액체수소 기반 고압기체수소 공급시스템用 극저온 고압 기화기 제작

PIPING & INSTRUMENT DIAGRAM

2023. 05. 25

KIMM 한국기계연구원
KOREA INSTITUTE OF MACHINERY & MATERIALS

HANYANG ENG

A1 (841 x 594 m/m)

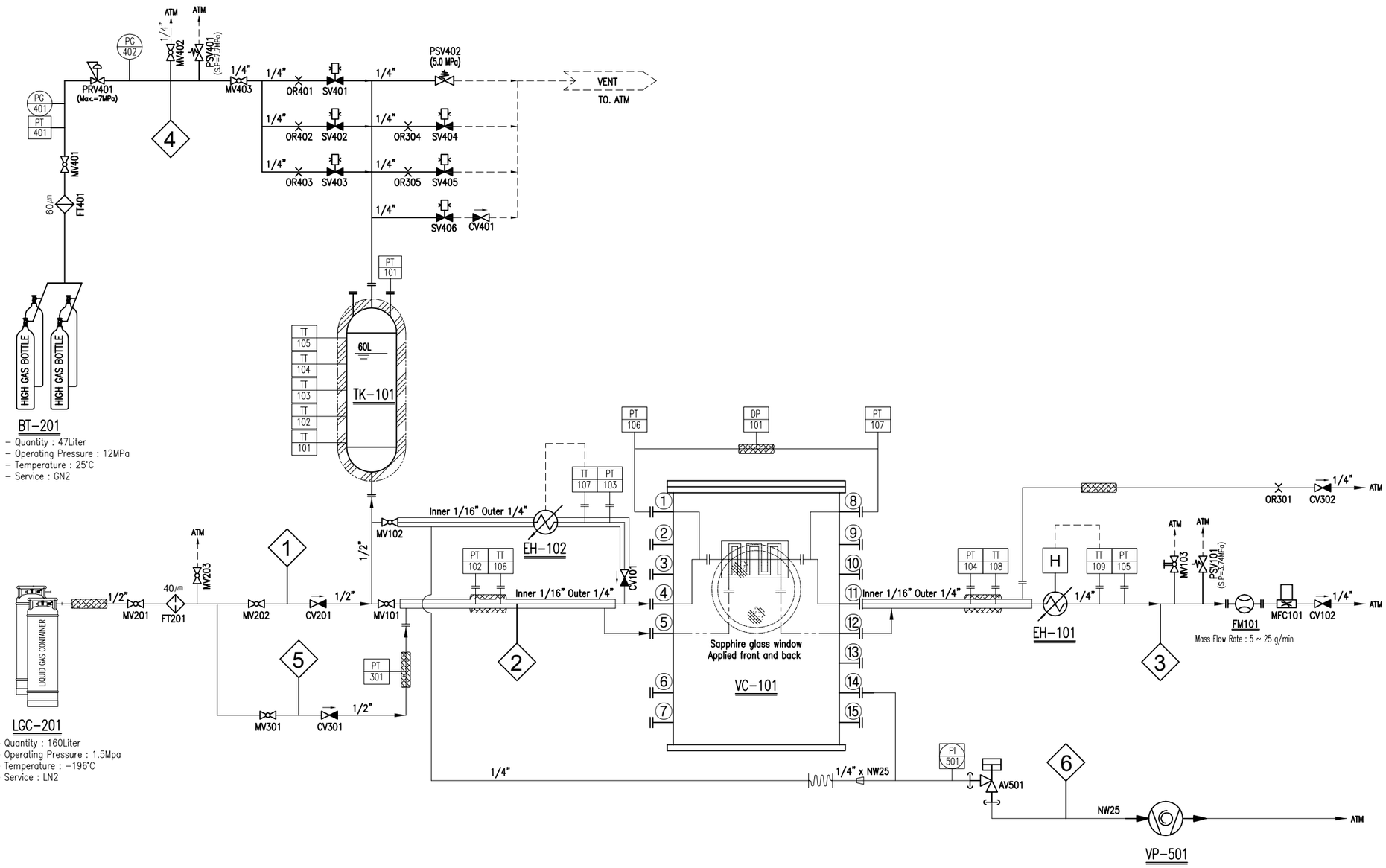
RUN TANK
TK-101
MATERIAL : STAINLESS STEEL
VOLUME : 60 L
FLUID : LIQUID NITROGEN (LN2)
WORKING TEMP. : -252.7℃
WORKING PRES. : 0 ~ 5.0 MPa

LIQUID GAS CONTAINER
LGC-101
MATERIAL : STAINLESS STEEL
VOLUME : 160 L
FLUID : LIQUID NITROGEN (LN2)
WORKING TEMP. : -196℃
WORKING PRES. : 0 ~ 1.0 MPa

HP. GN2 BOTTLE
BT-201
TANK MATERIAL : AISI 4130 STEEL
TANK VOLUME : 47 L x 4EA
FLUID : GN2
WORKING TEMP. : ROOM TEMP
WORKING PRES. : 0~12 MPa

VACUUM CHAMBER
VC-101
MATERIAL : STAINLESS STEEL
SIZE : 500Ax400mmx3t
FLUID : VACUUM
WORKING TEMP. : 15~50℃
WORKING PRES. : ~ 10^{-3} torr

SCROLL VACUUM PUMP
VP-501
MAKER : EDWARDS
MODEL : RV5
TYPE : ROTARY VANE PUMP
FLUID : VACUUM
PEAK PUMPING SPEED. : 3.6 CFM
ULTICATE PRES. : $1.5x10^{-3}$ Torr



PROCESS DATA TABLE

STREAM NO.	①	②	③	④	⑤	⑥
PHASE	LIQUID	LIQUID	LIQUID	GAS	LIQUID	GAS
FLUID	LN2	LN2	LN2	GN2	LN2	AIR
FLOW RATE m³/h	0.72	0.00205	0.11587	-	-	-
FLOW RATE g/min	8380	25	25	-	-	-
PRESSURE MPa(A)	0.7	0.45	0.45	12	-	5x10-3
TEMPERATURE °C	-175	-180	-150	20	-196	-
DENSITY kg/m³	698.33	730.93	12.945	136.94	-	-
ENTHALPY kj/kg	-76.685	-89.716	122.29	280.39	-	-
TUBE SIZE in	1/2	1/16	1/8	1/4	-	-
VELOCITY m/s	2.14	0.96	13.23	-	-	-

CHAMBER PORT TABLE

PORT NUMBER	DESCRIPTION	PORT NUMBER	DESCRIPTION
①	PT & DPT PORT	⑧	PT & DPT PORT
②	T or E TYPE THERMOCOUPLE FEEDTHROUGH	⑨	RTD 1/10 DIN CLASS 4 WIRE FEEDTHROUGH
③	T or E TYPE THERMOCOUPLE FEEDTHROUGH	⑩	RTD 1/10 DIN CLASS 4 WIRE FEEDTHROUGH
④	PROCESS FLUID INLET PORT	⑪	PROCESS FLUID OUTLET PORT
⑤	COOLING FLUID INLET PORT	⑫	COOLING FLUID OUTLET PORT
⑥	HEATING FLUID INLET PORT	⑬	HEATER POWER SUPPLY FEEDTHROUGH
⑦	HEIGHT ADJUSTABLE SUPPORT POWER SUPPLY FEEDTHROUGH	⑭	VACUUM PORT
		⑮	HEATING FLUID OUTLET PORT

대외주의
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REVISIONS

NO.	DATE	DESCRIPTION	DRAWN	CHK'D	CHK'D	APP'D
0	2023.02.15	ISSUED FOR INFORMATION	D.S.Baek	-	J.S.Kim	S.Y.Ji
1	2023.03.21	ISSUED FOR INFORMATION	D.S.Baek	-	J.S.Kim	S.Y.Ji

TAG NUMBER & REPRESENTATION
MV 1 0 1
- TAG NO.
- LOCATION NO.
- FLUID NO.
- DENOMINATION

DENOMINATION
FT: FILTER
SV: SOLENOID VALVE
CV: CHECK VALVE
FM: FLOW METER
OR: ORIFICE
TT: TEMPERATURE TRANSMITTER
PT: PRESSURE TRANSMITTER
DP: DYNAMIC PRESSURE SENSOR
MV: MANUAL VALVE
PSV: PRESSURE SAFETY VALVE
NV: NIDDLE VALVE
PG: PRESSURE GAUGE

FLUID NO.
1: LNG
2: LOX
3: GN_2
4: LPG
5: WATER
6: LN_2

SYMBOL IDENTIFICATION
- Filter
- Solenoid Valve (DC-24V)
- Check Valve
- Flow Meter
- Orifice
- Temp. Sensor for Ground
- Press. Sensor for Ground
- Dynamic Press. Sensor
- Manual Valve
- Pressure Safety Valve
- Niddle Valve
- Pressure Gauge
- Pressure Regulator
- Angle Valve

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CLIENT JOB SITE: -
CONTRACTOR: HANYANG ENG
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PROJECT NAME: 액체수소 기반 고압기체수소 공급시스템用 극저온 고압 기화기 제작
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A1(594x841mm ×2mm)