

SHEET	DESCRIPTION	REVISION							
		0	1	2	3	4	5	6	7
A 1	P&ID'S FRONTSHEET	0							
2	P&ID PROCESS GAS SYSTEM	0							
3	P&ID LUBRICATION SYSTEM MOTIONWORK	0							
4	P&ID COOLINGWATER SYSTEM	0							
5	P&ID MECHANICAL	0							
6	P&ID LEGEND	0							
7	P&ID LEGEND	0							

REV.0: GBR 07-03-22

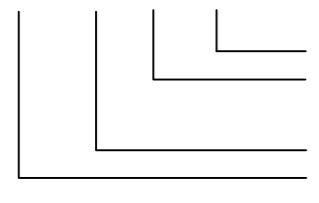
HYDROGEN COMPRESSOR

REFERENCE DRAWINGS:

- 1. EQUIPMENT & UTILITY LIST 927 E 9398
- 2. INSTRUMENT SCHEDULE 927 E 9399
- 3. VALVE LIST 927 E

LINE NUMBERING:

- 1. FOR EXPLANATION OF THE LINE NUMBER REFER TO PID LEGEND
- 2. SEQUENCE NUMBER IN THE LINE NUMBER (LAST FIGURE IN THE LINE NUMBER):
E.G. 2"-XXXX-XXX-103:



SEQUENCE NUMBER OF LINE IN THE PIPING SYSTEM
 NUMBER FOR THE COMPRESSOR IN THE HBC CONTRACT NUMBER:
 a. 1 FOR COMPRESSOR A
 PIPE CLASS
 LINE SIZE

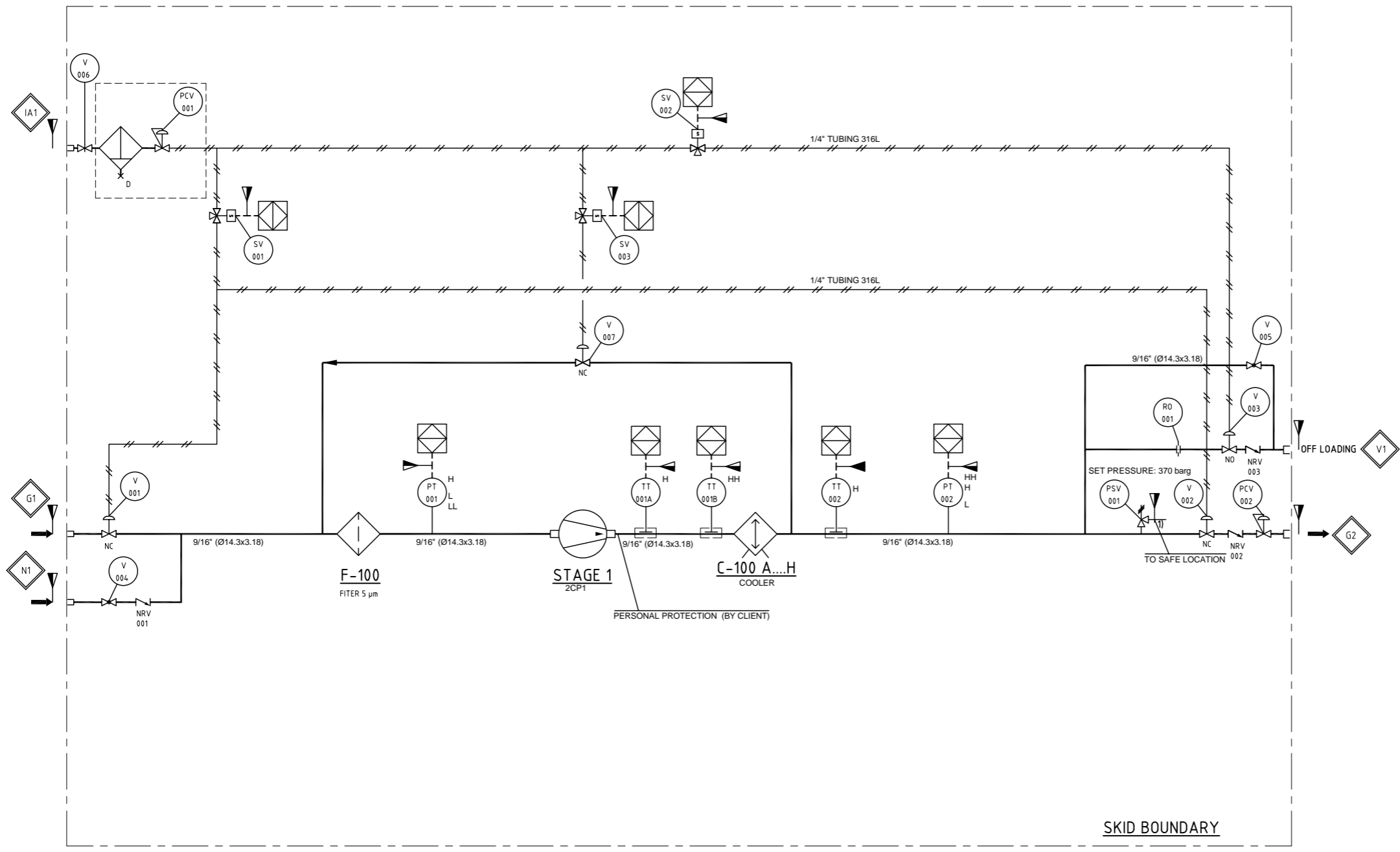
0	GBR	AST	FEA
REV	C	PC	PSE

CERTIFIED FOR CONSTRUCTION		THOM. ITEM NR. 4704	SUPERSEDES DRWG. NR. -	DRAFTING GR. 03
<input checked="" type="checkbox"/> For approval <input type="checkbox"/> Advanced copy <small>TO MEET SHIPPING PROMISE ONE APPROVED COPY MUST BE RETURNED AS PER I.O.T.</small>	<input checked="" type="checkbox"/> Final <small>EQUIPMENT COVERED BY THIS DRAWING IS IN MANUFACTURING PROCESS. ANY REQUESTED CHANGE IS SUBJECT TO PRICE AND SHIPPING PROMISE ADJUSTMENT.</small>	THIRD ANGLE PROJECTION 	TYPE D166 SCALE	TITLE P&ID FRONT SHEET
BY: _____ DATE: _____		DRWG. NR. _____	SHEET 1 OF 7	OF 7
PURCHASER: _____ PURCH ORDER NR.: _____ USER: _____ THOMASSEN'S O.NR.: SC00037122	ITEM NR.: D166 LG2/35 DRWG SEQ NR.: _____		P&I LIS I NR. _____	SO. NR. SC00037122

CUSTOMER CONNECTIONS

REV.0: GBR 07-03-22

TAG	QTY.	DESCRIPTION	TUBE/FITTING x CONE/THREADED		
			SIZE	MALE	FEM.
G1	1	PROCESS GAS INLET	x 9/16"	-	X
G2	1	PROCESS OUTLET	x 9/16"	-	X
N1	1	NITROGEN	x 9/16"	-	X
V1	1	OFF LOADING	x 9/16"	-	X
IA1	1	INSTRUMENT AIR	1/2"NPT	-	X



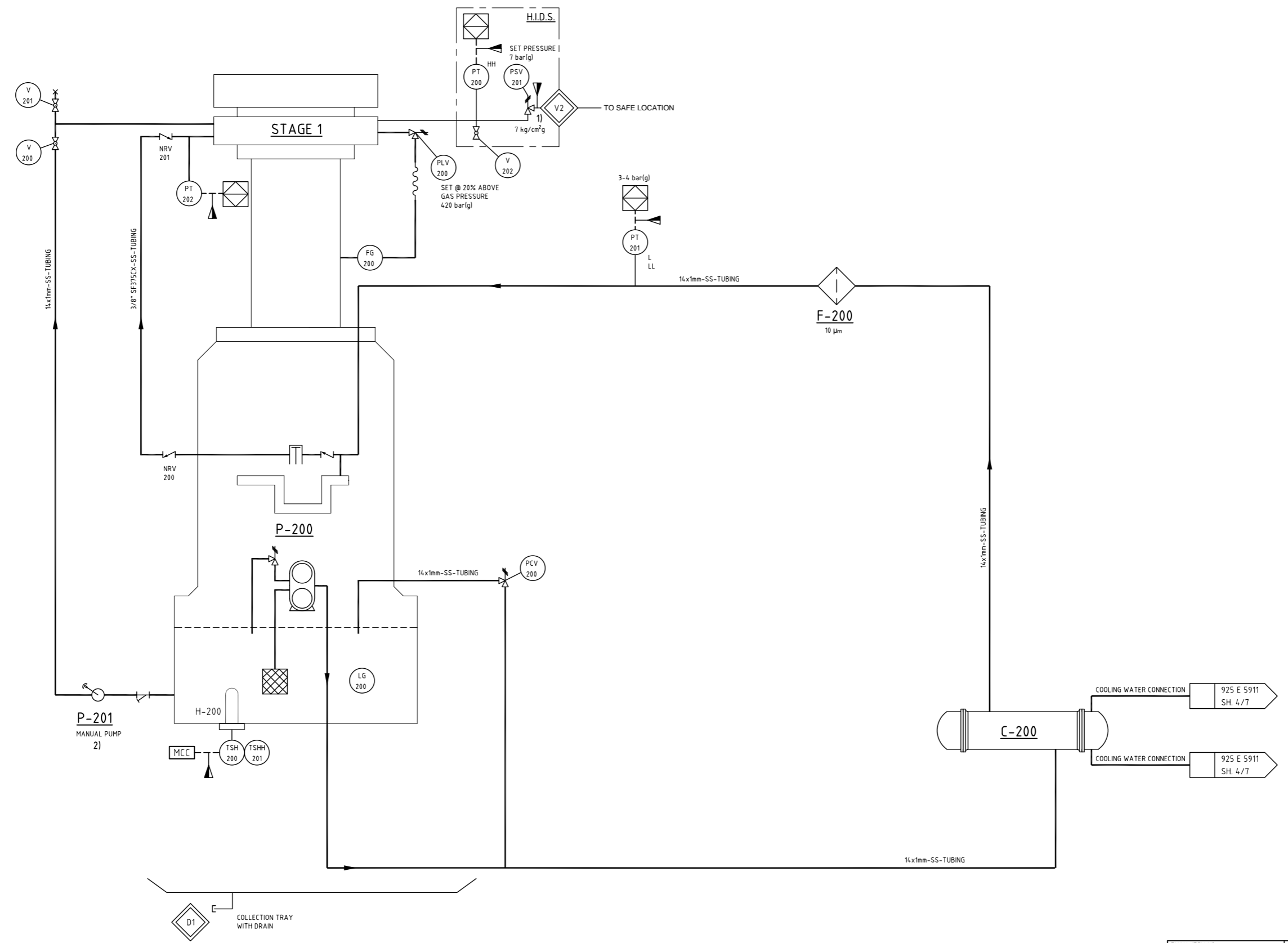
- 1) INSULATION/PERSONAL PROTECTION BY OTHERS
- 2) TO AVOID EXCESSIVE LOADS ON THE COMPRESSOR AND DRIVE SYSTEMS, UNLOADING THE UNIT IS RECOMMENDED WHEN THE COMPRESSOR IS STARTED. UNLOADING THE UNIT IS SIMPLY VENTING THE PROCESS GAS PRESSURE FROM THE COMPRESSOR TO FLARE. (INLET AND OUTLET ISOLATING VALVE CLOSED, AND OFFLOADING VALVE OPENED)

THOM. ITEM NR.	4.704	SUPERSEDES DRWG. NR.	-	DRAFTING GR.	03
THIRD ANGLE PROJECTION	D166	TITLE	P&ID		
SCALE		TITLE	PROCESS GAS SYSTEM		
DRWG. NR.		SHEET 2		OF 7	
PARTLIST NR.		SO. NR.		SC00037122	

AutocAD versie: 23.0s

CUSTOMER CONNECTIONS

TAG	QTY.	DESCRIPTION	FLANGED (Finish acc. ANSI B16.5)			Swagelok/Parker		
			SIZE	RAT'G	FACE	SIZE	MALE	FEM.
V2	1	DISCHARGE H.I.D.S.	-	-	-	1/4"NPT	-	X
D1	1	DRAIN COLLECTION TRAY	-	-	-	G1/2"	X	-



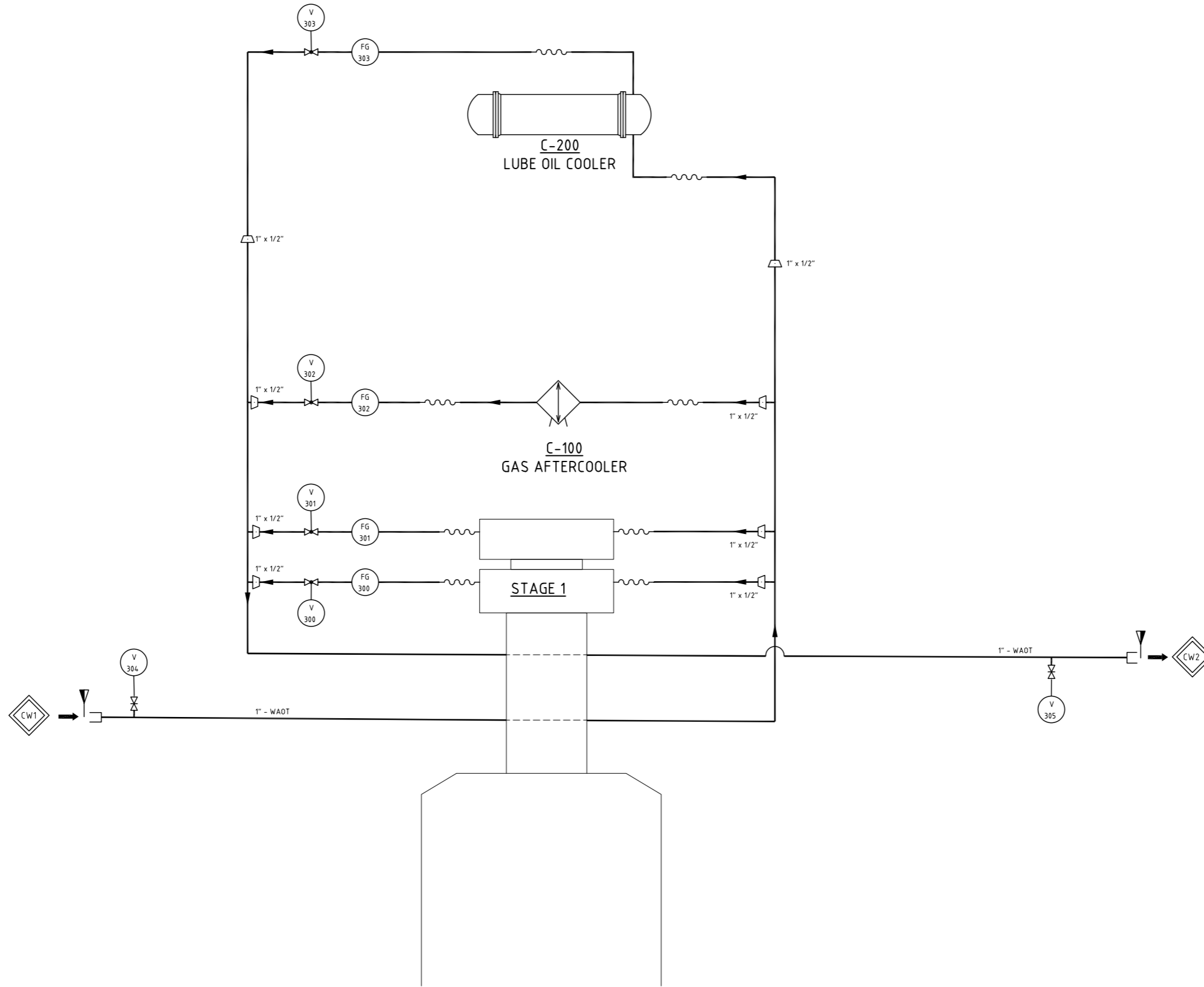
- NOTE:
- H.I.D.S. HEAD INTEGRITY DETECTION SYSTEM.
 - HANDPUMP FOR FILLING HEAD BEFORE START UP.

THOM. ITEM NR.	4704	SUPERSEDES DRWG. NR.	-	DRAFTING GR.	03
THIRD ANGLE PROJECTION	D166	TITLE	P&ID		
SCALE		TITLE	LUBRICATION SYSTEM MOTIONWORK		
DRWG. NR.		SHEET	3	OF	7
SO. NR.		PART LIST NR.	-		

CUSTOMER CONNECTIONS

TAG	QTY.	DESCRIPTION	FLANGED (Finish acc. ANSI B16.5)			Swagelok/Parker		
			SIZE	RAT'G	FACE	SIZE	MALE	FEM.
CW1	1	COOLING WATER INLET	-	-	-	1"NPT	X	-
CW2	1	COOLING WATER OUTLET	-	-	-	1"NPT	X	-

REV.0: GBR 07-03-22

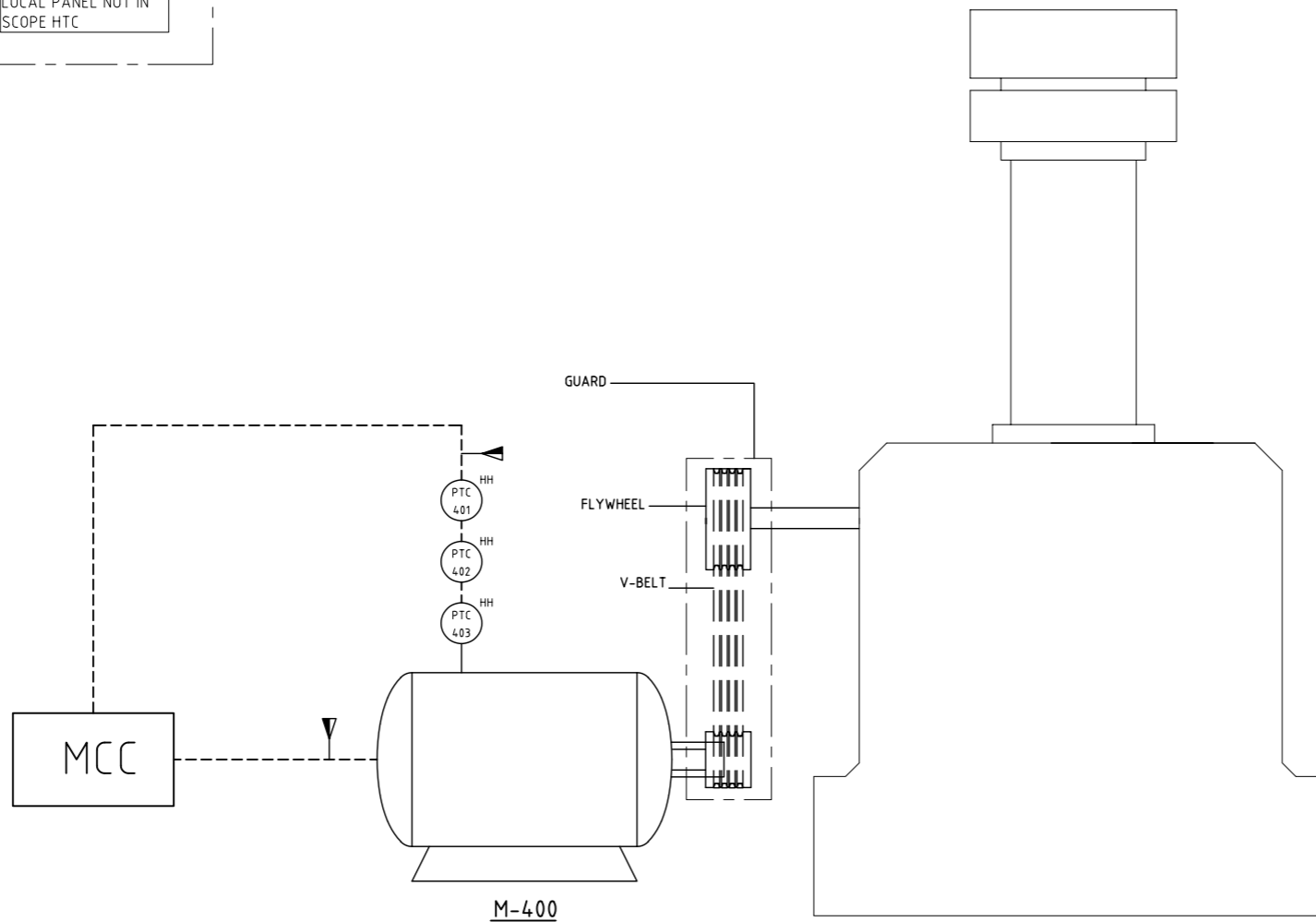
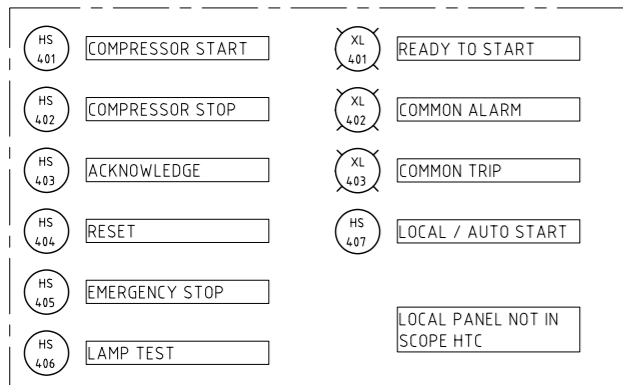


0	GBR	AST	FEA
REV	C	PC	PSE

DRAFTING GR. 03

THOM. ITEM NR.	4704	SUPERSEDES DRWG. NR.	-
THIRD ANGLE PROJECTION	D166	TITLE	P&ID
SCALE		TITLE	COOLING WATER CIRCUIT
PARTLIST NR.		-	
SHEET		4	OF 7
SO. NR.		SC00037122	

AutocAD versie: 23.0s



0	GBR	AST	FEA
REV	C	PC	PSE

THOM. ITEM NR.	4.704	SUPERSEDES DRWG. NR.	-	DRAFTING GR.	03
THIRD ANGLE PROJECTION		TITLE	P&ID		
SCALE	D166	SCALE	MAIN DRIVE		
DRWG. NR.	-	SHEET	5	OF	7
PARTLIST NR.	-	SO. NR.	SC00037122		

LINE SYMBOLS

- MAJOR PROCESS LINE
- MAJOR PROCESS LINE SUPPLIED BY OTHERS
- MINOR PROCESS OR UTILITY LINE
- MINOR PROCESS OR UTILITY LINE SUPPLIED BY OTHERS
- SKID OR PACKAGED UNIT LIMIT
- LINES TO OR FROM OTHER DRAWING (XX 925 E SH)
- DIRECTION OF FLOW
- START OF PROCESS STREAM
- END OF PROCESS STREAM

PIPING SYMBOLS

- SPECTACLE BLIND (TOP CLOSED)
- SPECTACLE BLIND (BOTTOM CLOSED)
- SPOOL PIECE WITH START UP STRAINER (CONICAL TYPE)
- Y-TYPE STRAINER
- OPEN VENT WITH ELBOW
- SYPHON (SEAL LEG)
- STRAINER/FILTER
- BREATHER
- FLEXIBLE HOSE
- OPEN DRAIN SYSTEM
- REDUCER
- FLANGED CONN.
- ORIFICE
- EXPLOSION RELIEF VALVE
- RUPTURE DISC

CONTROL SIGNAL TRANSDUCERS

- INPUT / OUTPUT DEVICES USING THE FOLLOWING:
- I CURRENT
- P PNEUMATIC

VALVE SYMBOLS

- GATE VALVE
- GLOBE VALVE
- BALL VALVE
- NEEDLE VALVE
- CHECK VALVE
- CHECK VALVE WITH ORIFICE
- BUTTERFLY VALVE
- DIAPHRAGM VALVE
- THREE WAY VALVE
- FOUR WAY VALVE
- BLEEDER
- MANIFOLD (BLOCK & BLEED)
- DIRECTIONAL VALVE
- LEVEL CONTROL VALVE
- OIL FILTER
- GAS FILTER
- GAS COOLER
- FLOW METER

MISCELLANEOUS SYMBOLS

- EJECTOR
- CONDENSATE TRAP
- EXHAUST SILENCER
- SEPERATOR INLET DEVICE
- HALF PIPE
- SCHOEPENTOETER
- SWIRL/CYCLONE
- SEPERATION DEVICE
- WIRE MESH (DEMISTOR)
- VANE PACK
- MULTI CYCLONE
- CYCLONE
- COALESCING FILTER
- VORTEX BREAKER
- HAND PUMP
- COMPENSATE PUMP

MISCELLANEOUS SYMBOLS

- SET:
 - FILTER
 - REGULATOR
 - GAUGE
 - RELIEF

PIPING / LINE IDENTIFICATION

6"-X-XXX-XXYY-XXXX-C

INSULATION
IC = COLD INSULATION
HC = HOT INSULATION
PP = PERSONAL PROTECTION
N = NOISE PROTECTION

SLOPE

INSULATION LINE

Insulation 80mm

INSULATED LINE

Insulation 80mm

Traced
E = Electric
S = Steam

TRACED & INSULATED LINE

EQUIPMENT SYMBOLS

- MECHANICAL DRIVEN POS. DISPLACEMENT PUMP
- E.M. DRIVEN POS. DISPLACEMENT PUMP (OIL)
- HORIZONTAL CENTRIFUGAL PUMP (C.W.)
- VERTICAL IN LINE PUMP
- VERTICAL PUMP
- E-MOTOR
- ELECTRIC HEATER
- STEAM HEATER
- DRIP RIM
- AIR COOLED HEAT EXCHANGER
- SHELL & TUBE HEAT EXCHANGER
- DUPLEX CARTRIDGE FILTER
- CARTRIDGE FILTER
- PLATE TYPE HEAT EXCHANGER

IDENTIFICATION OF EQUIPMENT

- A - MISCELLANEOUS EQUIPMENT
- C - COLUMNS:
 - TRAY COLUMNS
 - PACKED COLUMNS
 - ROTATING DISC CONTACTORS
- D - DRYING EQUIPMENT
- E - HEAT TRANSFER EQUIPMENT:
 - HEAT EXCHANGERS
 - CONDENSERS
 - COOLERS
 - REBOILERS
- F - FILTERS
- H - HEATERS
- J - JETS (EJECTORS, INJECTORS AND EDUCATORS)
- K - COMPRESSORS
- M - DRIVERS
- P - PUMPS (CENTRIFUGAL, RECIPROCATING, ROTARY)
- T - ATMOSPHERIC STORAGE TANKS, INTERCEPTORS, NEUTRALIZING PITS
- V - VESSELS, INCL. PRESSURE STORAGE VESSELS

SYMBOLS ARE RELATED TO ISA AND ASME

EQUIPMENT SYMBOLS

- COMPRESSOR
- COMPRESSOR CYLINDER
- PULSATION SUPPRESSOR
- SEPARATOR
- SEPARATOR WITH TOP COVER

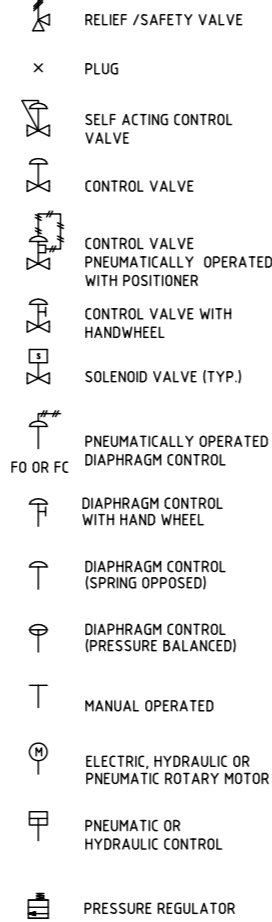
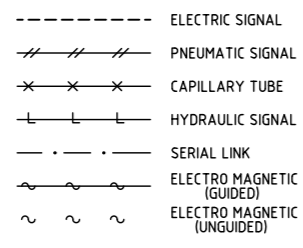
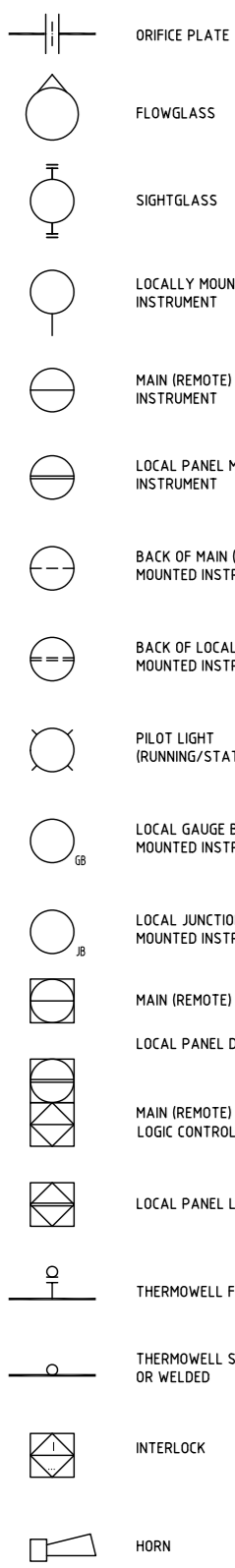
THOM. ITEM NR.	4.704	SUPERSEDES DRWG. NR.	-
THIRD ANGLE PROJECTION	TYPE D166	TITLE	P&ID LEGEND
SCALE	-	PARTLIST NR.	-
		SHEET	6
		OF	7
		SQ. NR.	SC00037122

REV	C	PC	PSE
0	GBR	AST	FEA
DRAFTING GR. 03			

INSTRUMENT SYMBOLS

INSTRUMENT SIGNAL LINES

INSTRUMENT LEGEND



DESIGNATION	MEASURED VARIABLE	ELEMENT	TRANSMITTER	INDICATING TRANSMITTER	CONVERTER, TRANSDUCER, RELAY SPECIAL DEVICES	INDICATOR	RECORDER	CONTROLLER	INDICATING CONTROLLER	RECORDING CONTROLLER	SWITCH	SWITCH LOW LOW	SWITCH LOW	SWITCH HIGH	SWITCH HIGH HIGH	SWITCH COMBINATION HIGH LOW	ALARM LOW LOW	ALARM LOW	ALARM HIGH	ALARM HIGH HIGH	TOTALIZER	VALVE	GAUGE	LIGHT
E	VOLTAGE				EI																			
F	FLOW	FE	FT	FIT	FY	FI	FR	FC	FIC	FRC	FS	FSL	FSL	FSH	FSH	FSHL	FALL	FAL	FAH	FAHH	FQI	FV	FG	FL
H	HAND (MANUAL)	-	-	-	HY	-	-	HC	HIC	-	HS	-	-	-	-	-	-	-	-	-	-	HV	-	HL
I	CURRENT	-	IT	-	IY	II	IR	IC	IIC	IRC	IS	ISLL	ISL	ISH	ISHH	-	IALL	IAL	IAH	IAHH	-	-	-	IL
L	LEVEL	LE	LT	LIT	LY	LI	LR	LC	LIC	LRC	LS	LSLL	LSL	LSH	LSHH	LSHL	LALL	LAL	LAH	LAHH	-	LV	LG	LL
V	VIBRATION	VE	VT	-	VY	VI	VR	VC	VIC	VRC	VS	VSL	VSL	VSH	VSHH	-	VALL	VAL	VAH	VAHH	-	-	-	-
P	PRESSURE OR VACUUM	-	PT	PIT	PY	PI	PR	PC	PIC	PRC	PS	PSLL	PSL	PSH	PSHH	PSHL	PALL	PAL	PAH	PAHH	-	PV	PG	PL
PD	DIFFERENTIAL PRESSURE	-	PDT	PDIT	PDY	PDI	PDR	PDC	PDIC	PDRC	PDS	PDSLL	PDSL	PDSH	PDSH	-	PDALL	PDAL	PDAH	PDAHH	-	PDV	PDG	PDL
R	RUN																							
S	SPEED	SE	ST	-	SY	SI	SR	SC	SIC	SRC	SS	SSL	SSL	SSH	SSH	-	SALL	SAL	SAH	SAHH	-	-	-	-
T	TEMPERATURE	TE	TT	TIT	TY	TI	TR	TC	TIC	TRC	TS	TSL	TSL	TSH	TSHH	TSHL	TALL	TAL	TAH	TAHH	-	TV	TG	TL
TD	DIFFERENTIAL TEMPERATURE	-	TDI	-	TDY	TDI	TDR	TDC	TDIC	TDRC	TDS	TDLL	TDSL	TDSH	TDSH	-	TDALL	TDAL	TDH	TDHH	-	TDV	-	TDL
X	UNCLASSIFIED	XE	XT	-	XY	XI	XR	XC	XIC	XRC	XS	XSL	XSL	XSH	XSH	-	XALL	XAL	XAH	XAHH	-	XV	XG	XL
Z	POSITION	ZE	ZT	-	ZY	ZI	-	-	-	-	ZS	-	-	-	-	-	-	-	-	-	-	ZV	-	ZL

TZE = TEMPERATURE ELEMENT IPS SIGNAL.
 FZT = FLOW TRANSMITTER IPS SIGNAL.
 TZT = TEMP TRANSMITTER IPS SIGNAL.
 LZT = LEVEL TRANSMITTER IPS SIGNAL.
 SZT = SPEED SENSOR IPS SIGNAL.
 PZT = PRESSURE TRANSMITTER IPS SIGNAL.
 HZS = EMERGENCY STOP HANDSWITCH.

THIS TABLE APPLIES ONLY TO THE FUNCTIONAL IDENTIFICATION OF INSTRUMENTS AND IS BASED ON ANSI/ISA-55-1

ADDITIONAL INSTRUMENT LEGEND

SUCCEEDING 0=OPEN, C=CLOSED

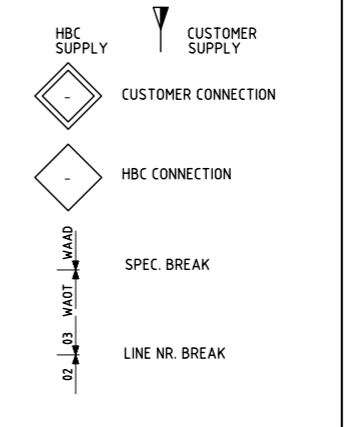
RO = RESTRICTION ORIFICE	PSE = PRESSURE SAFETY ELEMENT	TRV = THERMAL RELIEF VALVE
TCV = TEMP CONTROL VALVE	SV = SOLENOID VALVE	NRV = NITROGEN RELIEF VALVE
PCV = PRESSURE CONTROL VALVE	TSV = THERMAL SAFETY VALVE	RD = RUPTURE DISC
PSV = PRESSURE SAFETY VALVE	PZT = PRESSURE TRANSMITTER IPS SIGNAL	
PLV = PRESSURE LIMITING VALVE	TZT = TEMPERATURE TRANSMITTER IPS SIGNAL	
PRV = PRESSURE RELIEF VALVE	RV = RELIEVE VALVE	

ABBREVIATIONS

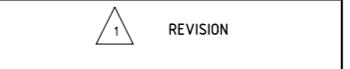
- CE = CRANK END
- HE = HEAD END
- HOVCP = HYDRAULIC OPERATED VARIABLE CLEARANCE POCKET
- HCU = HYDRAULIC CONTROL UNIT
- CP = CLEARANCE POCKET
- I.C. = INBOARD COMPARTMENT
- O.C. = OUTBOARD COMPARTMENT
- FO = FAILURE TO OPEN
- FC = FAILURE TO CLOSE
- NO = NORMALLY OPEN
- NC = NORMALLY CLOSED
- LO = LOCKED OPEN
- LC = LOCKED CLOSED
- RO = RESTRICTION ORIFICE
- CIU = COMPRESSOR INTERFACE UNIT
- EPS = EXTERNAL POWER UNIT
- HU = HYDRAULIC UNIT
- ACT = ACTUATOR
- ATM = ATMOSPHERE
- CWS = COOLING WATER SUPPLY
- CWR = COOLING WATER RETURN
- IA = INSTRUMENT AIR
- PA = PLANT AIR
- FL = FLARE
- OWS = OILY WATER SEWER
- DO = DRAIN - OPEN
- DC = DRAIN - CLOSED
- VA = VENT - ATMOSPHERIC
- P = PROCESS GAS CONNECTION
- CW = COOLING WATER CONNECTION
- LO = LUBE OIL CONNECTION
- PU = PURGE CONNECTION
- BU = BUFFER CONNECTION
- A = AIR CONNECTION
- V = VENT (CONNECTION)
- D = DRAIN (CONNECTION)
- F = FILL (CONNECTION)
- SP = SPOOL PIECE
- TS = TEMPORARY STRAINER
- H = HYDRAULIC CONNECTION
- MCC = MOTOR CONTROL CENTER
- DCS = DISTRIBUTED CONTROL SYSTEM
- LOS = LOCAL OPERATOR STATION
- GB = GAUGE BOARD
- JB = JUNCTION BOX
- LK = LEAK OFF CONNECTION
- SC = STEAM CONDENSATE
- MAG = MAGNETIC TYPE LEVEL GAUGE
- GG = GAUGE GLASS
- DP = DIFFERENTIAL PRESSURE
- GWR = GUIDED WAVE RADAR
- US = ULTRASONIC
- RTD = RESISTANCE TEMPERATURE DETECTOR
- TC = THERMOCOUPLE
- PP = PERSONAL PROTECTION
- IPS = INSTRUMENTAL PROTECTIVE SYSTEM
- GS = VALVE POSITION

- 2.o.o.2 = TWO OUT OF TWO
- 2.o.o.3 = TWO OUT OF THREE
- SGLA = SIGHTGLASS

CONNECTION SYMBOLS



REVISION STATUS



0	GBR	AST	FEA
REV	C	PC	PSE

THOM. ITEM NR.	4704	SUPERSEDES DRWG. NR.	-
THIRD ANGLE PROJECTION	D166	TITLE	P&ID LEGEND
SCALE	-	PARTLIST NR.	-
		SHEET	7
		OF	7
		S.O. NR.	SC00037122