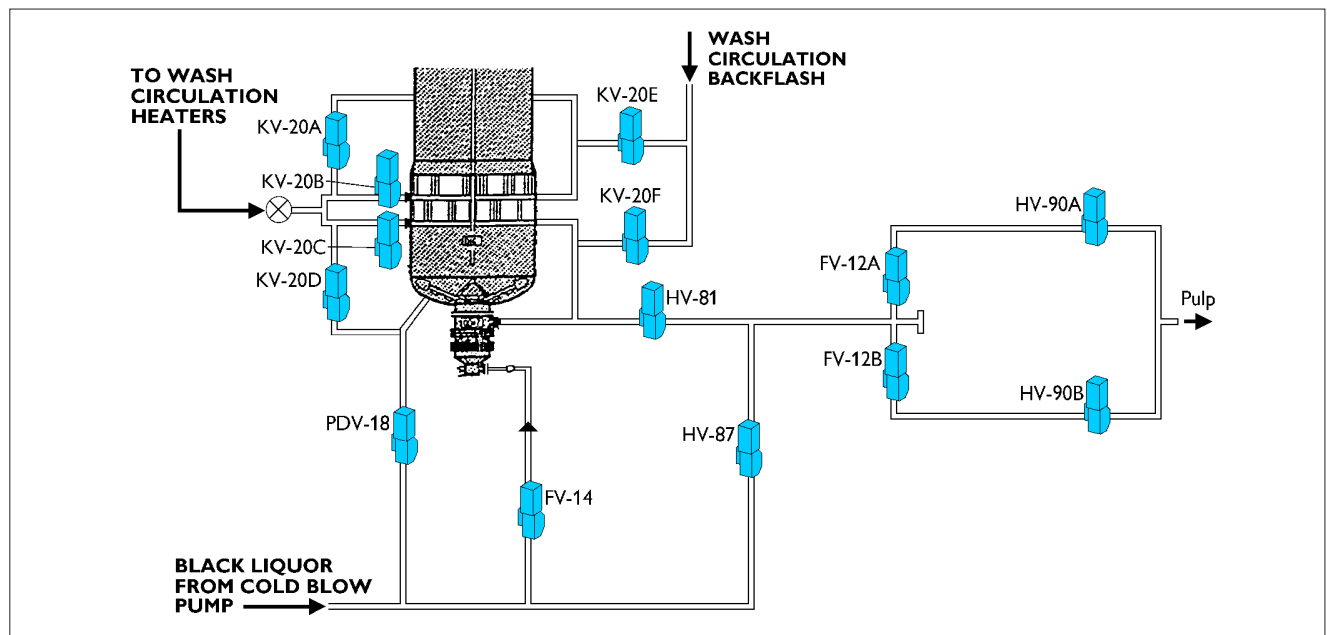


Continuous digester ANDRITZ Continuous Pulp Cooking System Low Temperature Blowing



Introduction and background

Continuous cooking is a method of chemical cooking in which wood chips and cooking liquors are fed at controlled rates into the pressurized digester, the chips move down through successive cooking zones within the digester and are continuously discharged at the bottom as pulp. Cooling and discharging the pulp from the digester and the application of valves from Valmet in this process will be addressed in this bulletin.

Process description

TV-2

- Application: Chip Bin temperature control
- Steam saturated with black liquor
- Controls Flash Steam to the chip bin for Atmospheric Presteaming. TV-2 and TV-2A operate together to control the steam to the chip bin.
- Flow: 20,000 to 80,000 lb/hr

TV-2A

- Application: Chip Bin temperature control
- Fresh Steam
- Controls Fresh Steam to the chip bin for Atmospheric Presteaming. TV-2 and TV-2A operate together to control the steam to the chip bin.

PV-5

- Application: Steaming Vessel Pressure Control

HV-5A

- Application: Steaming Vessel Relief Screen Cleaning

HV-25

- Application: Steaming Vessel Sightglass Purge
- Digester heater condensate or hot water
- Used to wash the sightglass of fines and liquor.

TV-4

- Application: Low Pressure Steam Desuperheating

Tag #	FV-12A & FV-12B	x	Two Vessel System	x	Single Vessel System
Application:	Blow Line Flow Control				
	10 % - 12 % Pulp Stock – On-Off Valve				
	FV-12A & FV-12B are designed to be the main flow control valves in the primary and secondary blow lines respectively. Control signals are received from flowmeters downstream. Blow line flow control is among the most difficult service in the ANDRITZ system. Tag#'s FV-12A and FV-12B are continuously subjected to erosion and vibration from the high velocity of the stock flow. High levels of sand and/or other tramp material from the chip feed stock will ultimately cause premature valve body and ball erosion (screening systems used in newer systems have reduced erosion).				
	Differential: 74 psid = 5,1 bar Temp: 180 °F = 82 °C		Shut-off: 220 psid = 15,2 bar Flow: 2000 gal/min = 7600 liters/min		
Control valve	ASME		DIN		
Class:	300		PN 25		
Size:	4", 6", 8"		DN 100, 150, 200		
Recommendation:	M2DA__AP-B1C__-ND		M1LA__AP-B1C__-ND		
Comments:	Common upgrades for customers experiencing problems with valves FV-12A and FV-12B are stellite body liners and 17-4 tunnel bore balls with "chamfered lips". When ordering a stellite liner you must change the P seat to a K seat. Some customers that are unable to control with FV-12A and FV-12B will instead control with HV-90A and HV-90B.				

Tag #	FV-14	x	Two Vessel System	x	Single Vessel System
Application:	Inner Counter-wash Flow				
	Black Liquor — Control Valve				
	FV-14 controls inlet liquor flow to the counter wash nozzles which improves the liquor distribution to the bottom of the digester which provides better control of the outlet device's load and blow line consistency.				
	Differential: 5-130 psid = 0,3-9 bar Shut-off: 350 psid = 24 bar Temp: 170 °F = 77 °C Flow: 100-1000 gal/min = 380-3800 liters/min				
Control valve	ASME	DIN			
Class:	300	PN 25			
Size:	4"	DN 100			
Recommendation:	REDA04CJJST-B1C6-ND	RELA100AJJST-B1C6-ND			

Tag #	HV-81 (RO3)	x	Two Vessel System	x	Single Vessel System
Application:	Blow Line Isolation				
	10 % Pulp Stock				
	HV-81 is also known as "RO3" (Remote Operated Valve #3). HV-81 is normally open and is only closed when the digester is shutdown.				
	Differential: 235 psid = 16,2 bar Temp: 185 °F = 85 °C Flow 2500 gal/min = 9500 liters/min				
Control valve	ASME	DIN			
Class:	300	PN 25			
Size:	12", 14", 16"	DN 300, 350, 400			
Recommendation:	M2DB_AS12-B1C40-SV, 12=large 1/4" male M2DB_AS13-B1C40-SV, 13=large 1/4" female	M1LB_AS/12-B1C_, 12=large 1/4" male, M1LB_AS/13-B1C_, 13=large 1/4" female			

Valves sizes and process data that are shown on this page are for REFERENCE ONLY.
To appropriately size a valve, use actual process data obtained from the system.

Tag #	HV-87	x	Two Vessel System	x	Single Vessel System
Application:	Blow Line Pressurization Dilute Black Liquor (Dilute Black Liquor) HV-87 is used to pressurize the blow line before opening HV-81 during start-up. Tag# HV-87 can also be used to "unplug" the blow line. Differential: 10-50 psid = 0,7-3,4 bar Shut-Off: 350 psid = 24,1 bar Temp: 170 °F = 77 °C Flow: 165 gal/min = 625 liters/min				
Control valve	ASME		DIN		
Class:	300		PN 25		
Size:	2"		DN 50		
Recommendation:	M2DA02AP-B1C9-ND		M1LA050AP-B1C9-ND		

Tag #	KV-20 (A-D)	x	Two Vessel System	x	Single Vessel System
Application:	Wash Extraction Switching Black Liquor — On-Off Tag #'s KV-20A, KV-20B, KV-20C and KV-20D control the flow of black liquor through the extraction screens at the bottom of the digester. The extracted liquor is pumped via the Wash Circulation Pump to the Wash Circulation Heater. Shut-off: 10 psid = 0,7 bar Temp: 245 °F = 118 °C Flow: 1500 gal/min = 5680 liters/min				
Control valve	ASME		DIN		
Class:	300		PN 25		
Size:	8"		DN 200		
Recommendation:	B2B08AABD-B1CU11-SV-F-SS		LW8MBT200AANAT/L-B1C11-SV T = Switching valve construction		
Comments:	The current design only uses KV-20A and KV-20B.				

Tag #	KV-20E, KV-20F	x	Two Vessel System	x	Single Vessel System
Application:	Wash Extraction Switching (Backflush) Black Liquor — On-Off Tag #'s KV-20E AND KV-20F operate opposite the Wash Extraction Switching valves (KV-20 A-D) to "backflush" and clean the wash screens. Shut-off: 250 psid = 17,2 bar Temp: 245 °F = 118 °C Flow: 100 gal/min = 380 liters/min				
Control valve	ASME		DIN		
Class:	300		PN 25		
Size:	3"		DN 80		
Recommendation:	LW5CBY03AANAT-B1J8 Y = Standard H-construction with PTFE shaft packing		LW8MBY80AANAT-B1J8-SV Y = Standard H-construction with PTFE shaft packing		
Comments:	Stellite bearings with hard facing on the shafts bearing surfaces are required because of the high cycle rate (350 000 cycles per year). Tag #'s KV-20E and KV-20F must shut-off tightly when closed, to allow for proper extraction through the switching valves (KV-20 A-D). Current designs manufactured today do not use there valves.				

Valves sizes and process data that are shown on this page are for REFERENCE ONLY.
To appropriately size a valve, use actual process data obtained from the system.

Tag #	HV-90A & HV-90B	x	Two Vessel System	x	Single Vessel System
Application:	Blow Line Isolation				
	10 % - 12 % Pulp Stock				
	FV-12A & FV-12B are designed to be the isolation valve for the primary and secondary blow lines respectively; however, they are supplied with positioners so that they can be used to control flow at low production rates to assist FV-12A or FV-12B. Tag#'s HV-90A and HV-90B are continuously subjected to erosion and vibration from the high velocity of the stock flow. High levels of sand and/or other tramp material from the chip feed stock will ultimately cause premature valve body and ball erosion.				
	Shut-off: 250 psid = 17,2 bar		Temp: 190 °F = 88 °C		
	Flow: 2200 gal/min = 8300 liters/min				
Control valve	ASME		DIN		
Class:	300		PN 25		
Size:	8”		DN 200		
Recommendation:	M2DA08AP-B1C20-ND		M1LA200AP-B1C20-ND		
Comments:	Common upgrades for customers experiencing problems with valves HV-90A and HV-90B are stellite body liners and 17-4 tunnel bore balls with “chamfered lips”. When ordering a stellite liner you must change the P seat to a K seat. Some customers that are unable to control with FV-12A and FV-12B will instead control with HV-90A and HV-90B.				

Tag #	PDV-18	x	Two Vessel System	x	Single Vessel System
Application:	Digester Outlet Device Differential Pressure				
	Black Liquor				
	PDV-18 adds cool liquor to dilute the chip mass in the area of the outlet device to allow for rotation of the scraper mechanism.				
	Differential: 5-130 psid = 0,3-9 bar Temp: 170 °F = 77 °C Flow: 100-1000 gal/min = 380-3800 liters/min				
Control valve	ASME	DIN			
Class:	300	PN 25			
Size:	4"	DN 100			
Recommendation:	REDA04CJJST-B1C9-ND	RELA100AJJST-B1C9-ND			

Valves sizes and process data that are shown on this page are for REFERENCE ONLY.
To appropriately size a valve, use actual process data obtained from the system.

Subject to change without prior notice.

Neles, Neles Easyflow, Jamesbury, Stonel, Valvcon and Flowrox, and certain other trademarks, are either registered trademarks or trademarks of Valmet Oyj or its subsidiaries in the United States and/or in other countries.
For more information www.neles.com/trademarks

Valmet Flow Control Oy

Vanha Porvoontie 229, 01380 Vantaa, Finland.
Tel. +358 10 417 5000.
www.valmet.com/flowcontrol

