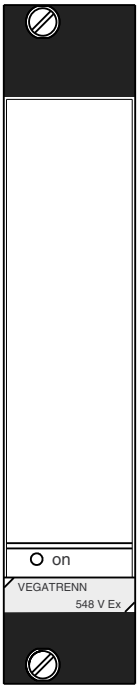
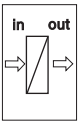
Level and Pressure

Operating Instruction

VEGATRENN 548 V Ex





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Safety information

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

1 Product description

1.1 Function, configuration and mounting

Function

Ex-separator VEGATRENN 548 V Ex is used for intrinsically safe, galvanically isolated supply of up to 15 digital (VBUS) presure transmitters. At the input side it is connected to the tow-wire-VBUS-line of the signal conditioning instruent and provides at the output side 15 intrinsically safe ia-circuits.

The Ex-separator can be used in conjunction with the following signal conditioning instruments or sensors:
- VEGAMET 514 V and 515 V
- EV-card of VEGALOG 571
- pressure transmitter D80, D81, D84 or D86 in Ex-version with VBUS-electronics E23V

The ia-circuits are divided into 3 branches, up to five sensors can be connected to each branch. The ia-circuits are galvanically connected and a fuse per branch is used for safety reasons.

The intrinsically safe circuits are galvanically isolated from the not intrinsically safe circuits.

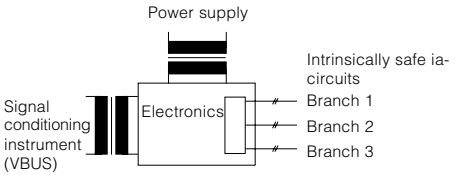


Fig. 1.1: Block diagram of the Ex-separator

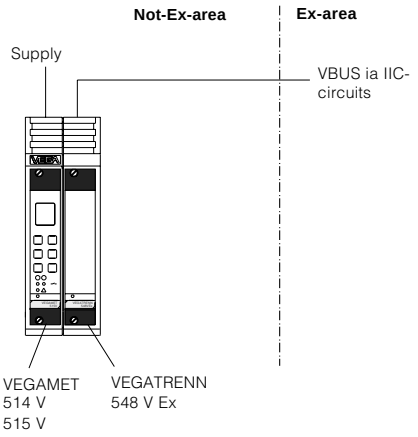
Configuration

The Ex-separator VEGATRENN 548 V Ex is designed in 19"-technology with 5 TE (= 25,4 mm). The connection is made via a multiple plug acc. to DIN 41 612.

Mounting

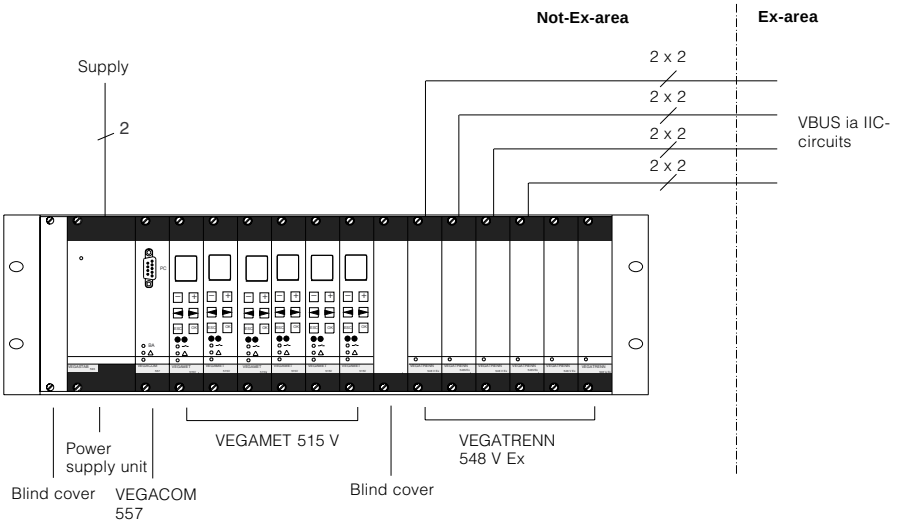
There are the following mounting possibilities:
- in housing type 506 with VEGAMET
- in carrier BGT 596 Ex with VEGAMET
- in carrier BGT LOG 571 *) with VEGALOG

Example 1:
In housing type 506 with VEGAMET

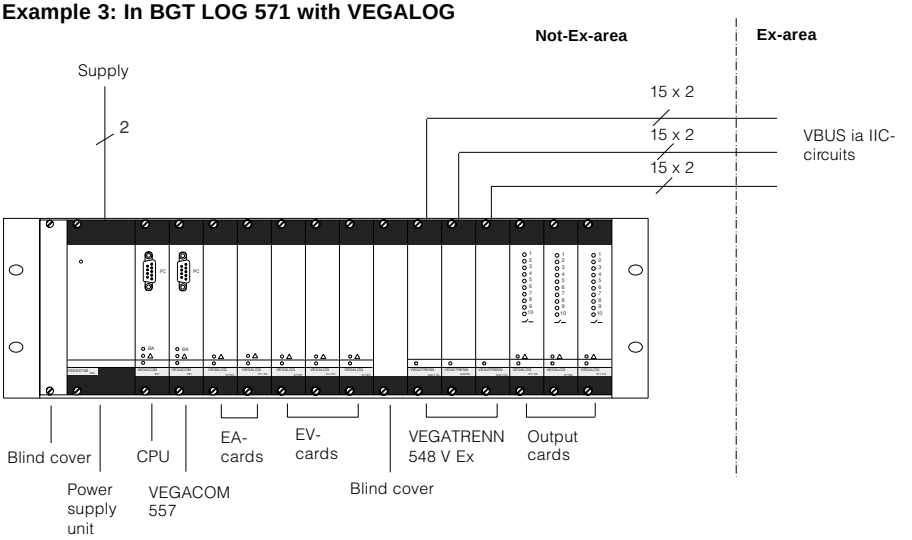


*) If several VEGATRENN 548 V Ex are used, it is recommended to separate them into the cheaper BGT 596 Ex.

Example 2: In BGT 596 Ex M with VEGAMET



Example 3: In BGT LOG 571 with VEGALOG



1.2 Technical data

Power supply

Operating voltage	U_{nenn} = 24 V AC (20 … 53 V), 50/60 Hz = 24 V DC (20 … 72 V)
Power consumption	approx. 4 W, approx. 6 VA
Fuse	1 A, slow-blow

Signal conditioning instrument circuit

For connection to	signal conditioning instrument VEGAMET 514 V, 515 V or EV-card of VEGALOG 571
Input voltage	U_{nenn} = 25 V DC with VEGAMET = 24 V DC with EV-card VEGALOG

The signal conditioning instrument circuit must only be connected to instruments with an operating votlage less than 250 V.

Sensor circuit

Number	3 branches with 5 sensor current circuits each
Sensors	hydrostatic pressure transmitter with electronics type B (VBUS)
Voltage	at 5 mA approx. 15 V DC, at 25 mA approx. 13,5 V DC
Current limitation	at approx. 30 mA, shortcircuit proof
Fuse	per circuit 1 fuse 40 mA, slow-blow
Connection line	2-wire (standard line) *)
Resistance per conductor	max. 15 Ω
Line length	max. 1000 m

Sensor circuits, Ex-technical data

Classification	[EEx ia] IIC, [EEx ia] IIB, [EEx ib] IIC, [EEx ib] IIB
Max. values (per branch)	
- voltage	U_O - 18,2 V
- current	I_O - 270 mA
- efficiency	P_O - 926 mW
Characteristics	linear

	EEx ia IIC	EEx ia IIB	EEx ib IIC	EEx ib IIB
Max. permissible outer inductance L_a	0,41 mH	1,8 mH	0,41 mH	1,8 mH
Max. permissible outer capacitance C_a	83 nF	384 nF	290 nF	1300 nF

The intrinsically safe sensor current circuits are reliably galvanically isolated from the not intrinsically safe circuits up to a peak value of the nominal voltage of 375 V.

Indicating elements

LED in front plate	green on: operating voltage on

*) screened cable is recommended for electromagnetic interferences.

Electrical connection

Multiple plug component	acc. to DIN 41 612, series F, 33-pole, 3 rows d, b, z (partly equipped)
In conjunction with	
- carrier BGT 596 Ex, BGT LOG 571	connection to appropriate Ex-module
- housing type 506	connection to screw terminals (max. 2,5 mm²)

Protective measures

Protection	
- not mounted	IP 00
- mounted in BGT 596 Ex oder BGT LOG 571	front side (completely equipped): IP 40 upper and lower side: IP 20 wiring side: IP 00
- mounted in housing type 506	front side (completely equipped): IP 40 housing gerneal: IP 30 terminal side: IP 20
Protection class (in housing type 506)	II
Overvoltage category	II

Electrical separating measures

Galvanic isolation	between intrinsically safe circuits and not intrinsically safe circuits as well as against the power supply
- reference voltage	250 V
- isolation resistance	1,5 kV
Common potential	with the intrinsically safe circuits

CE-conformity

The Ex-separator VEGATRENN 548 V Ex meets the portective regulations of EMVG (89/336/EWG) and NSR (73/23/EWG). The conformity has been judged acc. to the following standards:

EMVG	Emission	EN 50 081
	Susceptibility	EN 50 082
NSR		EN 61 010

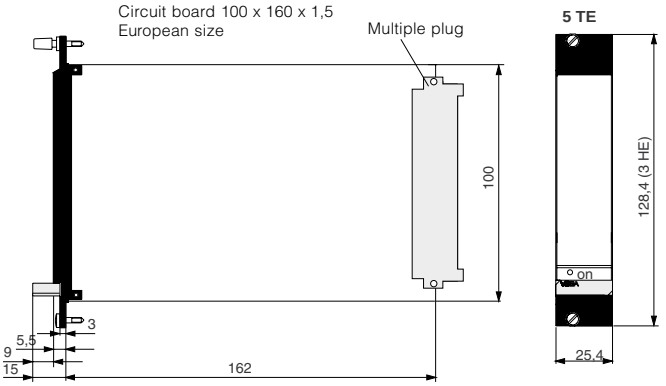
Mechanical data

Series	module unit for 19“-carrier or housing type 506
Dimensions	W = 25,4 mm (5 TE), H = 128,4 mm, D = 162 mm
Weight	approx. 350 g

Ambient conditions

Permissible ambient temperature	-20°C … +60°C
Storage and transport temperature	-40°C … +80°C

1.3 Dimensions

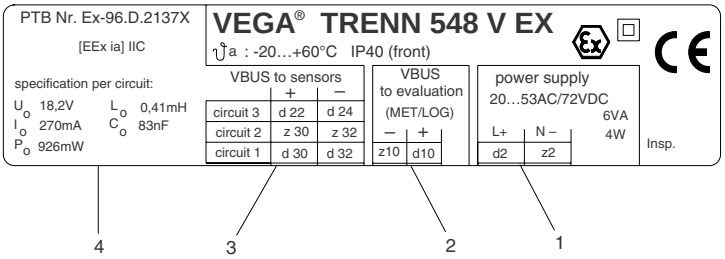


1.4 Approvals

The Ex-separator VEGATRENN 548 V Ex is approved for connection of sensors in hazardous areas. The conformity certificate acc. to CENELEC has PTB-no. Ex-96.D.2137 X.

1.5 Type plate

The type plate contains important data required for connection. The type plate is located laterally on the multiple plug. The configuration and parts of the type plate are described in the following:



1 Power supply
2 Signal conditioning instrument circuit
3 Branches with sensor current circuits
4 Data of each branch

2 Mounting

The Ex-separator VEGATRENN 548 V Ex can be mounted as follows:
- in carrier BGT 596 Ex or BGT LOG 571
- in housing type 506

Mounting in carrier

First of all mount the Ex-module inot your carrier. The Ex-module consists of a multipoint connector acc. to DIN 41 612, individual coded pins (see drawing), a separating chamber as well as guide rails and mounting material.

Wire the connections of the multipoint connectro acc. to the wiring place on the following pages.

The multipoint connector is available as follows:
- Wire-Wrap standard connection 1,0 x 1,0 mm
- Plug-connection 2,8 x 0,8 mm
- Termi-Point standard connection 1,6 x 0,8 mm
- Soldering connection
- Screw terminals 2 x 0,5 mm²

Further information concerning mounting is stated in the operating instruction of the carrier.

Mounting in single housing

The housing socket can be either screwed directly to a mounting plate or plugged on a carier rail (TS 35 x 7,5 acc. to EN 50 022 or TS 32 acc. to EN 50 035). Further information concerning mounting are stated in the operating instruction of the housing. Connect the wires acc. to the wiring plan.

Coding

The multipoint connector of the carrier or the housing must be provided with coded eys to avoid interchanging of the various signal conditioning instruments. The multiple plug of VEGATRENN is povided with the appropriate holes (mechanical coding).

The instrument coding ensures that the various signal conditioning instruments are not interchanged. The appropriate coded pins are attached to each module or housing. Provide the multipoint connector with these coded pins acc. to the following table and figure.

The Ex-coding with fixed coded pin ensures that not-Ex and Ex-intruments are not interchanged.

	Instrument coding	**Ex-coding**
VEGATRENN 548 V Ex	a25 / c11	c23

Fig. 2.1 Coding table

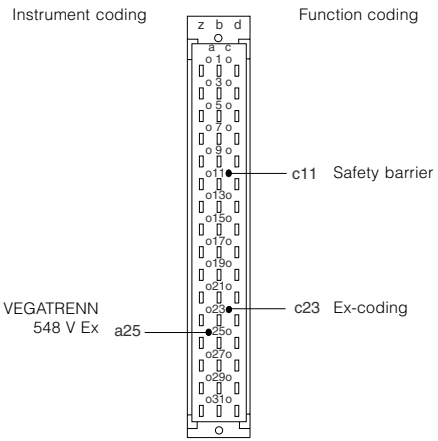


Fig. 2.2 Module coding VEGATRENN

3 Electrical connection

3.1 Installationinformation

Generally the following instructions must be noted for installation:

Installation place

VEGATRENN 548 V Ex as well as the apropriate signal conditioning instrument must be generally instaled outside the hazardous areas.

Protection

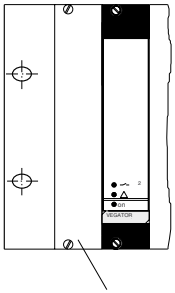
In Ex-applications protection IP 20 must be maintained. Cover the gaps or free modules from the front with appropriate blind covers.

Ex-separating chamber

An Ex-separating chamber must be mounted to the connections of VEGATRENN to ensure sufficient „air and creeping distances“. Loop the cable through the Ex-separating chamber and connect the cables. Fasten the Ex-separating chamber with the lower screw. Note the operating instruction of the carrier BGT 596 Ex.M.

Mounting in carrier

When you mount VEGATRENN in a carrier, you have to use a VEGA-Ex-module. Keep a distance of at least 10 mm (2 TE) to module cards of other manufacturers. When you want to mount VEGATRENN in the complete left position in the carrier, a blind cover of at least 20 mm (4 TE) must be mounted in front of the module of the instrument.



Separation from not intrinsically safe circuits

A separating wall must be provided between the connection parts of intrinsically safe and not intrinsically safe circuits so that the min. distance of 50 mm must be kept. When using a separating chamber (supplied with the module) this condition is met.

General conditions

In addition the valid „Installation and operating instructions“ as well as the special conditions and instructions in the conformity certificates must be noted.

3.2 Connection instructions

Not intrinsically safe input

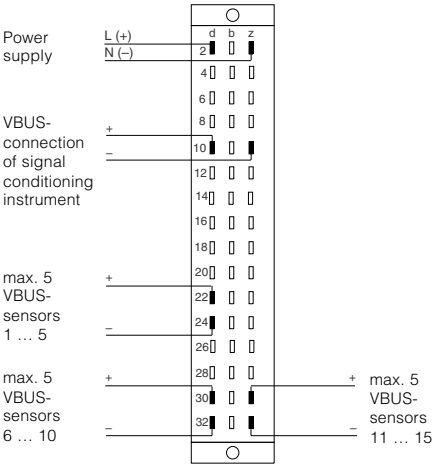
The not intrinsically safe input of the Ex-separator is connected via a standard two-wire line with a signal conditioning instrument. If electromagnetic interferences have to be expected, screened cable should be used. The screen must only be earthed a one end of the signal conditioning instrument.

Intrinsically safe output

The wiring of the intrinsically safe outputs of the Ex-separator with the sensors must meet with the valid installation regulations. E.g. the DIN-regulations prescribe that the connection lines between Ex-separator and sensors must be marked on the entire length. For coverings light blue must be used as colour.

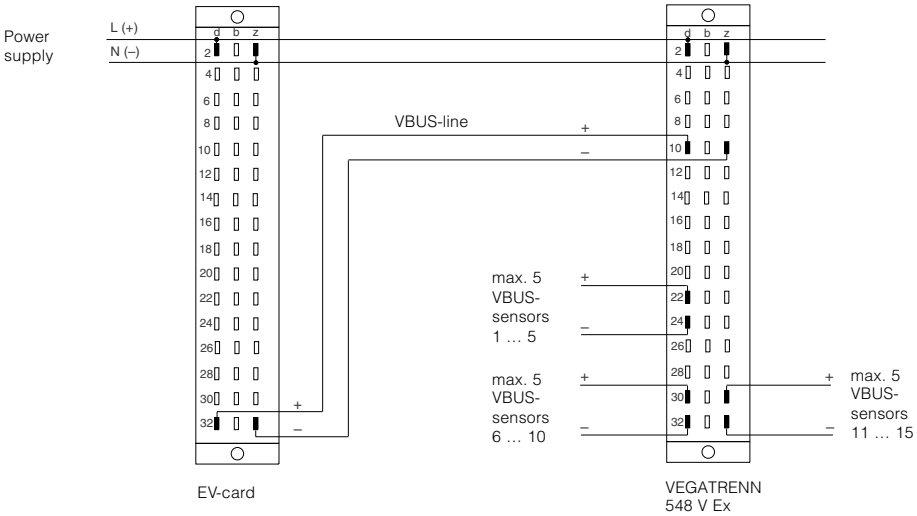
If electromagnetic interferences must be expected, screened cable must be used. The screen must only be earthed at one sensor end.

3.3 Wiring plan

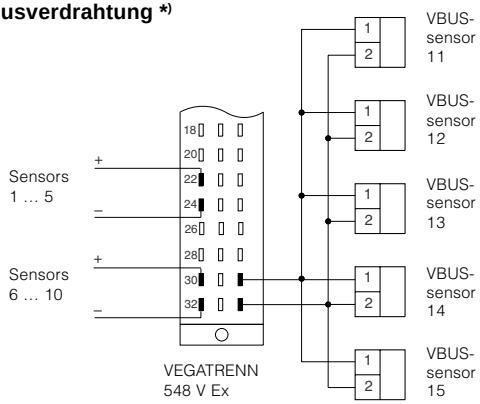


3.4 Connection examples

In conjunction with VEGALOG 571

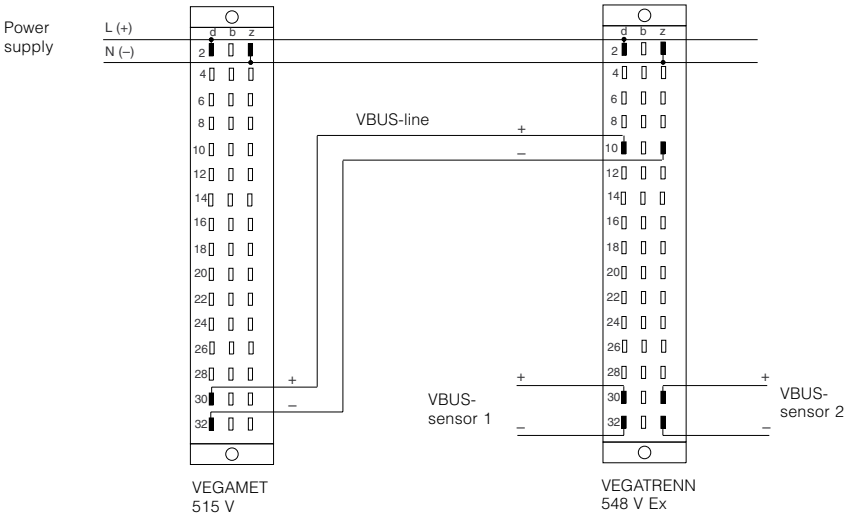


Busverdrahtung *)

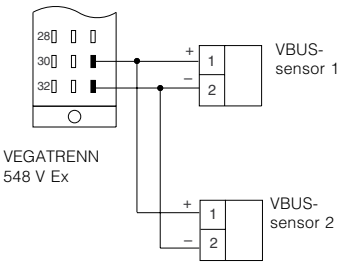


*) The connectionof sensors 1 … 5 or 6 … 10 is made in the same way.

In conjunction with VEGAMET 514 V and 515 V (carrier)

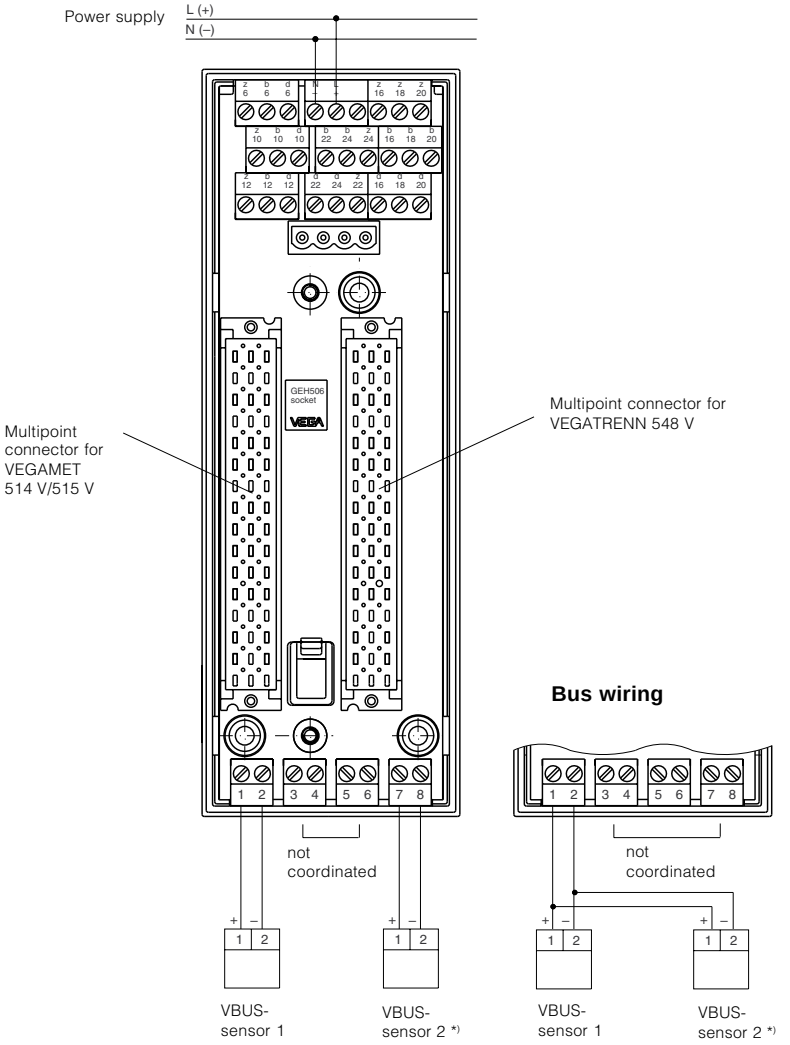


Bus wiring *)



*) only with VEGAMET 515 V

In conjunction with VEGAMET 514 V and 515 V (housing type 506)



*) only with VEGAMET 515 V

4 Set-up

For set-up note additionally the operating instruction and the legal documents of the sensors and signal conditioning instrumetns used.

5 Diagnosis

5.1 Maintenance

The instrument is maintenance free.

5.2 Repair

Due to safety and guarantee reasons repair work must only be done by VEGA-staff.

5.3 Fault signal

VEGATRENN 548 V Ex has no own monitoring. The signal conditioning instrumetn circuit and the sensor current circuits are monitored by the signal conditioning instrument on shortcircuit and line break.

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