



PRESSURE-FLOW-SYSTEM CONTROLLER CALMS FOR PET BLOWING 40 BAR SYSTEM

Case Study in a bottling plant running three separate PET lines simultaneously

- Compressed Air System in PET bottling company Coca-Cola
- PET manufacturing and processing
- CALMS PFSC control system and permanent monitoring is installed there since compressor station upgrade in May 2021
- 2 x LMF 250kW with VSD blower high pressure compressors and
- 1x AF high pressure compressor
- 3 x SIG PET bottling production equipment

Executive Summary

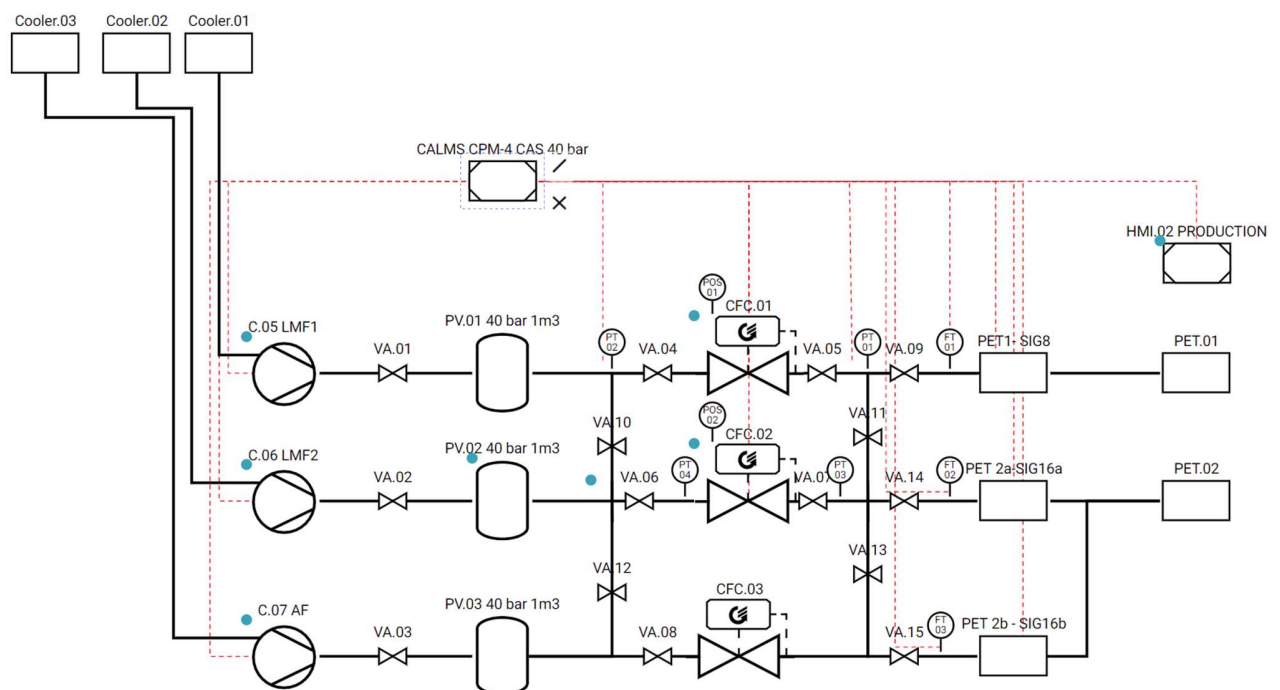
- Customer would like to enhance the compressed air production efficiency by adding a new compressor and controller.
- Calms control and permanent compressed air monitoring was chosen because of its multi brand integration capabilities and unique approach to multiple pressure control
- Three separate PET machines now run at their own pressure bands depending on the bottle size being processed
- The possibility of controlling multiband compressors and keeping the pressure at both machines just above their respective minimum pressure has already started to show savings
- PFSC valves can shut off line in case production is off-line or stopped during bottle size change or trip
- Reducing leaks in complete PET line when not in operation

CHALLENGES

- The customer was upgrading the high-pressure compressor station feeding the PET machines. The upgrade was to include a new PET compressor and master control system for all installed compressors. Of the three PET machines on site, two would run simultaneously, both producing different size bottles for two separate bottling lines. The working pressures of the PET machines change according to the type and size of bottle produced. The customer challenged us to create a control and monitoring system for the two old compressors and the

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- new compressor they were planning to buy to increase compressed air production while maintaining energy efficiency. We further challenged ourselves to create a control system that included the energy saving strategy of preparing compressed air of different pressures simultaneously for all three PET machines.



CALMS SOLUTION

- Our in-house capabilities to rapidly develop custom control solutions allowed us to produce a control system that incorporates compressors of different make and brand into a coherent unit
- With our permanent compressed air management system, we are able to constantly monitor efficiency online and compare the efficiency to the best in class. When necessary we can adapt the control parameters of the system to shifting changes in demand.





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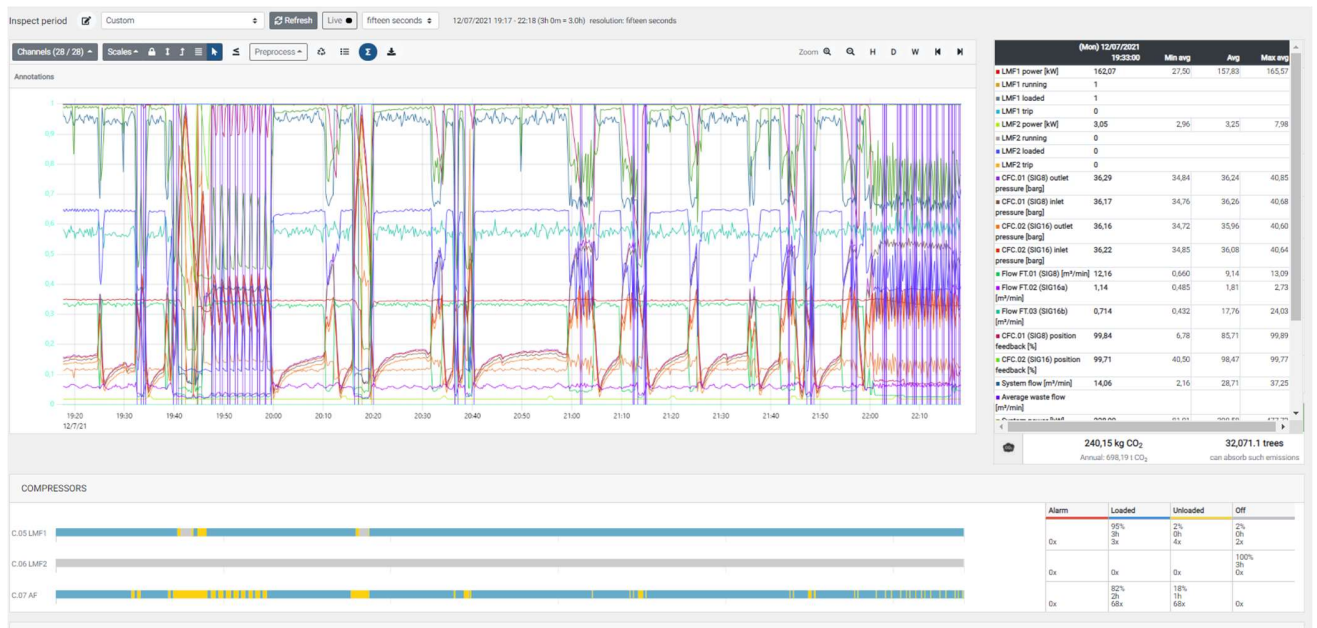
- By using two high pressure CALMC CFC valves the CALMS control system can supply both PET production lines with the exact pressure needed according to the type and size of the bottle currently being produced. To minimize operator input error a recipe system linked to the work order sets the appropriate pressure. An operator override with logging is also incorporated as an emergency safety feature.
- More info about CALMS CFC solutions on www.calms.com/CALMS-CFC-Flow-controller-with-wireless-web-monitoring

RESULTS

- The successful implementation of a control system for three machines of different brands on time and on budget
- The implementation of an online monitoring platform with an emphasis on overall system efficiency.
- The implementation of dual pressure control
- An added benefit of the CALMS system is the integrated leak management suite, which was used by the customer at the startup of the upgraded system. A non-zero flowmeter reading when the PET machine was not operating indicated leakage. A preliminary check of the PET machine revealed several leaks which were promptly added to the management system and repaired in a timely fashion. Of the three PET machines, two had measurable leaks. "Sig8" had a leakage rate of 3.2m³/min and "sig16a" had a leakage rate of 1.2m³/min. The leakage rate of "sig16b" is below the 0.2m³/min threshold of the flowmeter at 2 € cents per m³ the yearly leakage is estimated at 32.000€

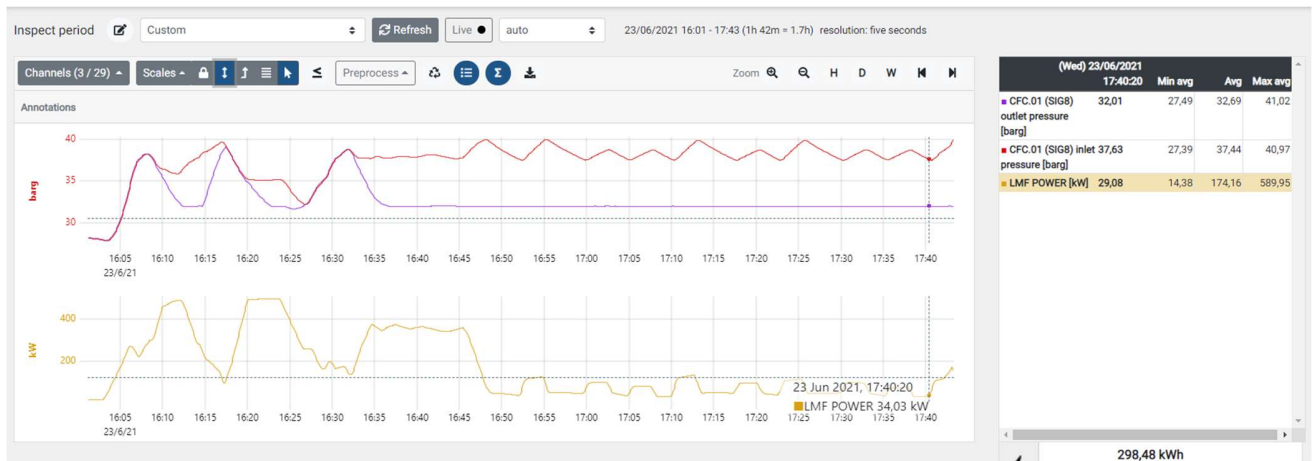
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An overview of the CALMS system monitoring the controller.

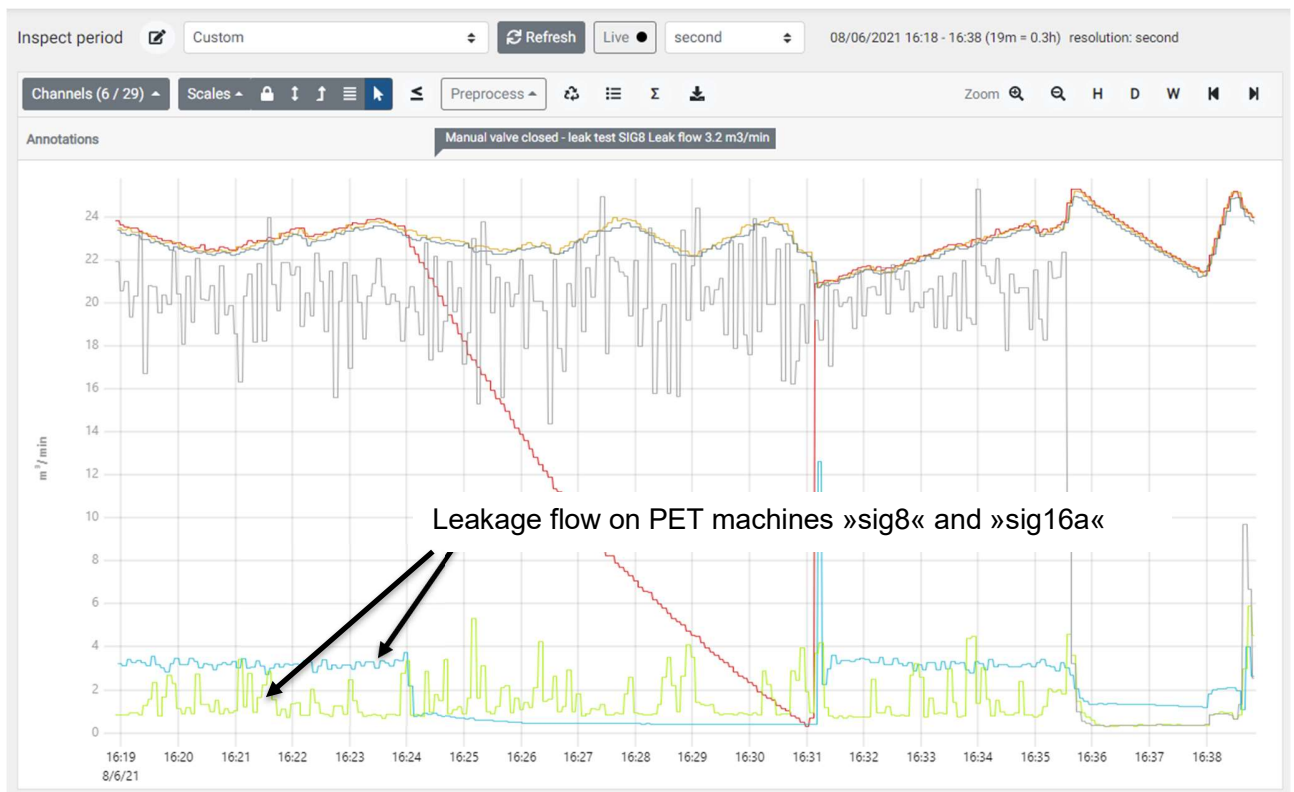


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CALMS CFC pressure controller activation lowers the consumed power of the system.



Leakage of 3.2 m³/min was verified by closing the manual valve before the PET machine.



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A quick leak check reveals savings possibilities (this is just a quick check at time of upgrade commissioning and not a complete survey)

Assessment

2021-06-02CA

REPORT

SETUP

CREATE NEW

Leaks

Artificial demand

Inappropriate uses

End uses

Survey

Estimation

Repair

Recalculate

Import

#	dB	Pressure bar	End use	Component	Description	Connector size	Status	Flow m³/min	Annual cost EUR	
357	40	40	Cevovod	Fitting, sealant, thread	Drovičnik pred ventilom za tlačno sondo calm:		Surveyed	0,080	1262,00	
358	52	40	stroj	Instrumentation	Pušača manometer		Surveyed	0,104	1637,00	
359	61	40	Trak	Pressure regulator			Surveyed	0,123	1936,00	
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ESTIMATED	Repair time (min)	# total	Repair material cost	Average waste flow	Annual cost
	0	3	0,00 €	0,307 m³/min	4.835,00 €
ACTUAL REPAIR	Repair time (min)	# repaired	Repair material cost	Repaired average waste flow	Repaired annual cost
	0	0		0 m³/min	