ENGINEERING SERVICES DEPARTMENT					
SPECIFICATION SHEET FOR INSTRUMENT AIR PRESSURE REGULATOR PCV 1710					PAGE 1 of 3

Project	PTFE Filter Destruction Demonstration Facility	**Unit Tag Number**	PCV 1710
Datasheet Document No.	ENS-NWPVR-SPE-24029	**Revision**	1

GENERAL INFORMATION

Description	The pressure regulator will be installed on the instrument air supply line to the air-driven diaphragm pump P83165 in the PTFE Filter Destruction Demonstration Facility.
Plant Location	Necsa, Pelindaba, North-West Province.
Equipment Location	PTFE Filter Destruction Demonstration Facility - Inside Laboratory 131, Building V-H2.
Safety Classification	Non-classified (N) and Non-classified (C).
Quality Classification	Non-classified (N) and Non-classified (C).
Process Fluid	Compressed air grade ISO 8573-1:2010 [3:4:1]
Fluid State	Gas
P&ID Number	ENS-NWPVR-PID-24014 [4]
Line Number	15-17-AICX-089
Design Temperature [°C]	100
Design Pressure [kPa(g)]	1965

OPERATING CONDITIONS OF PROCESS FLUID

FLUID PROPERTIES	UNITS	MINIMUM	NORMAL	MAXIMUM	REFERENCES
Molecular Weight	**kg/kmol**	-	28,88	-	Note 2
Operating Temperature	**°C**	-2,6	20	40	[2]
Operating Pressure (upstream)	**kPa(g)**	100	500	750	Table 4 of [3]
Density (@ min., normal, and max. for both operating pressure and temperature.)	**kg/m^3**	2,09	6,98	10,78	Note 3
Viscosity (@ min., normal, and max. for operating temperature.)	**cP**	$1,75 \times 10^{-5}$	$1,88 \times 10^{-5}$	$2,6 \times 10^{-5}$	Table 2-363 of [1]
Compressibility Factor	**Z**	0,997	0,999	0,999	Table 2-165 of [1]
Specific Heat Ratio (Cp/Cv)	**-**	-	1,416	-	Table 2-200 of [1]
Thermal Conductivity	**W/m.K**	0,024	0,026	0,030	Table 2-363 of [1]

CONTROL INFORMATION

VALVE SIZING INFO. & SPECIFICATION	UNITS	MINIMUM	NORMAL	MAXIMUM	REFERENCE
Valve Inlet Pressure	**kPa(g)**	100	500	750	-
Valve Outlet Pressure = Regulator Setpoint Pressure	**kPa(g)**	-	Note 1	-	-
Maximum Differential Pressure Allowed Across Pressure Regulator	**kPa**	-	-	650	-
Critical Flow	**-**	-	No	-	-
Volumetric flow rate (@ 20 ^{o}C and 500 kPa(g)	**m^3/h**	-	18,75	-	Table 4 of [3]
P_c - Critical Pressure	**kPa(a)**	-	3790	-	Table 2-164, page 2-139 [1]
Required Measured Range (upstream)	**kPa(g)**	0	-	850	-
Required Measured Range (downstream)	**kPa(g)**	0	-	850	-
Fail Action	**-**	N/A			-
Seat Leakage Class	**-**	Supplier to advise			-
Maximum Shut - Off Differential Pressure	**kPa**	750			-

VALVE MECHANICAL REQUIREMENTS

MATERIAL OF CONSTRUNCTION

Body	Bellows	Spring	Seat	Disk and STEM
Carbon Steel	Supplier To Advise	NA	Steel (Supplier To Advise)	Carbon Steel

Bonnet/Cap	Type	Wetted parts	Non-wetted parts
Carbon Steel	Two-Stage	Carbon Steel	Carbon Steel

PROCESS CONNECTIONS

	Flange Spec.	Flange Rating	Pipe Size (NB)
Inlet	CS, ASTM A105, ASME B16.5 (Supplier To Advise On Alternatives)	Class 1500	15
Outlet	CS, ASTM A105, ASME B16.5 (Supplier To Advise On Alternatives)	Class 1500	15
Valve rating	Class 1500		

VALVE INSTRUMENTATION REQUIREMENTS

PRESSURE INDICATING INSTRUMENTS	LOCAL	REMOTE	RECORDING
	Yes [Note 4]	Not required.	Not required.

REFERENCE DRAWINGS / DOCUMENTS

[1] Perry, R. H., & Green, D. W. (1997). Perry's Chemical Engineers Handbook 7th Edition. McGraw-Hill Company.

[2] SHEQ-2011-REP-01017, 2011 : Pelindaba Site, Site Description.

[3] ENS-NWPVR-REP-24004: Pipe Diameter Verification Report (NW PlasGas Demonstration Facility)

[4] ENS-NWPVR-PIP-24014: P&ID for Compressed Air Supply to Lab 150 and Lab 131

NOTES

1) The actual pressure set-point for the regulator will be determined by the operating requirements of the air-driven diaphragm pump P83165. This value will only become available once the pump is selected. However, the pressure regulator valve PCV1710 must be able regulate the pressure of the instrument air within the pressure regulating range of 100 to 750 kPa(g).

2) Molecular weight of air is estimated from molar composition of 78% N_2 and 22% O_2 in air.

3) The minimum density is calculated using the maximum operating temperature and minimum operating pressure of the instrument air. The maximum density is calculated using maximum operating pressure and minimum operating temperature of the instrument air. The normal density is calculated using normal operating temperature and the normal operating of the instrument air.

4) The pressure regulator must be supplied with a local pressure indicator upstream and downstream of the regulator. The local pressure indicators must provide a pressure read-out range of 0 to 850 kPa(g).

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