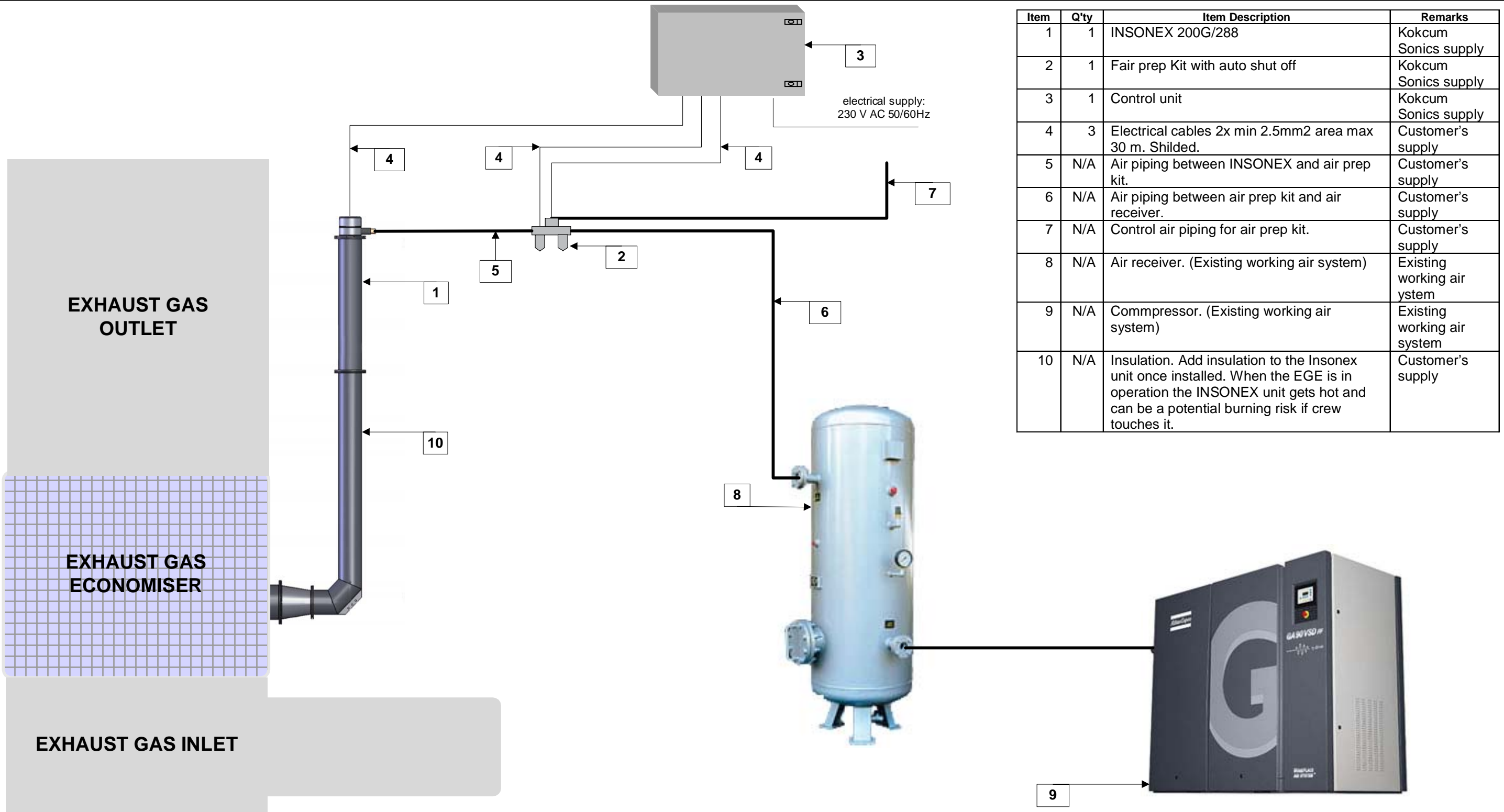


## **APPENDIX A**

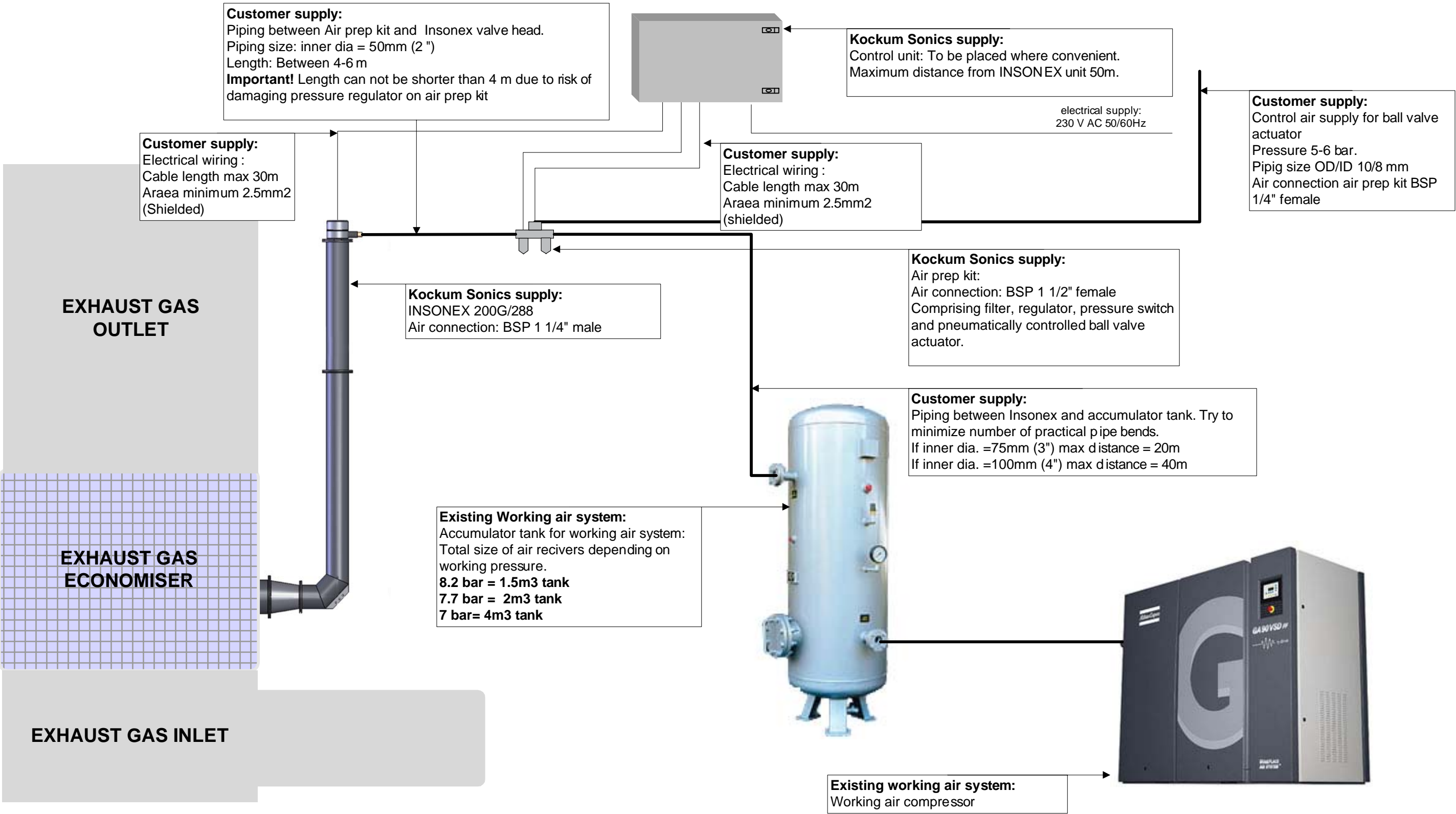
### **SCOPE OF SUPPLY AND GENERAL GUIDELINES**

Scope of supply

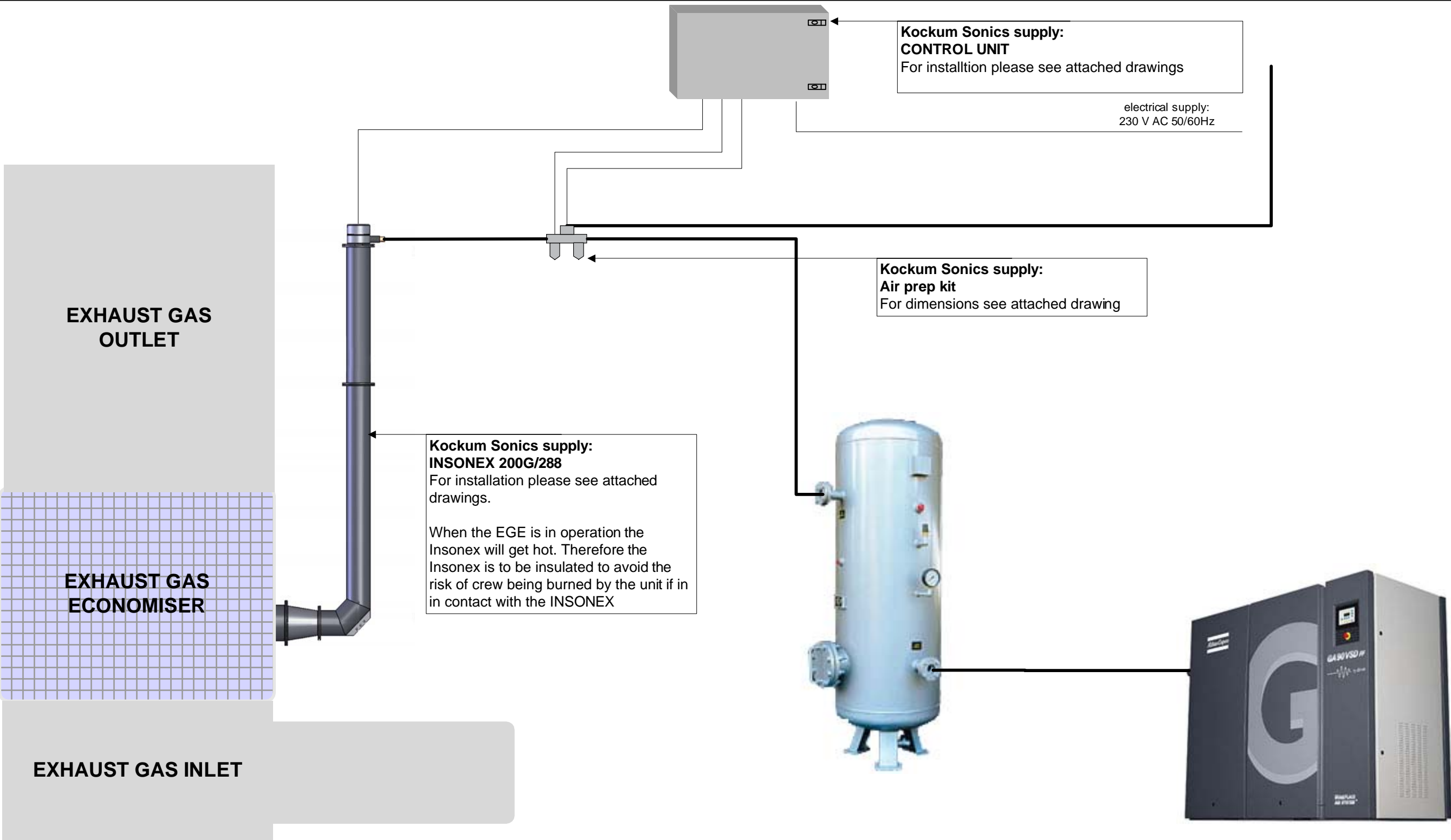


Kockum Sonics AB  
Document: Piping dimension, counter threads and air reciever sizes  
Customer: Teekay Shipping

Piping dimension, counter threads & air receiver size proposal



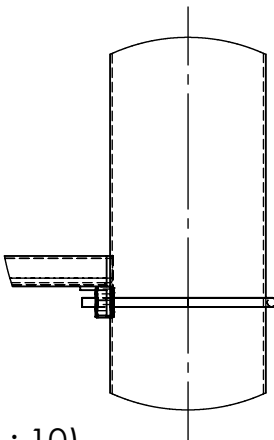
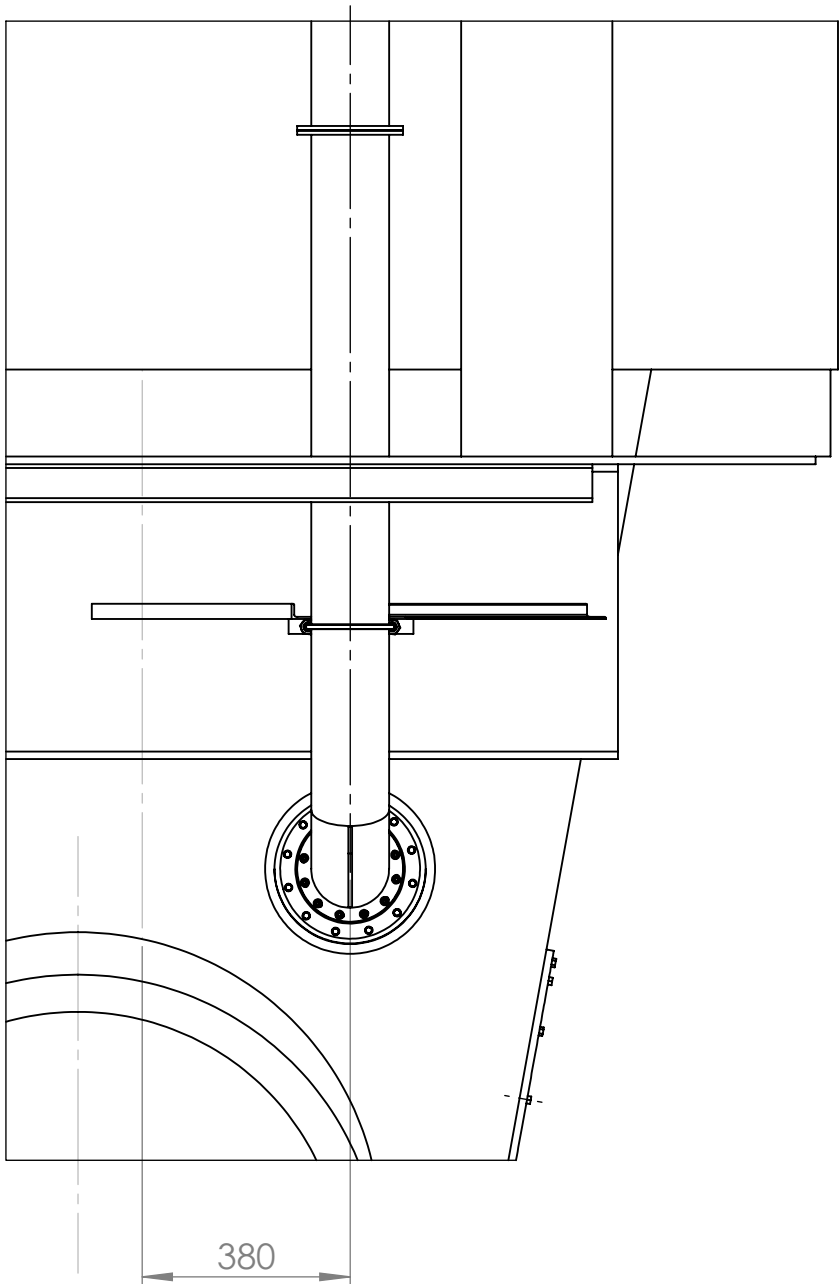
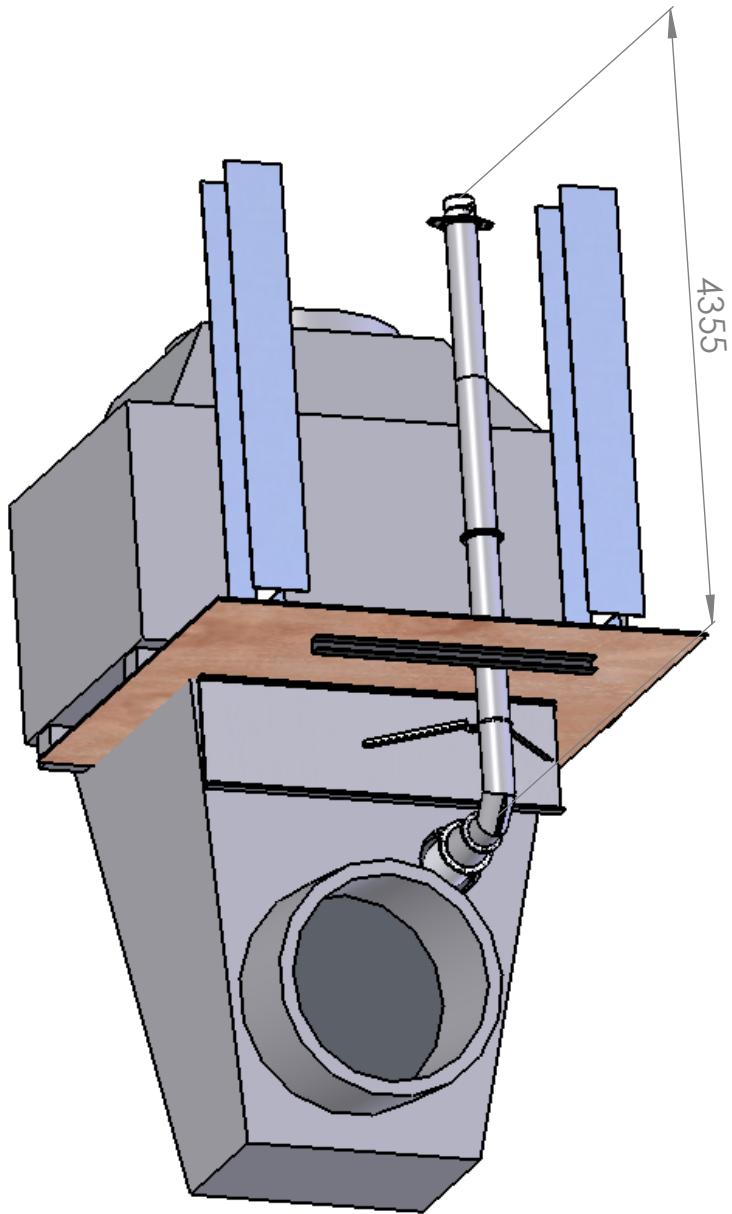
Drawing references



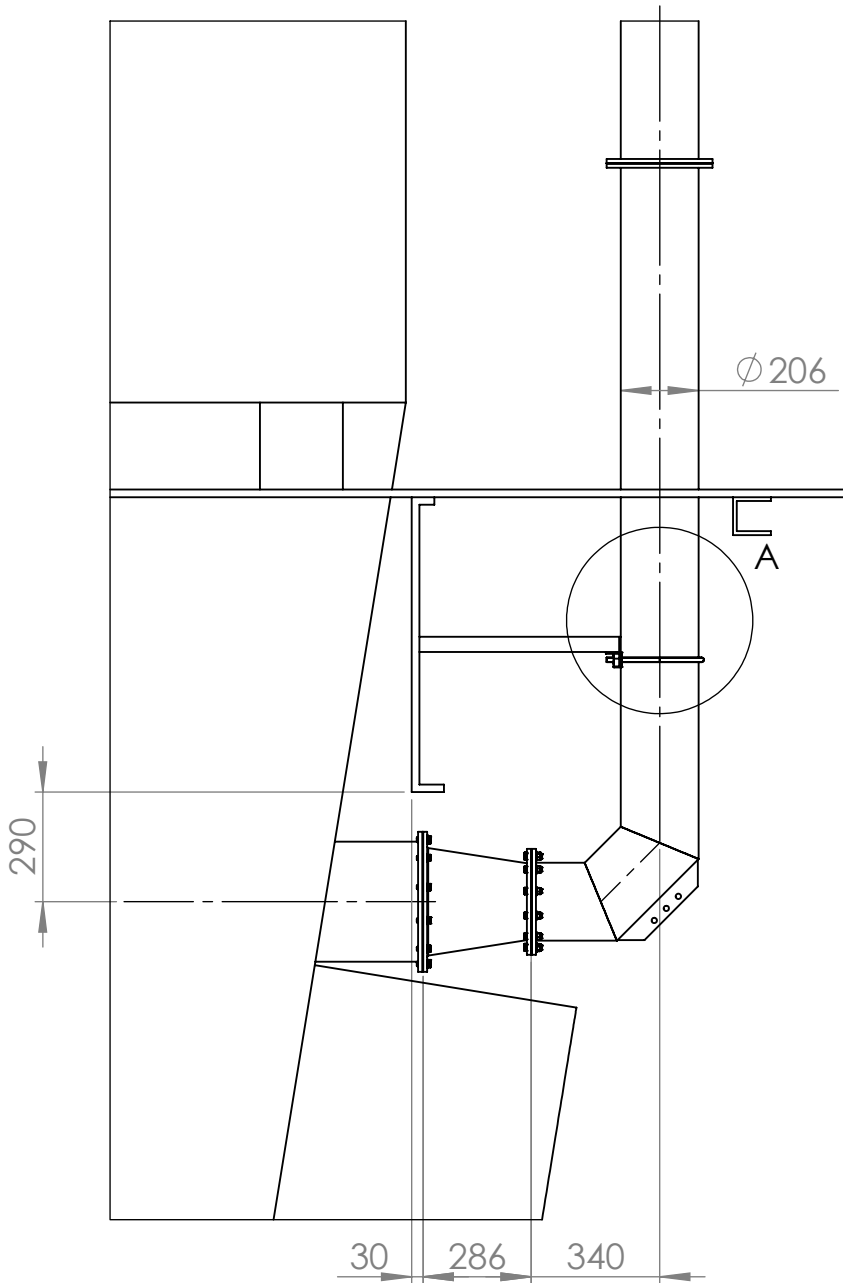
## **APPENDIX B**

### **DRAWINGS WIRING DIAGRAMS AND DATA SHEETS**

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A (1 : 10)



If not indicated  
-Tolerances ISO 2768-M  
-Sharp edges broken

Material

Scale

1:20



Description

Yamuna Spirit-Insonex  
Insallation proposal

Date

070912

Created by

MW

Checked by

-

Page/of

(1/2)

Drawing no

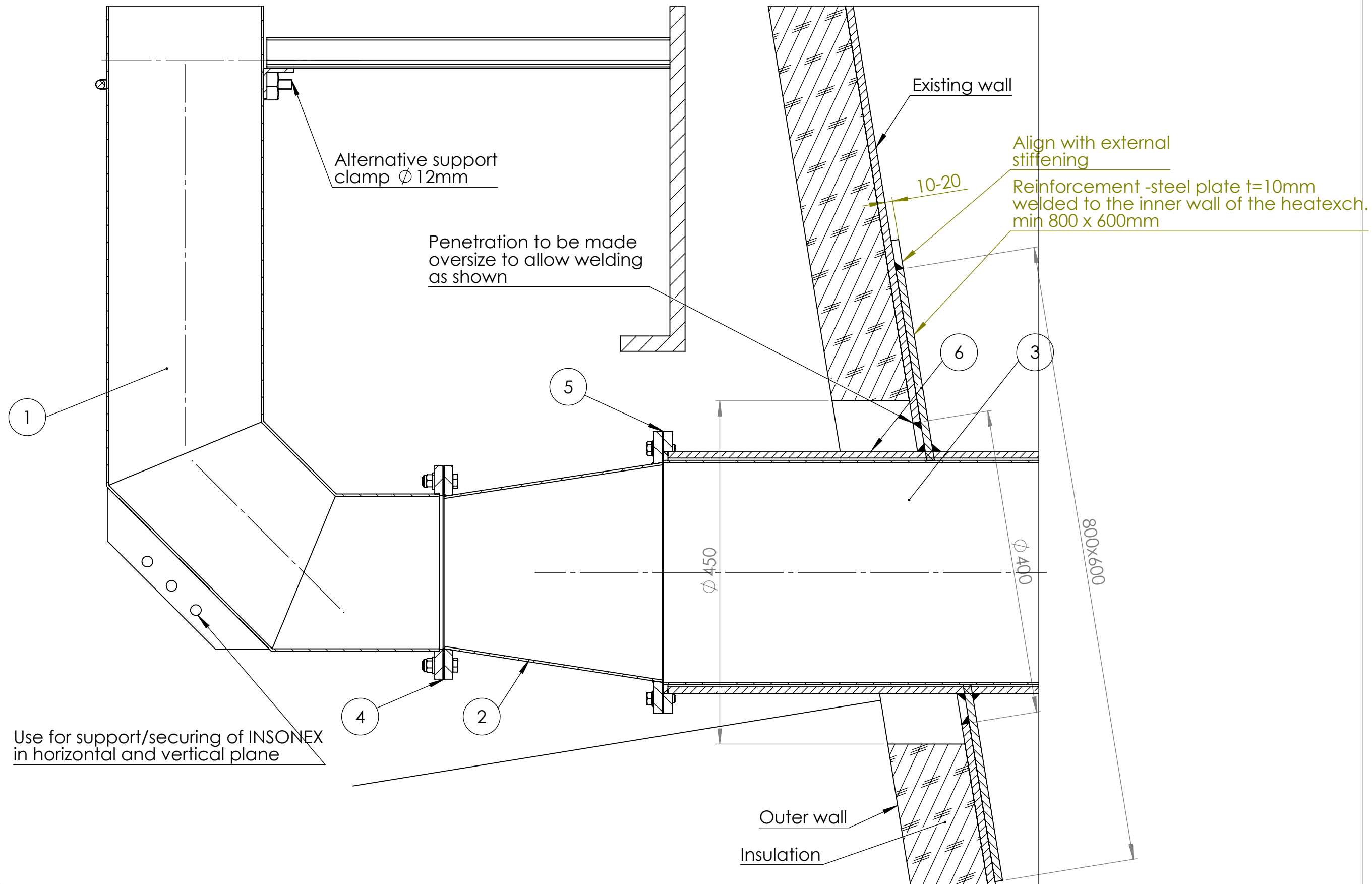
25800044-03

Revision



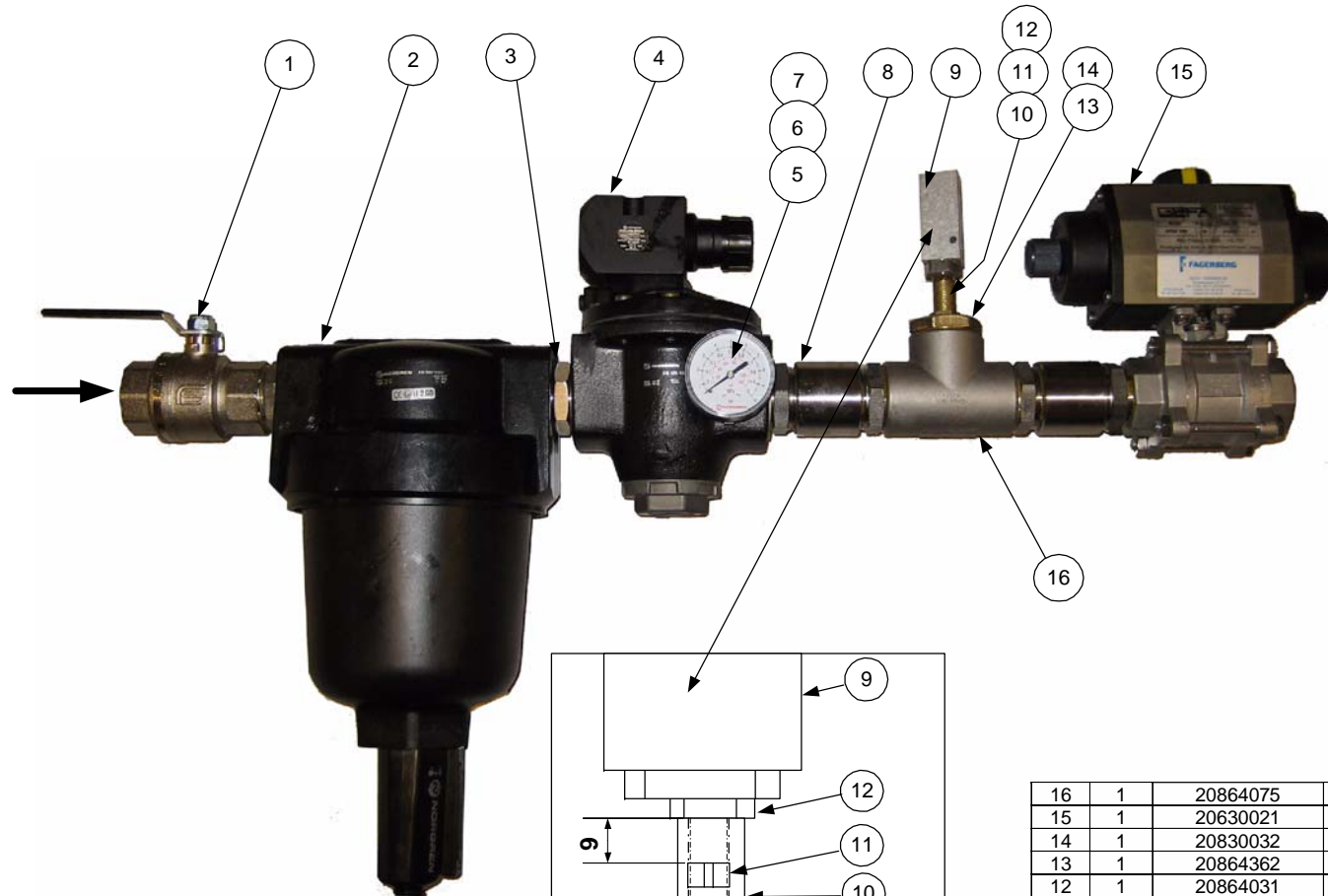
Kockum Sonics

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- KSA supply:
1. Insonex resonance pipe
  2. Cone
  3. Pipe stud St. Steel
  4. Gasket Insonex
  5. Gasket
  6. Pipe stud mild steel

If not indicated -Tolerances ISO 2768-M -Sharp edges broken		Material		Scale 1:5		Description Yamuna Spirit-Insonex Insallation proposal	
Date 070912		Created by MW		Checked by -		Drawing no 25800044-03	
Kockum Sonics		Notes		Page/of (2/2)		Revision	



View from underneath item "15": Control valve



Connection to working air: Thread size: 1/4" BSP female.

Use middle port marked "1"

For thread use LocTite 577

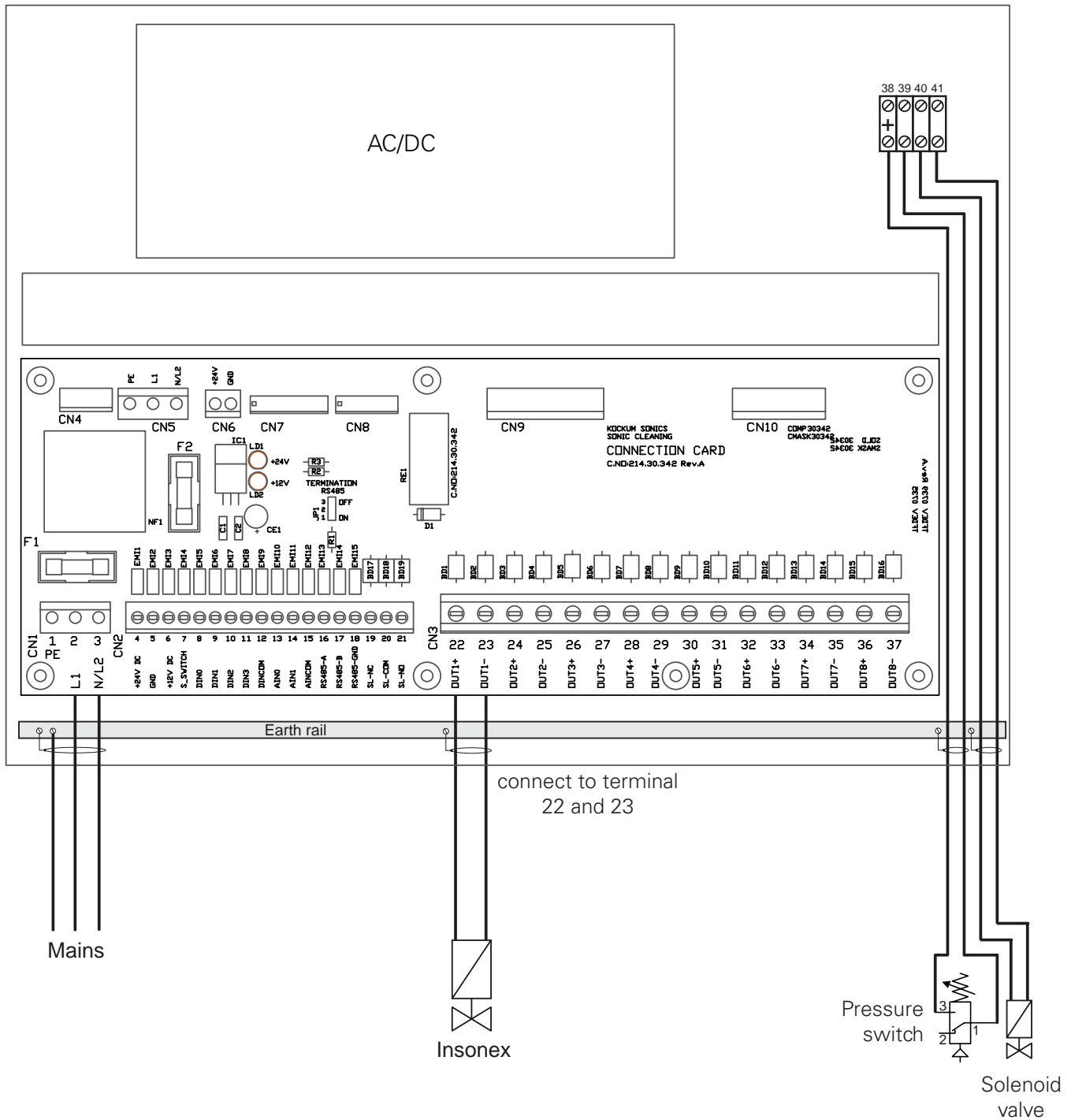
Item 9 and 15 is to be connected to the control unit: Please see the separate wiring diagram for connections and cable specification

16	1	20864075	Angle tee	1 1/2"	Ahlsell 1237051
15	1	20630021	Cut-off valve	1 1/2"	
14	1	20830032	Bushing	1/2" x 1/4"	Ahlsell 1486207
13	1	20864362	Bushing	1 1/2" x 1/2"	
12	1	20864031	Nipple	1/4" x 1/4"	
11	1	32170400	Choke	1/4"	Drill hole diameter 2 mm
10	1	20864037	Muff	1/4"	
9	1	21769482	Pressure switch	1/4"	
8	2	20864338	Muff	1 1/2"	Ahlsell 1985449
7	1	20864500	Ball valve	1/4"	Cut-off valve for manometer
6	1	20864035	Bushing	1/4" x 1/8"	
5	1	20864507	Manometer	1/8"	
4	1	20480027	Regulator	1 1/2"	
3	6	20864346	Nipple	1 1/2" x 1 1/2"	
2	1	20900104	Filter	1 1/2"	
1	1	20864519	Ball valve	1 1/2"	

Item	Qty	Art No/Drawing	Description	Dimension	Material
Där ej annat angivits -Toleranser SMS 715 Medel (ISO 2768-m) -Ytjämnhet $\sqrt{}$ (Ra mm) -Skarpa kanter brytes			Material	Scale	INSONEX Air Prep. Pack 1 1/2"
07-10-23			Date	Drawn by ceN	
			Checked by		
Order No.			Replce	Reg. No.	24650056
Kockum Sonics					1



## ELECTRICAL CONNECTION



### Fuses

F1	2.5A slow	5x20mm	recommended spare part
F2	3.15A fast	5x20mm	recommended spare part

### Cables

Mains	min 3 x 0.5 mm <sup>2</sup>	
Insonex	min 2 x 1mm <sup>2</sup>	depending of lenght between SC501 and Insonex
Pressure switch	min 2 x 1mm <sup>2</sup>	
Solenoid valve	min 2 x 1mm <sup>2</sup>	
Connect cables shield to the earth rail		

**APPENDIX C**  
**MANUALS**

# **OPERATIONS MANUAL SONIC CONTROLLER SC501**



## TECHNICAL DATA

Power supply 230/115V AC, 50/60 Hz  
(85 ... 260V AC, 47...63Hz)

Power consumption without load 230/115V AC 10VA

Operating ambient temperature range -10...+50°C  
Storage temperature -20...+70°C

8 individual outputs depending of mode of operation:

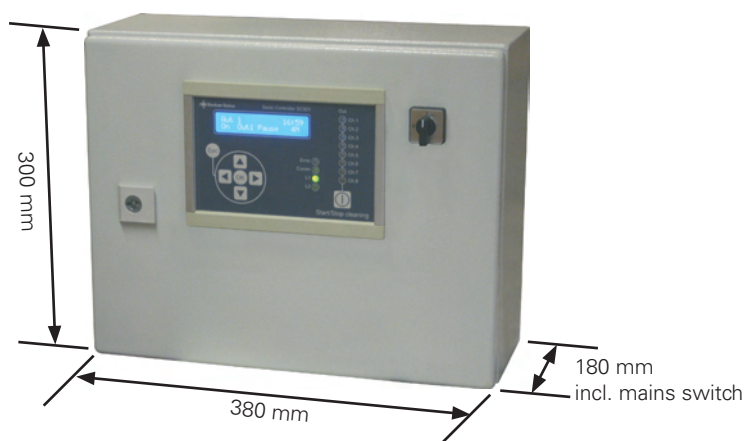
- Complementary	4x2 outputs	24V DC	Max load 1A	Frequency adjustable
- Single	8 outputs	24V DC	Max load 1A	Frequency adjustable
- Static	8 outputs	24V DC	Max load 1A	DC output
- IKT	8 potential free relay (NO)	Max load 250VAC/5A, 30V DC/2A		

Max total load on 24V DC outputs (when activated simultaneously) = 2.5A

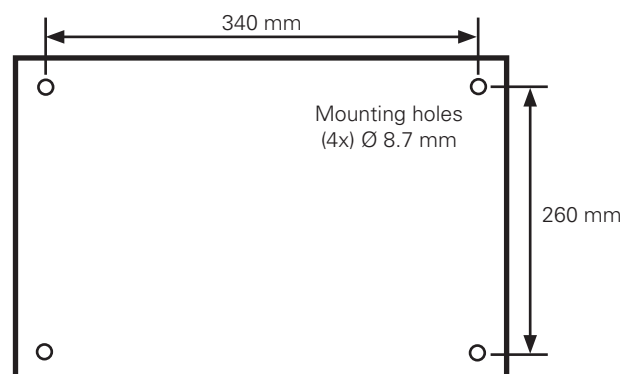
Enclosure protection class IP 55  
Weight 9.5 kg

Max load on external 24V DC (term 4) 500mA  
Max load on external 12V DC (term 6) 200mA

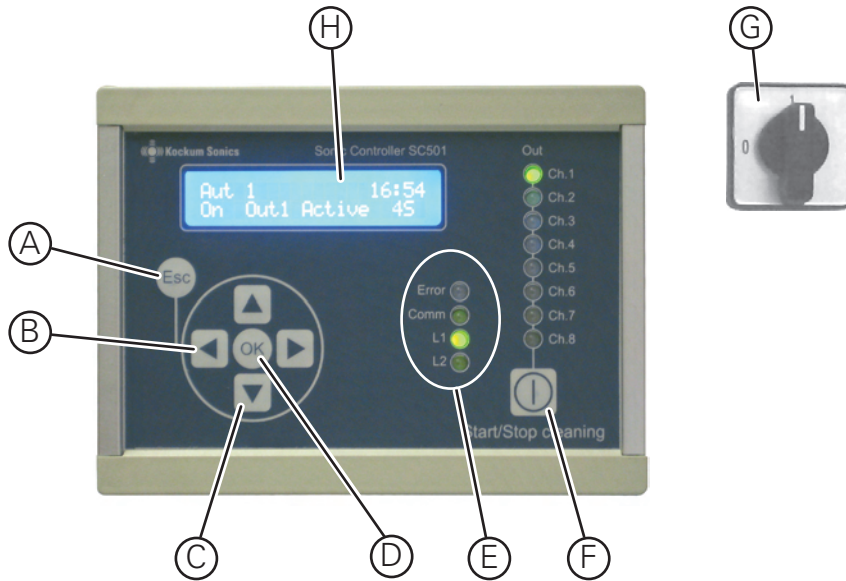
### Mounting dimensions:



### Mounting holes:



## FRONT PANEL AND QUICK START UP DESCRIPTION



### Overview of frontpanel

- A. Button to enter or leave the configuration meny
- B. Left/right buttons. For scrolling side ways on display (only valid in conf. meny)
- C. Up/down buttons. Used to choose between different values (only valid in conf. meny)
- D. OK button. Used to confirm a new value (only valid in conf. meny)
- E. Status leds such as "Error" and "Sum alarm (L1)"
- F. Start and Stop button
- G. Mains switch
- H. Display showing actual settings and status

### Quick start up setting

1. Switch the mains power (G) to POS 1 (ON).
2. The control unit will intialize and start up.
3. Press button F to stop the unit.  
The arrow buttons (left/right) is used for toggling between different menues

#### Set menu "Function"

*Toggle between the different modes with up/down arrow keys. (Automatic, Manual, External)*

4. Press ESC, button A to enter configurations meny.
5. Choose **"Automatic"**.
6. Press OK to confirm

#### Set menu "Output type"

*Toggle between the different modes with up/down arrow keys. (Complementary, Single, Static, IKT)*

7. Press right arrow button to **"Output type"**
8. Set **"OUTPUTTYPE"** to **"Single"**.
9. Press OK to confirm

#### Set menu "Out Channels"

*Toggle between the different modes with up/down arrow keys.*

10. Press right arrow button to **"Output Channels"**
11. Set **"Output Channels"** to **"1"**
12. Press OK to confirm

#### Set menu "Active time"

*Toggle the activation time with up/down arrow keys (1-99 Sec).*

13. Press right arrow button to **"Active time"**
14. Set **"Active time"** to **"10 sec"**
15. Press OK to confirm

#### Set menu "Pause time"

*Toggle the activation time with up/down arrow keys (1-99 Min).*

16. Press right arrow button to **"Pause time"**
17. Set **"Pause time"** to **"10 min"**
18. Press OK to confirm

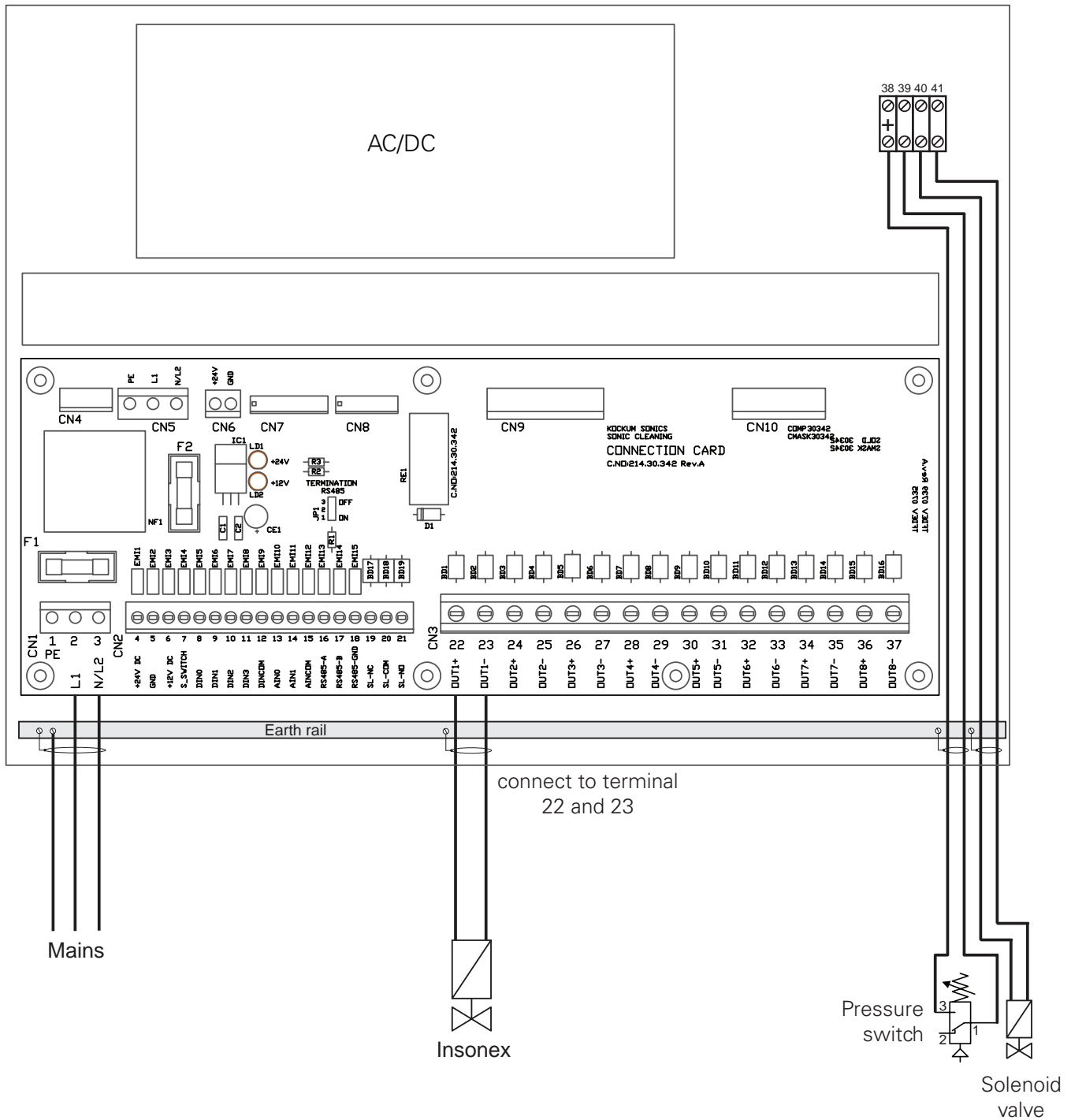
#### Set menu "Frequency"

*Toggle the frequency with up/down arrow keys (10-50 Hz in steps of 0.1 Hz).*

19. Press right arrow button to **"Frequency"**
20. Set **"Frequency"** to **"17.5 Hz"**
20. Press OK to confirm

To leave the configuration meny, press the ESC button.

## ELECTRICAL CONNECTION



### Fuses

F1	2.5A slow	5x20mm	recommended spare part
F2	3.15A fast	5x20mm	recommended spare part

### Cables

Mains	min 3 x 0.5 mm <sup>2</sup>	
Insonex	min 2 x 1mm <sup>2</sup>	depending of lenght between SC501 and Insonex
Pressure switch	min 2 x 1mm <sup>2</sup>	
Solenoid valve	min 2 x 1mm <sup>2</sup>	
Connect cables shield to the earth rail		

# **INSONEX 200 - SERIES , VALVE UNIT TV-820**

## **MAINTENANCE & TUNING MANUAL**

**IMPORTANT!!!**

**THE INSONEX UNIT IS A POWERFUL SOUND EMITTER  
BEFORE ANY MAINTENANCE WORK IS DONE ON THE UNIT**

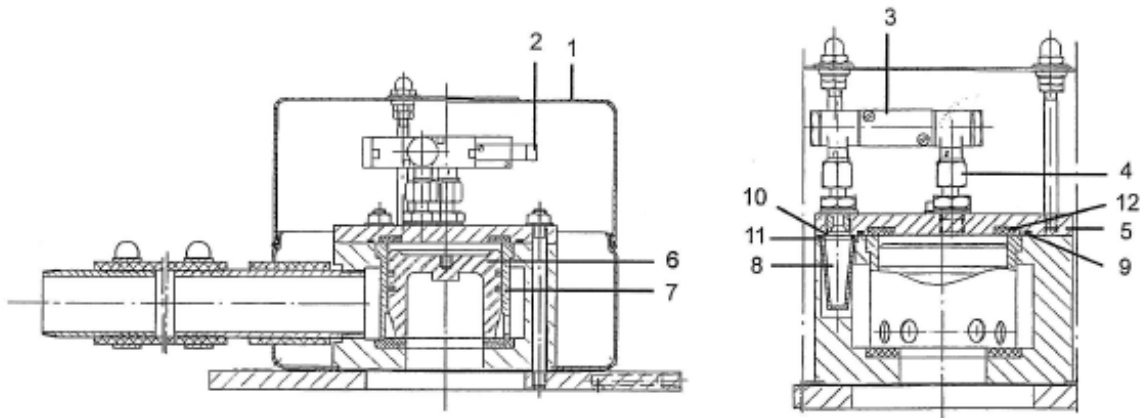
**ENSURE THAT THE CONTROL CABINET HAS BEEN  
SWITCHED OFF AND THAT THE SHUT OFF VALVE ON THE  
AIRPREPARTION UNIT HAS BEEN CLOSED!!!**



---

# VALVE UNIT TV 820 MAINTENANCE & TUNING

---



## Dismantling the valve

- Shut off the air supply and release the air pressure to the valve.
- Shut off main electric power supply.
- Dismount the cover to the control unit (1).
- Remove the connection to the solenoid valve (2).
- Dismount the solenoid valve (3) with the screws (4). **IMPORTANT!** Note the position of the valve.
- Unscrew the lid (5)
- Lift out the piston (6) with a M6 screw.
- Remove the cylinder (7) with the puller. Part No. 24650024

## Inspection

- Cylinder: The inside of the surface must be smooth and the diameter not bigger than  $\varnothing 65.05$  mm.
- Piston ring: The width shall not be smaller than 2.8 mm.
- Piston: The diameter must not be smaller than  $\varnothing 64.2$  mm. The sealing surface must be plane and smooth.
- Dampers: The sealing surface shall be smooth with no damages and deformations.

## Reassembling

Clean all parts carefully. Replace wear parts. Always replace the filter (8) and the O-rings (9), (10) and (11). Glue the damper (12) and the O-ring (9) to the lid (5).

Reassemble the valve, reconnect it on the resonance tube and check that the power is within the limits using the power measurement equipment.

## Routine maintenance

### Every week:

Inspect the system. Look for leaks. Listen and check that the function is normal

### Every Month:

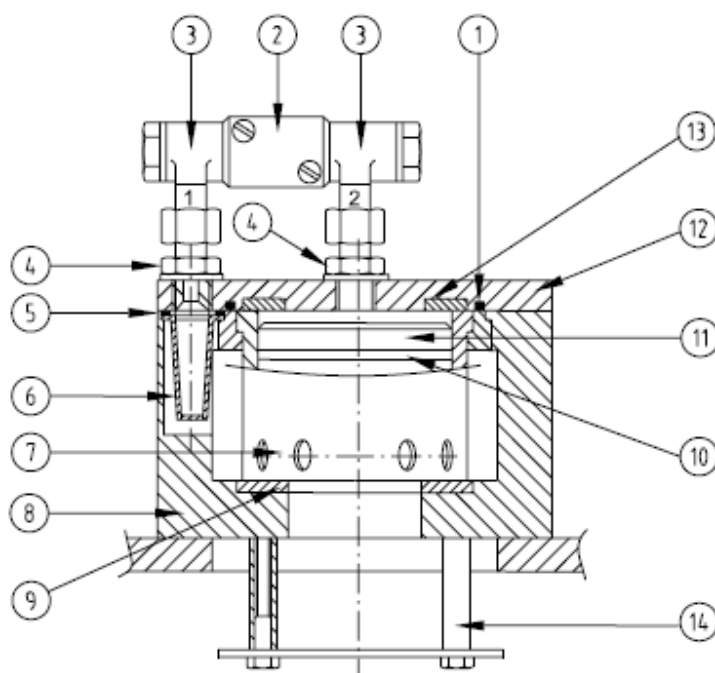
Check the manometer on the main filter during activation time. If the pressure is low, clean the air filter. Adjust the power according to "Power control and tuning".

### Every year:

Dismount and inspect the valve. See maintenance instructions

# VALVE UNIT TV 820 MAINTENANCE & TUNING

## Spare parts



Parts for Valve Unit

No.	Name	Ref. No.
1	O-Ring (large)	20862073
2	Solenoid Valve	20630019
3	Pipe coupling (2 required)	20864196
4	Pipe coupling (2 required)	21769202
5	O-Ring (small)	20862056
6	Filter	21769196
7	Cylinder	21768784
8	Valve Housing	21769198
9	Damper (lower)	21768824
10	Piston-rings (4 required)	21765012
11	Piston	21769396
12	Cover	21769199
13	Damper (upper)	21768825
14	Measuring disc (complete set)	21769313

When ordering parts, give part name and ref. No.



**Kockum Sonics**

Telefax +46 (0)40 2165 13  
Phone +46 (0)40 671 88 00  
Malmö Sweden

## Valve Unit TV 820

E-mail [info@sonics.se](mailto:info@sonics.se)

Reg. No  
4016

Edition  
2



**Kockum Sonics**

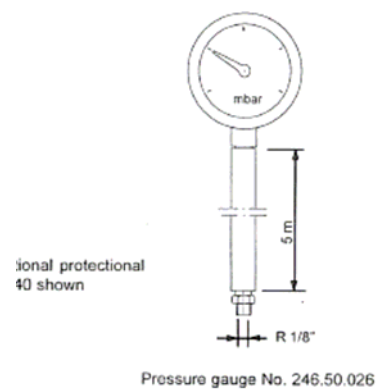
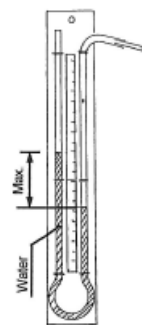
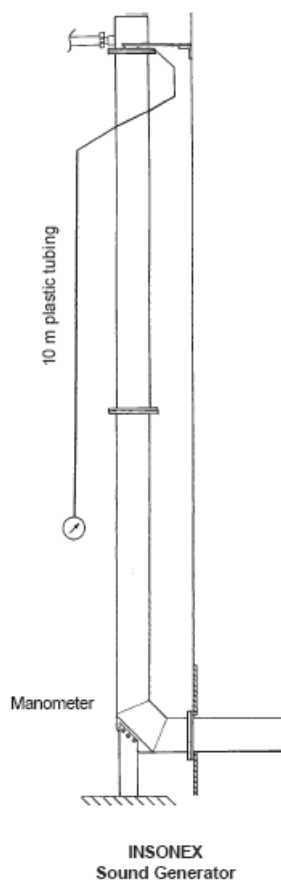
# VALVE UNIT TV 820 MAINTENANCE & TUNING

## Power control and tuning

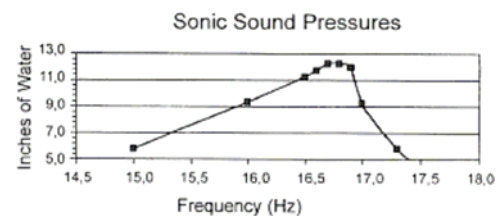
Connect the pressure gauge Art No. 246.50.026, or a U-pipe, to the connection on the lower flange of the valve unit. Adjust the frequency on the Control Unit until you have the maximum pressure on the pressure gauge.

**IMPORTANT!** Make sure that the feeding pressure is the same for each of the comparable output – power – measurements.

**Example at 6 bar and 16.5 Hz the sonic sound pressure is 11 inches of water.**



## Example on Power control measurement



Frequency Hz	Boiler Suction inches water	Sonic Pressure inches water	Total Pressure inches water
15,0	0,8	5,0	5,8
16,0	0,8	8,5	9,3
16,5	0,8	10,4	11,2
16,6	0,9	10,8	11,7
16,7	0,8	11,4	12,2
16,8	0,8	11,4	12,2
16,9	0,9	11,0	11,9
17,0	0,6	8,6	9,2
17,3	0,8	5,0	5,8
17,5	0,8	3,6	4,4