BIOTECH®
THE WORLD OF FLOW

Universal Flow Controller
Model 261 / 261-EC-01

Type ARS 261-EC 01
Art.-no: 82212264

Type ARS 261
Art.-no: 82212164

Instruction Manual

<u>**1. Safety Instructions**</u>
This instrument has been manufactured in accordance with the applicable state of the art and meets all safety regulations as shipped from the factory. Installation and startup must be performed by qualified electricians only!
Operate instrument only when properly installed!
If safe operation can no longer be ensured, disable the instrument and secure it against unauthorized operation.
Prevent injury to people or damage to property due to failure or malfunction of the equipment through additional safety measures such as limit switches, protective equipment, etc. .
Read the Instruction Manual carefully before startup!

2. Product Identification - Dimensions
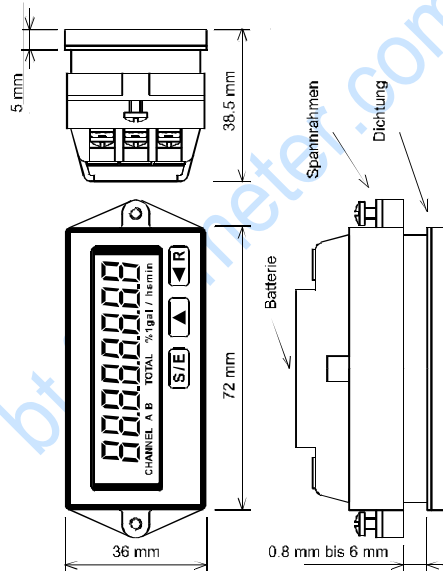
3. Function Description

This instrument is used as a pulse counter.

You should adapt the factory-programmed instrument to your counting process prior to first use (see Section 5, Programming).

The instrument is ready for operation when the programming input is not wired.

The instrument has two counter inputs, A and B.
You can program the following counting modes: ADD/SUB, ADD/ADD and ADD/Count Direction.

For ADD/SUB:	Counter input A	adding
	Counter input B	subtracting
For ADD/ADD:	Counter input A	adding
	Counter input B	adding
For ADD/Count Dir:	Unwired counter input B:	
	Counter input A	adding
	Counter input B switched to 0 V:	
	Counter input A	subtracting

The pulses entering at the inputs are evaluated and displayed according to the counting mode selected.
You can program the counter inputs either as HIGH SPEED inputs ("High" active) or as LOW-SPEED inputs ("Low" active). For the ADD/ADD and ADD/SUB counting modes this applies to both counter inputs together.

For ADD/Count Direction, it only applies to Counter Input A, while Counter Input B is permanently programmed as a LOW-SPEED input ("Low" active).
You can scale the display by programming suitable scaling factors. For the ADD/SUB and ADD/ADD counting modes, this can be done separately for each counting mode; for the ADD/Count Direction mode, a single scaling factor can be set.

You can set a fixed decimal point and program the pulse counter so that you can reset the instrument using the front side **R** key in addition to the regular electric reset on the back.

Backlighting is activated and load on the battery is reduced by applying an external voltage of 24 VDC.

When replacing the battery, all stored data is lost. After installing the new battery, the display shows 261_ xx" (xx for software version number). You are ready to operate with the factory-programmed parameters after pressing **S/E**.
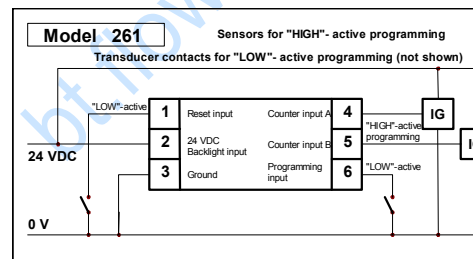
Display as delivered:

4. Installation – Battery Replacement

After unpacking the instrument, remove the light-colored frame from the back of the housing by simultaneously bending both long sides of the frame slightly apart to disengage them from the locking holes.
Then slide the housing through the cutout prepared in the front panel, attach the frame onto the back of the housing, slide it all the way against the back of the front panel, and carefully attach it with the two side screws to the front panel.
In this way, you can compensate for different front panel thicknesses. Class IP 65 front protection is achieved through the seal integrated in the housing.
See the wiring diagram below for the electric wiring.

| Model 261 | Sensors for "HIGH"- active programming |
| Transducer contacts for "LOW"- active programming (not shown) |

"LOW"-active	1 Reset input	Counter input A 4	IG
24 VDC	2 24 VDC Backlight input	Counter input B 5	"HIGH"-active programming	IG
0 V	3 Ground	Programming input 6	"LOW"-active

The battery is accessible from the back of the instrument. There is a vertical notch under the middle of the nameplate. Cut through the nameplate there. Then slide out the two-part battery cover to one side along the guide grooves, and replace the battery observing the correct polarity. The instrument should **not** be connected to 24 VDC at this time!

5. Programming

The instrument can only be programmed by setting the programming input PROG to 0 V.
Please note that this causes the pulse counter to be reset.

After having set the programming input PROG to 0 V, the following is displayed:

```
CountEr
```

This display identifies the pulse counter; it cannot be changed.

By repeatedly pressing the **S/E** key, you can cycle through the individual menu items. The following figures correspond to the factory settings of the instrument:
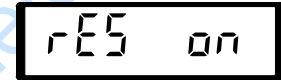
```
Add    Sub
```
Count Mode

```
SPEEd HI
```
Count Frequency

```
SF   1.0000
      A
```
Scaling Factor
Counter Input A

```
SF   1.0000
      B
```
Scaling Factor
Counter Input B

```
dP        0
```
Decimal Point

```
rES   on
```
Reset Enabled

You can make changes within each menu point as follows:
1. Press the **<R** key:
   The parameter to be changed is activated, i.e., it begins to flash.
2. Press **^** repeatedly if necessary:
   Set the desired parameter.
3. Press **S/E**:
   The parameter just set is confirmed and displayed steadily.

4. Press **S/E** again:
You reach the next menu item.

The following illustrations show the settings allowed in the individual menus.
Flashing display elements are shown in a lighter color.

Count Mode

Add Sub

Add Add

Count Mode 1: Difference
Counter Input A: adding
Counter Input B: subtracting

Count Mode 2: Sum
Counter Input A: adding
Counter Input B: adding

Add dI r

Count Mode 3:
Counter Input A: adding
Counter Input B: Count Direction

Count Frequency

SPEEd HI

SPEEd LO

maximum frequency 10 kHz   maximum frequency 30 Hz

Scaling Factor Counter Input A,
Scaling Factor Counter Input B

If you have selected Count Mode 1 or 2, you can set a separate **S**caling **F**actor in the range of 0.0001 to 99.9999 for both Counter Input A and Counter Input B.

Example: Set a scaling factor 3,1416 for Counter Input A

SF 1.0000
A

Press **<R**:

SF0 1.0000
A

Press **^** 6 times:

SF0 1.0006
A

Press **<R**:

SF0 1.0006
A

Press **^**:   Press **<R**:

`5F0 1.00 16`	`5F0 1.00 16`

Press **^** 4 times: | Press **<R**:

`5F0 1.04 16`	`5F0 1.04 16`

Press **^**: | Press **<R**:

`5F0 1.14 16`	`5F0 1.14 16`

Press **^** twice: | Press **S/E**:

`5F03.14 16`	`5F 3.14 16`
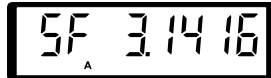
Please note that only one scaling factor can be programmed when Count Mode 3 is selected.

Decimal Point

`dP      0`	`dP     0.0`
`dP    0.00`	`dP   0.000`
`dP  0.0000`	

Reset Key Enabled
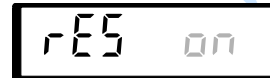
`rE5   on`	`rE5   oFF` TOTAL
Reset key enabled	Reset key disabled

If the Reset key has not been enabled, the string "TOTAL" is displayed.

Having completed the programming, isolate the programming input PROG from 0 V.

Please note that only the parameters confirmed with **S/E** are accepted.

6. Technical Data

Displays
Special LC display with dimension line, 8 digits, digit height 10 mm, pre-decimal point zero suppressed.

Display Capacity:	+/- 99999999
	Programmable decimal point

Power Supply
internal lithium battery	3.6 V / 1.2 Ah
Average battery life	5 years

LED – Display backlighting
The LED display backlighting must be operated with external voltage connected to 24 VDC and 0 V screw terminals.

External Voltage: 24 VDC	max. residual ripple 5%
absolute limits	19 to 30 VDC

Electromagnetic Compatibility (EMC)
Interference emission EN 55011	Group 1 Class B
Interference strength EN 50082-2	

EN 61010-1 Measuring Insulation Voltage
100 Veff, Contamination Class 2, Surge Category III

DIN VDE 0411 Protection Class
Protection Class II

Electrical Connection
Terminal screw connection, P Phillips screws, size 1

max. lead section	2 x 1.5 mm²
min. lead section	2 x 0.2 mm²

IEC 529 Protection Class
IP 65	front

Temperature / Humidity range
Operating temperature range	- 10°C to + 50°C
Storage temperature range	- 20°C to + 70°C
Temperature / Humidity	90% relative humidity @ 38°C

IEC 68-2-6 Vibration Strength
Variable frequency range 10 to 500 Hz
0.35 mm or 5 g amplitude
10 Frequency cycles per axis

Dimensions
Frontal dimensions	36 mm x 72 mm
Total depth	38.5 mm

Fastening
Front panel mount via frame

Front panel thickness	0.8 mm to 6 mm
Front panel cutout DIN 43700	
	33 +0.6 mm x 68 + 0.6 mm

Weight
approx. 95 g

Housing Material / Combustibility
PC plastic
Combustibiity V0 under UL Standard 94

Inputs

Counter Input A

Pulse shape	any
Programmed as "HIGH-SPEED" input	"High" active
Signal level L<= 1 VDC	H>= 5 VDC
Max. voltage amplitude	± 30 VDC
Input resistance	approx. 39 kOhm
Max. frequency (pulse duty factor 1:1)	10 kHz
min. pulse time	50 μs
min. pulse pause	50 μs
Active edge	High/Low
Programmed as "LOW-SPEED" input	"Low" active
Signal level L<= 0 VDC	H>=5 VDC or open
Max. voltage amplitude	± 30 VDC
Input resistance	approx. 1 MOhm
Max. frequency (pulse duty factor 1:1)	30 Hz
min. pulse time	16 ms
min. pulse pause	16 ms
Active edge	Low/High

Counter Input B

Pulse shape	any
Programmed as "HIGH – SPEED" input	"High" active
Signal level L<= 1 VDC	H>= 5 VDC
Max. voltage amplitude	± 30 VDC
Input resistance	approx. 1 MOhm
Max. frequency (pulse duty factor 1:1)	10 kHz
min. pulse time	50 μs
min. pulse pause	50 μs
Active edge	High/Low
Programmed as "LOW – SPEED" input	"Low" active
Signal level L<= 1 VDC	H>=5 VDC or open
Max. voltage amplitude	± 30 VDC
Input resistance	approx. 1 MOhm
Max. frequency (pulse duty factor 1:1)	30 Hz
min. pulse time	16 ms
min. pulse pause	16 ms
Active edge	High/Low

Reset Input R

Pulse shape	any
Signal level L<= 0 VDC	H>=5 VDC or open
Max. voltage amplitude	± 30 VDC
Input resistance	approx. 1 MOhm
Static response	"Low" - active
min. pulse time	65 ms

Programming Input PROG

Static response	"Low" active
Input open	Operating mode
Input connected to "0 V"	Programming mode

7. Spare Parts

Lithium battery Art.-No.:
82202233