The sensors **SEMIFLOW CO.65/xxxPI V2.0** – designed as clamp-on-sensors with inlay – detect the flow rate of liquids in plastic tubes of different diameters within a few milliseconds. The sensors have no contact to the medium or product and are suitable for applications in fields with strict hygienic standards e.g. the medical technology, biotechnology and pharmaceutical industry as well as chemical and semiconductor industry. Due to the current, frequency and switching outputs industrial dosing applications can be supported. The RS485 interface allows bus operation of up to 12 sensors in rough industrial environments.

The **SEMIFLOW CO.65/xxxPI V2.0** sensors with complete built-in electronics can be installed in machines or apparatuses.

General sensor specification

Specification SEMIFLOW	Order-No.	Measuring channel (see also technical drawings) Width with inlay	Tubing OD	Dimensions (L x W x H)
CO.65/080PI V2.0	200 08 0024	6 mm	1/4"	44 x 44 x 34 mm
CO.65/120PI V2.0	200 08 0056	8.5 mm	3/8"	44 x 44 x 38 mm
CO.65/160PI V2.0	200 08 0052	12 mm	1/2"	44 x 56 x 41 mm
CO.65/190PI V2.0	200 08 0061	17.8 mm	3/4"	50 x 76 x 54 mm
CO.65/260PI V2.0	200 08 0039	23.4 mm	1"	50 x 76 x 60 mm

Tubing properties

Defined by customer: PFA

To realize an acoustic coupling of the sensor, the customer specific tube is surrounded by a silicone inlay.

NOTE!	Recommended is the use of the delivered silicone inlay for coupling. **Sensors are factory calibrated with customer tubing and silicone inlay.** **Sensors are calibrated at T_{Medium} = 23 °C with water.**

Accuracy

With standard flow rate and standard tubing:

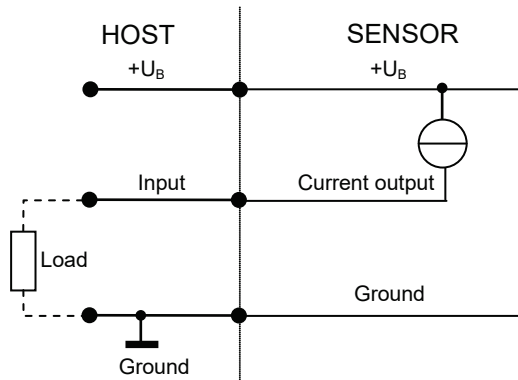| Specification SEMIFLOW	Flowrate	Accuracy for water: adjusted at 23 °C ± 2 K and 1 bar on standard tube	
CO.65/080PI V2.0	0 … 8 000 ml/min	0 … 800 ml/min: ± 16 ml/min	800 … 8 000 ml/min: ± 2 %
CO.65/120PI V2.0	0 … 12 000 ml/min	0 … 1 200 ml/min: ± 24 ml/min	1 200 … 12 000 ml/min: ± 2 %
CO.65/160PI V2.0	0 … 16 000 ml/min	0 … 1 600 ml/min: ± 32 ml/min	1 600 … 16 000 ml/min: ± 2 %
CO.65/190PI V2.0	0 … 18 000 ml/min	0 … 1 800 ml/min: ± 36ml/min	1 800 … 18 000 ml/min: ± 2 %
CO.65/260PI V2.0	0 … 40 000 ml/min	0 … 4 000 ml/min: ± 80 ml/min	4 000 … 40 000 ml/min: ± 2 %

The sensors are calibrated to specific tubing. Please find the data in the sensor calibration report.

Technical data

SEMIFLOW CO.65/080 V2.0 Flow Sensor for liquids		
Measuring method	Ultrasound, two sections of measurements, dry coupling, silicone inlay	
Calibration	Sensors are factory calibrated for water at 23 °C ± 2 K, tube end depressurized; other calibration on request	
Mounting	Fixed installation with screws: 4 fixing holes	CO.65/080PI V2.0 … CO.65/160PI V2.0 M4, 8 mm deep
		CO.65/190PI V2.0, CO.65/260PI V2.0 M6, 10 mm deep
Media	Water or other acoustically transparent liquids	
Sensor materials	Measuring channel: PMMA black, silicone inlay Housing: PVCC, grey, screws: plastics	
Labeling	See technical drawings	
Operating voltage	12 ... 30 VDC, maximum ripple 10 %, protection against reverse-polarity	
Current consumption	Maximum 30 mA (with open current, frequency and switching output)	
Electrical connection	Fixed cable (10 m), 8-pin connector	
Shielding	Required: Shield of cable has to be connected on side of machine	

SONOTEC

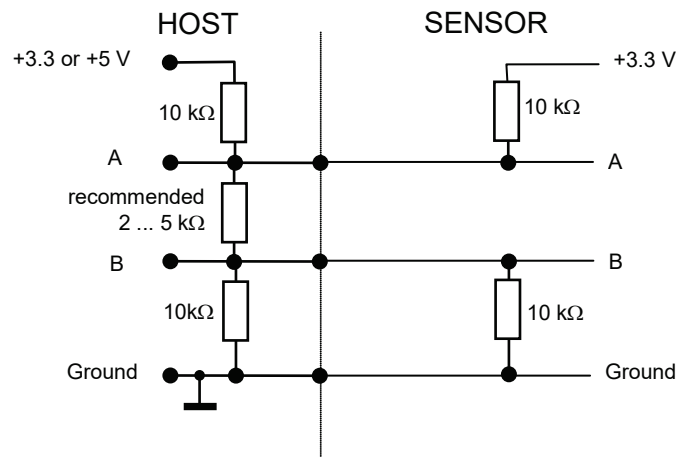|	
Interfaces **(* not activated)**	• Current output for flow rate: 0/4 … 20 mA • Frequency output for flow rate: 0 … 20 kHz, 5 V digital * • RS485 interface: bus-capable * • Switching output: configurable as PNP / NPN / Push-Pull, 0 … 30 V • Digital input *
Current output **for flow rate**	⚠ **NOTE:** Load to GND. The max. load depends on the operating voltage: 12 V → 250 Ω, 15 V → 500 Ω, 24 V → 1 kΩ, 30 V → 1.2 kΩ

HOST　　　　　　　SENSOR

$+U_B$　　　　　　　$+U_B$

Input　　　　Current output

Load

Ground

Ground

Frequency output **for flow rate ***	

HOST　　　　　　SENSOR

Input　　　　Frequency output 5 V

Load min. 5 kΩ

Ground

Ground

RS485 interface *	Half-duplex operation / 115.200 baud / 8 data bit / no parity / 1 stop bit / no handshaking ⚠ **NOTE:** Please find the description of the serial protocol for details (upon request).

HOST　　　　　　SENSOR

+3.3 or +5 V　　　　　　　　+3.3 V

10 kΩ　　　　　　　　10 kΩ

A　　　　　　　　　　A

recommended
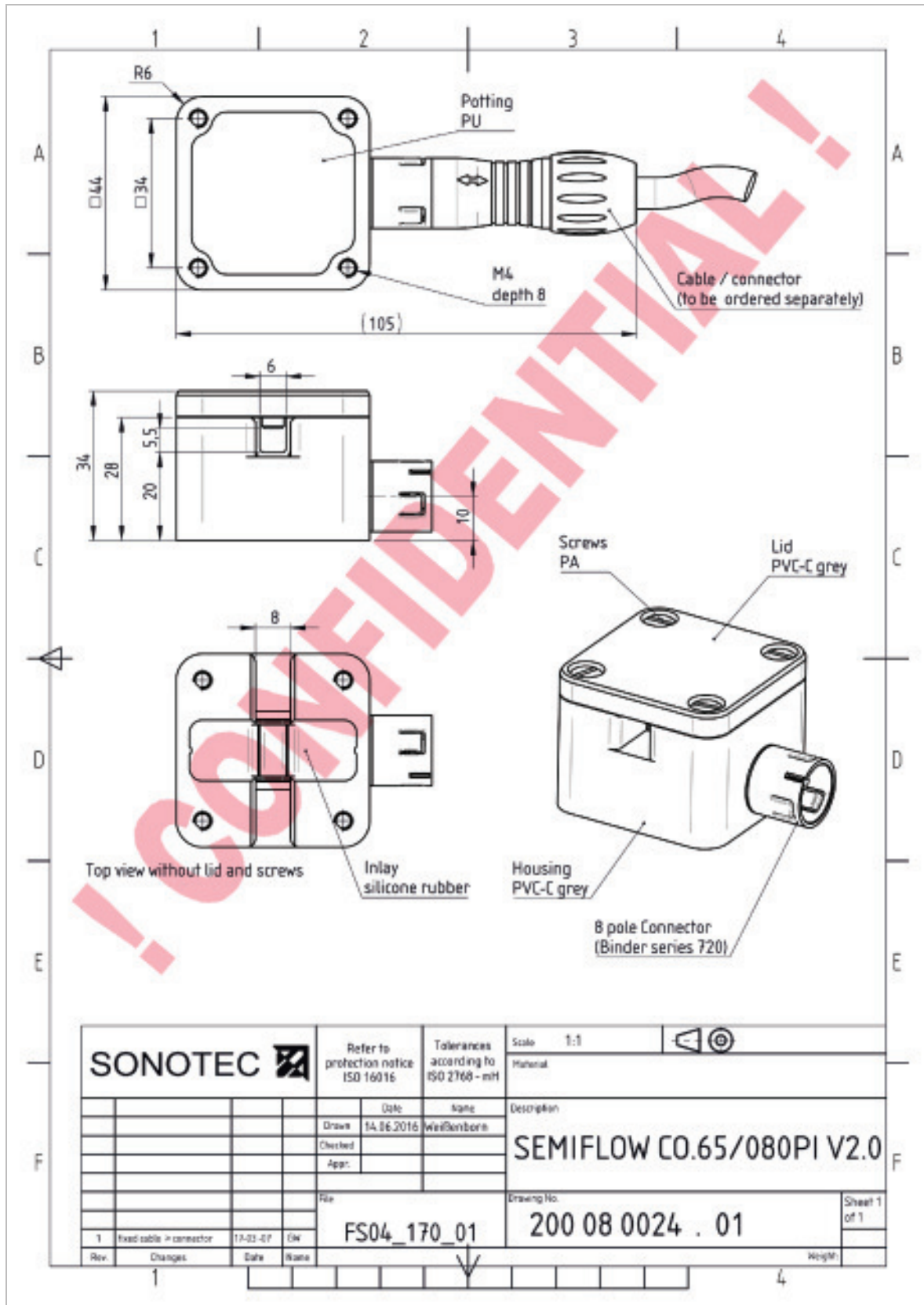2 ... 5 kΩ

B　　　　　　　　　　B

10kΩ　　　　　　　10 kΩ

Ground　　　　　　　　Ground

Recommended electrical connection of the RS 485 interface.

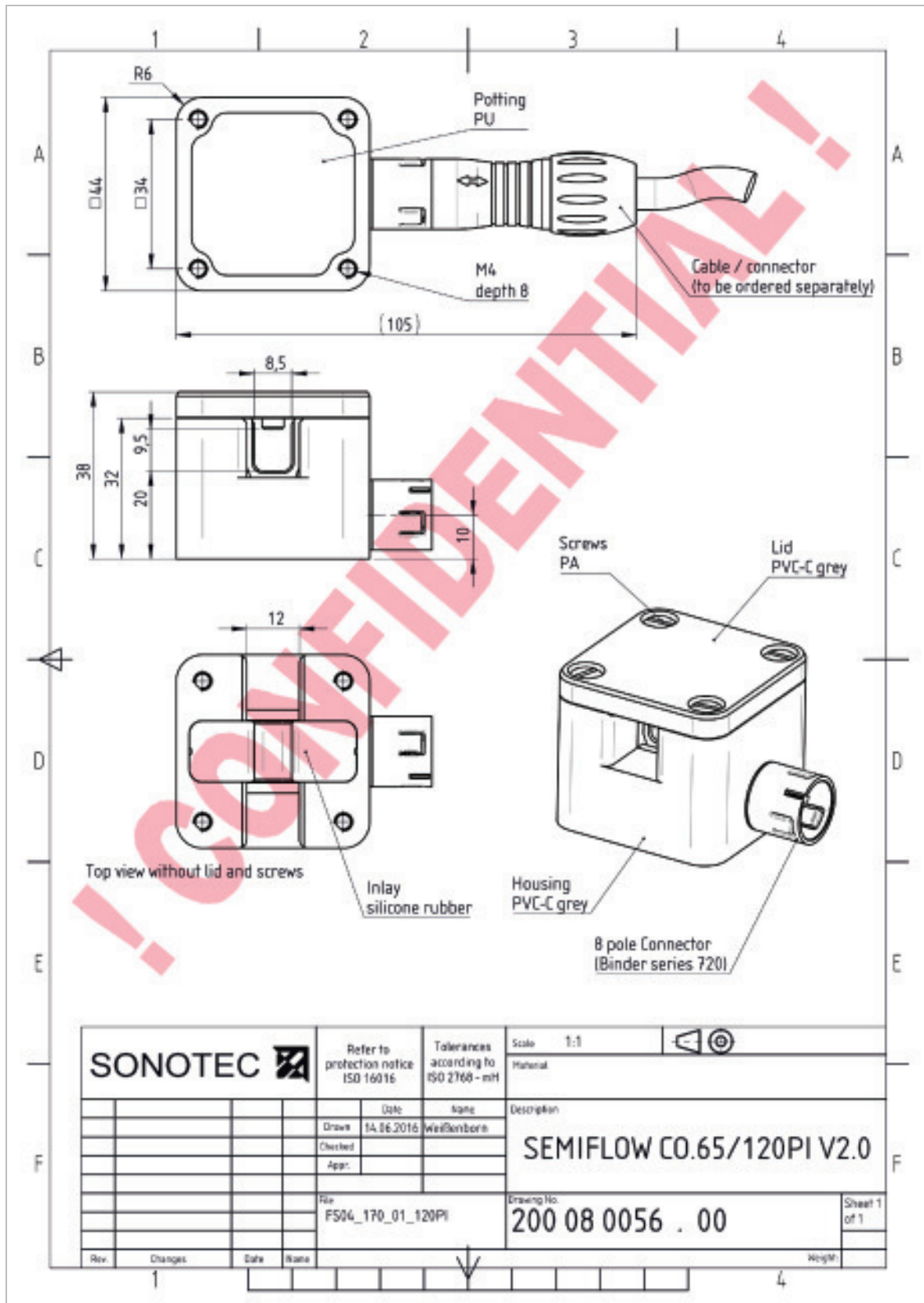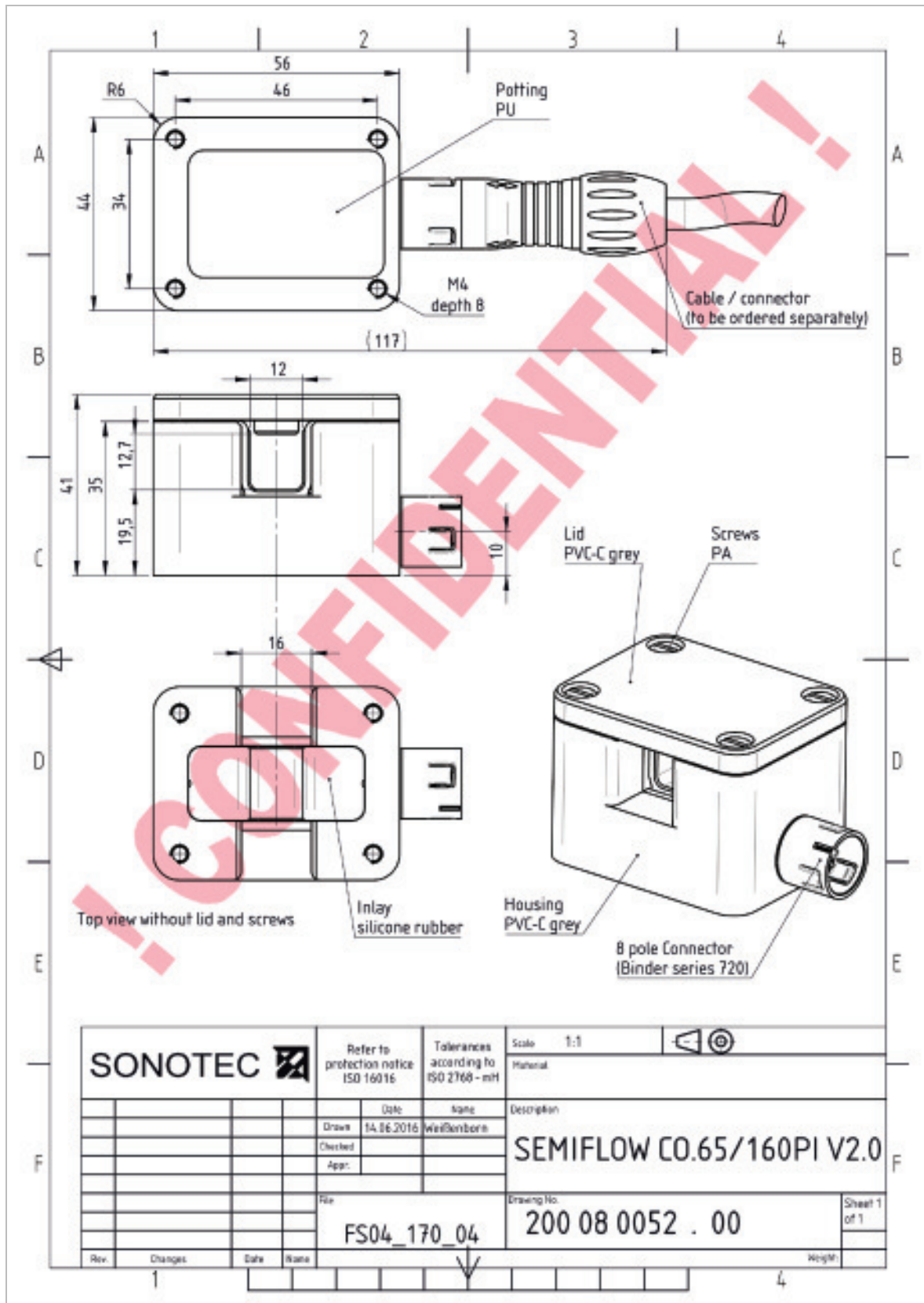⚠ **CAUTION!** If the interface is not used the two pins A & B shall remain open.

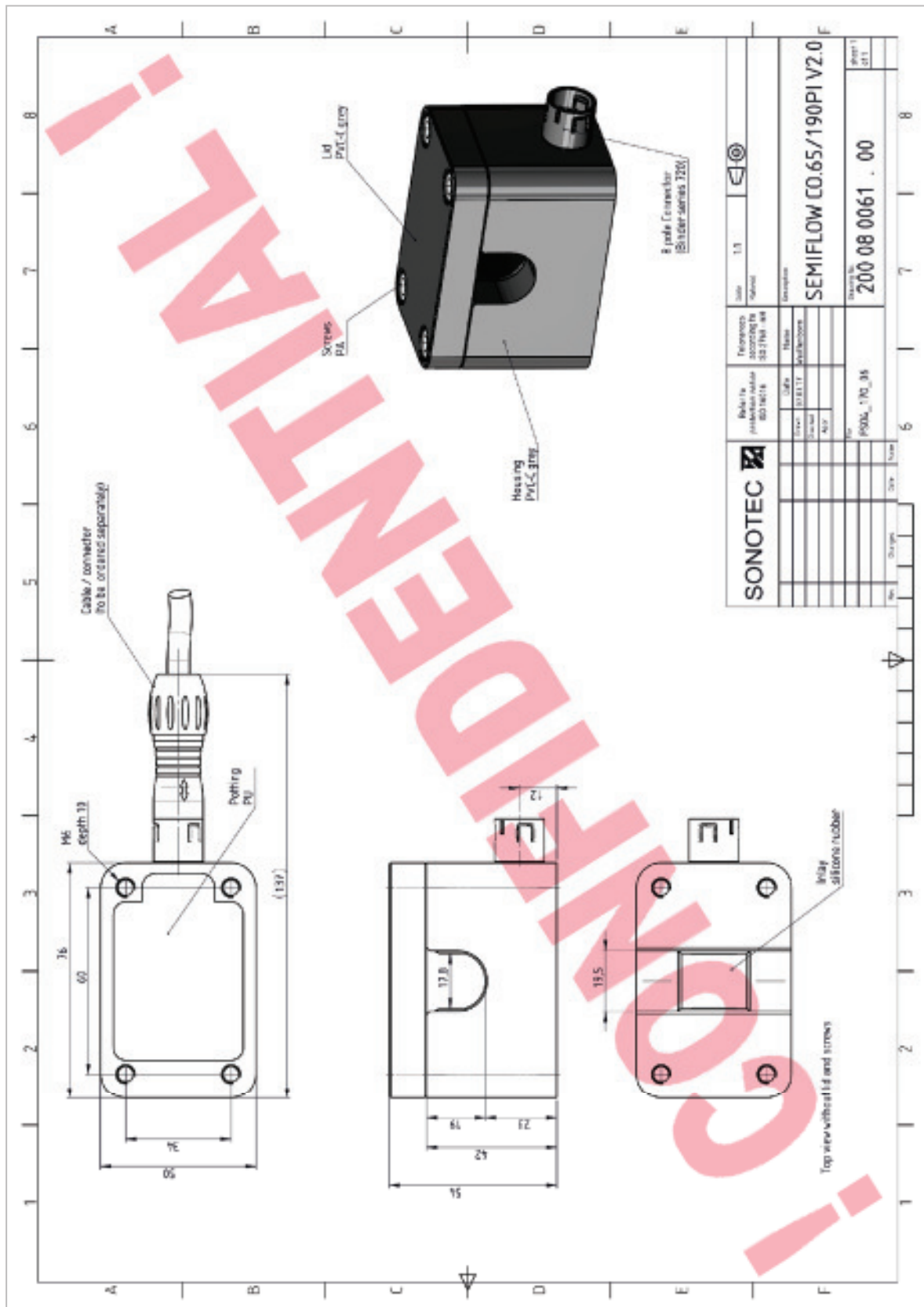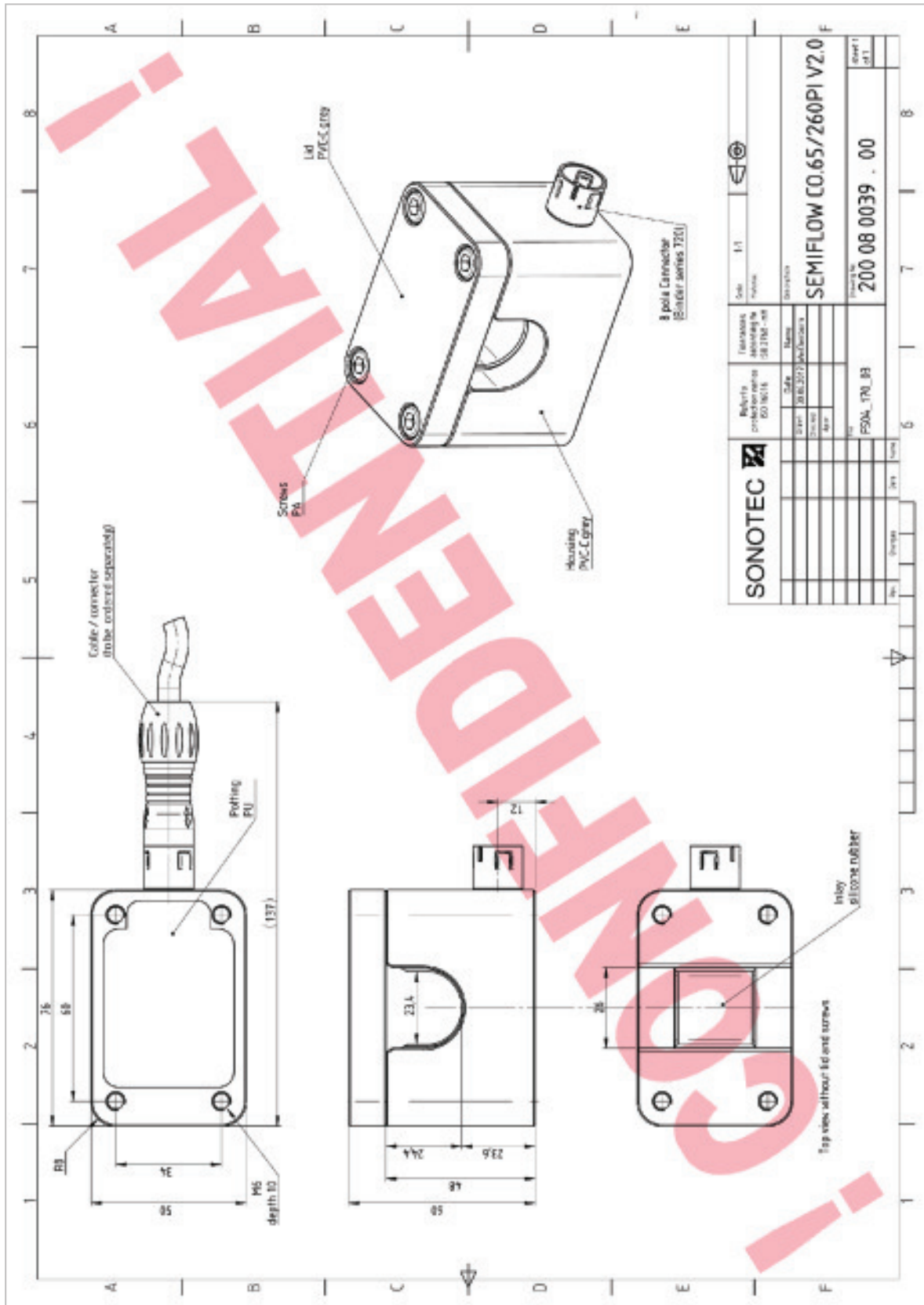|	
RS485 Bus operation *	The sensor supports bus operation with max. 12 devices. The default address is #01. ⚠ **NOTE:** The address can be changed with the help of the ABD Monitor. Permitted are addresses from #01 … #12. → Menu: Identification | RS485 address

Switching output	Freely configurable as PNP / NPN / Push-Pull, 0 … 30 V for applications:
	    adapting batch process (dosing) or
	    threshold switch of flow or
	    slow pulses of volume (max.. 20 Hz)
	Maximum 100 mA

Digital input *	Freely configurable: for example for zero point calibration of flow or start dosing processes Voltage resistant up to 30 V HOST SENSOR Digital input Ground Ground
Ambient- / Media temperature	0 ... 60 °C, other temperatures available on request
Storage temperature	-20 ... +70 °C
Protection class	IP65
Directives and standards	• EMC directive 2014/30/EU • RoHS: 2011/65/EU, exception: III 7cI/ IV 15 • Acoustic emission: IEC 61157
Maintenance	Maintenance-free
Scope of delivery	• SEMIFLOW CO.65/xxxPI V2.0 according to specification • Silicone inly for each sensor • Fixed cable (10 m), 8-pin connector
Optional accessories	SONOFLOW Monitor V2.0 for setting parameters and recording measurements consisting of • USB Data Converter, type 013 for the connection to a computer • Power supply unit (24 VDC) • 8-pin connecting cable (for service) • 10 m USB cable, type A-B, length 2 m • CD with Software SONOFLOW Monitor and driver for Windows
Optional	• Calibration protocol

SONOTEC

Technical drawings

Technical drawing — SEMIFLOW CO.65/120PI V2.0

Labels in drawing:
- R6
- □44
- □34
- Potting PU
- M4 depth 8
- (105)
- Cable / connector (to be ordered separately)
- 8,5
- 9,5
- 38 / 32 / 20
- 10
- 12
- Screws PA
- Lid PVC-C grey
- Top view without lid and screws
- Inlay silicone rubber
- Housing PVC-C grey
- 8 pole Connector (Binder series 720)

Title block:
- SONOTEC
- Refer to protection notice ISO 16016
- Tolerances according to ISO 2768 – mH
- Scale 1:1
- Material
- Drawn 14.06.2016 Weißenborn
- Checked
- Appr.
- Description: SEMIFLOW CO.65/120PI V2.0
- File FS04_170_01_120PI
- Drawing No. 200 08 0056 . 00
- Sheet 1 of 1
- Rev. Changes Date Name Weight
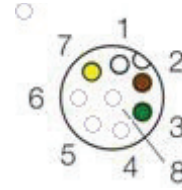
SONOTEC

Electrical Connection

8-pole connector to 4-pole cable:

Male connector
(at the sensor)

Female connector
(at the cable)

Connecting cable	Pin	Color	Connection
Assignment	1	White	Ground
	2	Brown	Operating voltage +12 ... 30 VDC
	3	Green	Current output (0/4 … 20 mA)
	4		RS485 B
	5		RS485 A
	6		Frequency output 0 … 20 kHz
	7	Yellow	Switching output: PNP / NPN / Push-Pull
	8		
	Shield		If available, should be connected on side of machine

Drawings are not to scale. Information is subject to change without notice!

SONOTEC