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Dosing-Controller

for the hazardous area
PTB 98 ATEX 2071

DC155

- **Mounting inside hazardous area zone 1**
- **Ex-protection: EEx ib IIC T6**
- **Solid housing, protection class IP65**
- **Universal dosing functions:**
  - **Dosing control with digital solenoid valves**
  - **Dosing control using proportional solenoid valve**
  - **Dosing control with absolute level signal**
  - **Dosing with PID controlled flow (Option)**
- **Graphic LCD: 240x128 Pixels**
- **Menu-guided configuration, continuous indication of preset, current quantity, flow, total sum and time during the batch**
- **Remote control via special function inputs possible**
- **Operates with one transmitter power supply (in minimal configuration)**
- **Adjustable maximum preset**
- **Continuos rise and fall ramp for analogous output**
- **lockable front keys, configuration and parameters are code protected**

Additional Options

- **TTY- or Modbus- Interface**
- **calibratable batch protocol print**
- **Pt100- input for temperature compensation of the expansion coefficient γ and temperature indication**
- **Separate analogous output power supply terminals (max. impedance of 1 kΩ)**
- **Connect the DC155 simply to a 24V DC line voltage, for non hazardous area application**

Short description

The dosing controller DC155 is an all purpose dosing control device to manage batch controlling of any arbitrary liquids or solid products inside the hazardous area. With a comfortable keyboard, large keys (22 x 22 mm), a clearly arranged display and the flexible functionality it is easy to realise simple as well as complex batch applications direct in hazardous area, without huge wiring expense to a e.g. panel room in safe area.

It is possible to realise a remote control for the basic functions >START, STOP, RESET<. The DC155 keeps the actual dosing status in a EEPROM, if the power supply fails the DC155 is able to continue working after the power is back. The DC155 works nearly with any available transmitter, because he can operate with NAMUR- and digital 24V- signals in standard version and with analogous signals as an option.

Shocks on the pipe system can be prevented by a rising and falling ramp using a proportional solenoid valve or by using a coarse and a fine valve. Moreover it is possible to utilise the lag quantity and the preshut of the coarse valve to achieve a high dosing accuracy. The DC155 has a comfortable malfunction and disturbance monitoring system to monitor the sensor wiring and the flow.

The analogous output of the DC155 has a 14 bit resolution and it can drive a impedance up to 600 Ω, respectively 1000 Ω, using the separate analogous output supply option.

The DC155 has an **internal PID- flow controller** as an option. With this option the DC155 is a batch controller **and** a PID- flow controller in one device. The batch controller fills up the desired volume and the flow controller regulates the medium flow to the predefined set-point flow during the batch process. The set-point flow has also a ramp shape. The dynamical behaviour of the feedback flow controller can be adjusted with the common PID-parameter set: Kp, Ki and Kd.

Service

- Customised ex works calibration
- Application consultation

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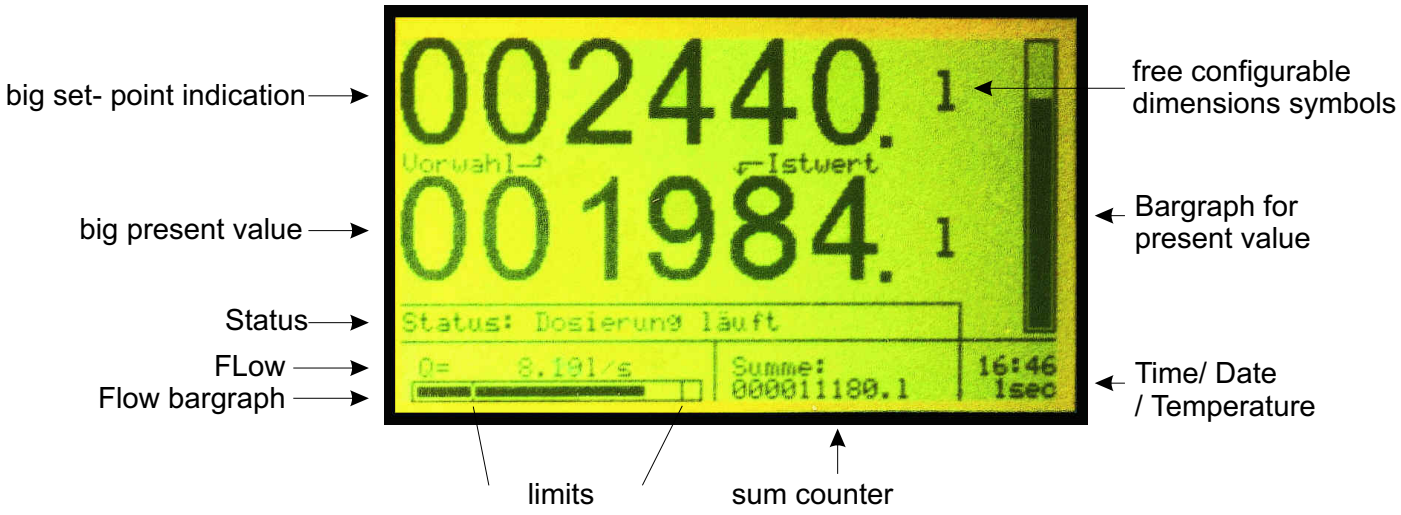
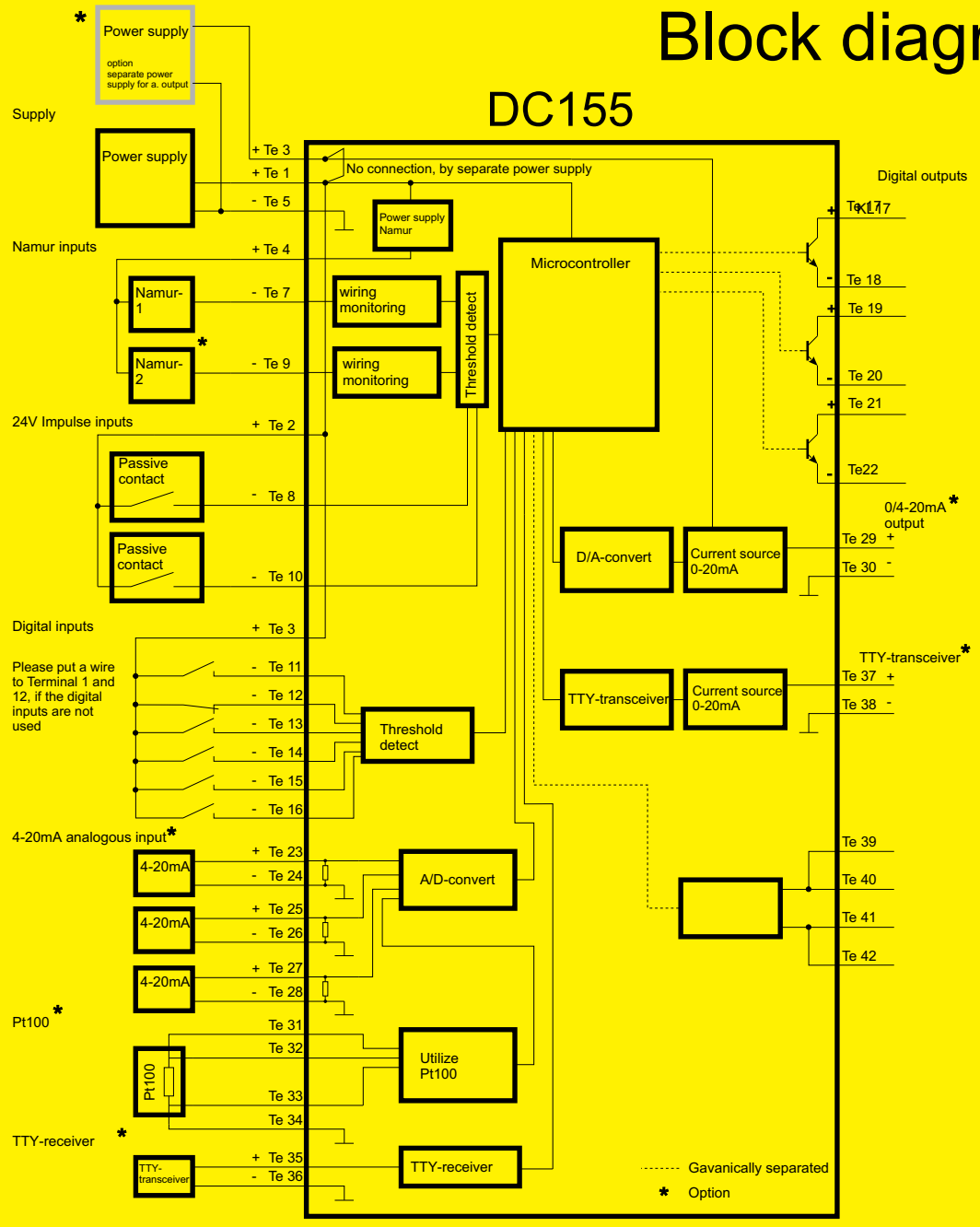
More transparency: graphic LC-Display



Block diagram

DC155



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Easy configuration: menu structure

```
Main menu

1. Structure
2. Parameter
3. Codes

4. reset sum counter
   End
```

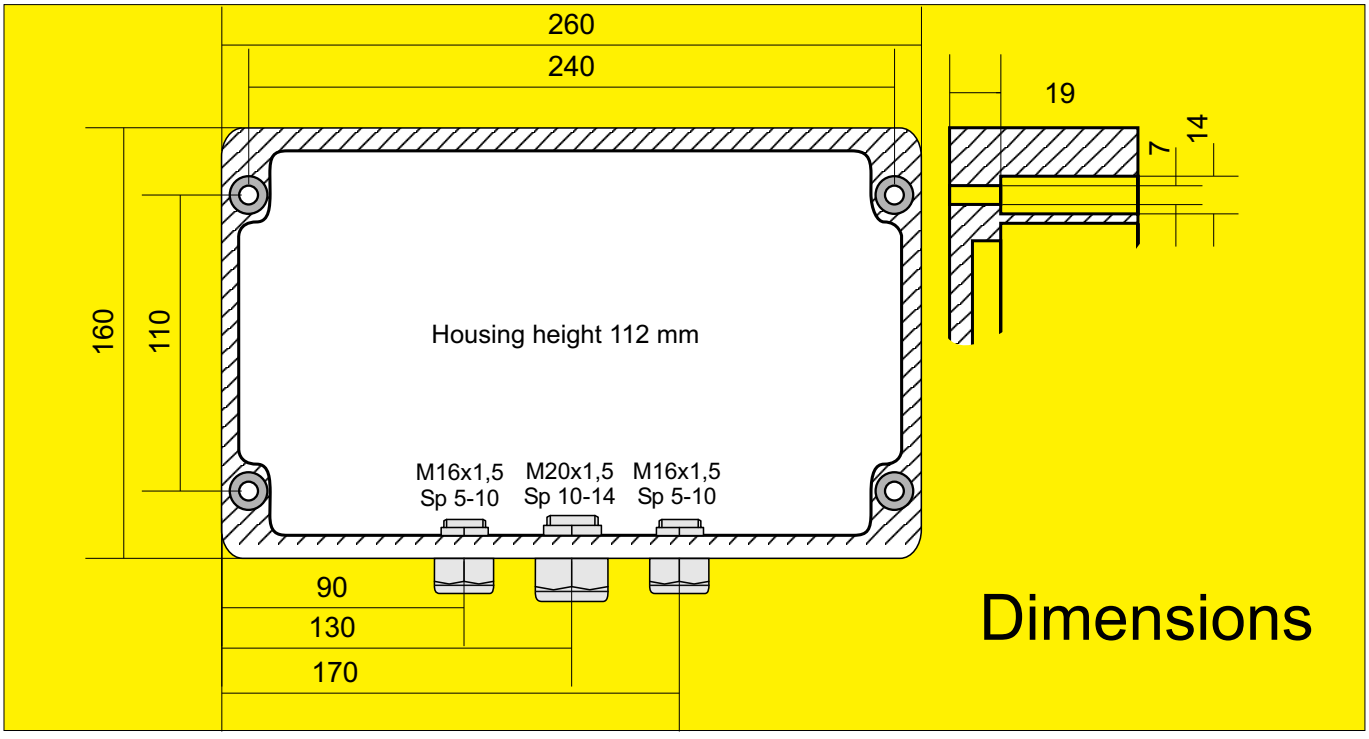
```
Structure menu

1. Input
2. Outputs
3. Flow monitoring
4. Display
5. Key-lock
   End
```

```
Parameter menu

0. Set-points
1. Flow monitoring
2. Pause time
3. Date / time
   End
```

```
The flow sensor is connected
to 24V- input

0. NAMUR-input
1. 24V-input

2. One pulse is equal to: 1.000001
                          10.001/s
```

```
Set set-points
Setpoint
------------------------->|
Set-p.1        Set-p.2 res-v.
--->|            |<----|<---|
 1  |     1      |  1  |  0 | fine valve
 0  |     1      |  0  |  0 | wide valve

0. Setpoint       : 002440. kg
1. Setpoint 1     : 000050. kg
2. Setpoint 2     : 000100. kg
3. Res. quantity  : 000005. kg
4. Max. setpoint  : 010000. kg
   End
```

The configuration and the parameter entering is easy and understandable, because of the big LCD



Dimensions

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Technical Details

		Dosing controller DC155
General	Mounting	Inside hazardous area
	Ex-protection	EEx ib IIC T6
	Housing protection class	IP65
Mounting	Ambient temperature	-10°C ...+45°C at T6 -10°C ...+65°C at T4
Housing	Dimensions	H x B x T: 160 mm x 260 mm x 112 mm
	Material	Aluminium lacquered / front foil: polyester
Electrical	Main voltage	Intrinsically safety EEx ib IIC
Specifications	Power consumption	min. 20 mA at 15V = 300 mW (without analogous output)
Inputs	NAMUR	Max input frequency: 2 kHz
	24V- Digital input	Threshold : 0-Signal: U < 2 V, 1- Signal: U > 5 V
	Analogous input	4-20 mA, load: 15 Ω
	Measuring error	< 0,2 %
	Temperature coefficient	< 0,01 % /K
Outputs	Digital output	3 intrinsically safe galvanically separated digital outputs closed output remain voltage ≈ 2,5 V
	analogous output	4-20 mA, min 600 Ω , error < 0,2 % TK < 0,01 %/K
Power supply	minimum DC155.x.0.0.x.0.0.x	MUS with U ≥ 15 V, I ≥ 20 mA, load ≥ 750 Ω
	with analogous output	U ≥ 15 V, current delivery see above + 20 mA or using separate MUS : DC155.x.x.x.x.x.x.1
	with TTY-interface	U ≥ 15 V, current delivery see above + 20 mA
	with 2. NAMUR- input	U ≥ 15 V, current delivery see above + 6 mA
Ergonomy	Display	Graphical LC-Display
	Entering configuration	Menu guided, languages: German, English, French, Dutch
	TTY-interface	Protocol print remote control via ESC- sequence
	Modbus	Control, operate, Indicate with Bus- Interface

Please see electrical ex-limits at EC-TYPE EXAMINATION CERTIFICATE PTB 98 ATEX 2071

Type code

DC155	.x	.x	.x	.x	.x	.x	.x
Analogous input: no Analogous input	.0						
one 4...20mA analogous input	.1						
Scale signal amplifier WV157	.4						
Analog. output: no analogous output		.0					
one 0/4...20mA analogous output		.1					
PID controlled analogous output		.2					
NAMUR input: one NAMUR- input			.0				
two NAMUR- inputs			.1				
Pt100 input: no Pt100- input				.0			
one Pt100- input				.1			
TTY- interface: no interface					.0		
TTY- transceiver					.1		
TTY- receiver					.2		
TTY- transceiver and receiver					.3		
Modbus: no interface						.0	
Modbus interface present						.2	
Separate power supply: no separate power supply							.0
Analogous output separate power supply							.1

Accessories: Ex- i power supply mounting in hazardous area: SG160
Supply and interface module mounting in hazardous area: VI156

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