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 or semiconductor industry. Due to the current, frequency and switching outputs, industrial dosing applications can be supported. The RS485 interface (SONOTEC® protocol; MODBUS® via software settings) 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 Width | Width with inlay (see also technical drawings)	Standard tubing OD	Dimensions (L x W x H)	Weight
CO.65/080PI V2.0	200 08 0024	8 mm | 6 mm	1/4“	44 x 44 x 34 mm	90 g
CO.65/120PI V2.0	200 08 0056	12 mm | 8.5 mm	3/8“	44 x 44 x 38 mm	100 g
CO.65/160PI V2.0	200 08 0052	16 mm | 12 mm	1/2“	44 x 56 x 41 mm	130 g
CO.65/190PI V2.0	200 08 0061	19.5 mm | 17.8 mm	3/4"	50 x 76 x 54 mm	260 g
CO.65/260PI V2.0	200 08 0039	26 mm | 23.4 mm	1“	50 x 76 x 60 mm	280 g
CO.65/340PI V2.0	200 08 0073	34 mm | 32 mm	1.32"	58 x 84 x 62 mm	340 g
CO.65/500PI V2.0	200 08 0098	50 mm | 45.4 mm	48.5 mm	70 x 116 x 75 mm	840 g
CO.65/630PI V2.0	200 08 0099	63 mm | 57.4 mm	61 mm	80 x 130 x 90 mm	950 g

Tubing properties

Material: Preferably PFA

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

NOTE! For appropriate coupling the use of the silicone inlays is required.
Sensors are factory calibrated with inlay and standard tubing, unless requested differently. Customized calibration is documented in the sensor calibration report.

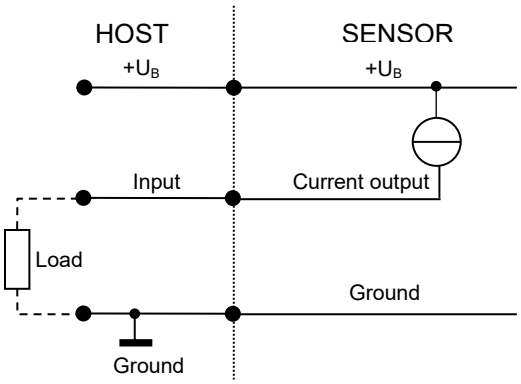
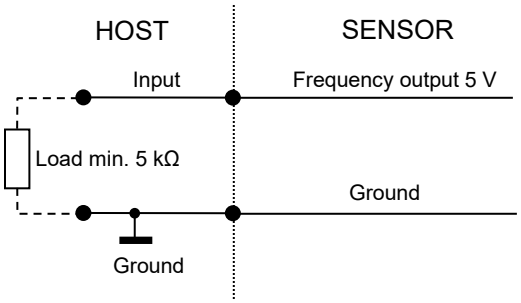
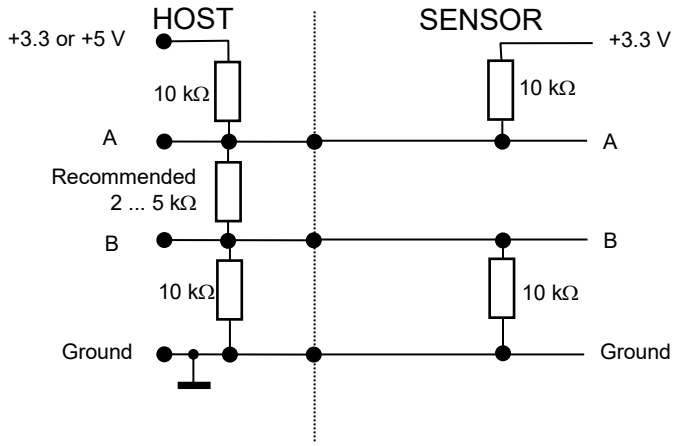
Accuracy

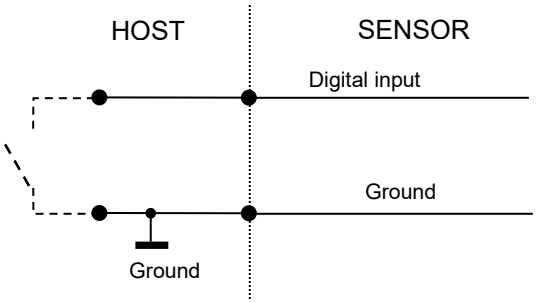
Specification SEMIFLOW	Accuracy for water with standard flow rate and standard tubing, adjusted at 23 °C ± 2 K and 1 bar		Typical max. flow
CO.65/080PI V2.0	< 800 ml/min: ± 16 ml/min	> 800 ml/min: ± 2 % (1	6 000 ml/min (2
CO.65/120PI V2.0	< 1 200 ml/min: ± 24 ml/min	> 1 200 ml/min: ± 2 % (1	20 000 ml/min (2
CO.65/160PI V2.0	< 1 600 ml/min: ± 32 ml/min	> 1 600 ml/min: ± 2 % (1	40 000 ml/min (2
CO.65/190PI V2.0	< 1 800 ml/min: ± 36 ml/min	> 1 800 ml/min: ± 2 % (1	60 000 ml/min (2
CO.65/260PI V2.0	< 4 000 ml/min: ± 80 ml/min	> 4 000 ml/min: ± 2 % (1	80 000 ml/min (2
CO.65/340PI V2.0	< 14 000 ml/min: ± 280 ml/min	> 14 000 ml/min: ± 2 % (1	150 000 ml/min (2
CO.65/500PI V2.0	< 16 000 ml/min: ± 480 ml/min	> 16 000 ml/min: ± 3 % (1	250 000 ml/min (2
CO.65/630PI V2.0	< 18 000 ml/min: ± 540 ml/min	> 18 000 ml/min: ± 3 % (1	290 000 ml/min (2

Technical data

SEMIFLOW CO.65/xxx 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, depth 8 mm
		CO.65/190PI V2.0 … CO.65/340PI V2.0	M6, depth 10 mm
		CO.65/500PI V2.0 … CO.65/630PI V2.0	M10, depth 12 mm
Media	Water or other acoustically transparent liquids		
Sensor materials	Channel: PMMA black | Inlay: silicone | Housing: PVCC grey | Potting: PU | Screws: PA natural | Connector: PA black | Pins: brass		
Operating voltage	12 ... 30 VDC, maximum ripple 10 %, protection against reverse-polarity (external fuse, if required: min. 200 mA)		
Current consumption	Maximum 50 mA (with open current, frequency and switching output depending on supply voltage)		
Electrical connection	8 pin connector (Binder 720 male)		
Shielding	Required: Shield of cable has to be connected on side of machine		

(1 [Percent] of measurement reading. | (2 Unless requested differently. Limited by tubing capacity only.

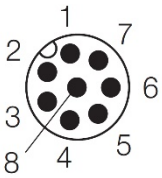
Interfaces	• Current output for flow rate: 0/4 … 20 mA • Frequency output for flow rate: 0 … 20 kHz, 5 V digital • RS485 interface: bus-capable (SONOTEC® protocol, optional MODBUS®) • Switching output: configurable as PNP / NPN / Push-Pull, 0 … 30 V • Digital input
Current output for flow rate	⚠ **NOTE:** 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 
Frequency output for flow rate	
RS485 interface	SONOTEC® protocol: Half-duplex operation / 115.200 baud / 8 data bit / no parity / 1 stop bit / no handshaking (MODBUS® via software settings) ⚠ **NOTE:** Description of serial protocol upon request.  Recommended electrical connection of the RS485 interface. ⚠ **CAUTION!** If the interface is not used, the two pins A & B must 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	PNP / NPN / Push-Pull, 0 … 30 V, maximum 100 mA, configurable for applications such as • Adapting batch process (dosing) • Threshold switch of flow • Slow pulses of volume (max.. 20 Hz)
Digital input	Freely configurable. For applications such as: • Zero point calibration • Flow or start dosing processes Voltage resistant up to 30 V
	
Media temperature (depending on ambient temperature)	**Sensors CO.65/080PI V2.0 … CO.65/340PI V2.0**
	0 ... 90 °C @ 0 … 25 °C ambient temperature
	0 ... 60 °C @ 0 … 60 °C ambient temperature
	Sensors CO.65/500PI V2.0 | CO.65/630PI V2.0
	0 ... 60 °C
Storage temperature (all sensors)	-20 ... +70 °C
Degree of protection	IP65 (in plugged condition)
Directives and standards	• EMC directive 2014/30/EU • RoHS: 2011/65/EU, exception: III 7cl/ IV 15 • Acoustic emission: IEC 61157
Maintenance	Maintenance-free

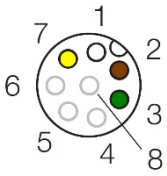
Scope of delivery	SEMIFLOW CO.65/xxxPI V2.0 according to specification (including cover and screws)
Optional accessories	SEMIFLOW Monitor V2.0 for setting parameters and recording measurements consisting of • USB Data Converter, type 013 for the connection to computer • Plug-in power supply (12 VDC) • Sensor cable SEMIFLOW, 8 pole (Binder 720) | 8 wire, 10 m • USB cable, type A-B, length 2 m • CD with software SONOFLOW Monitor and driver for Windows
	SONOFLOW® RD.10 Remote Display for • Monitoring sensor performance (display e.g. current flow rate, volume or measuring state) • Zero calibration • Manual volume reset
Optional	• Sensor cable SEMIFLOW, 8 pole (Binder 720) | 4 wire, 10 m • Sensor cable SEMIFLOW, 8 pole (Binder 720) | 8 wire, 10 m • Calibration protocol

Electrical connection

8 pin connector to 4 pole cable:



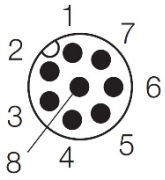
Male connector (at the sensor)



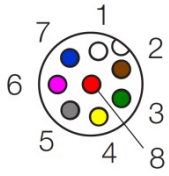
Female connector (at the cable)

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

8 pin connector to 8 pole cable:



Male connector (at the sensor)

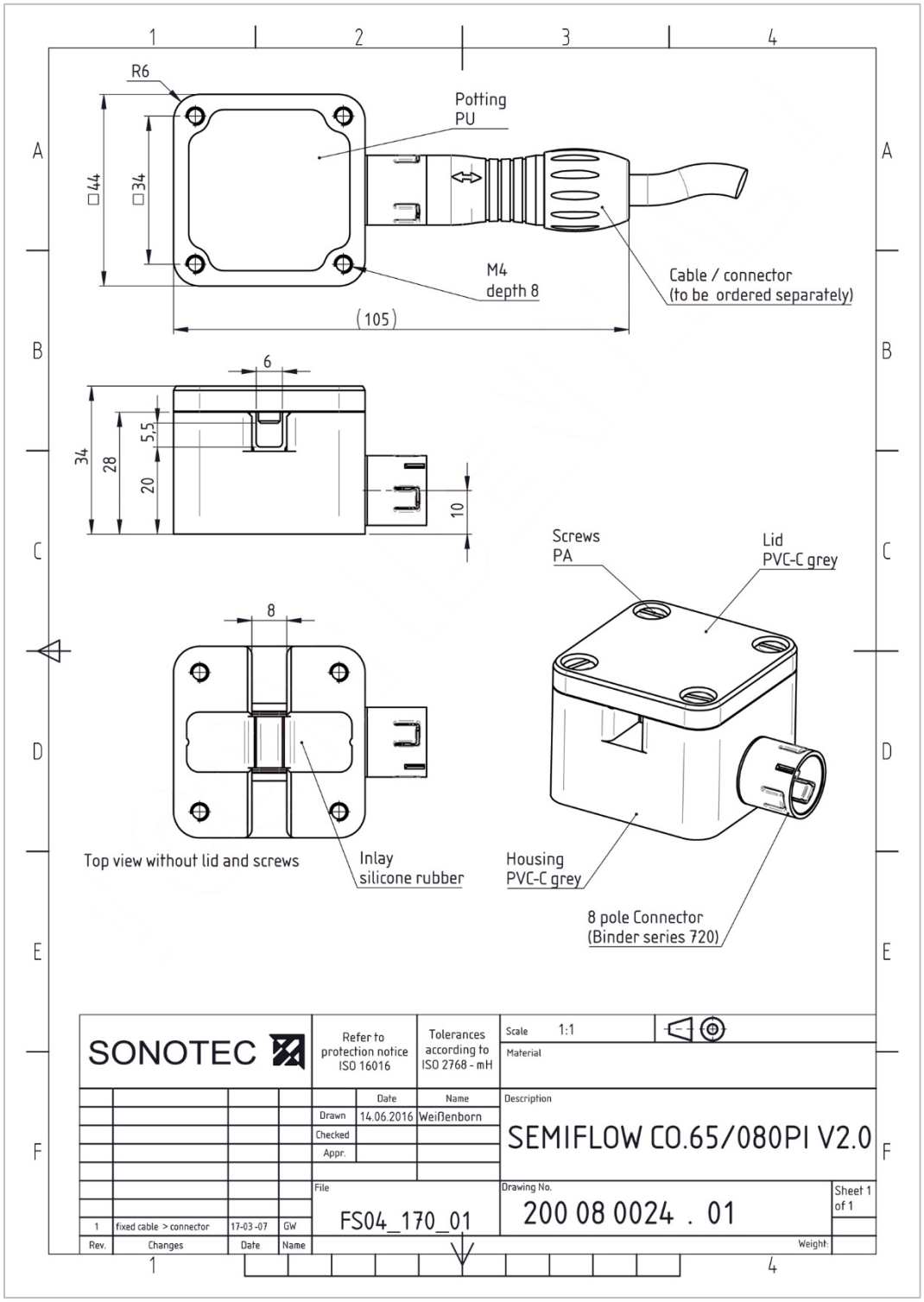


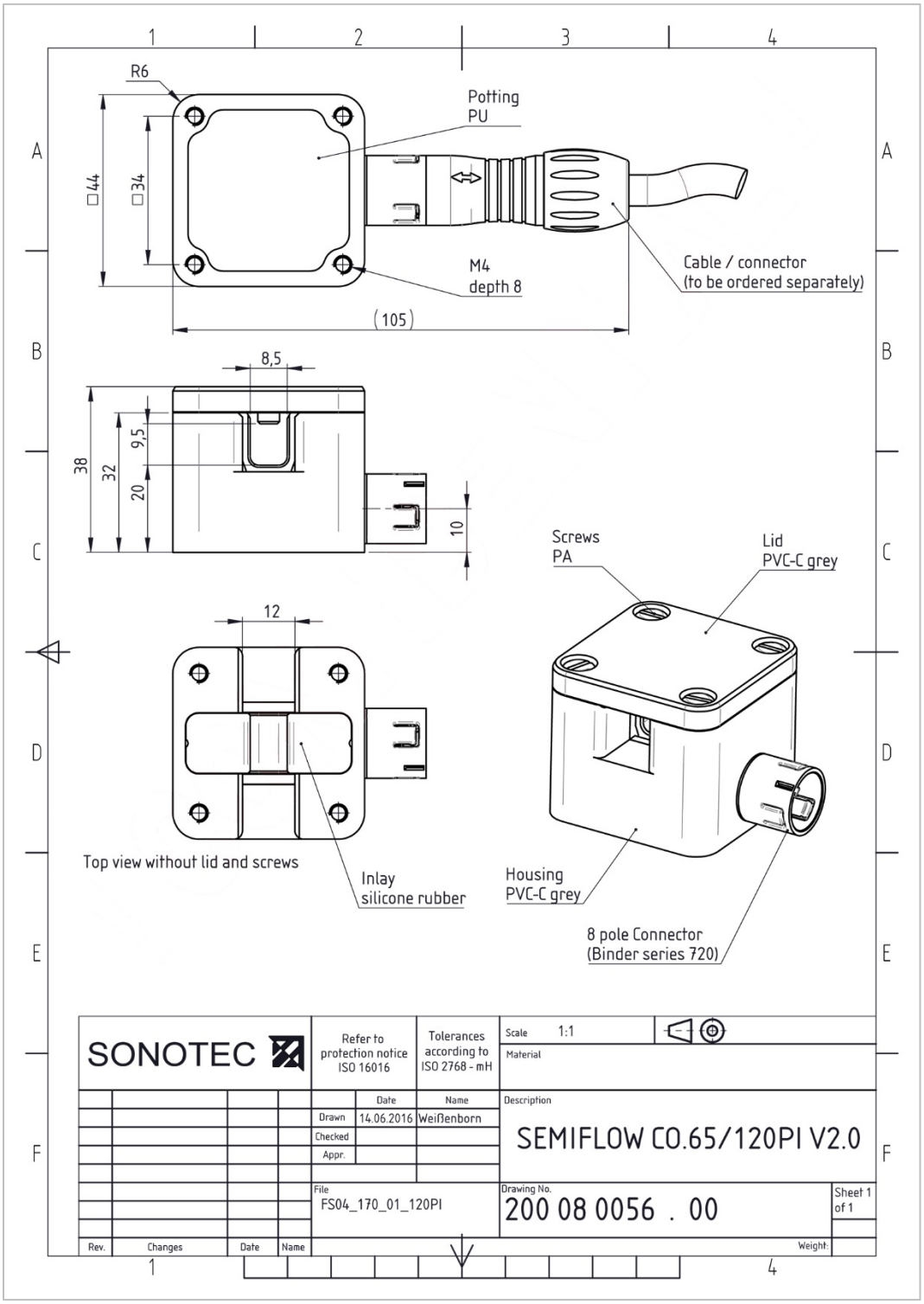
Female connector (at the cable)

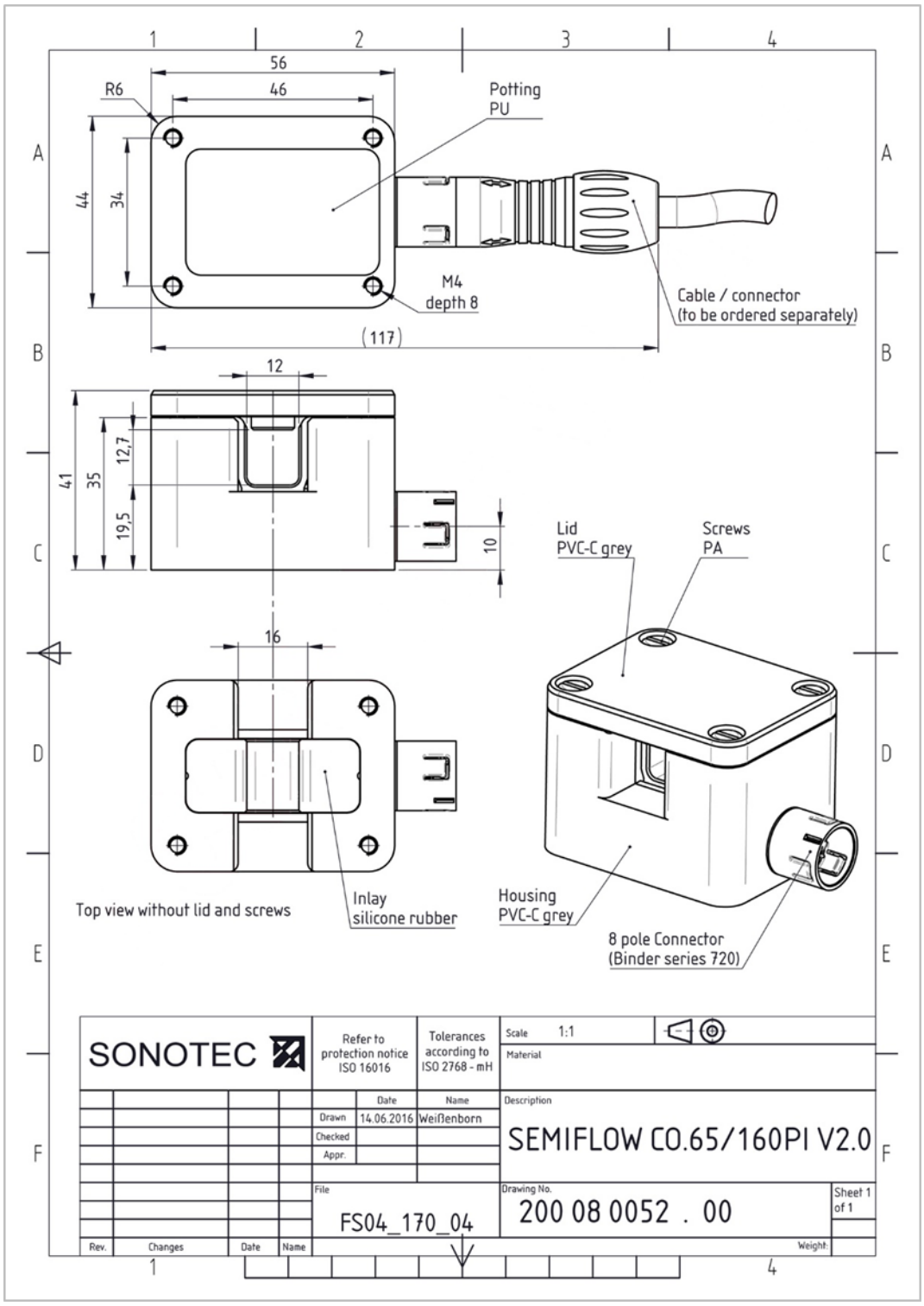
Connecting cable	Pin	Connection	Color*
Assignment	1	Ground	White
	2	Operating voltage +12 ... 30 VDC	Brown
	3	Current output (0/4 … 20 mA)	Green
	4	RS485 B	Yellow
	5	RS485 A	Grey
	6	Frequency output 0 … 20 kHz	Pink
	7	Switching output: PNP / NPN / Push-Pull	Blue
	8	Digital input	Red
	Shield	If available,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

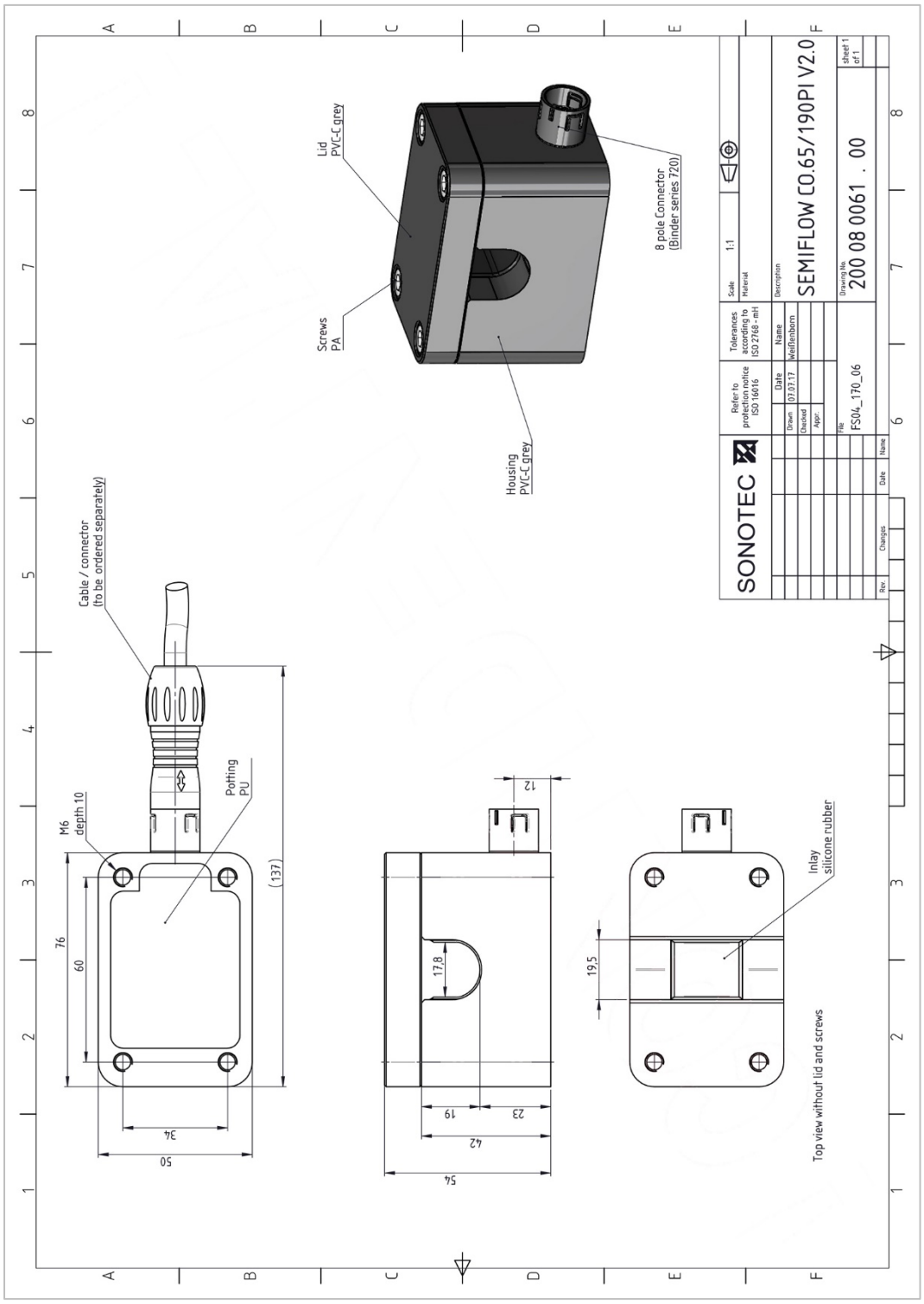
* of specified SONOTEC cable

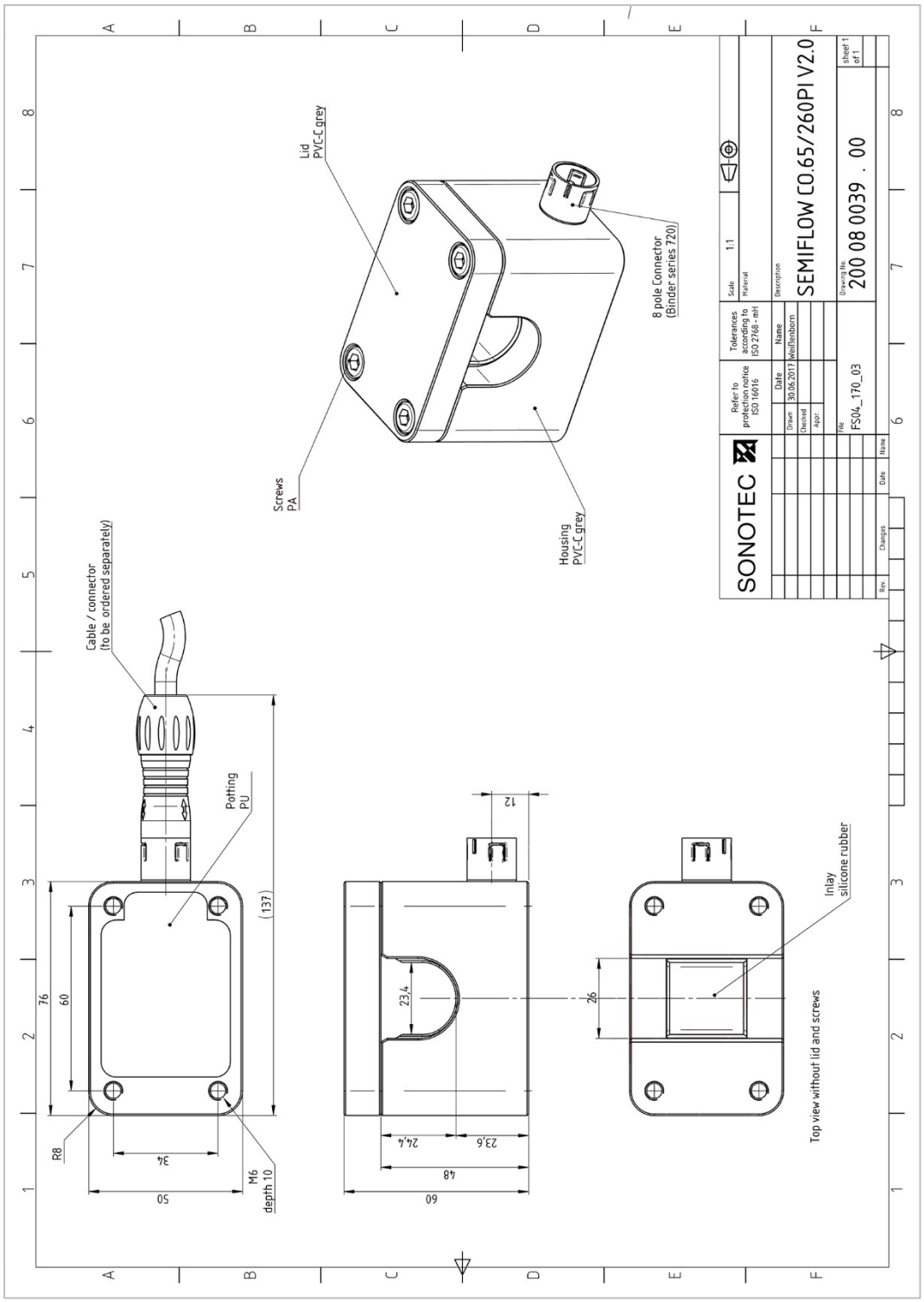
Technical drawings

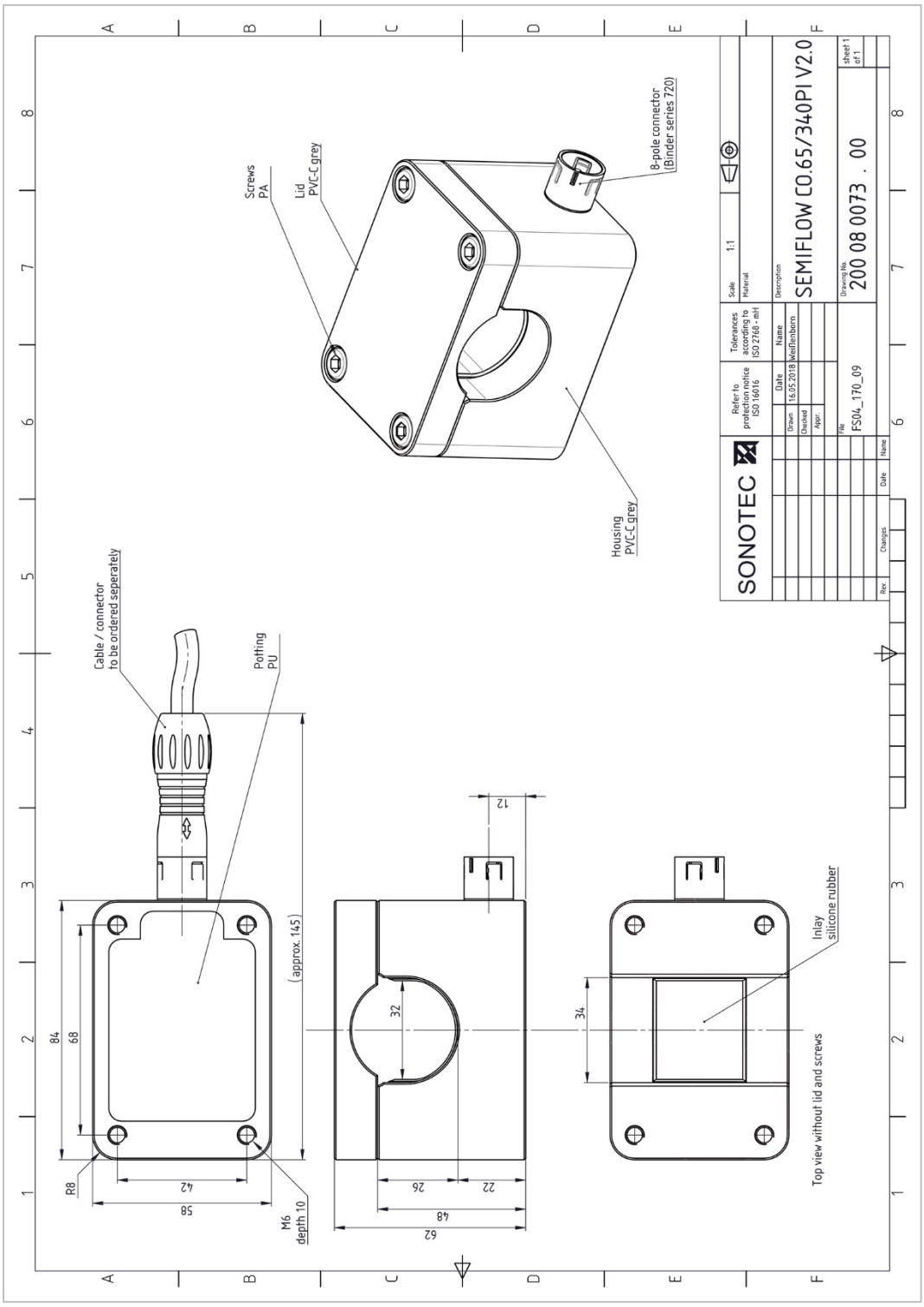


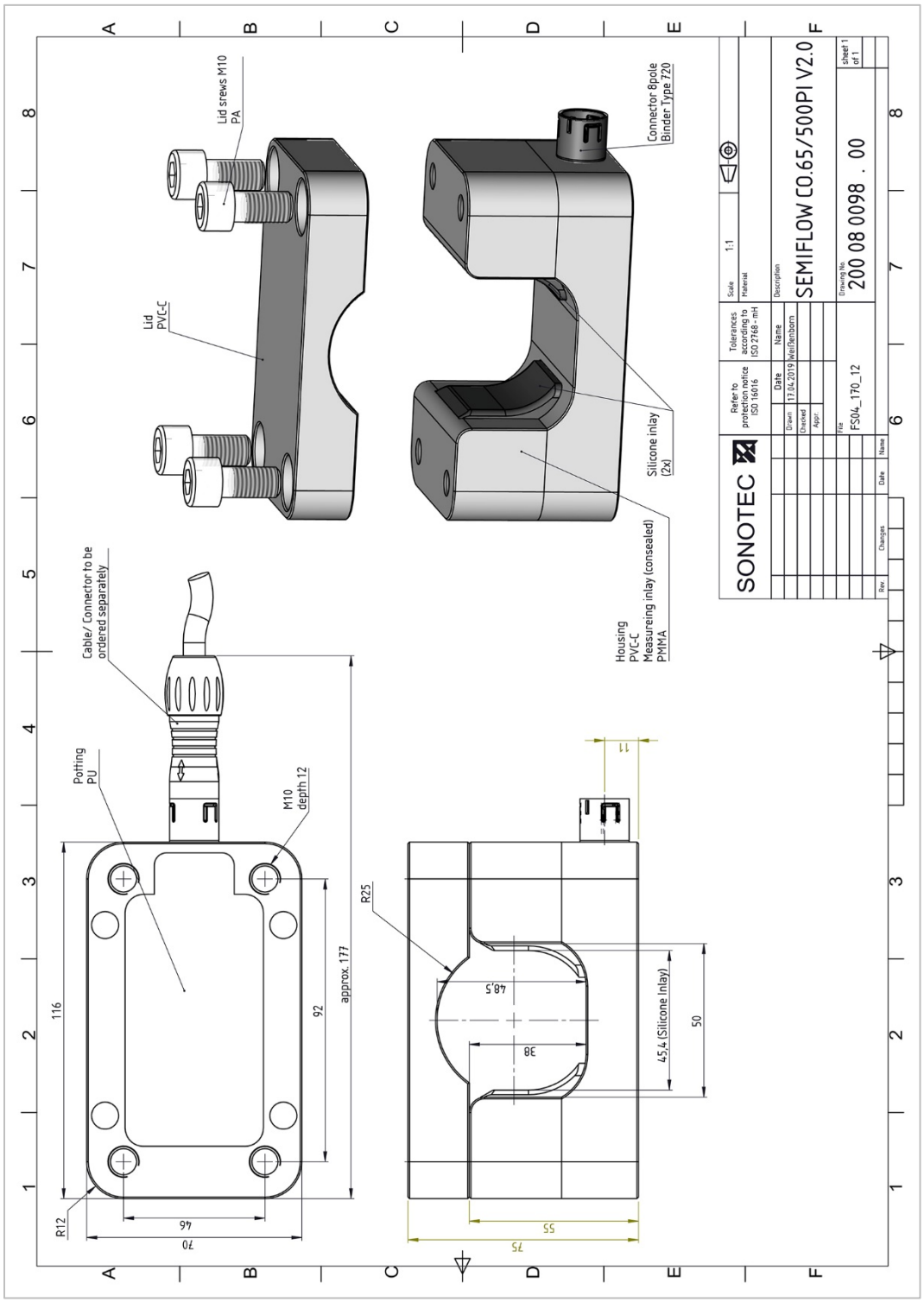

R6
Potting
PU
□44
□34
M4
depth 8
Cable / connector
(to be ordered separately)
(105)
8,5
38
32
9,5
20
10
12
Top view without lid and screws
Inlay
silicone rubber
Screws
PA
Lid
PVC-C grey
Housing
PVC-C grey
8 pole Connector
(Binder series 720)
SONOTEC
Refer to protection notice ISO 16016
Tolerances according to ISO 2768 - mH
Scale 1:1
Material
Date
Name
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:

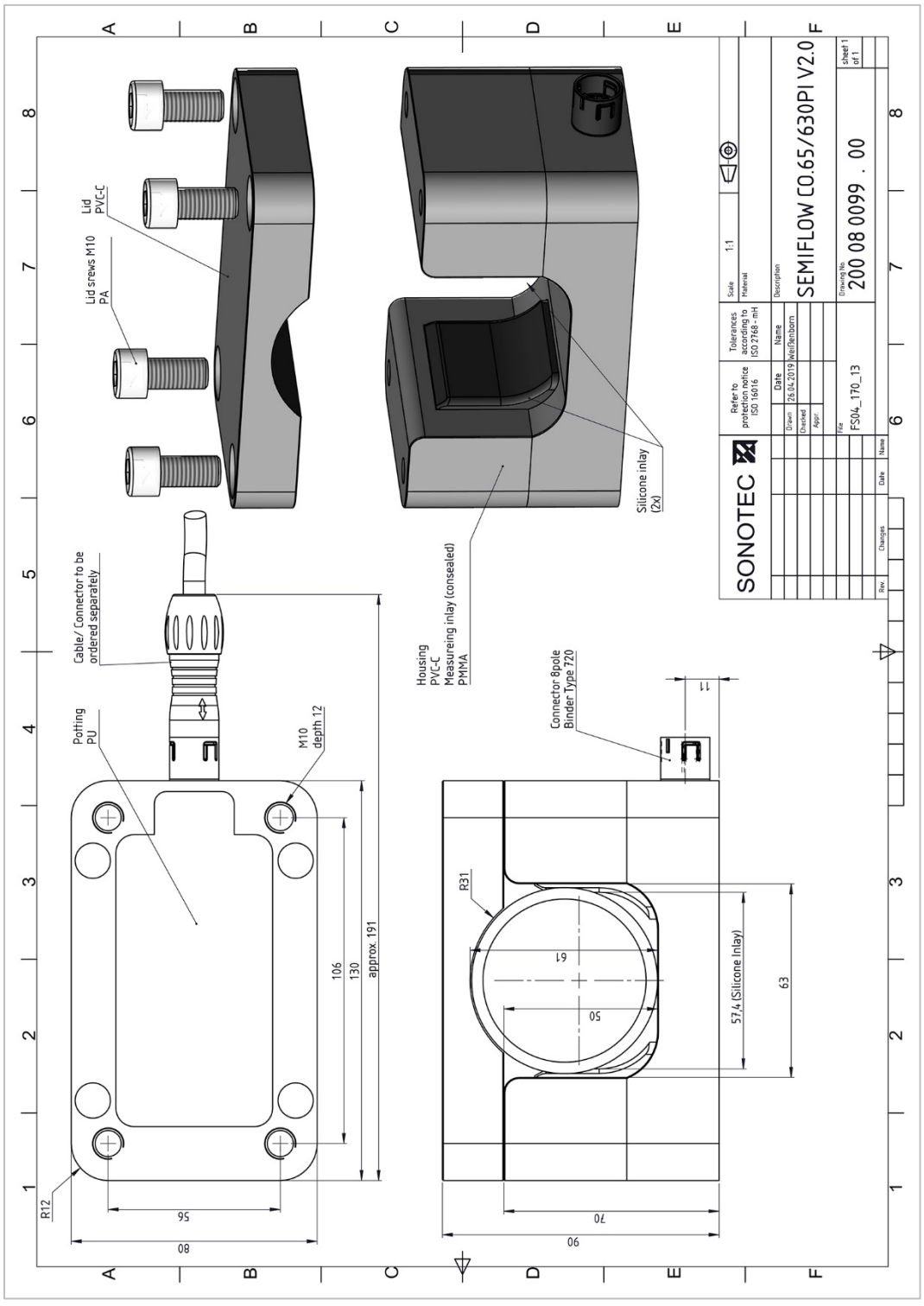

56
46
R6
Potting
PU
44
34
M4
depth 8
Cable / connector
(to be ordered separately)
(117)
12
41
35
12,7
19,5
10
16
Lid
PVC-C grey
Screws
PA
Top view without lid and screws
Inlay
silicone rubber
Housing
PVC-C grey
8 pole Connector
(Binder series 720)
SONOTEC
Refer to protection notice ISO 16016
Tolerances according to ISO 2768 - mH
Scale 1:1
Material
Description
Drawn 14.06.2016 Weißenborn
Checked
Appr.
SEMIFLOW CO.65/160PI V2.0
File
FS04_170_04
Drawing No.
200 08 0052 . 00
Sheet 1 of 1
Rev. Changes Date Name
Weight:


Lid
PVC-C grey
Screws
PA
8 pole Connector
(Binder series 720)
Housing
PVC-C grey
Cable / connector
(to be ordered separately)
Potting
PU
M6
depth 10
76
60
(137)
34
50
12
17,8
19
23
42
54
19,5
Inlay
silicone rubber
Top view without lid and screws
SONOTEC
Refer to
protection notice
ISO 16016
Tolerances
according to
ISO 2768 - mH
Scale 1:1
Material
Description
SEMIFLOW CO.65/190PI V2.0
Drawing No.
200 08 0061 . 00
sheet 1
of 1
Drawn 07.07.17 Wolfenborn
Checked
Appr.
File FS04_170_06
Rev
Changes
Date
Name


Lid
PVC-C grey
8 pole Connector
(Binder series 720)
Screws
PA
Housing
PVC-C grey
Cable / connector
(to be ordered separately)
Potting
PU
(137)
76
60
R8
34
50
M6
depth 10
12
23,4
24,4
23,6
48
60
26
Inlay
silicone rubber
Top view without lid and screws
SONOTEC
Refer to
protection notice
ISO 16016
Tolerances
according to
ISO 2768 - mH
Scale 1:1
Material
Description
SEMIFLOW CO.65/260PI V2.0
Drawing No.
200 08 0039 . 00
sheet 1
of 1
File
FS04_170_03
Drawn 30.06.2017 Wolfenborn
Checked
Appr.
Rev.
Changes
Date
Name


Screws PA
Lid PVC-C grey
8-pole connector (Binder series 720)
Housing PVC-C grey
Cable / connector to be ordered seperately
Potting PU
(approx. 145)
84
68
R8
42
58
M6 depth 10
12
32
26
22
48
62
34
Inlay silicone rubber
Top view without lid and screws
SONOTEC
Refer to protection notice ISO 16016
Tolerances according to ISO 2768 - mH
Scale 1:1
Material
Description
SEMIFLOW CO.65/340PI V2.0
Drawing No. 200 08 0073 . 00
sheet 1 of 1
Drawn 16.05.2018 Wolfbenborn
Checked
Appr.
File FS04_170_09
Rev. Changes Date Name


Lid srews M10
PA
Lid
PVC-C
Connector 8pole
Binder Type 720
Silicone inlay
(2x)
Housing
PVC-C
Measureing inlay (conseald)
PMMA
Cable/ Connector to be
ordered separately
Potting
PU
M10
depth 12
R12
R25
116
92
approx. 177
70
46
75
55
48,5
38
45,4 (Silicone Inlay)
50
11
SONOTEC
Refer to
protection notice
ISO 16016
Tolerances
according to
ISO 2768 - mH
Scale 1:1
Material
Description
SEMIFLOW CO.65/500PI V2.0
Drawing No.
200 08 0098 . 00
sheet 1
of 1
Drawn 17.04.2019 Weißenborn
Checked
Appr.
File FS04_170_12
Rev.
Changes
Date
Name



Drawings are not to scale. Dimensions in mm, unless otherwise specified. Information is subject to change without notice.

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