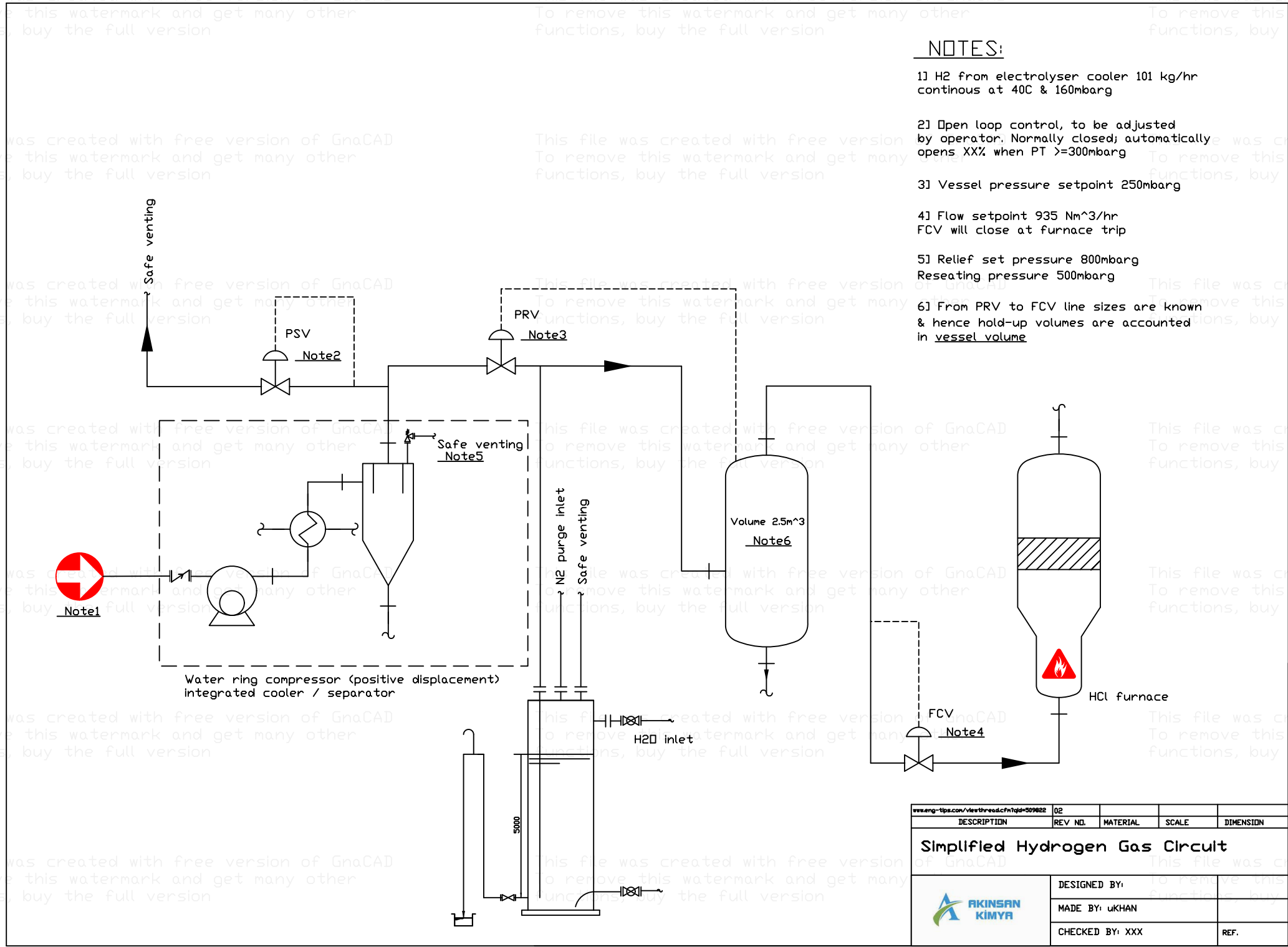




NOTES:

1) H₂ from electrolyser cooler 101 kg/hr
continuous at 40C & 160mbarg

2) Open loop control, to be adjusted
by operator. Normally closed; automatically
opens XX% when PT >=300mbarg

3) Vessel pressure setpoint 250mbarg

4) Flow setpoint 935 Nm³/hr
FCV will close at furnace trip

5) Relief set pressure 800mbarg
Reseating pressure 500mbarg

6) From PRV to FCV line sizes are known
& hence hold-up volumes are accounted
in vessel volume

www.eng-tips.com/viewthread.php?p=509822		02		
DESCRIPTION	REV. NO.	MATERIAL	SCALE	DIMENSION
Simplified Hydrogen Gas Circuit				
		DESIGNED BY:		
		MADE BY: UKHAN		
		CHECKED BY: XXX	REF.	

EC CE certification
Manufacturing license TS

FYA42Y-10C Spring Type
Safety Valve
Manufacturing License:
TSF710076-2023
Nominal diameter: 32mm
Flow channel diameter: 20mm
Pressure level: 0.06-0.1MPa
Nominal pressure: 1.0MPa
Setting pressure: 0.08MPa
Discharge pressure: 0.088MPa
Reseating pressure: 0.05MPa
Opening height: ≥ 5 mm
Applicable temperature: $\leq 300^{\circ}\text{C}$
Displacement factor: 0.75
Applicable medium: gas, water, oil, etc
Factory No.: 220650900
Factory date: June, 2022

欧共体CE认证 制造许可(TS)

YOY®

YFA42Y-10C 型弹簧式安全阀

制造许可证 TSF710076-2023

公称通径	32	mm
流道直径	20	mm
压力等级	0.06 - 0.1	MPa
公称压力	1.0	MPa
整定压力	0.08	MPa
排放压力	0.088	MPa
回座压力	0.05	MPa
开启高度	≥ 5	mm
适用温度	≤ 300	$^{\circ}\text{C}$
排量系数	0.75	
适用介质	气体、水、油品等	
出厂编号	220650900	
出厂日期	20 22 年 06 月	

中国·永一阀门集团
CHINA YOY VALVE GROUP

$$H_2 \text{ mass from Elz} = 10 \text{ kg/hr} = 2.81 \times 10^{-2} \text{ kg/s}$$

$$\text{Furnace flow} = 925 \text{ Nm}^3/\text{hr}$$

$$\begin{array}{c} \text{1.25 bar a} \leftarrow \text{250 mbar g} \leftarrow \text{30}^\circ\text{C} \rightarrow 303.15 \text{ K} \\ \rho_{H_2} = x \text{ kg/m}^3 \end{array}$$

Absolute values

$$\text{Ideal gas eq.} \Rightarrow PV = nRT$$

$$PV = \frac{m}{M} RT$$

$$\rightarrow PM = \int R T$$

ideal gas constant

$$125000 \times 2 = x \times 8.314 \times 303.15$$

$$\rho_{H_2} = x = 99.2 \text{ kg/m}^3$$

$$\text{Vessel vol} = 2.5 \text{ m}^3$$

$$\text{Vessel mass} = 2.5 \times 99.2 = 248 \text{ kg}$$

$$\text{Valve duration} = 2 \text{ sec}$$

valve reaction time

$$\text{Mass introduced at trip} = 2 \times 2.81 \times 10^{-2} = 5.61 \text{ kg/s}$$

$$\rho_{H_2} \text{ at trip} = \left[\frac{297.6 + 5.61}{2.5} \right] = y \text{ kg/m}^3$$

$$P_{\text{at trip}} = \frac{y \times 8.314 \times 303.15}{2}$$

$$= 150042 \text{ Pa}$$

$$= 500 \text{ mbar g} \quad \left\{ \text{our seal is 500 mbar g} \right\}$$