

*Manual*

# Scale amplifier WV157



Rev. 0



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# 1 Safety Guidelines for explosion proof devices

## Application and Standards

This instruction manual applies to explosion protected control systems of protection types below. This apparatus is only to be used as defined and meets requirements of EN 60 079 particularly EN60 079-14 "electrical apparatus for potentiality explosive atmospheres".

It can be used in hazardous locations which are hazardous due to gases and vapours according to the explosion group and temperature class as stipulated on the type label. When installing and operating the explosion protected device as well as its periphery, the respective nationally valid regulations and requirements have to be observed.

## General Instructions

Work on electrical installations and apparatus in operation is generally forbidden in hazardous locations, with the exception of intrinsically safe circuits. In special cases, work can be done on non-intrinsically safe circuits, on the condition that during the duration of such work no explosive atmosphere exists. Only explosion protected certified measuring instruments may be used to ensure that the apparatus is voltage-free. Grounding and short circuiting may only be carried out, if there is no explosion hazard at the grounding or short circuit connection.

The control unit has to have a back-up fuse as stipulated. The mains connection must have a sufficient short circuit current to ensure safe breaking of the fuse. To achieve an impeccable and safety device operation, please take care for adept transportation, storage and mounting, as well as accurate service and maintenance. Operation on this device should only be implemented by authorised persons and in strict accordance with local safety standards.

The electrical data on the type label and if applicable, the "special conditions" of the test certificate TÜV 01 ATEX 1694 is to be observed.

For outdoor installation it is recommended to protect the explosion protected distribution and control system against direct climatic influence, e.g. with a protective roof. The maximum ambient temperature is 140°F (60°C) at T4, if not stipulated otherwise (please note temperature classes of hazardous area and refer to EC- type certificate)

## Terminal compartment in Increased Safety

When closing, it is to be ensured that the gaskets of the terminal compartment remain effective, thus maintaining degree of protection IP 54. Unused entries are to be closed off by impact proof stopping plugs, which are secured against self-loosening and turning.

## Maintenance Work

The gaskets of all parts of the housings have to be checked for damages and replaced, if required. Terminals have to be tightened correctly. Possible changes in colour point to increased temperature. Cable glands, stopping plugs and flanges have to be tested for tightness and secure fitting.

## Intrinsically Safe Circuits

Installation instructions in the testing certificates of intrinsically safe apparatus have to be observed. The electrical safety values stipulated on the type plate must not be exceeded. This is also important at the intrinsically safe circuits. When interconnecting intrinsically safe circuits it is to be tested, whether a voltage and/or current addition occurs. The intrinsic safety of interconnected circuits is to be ensured!

## 2 Scale amplifier WV157

### 2.1 Short description of the WV157

The balancing amplifier WV157 serves for the evaluation of signals, as they supply Wägezellen on DMS basis. The WV157 possesses six lines for the connection of a Widerstandsbrücke. The difference signal of the bridge is strengthened and digitized in the WV157. The digitized signal is transmitted over two digital exits to an evaluation unit.

### 2.2 Scale dosage with dosing CONTROLLER DC155

The combination dosing CONTROLLER DC155 with balancing amplifier represents a dosing system within the Ex area, which works with a scale signal. The service personnel starts the dosing procedure by push of a button at the DC155. The increasing weight of the filling material during the dosage is seized by means of a scale with strain gauge (DMS). As soon as the target weight is reached switches off the dosing CONTROLLERs the promotion actuators automatically and the dosage is final.

The scale amplifier WV157 serves thereby for the evaluation of the signals, which the scale cells supplies. The difference signal of the DMS bridge is amplified, digitized in the WV157 and conveyed to the dosing CONTROLLER.

Mount the WV157 in short distance (e.g. ex range) to the scale cells, where influences of noise are around. The fail safe digital output signal to the controller DC155 can be longer.

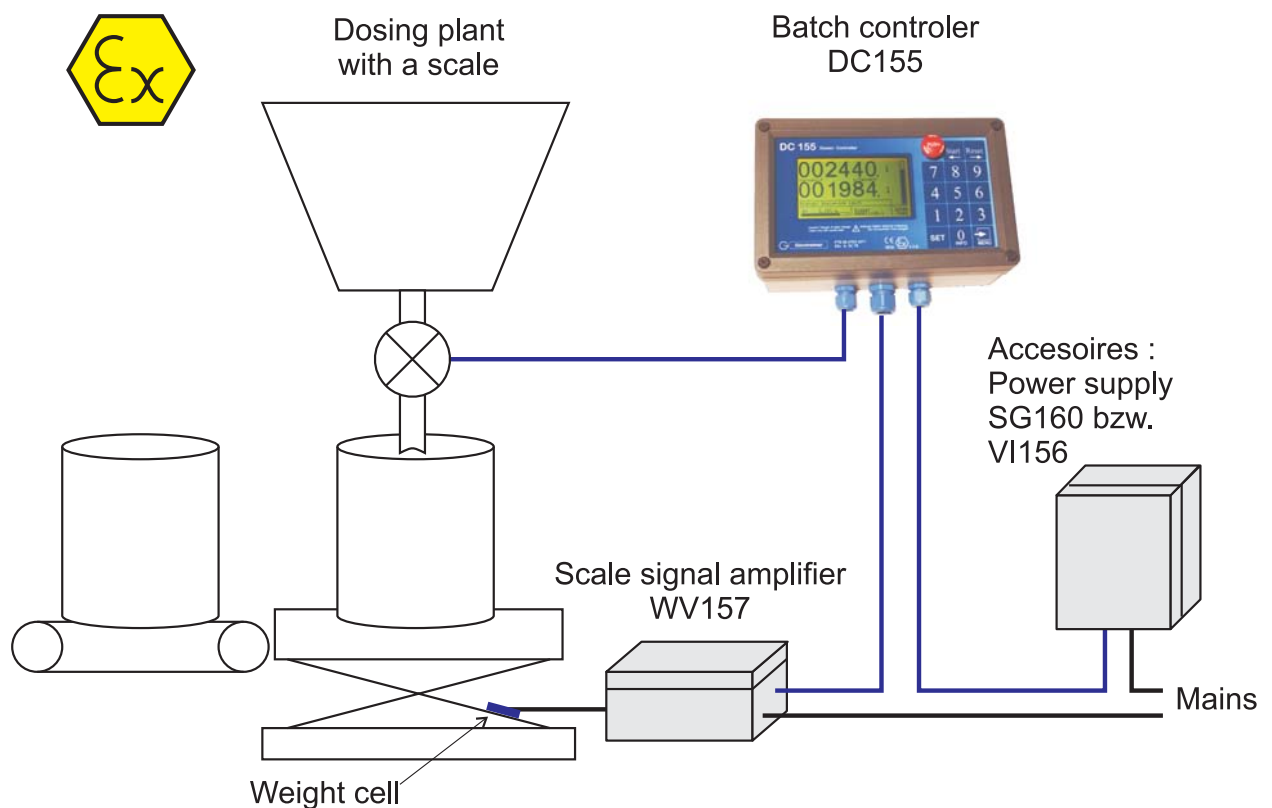
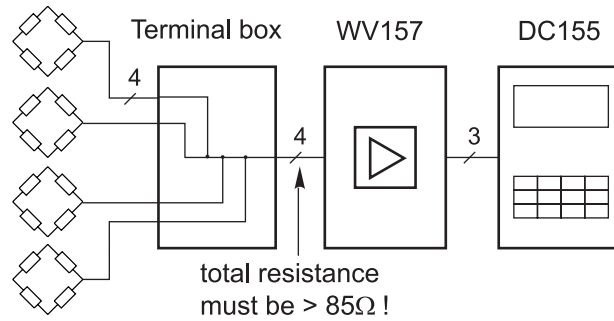


Illustration 1: Balancing application DC155 with WV157

### 2.3 Connection of the scale

The weight cell is shown, attached at the blue clamps 1 to 6, as in Illustration 4. There can be parallel attached up to 4 weight cells. The resulting burden resistance must be ever larger thereby than 85W.



**Illustration 2: Connection of 4 scale cells**

### 3 Appendix

#### 3.1 Technical data and clamp limit values

		Scale amplifier WV157
General information	Explosion protection	E ex e m ib IIC T4
	Group of equipment	II 2 G
	EEC design inspection certificate	TÜV 01 ATEX 1694
Assembly	Ambient temperature	- 20°C... +50°C T4
	Zone	Within ex range, Zone1
Housing	Dimensions H x B x T	175 mm x 80 mm x 57 mm
	Material	Aluminum, paints
	Enclosure	IP65
Electrical specifications	Measuring rate	8 cycles per second
	Accuracy	0.03% VE with 2mV/V
	Temperature coefficient	0.015% VE per 10 K
	Mains voltages Kl. 1,2	AC: 230V, 120V, DC: 24V, Over = 253 V
	Kl 13	PE
E ex i	Connection DMS bridge Kl. 1-6	U0 = 5,9V, I0 = 153 mA, P0 = 225 mW C0 = 1.5 µF, L0 = 1.7 mH
	Serial interface Kl 7+ 9, and/or 8+ 9	U0 = 5,9V, I0 = 13 mA, P0 = 19 mW C0 = 575 nF, L0 = 40 mH
	PE for the connection of the screen (Kl. 10)	

For further safety-relevant information see EEC design inspection certificate TÜV 01 ATEX 1964

Min. and max. clamping torque	min. 0,3 Nm max. 0,4 Nm
Min. and Max. wire cross- section	steep: 0,2 – 2,5 mm <sup>2</sup> flexible: 0,2 – 2,5 mm <sup>2</sup>

### 3.2 Dimensions

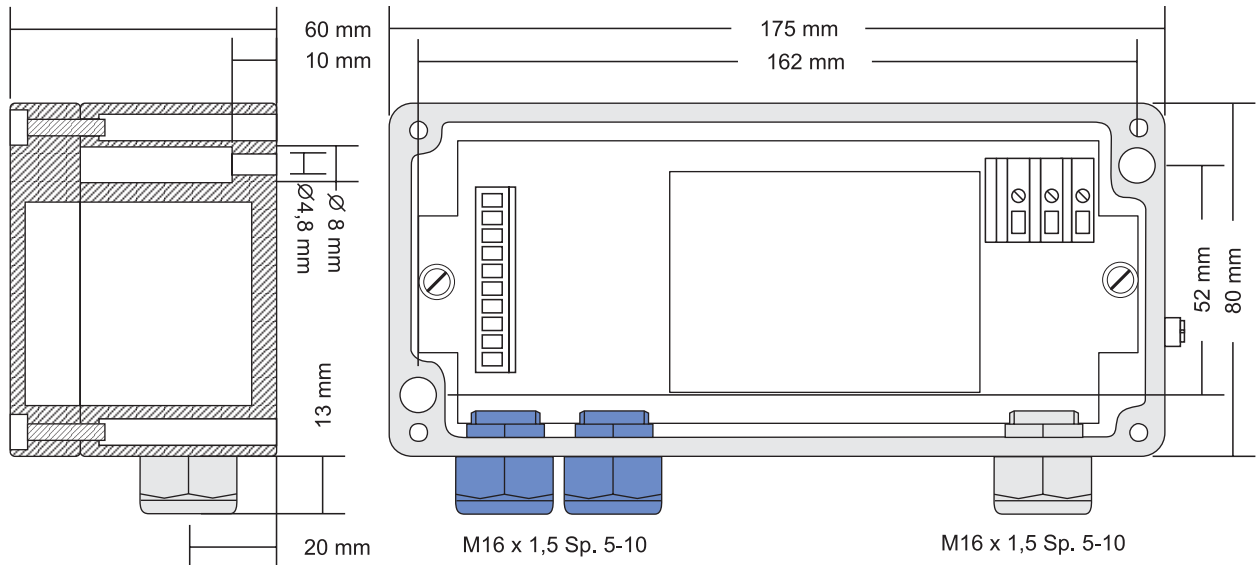


Illustration 3: Dimensions WV157

### 3.3 Correspondence of WV157 – DC155

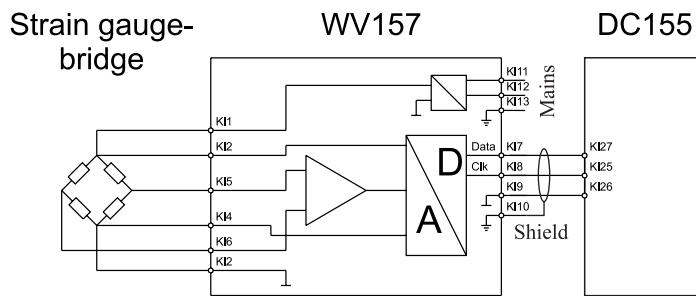


Illustration 4: Block diagram WV157

### 3.4 Type code

	<b>WV157</b>	<b>.X</b>
<b>Mains voltage:</b>		
230V AC .....		.0
120V AC .....		.2
24V DC .....		.6