



한국기계연구원  
KOREA INSTITUTE OF MACHINERY & MATERIALS

스마트 제조장비 실증실험동  
설계용역

DESIGN DATA			
APPLIED CODE		고압가스안전관리법	
INTERNAL VOLUME		LITTER	3,899
STORAGE VOLUME (AT 90%)		LITTER	3,509
STORAGE CAPACITY (LN , LO , LAr)		kg	2,835 / 4,000 / 4,913
FLUID		LN , LO <sub>2</sub> , LAr	
PRESSURE	DESIGN	MPaG	1.76
	OPERATING	MPaG	1.3
TEMPERATURE	DESIGN	°C	-196 ~ 40
	OPERATING	°C	-151
TEST PRESSURE	HYDRAULIC	MPaG	-
	PNEUMATIC	MPaG	1.94
RADIOGRAPHIC	SHELL	FULL	
EXAMINATION	HEAD	FULL	
PENETRANT EXAMINATION		ALL WELD PART	
JOINT	SHELL	1	
EFFICIENCY	HEAD	1	
INSULATION	THICKNESS	mm	206 (PERLITE)
	VOLUME	m <sup>3</sup>	4.0
CORROSION ALLOWANCE		mm	0
VACUUM DEGREE	ON FABRICATION	torr	0.10
	ON OPERATING	torr	0.05
SURFACE PREP.	EXTERNAL	SEE NOTE 5. 1)	
FOR OUTER VESSEL	INTERNAL	SEE NOTE 5. 1)	
PAINTING	EXTERNAL	SEE NOTE 5. 2)	
FOR OUTER VESSEL	INTERNAL	-	
WEIGHT	EMPTY	kg	3,600
	OPERATING	kg	6,435 (LN )
			7,600 (LO )
			8,513 (LAr)

NOTE

- ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
- FLANGE : KS 20K SO. RF, MAT'L : A182-F304
- PIPE MAT'L : STS304TP-A, SCH. 20S
- ALL BOLT HOLES SHALL BE STRADDLED NORTH & SOUTH C.L OR NATURAL HORIZ. & VERT. C.L OF EQUIPMENT UNLESS OTHERWISE NOTED.
- PAINING SPECIFICATION (OUTER VESSEL's OUTSIDE)
  - SURFACE PREPARATION : CRYOS STANDARD
  - PAINING : CRYOS PAINTING SYSTEM
  - FINAL COLOR : WHITE

3	LEG	200A	SGP	3	-	-	-
2	OUTER VESSEL	S:t8/H:t8	SS400	1	-	-	-
1	INNER VESSEL	S:t9/H:t10	A240-304	1	-	-	-

2					
1					
NO.	DATE	REVISION DESCRIPTION	BY	APP.	

ARCHITECTURAL



(주)종합건축사사무소 림  
서울 성동구 성수일로 66 서울숲드림타워 7,13층  
TEL:02)499-4599, FAX:02)499-0690



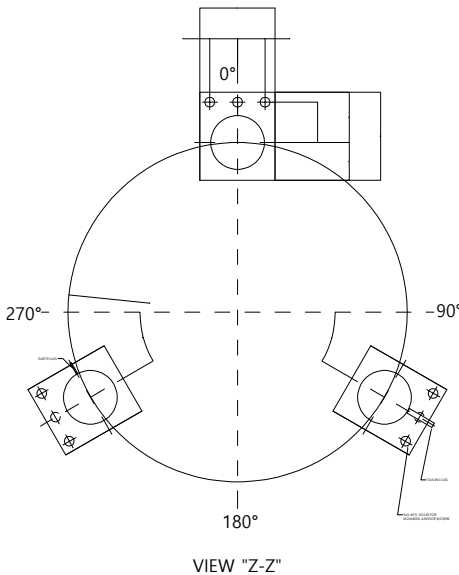
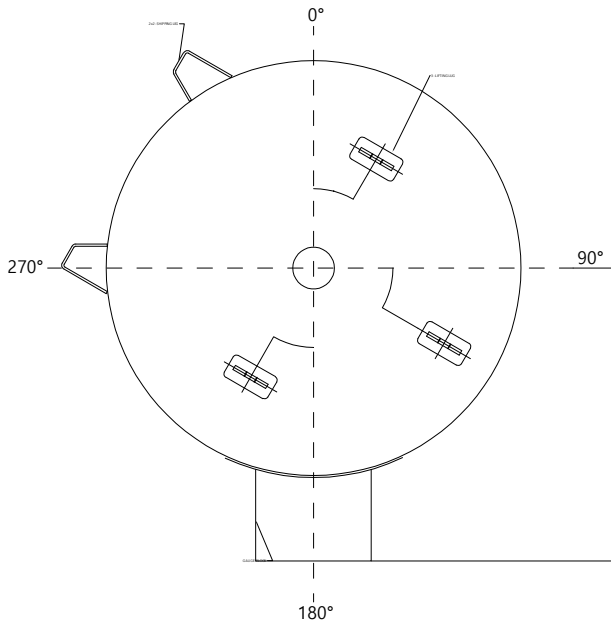
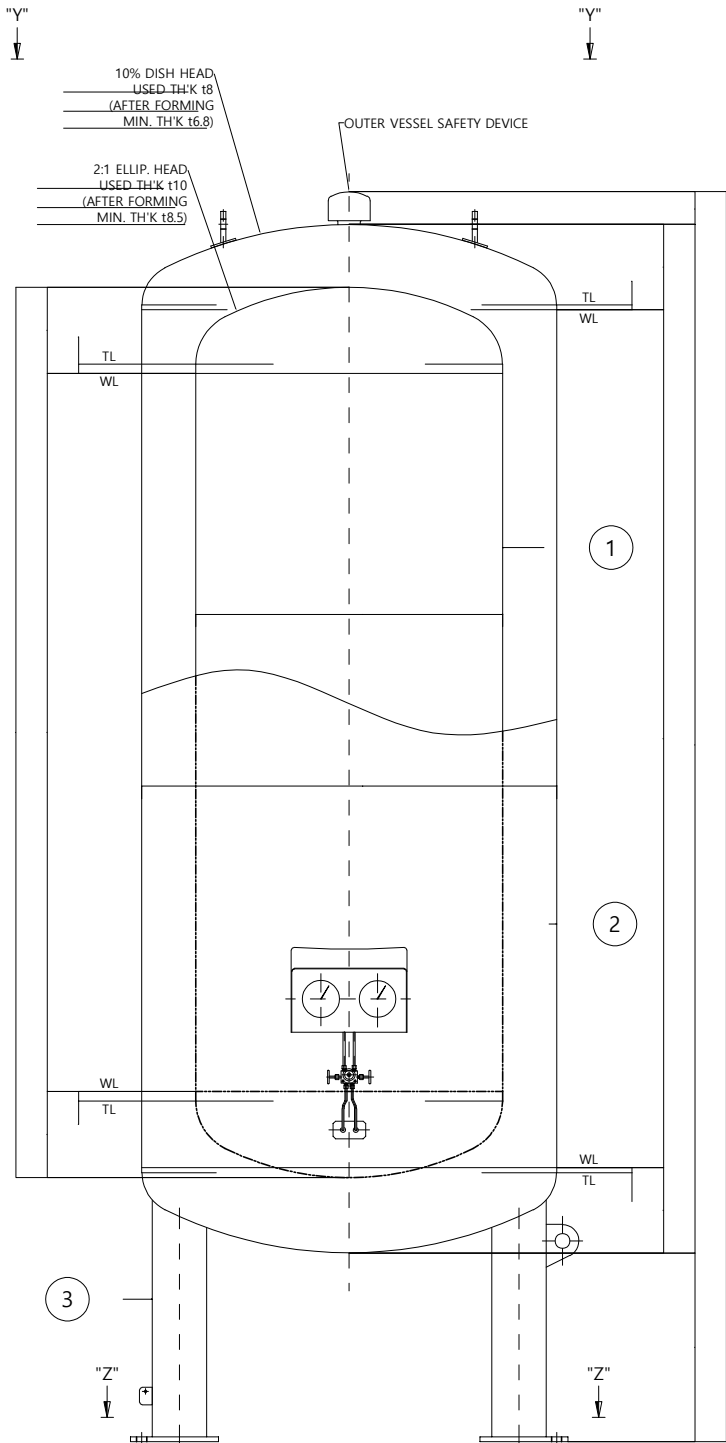
I주|종합건축사사무소 건  
부산 남구 수영로 233, 민석빌딩10층 1001호  
TEL:070-4044-7174 FAX:051)611-2121

STRUCTURAL ENGINEER (주)도담구조 대구광역시 중구 동덕로26길 18, 2층	T:053. 262. 8955 F:053. 262. 8956
기계·기계소방·전기소방 (주)기성이엔씨 서울특별시 구로구 디지털로34길 55-0(구로동)915호	T:02. 2105. 9900 F:02. 2105. 9999
전기·통신 (주)형진이엔씨 서울특별시 영등포구 선유로49길 23 (영등동47)	T:02. 6673. 7011 T:02. 6673. 7010
CIVIL ENGINEER (주)엘디엔지니어링 경기도 성남시 중원구 사기막길로 124, 1504	T:062. 974. 4775 F:062. 974. 4776

DRAWING TITLE

액체알곤(LAr) 탱크 상세도 1

DATE	2022.04.	SCALE	A1 : 1/ NONE A3 : 1/ NONE
APPROVED			
CHECKED		DRAWING NO	
DRAWING			M-810
DRAWING			



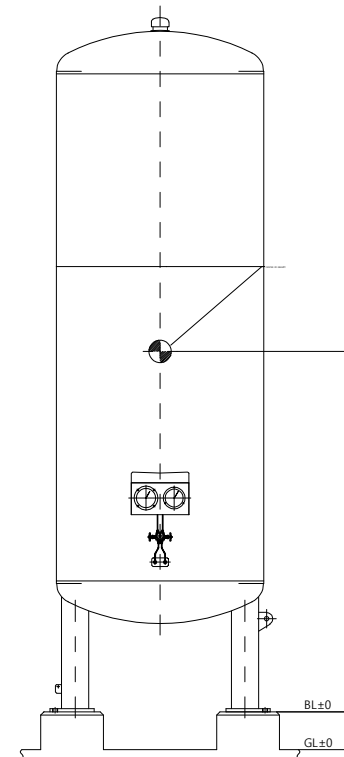
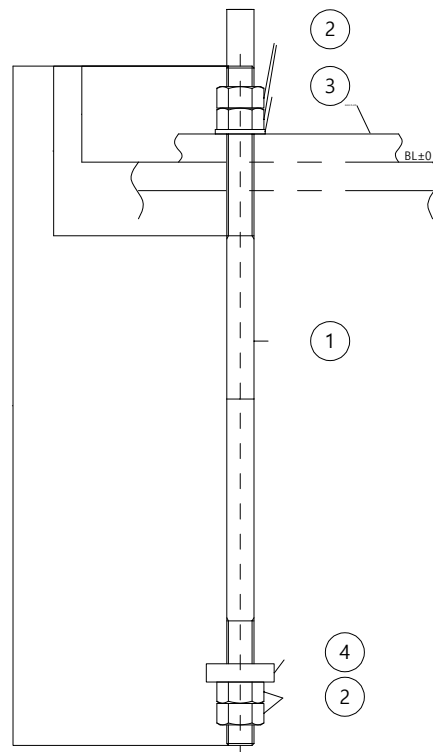
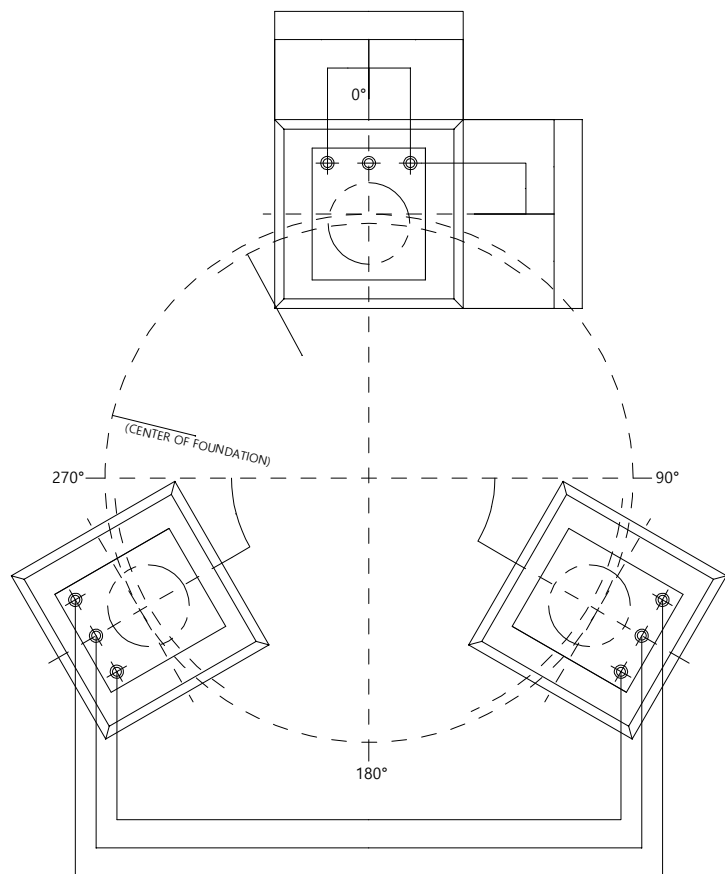
액체알곤(LAr) 탱크 상세도 1

축척 : NONE



한국기계연구원  
KOREA INSTITUTE OF MACHINERY & MATERIALS

스마트 제조장비 실증실험동  
설계용역



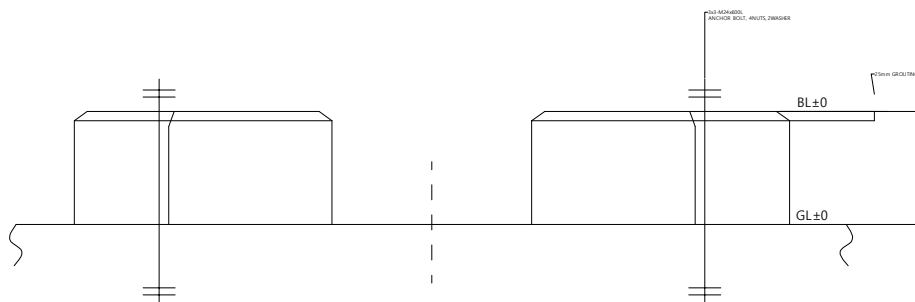
LOADING DATA

EMPTY WEIGHT		3,600	kg
OPERATING WEIGHT	LNz	6,435	kg
	LOz	7,600	kg
	LAr	8,513	kg

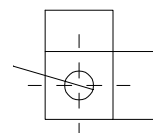
NOTE

- 기초의 저면적 및 깊이는 지반의 내력에 따라 시공자가 결정할 것.
- ( ) 치는 참고 치수임.

4	SQUARE WASHER	t16*□60	SS400	9	-	-	-
3	PLAIN WASHER	FOR M24	SS400	9	-	-	-
2	HEX. NUT	M24	SS400	36	-	-	1종
1	ANCHOR BOLT	M24x600L	SS400	9	-	-	S=150, S=110



1 2 3



DETAIL OF  
(SCALE 1:3)

4



액체알곤(LAr) 탱크 상세도 2

축척 : NONE



(주)종합건축사사무소 림  
서울 성동구 성수일로 66 서울숲드림타워 7,13층  
TEL:02)499-4599, FAX:02)499-0690



1주|종합건축사사무소 건  
부산 남구 수영로 233, 민석빌딩10층 1001호  
TEL:070-4044-7174 FAX:051)611-2121

STRUCTURAL ENGINEER  
(주)도담구조 T:053. 262. 8955  
대구광역시 중구 동덕로26길 18, 2층 F:053. 262. 8956

기계,기계소방,전기소방 T:02. 2105. 9900  
(주)기성이엔씨 F:02. 2105. 9999  
서울특별시 구로구 디지털로34길 55-0(구로동)915호

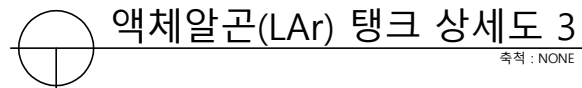
전기,통신 T:02. 6673. 7011  
(주)형진이엔씨 T:02. 6673. 7010  
서울특별시 영등포구 선유로49길 23 (영등동47)

CIVIL ENGINEER T:062. 974. 4775  
(주)엘디엔지니어링 F:062. 974. 4776  
경기도 성남시 중원구 사기막길로 124, 1504

DRAWING TITLE



액체알곤(LAr) 탱크 상세도 2

DATE	2022.04.	SCALE	A1 : 1/ NONE
APPROVED			A3 : 1/ NONE
CHECKED		DRAWING NO	
DRAWING			M-811
DRAWING			

스마트 제조장비 실증실험동  
설계용역

NOZZLE LIST			
MARK	Q'TY	SIZE	REMARK
N1	1	25A	TOP INLET
N2	1	25A	BOTTOM INLET
N3	1	25A	LIQUID OUTLET
N4	1	25A	SAFETY CONN. / VENT
N5	1	10A	FULL TEST
N6	1	8A	TOP PRESSURE GAUGE
N7	1	8A	BOTTOM LEVEL GAUGE
N8	1	25A	PUMPING
N9	1	15A	PUMP RETURN

VALVE & INSTRUMENT LIST				
NO.	DESCRIPTION	SIZE	MATERIAL	REMARK
M1	TOP INLET VALVE	25A	BC7	30K, LONG STEM, GLOBE, UB, W
M2	BOTTOM INLET VALVE	25A	BC7	30K, LONG STEM, GLOBE, UB, W
M3	PBC BLOCK VALVE	15A	BC7	30K, LONG STEM, GLOBE, UB, W
M4	LIQUID OUTLET VALVE	25A	BC7	30K, LONG STEM, GLOBE, UB, W
M5	3-WAY DIVERT VALVE	20A	C3771	30K, BALL, PT3/4(IN) x PT1/2(OUT)
M6	PUMPING VALVE	25A	BC7	30K, LONG STEM, GLOBE, UB, W
M7	PUMP RETURN VALVE	15A	BC7	30K, LONG STEM, GLOBE, UB, W
B1	VENT VALVE	25A	BC7	30K, LONG STEM, GLOBE, UB, W
F1	LINE DRAIN VALVE	10A	BC7	30K, LONG STEM, GLOBE, UB, W
F2	FULL TEST VALVE	10A	BC7	30K, LONG STEM, GLOBE, UB, W
S1	PRESSURE RETURN VALVE	25A	BC7	30K, LONG STEM, GLOBE, UB, W
S2	ECONOMIZER BLOCK VALVE	15A	BC7	30K, LONG STEM, GLOBE, UB, W
C1	INLET CHECK VALVE	25A	BC7	30K, LIFT CHECK, W
R1	COMBINATION REGULATOR	25x15A	C3771	30K, SET PRESS 1.3 MPaG
V1	EVACUATION VALVE	40A	A312-TP304	VF40, VACUUM VALVE
V2	SENSOR ISOLATION VALVE	ø9	BC6	10K, DIAPHRAGM VALVE
SV1-1	TANK SAFETY VALVE	15Ax20A	BC6	SET PRESS 1.76 MPaG
SV1-2	TANK SAFETY VALVE	15Ax20A	BC6	SET PRESS 1.76 MPaG
SV2	LINE SAFETY VALVE	ø7	BC6	NPT1/4, SET PRESS 1.76 MPaG (255 psig)
SV3	LINE SAFETY VALVE	ø7	BC6	NPT1/4, SET PRESS 1.76 MPaG (255 psig)
LG	LEVEL GAUGE	ø150	S.S304	NPT1/4, D.P TYPE, 0-5,000mmH2O
PG	PRESSURE GAUGE	ø150	S.S304	PT1/2, 0-3.5 MPaG (USE NO OIL)
PV	PV1 UPPER GAUGE BLOCK VALVE	ø4	C3604	PT1/4, 3-WAY, MANIFOLD VALVE
	PV2 LOWER GAUGE BLOCK VALVE	ø4		
	PV3 BALANCE VALVE	ø4		
PBC	PRESSURE BUILD-UP COIL	-	A60635-T5	10 Nm /hr
SD1	OUTER VESSEL SAFETY DEVICE	ø105	S.S304	CRYOS STD

				
				
NO.	DATE	REVISION DESCRIPTION	BY	APP.

ARCHITECTURAL



LIM ARCHITECTURE

(주)종합건축사사무소 림

서울 성동구 성수일로 66 서울숲드림타워 7,13층

TEL: (02)499-4599, FAX: (02)499-0690



**Geon**  
Engineering & Construction Co., Ltd.

**주주조합건축사사무소 건**

**부산 남구 수영로 233, 민석빌딩10층 1001호**

TEL:070-4044-7174 FAX:(051)611-2121

STRUCTURAL ENGINEER	T.053. 262. 8955
(주)도담구조	F.053. 262. 8956
대우건설주주 공구 동복로26길 18 2층	
기계/기계소방/전기/소방	T.02. 2105. 9990
(주)기성엔지니어링	F.02. 2105. 9999
서울특별시 구로구 디지털로34길 55-0(구로동)기915호	
전기/통신	T.062. 7063. 7011
(주)형진엔지니어링	F.02. 6673. 7010
서울특별시 동대문구 선유로49길 23 (영등포구)	
CIVIL ENGINEER	T.062. 974. 4775
(주)엘디엔지니어링	F.062. 974. 4776
경기도 성남시 중원구 사기막로 124, 1504	

DRAWING TITLE

액체알곤(LAr) 탱크 상세도 3

DATE	2022.04.	SCALE	A1 : 1/ NONE
APPROVED			A3 : 1/ NONE
CHECKED		DRAWING NO	
DRAWING			M-812
DRAWING			



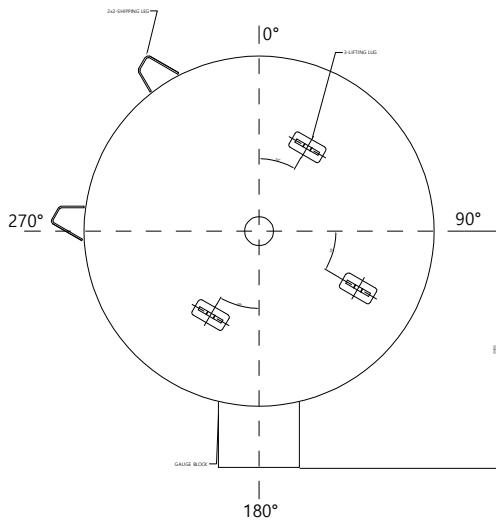
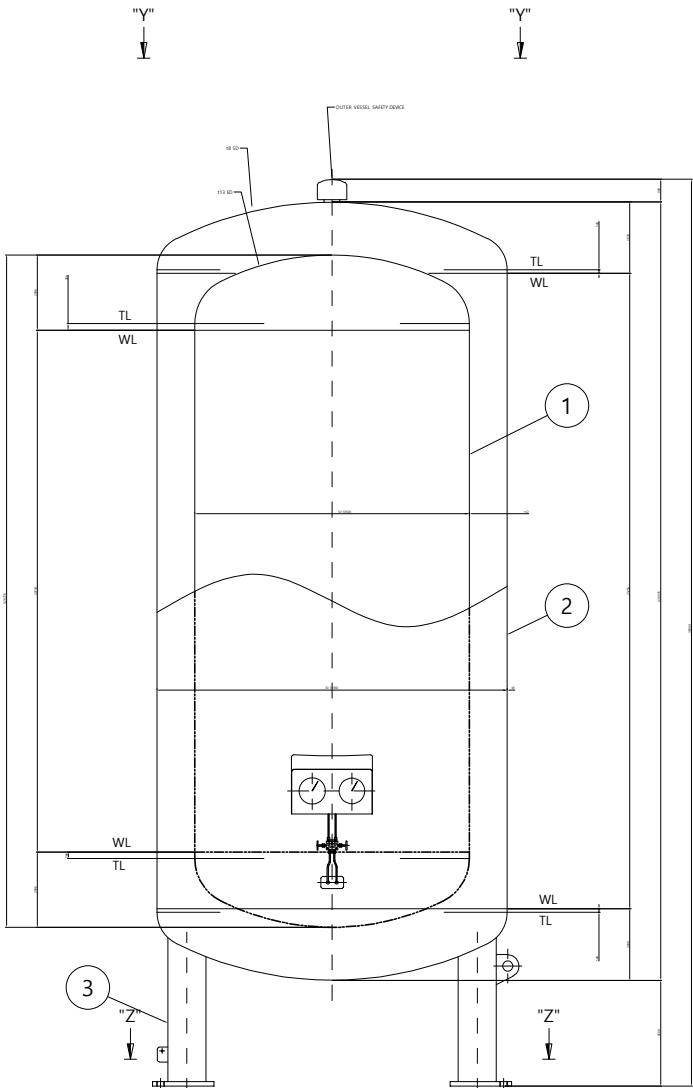
한국기계연구원  
KOREA INSTITUTE OF MACHINERY & MATERIALS

스마트 제조장비 실증실험동  
설계용역

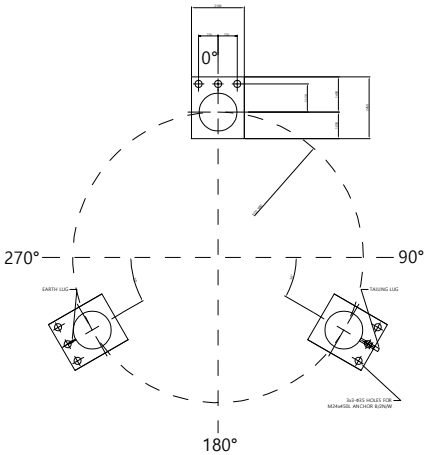
DESIGN DATA			
APPLIED CODE		고압가스안전관리법	
INTERNAL VOLUME		LITTER	6,801
STORAGE VOLUME (AT 90%)		LITTER	6,121
STORAGE CAPACITY (LN , LO , LAr)		kg	4,946 / 6,978 / 8,569
FLUID		LN , LO₂ LAr	
PRESSURE	DESIGN	MPaG	1.76
	OPERATING	MPaG	1.3
TEMPERATURE	DESIGN	℃	-196 ~ 40
	OPERATING	℃	-164
TEST PRESSURE	HYDRAULIC	MPaG	-
	PNEUMATIC	MPaG	1.94
RADIOGRAPHIC	SHELL		FULL
EXAMINATION	HEAD		FULL
PENETRANT EXAMINATION		ALL WELD PART	
JOINT	SHELL		1
EFFICIENCY	HEAD		1
INSULATION	THICKNESS	mm	203 (PERLITE)
	VOLUME	m³	6
CORROSION ALLOWANCE		mm	0
VACUUM DEGREE	ON FABRICATION	torr	0.10
	ON OPERATING	torr	0.05
SURFACE PREP.	EXTERNAL		SEE NOTE 5. 1)
FOR OUTER VESSEL	INTERNAL		SEE NOTE 5. 1)
PAINTING	EXTERNAL		SEE NOTE 5. 2)
FOR OUTER VESSEL	INTERNAL		-
WEIGHT	EMPTY	kg	5,600
	OPERATING	kg	10,546 (LN ½
			12,578 (LO ½
			14,169 (LAr)

- NOTE
- ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
  - FLANGE : KS 20K SO,RF, MATL : SUSF304
  - PIPE MATL : SUS304TP-A, SCH.20S
  - ALL BOLT HOLES SHALL BE STRADDLED NORTH & SOUTH C.L OR NATURAL HORIZ. & VERT. C.L OF EQUIPMENT UNLESS OTHERWISE NOTED.
  - PAINTING SPECIFICATION (OUTER VESSEL's OUTSIDE)
    - SURFACE PREPARATION : SSPC-SP-10
    - PAINTING : A) 1st : EPOXY PRIMER 30~40 MICRON  
B) 2nd : EPOXY PAINT 30~40 MICRON  
C) 3rd : URETHANE PAINT 30~40 MICRON (WHITE)

3	LEG	200A	SGP	3	-	-	-
2	OUTER VESSEL	S:t8/H:t8	SS400	1	-	-	-
1	INNER VESSEL	S:t12/H:t13	A240-304	1	-	-	-



VIEW "Y-Y"



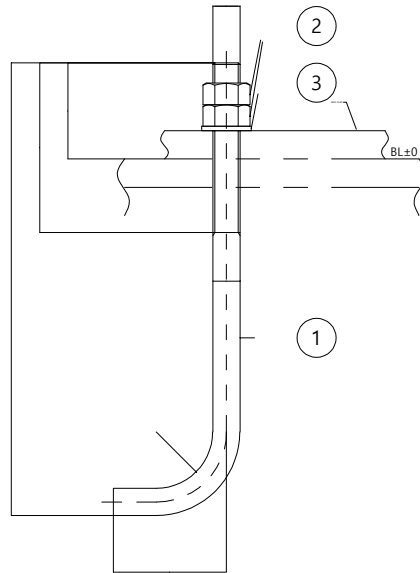
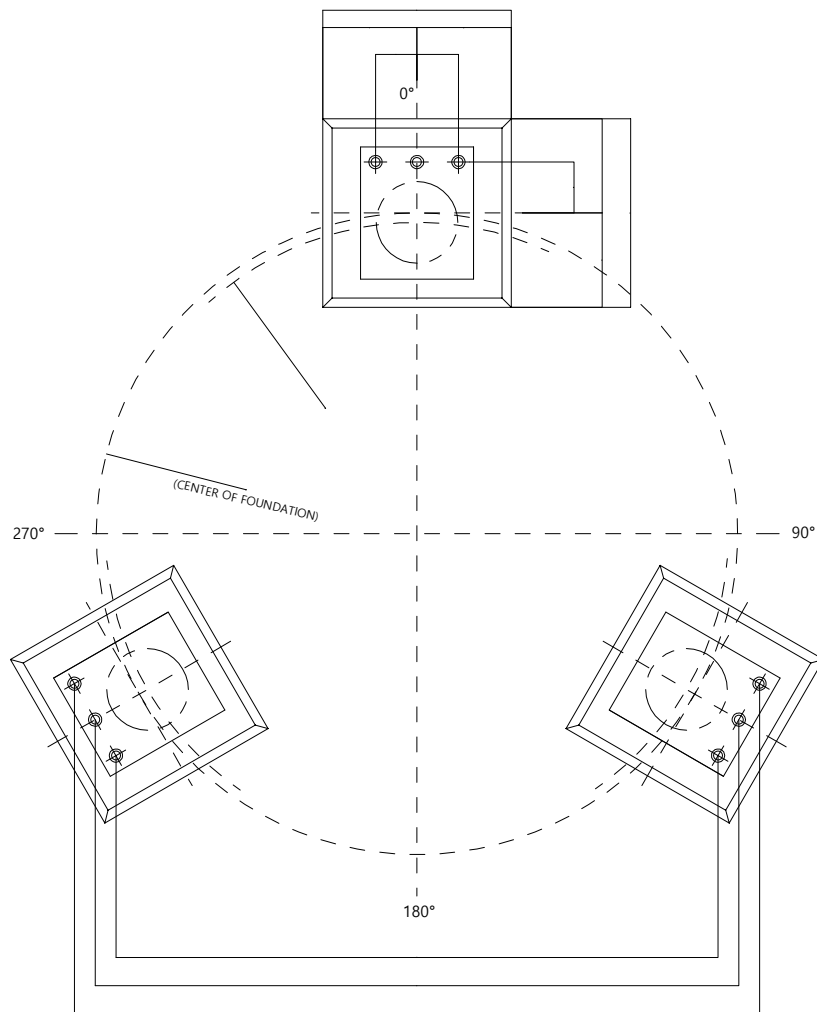
VIEW "Z-Z"

액체질소(LA2) 탱크 상세도 1  
축척 : NONE

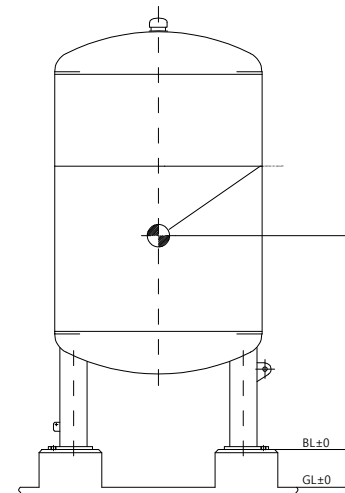


한국기계연구원  
KOREA INSTITUTE OF MACHINERY & MATERIALS

스마트 제조장비 실증실험동  
설계용역



DETAIL OF ANCHOR B/2N/W  
(SCALE 1:5)



LOADING DATA

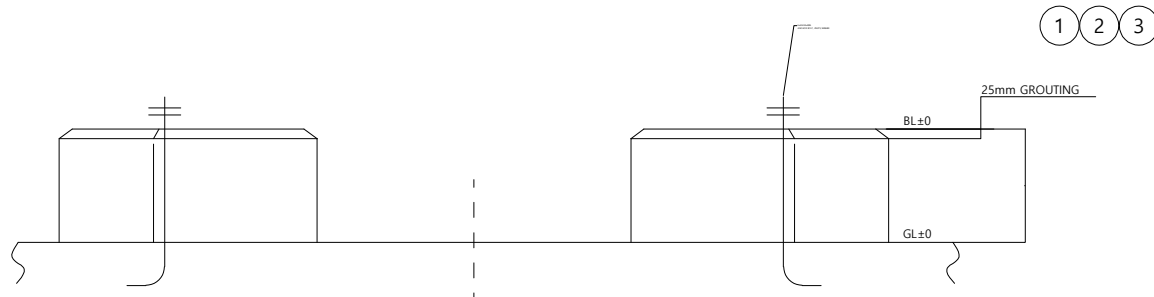
EMPTY WEIGHT		5,600	kg
OPERATING WEIGHT	LN2	10,546	kg
	LO2	12,578	kg
	LAr	14,169	kg

NOTE

- 기초의 저면적 및 길이는 지반의 내력에 따라 시공자가 결정할 것.
- ( ) 치는 참고 치수임.

\* TOTAL WEIGHT : 17.1 kg

3	PLAIN WASHER	FOR M24	SS400	9	-	-	-
2	HEX. NUT	M24	SS400	18	0.1	1.8	1종
1	ANCHOR BOLT	M24x450L	SS400	9	1.7	15.3	S=150



액체질소(LA2) 탱크 상세도 2

축척 : NONE

2				
1				
NO.	DATE	REVISION DESCRIPTION	BY	APP.

ARCHITECTURAL



(주)종합건축사사무소 림  
서울 성동구 성수일로 66 서울숲드림타워 7,13층  
TEL:02)499-4599, FAX:02)499-0690



1주|종합건축사사무소 건  
부산 남구 수영로 233, 민석빌딩10층 1001호  
TEL:070-4044-7174 FAX:051)611-2121

STRUCTURAL ENGINEER  
(주)도담구조 T:053. 262. 8955  
F:053. 262. 8956  
대구광역시 중구 동덕로26길 18, 2층

기계·기계소방·전기소방 T:02. 2105. 9900  
(주)기성이앤씨 F:02. 2105. 9999  
서울특별시 구로구 디지털로34길 55-0(구로동)915호

전기·통신 T:02. 6673. 7011  
(주)형진이앤씨 T:02. 6673. 7010  
서울특별시 영등포구 선유로49길 23 (영등동4가)

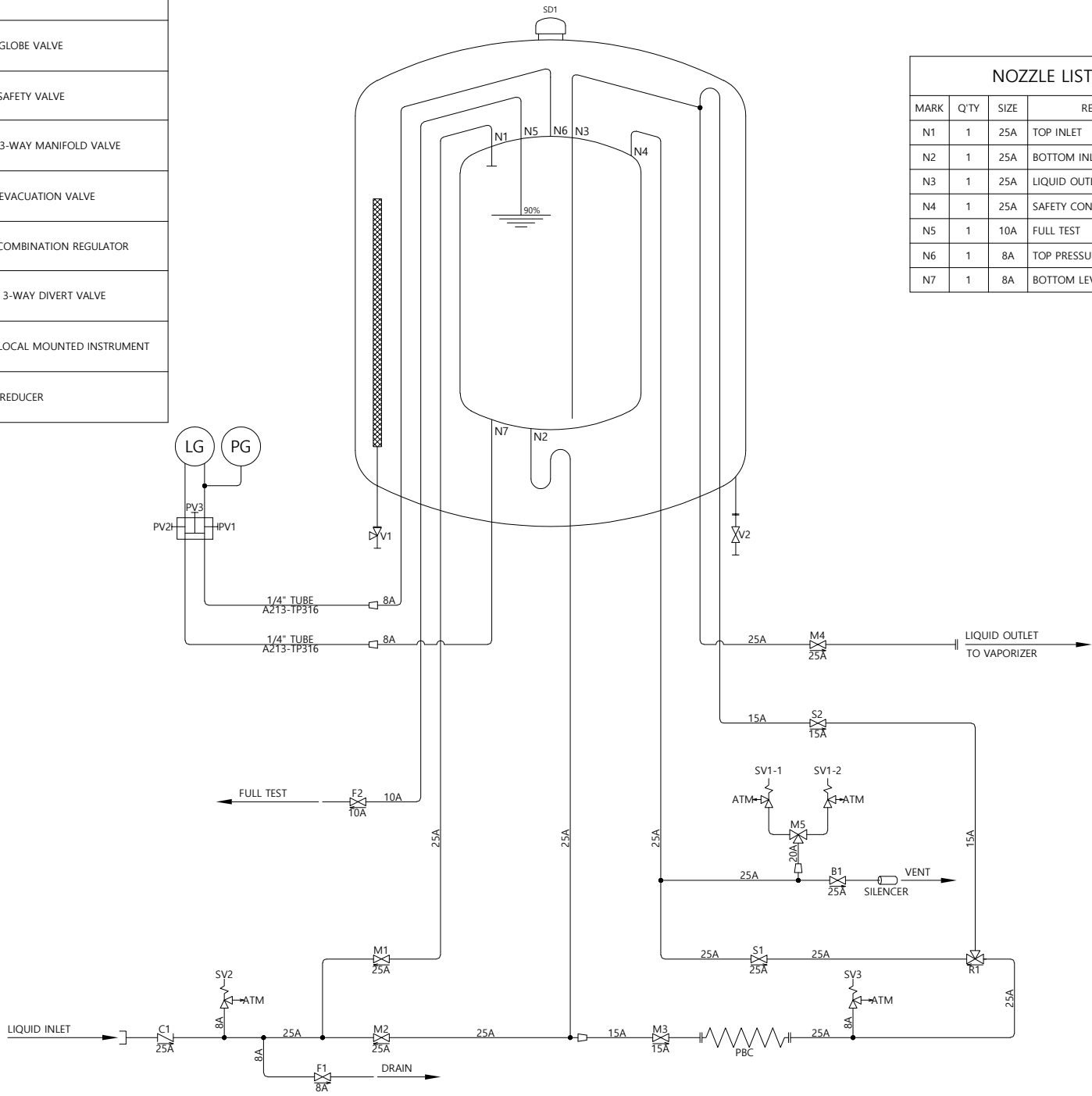
CIVIL ENGINEER T:062. 974. 4775  
(주)엘디엔지니어링 F:062. 974. 4776  
경기도 성남시 중원구 사기막골로 124, 1504

DRAWING TITLE

액체질소(LA2) 탱크 상세도 2

DATE	2022.04.	SCALE	A1 : 1/ NONE A3 : 1/ NONE
APPROVED			
CHECKED		DRAWING NO	
DRAWING			
DRAWING			M-814

SYMBOLS	
	PROCESS LEAD LINES
	CHECK VALVE
	GLOBE VALVE
	SAFETY VALVE
	3-WAY MANIFOLD VALVE
	EVACUATION VALVE
	COMBINATION REGULATOR
	3-WAY DIVERT VALVE
	LOCAL MOUNTED INSTRUMENT
	REDUCER



NOZZLE LIST			
MARK	Q'TY	SIZE	REMARK
N1	1	25A	TOP INLET
N2	1	25A	BOTTOM INLET
N3	1	25A	LIQUID OUTLET
N4	1	25A	SAFETY CONN. / VENT
N5	1	10A	FULL TEST
N6	1	8A	TOP PRESSURE GAUGE
N7	1	8A	BOTTOM LEVEL GAUGE

VALVE & INSTRUMENT LIST				
NO.	DESCRIPTION	SIZE	MATERIAL	REMARK
M1	TOP INLET VALVE	25A	BC7	30K, LONG STEM, GLOBE, UB, W
M2	BOTTOM INLET VALVE	25A	BC7	30K, LONG STEM, GLOBE, UB, W
M3	PBC BLOCK VALVE	15A	BC7	30K, LONG STEM, GLOBE, UB, W
M4	LIQUID OUTLET VALVE	25A	BC7	30K, LONG STEM, GLOBE, UB, W
M5	3-WAY DIVERT VALVE	15A	C3771	30K, BALL, PT3/4(IN) x PT1/2(OUT)
B1	VENT VALVE	25A	BC7	30K, LONG STEM, GLOBE, UB, W
F1	LINE DRAIN VALVE	8A	BC7	30K, LONG STEM, GLOBE, UB, W
F2	FULL TEST VALVE	10A	BC7	30K, LONG STEM, GLOBE, UB, W
S1	PRESSURE RETURN VALVE	25A	BC7	30K, LONG STEM, GLOBE, UB, W
S2	ECONOMIZER BLOCK VALVE	15A	BC7	30K, LONG STEM, GLOBE, UB, W
C1	INLET CHECK VALVE	25A	BC7	30K, LIFT CHECK, W
R1	COMBINATION REGULATOR	25Ax15A	C3771	30K, SET PRESS 1.3 MPaG
V1	EVACUATION VALVE	40A	A312-TP304	VF40, VACUUM VALVE
V2	SENSOR ISOLATION VALVE	ø 9	BC6	10K, DIAPHRAGM VALVE
SV1-1	TANK SAFETY VALVE	15Ax20A	BC6	SET PRESS 1.76 MPaG
SV1-2	TANK SAFETY VALVE	15Ax20A	BC6	SET PRESS 1.76 MPaG
SV2	LINE SAFETY VALVE	ø 7	BC6	NPT1/4, SET PRESS 2.41 MPaG (250 psig)
SV3	LINE SAFETY VALVE	ø 7	BC6	NPT1/4, SET PRESS 2.41 MPaG (250 psig)
LG	LEVEL GAUGE	ø 150	SUS304	NPT1/4, DP TYPE, 0-5,000mmH2O
PG	PRESSURE GAUGE	ø 150	SUS304	PT1/2, 0-3.5 MPaG (USE NO OIL)
PV1	UPPER GAUGE BLOCK VALVE	ø 4	C3604	PT1/4, 3-WAY, MANIFOLD VALVE
PV2	LOWER GAUGE BLOCK VALVE	ø 4		
PV3	BALANCE VALVE	ø 4		
PBC	PRESSURE BUILD-UP COIL	-	A6063S-T5	10 Nm /hr
SD1	OUTER VESSEL SAFETY DEVICE	ø 105	SUS304	CRYOS STD

NOTE  
1. PIPE MATERIAL : SUS304TP-A, SCH.20S  
2. FLANGE : KS 20K SO. RF / MATL : SUSF304

액체질소(LA2) 탱크 상세도 3  
축척 : NONE



한국기계연구원  
KOREA INSTITUTE OF MACHINERY & MATERIALS

스마트 제조장비 실증실험동  
설계용역

2				
1				
NO.	DATE	REVISION DESCRIPTION	BY	APP.

ARCHITECTURAL



(주)종합건축사사무소 림  
서울 성동구 성수일로 66 서울숲드림타워 7,13층  
TEL:02-499-4599, FAX:02-499-0690



I주|종합건축사사무소 건  
부산 남구 수영로 233, 민석빌딩10층 1001호  
TEL:070-4044-7174 FAX:051-611-2121

STRUCTURAL ENGINEER  
(주)도담구조 T:053. 262. 8955  
F:053. 262. 8956  
대구광역시 중구 동덕로26길 18, 2층

기계·기계소방·전기소방 T:02. 2105. 9900  
(주)기성이엔씨 F:02. 2105. 9999  
서울특별시 구로구 디지털로34길 55-0(구로동)915호

전기·통신 T:02. 6673. 7011  
(주)형건이엔씨 T:02. 6673. 7010  
서울특별시 영등포구 선유로49길 23 (영등동4가)

CIVIL ENGINEER T:062. 974. 4775  
(주)엘디엔지니어링 F:062. 974. 4776  
경기도 성남시 중원구 사기막골로 124, 1504

DRAWING TITLE

액체질소(LA2) 탱크 상세도 3

DATE	2022.04.	SCALE	A1 : 1/ NONE A3 : 1/ NONE
APPROVED			
CHECKED		DRAWING NO	
DRAWING			
DRAWING			M-815