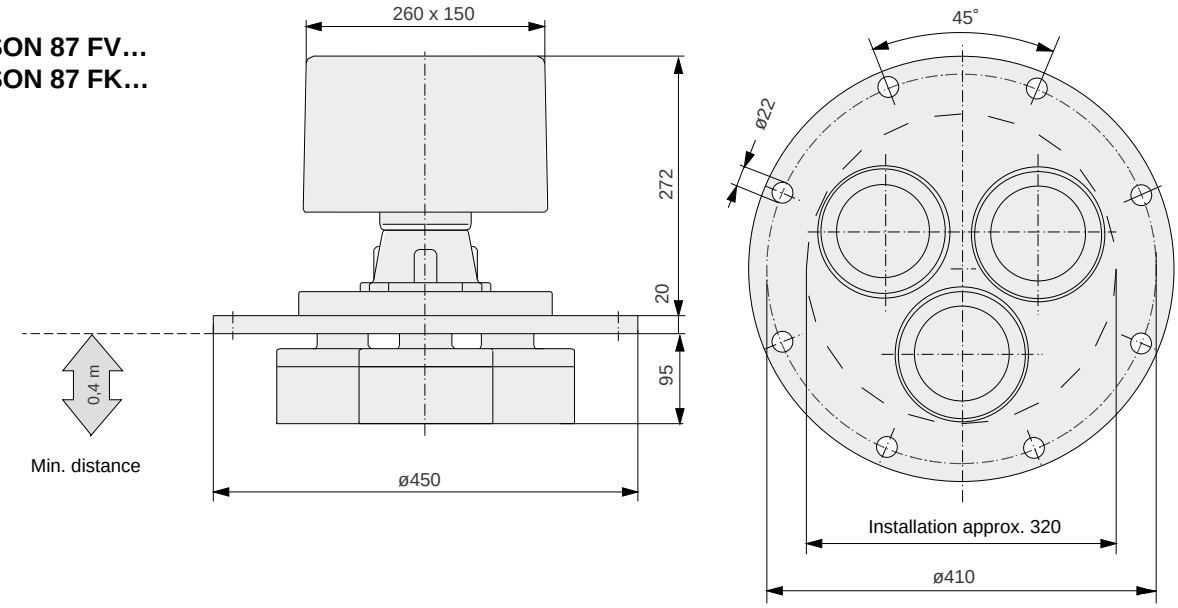
Flange acc. to DIN - DN 100 PN 16 (ANSI $3^1/_2$" 150 psi)

VEGASON 84 and 85 FV…
VEGASON 84 and 85 FK…



Flange acc. to DIN - DN 150 PN 16 (ANSI 6" 150 psi)

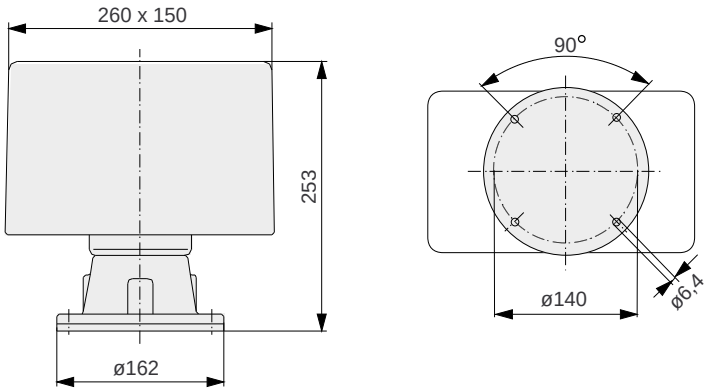
VEGASON 87 FV…
VEGASON 87 FK…



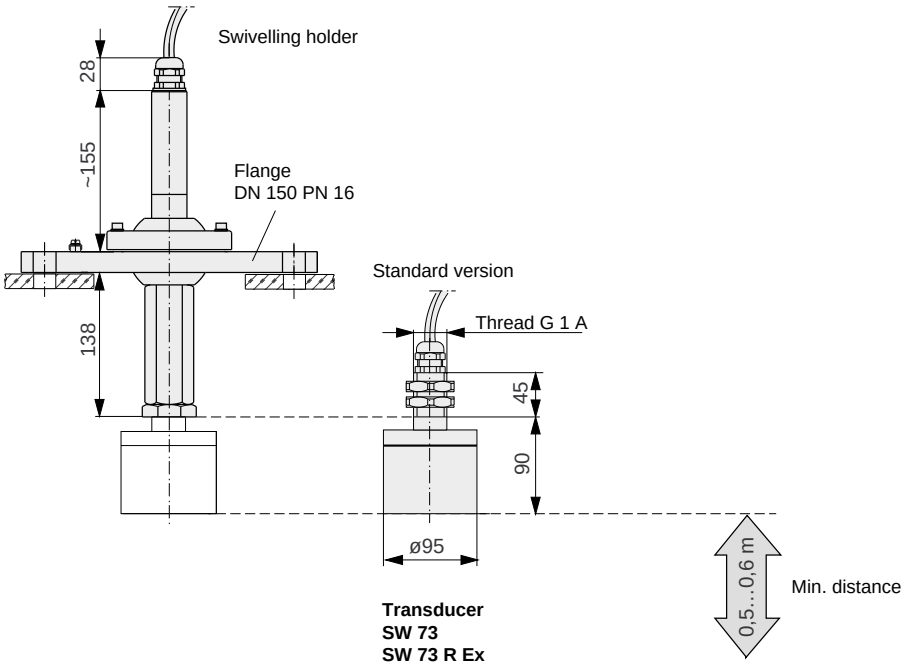
Standard- and StEx-versions

(Dimensions in mm)

Electronics unit

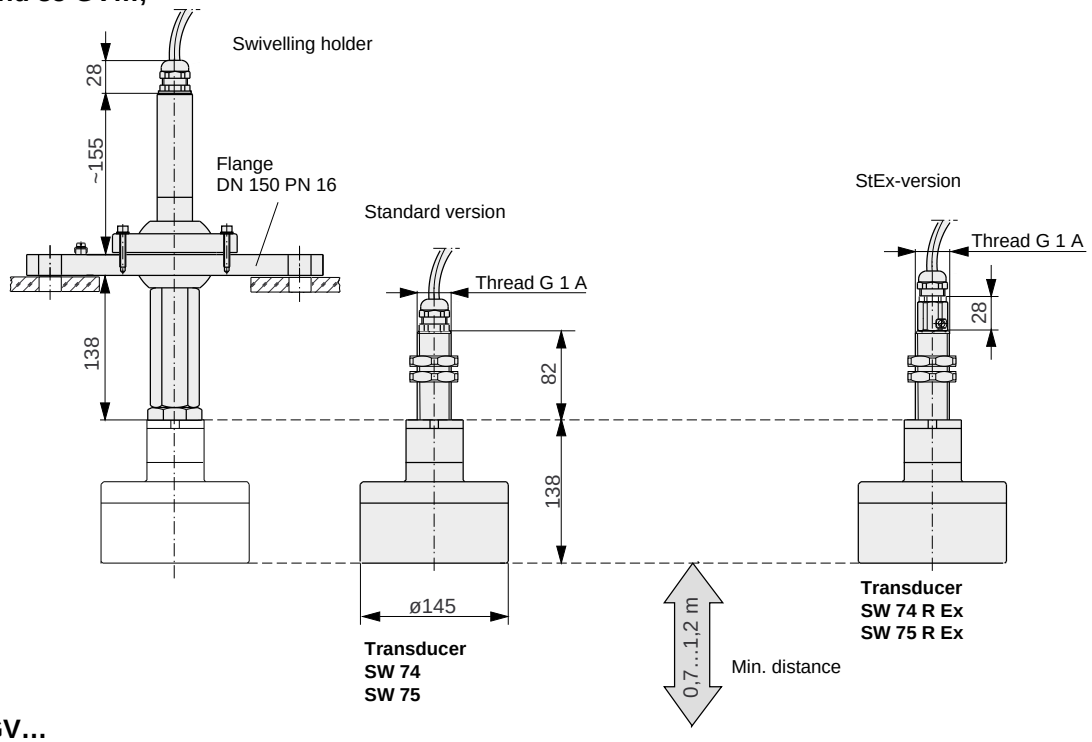


VEGASON 83 GV
VEGASON 83 GK

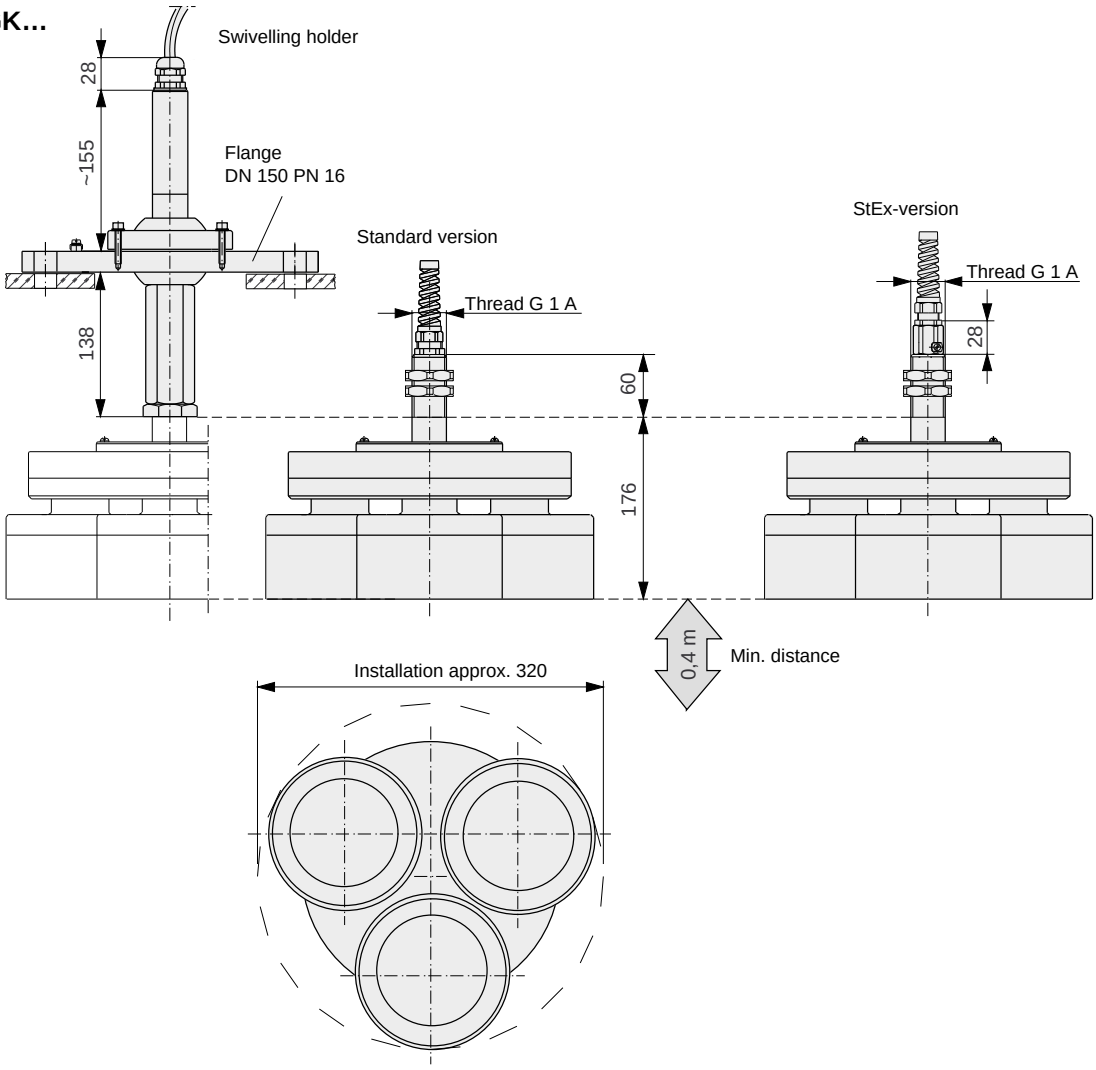


Standard- or StEx-versions
(Dimensions in mm)

VEGASON 84 and 85 GV…,
84 and 85 GK…



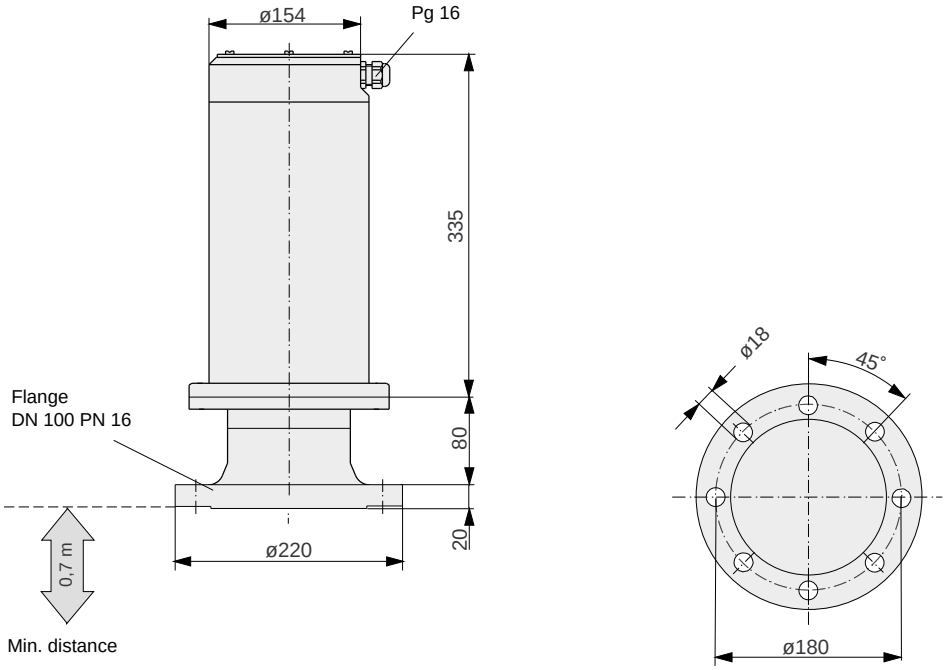
VEGASON 87 GV…
VEGASON 87 GK…



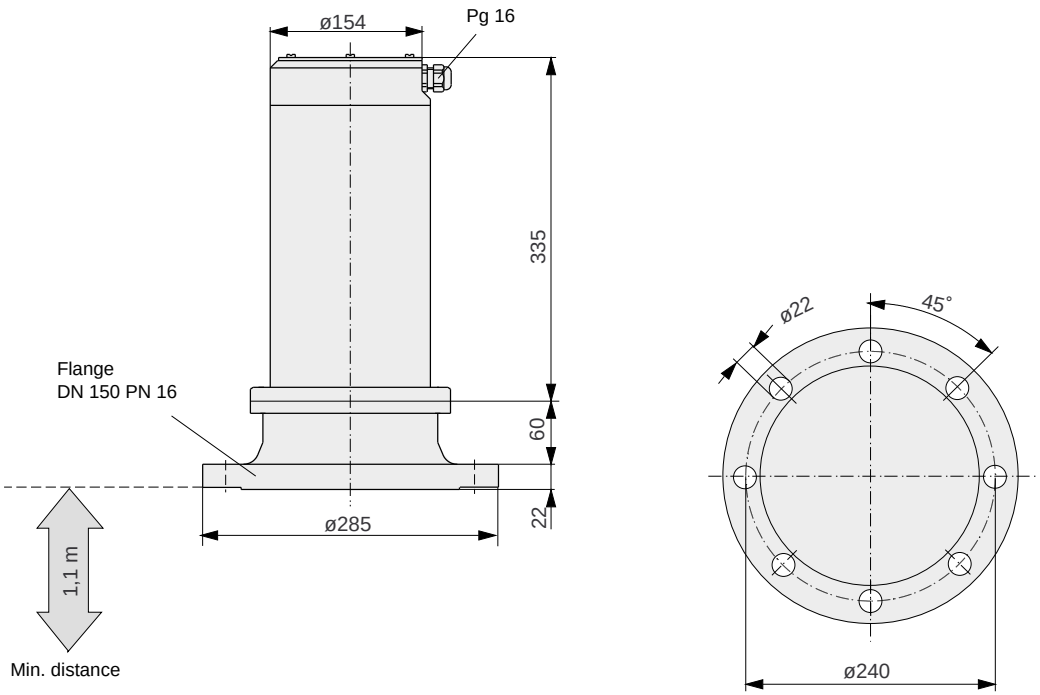
Ex-version

(Dimensions in mm)

VEGASON 83 FV Ex, Ex B
VEGASON 83 FV Ex 0, Ex 0 B



VEGASON 84 FV Ex, Ex B
VEGASON 84 FV Ex 0, Ex 0 B



2.11 Approvals

If measuring systems acc. to the following approvals are installed, the respective legal documents have to be observed. The documents are enclosed to the respecitve measuring system.

StEx-approval

For measuring systems in dust-Ex areas.

- pulse-echo sensor	VEGASON 84 … 87 FK StEx and GK StEx VEGASON 84 … 87 FV StEx and GV StEx

defined in the type approval **BVS 93.Y.8005**

- signal conditioning instrument	VEGAMET … with digital transmission of measuring data
- processing system	VEGALOG 571 with EV-input cards
- auxiliary level switch	all VEGASEL with current input 0/4 … 20 mA

Ex-approval

For measuring system in hazardous areas,
certificated acc. to - CENELEC
- ElexV Zone 0 (Germany)

- pulse-echo sensor	VEGASON 83 and 84 FV Ex VEGASON 83 and 84 FV Ex B
- power supply via	separator type 146 or VEGATRENN 546 acc. to conformity certificate PTB-no. Ex-93.C.4025

defined in the conformity certificate **PTB-no. Ex-93.C.4092** (CENELEC-certificate)

- signal conditioning instrument	VEGAMET … with digital transmission of measuring data
- processing system	VEGALOG 571 with EV-input cards
- auxiliary level switch	all VEGASEL with current input 0/4 … 20 mA
- pulse-echo sensor	VEGASON 83 and 84 FV Ex 0 VEGASON 83 and 84 FV Ex 0 B
- power supply via	separator type 146 or VEGATRENN 546 acc. to conformity certificate PTB-no. Ex-93.C.4025

defined in the conformity certificate **PTB-no. Ex-94.C.4041** (CENELEC and ElexV, Zone 0, Germany)

- signal conditioning instrument	VEGAMET … with digital transmission of measuring data
- processing system	VEGALOG 571 with EV-input cards
- auxiliary level switch	all VEGASEL with current input 0/4 … 20 mA

Ex-technical data of sensors

Signal current circuit	in flame proofing intrinsic safe EEx ia IIB	
Terminals	1 (+) und 2 (–) bzw. 3 (+) und 4 (–)	
Effective inner inductance		
each current circuit L_i	VEGASON 8. FV Ex, Ex0	not important
	VEGASON 8. FV Ex B, Ex 0 B	65 µH
Effective inner capacitance	not important	

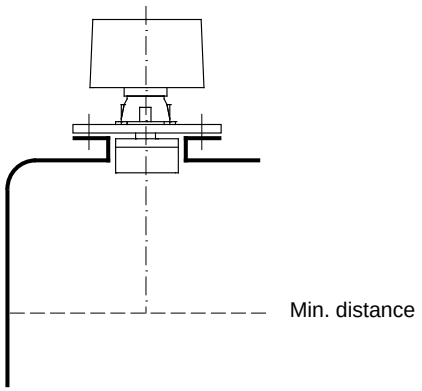
3 Environment

3.1 Installation recommendations relating to liquid tank / vessels

Installation under normal conditions

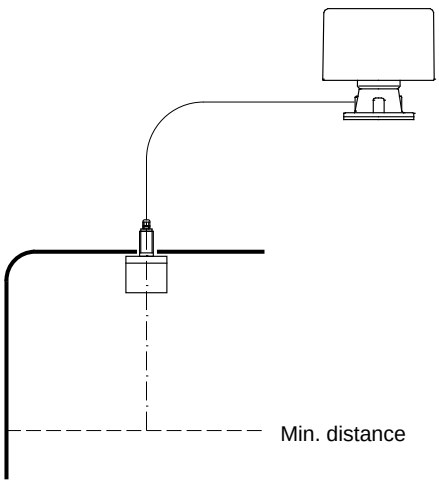
Flange version
Mounting on a very short, generally on a DIN-socket piece available on the tank.

The max. filling of the tank depends on the min. distance of the respective sensor or compact instrument.



Separate version
Mounting of the transducer in a very small hole (ø 35 mm) in the tank ceiling. The mounting procedure can be provided via an available access hatch.

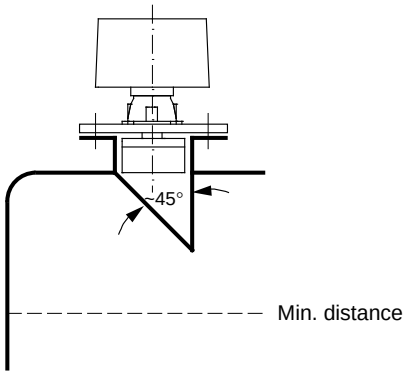
The max. filling of the tank depends on the min. distance of the respective sensor or compact instrument.



Installation under special conditions

If the min. distance of the sensor is decreased, mounting on a socket piece is necessary.

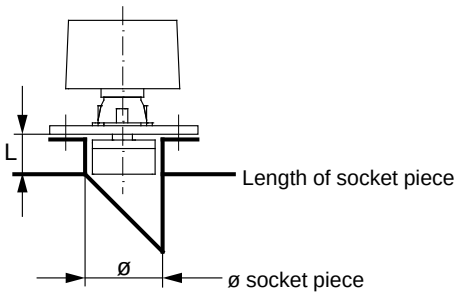
Generally the diameter of the socket piece should be as large as possible and the socket length should be as short as possible.



See the following schedule as general tube relating to the dimensioning of the socket piece length to socket piece diameter.

Tube length L to tube diameter ø

VEGASON / Socket piece-ø	83	84	85	87
100	400	—	—	—
150	400	300	300	—
200	500	400	400	—
250	600	500	500	—
300	—	600	600	—
350	—	700	700	350

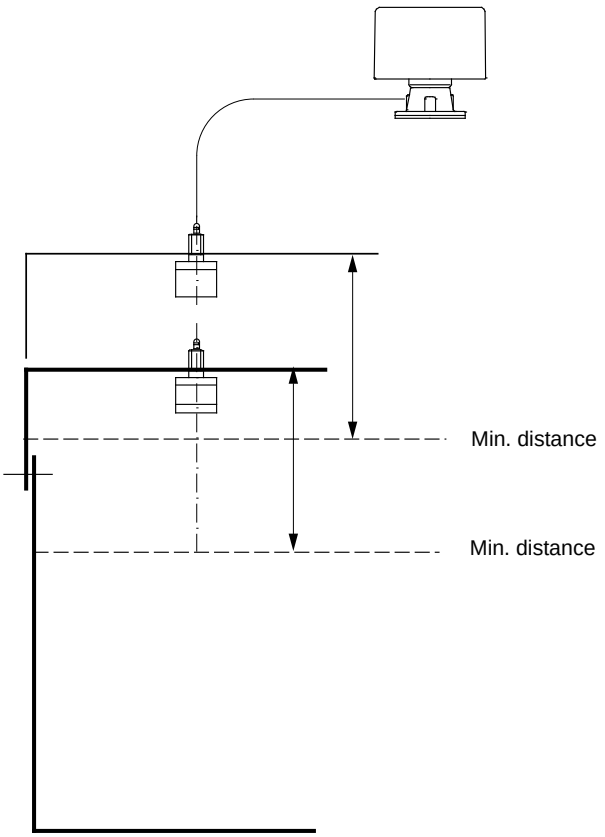


Installation in open vessels

In most applications a separate version is recommended for open vessels, i.e. mounting of the transducer to a fastening bracket or in another fix position above the vessel opening.

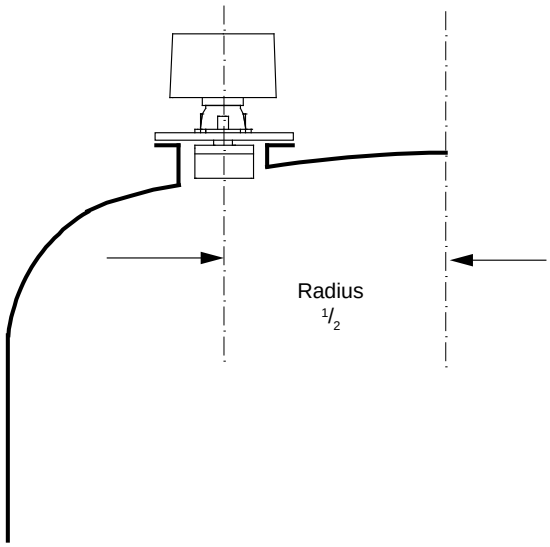
The max. filling of the vessel depends on the min. distance of the respective sensor or compact instrument.

Due to variation possibilities of the transducer position, the requested filling height can be ensured.

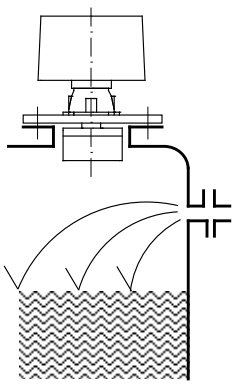


Information to socket piece / mounting

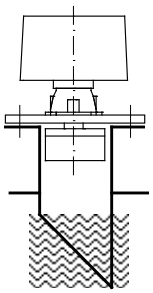
- In case of round top the sensor or the compact instrument should be mounted on a socket piece outside the center (mounting on half the range).



- The emitted sound impulse packets must not be influenced by the filling stream.



- The socket piece must not be flooded by the measured product.

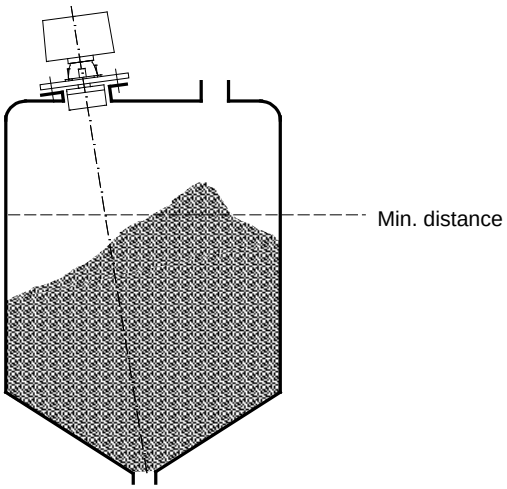


- Chamfer the edges of the socket piece.
- There must be no weldment joints inside the socket piece.

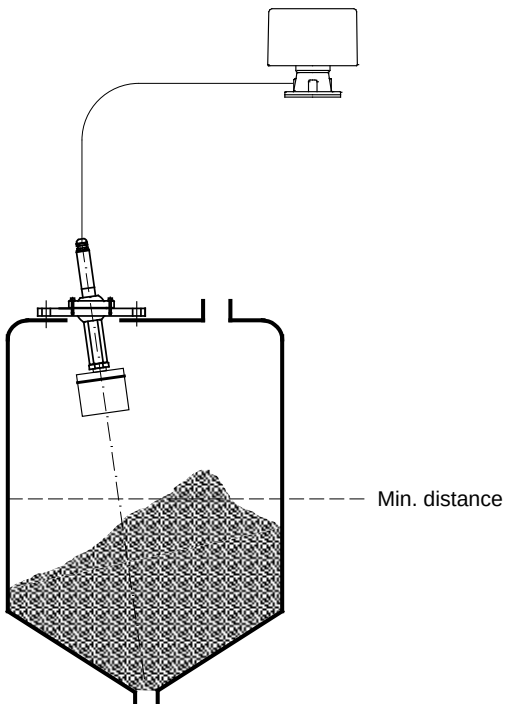
3.2 Installation recommendations relating to solid silos

Installation under normal conditions

Flange version
Mounting on a very short, generally on a DIN-socket piece. The socket piece must be directed to the center of the silo outlet to ensure sufficient reflection in case of different material angles of repose. The max. filling on the silo depends on the min. distance of the respective sensor or compact instrument.



Separate version
In case of horizontal silo top the transducer of the separate version in conjunction with a swivelling holder can be easily and optimally directed to the center of the silo outlet. The max. filling of the silo depends on the min. distance of the respective sensor or compact instrument.

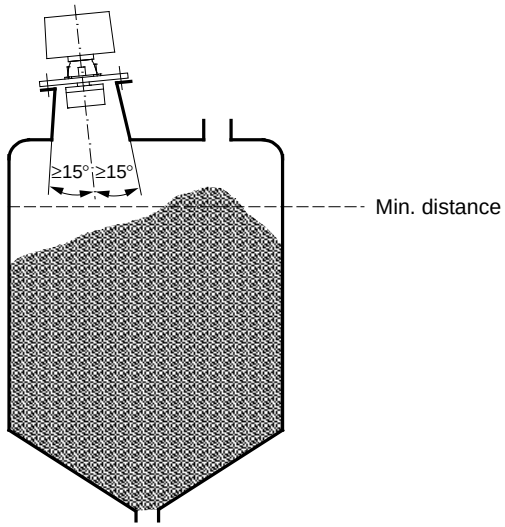


Installation under special conditions

If the min. distance of the sensor is decreased, mounting on a conical socket piece extension is necessary.

Information to socket piece / mounting

- Conical socket pieces acc. to drawing, i.e. conus ≥ 2 x 15°.



- Cylindrical socket pieces acc. to the values in the schedule (see page 23) should only be used in silos after consultance.
- Chamfer the edges of the socket piece.
- There must be no weldment joints inside the socket piece.

Important:
The distance from the mounting position to the filling and suction openings should be as large as possible.

4 Electrical connection

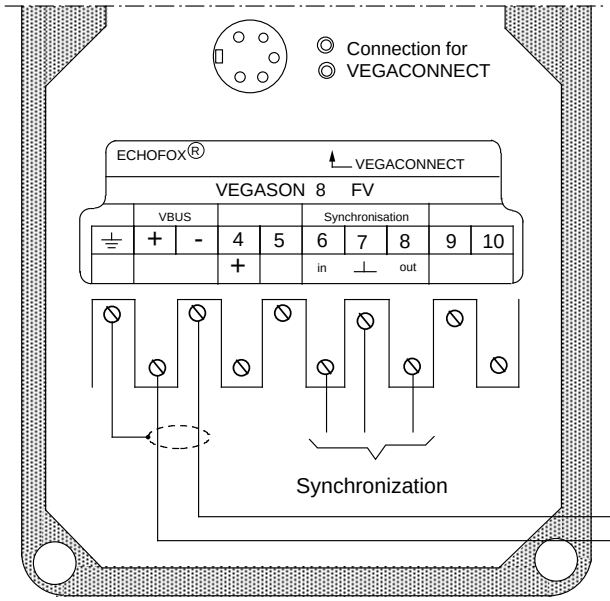
4.1 Connection example of sensors

The connection between echo sensor and signal conditioning instrument or processing system can be made with standard two-wire cable.

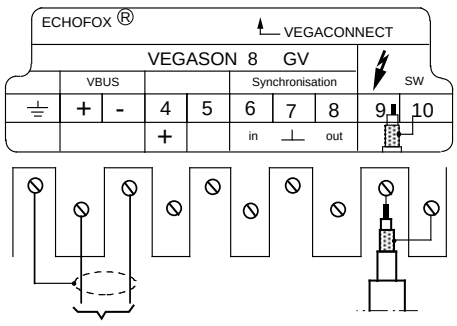
For installation with strong interference, screened cable is recommended. Screening must only be earthed **at one end**.

The two terminals marked with "⏚" are connected in the housing. Connect screening as marked and carry out screening on the upper large terminal. Potential equalization to the outer terminals.

VEGASON 83 ... 87 FV und 84 ... 87 FV StEx



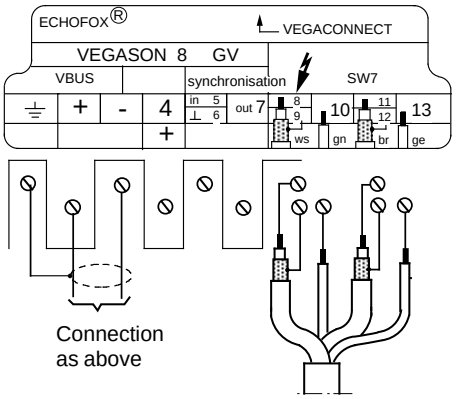
VEGASON 83 ... 85 GV
VEGASON 84 and 85 GV StEx



Connection as above

Connection cable of transducers SW 73 ... SW 75 (max. line length 300 m)

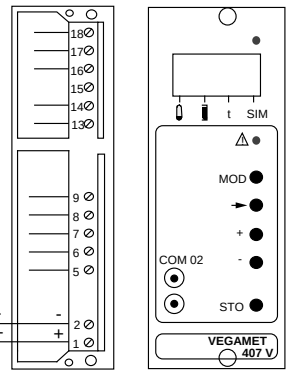
VEGASON 87 GV und GV StEx



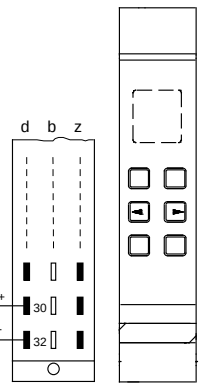
Connection as above

Connection cable of transducers SW 7 (max. line length 35 m)

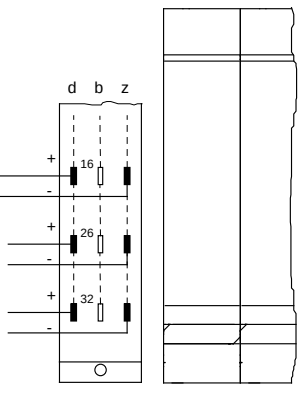
VEGAMET 407 V



VEGAMET 514 V



Further connection possibilities. Max. 3 x 5 = 15 sensors



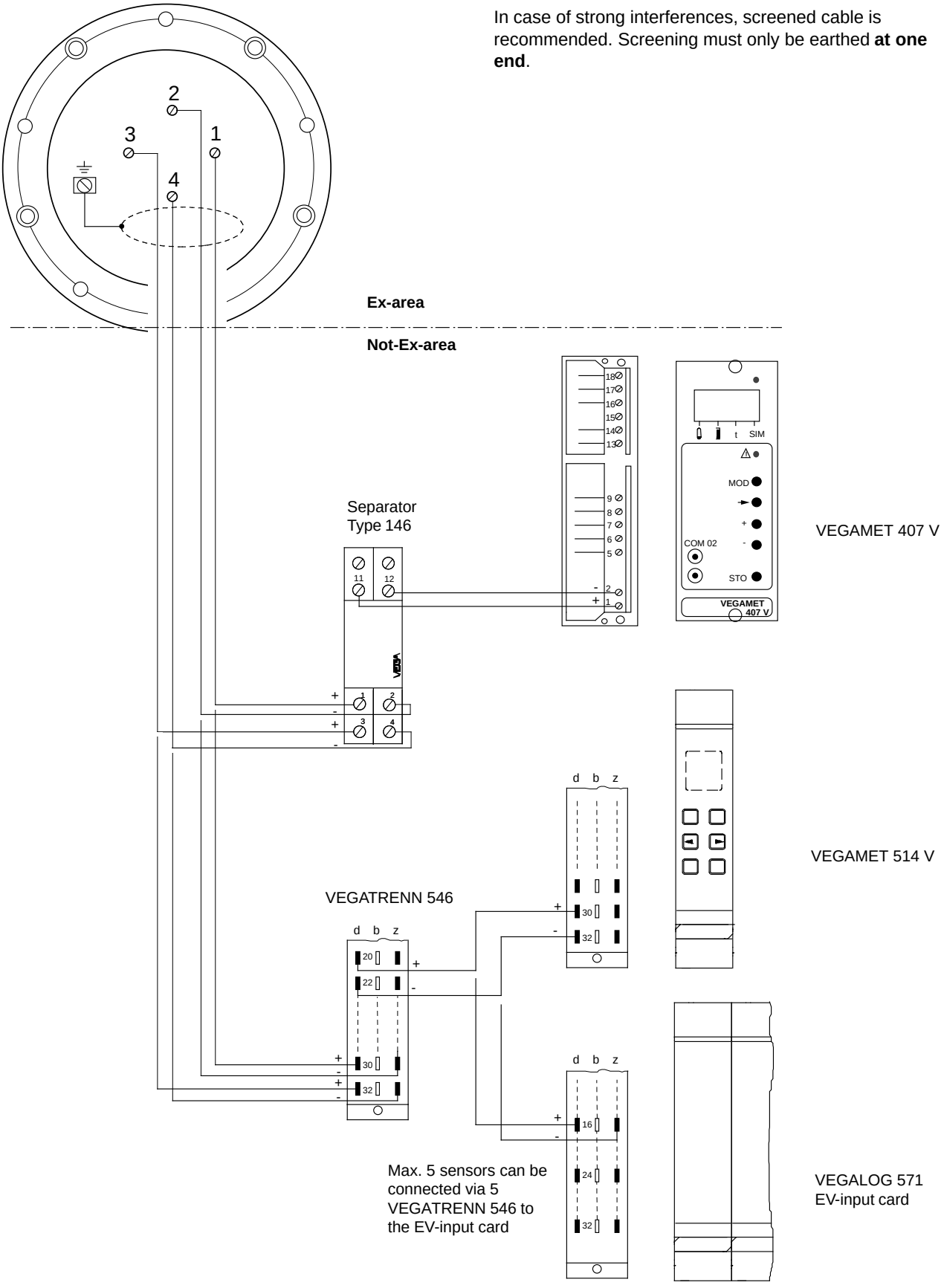
VEGALOG 571
EV-input card

4.2 Connection example of Ex-sensors

VEGASON 83 and 84 FV Ex, FV Ex B
VEGASON 83 and 84 FV Ex 0, FV Ex 0 B

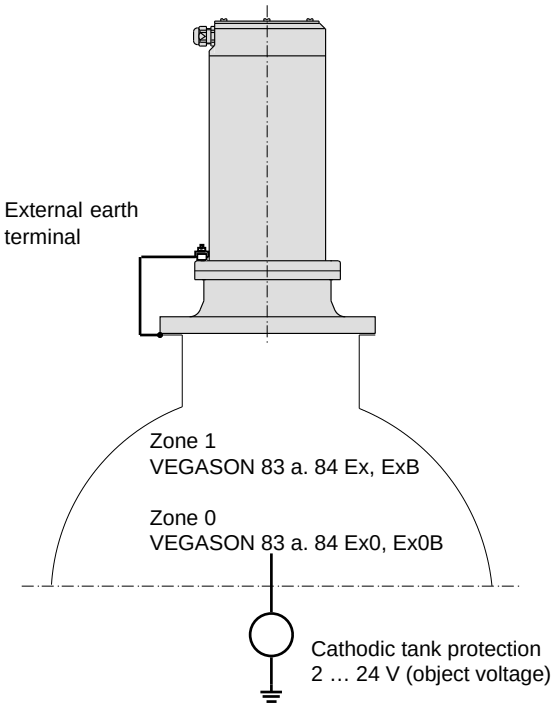
Information concerning safety and installation see following page.

In case of strong interferences, screened cable is recommended. Screening must only be earthed **at one end**.



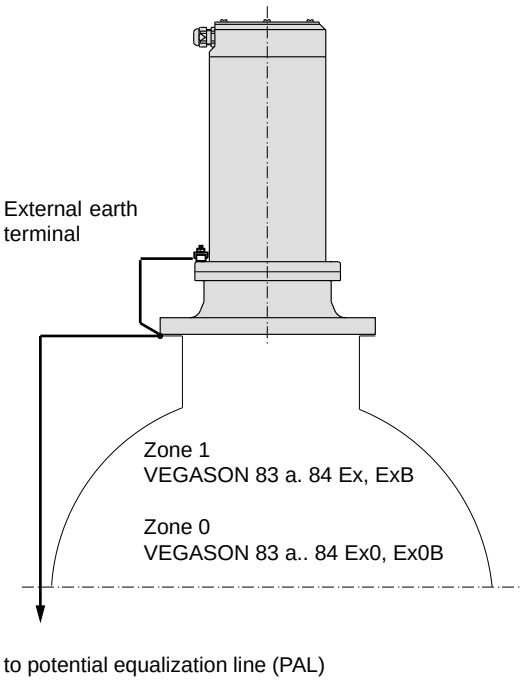
Connection example of Ex-sensors

Vessel with cathodic protection



Furthermore all installations must be carried out acc. to local regulations.

Vessel without cathodic protection



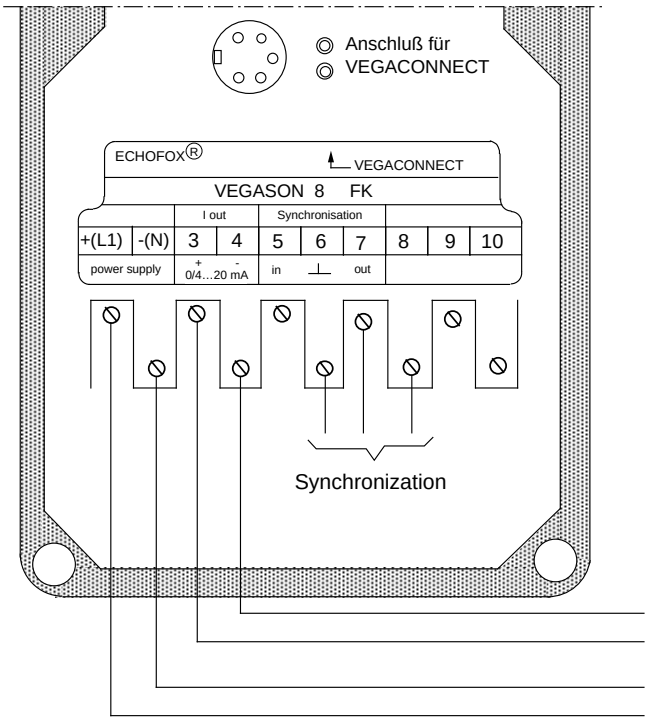
Furthermore all installations must be carried out acc. to local regulations.

4.3 Connection example of compact instruments

VEGASON 83 … 87 FK and 84 … 87 FK StEx

The two terminals marked " ⏚ " are connected in the housing.

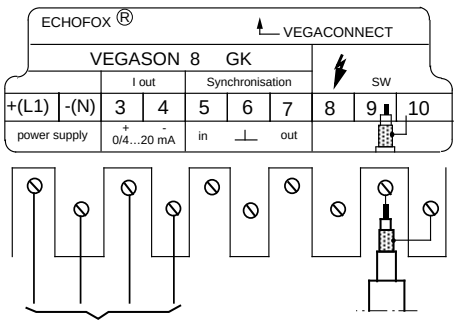
Potential equalization at the outer terminals.



Evaluation, current output 0 … 20 mA
The current output can be directly connected to the indicators or the processors.

Power supply,
Supply voltage see 2.9.1 Technical data

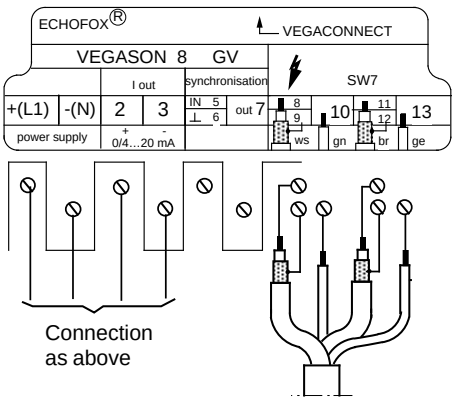
VEGASON 83 … 85 GK and 84 and 85 GK StEx



Connection as above

Connection cable of transducers SW 73 … SW 75 (max. line length 300 m)

VEGASON 87 GK and GK StEx



Connection as above

Connection cable of transducers SW 7 (max. line length 35 m)

5 Set-up

Set-up can be realized in different ways. Observe the separate instruction for ECHOFOX®-sensors.

5.1 Sensor and signal conditioning instrument (e.g. VEGAMET)

The set-up can be made directly via the operating elements of the signal conditioning instrument or via a PC (equipped with VVO-Software).

In this case the computer can be connected via VEGACONNECT with the signal conditioning instrument or directly with the sensor.

Attention, in case of Ex-sensors in the Ex-area, VEGACONNECT must only be connected in the Ex-area (e.g. signal conditioning instrument).

5.2 Sensor and processing system (VEGALOG 571)

The set-up can be only made via PC (equipped with VVO-Software).

The PC must be connected with a suitable central unit (CPU) with the processing system VEGALOG 571 (interface RS 232).

5.3 Compact instrument

The PC (equipped with VVO-Software) must be directly connected via VEGACONNECT with the compact instrument or the current output.

VEGA Grieshaber KG
Am Hohenstein 113
D-77761 Schiltach
Phone 0 78 36 / 50 - 0
Fax 0 78 36 / 50 201