

INSTRUMENT AIR CONSUMPTION AND RECEIVER SIZING

Project: Boiler 3 instrument air

Calc no: CALC IA 001 Rev: 0

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Design data

Leakage allowance (%)	10	Design margin (%)	20
Hold up time after compressor trip (min)	10	Receiver normal pressure (bar g)	7
Minimum header pressure (bar g)	4.5	Atmospheric pressure (bar a)	1.013

Air users

User	Qty	Steady each (Nm³/h)	Air per stroke each (L free)	Strokes per hour each	Steady total (Nm³/h)	Stroking total (Nm³/h)	Total (Nm³/h)	Remarks
Control valve positioners (digital)	18	0.10	6.0	20	1.80	2.16	3.96	
On off valve actuators	10	0.00	25.0	2	0.00	0.50	0.50	
I/P converters	4	0.25			1.00	0.00	1.00	
Analyser shelter purge	1	6.00			6.00	0.00	6.00	
Gas analyser (sample aspirator)	2	1.20			2.40	0.00	2.40	
Total connected demand (Nm³/h)							13.9	
With leakage and margin (Nm³/h)							18.3	
Required receiver volume (m³)							1.03	

Receiver volume $V = t \times C \times Pa \div (P1 - P2)$, with t the hold up time in minutes, C the demand with leakage in Nm³/min (no compressor supply during the event) and $P1 - P2$ the usable pressure band. Design margin applies to compressor sizing, not to the hold up volume.

Prepared by	Checked by
Name:	Name:
Signature:	Signature:
Date:	Date: