17. Measurement Range and Limit Value List

TAG-NO. / FUNCTION	DESIG-NATION	RANGE	LL S/A	LL loc	LL prio	LL threshold	L S/A	L loc	L prio	L threshold	H S/A	H loc	H prio	H threshold	HH S/A	HH loc	HH prio	HH threshold	CONTROLLER SETTINGS W	Kp	Tn	Td	P&I SHEET	REMARKS
E 13100 / EI	CURRENT DCAC PUMP P13100	0...120 A																					002	
E 13200 / EI	CURRENT DCAC PUMP P13200	0...120 A																					002	
E 14100 / EI	CURRENT CHILL TOWER PUMP P14100	0...50 A																					003	
E 14200 / EI	CURRENT CHILL TOWER PUMP P14200	0...50 A																					003	
E 24111 / EISLL	EFFECTIVE POWER MG24101	0...400 kW	A	PCS	3	10																	007	
E 24211 / EISLL	EFFECTIVE POWER MG24201	0...400 kW	A	PCS	3	10																	008	
E 61100 / EI	CURRENT LOX PUMP P61100	0...150 A																					012	

Legend: F = local, V = local cabinet , S = control room, PCS = process control system

Annotation on column "Hook Up":
(FP*) = Frost Protection recommended

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0	21.12.2004	Frohn		Initial version

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E 61200 / EI	CURRENT LOX PUMP P61200	0...150 A																					012	
E 73101 / EI	CURRENT LIN PUMP P73101	0...100 A																					037	
E 73201 / EI	CURRENT LIN PUMP P73201	0...100 A																					037	
E 98012-3 / EI	EFFECTIVE POWER BAC	0...10 MW																					006	
E 98012-4 / EI	EFFECTIVE POWER MAC	0...10 MW																					001	
F 11074 / FIC	ANTI SURGE CONTROLLER	0...150 mbar																					001	
F 12005 / FICAL	CHILLED WATER FROM KA12001	0...50 m³/h					A	PCS	3	30										0,45	30s		002	

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F 13006 / FICAL	CHILLED WATER TO DC/AC	0...40 m³/h					A	PCS	3	20										0,5	5min		002	
F 13007 / FICAL	COOLING WATER TO DC/AC	0...250 m³/h					A	PCS	3	150										0,6	30s		002	
F 15035 / FIC	AIR BEHIND SOL SIEVE	0...120000 Nm³/h 0...22,4 mbar									A	PCS	3	10000						1,0	45s		004	K1 = 25354,628 P1 = 5,62 bar T1 = 23,1°C
F 15041 / FICSAL	INLET REGENERATIO N GAS HEATERS	0...22000 Nm³/h 0...13,83 mbar					SA	PCS	3	10000										0,6	45s		005	K1 = 5915,774 P1 = 1,17 bar T1 = 20°C
F 16073 / FI	HP-AIR FROM BAC	0...65000 Nm³/h 0...40,19 mbar										PCS		1000		PCS		50000					006	K1 = 10253,08 P1 = 57 bar T1 = 25°C
F 16074 / FIC (F16007)	ANTI SURGE CONTROLLER BAC	0...100 %																					006	
F 20001 / FIC	HP-GAN OUTLET COLDBOX	0...4500 Nm³/h 0...150 mbar																		1: 0,6 2: 1,15	1: 5min 2: 20s		010	K1 = 365,842 P1 = 21 bar T1 = 20°C

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F 20002 FIC	HP-GAN BLOW OFF	0...4500 Nm³/h																		0,4	20s		010	
F 20003 FI	HP-GAN TO CUSTOMER	0...4500 Nm³/h 0...150 mbar																					010	K1 = 372,461 P1 = 21 bar T1 = 20°C
F 20005 FICALSALL	LP-GAN OUTLET COLDBOX	0...35000 Nm³/h 0...16,75 mbar	SA	PCS	1	5000	A	PCS	3	7000										1: 0,6 2: 1,15	1: 5min 2: 20s		010	K1 = 8551,861 P1 = 1,15 T1 = 20°C
F 20006 FIC	LP-GAN BLOW OFF	0...35000 Nm³/h																		0,3	20s		010	
F 20011 FICALSALL	GOX OUTLET COLDBOX	0...35000 Nm³/h 0...250 mbar	SA	PCS		5000	A	PCS		7000										1: 0,8 2: 1,15	1: 5min 2: 20s		010	K1 = 2206,150 P1 = 28 bar T1 = 20°C
F 20012 FIC	GOX BLOW OFF	0...35000 Nm³/h																		0,5	20s		010	
F 20013 FI	GOX TO CUSTOMER	0...35000 Nm³/h 0...250 mbar																					010	K1 = 2206,150 P1 = 28 bar T1 = 20°C

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			threshold			threshold			threshold			threshold								
F 22013 FIC	ULIN TO LP-COLUMN	0...35000 Nm³/h 0...125 mbar														0,3	20s		013	K1 = 3130,495 P1 = 4,7 bar T1 = -191,6°C
F 22043 FIC	GOX FROM LP-COLUMN	0...500 Nm³/h 0...60 mbar														0,5	40s		013	K1 = 64,55 P1 = 1,38 bar T1 = -180°C
F 23013 FIC	LIN PRODUCT TO STORAGE	0...5000 Nm³/h														1,0	15s		011	
F 23016 FI	LOX TO STORAGE	0...5000 Nm³/h																	011	
F 23073 FIC	LIN PRODUCT TO DUMP	0...5000 Nm³/h														1,0	15s		011	
F 24101 FIC	AIR TO EXPANDER TURBINE 1	0...15000 Nm³/h 0...100 mbar														0,3	45s		007	K1 = 1500 P1 = 56,65 bar T1 = -91°C
F 24201 FIC	AIR TO EXPANDER TURBINE 2	0...15000 Nm³/h 0...100 mbar														1,0	30s		008	K1 = 1500 P1 = 56,65 bar T1 = -91°C

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			threshold			threshold			threshold			threshold								
F 40011 FIC	SIDEARMLIQUID FROM LP-COLUMN	0...30000 Nm³/h 0...50 mbar														0,3	2min		016 / 017	K1 = 4242,641 P1 = 1,35 bar T1 = -180,5°C
F 40014 FIC	LAR TO PURE AR COLUMN	0...1000 Nm³/h														0,3	2min		017	
F 62030 FI	PURGEGAS LOX TANK B62001	Nm³/h																	032	local indicator
F 63033 FI	LOX CONVERTER CYCLE	0...6000 Nm³/h 0...450 mbar																	032	K1 = 306,586 P1 = 4,5 bar T1 = -181,8°C
F 64061 FIC		0...35000 Nm³/h 0...450 mbar														1,0	30s			
F 70041 FIC	MP-GAN TO CUSTOMER	0...35000 Nm³/h 0...150 mbar																	020	K1 = 2857,738 P1 = 7,3 bar T1 = 26°C
F 70074 FIC	ANTI SURGE CONTROLLER	0...100 %																	019	

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F 72030 / FI	PURGEGAS LIN TANK B72001	Nm³/h																					035	local indicator
F 72071 / FI	PURGE GAS P72001	Nm³/h																					035	local indicator
F 77074 / FIC	ANTI SURGE CONTROLLER	0...100 %																					020	
F 80001 / FIAL	COOLING WATER	0...2000 m³/h					A	PCS	3	1000													023	
F 87020 / FI	BOXPURGE HE-BOX	2,5...35 Nm³/h																					024	local indicator
F 87021 / FI	BOXPURGE HE-BOX	2,5...35 Nm³/h																					024	local indicator
F 87060 / FI	BOXPURGE COLD-BOX	2,5...35 Nm³/h																					024	local indicator

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			threshold			threshold			threshold			threshold								
F 87061	BOXPURGE COLD-BOX	2,5...35 Nm³/h																	024	local indicator
FI																				
F 87062	BOXPURGE COLD-BOX	2,5...35 Nm³/h																	024	local indicator
FI																				
F 87063	BOXPURGE COLD-BOX	2,5...35 Nm³/h																	024	local indicator
FI																				
F 87064	BOXPURGE COLD-BOX	2,5...35 Nm³/h																	024	local indicator
FI																				
G 11010	GUIDE VANE MAC	0...100 %																	001	
GISOL																				
G 11074	BLOW OFF VALVE MAC	0...100 %							SO	PCS	4								001	
GISOH									75											
G 11742	SHAFT POSITION GEARING MAC	-2...0...+2 mm	SA	PCS	1	A	PCS	3	A	PCS	3	SA	PCS	1					027	
GIAHLSAHHLL			-0,8			-0,6			0,6			0,8								

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G 16010 / GISOL	GUIDE VANE BAC STAGE 1	0...100 %						PCS		5,0													006	
G 16733 / GIAHLSAHHLL	POSITION MAIN SHAFT BAC	-2...+2 mm	SA	PCS	1	-0,8	A	PCS	3	-0,6	A	PCS	3	0,6	SA	PCS	1	0,8					028	
G 24105 / GIOL	NOZZLE RING EXPANDER TURBINE 1	0...100 %																					007	
G 24205 / GIOL	NOZZLE RING EXPANDER TURBINE 2	0...100 %																					008	
G 70010 / GISOL	GUIDE VANE GAN COMPR. 1	0...100 %																					019	
G 70738 / GIAHLSAHHLL	SHAFT POSITION GEARING NV1	-0,6...0,6 mm	SA	PCS	1	-0,3	A	PCS	3	-0,25	A	PCS	3	0,25	SA	PCS	1	0,3					021	
G 70743 / GIAHLSAHHLL	SHAFT POSITION GEARING NV1	-0,6...0,6 mm	SA	PCS	1	-0,3	A	PCS	3	-0,25	A	PCS	3	0,25	SA	PCS	1	0,3					021	

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G 77010 / GISOL	GUIDE VANE GAN COMPR. 2	0...100 %																					020	
G 77738 / GIAHLSAHHLL	SHAFT POSITION GEARING NV2	-0,6...0,6 mm	SA	PCS	1	-0,3	A	PCS	3	-0,25	A	PCS	3	0,25	SA	PCS	1	0,3					022	
G 77743 / GIAHLSAHHLL	SHAFT POSITION GEARING NV2	-0,6...0,6 mm	SA	PCS	1	-0,3	A	PCS	3	-0,25	A	PCS	3	0,25	SA	PCS	1	0,3					022	
H 16071 / HIC	BLOW OUT VALVE BAC	0...100 %																					006	
H 16073 / HIC / GSHL	AIR FROM BOOSTER	0...100 %																					006	
H 20013 / HIC	PRESSURISATI ON GOX TO CUSTOMER 1	0...100 %																					010	
H 20014 / HIC	PRESSURISATI ON GOX TO CUSTOMER 2	0...100 %																					010	

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H 20027 / HIC	PRESSURISATI ON AIR TO MHE	0...100 %																					006	
H 21006 / HIC	NL FROM B21002	0...100 %																					014	
H 21014 / HIC	LIQUID AIR TO HP-COLUMN	0...100 %																					014	
H 24105 / HIC	NOZZLE RING EXPANDER TURBINE 1	0...100 %																					007	
H 24205 / HIC / GIOL	NOZZLE RING EXPANDER TURBINE 2	0...100 %																					008	
H 40005 / HIC	LAR BLOW OUT CONDENSER B40001	0...100 %																					017	
H 40100 / HIC / ESAL	SPEED LAR PUMP P40100	0...100 %																					016	

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H 61100 / HIC / ESAL	SPEED LOX PUMP P61100	0...100 %																					012	
H 61200 / HIC / ESAL	SPEED LOX PUMP P61200	0...100 %																					012	
H 70035 / HIC	BLOW OUT VALVE GAN COMP. 1	0...100 %																					019	
H 70036 / HIC	CHARGE GAN COMP. 1	0...100 %																					019	
H 71100 / HIC / ESAL	SPEED LIN PUMP P71100	0...100 %																					015	
H 71200 / HIC / ESAL	SPEED LIN PUMP P71200	0...100 %																					015	
H 73001 / HIC	LIN LDCC FROM SUBCOOLER	0...100 %																					014	

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H 73101 / HIC	SPEED LIN BACK UP PUMP P73101	0...100 %																					037	
H 73201 / HIC	SPEED LIN BACK UP PUMP P73201	0...100 %																					037	
H 77035 / HIC	BLOW OUT VALVE GAN COMP. 2	0...100 %																					020	
H 77036 / HIC	CHARGE GAN COMP. 2	0...100 %																					020	
L 11812 / LSAL	OIL CONTAINER MAC	0...100 %						PCS		30													027	
L 13003 / LICAHLSAHH	LEVEL COOLING WATER DC/AC	0...100 %					A	PCS	3	20	A	PCS	3	80	SA	PCS	1	95					002	
L 13013 / LIAHLSAHH	LEVEL COOLING WATER DC/AC	0...100 %					A	PCS	3	20	80	PCS	3	80	SA	PCS	1	95					002	

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L 14003 / LICAHLSAHHLL	LEVEL CHILL TOWER	0...100 %	SA	PCS	1	15	A	PCS	3	20	A	PCS	3	65	SA	PCS	1	95		1,0	40min		003	
L 16812 / LSAL	OIL CONTAINER BAC	0...100 %					A	F		60													028	
L 21003 / LICAHLSAHH	LEVEL SUMP HP-COLUMN	0...100 %					A	PCS	3	20	A	PCS	3	60	SA	PCS	1	80		1,0	5min		014 / 017	
L 21060 / LICAHL	LIQUID AIR SEPARATOR B21001	0...100 %					A	PCS	3	15	A	PCS	3	65						1,0	2min		009 / 013	
L 22001 / LICAHLSAHHLL	LEVEL SUMP LP-COLUMN	-49...231 %	SA	PCS	1	80	A	PCS	3	90	A	PCS	3	110	SA	PCS	1	160	100%	1,0	10s		014 / 011	
L 22002 / LIC	LEVEL SUMP LP-COLUMN	-50...223 %																		1,0	15s		014	
L 22011 / LIAHLSALL	LEVEL SUMP LP-COLUMN	65...130 %	SA	PCS	1	80	A	PCS	3	90	A	PCS	3	110					100%				014	

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MEASURING RANGE & LIMIT VALUES

AIR LIQUIDE

Air Liquide AGS GmbH
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Drwg.-No.:

TAG-NO. / FUNCTION	DESIG-NATION	RANGE	LL S/A	LL loc	LL prio	LL threshold	L S/A	L loc	L prio	L threshold	H S/A	H loc	H prio	H threshold	HH S/A	HH loc	HH prio	HH threshold	CONTROLLER SETTINGS W	Kp	Tn	Td	P&I SHEET	REMARKS
L 23076 / LIC	LOX PRODUCT TO DUMP	-50...223 %																		5,0	20min		011	
L 40007 / LICAHLSAHHLL	LEVEL AR-COND. B40001	-46...233 %	SA	PCS	1	80	A	PCS	3	90	A	PCS	3	110	SA	PCS	1	160	100%	0,8	1min		017	
L 40017 / LIAHLSALL	LEVEL LOX BOILER B40001	65...129 %	SA	PCS	1	80	A	PCS	3	90	A	PCS	3	110									017	
L 40053 / LICAHLSAHHLL	LEVEL SUMP CAR COLUMN 1	0...100 %	SA	PCS	1	30	A	PCS	3	35	A	PCS	3	65	SA	PCS	1	78		0,3	20s		016	
L 43023 / LICAHLSAHH	PURE AR COLUMN K43001	-26...138 %					A	PCS	3	50	A	PCS	3	100	SA	PCS	1	131	100%	0,3	20s		018	
L 43027 / LICAHLSAHHLL	LIQ. NITR. SEPARATOR B43001	3...151 %	SA	PCS	1	50	A	PCS	3	70	A	PCS	3	110	SA	PCS	1	145	100%	0,3	20s		018	
L 43027-1 / LIC	LEVEL CONTROL VALVE AR CONDENSER	3...151 %																		0,3	20s		018	X from L43027

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L 43033 / LIC	PURE AR PRODUCT TO DUMP	-26...138 %																		0,3	20s		018	X from L43023
L 44007 / LI	LP LAR TANK 1 B44101	0...100 %																					041	
L 44105 / LIAHLSAHHLL	LP LAR TANK 1 B44101	0...100 %	SA	PCS	1	20	A	PCS	3	30	A	PCS	3	70	SA	PCS	1	80					041	
L 44205 / LIAHLSAHHLL	LP LAR TANK 2 B44201	0...100 %	SA	PCS	1	20	A	PCS	3	30	A	PCS	3	70	SA	PCS	1	80					042	
L 44207 / LI	LP LAR TANK 2 B44201	0...100 %																					042	
L 48015 / LI	HP LAR TANK B48001	0...100 %																					044	
L 48020 / LIAHLSAHHLL	HP LAR TANK B48001	0...100 %	SA	PCS	1	20	A	PCS	3	30	A	PCS	3	70	SA	PCS	1	80					044	

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L 62005 / LIAHLZAHHSALL	LOX TANK B62001	0...100 %	SA	PCS		3	A	PCS		5	A	PCS		95	ZA	S		97,5					032	
L 62006 / LAHZAHH	OVERFLOW LOX TANK BL62001	94,37...100 %									A	PCS	3	95	ZA	S	1	98					032	
L 64030 / LZAL	WATER BATH VAPORIZER GOX	mm																					034	
L 72005 / LIAHLZAHHSALL	LIN TANK B72001	0...100 %	SA	PCS	1	3	A	PCS	3	5	A	PCS	3	95	ZA	S	1	97,5					035	
L 72006 / LAHZAHH	OVERFLOW LIN TANK B72001	93,6...100 %									A	PCS	3	95	ZA	S	1	98					035	
L 73002 / LI	MP LIN TANK B73001	0...100 %																					038	Local indicator
L 73007 / LIAHLSAHHLL	MP LIN TANK B73001	0...100 %	SA	PCS	1	10	A	PCS	3	50	A	PCS	3	75	SA	PCS	1	80					038	

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L 73030 / LZAL	WATER BATH VAPORIZER GAN	mm																					039	
L 73130 / LSAH	WATER BATH NAT. GAS VAP.	mm																					040	
L 73131 / LZAL	WATER BATH NAT. GAS VAP.	mm																					040	
L 73132 / LZALL	WATER BATH NAT. GAS VAP.	mm																					040	
P 11007 / PI	AIR CHARGE 1ST STAGE MAC	-1,0...+0,5 bar																					001	
P 11016 / PI	AIR BEHIND INTERCOOLER 1ST STAGE MAC	0...2,5 bar																					001	
P 11026 / PI	AIR BEHIND INTERCOOLER 2ST STAGE MAC	0...2,5 bar																					001	

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P 11036 / PI	AIR BEHIND INTERCOOLER 3RD STAGE MAC	0...8 bar																					001	
P 11041 / PICAL	AIR DISCHARGE 4TH STAGE MAC	0...8 bar					A	PCS	3	4										0,6	50s		001	
P 11505 / PI	COOLING WATER CHARGE MAC	0...10 bar					-	F	-	3													001	local indicator
P 11590 / PI	COOLING WATER DISCHARGE MAC	0...10 bar																					001	local indicator
P 11747 / PIALSALL	LUBE OIL BEARINGS MAC	0...2,5 bar	SA	PCS	1	0,8	A	PCS	3	1,2													027	
P 11752 / PI	SEAL GAS MAC	0...6 bar																					027	local indicator
P 11754 / PIAHL	SEAL GAS MAC	bar																					027	

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P 11754	SEAL CHAMBER PRESSURE	0...50 mbar					A	PCS	3	8													027	
PIAL																								
P 11840	LUBE OIL MAC	0...6 bar					-	F	-	1,2													027	local indicator
PI																								
P 11854	LUBE OIL MAC	0...2,5 bar					A	PCS	3	1,2													027	
PIAL																								
P 13120	COOLING WATER TO DC/AC	0...10 bar																					002	local indicator
PI																								
P 13220	COOLING WATER TO DC/AC	0...16 bar																					002	local indicator
PI																								
P 14120	CHILLED WATER TO DC/AC	0...16 bar																					003	local indicator
PI																								
P 14220	CHILLED WATER TO DC/AC	0...16 bar																					003	local indicator
PI																								

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P 15010 / PIAL	AIR INLET MOL SIEVE	0...6 bar					A	PCS	3	4													004	
P 15012 / PISHL	ADSORBER A15001	0...6 bar					S	PCS	3	0,3	S	PCS	3	4									004	
P 15022 / PISHL	ADSORBER A15002	0...6 bar					S	PCS	3	0,3	S	PCS	3	4									004	
P 15035 / PIALSALL	AIR BEHIND MOL SIEVE	0...6 bar	SA	PCS	1	3	A	PCS	3	4													004	
P 15037 / PICAHSAHH	AIR TO REGENERATIO N GAS HEATER	0...400 mbar									SA	PCS	3	200	SA	PCS	1	350		0,4	30s		004	
P 15041 / PICAHL	WN2 TO REG. GAS HEATER	0...450 mbar					A	PCS	3	50	A	PCS	3	300						0,8	30s		005 / 003	
P 16007 / PICAHLSAHHLL	CHARGE PRESSURE BAC	0...7 bar	SA	PCS	1	1,5	A	PCS	3	4	A	PCS	3	5	SA	PCS	1	5,4		1,0	30s		006	

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P 16015 / PI	AIR BEHIND INTERCOOLER 1ST STAGE BAC	0...15 bar																					006	
P 16025 / PI	AIR BEHIND INTERCOOLER 2ND STAGE BAC	0...25 bar																					006	
P 16035 / PI	AIR BEHIND INTERCOOLER 3RD STAGE BAC	0...50 bar																					006	
P 16045-1 / PICAHSAHH	AIR DISCHARGE INTERCOOLER 4TH STAGE	0...70 bar									A	PCS	3	59	SA	PCS	1	61					006	
P 16073 / PISAHLALL	HP-AIR FROM BAC	-1...100 bar	SA	PCS	1	25	A	PCS	3	50	A	PCS	3	60									006	
P 16505 / PI	COOLING WATER BAC	0...10 bar					-	F	-	3													006	local indicator
P 16512 / PI	COOLING WATER BEHIND VW16001 BAC	0...10 bar																					006	local indicator

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P 16522 / PI	COOLING WATER BEHIND VW16002	0...10 bar																					006	local indicator
P 16532 / PI	COOLING WATER BEHIND VW16003	0...10 bar																					006	local indicator
P 16542 / PI	COOLING WATER BEHIND VW16004	0...10 bar																					006	local indicator
P 16590 / PI	COOLING WATER RETURN BAC	0...10 bar																					006	local indicator
P 16623 / PI	LUBE OIL P16830 BAC	bar																					028	local indicator
P 16751 / PIAL	SEAL GAS BAC	0...250 mbar					A	PCS	3	70													028	
P 16752 / PI	SEAL GAS BAC	0...1,4 bar					-	A	-	0,4													028	local indicator

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P 16824 / PI	LUBE OIL P16820 BAC	0... bar					-	F	-	2													028	local indicator
P 16854 / PISAL	LUBE OIL BAC	0...4 bar	SA	PCS	1	1,6	A	PCS	3	2													028	
P 16855 / PISAL	LUBE OIL BAC	0...4 bar					A	PCS	3	1,8													028	
P 16861 / PI	LUBE OIL HEADER	0... bar					-	F	-	2													028	local indicator
P 16862 / PI	LUBE OIL SUPPLY	0... bar					-	F	-	2													028	local indicator
P 16867 / PI	LUBE OIL MAIN MOTOR BAC	0...6 bar					-	F	-	2													028	local indicator
P 16868 / PI	LUBE OIL MAIN MOTOR BAC	0...6 bar					-	F	-	2													028	local indicator

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P 20001 / PICAHL	HP-GAN OUTLET COLDBOX	0...30 bar					A	PCS	3	18	A	PCS	3	22									010	
P 20003 / PI	HP-GAN TO CUSTOMER	0...30 bar																					010	
P 20005 / PICAL	LP-GAN OUTLET COLDBOX	0...250 mbar					A	PCS	3	50													010	
P 20011 / PICAHL	GOX OUTLET COLDBOX	0...40 bar					A	PCS	3	25	A	PCS	3	29									010	
P 20013 / PI	GOX TO CUSTOMER	0...40 bar																					010	
P 20015 / PI	GOX TO CUSTOMER 1	0...40 bar																					010	
P 20016 / PI	GOX TO CUSTOMER 2	0...40 bar																					010	

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P 21002 / PISHL	HP-COLUMN TOP	0...6 bar					S	PCS	3	3,8	S	PCS	3	5,5									014	
P 22001 / PIAH	LP-COLUMN BOTTOM	0...600 mbar									A	PCS	3	500									013	
P 24101 / PISAH	AIR TO EXPANDER TURBINE 1	0...70 bar									A	PCS	3	58									007	
P 24102 / PIAHSHH	AIR OUTLET EXPANDER TURBINE 1	0...10 bar									A	PCS	3	2	S	PCS	1	5,5					007	H for deriming
P 24107 / PIAH	AIR INLET EXPANDER TURBINE 1	0...70 bar									A	PCS	3	2									007	H for deriming
P 24108 / PI	AIR INLET EXPANDER TURBINE 1	0...100 bar									-	F	-	60									007	local indicator
P 24110 / PI	AIR OUTLET EXPANDER TURBINE 1	0...100 bar									-	F	-	1	-	F	-	5,5					007	local indicator

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P 24140 / PI	SEAL GAS EXPANDER TURBINE 1	0...40 bar					-	F	-	4													029	local indicator
P 24144 / PIALSALL	SEAL GAS EXPANDER TURBINE 1	0...25 bar	SA	PCS	1	1,0 20,7	A	PCS	3	2,0 21,2													029	
P 24145 / PI	BACK PRESSURE SEAL GAS	0...10 bar				see PLL24145	-	F	-	see PL24145													029	local indicator
P 24169 / PI	LUBE OIL EXPANDER TURBINE 1	0...6 bar	-	F	-	see PCS	-	F	-	see PCS													029	local indicator
P 24169 / PISALSALL	LUBE OIL EXPANDER TURBINE 1	0...6 bar	SA	PCS	1	1,8	A	PCS	3	2,1													029	
P 24201 / PISAH	AIR TO EXPANDER TURBINE 2	0...70 bar									A	PCS	3	58									008	
P 24202 / PIAHSHH	AIR OUTLET EXPANDER TURBINE 2	0...10 bar									A	PCS	3	2	S	PCS	1	5,5					008	H for deriming

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P 24207 / PIAH	AIR INLET EXPANDER TURBINE 2	0...70 bar									A	PCS	3	2									008	H for deriming
P 24208 / PI	AIR INLET EXPANDER TURBINE 2	0...100 bar									-	F	-	60									008	local indicator
P 24210 / PI	AIR OUTLET EXPANDER TURBINE 1	0...10 bar									-	A	-	1	-	A	-	5,5					007	local indicator
P 24240 / PI	SEAL GAS EXPANDER TURBINE 2	0...10 bar					-	F	-	4													030	local indicator
P 24244 / PIALSALL	SEAL GAS EXPANDER TURBINE 2	0...25 bar	SA	PCS	1	1,0 20,7	A	PCS	3	2,0 21,2													030	
P 24245 / PI	BACK PRESSURE SEAL GAS	0...10 bar																					030	local indicator
P 24269 / PISALSALL	LUBE OIL EXPANDER TURBINE 2	0...6 bar	SA	PCS	1	1,8	A	PCS	3	2,1													030	

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Annotation on column "Hook Up": (FP*) = Frost Protection recommended

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P 24269 / PI	LUBE OIL EXPANDER TURBINE 2	0...6 bar	-	F	-	see PCS	-	F	-	see PCS													030	local indicator
P 40003 / PICAL	CAR COLUMN C40002	0...600 mbar					A	PCS	3	50									175				017 / 016	
P 40007 / PI	LOX BOILER TOP	0...500 mbar																					017	
P 40130 / PI	CHARGE PRESSURE P40100	0...6 bar																					016	local indicator
P 40170 / PIAHLSAHHLL	DISCHARGE CLOX PUMP P40100	0...10 bar	SA	PCS	1	3,5	A	PCS	3	4,0	A	PCS	3	7,0	SA	PCS	1	8					016	
P 43022 / PICAHL	PURE AR COLUMN K43001 TOP	0...1000 mbar					A	PCS	3	50	A	PCS	3	900									018	
P 43028 / PICAHL	LIQ. NITR. SEPARATOR B43001	0...2000 mbar					A	PCS	3	1000	A	PCS	3	1900									018	

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P 44057 / PI	END PRESSURE P44001	0...10 bar																					042	local indicator
P 44072 / PI	PURGE GAS TO P44001	0...6 bar																					042	local indicator
P 44105 / PICAHLSAHHLL	LP LAR TANK 1 B44001	0...6 bar	SA	PCS	1	0,2	A	PCS	3	0,3	A	PCS	3	4	SA	PCS	1	4,5					041	
P 44106 / PSH	LP LAR TANK 1 B44001	0...6 bar																					041	
P 44107 / PI	LP LAR TANK 1 B44001	0...6 bar	-	F	-	0,2	-	F	-	0,3	-	F	-	4	-	F	-	4,5					041	local indicator
P 44205 / PICAHSAHHLL	LP LAR TANK 2 B44201	0...6 bar	SA	PCS	1	0,2	A	PCS	3	0,3	A	PCS	3	4	SA	PCS	1	4,5					042	
P 44207 / PI	LP LAR TANK 2 B44201	0...6 bar	-	F	-	0,2	-	F	-	0,3	-	F	-	4	-	F	-	4,5					042	local indicator

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P 48004 / PSAH	HP LAR TANK B48001	0...40 bar									SA	S	1										044	
P 48005 / PICAHSAHHLL	HP LAR TANK B48001	0...40 bar	SA	PCS	1	0,2	A	PCS	3	0,3	A	PCS	3	30	SA	PCS	1	35					044	
P 48015 / PI	HP LAR TANK B48001	0...60 bar	-	F	-	0,2	-	F	-	0,3	-	F	-	30	-	F	-	35					044	local indicator
P 48050 / PIAHLSAHHLL	END PRESSURE LAR PUMP P48001	0...40 bar	SA	PCS	1	15	A	PCS	3	20	A	PCS	3	30	SA	PCS	1	35					043	
P 48080 / PIC	SEAL GAS P48001	bar																					043	
P 49020 / PICAL	HP-GAR TO CUSTOMER	0...40 bar					A	PCS	3														044	
P 49021 / PI	HP-GAR DISCHARGE EVAPORIZERS	0...40 bar																					044	local indicator

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P 61130 / PI	CHARGE PRESSURE P61100	0...6 bar																					012	local indicator
P 61170 / PICAHLSAHHLL	DISCHARGE LOX PUMP P61100	0...40 bar	SA	PCS	1	15	A	PCS	3	26	A	PCS	3	30	SA	PCS	1	32					012	
P 61230 / PI	CHARGE PRESSURE P61200	0...6 bar																					012	local indicator
P 61270 / PICAHLSAHHLL	DISCHARGE LOX PUMP P61200	0...40 bar	SA	PCS	1	15	A	PCS	3	26	A	PCS	3	30	SA	PCS	1	32					012	
P 62004 / PIC	PRESSURIZIATION LOX TANK B62001	bar																	30	1	30s		032	
P 62005 / PICAHLSAHHLL	LOX TANK B62001 BLOW OUT	-10...+250 mbar	A	PCS	1	5	A	PCS	3	10	A	PCS	3	160	SA	PCS	1	180	50	4	45s		032	PIC62004, SP=30, KP=1, Tn=30s
P 62006 / PSAHH	LOX TANK BL62001	0...400 mbar													SA	F	1	180					032	

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P 62011 / PI	END PRESSURE LOX PUMP P62001	0...10 bar					-	F	-	4													032	local indicator
P 62012 / PISAL	END PRESSURE LOX PUMP P62001	0...10 bar					SA	PCS	3	4													032	
P 62032 / PI	TANK SHELL B62001	0...25 mbar																					032	local indicator
P 62170 / PI	O2 SEAL GAS P62001	0...0,6 bar																					032	local indicator
P 62171 / PIC	O2 SEAL GAS P62001	bar																					032	
P 63033 / PIC	END PRESSURE LOX PUMP P63001	0...6 bar																					032	
P 64050 / PICAHSAHH	GOX BEHIND WATER BATH VAPORIZER	0...40 bar									A	PCS	3	30	A	PCS	1	38	25	0,7	30s		034	

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P 64080 / PIALSALL	STEAM TO WATER BAD VAPORIZER GOX	0...25 bar	SA	PCS	1	7	A	PCS	3	10													034	
P 64081 / PI	STEAM TO W64001	0...25 bar																					034	local indicator
P 64101 / PI	LOX TO P64101	0...6 bar																					033	local indicator
P 64150 / PICAHLAHHLL	END PRESSURE LOX PUMP P64101	0...40 bar	SA	PCS	1	20	A	PCS	3	25	A	PCS	3	32	A	PCS	1	35	29	0,7	15s		033	
P 64170 / PI	O2 SEAL GAS P64101	bar																					033	local indicator
P 64171 / PIC	O2 SEAL GAS P64101	bar																					033	
P 64201 / PI	LOX TO P64201	0...6 bar																					033	local indicator

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P 64250 / PICAHLAHHLL	END PRESSURE LOX PUMP P64201	0...40 bar	SA	PCS	1	20	A	PCS	3	25	A	PCS	3	32	A	PCS	1	35	29	0,7	15s		033	
P 64270 / PI	O2 SEAL GAS P64201	bar																					033	local indicator
P 64271 / PIC	O2 SEAL GAS P64201	bar																					033	
P 70001 / PIAHLSAHH	INLET GAN COMPRESSOR 1	0...250 mbar					A	PCS	3	50	A	PCS	1	50 ??	SA	PCS	3	100					019	
P 70007 / PIAHSAHH	INLET GAN COMPRESSOR 1	0...2 bar									A	PCS	3	1,05	SA	PCS	1	1,10					019	
P 70015 / PI	GAN BEH. COOLER 1ST STAGE	0...2 bar																					019	
P 70025 / PI	GAN BEH. COOLER 2ND STAGE	0...4 bar																					019	

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P 70031 / PISAHSAHH	GAN BEH. 3RD STAGE	0...10 Bar									A	PCS	3		SA	PCS	1						019	
P 70035 / PI	GAN BEH. COOLER 3RD STAGE	0...10 bar																					019	
P 70036 / PI	GAN DISCHARGE GAN COMPR. 1	bar																					019	
P 70041 / PICAH	MP-GAN TO CUSTOMER	0...10 bar									A	PCS	3										020	
P 70753 / PIAL	SEAL GAS N2 COMP.1	bar																					021	
P 70854 / PISALSALL	LUBE OIL GAN COMP. 1	0...4 bar	SA	PCS	1	1,0	A	PCS	3	1,4													021	
P 70855 / PI	LUBE OIL GAN COMP. 1	0...6 bar	-	F	-	1	-	F	-	1,4													021	local indicator

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P 70867 / PI	LUBE OIL MAIN MOTOR GAN COMP. 1	0...6 bar	-	F	-	1	-	F	-	1,4													021	local indicator
P 70868 / PI	LUBE OIL MAIN MOTOR GAN COMP. 1	0...6 bar	-	F	-	1	-	F	-	1,4													021	local indicator
P 71130 / PI	CHARGE PRESSURE P71100	0...6 bar																					015	local indicator
P 71170 / PICAHLSAHHLL	DISCHARGE LIN PUMP P71100	0...40 bar	SA	PCS	1	10	A	PCS	3	19	A	PCS	3	23	SA	PCS	1	25					015	
P 71230 / PI	CHARGE PRESSURE P71200	0...6 bar																					015	local indicator
P 71270 / PICAHLSAHHLL	DISCHARGE LIN PUMP P71200	0...40 bar	SA	PCS	1	10	A	PCS	3	19	A	PCS	3	23	SA	PCS	1	25					015	
P 72005 / PICAHLSAHHLL	LIN TANK B72001 BLOW OUT	-10...+250 mbar	A	PCS	1	5	A	PCS	3	10	A	PCS	3	160	S	PCS	1	180	50	4	30s		035	

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			threshold			threshold			threshold			threshold								
P 72006	LIN TANK B72001	0...400 mbar										S	F	1					035	
PSAHH												180								
P 72011	END PRESSURE LIN PUMP P72001	0...10 bar				-	F	-											035	local indicator
PI						4														
P 72012	END PRESSURE LIN PUMP P72001	0...10 bar				SA	PCS	3											035	
PISAL						4														
P 72032	TANK SHELL B72001	0...15 mbar																	035	local indicator
PI																				
P 73002	REFILL GAN RESERVOIR	0...25 bar				SA	PCS	1											038	
PISAL						10,5														
P 73002	MP LIN TANK B73001	0...25 bar				-	F	-	-	F	-	-	F	-					038	local indicator
PI						9			13			14								
P 73005	MP LIN TANK B73001 BLOW OUT	bar													9,5	3	20s		038	
PIC																				

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P 73006 / PSAH	MP LIN TANK B73001	0...25 bar									SA	F	3	14									038	
P 73007 / PISAHL	HP-GAN RESERVOIR B73002	0...25 bar					S	PCS	3	11	S	PCS	3	20									038	
P 73009 / PI	HP-GAN RESERVOIR B73002	0...25 bar					-	F	-	11	-	F	-	20									038	local indicator
P 73015 / PICAHLSAHH	MP LIN TANK B73001	0...25 bar					A	PCS	3	7	A	PCS	3	13	SA	PCS	1	14	7,5	2	45s		038	PIC73005, w=9,5, Kp=2, Tn=20s
P 73050 / PICAH	GAN BEHIND WATER BATH VAPORIZER	0...25 bar									A	H	3	10					5,8	1,9	30s		039	
P 73080 / PIALSALL	STEAM TO WATER BATH VAPORIZER GAN	0...25 bar	SA	PCS	1	7	A	PCS	3	11													039	
P 73081 / PI	STEAM TO WATER BATH VAPORIZER GAN	0...25 bar																					039	local indicator

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P 73101 / PI	LIN TO P73101	0...6 bar																					037	local indicator
P 73150 / PICAHLSAHHLL	END PRESSURE LIN PUMP P73101	0...25 bar	SA	PCS	1	4	A	PCS	3	6	A	PCS	3	8	SA	PCS	1	15	25	1,5	20s		037	
P 73158 / PICAHSAHH	GAN BEHIND W73101	0...25 bar									A	PCS	3	6	SA	PCS	1	7	5,8	2,5	30s		040	
P 73201 / PI	LIN TO P73201	0...6 bar																					037	local indicator
P 73250 / PICAHLSAHHLL	END PRESSURE LIN PUMP P73201	0...25 bar	SA	PCS	1	4	A	PCS	3	6	A	PCS	3	8	SA	PCS	1	15	25	3	20s		037	
P 74090 / PICSAHL	OUTLET PRESSURE HP-GAN	0...40 bar					A	PCS	3	10,5	A	PCS	3	27					15	3,5	25s		036	
P 74101 / PI	LIN TO P74101	0...6 bar																					036	local indicator

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P 74150 / PICAHLSAHHLL	END PRESSURE LIN PUMP P74101	0...40 bar	SA	PCS	1	10	A	PCS	3	20	A	PCS	3	24	SA	PCS	1	25	22	1	30s		036	
P 74170 / PI	N2 SEAL GAS P74101	bar																					036	local indicator
P 74171 / PIC	N2 SEAL GAS P74101	bar																					036	
P 74201 / PI	LIN TO P74201	0...6 bar																					036	local indicator
P 74250 / PIAHLSAHHLL	END PRESSURE LIN PUMP P74201	0...40 bar	SA	PCS	1	10	A	PCS	3	20	A	PCS	3	24	SA	PCS	1	25	22	1	30s		036	
P 74270 / PI	N2 SEAL GAS P74201	bar																					036	local indicator
P 74271 / PIC	N2 SEAL GAS P74201	bar																					036	

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0	21.12.2004	Frohn		Initial version

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AIR LIQUIDE

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P 77001 / PIAHLSAHH	INLET GAN COMPRESSOR 2	0...250 mbar					A	PCS	3	50	A	PCS	3	180	SA	PCS	1	240					020	
P 77007 / PI	INLET GAN COMPRESSOR 2	0...2 bar																					020	
P 77015 / PI	GAN BEH. COOLER 1ST STAGE	0...2 bar																					020	
P 77025 / PI	GAN BEH. COOLER 2ND STAGE	0...4 bar																					020	
P 77031 / PISAHSAHH	GAN BEH. 3RD STAGE	0...10 bar																					020	
P 77035 / PI	GAN BEH. COOLER 3RD STAGE	bar																					020	
P 77036 / PI	GAN DISCHARGE GAN COMPR. 2	bar																					020	

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P 77753 / PIAL	SEAL GAS N2 COMP.2	bar																					022	
P 77854 / PISALSALL	LUBE OIL GAN COMP. 2	0...4 bar	SA	PCS	1	1,0	A	PCS	3	1,4													022	
P 77855 / PI	LUBE OIL GAN COMP. 2	0...6 bar	-	F	-	1	-	F	-	1,4													022	local indicator
P 77867 / PI	LUBE OIL MAIN MOTOR GAN COMP. 2	0...6 bar	-	F	-	1	-	F	-	1,4													022	local indicator
P 77868 / PI	LUBE OIL MAIN MOTOR GAN COMP. 2	0...6 bar	-	F	-	1	-	F	-	1,4													022	local indicator
P 80001 / PIAL	COOLING WATER	0...6 bar					A	PCS	3	3													023	
P 81010 / PIAL	PURGE GAS HEADER	0...10 bar					A	PCS	3	4													025	

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P 82010 / PIAL	INSTRUMENT GAS HEADER	0...10 bar					A	PCS	3	4													025	
P 82022 / PI	GAN TO INSTRUMENT AIR	0...6 bar					-	F	-	3,5													025	local indicator
P 84010 / PIAHL	STEAM FROM CUSTOMER	0...25 bar					A	PCS	3	7	A	PCS	3	20									031	
P 87012 / PIAL	PURGEGAS TO COLDBOX	0...400 mbar					A	PCS	3	100													024	
P 87025 / PIAHL	TOP HE-BOX	-10...+25 mbar					A	PCS	3	+1	A	PCS	3	7									024	
P 87065 / PIAHL	TOP COLD-BOX	-10...+25 mbar					A	PCS	3	+1	A	PCS	3	7									024	
PD 10000 / PDIAHSAHH	AIR FILTER MAC	0...60 mbar									A	PCS	3	45	SA	PCS	1	50					001	

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PD 11812 / PDIAL	VACUUM MONITOR OIL CONTAINER MAC	mbar																					027	
PD 11846 / PDIAH	OIL FILTERS MAC	mbar																					027	local indicator
PD 13004 / PDIAHSAHH	DIFF.-PRESSURE DC/AC	0...60 mbar									A	PCS	3	45	SA	PCS	1	55					002	
PD 13110 / PDI	CW FILTER F13110	0...1,6 bar																					002	local indicator
PD 13210 / PDI	CW FILTER F13210	0...1,6 bar																					002	local indicator
PD 14010 / PDI	CW FILTER F14010	0...1,6 bar																					003	local indicator
PD 14110 / PDI	CW FILTER F14110	0...1,6 bar																					003	local indicator

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PD 14210 / PDI	CW FILTER F14210	0...1,6 bar																					003	local indicator
PD 15031 / PDIAH	AIR FILTER BEHIND MOL SIEVE	0...150 mbar									A	PCS	3	50									004	
PD 16812 / PDIAL	VACUUM MONITOR OIL CONTAINER BAC	-15...15 mbar					A	PCS	3	-5													028	
PD 16846 / PDIAH	OIL FILTERS BAC	0...1,6 bar									A	PCS	3	0,8									028	local indicator
PD 20012 / PDI	GOX BARRIER K20012	0...40 bar																					010	local indicator
PD 20015 / PDSH	DIFF.-PRESSURE UK20013	0...40 bar									S	F	3	2									010	
PD 20016 / PDSH	DIFF.-PRESSURE UK20014	0...40 bar									S	F	3	2									010	

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PD 21003 / PDIAH	DIFF. PRESS. HP-COLUMN	0...300 mbar									A	PCS	3	200									014	
PD 22001 / PDIAH	DIFF. PRESS. LP-COLUMN	0...100 mbar									A	PCS	3	100									013	
PD 24141 / PDIALSALL	DIFF.-PRESS SEAL GAS TURBINE 1	0...2000 mbar	SA	PCS	1	250	A	PCS	3	280													029	
PD 24169 / PDIAH	DIFF.-PRESS OILFILTER	bar																					029	local indicator
PD 24241 / PDIALSALL	DIFF.-PRESS SEAL GAS TURBINE 2	0...2000 mbar	SA	PCS	1	250	A	PCS	3	280													030	
PD 24269 / PDIAH	DIFF.-PRESS OILFILTER AF24268	bar																					030	local indicator
PD 40003 / PDIAH	CAR COLUMN K40002	0...150 mbar									A	PCS	3	60									017	

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PD 40053 / PDIAH	DIFF. PRESS. CAR COLUMN K40001	0...150 mbar									A	PCS	3	60									016	
PD 43021 / PDICAH	DIFF. PRESS. PURE AR COLUMN C43001	0...300 mbar									A	PCS	3	30									018	
PD 64060 / PDI	GOX PRODUCT	0...3 bar																					034	
PD 70846 / PDIAH	OIL FILTERS GAN COMP. 1	0...4 bar									A	F	3	1,8									021	local indicator
PD 77846 / PDIAH	OIL FILTERS GAN COMP. 2	0...4 bar									A	F	3	1,8									022	local indicator
Q 15038 / QIAHAHH	PPM CO2 IN AIR BEHIND MOL SIEVE	0...5 ppm									A	PCS	3	1	SA	PCS	1	3					004	
Q 15038_2 / QIAHAHH	PPM CO2 IN AIR BEHIND MOL SIEVE	0...50 ppm									A	PCS	3	1	SA	PCS	1	3					004	

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Q 15043 / QIAHAHH	PPM H2O IN REGENERATION GAS	0...10 ppm									A	PCS	3	1	A	PCS	1	3					005	
Q 16055 / QIAHAHH	PPM H2O IN HPAIR	0...10 ppm									A	PCS	3	1	A	PCS	1	3					006	
Q 20001 / QIAHSAHH	PPM O2 IN HP-GAN OUTLET COLDBOX	0...10 ppm									A	PCS	3	5	SA	PCS	1	10					010	
Q 20001_2 / QIAHSAHH	PPM O2 IN HP-GAN OUTLET COLDBOX	0...1000 ppm									A	PCS	3	5	SA	PCS	1	10					010	
Q 20005 / QIAHSAHH	PPM O2 IN LP-GAN OUTLET COLDBOX	0...10 ppm									A	PCS	3	5	SA	PCS	1	10					010	
Q 20005_2 / QIAHSAHH	PPM O2 IN LP-GAN OUTLET COLDBOX	0...1000 ppm									A	PCS	3	5	SA	PCS	1	10					010	
Q 20011 / QIALSALL	% O2 IN GOX OUTLET COLDBOX	98...100 %	SA	PCS	1	99,5	A	PCS	3	99,6													010	

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Q 20011_2 / QIALSALL	% O2 IN GOX OUTLET COLDBOX	0...100 %	SA	PCS	1	99,5	S	PCS	3	99,6													010	
Q 20012 / QIAHSAHH	PPM N2 IN GOX OUTLET COLDBOX	0...100 ppm									A	PCS	3	0,5	SA	PCS	1	1					010	
Q 20012_2 / QIAHSAHH	PPM N2 IN GOX OUTLET COLDBOX	0...1000 ppm									A	PCS	3	0,5	SA	PCS	1	1					010	
Q 20029 / QIAH	%O2 IN WASTE GAS EX MHE	0...5 %									A	PCS	3	5									009	
Q 20029_2 / QIAH	%O2 IN WASTE GAS EX MHE	0...100 %									A	PCS	3	5									009	
Q 21004 / QICAH	% O2 IN HP-COLUMN	0...100 %									A	PCS	3	5									014	
Q 21004_2 / QICAH	% O2 IN HP-COLUMN	0...100 %									A	PCS	3	5									014	

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Q 22011_T TIC	ANALYTIC VAPORIZER	0...50 °C																					014	
Q 23013 QIAHSAHH	PPM O2 IN LIN TO STORAGE	0...10 ppm									A	PCS	3	5	SA	PCS	1	10					011	
Q 23013_2 QIAHSAHH	PPM O2 IN LIN TO STORAGE	0...1000 ppm									A	PCS	3	5	SA	PCS	1	10					011	
Q 23013_T TIC	ANALYTIC VAPORIZER	0...50 °C																					011	
Q 23016 QIALSALL	% O2 IN LOX TO STORAGE	98...100 %	SA	PCS	1	99,5	A	PCS	3	99,6													011	
Q 23016_2 QIALSALL	% O2 IN LOX TO STORAGE	0...100 %	SA	PCS	1	99,5	A	PCS	3	99,6													011	
Q 23016_T TIC	ANALYTIC VAPORIZER	0...50 °C																					011	

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Q 40011 / QICAHL	% O2 IN SIDEARMLIQUID	80...100 %					A	PCS	3	85	A	PCS	3	95									016	
Q 40011_2 / QICAHL	% O2 IN SIDEARMLIQUID	0...100 %					A	PCS	3	85	A	PCS	3	95					90%				016	
Q 40012 / QIAHSAHH	PPM O2 IN CAR COLUMN K40002	0...10 ppm									A	PCS	3	1,5	SA	PCS	1	2					017	
Q 40012_2 / QIAHSAHH	PPM O2 IN CAR COLUMN K40002	0...1000 ppm									A	PCS	3	1,5	SA	PCS	1	2					017	
Q 40014_T / TIC	ANALYTIC VAPORIZER	0...50 °C																					017	
Q 43033 / QIAHSAHH	PPM O2 IN LAR PRODUCT	0...10 ppm									A	PCS	3	1,5	SA	PCS	1	2					018	
Q 43033_2 / QIAHSAHH	PPM O2 IN LAR PRODUCT	0...1000 ppm									A	PCS	3	1,5	SA	PCS	1	2					018	

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Q 43033_T / TIC	ANALYTIC VAPORIZER	0...50 °C																					018	
Q 43034_1 / QI	PPM H2 IN LAR	0...10 vpm																					018	
Q 43034_2 / QIAHSAHH	PPM N2 IN LAR	0...10 ppm									A	PCS	3	4	SA	PCS	1	5					018	
Q 43034_3 / QIAH	PPM CO2 IN LAR	0...5 ppm																					018	
Q 43034_4 / QIAHSAHH	PPM CO IN LAR	0...2 ppm									A	PCS	3	0,8	SA	PCS	1	1					018	
Q 43034_5 / QIAHSAHH	PPM NMHC IN LAR	0...2 ppm									A	PCS	3	0,4	A	PCS	1	0,5					018	
Q 43034_6 / QI	PPM CH4 IN LAR	0...2 ppm																					018	

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Q 64051 / QIALSALL	% O2 IN GOX OUTLET W64001	98...100 %	SA	PCS	1	99,5	A	PCS	3	99,6													034	
Q 64051_2 / QI	% O2 IN GOX OUTLET W64001	0...100 %																					034	
Q 74090 / QIAHSAHH	PPM O2 IN MP GAN	0...10 ppm									A	PCS	3	5	A	PCS	1	10					036	
Q 74090_2 / QI	PPM O2 IN MP GAN	0...1000 ppm																					036	
S 24124 / SISAHLSAHHLL	SPEED EXPANDER TURBINE 1	0...50000 rpm	SA	PCS	1	500	SA	PCS	3	50	SA	PCS	3	36275	SA	PCS	1	38000					029	HARD SWITCH: SHH = 37964
S 24224 / SISAHLSAHHLL	SPEED EXPANDER TURBINE 2	0...50000 rpm/min	SA	PCS	1	500	A	PCS	3	50	A	PCS	3	36275	A	PCS	1	38000					030	HARD SWITCH: SHH = 37964
S 73101 / SISL	SPEED LIN BACKUP PUMP P73100	0...84 Hz					S	PCS	4	64													037	

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S 73201 / SISL	SPEED LIN BACKUP PUMP P73200	0...84 HZ					S	PCS	4	64													037	
T 11007 / TI	AIR INLET MAC	-30...60 °C																					001	
T 11011 / TIAH	AIR INLET VW11011	0...160 °C									A	PCS	3	100									001	
T 11012 / TIAH	AIR INLET VW11012	0...160 °C									A	PCS	3	100									001	
T 11016 / TIAH	AIR OUTLET VW11011	0...160 °C									A	PCS	3	50									001	
T 11017 / TIAH	AIR OUTLET VW11012	0...160 °C									A	PCS	3	50									001	
T 11021 / TIAH	AIR INLET VW11021	0...160 °C									A	PCS	3	100									001	

Legend: F = local, V = local cabinet , S = control room, PCS = process control system

Annotation on column "Hook Up": (FP*) = Frost Protection recommended

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0	21.12.2004	Frohn		Initial version

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T 11022 / TIAH	AIR INLET VW11022	0...160 °C									A	PCS	3	100									001	
T 11026 / TIAH	AIR OUTLET VW11021	0...160 °C									A	PCS	3	50									001	
T 11027 / TIAH	AIR OUTLET VW11022	0...160 °C									A	PCS	3	50									001	
T 11031 / TIAH	AIR INLET VW11031	0...160 °C									A	PCS	3	100									001	
T 11032 / TIAH	AIR INLET VW11032	0...160 °C									A	PCS	3	100									001	
T 11036 / TIAH	AIR OUTLET VW11031	0...160 °C									A	PCS	3	50									001	
T 11037 / TIAH	AIR OUTLET VW11032	0...160 °C									A	PCS	3	50									001	

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T 11041 / TIAHSAHH	AIR DISCHARGE 4TH STAGE MAC	0...160 °C									A	PCS	3	100	SA	PCS	1	110					001	
T 11505 / TI	COOLING WATER MAC	0...60 °C									-	F	-	35									001	local indicator
T 11515 / TI	COOLING WATER BEHIND VW11011	0...60 °C																					001	local indicator
T 11516 / TI	COOLING WATER BEHIND VW11012	0...60 °C																					001	local indicator
T 11525 / TI	COOLING WATER BEHIND VW11021	0...60 °C																					001	local indicator
T 11526 / TI	COOLING WATER BEHIND VW11022	0...60 °C																					001	local indicator
T 11535 / TI	COOLING WATER BEHIND VW11031	0...60 °C																					001	local indicator

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T 11536 / TI	COOLING WATER BEHIND VW11032	0...60 °C																					001	local indicator
T 11621 / TI	COOLING WATER RETURN MOTOR MAC	0...60 °C																					001	local indicator
T 11632 / TI	COOLING WATER RETURN OIL-COOLER MAC	0...60 °C																					001	local indicator
T 11701 / TIAH	BEARING MAIN MOTOR MAC	0...150 °C									A	PCS	3										027	
T 11703 / TIAH	BEARING MAIN MOTOR MAC	0...150 °C									A	PCS	3										027	
T 11715 / TIAHSAHH	MOTOR WINDING U MAC	0...200 °C									A	PCS	3		SA	PCS	1						027	
T 11718 / TIAHSAHH	MOTOR WINDING V MAC	0...200 °C									A	PCS	3		SA	PCS	1						027	

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			threshold			threshold			threshold			threshold								
T 11721	MOTOR WINDING W MAC	0...200 °C							A	PCS	3	SA	PCS	1					027	
TIAHSAHH																				
T 11730	BEARING MAIN SHAFT MAC	0 .. 160 °C							A	PCS	3	SA	PCS	1					027	
TIAHSAHH									110			120								
T 11733	BEARING MAIN SHAFT MAC	0...160 °C							A	PCS	3	SA	PCS	1					027	
TIAHSAHH									110			120								
T 11735	BEARING MAIN SHAFT MAC	0...160 °C							A	PCS	3	SA	PCS	1					027	
TIAHSAHH									110			120								
T 11737	BEARING MAC	0...160 °C							A	PCS	3	SA	PCS	1					027	
TIAHSAHH									110			120								
T 11740	BEARING MAC	0...160 °C							A	PCS	3	SA	PCS	1					027	
TIAHSAHH									110			120								
T 11743	BEARING MAC	0...160 °C							A	PCS	3	SA	PCS	1					027	
TIAHSAHH									110			120								

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T 11745 / TIAHSAHH	BEARING MAC	0...160 °C									A	PCS	3	110	SA	PCS	1	120					027	
T 11747 / TIAHSAHH	BEARING MAC	0...160 °C									A	PCS	3	110	SA	PCS	1	120					027	
T 11810 / TCAH	OIL HEATING W11810 MAC	°C																					027	
T 11814 / TIAHLSLL	LUBE OIL TANK MAC	0...120 °C	SA	PCS	1	10	A	PCS	3	28	A	PCS	3	45									027	
T 11854 / TIAHL	LUBE OIL MAC	0...100 °C					A	PCS	3	30	A	PCS	3	50									027	
T 11855 / TI	LUBE OIL MAC	0...60 °C					-	F	-	30	-	F	-	50									027	local indicator
T 12003 / TICAL	CHILLED WATER TO KA12001	0...60 °C					A	PCS	3	5													002 / 003	

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T 12072 / TI	COOLING WATER TO KA12002	0...60 °C																					002	local indicator
T 13005 / TIAHSAHH	AIR BEHIND DC/AC	-30...+50 °C									A	PCS	3	15	SA	PCS	1	20					002	
T 13026 / TIAHL	CHILLED WATER TO DC/AC	-30...+50 °C					A	PCS	3	5	A	PCS	3	14									002	
T 15011 / TIAHLSAHH	REGEN GAS DISCHARGE A15001	0...250 °C					A	PCS	3	30	A	PCS	3	10 ??	SA	PCS	1	100					004	
T 15021 / TIAHLSAHH	REGEN GAS DISCHARGE MS15002	0...250 °C					A	PCS	3	30	A	PCS	3	10 ??	SA	PCS	1	100					004	
T 15035 / TIAHSAHH	AIR BEHIND MOL SIEVE	0...100 °C									A	PCS	3	35	SA	PCS	1	65					004	
T 15040 / TZHSAH	REGENERATION GAS HEATER HE15001	0...250 °C									SA	PCS	3	220									005	

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T 15043 / TICAHLSAHH	REGENERATION GAS	0...250 °C					A	PCS	3	180	A	PCS	3	220	SA	PCS	1	250					005	
T 16007 / TIAHLAHH	AIR INLET BAC	0...60 °C									A	PCS	3	50	S	PCS	1	55					006	
T 16011 / TI	AIR BEHIND 1ST STAGE BAC	0...60 °C																					006	
T 16012 / TI	AIR BEHIND 1ST STAGE BAC	0...60 °C																					006	local indicator
T 16015 / TIAHSAHH	AIR BEHIND 1ST STAGE VW16001	0...60 °C									A	PCS	3	45	SA	PCS	1	50					006	
T 16016 / TI	AIR BEHIND 1ST STAGE VW16001	0...60 °C																					006	local indicator
T 16021 / TI	AIR BEHIND 2ND STAGE BAC	0...200 °C																					006	

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T 16022 / TI	AIR BEHIND 2ND STAGE BAC	0...60 °C																					006	local indicator
T 16025 / TIAHSAHH	AIR BEHIND 2ND STAGE VW16002	0...60 °C									A	PCS	3	45	SA	PCS	1	50					006	
T 16026 / TI	AIR BEHIND 2ND STAGE VW16002	0...60 °C																					006	local indicator
T 16031 / TI	AIR BEHIND 3RD STAGE BAC	0...200 °C																					006	
T 16032 / TI	AIR BEHIND 3RD STAGE BAC	0...60 °C																					006	local indicator
T 16035 / TIAHSAHH	AIR BEHIND 3RD STAGE VW16003	0...60 °C									A	PCS	3	45	SA	PCS	1	50					006	
T 16036 / TI	AIR BEHIND 3RD STAGE VW16003	0...60 °C																					006	local indicator

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T 16041 / TI	AIR BEHIND 4TH STAGE BAC	0...200 °C																					006	
T 16042 / TI	AIR BEHIND 4TH STAGE BAC	0...60 °C																					006	local indicator
T 16045 / TIAHSAHH	AIR BEHIND 4TH STAGE VW16004	0...60 °C									A	PCS	3	48	A	PCS	1	53					006	
T 16046 / TI	AIR BEHIND 4TH STAGE VW16004	0...60 °C																					006	local indicator
T 16512 / TI	COOLING WATER BEHIND VW16001	0...60 °C																					006	local indicator
T 16522 / TI	COOLING WATER BEHIND VW16002	0...60 °C																					006	local indicator
T 16532 / TI	COOLING WATER BEHIND VW16003	0...60 °C																					006	local indicator

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T 16542 / TI	COOLING WATER BEHIND VW16004	0...60 °C																					006	local indicator
T 16632 / TI	COLLING WATER BEHIND W16842	0...60 °C																					028	local indicator
T 16701 / TIAHSAHH	BEARING MAIN MOTOR BAC	0...150 °C									A	PCS	3	85	SA	PCS	1	90					028	
T 16703 / TIAHSAHH	BEARING MAIN MOTOR BAC	0...150 °C									A	PCS	3	85	SA	PCS	1	90					028	
T 16715 / TIAHSAHH	MOTOR WINDING U BAC	0...200 °C									A	PCS	3	120	SA	PCS	1	130					028	
T 16718 / TIAHSAHH	MOTOR WINDING V BAC	0...200 °C									A	PCS	3	120	SA	PCS	1	130					028	
T 16721 / TIAHSAHH	MOTOR WINDING W BAC	0...200 °C									A	PCS	3	120	SA	PCS	1	130					028	

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T 16730 / TIAHSAHH	BEARING MAIN SHAFT BAC	0...150 °C									A	PCS	3	105	SA	PCS	1	115					028	
T 16733 / TIAHSAHH	BEARING MAIN SHAFT BAC	0...150 °C									A	PCS	3	105	SA	PCS	1	115					028	
T 16734 / TIAHSAHH	BEARING MAIN SHAFT BAC	0...150 °C									A	PCS	3	105	SA	PCS	1	115					028	
T 16735 / TIAHSAHH	BEARING MAIN SHAFT BAC	0...150 °C									A	PCS	3	105	A	PCS	1	115					028	
T 16736 / TIAHSAHH	BEARING 1ST STAGE BAC	0...150 °C									A	PCS	3	110	SA	PCS	1	115					028	
T 16738 / TIAHSAHH	BEARING 2ND STAGE BAC	0...150 °C									A	PCS	3	110	A	PCS	1	115					028	
T 16740 / TIAHSAHH	BEARING 3RD STAGE BAC	0...150 °C									A	PCS	3	110	SA	PCS	1	115					028	

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T 16743 / TIAHSAHH	BEARING 4TH STAGE BAC	0...150 °C									A	PCS	3	115	SA	PCS	1	125					028	
T 16810 / TCAHSHH	OIL HEATING W16810 BAC	0...100 °C									A	F	3	70	S	F	1	80					028	
T 16812 / TI	LUBE OIL TANK BAC	°C																					028	
T 16813 / TI	LUBE OIL TANK BAC	0...60 °C								see TL16854				see TH16854									028	local indicator
T 16854 / TIAHLSAHH	LUBE OIL BAC	0...100 °C					A	PCS	3	35	A	PCS	3	50	SA	PCS	1	90					028	
T 16855 / TI	LUBE OIL BAC	0...60 °C																					028	local indicator
T 20001 / TIALSLL	HP-GAN OUTLET COLDBOX	-50...+50 °C	SA	PCS	1	-10	A	PCS	3	10													010	

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T 20003 / TI	HP-GAN TO CUSTOMER	-20...+40 °C																					010	
T 20004 / TI	HP-LIN FROM LIN-PUMPS	-200...+50 °C																					009	
T 20005 / TIALSALL	LP-GAN OUTLET COLDBOX	-50...+50 °C	SA	PCS	1	-10	A	PCS	3	10													010	
T 20006 / TI	AIR TO HP-COLUMN C21001	-200...+50 °C																					009	
T 20007 / TI	HP-LOX FROM LOX-PUMPS	-200...+50 °C																					009	
T 20008 / TIC	HP-AIR OUTLET MHE	-200...+50 °C																					009	
T 20009 / TI	WASTE N2 INLET MHE	-200...+50 °C																					009	

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T 20010 / TI	GAN FROM W2301	-200...+50 °C																					009	
T 20011 / TIALSALL	GOX OUTLET COLDBOX	-50...+50 °C	SA	PCS	1	-10	A	PCS	3	10													010	
T 20013 / TI	GOX TO CUSTOMER	-20...+40 °C																					010	
T 20023 / TIAL	LP-GAN OUTLET COLDBOX	-50...+50 °C					A	PCS	3	10													009	
T 20025 / TIALZALL	HP-GAN OUTLET COLDBOX	-50...+50 °C	ZA	S	1	-10	A	PCS	3	10													009	
T 20026 / TIALZALL	HP-GAN OUTLET COLDBOX	-50...+50 °C	ZA	S	1	-10	A	PCS	3	10													009	
T 20027 / TIALZALL	GOX OUTLET COLDBOX	-50...+50 °C	ZA	S	1	-10	A	PCS	3	10													009	

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MEASURING RANGE & LIMIT VALUES

AIR LIQUIDE

Air Liquide AGS GmbH
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Drwg.-No.:

TAG-NO. / FUNCTION	DESIG-NATION	RANGE	LL S/A	LL loc	LL prio	LL threshold	L S/A	L loc	L prio	L threshold	H S/A	H loc	H prio	H threshold	HH S/A	HH loc	HH prio	HH threshold	CONTROLLER SETTINGS W	Kp	Tn	Td	P&I SHEET	REMARKS
T 20028 / TIALZALL	GOX OUTLET COLDBOX	-50...+50 °C	ZA	S	1	-10	A	S	3	10													009	
T 20029 / TIAL	WASTE N2 OUTLET MHE	-50...+50 °C					A	PCs	3	10													009	
T 21006 / TI	LIN TO B21002	-200...+50 °C																					014	
T 23013 / TI	LIN PRODUCT TO STORAGE	-200...+50 °C																					011	
T 23014 / TI	CRUDE LOX BEHIND SUBCOOLER	-200...+50 °C																					011	
T 23015 / TI	LIQUID AIR BEHIND SUBCOOLER	-200...+50 °C																					011	
T 24101 / TIALSLL	AIR TO EXPANDER TURBINE 1	-150...+50 °C	S	PCS	1	-123...-73 *)	A	PCS	3	LL + 5K													007	*) LL = 37,253 * LN(P24101/P24102 + P24101 - P24102) + 26,688 - 273,15

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T 24102	AIR OUTLET EXPANDER TURBINE 1	-200...+50 °C					A	PCS	3	-150...-170 *)													007	*) LL = -0,2332 * P24102^2 + 4,8877 * P24102 + 79,942 - 273,15
TIAL																								
T 24120	BEARING EXPANDER TURBINE 1	-50...+150 °C					A	PCS	3	20	A	PCS	3	100	SA	PCS	1	110					029	
TIAHLSAHH																								
T 24121	BEARING EXPANDER TURBINE 1	-50...+150 °C					A	PCS	3	20	A	PCS	3	100	SA	PCS	1	110					029	
TIAHLSAHH																								
T 24122	BEARING EXPANDER TURBINE 1	-50...+150 °C									A	PCS	3		SA	PCS	1						029	
TIAHSAHH																								
T 24123	BEARING EXPANDER TURBINE 1	-50...+150 °C					A	PCS	3	20	A	PCS	3	100	SA	PCS	1	110					029	
TIAHLSAHH																								
T 24130	COOLING WATER REFLUX TURBINE 1	0...60 °C																					029	local indicator
TI																								
T 24151	OIL BEHIND GEARBOX TURBINE 1	0...100 °C																					029	
TI																								

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T 24160 / TCAHSAHH	OIL HEATING W24160 TURBINE 1	0...100 °C									A	PCS	3	40	SA	PCS	1	80					029	
T 24161 / TAL	OIL CONTAINER EXPANDER TURBINE 1	0...100 °C					A	PCS	3	10													029	
T 24162 / TI	OIL CONTAINER EXPANDER TURBINE 1	0...120 °C																					029	local indicator
T 24168 / TI	OIL BEHIND OILFILTER TURBINE 1	0...120 °C																					029	local indicator
T 24169 / TIAHLSAHHLL	LUBE OIL EXPANDER TURBINE 1	0...100 °C	A	PCS	3	5	A	PCS	3	20	A	PCS	3	52	SA	PCS	1	55					029	
T 24171 / TIAHSAHH	BEARING MOTOR TURBINE 1	0...+150 °C									A	PCS	3	105	SA	PCS	1	115					029	
T 24173 / TIAHSAHH	BEARING MOTOR TURBINE 1	0...+150 °C									A	PCS	3	105	SA	PCS	1	115					029	

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T 24175 / TIAHSAHH	MOTOR WINDING U TURBINE 1	0...+200 °C									A	PCS	3	120	SA	PCS	1	135					029	
T 24176 / TIAHSAHH	MOTOR WINDING V TURBINE 1	0...+200 °C									A	PCS	3	120	SA	PCS	1	135					029	
T 24177 / TIAHSAHH	MOTOR WINDING W TURBINE 1	0...+200 °C									A	PCS	3	120	SA	PCS	1	135					029	
T 24201 / TIALSLL	AIR TO EXPANDER TURBINE 2	-150...+50 °C	S	PCS	1	-123...-73 *)	A	PCS	3	LL + 5K													008	*) LL = 37,253 * LN(P24201/P24202 + P24201 - P24202) + 26,688 - 273,15
T 24202 / TIAL	AIR OUTLET EXPANDER TURBINE 2	-200...+50 °C					A	PCS	3	-180...-170 *)													008	*) LL = -0,2332 * P24202^2 + 4,8877 * P24202 + 79,942 - 273,15
T 24220 / TIAHLSAHH	BEARING EXPANDER TURBINE 2	-50...+150 °C					A	PCS	3	20	A	PCS	3	100	SA	PCS	1	110					030	
T 24221 / TIAHLSAHH	BEARING EXPANDER TURBINE 2	-50...+150 °C					A	PCS	3	20	A	PCS	3	100	SA	PCS	1	110					030	

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T 24222 / TIAHSAHH	BEARING EXPANDER TURBINE 2	-50...+150 °C									A	PCS	3	100	A	PCS	1	110					030	
T 24223 / TIAHLSAHH	BEARING EXPANDER TURBINE 2	0...+150 °C					A	PCS	3	20	A	PCS	3	100	SA	PCS	1	110					030	
T 24230 / TI	COOLING WATER REFLUX TURBINE 2	0...60 °C																					030	local indicator
T 24251 / TIAHLSHH	OIL BEHIND GEARBOX TURBINE 2	0...100 °C					A	PCS	3		A	PCS	3		S	PCS	1						030	
T 24260 / TCAHSAHH	OIL HEATING W24260 TURBINE 2	°C									A	PCS	3	40	SA	PCS	1	80					030	
T 24261 / TIAL	OIL CONTAINER EXPANDER TURBINE 2	0...120 °C					A	PCS	3	10													030	local indicator
T 24262 / TI	OIL CONTAINER EXPANDER TURBINE 2	0...100 °C																					030	

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T 24268 / TI	OIL BEHIND OILFILTER TURBINE 2	0...100 °C																					030	local indicator
T 24269 / TIAHLSAHHLL	LUBE OIL EXPANDER TURBINE 2	0...100 °C	SA	PCS	3	5	A	PCS	3	20	A	PCS	3	52	SA	PCS	1	55					030	
T 24271 / TIAHSAHH	BEARING MOTOR TURBINE 2	0...+150 °C									A	PCS	3	105	SA	PCS	1	115					030	
T 24273 / TIAHSAHH	BEARING MOTOR TURBINE 2	0...+150 °C									A	PCS	3	105	SA	PCS	1	115					030	
T 24275 / TIAHSAHH	MOTOR WINDING U TURBINE 2	0...+200 °C									A	PCS	3	120	SA	PCS	1	135					030	
T 24276 / TIAHSAHH	MOTOR WINDING V TURBINE 2	0...+200 °C									A	PCS	3	120	SA	PCS	1	135					030	
T 24277 / TIAHSAHH	MOTOR WINDING W TURBINE 2	0...+200 °C									A	PCS	3	120	SA	PCS	1	135					030	

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T 40009 / TIAH	CR-LOX BEHIND B40001	-200...+50 °C									A	PCS	3	-150									017	
T 40011 / TI	SIDEARMLIQUID FROM LP-COLUMN	-200...+50 °C																					016	
T 40013 / TI	LAR PREPRODUCT DISCHARGE CAR-COLUMN	-200...+50 °C																					017	
T 40014 / TI	LAR BEHIND CONDENSER BL40001	-200...+50 °C																					017	
T 40130 / TISL	COOLING DOWN TEMP. P40100	-200...+50 °C					S	PCS	3	-150													016	
T 40140 / TALSLL	BEARING TEMP. P40100	-100...+50 °C	S	PCS	1	XX	A	PCS	3	XX													016	
T 40141 / TIAHLSHHLL	BEARING TEMP. P40100	-100...+100 °C	S	PCS	1	XX	A	PCS	3	XX	A	PCS	3	XX	S	PCS	1	XX					016	

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T 43034 / TI	LAR PRODUCT TO STORAGE	-200...+50 °C																					018	
T 44104 / TISAL	OVERFLOW LP LAR TANK 1 B44101	-200...+50 °C					SA	PCS	1	-20													041	
T 44204 / TISAL	OVERFLOW LP LAR TANK 2 B44201	-200...+50 °C					SA	PCS	1	-20													042	
T 48004 / TISAL	OVERFLOW HP LAR TANK B48001	-200...+50 °C					SA	PCS	1	-20													044	
T 48050 / TISL	COOL DOWN TEMP. P48001	-200...+50 °C					S	PCS	4	-150													043	
T 49020 / TICALZALL	HP-GAR DISCHARGE EVAPORIZERS	-40...+60 °C	ZA	S	1	-40	A	PCS	3	-20													044	
T 49021 / TIALZLL	HP-GAR DISCHARGE EVAPORIZERS	-40...+60 °C	ZA	S	1	-40	A	PCS	3	-20													044	

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T 61130 / TISL	COOLING DOWN TEMP. P61100	-200...+50 °C					S	PCS	3	-150													012	
T 61140 / TALSLL	BEARING TEMP. P61100	-200...+50 °C	S	PCS	1	-150	A	PCS	3	-130													012	
T 61141 / TIAHLSHHLL	BEARING TEMP. P61100	-100...+150 °C	S	PCS	1	-40	A	PCS	3	-30	A	PCS	3	110	S	PCS	1	120					012	
T 61230 / TISL	COOLING DOWN TEMP. P61200	-200...+50 °C					S	PCS	3	-150													012	
T 61240 / TALSLL	BEARING TEMP. P61200	-200...+50 °C	S	PCS	1	-150	A	PCS	3	-130													012	
T 61241 / TIAHLSHHLL	BEARING TEMP. P61200	-100...+150 °C	S	PCS	1	-40	A	PCS	3	-30	A	PCS	3	110	S	PCS	1	120					012	
T 62001 / TISL	COOLING DOWN TEMP. P62001	-200...+50 °C					S	PCS	4	-130													032	

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T 62020 / TI	LOX TANK B62001	-200...+50 °C																					032	
T 62021 / TI	BOTTOM LOX TANK B62001	-200..+50 °C																					032	
T 62022 / TALZALL	OVERFLOW PIPE LOX TANK B62001	-200...+50 °C	ZA	S	1	-40	A	PCS	3	-30													032	
T 62041 / TIALSALL	SEAL LEAKAGE	-200...+50 °C	SA	PCS	1	-150	A	PCS	3	-130													032	
T 63001 / TISL	COOL DOWN TEMP. P63001	-200...+50 °C					S	PCS	4	-150													032	
T 63041 / TIALSALL	SEAL LEAKAGE	-200...+50 °C	SA	PCS	1	-150	A	PCS	3	-130													032	
T 64030 / TI	LOX WATER BATH VAPORIZER	0...100 °C																					034	local indicator

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T 64031 / TICSAHL	WATER BATH VAPORIZER GOX	0...100 °C					SA	PCS	3	10	A	PCS	3	80					40/60				034	
T 64032 / TISAHL	WATER BATH VAPORIZER GOX	0...100 °C					SA	PCS	3	10	A	PCS	3	50									034	
T 64050 / TIALZALL	GOX BEHIND WATER BAD VAPORIZER	-40...+60 °C	ZA	S	1	-10	A	PCS	3	-5													034	TIC64055 SP15°C; Kp=2, Tn=1min
T 64051 / TIALZALL	GOX BEHIND WATER BAD VAPORIZER	-40...+60 °C	ZA	S	1	-10	A	PCS	3	-5													034	
T 64130 / TISLAH	COOL DOWN TEMP. P64101	-200...+50 °C					SA	PCS	4	-115	A	PCS	3	50									033	
T 64140 / TIALSALL	SEAL LEAKAGE LOX PUMP P64101	-200...+100 °C	S	PCS	1	-180	A	PCS	3	-160													033	
T 64141 / TIALSALL	SEAL LEAKAGE LOX PUMP P64101	-200...+50 °C	SA	PCS	1	-180	A	PCS	3	-160													033	

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T 64230 / TISLAH	COOL DOWN TEMP. P64201	-200...+50 °C					SA	PCS	4	-115													033	
T 64240 / TIALSALL	SEAL LEAKAGE LOX PUMP P64201	-200...+50 °C	S	PCS	1	-180	A	PCS	3	-160													033	
T 64241 / TIALSALL	SEAL LEAKAGE LOX PUMP P64201	-200...+50 °C	SA	PCS	1	-180	A	PCS	3	-160													033	
T 70001 / TI	INLET GAN COMPRESSOR 1	0...60 °C																					019	
T 70015 / TIAHSAHH	GAN BEH. COOLER 1ST STAGE	0...200 °C									A	PCS	3	55	SA	PCS	1	60					019	
T 70025 / TIAHSAHH	GAN BEH. COOLER 2ND STAGE	0...200 °C									A	PCS	3	55	SA	PCS	1	60					019	
T 70035 / TIAHSAHH	GAN BEH. COOLER 3RD STAGE	0...200 °C									A	PCS	3	55	SA	PCS	1	60					019	

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TAG-NO. / FUNCTION	DESIG-NATION	RANGE	LL S/A	LL loc	LL prio	LL threshold	L S/A	L loc	L prio	L threshold	H S/A	H loc	H prio	H threshold	HH S/A	HH loc	HH prio	HH threshold	CONTROLLER SETTINGS W	Kp	Tn	Td	P&I SHEET	REMARKS
T 70041 / TIAL	MP-GAN TO CUSTOMER	-20...+40 °C					A	PCS	3														020	
T 70512 / TI	COOLING WATER BEH. VW70001	0...60 °C																					019	local indicator
T 70522 / TI	COOLING WATER BEH. VW70002	0...60 °C																					019	local indicator
T 70532 / TI	COOLING WATER BEH. VW70003	0...60 °C																					019	local indicator
T 70621 / TI	COOLING WATER BEH. MOTOR	0...60 °C																					019	local indicator
T 70701 / TIAHSAHH	BEARING MAIN MOTOR GAN COMP. 1	0...150 °C									A	PCS	3	75	SA	PCS	1	80					021	
T 70703 / TIAHSAHH	BEARING MAIN MOTOR GAN COMP. 1	0...150 °C									A	PCS	3	75	SA	PCS	1	80					021	

Legend: F = local, V = local cabinet , S = control room, PCS = process control system

Annotation on column "Hook Up": (FP*) = Frost Protection recommended

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2	24.02.2006	Frohn		Rev. 2
3	16.11.2006	Möller		As Buildt
0	21.12.2004	Frohn		Initial version

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			threshold			threshold			threshold			threshold								
T 70715	MOTOR WINDING U COMP. 1	0...200 °C							A	PCS	3	SA	PCS	1					021	
TIAHSAHH																				
T 70718	MOTOR WINDING V COMP. 1	0...200 °C							A	PCS	3	SA	PCS	1					021	
TIAHSAHH																				
T 70721	MOTOR WINDING W COMP. 1	0...200 °C							A	PCS	3	SA	PCS	1					021	
TIAHSAHH																				
T 70736	BEARING 1.ST STAGE GAN COMP. 1	0...200 °C							A	PCS	3	SA	PCS	1					021	
TIAHSAHH									110			115								
T 70737	BEARING 1.ST STAGE GAN COMP. 1	0...200 °C							A	PCS	3	SA	PCS	1					021	
TIAHSAHH									110			115								
T 70738	BEARING 2.ND STAGE GAN COMP. 1	0...200 °C							A	PCS	3	SA	PCS	1					021	
TIAHSAHH									110			115								
T 70739	BEARING 2.ND STAGE GAN COMP. 1	0...200 °C							A	PCS	3	SA	PCS	1					021	
TIAHSAHH									110			115								

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T 70740 / TIAHSAHH	BEARING 3.RD STAGE GAN COMP. 1	0...200 °C									A	PCS	3	110	SA	PCS	1	115					021	
T 70741 / TIAHSAHH	BEARING 3.RD STAGE GAN COMP. 1	0...200 °C									A	PCS	3	110	SA	PCS	1	115					021	
T 70742 / TIAHSAHH	BEARING 4.TH STAGE GAN COMP. 1	0...200 °C									A	PCS	3	110	SA	PCS	1	115					021	
T 70743 / TIAHSAHH	BEARING 4.TH STAGE GAN COMP. 1	0...200 °C									A	PCS	3	110	SA	PCS	1	115					021	
T 70810 / TCSAH	OIL HEATING W11810 GAN COMP. 1	°C																					021	
T 70815 / TCSAH	OIL HEATING W70815 GAN COMP. 1	°C																					021	
T 70854 / TIAHLSAHH	LUBE OIL GAN COMP. 1	0...100 °C					A	PCS	3	20	A	PCS	3	55	SA	PCS	1	60					021	

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T 71130 / TISL	COOLING DOWN TEMP. P71100	-200...+50 °C					S	PCS	3	-160													015	
T 71140 / TALSLL	BEARING TEMP. P71100	-200...+50 °C	S	PCS	1	-150	A	PCS	3	-90													015	
T 71141 / TIAHLSHHLL	BEARING TEMP. P71100	-100...+150 °C	S	PCS	1	-40	A	PCS	3	-30	A	PCS	3	110	S	PCS	1	120					015	
T 71230 / TISL	COOLING DOWN TEMP. P71200	-200...+50 °C					S	PCS	3	-160													015	
T 71240 / TALSLL	BEARING TEMP. P71200	-200...+50 °C	S	PCS	1	-150	A	PCS	3	-90													015	
T 71241 / TIAHLSHHLL	BEARING TEMP. P71200	-100...+150 °C	S	PCS	1	-40	A	PCS	3	-30	A	PCS	3	110	S	PCS	1	120					015	
T 72001 / TISL	COOLING DOWN TEMP. P72101	-200...+50 °C					S	PCS	4	-150													035	

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T 72022 / TALZALL	OVERFLOW PIPE LIN TANK B72001	-200...+50 °C	ZA	S	1	-40	A	PCS	3	-30													035	
T 73005 / TIALSAL	OVERFLOW MP LIN TANK BL73001	-200...+50 °C	SA	PCS	1	-190	A	PCS	3	-150													038	
T 73031 / TICSAHL	WATER BATH VAPORIZER GAN	0...100 °C					SA	PCS	3	10	A	PCS	1	80					40/60	0,6	2min 45s		039	
T 73032 / TISAHL	WATER BATH VAPORIZER GAN	0...100 °C					SA	PCS	1	10	A	PCS	3	50									039	TIC73051, W=0°C, Kp=3, Tn=20s
T 73051 / TIALZALL; TIC	GAN BEHIND WATER BATH VAPORIZER	-40...+60 °C	ZA	S	1	-30	A	PCS	3	-5									0	3	20s		039	
T 73057 / TIALZALL	GAN BEHIND WATER BATH VAPORIZER	-40...+60 °C	ZA	S	1	-30	A	PCS	3	-5													039	
T 73130 / TISLAH	COOL DOWN TEMP. P73101	-200...+50 °C					S	PCS	4	-130	A	PCS	3	50									037	

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T 73131 / TSL	WATER BATH NAT. GAS VAP. LIN	°C																					040	
T 73132 / TSL	WATER BATH NAT. GAS VAP. LIN	°C																					040	
T 73133 / TSL	WATER BATH NAT. GAS VAP. LIN	°C																					040	
T 73134 / TI	WATER BATH NAT. GAS VAP. LIN	0...100 °C																					040	
T 73135 / TI	WATER BATH NAT. GAS VAP. LIN	0...100 °C																					040	local indicator
T 73140 / TIALSALL	SEAL LECKAGE LIN BACK UP PUMP P73101	-200...+50 °C	SA	PCS	1	-150	A	PCS	3	-130													037	
T 73141 / TIALSALL	SEAL LEAKAGE LIN BACK UP PUMP P73101	-200...+50 °C	SA	PCS	1	-150	A	PCS	3	-130													037	

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T 73151 / TIALZALL	GAN BEHIND W73101	°C	ZA	S		-10	A	PCS															040	
T 73157 / TIALZALL	GAN BEHIND W73101	°C	ZA	S		-10	A	PCS															040	
T 73159 / TICALSALL	GAN BEHIND WBV	-40...100 °C	SA	PCS	1	-20	A	PCS	3	-10									0	3	20s		040	
T 73230 / TISLAH	COOL DOWN TEMP. P73201	-200...+50 °C					S	PCS	4	-150	A	PCS	3	50									037	
T 73240 / TIALSALL	SEAL LEACKAGE LIN BACK UP PUMP P73102	-200...+50 °C	SA	PCS	1	-150	A	PCS	3	-130													037	
T 73241 / TIALSALL	SEAL LEACKAGE LIN BACK UP PUMP P73201	-200...+50 °C	SA	PCS	1	-150	A	PCS	3	-130													037	
T 74090 / TIALZALL	GAN BEHIND AIR EVAPORATOR S	-40...+60 °C	ZA	S	1	-40	A	PCS	3	-35													036	

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T 74095 / TICALZALL	GAN BEHIND AIR EVAPORATOR S	-40...+60 °C	ZA	S	1	-40	A	PCS	3	-35									-2.0	1	30s		036	
T 74130 / TISLAH	COOL DOWN TEMP. P74101	-200...+50 °C					S	PCS	4	-120	A	PCS	3	50									036	
T 74140 / TIALSALL	SEAL LEAKAGE LIN PUMP P74101	-200...+50 °C	S	PCS	1	-150	A	PCS	3	-130													036	
T 74141 / TIALSALL	SEAL LEAKAGE LIN PUMP P74101	-200...+50 °C	S	PCS	1	-150	A	PCS	3	-130													036	
T 74230 / TISLAH	COOL DOWN TEMP. P74201	-200...+50 °C					SA	PCS	4	-120	A	PCS	3	50									036	
T 74240 / TIALSALL	SEAL LEACKAGE LIN PUMP P74201	-200...+50 °C	SA	PCS	1	-150	A	PCS	3	-120													036	
T 74241 / TIALSALL	SEAL LEAKAGE LIN PUMP P74201	-200...+50 °C	SA	PCS	1	-150	A	PCS	3	-130													036	

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T 77001 / TI	INLET GAN COMPRESSOR 2	0...60 °C																					020	
T 77015 / TIAHSAHH	GAN BEH. COOLER 1ST STAGE	0...200 °C									A	PCS	3	55	SA	PCS	1	60					020	
T 77025 / TIAHSAHH	GAN BEH. COOLER 2ND STAGE	0...200 °C									A	PCS	3	55	SA	PCS	1	60					020	
T 77035 / TIAHSAHH	GAN BEH. COOLER 3RD STAGE	0...200 °C									A	PCS	3	55	SA	PCS	1	60					020	
T 77512 / TI	COOLING WATER BEH. VW77001	0...60 °C																					020	local indicator
T 77522 / TI	COOLING WATER BEH. VW77002	0...60 °C																					020	local indicator
T 77532 / TI	COOLING WATER BEH. VW77003	0...60 °C																					020	local indicator

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T 77621 / TI	COOLING WATER MOTOR COMP. 2	0...60 °C																					020	local indicator
T 77701 / TIAHSAHH	BEARING MAIN MOTOR GAN COMP. 2	0...150 °C									A	PCS	3	75	A	PCS	1	80					022	
T 77703 / TIAHSAHH	BEARING MAIN MOTOR GAN COMP. 2	0...150 °C									A	PCS	3	75	SA	PCS	1	80					022	
T 77715 / TIAHSAHH	MOTOR WINDING U COMP. 2	0...200 °C									A	PCS	3		SA	PCS	1						022	
T 77718 / TIAHSAHH	MOTOR WINDING V COMP. 2	0...200 °C									A	PCS	3		SA	PCS	1						022	
T 77721 / TIAHSAHH	MOTOR WINDING W COMP. 2	0...200 °C									A	PCS	3		SA	PCS	1						022	
T 77736 / TIAHSAHH	BEARING 1.ST STAGE GAN COMP. 2	0...200 °C									A	PCS	3	110	SA	PCS	1	115					022	

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T 77737 / TIAHSAHH	BEARING 1.ST STAGE GAN COMP. 2	0...200 °C									A	PCS	3	110	SA	PCS	1	115					022	
T 77738 / TIAHSAHH	BEARING 2.ND STAGE GAN COMP. 2	0...200 °C									A	PCS	3	110	SA	PCS	1	115					022	
T 77739 / TIAHSAHH	BEARING 2.ND STAGE GAN COMP. 2	0...200 °C									A	PCS	3	110	SA	PCS	1	115					022	
T 77740 / TIAHSAHH	BEARING 3.RD STAGE GAN COMP. 2	0...200 °C									A	PCS	3	110	SA	PCS	1	115					022	
T 77741 / TIAHSAHH	BEARING 3.RD STAGE GAN COMP. 2	0...200 °C									A	PCS	3	110	SA	PCS	1	115					022	
T 77742 / TIAHSAHH	BEARING 4.TH STAGE GAN COMP. 2	0...200 °C									A	PCS	3	110	SA	PCS	1	115					022	
T 77743 / TIAHSAHH	BEARING 4.TH STAGE GAN COMP. 2	0...200 °C									A	PCS	3	110	SA	PCS	1	115					022	

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T 77810 / TCAH	OIL HEATING W11810 GAN COMP. 2	°C																					022	
T 77815 / TCSAH	OIL HEATING W77815 GAN COMP. 2	°C																					022	
T 77854 / TIAHLSAHH	LUBE OIL GAN COMP. 2	0...100 °C					A	PCS	3	20	A	PCS	3	55	SA	PCS	1	60					022	
T 80001 / TIAH	COOLING WATER	0...60 °C									A	PCS	3	35									023	
T 80010 / TIAH	COOLING WATER REFLIX	0...60 °C									A	PCS	3	45									023	
T 84010 / TIAHL	STEAM FROM CUSTOMER	0...250 °C					A	PCS	3	200	A	PCs	3	300									031	
T 87038 / TIAL	BOTTOM HE-BOX	-50...+50 °C					A	PCS	3	0													024	

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T 87078 / TIAL	BOTTOM COLD-BOX	-50...+50 °C					A	PCS	3	0													024	
T 90008 / TIC	DUMP VAPORIZER OUTLET	-200...+50 °C																					026	
T 90010 / TIALSLL	DUMP VAPORIZER OUTLET	-200...+50 °C	S	PCS	1	-50	A	PCS	3	-20													026	
T 90013 / TIALSLL	DUMP VAPORIZER SUMP	-200...+50 °C	S	PCS	1	-50	A	PCS	3	-20													026	
X 11740 / XIAHSAHH	VIBRATION GEARING MAC	0...200 µm									A	PCS	3	75	SA	PCS	1	94					027	
X 11743 / XIAHSAHH	VIBRATION GEARING MAC	0...200 µm									A	PCS	3	75	SA	PCS	1	94					027	
X 11745 / XIAHSAHH	VIBRATION MAIN SHAFT MAC	0...200 µm									A	PCS	3	75	A	PCS	1	94					027	

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Fütingsweg 34
D-47805 Krefeld, Germany

Drwg.-No.:

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TAG-NO. / FUNCTION	DESIG-NATION	RANGE	LL S/A	LL loc	LL prio	LL threshold	L S/A	L loc	L prio	L threshold	H S/A	H loc	H prio	H threshold	HH S/A	HH loc	HH prio	HH threshold	CONTROLLER SETTINGS W	Kp	Tn	Td	P&I SHEET	REMARKS
X 11747 / XIAHSAHH	VIBRATION MAIN SHAFT MAC	0...200 µm									A	PCS	3	75	SA	PCS	1	94					027	
X 16736 / XIAHSAHH	VIBRATION X 1ST STAGE BAC	0...125 µm									A	PCS	3	28,6	SA	PCS	1	38,2					028	
X 16737 / XIAHSAHH	VIBRATION Y 1ST STAGE BAC	0...125 µm									A	PCS	3	28,6	SA	PCS	1	38,2					028	
X 16738 / XIAHSAHH	VIBRATION X 2ND STAGE BAC	0...200 µm									A	PCS	3	28,6	SA	PCS	1	38,2					028	
X 16739 / XIAHSAHH	VIBRATION Y 2ND STAGE BAC	0...200 µm									A	PCS	3	28,6	SA	PCS	1	38,2					028	
X 16740 / XIAHSAHH	VIBRATION X 3RD STAGE BAC	0...200 µm									A	PCS	3	27,5	SA	PCS	1	36,7					028	
X 16741 / XIAHSAHH	VIBRATION Y 3RD STAGE BAC	0...200 µm									A	PCS	3	27,5	SA	PCS	1	36,7					028	

Legend: F = local, V = local cabinet , S = control room, PCS = process control system

Annotation on column "Hook Up": (FP*) = Frost Protection recommended

Rev.	Date	Name	Checked	Change
2	24.02.2006	Frohn		Rev. 2
3	16.11.2006	Möller		As Buildt
0	21.12.2004	Frohn		Initial version

Project: K70101
ASU No.09 Kosice

MEASURING RANGE & LIMIT VALUES

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X 16743 / XIAHSAHH	VIBRATION X 4TH STAGE BAC	0...200µm									A	PCS	3	27,5	SA	PCS	1	36,7					028	
X 16744 / XIAHSAHH	VIBRATION Y 4TH STAGE BAC	0...200µm									A	PCS	3	27,5	SA	PCS	1	36,7					028	
X 24124 / XIAHSAHH	VIBRATION EXPANDER TURBINE 1	0...125µm									A	PCS	3	27	SA	PCS	1	42					029	
X 24224 / XIAHSAHH	VIBRATION EXPANDER TURBINE 2	0...125µm									A	PCS	3	27	SA	PCS	1	42					030	
X 70736 / XIAHSAHH	VIBRATION 1ST STAGE GAN COMP. 1	0...125µm									A	PCS	3	35	SA	PCS	1	55					021	
X 70738 / XIAHSAHH	VIBRATION 2ND STAGE GAN COMP. 1	0...125µm									A	PCS	3	35	SA	PCS	1	55					021	
X 70740 / XIAHSAHH	VIBRATION 3RD STAGE GAN COMP. 1	0...125µm									A	PCS	3	27	SA	PCS	1	42					021	

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X 70742 / XIAHSAHH	VIBRATION FREE END GAN COMP. 1	0...125µm									A	PCS	3	27	SA	PCS	1	42					021	
X 77736 / XIAHSAHH	VIBRATION 1ST STAGE GAN COMP. 2	0...125µm									A	PCS	3	35	SA	PCS	1	55					022	
X 77738 / XIAHSAHH	VIBRATION 2ND STAGE GAN COMP. 2	0...125µm									A	PCS	3	35	SA	PCS	1	55					022	
X 77740 / XIAHSAHH	VIBRATION 3RD STAGE GAN COMP. 2	0...125µm									A	PCS	3	27	SA	PCS	1	42					022	
X 77742 / XIAHSAHH	VIBRATION FREE END GAN COMP. 2	0...125µm									A	PCS	3	27	SA	PCS	1	42					022	

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