flowscreen

Operating Instructions
flowscreen

ViscoTec

Table of contents

1   Introduction

Dear customer,

Congratulations on purchasing flowscreen analysis system. This product will without doubt meet all your requirements. We trust that the unit will give you trouble-free and successful service.

This analysis system will give many years of satisfactory operation provided it is correctly operated and maintained. We value your feedback to help us in our efforts to maintain our standards of quality at the highest possible level. We would be happy to consider any suggestions you may have on how we might improve our products.
Do you have any questions? We look forward to hearing from you:

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1.1 Function description

The flowscreen analysis system is designed and produced for the monitoring of dosing processes. Up to two pressure sensors can be attached. The pressure values determined from the measurement signals are shown on a graphic display.

The start of a measurement can be set either at pressure build-up or after creating a start signal. The raw data from the attached sensors are defined using the calibration function. The display can be adapted for the current application in the view for the axes of pressure and time.

A fault message is indicated via a LED if the determined limits for pressure increase, pressure gradient during dosing and pressure reduction are exceeded. An error tolerance number can be set for each attached sensor.

1.2 General information on the menu guide / operation

The flowscreen analysis system is operated via a touch screen using the stylus provided.

The operating menu is largely self-explanatory. System states are depicted via symbols and plain text.

1.3 Description of software operation

In order to ease legibility, details on using the software interface that are considered too basic are not described.

If for example, a certain button must be pressed, the generally understandable information is not mentioned, with the necessary action and logical result described in brief.

Example

Long form	Short form
Click the "Save" button, the XY window is opened.	*<Save>* ► XY opens

1.4 Previous knowledge

The operator requires no particular previous knowledge. It is assumed that the operator is familiar with the use of a touchscreen interface and the characteristics of a dosing process.

2 Safety

2.1 About these operating and maintenance instructions

These instructions are structured so that text and the related figure are on the same page as far as possible. In this way the instructions can be understood quickly.
If reference is made to a component in a figure, the part has a key number.
The following symbols are used:

•	Work step
-	List
*	Reference to a comment
Bold text	Breakdown, note
Tip	Special note
Italics	Term or button on the screen display
➡	Reference to technical information about operation and / or about preventing damage.

2.2 Informal safety measures

The operating instructions must always be kept at the place the analysis system is used.

2.3   Correct use, warranty

The flowscreen analysis is intended for monitoring dosing processes in environments that are not protected against explosions.

The product warranty may be voided by any

- conversions or modifications

- use of non-original spare parts

- Repairs by persons or organisations not authorised by the manufacturer

that are done without the explicit and written approval of the manufacturer.
The manufacturer shall bear no liability whatsoever for damage resulting from failure to follow the operating instructions.

3   Operation

3.1   General overview

1	Display	See
2	Connection sensor 1	3.11
3	Connection sensor 2	3.11
4	System plug, power supply and signal management	3.11
5	RS232 port	
6	USB port	
7	LAN port	3.4.2
8	On / off switch	
9	LED error, illuminates when an error is detected	3.5.1
10	LED no error, dosing ok	

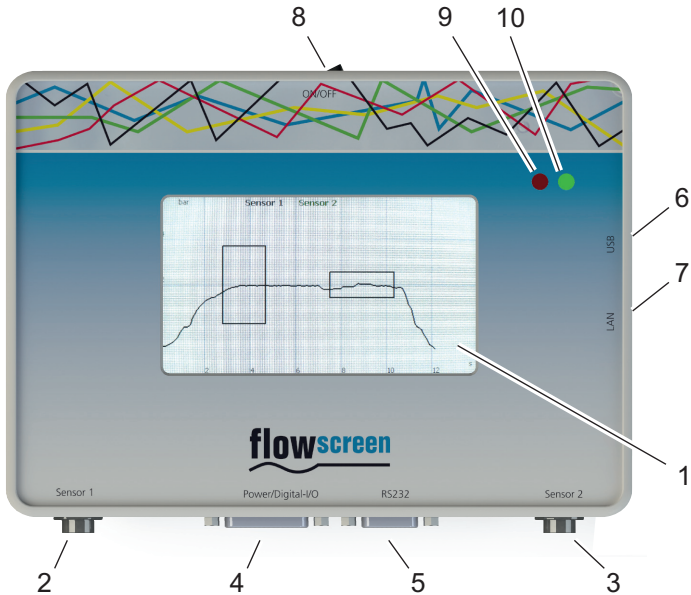
Fig. 1

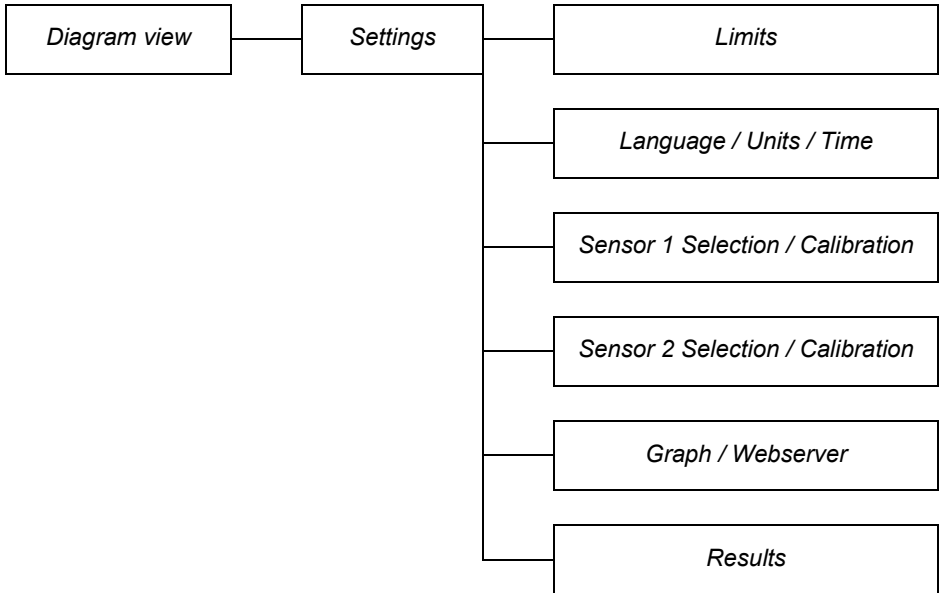## 3.2 Navigation in the touchscreen menu

The *Settings* menu is opened by touching the touchscreen in the diagram view.
The back button (arrow pointing left) goes back a level.

Diagram view	*Settings*	*Limits*
		Language / Units / Time
		Sensor 1 Selection / Calibration
		Sensor 2 Selection / Calibration
		Graph / Webserver
		Results

3.3 Switching on

- Move the on / off switch to the ON position. After a self-test, the diagram view for the set operating mode will appear as follows:
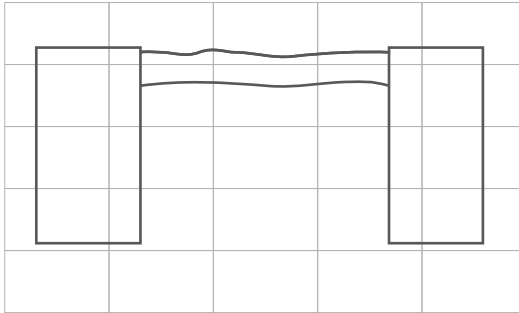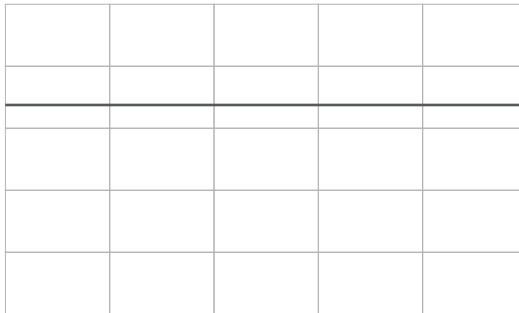
Range mode

Fig. 2

Overpressure mode

Fig. 3

- If required, save the measuring range B (envelope curve) (see 3.5.5). This is deleted if the power supply is interrupted.

3.4 Starting up

- Move the on / off switch to the OFF position.

- Connect the power supply to connection (4).

- Attach the sensor(s) (connection 2 and 3).

- Add extra connections (LAN, USB, RS232, system plug) if required

3.4.1 Language units time

- *<Settings>* <Language / Units / Time>

The settings options are self-explanatory, follow the information on the screen.

3.4.2 Network connection

<Settings> <Graph / Webserver> <Graph>

The settings options are self-explanatory, follow the information on the screen.

3.4.3   Defining sensors and connections

• *<Settings> <Sensor X Selection / Calibration>*

Select Channel
Pin allocation in the sensor cable plug (see 3.11). Factory setting is *Pin 2*.

3.4.4   Calibrating the sensors

• *<Settings> <Sensor X Selection / Calibration>*

Calibration
The sensors are set ex-works with the values 0 bar (*Zero Value*) and 16 bar (*Full Scale*).
If other sensors are to be connected, these values must be adjusted according to the
manufacturer's information.

3.5   Base settings

3.5.1   Results / error messages

• *<Settings>* <Results>

<Error after x faults> = After this number of consecutive defective dosings (pressure value
outside of measuring range), the error LED illuminates red.

3.5.2   Start and end of the measurement

• *<Settings> <Sensor X Selection / Calibration>*

Measurement Start/End at

Selection:

Pressure	Enter the pressure value that defines *Start/End*
Start/Stop-Signal	Signal analysis (system plug (4))

3.5.3   Diagram, size in display

- Determine the dosing to measured in seconds.

- Determine the maximum dosing pressure*.

- Set diagram size: *<Settings> <Graph / Webserver> <Graph>*

     - *max. X-Value* = Duration of the dosing in seconds, plus approx. 20%
     - *max. Y-Value* = Maximum dosing pressure in bar[1], plus approx. 20%

* Tip: If the pressure development for the dosing process is unknown, the pressure can be read off from the display. Follow: *<Settings> <Sensor X Selection / Calibration>* in *<Current Value>*
to display the value measured by the sensor. The maximum readable value in a representative dosing can be used as an approximate Y-value.

3.5.4   Select operating mode

Determine whether the flowscreen analysis system should analyse measurement ranges or overpressure: *<Settings> <Graph / Webserver> <Graph> <Mode>*

Selection:

Range	Pressure monitoring within set tolerances
Overpressure	Overpressure monitoring

---

1. or psi. depending on setting

3.5.5   Setting *Range* operating mode

General

The settings are possible if the *Range* operating mode is switched on (see 3.5.4). The pressure gradient of a dosing (1) can be monitored and displayed for each connected sensor with three different measurement ranges (see Fig. 4).

Measurement range	Setting	Description
A	Box1	Pressure build-up phase
B	Envelope curve	Pressure gradient, resulting from the three reference measurements
C	Box2	Pressure reduction phase

The dosing is judged to be error-free if the pressure gradient (1) of the dosing (as shown) is within the tolerances determined by ranges A, B and C.

In the event of an error, the error LED (9) illuminates if the set error threshold has been reached.
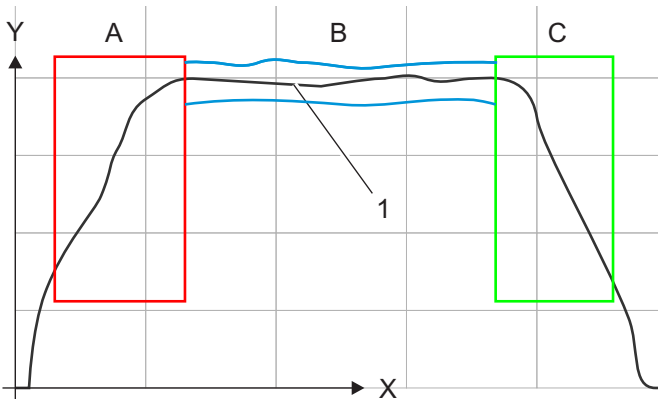

Fig. 4

The measurement starts (adjustable for each sensor) either when a pressure threshold is reached or via a signal applied to the system plug (4) (see 3.5.2).

Monitoring of the three measurement ranges can activated and deactivated individually for each sensor.

Enter the following settings for each pressure sensor

A Pressure build-up phase

• *<Settings> <Limits>*

The measuring range of the pressure build-up range (A) is
determined via Box1. The values are defined as follows:

- - 1 = *Left*
- - 2 = *Right*
- - 3 = *Top*
- - 4 = *Bottom*

Note Unrealistic values are corrected. If no box appears in the
display, it may be outside of the display window (diagram area),
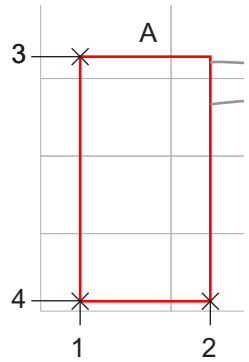to adjust this, see 3.5.3.

Fig. 5

B Pressure gradient

• *<Settings> <Limits>*

  Enter the settings under *Envelope Curve*.

  - 1 = Plus in %
  - 2 = Minus in %
  - 3 = *Begin*
  - 4 = *End*

• In the same display (*Limits*, perform three dosings. The measurement range B will be automatically calculated from the entered data and shown on the display when the the third measurement is completed. The measurement range for the pressure gradient (envelope curve) is saved.
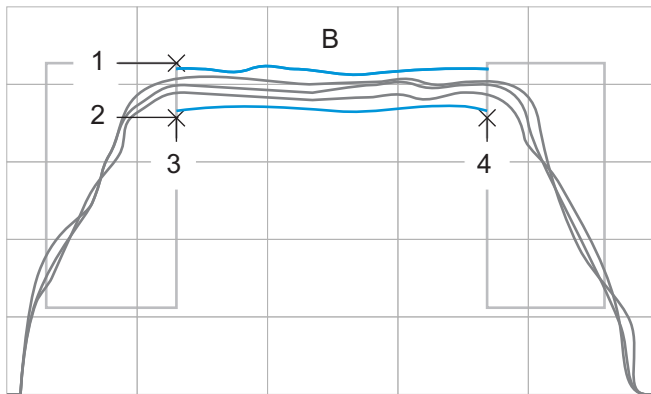

Fig. 6

Note The *Envelope Curve* must be recalculated if one of the parameters for the *Envelope Curve* is changed.

The envelope curve is deleted in the event of an interruption of the power supply.

C Pressure reduction phase

• Enter the settings under *Box2*. For a description, see setting for range A pressure build-up phase.

3.5.6   Setting *Overpressure* operating mode

General

The settings are possible if the *Overpressure* operating mode is switched on (see 3.5.4).
A overpressure value (2) can be monitored and displayed for the pressure gradient (1) of
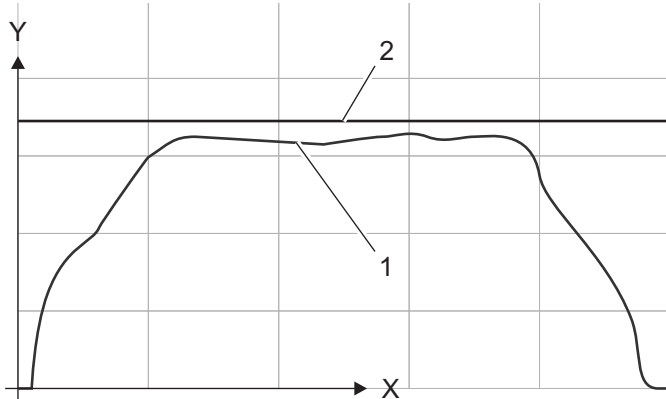the dosing for each connected sensor.

Fig. 7

- *<Settings> <Limits>*

- Set or activate *Limit Overpressure* for the respective sensor. The overpressure
  value (2) is displayed during a measurement.

3.6 Performing measurements

Measurement operation requires the settings from the following sections:
- 3.4, Starting up
- 3.5, Base settings

The flowscreen analysis system is then ready for operation (to switch on, see 3.3). If envelope curves have been saved (see 3.5.5), these must be reset every time after switching on.

Notice: The following description applies to both sensor inputs, which can each be configured differently from each other.

Measurement display
The pressure / time gradient of each measurement (pressure curve) is shown on the display.

Error display
If one or more of the set values / tolerances is exceeded in a measurement, this is shown optically (red)

Error counter
The error counter increases by a value of 1 each time an error occurs. The error LED illuminates as soon as the set threshold value is reached.
Error-free dosings increase the respective counter in the same way.

Error reset
<Reset Counter> (diagram view) ► Error counter is reset to 0. At the same time, the counter for error-free measurements is also reset to 0. All counters can be shown via <Settings><Results>.

3.7 Switching off

Move the on/off switch to the OFF position to switch off the flowscreen analysis system.

3.8   Software update (firmware)

General

The current version number can be read out via *<Settings>* in the lower-right corner of the display.

Uploading the update

1   2   3   4

Fig. 8

- Switch off flowscreen.

- Connect flowscreen to a PC (USB cable with 2x A-plug).

- Run the program microBootloader USB HID.exe on the PC.

- Switch on flowscreen.

- The connection between the PC and flowscreen is established when the USB logo (1) turns red[1] *<Connect>* (2) ►*<Connect>* changes to *<Disconnect>*.

- *<Browse for Hex>* and select the firmware file.

- *<Begin Uploading>*, to upload the update. The flowscreen analysis system is automatically restarted after the successful update.

- Switch off flowscreen and disconnect it from the PC. flowscreen is now ready for operation again.
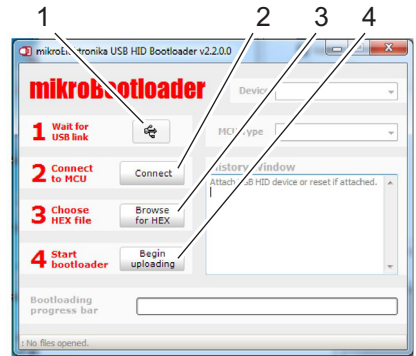

1.Only for approx. two seconds

3.9   Technical data

Installation	Wall mounting Front panel mounting * Table version *
Power supply Mains adapter Analysis system	230 VAC / 50 Hz 24V DC
Current input	200 mA / 24V
Power consumption, stand-by	1.2 W
Protection class	IP40
Display / resolution	4.3" TFT with resistant touchscreen, 480 x 272 pixels / 100ms (10Hz)
Construction type	Enclosed plastic housing
Dimensions LxWxD, approx. cm	19 x 13.5 x 4.5
Serial interfaces	RS232, 9600Baud, 8 data bits, no parity, one stop bit (9600 8N1)
Input / output signals Input Output	2x analogue signal 0-10V 1x ready, galvanically isolated
Interfaces	RS 232 USB (A port) LAN
Measurement programmes	Graphic display of the measurement values
Measurement over a certain time period	Measurement without analysis Measurement with analysis over max. 2 measurement win- dows and 1x envelope curve (freely configurable)
Constant measurement	Measurement without analysis Measurement with analysis over max. 1 measurement win- dow (freely configurable)

* Option

3.10   Declaration of Conformity

We,

ViscoTec – Pumpen- u. Dosiertechnik GmbH
Amperstr. 13,   84513 Töging

hereby declare that the product described below meets the fundamental requirements of the following European Directives in its design and construction, as well as in the configuration placed on the market by us:

2004/108/EC	Electromagnetic Compatibility
2006/95/EC	EC Low Voltage Directive
2011/65/EU	Restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)

Product designation: Analysis system flowscreen

Harmonised European norms applied:

EN 61326-1:2013	Electromagnetic Compatibility
EN 61010-1:2010	Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1
EN 50581:2012	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances (RoHS)

Töging, 17 June 2014

Georg Senftl
Managing Director

3.11   Pin allocations

Sensor plug (2 and 3, see 3.1)

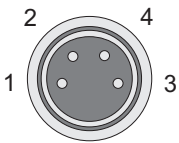| Pin	Description
1	Power supply 10-30V DC
2	Signal input 0-10V
3	GND
4	Signal input 0-10V

Fig. 9

(Flash direction: on the plugs)

System plugs (4, see 3.1)
Input / output signals are arranged as optocouplers.

Pin	Description
1	Power supply 24V DC
2	Input, start sensor 1
3	Input, start sensor 2
4	Input, reset error counter
5	- -
6	Output, ready (connected when device is operating)
7	Output, error sensor 1
8	Output, error sensor 2
9	Output, accumulated errors sensor 1
10	Output, accumulated errors sensor 2
11	Output, overpressure switch-off
12	- -
13	- -
14	GND for inputs
15	GND power supply

4 Disposal

Please dispose of the analysis system in an environmentally safe way. All materials must be handled in accordance with the appropriate recycling requirements.