NuMI Target Pile
Air Cooling System
Instrument List

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BPS --> Beam Permit System
PLC --> Programmable Logic Controller
PSR --> Power Supply Room
WC --> Water Column

TAG NO.	DESCRIPTION	LOCATION	UNITS	NORMAL OPERATING RANGE	NORMAL OPERATING VALUE	CALIBRATION RANGE	ACCURACY [+ / -]	ANALOG SIGNAL	DISCRETE SIGNAL	MANUFACTURER	MODEL NUMBER	INSTRUMENT DESCRIPTION	CABLE	WIRED TO	PLC INPUT MODULES	PLC OUTPUT HARDWIRED TO	PLC OUTPUT MODULES	ACNET PARAMETER PAGE	ACNET GRAPHIC DISPLAY	ACNET ALARM SET POINT
AE -	Analysis Element - Supply air relative humidity	Local	%	55 to 65	-	0 - 100								AIT -	-	-	-	-	-	-
AE -	Analysis Element - Return air relative humidity	Local	%	30 to 65	-	0 - 100								AIT -	-	-	-	-	-	-
AE -	Analysis Element - Target hall relative humidity	Local	%	50 to 100	-	0 - 100								AIT -	-	-	-	-	-	-
AIT -	Analysis Indicating Transmitter - Supply air relative humidity	PSR	%	55 to 65	-	0 - 100								PLC	AIM1 Ch 1	-	-	Yes	Yes	65
AIT -	Analysis Indicating Transmitter - Return air relative humidity	PSR	%	30 to 65	-	0 - 100								PLC	AIM1 Ch 2	-	-	Yes	Yes	65
AIT -	Analysis Indicating Transmitter - Target hall relative humidity	PSR	%	50 to 100	-	0 - 100								PLC	AIM1 Ch 3	-	-	Yes	Yes	-
HC -	Hand control, Open Auto Close - Evaporator #1 upper coil	PSR	-	-	-	-	-	-	0 to 24 VDC					Solenoid valve to evap #1 upper coil	-	-	-	No	-	-
HC -	Hand control, Open Auto Close - Evaporator #1 lower coil	PSR	-	-	-	-	-	-	0 to 24 VDC					Solenoid valve to evap #1 lower coil	-	-	-	No	-	-
HC -	Hand control, Open Auto Close - Evaporator #2 upper coil	PSR	-	-	-	-	-	-	0 to 24 VDC					Solenoid valve to evap #2 upper coil	-	-	-	No	-	-
HC -	Hand control, Open Auto Close - Evaporator #2 lower coil	PSR	-	-	-	-	-	-	0 to 24 VDC					Solenoid valve to evap #2 lower coil	-	-	-	No	-	-
HC -	Hand control, Open Auto Close - Evaporator #3 upper coil	PSR	-	-	-	-	-	-	0 to 24 VDC					Solenoid valve to evap #3 upper coil	-	-	-	No	-	-
HC -	Hand control, Open Auto Close - Evaporator #3 lower coil	PSR	-	-	-	-	-	-	0 to 24 VDC					Solenoid valve to evap #3 lower coil	-	-	-	No	-	-
HC -	Hand control, Open Auto Close - Evaporator #1 upper coil	Acnet command to PLC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Yes	-	-
HC -	Hand control, Open Auto Close - Evaporator #1 lower coil	Acnet command to PLC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Yes	-	-
HC -	Hand control, Open Auto Close - Evaporator #2 upper coil	Acnet command to PLC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Yes	-	-
HC -	Hand control, Open Auto Close - Evaporator #2 lower coil	Acnet command to PLC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Yes	-	-
HC -	Hand control, Open Auto Close - Evaporator #3 upper coil	Acnet command to PLC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Yes	-	-
HC -	Hand control, Open Auto Close - Evaporator #3 lower coil	Acnet command to PLC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Yes	-	-
HC -	Hand control, Start - Fan	PSR	-	-	-	-	-	-	-	-	-	-	-	PLC	DIM1 Ch 1	-	-	-	-	-
HC -	Hand control, Start - Fan	Local	-	-	-	-	-	-	-	-	-	-	-	PLC	DIM1 Ch 2	-	-	-	-	-
HC -	Hand control, Stop - Fan	PSR	-	-	-	-	-	-	-	-	-	-	-	PLC	DIM1 Ch 3	-	-	-	-	-
HC -	Hand control, Stop - Fan	Local	-	-	-	-	-	-	-	-	-	-	-	PLC	DIM1 Ch 4	-	-	-	-	-
HC -	Hand control, On Off Auto - Reheater	PSR - Vendor panel	-	-	-	-	-	-	-	-	-	-	-	Vendor panel wiring	-	-	-	-	-	-
IE -	Current Element - Fan motor	Motor contactor	%	55 to 70	65	0 - 100								PLC	AIM1 Ch 4	-	-	Yes	No	25
ISL -	Current Switch Low - Fan motor	PLC	%	0 - 100	25	-	-	-	-	-	-	PLC software switch	-	-	-	Pilot Light - Fan on	DOM1 Ch 1	No	No	-
JL -	Power Light - Reheater on	PSR - Vendor panel	-	-	-	-	-	-	-	-	-	-	-	Vendor panel wiring	-	-	-	-	-	-
PDI -	Pressure Differential Indicator / Switch - Prefilter bank	PSR	inches WC	0.7 to 1.3	< 1.5	0 to 3	± 2% FS	-	-	Dwyer	Photohelic 3003MR	Differential pressure gauge with two switches		-	-	-	-	-	-	-
PDI -	Pressure Differential Indicator / Switch - High efficiency filter bank	PSR	inches WC	1.5 to 3	< 3	0 to 5	± 2% FS	-	-	Dwyer	Photohelic 3005MR	Differential pressure gauge with two switches		-	-	-	-	-	-	-
PDI -	Pressure Differential Indicator / Switch - Fan	PSR	inches WC	10 to 13	12	0 to 15	± 2% FS	-	-	Dwyer	Photohelic 3015MR	Differential pressure gauge with two switches		-	-	-	-	-	-	-
PDIT -	Pressure Differential Transmitter - Fan	PSR	inches WC	10 to 13	12	0 to 20	1% FS	0 to 10 vdc	-	Orange Research	20107 w/LCD Display	Beryllium copper diaphragm with inductive pickup		BPS	-	-	-	-	-	-
PDSH -	Pressure Differential Switch High - Prefilter bank	PSR	inches WC	-	1.25	-	-	-	0 to 24 VDC	Dwyer	On PDI -	Phototransistor actuated SPDT relay, 1.0 amp @30 vdc		PLC	DIM1 Ch 5	-	-	Yes	-	-
PDSH -	Pressure Differential Switch High - High efficiency filter bank	PSR	inches WC	-	2.75	-	-	-	0 to 24 VDC	Dwyer	On PDI -	Phototransistor actuated SPDT relay, 1.0 amp @30 vdc		PLC	DIM1 Ch 6	-	-	Yes	-	-
PDSHH -	Pressure Differential Switch High High - Prefilter bank	PSR	inches WC	-	1.5	-	-	-	0 to 24 VDC	Dwyer	On PDI -	Phototransistor actuated SPDT relay, 1.0 amp @30 vdc		PLC	DIM1 Ch 7	-	-	No	-	-
PDSHH -	Pressure Differential Switch High High - High efficiency filter bank	PSR	inches WC	-	3	-	-	-	0 to 24 VDC	Dwyer	On PDI -	Phototransistor actuated SPDT relay, 1.0 amp @30 vdc		PLC	DIM1 Ch 8	-	-	No	-	-
PDSLL -	Pressure Differential Switch Low Low - Fan	PSR	inches WC	-	8	-	-	-	0 to 24 VDC	Dwyer	On PDI -	Phototransistor actuated SPDT relay, 1.0 amp @30 vdc		PLC	DIM2 Ch 1	-	-	No	-	-
PDT -	Pressure Differential Transmitter - Prefilter bank	PSR	inches WC	0.7 to 1.3	< 1.5	0 to 2.5	± 0.25% FS	4 to 20 mA	-	Setra	C-264 Option 717	Variable capacitance		PLC	AIM1 Ch 5	-	-	Yes	Yes	1.25
PDT -	Pressure Differential Transmitter - High efficiency filter bank	PSR	inches WC	1.5 to 3	< 3	0 to 5	± 0.25% FS	4 to 20 mA	-	Setra	C-264 Option 717	Variable capacitance		PLC	AIM1 Ch 6	-	-	Yes	Yes	2.75
PDT -	Pressure Differential Transmitter - Fan	PSR	inches WC	10 to 13	12	0 to 25	± 0.25% FS	4 to 20 mA	-	Setra	C-264 Option 717	Variable capacitance		PLC	AIM1 Ch 7	-	-	Yes	Yes	8
PI -	Pressure Indicator - Evaporator coil	PSR	psig	58 to 69	61.75	0 to 100	± 2% FS	-	-	Dwyer	Photohelic A36010S	Pressure gauge with two switches		-	-	-	-	-	-	-
PT -	Pressure Transmitter - Evaporator coil	PSR	psig	58 to 69	61.75	0 to 100	± 0.11% FS	4 to 20 mA	-	Setra	C-204	Variable capacitance		Refrigerator compressor control	-	-	-	-	-	-
TE -	Temperature Element - Return air temperature from target pile	Local	ºF	50 to 80	< 80	40 to 100	±0.5	-	-	Minco	S457PEZ24	Bendable averaging RTD, 100 Ω at 0 ºC		PLC	RTD IM1 Ch 1	-	-	Yes	No	-
TE -	Temperature Element - Supply air temperature to target pile	Local	ºF	50 to 60	55	40 to 100	±0.5	-	-	Minco	S457PEZ12	Bendable averaging RTD, 100 Ω at 0 ºC		PLC	RTD IM1 Ch 2	TIC - (Reheater)	AOM1 Ch 1	Yes	Yes	60
TE -	Temperature Element - Fan inlet temperature	Local	ºF	45 to 55	50	40 to 100	±0.5	-	-	Minco	S457PEZ12	Bendable averaging RTD, 100 Ω at 0 ºC		PLC	RTD IM1 Ch 3	-	-	Yes	No	-
TE -	Temperature Element - Fan discharge temperature	Local	ºF	50 to 60	55	40 to 100	±0.5	-	-	Minco	S457PEZ12	Bendable averaging RTD, 100 Ω at 0 ºC		PLC	RTD IM1 Ch 4	TIC - (Air damper)	AOM1 Ch 2	Yes	No	-
TE -	Temperature Element - Target pile pit wall #1 @ horn 1 midpoint	Local	ºF	50 to 60	55	40 to 100	±2	-	-	Omega		Omegaclad Type J - MgO insulation and metal sheath		PLC	T/C IM1 Ch 1	-	-	Yes	No	-
TE -	Temperature Element - Target pile pit wall #2 @ horn 1 midpoint	Local	ºF	50 to 60	55	40 to 100	±2	-	-	Omega		Omegaclad Type J - MgO insulation and metal sheath		PLC	T/C IM1 Ch 2	-	-	Yes	No	-
TE -	Temperature Element - Target pile pit floor #1 @ horn 1 midpoint	Local	ºF	50 to 60	55	40 to 100	±2	-	-	Omega		Omegaclad Type J - MgO insulation and metal sheath		PLC	T/C IM1 Ch 3	-	-	Yes	No	-
TE -	Temperature Element - Target pile pit floor #2 @ horn 1 midpoint	Local	ºF	50 to 60	55	40 to 100	±2	-	-	Omega		Omegaclad Type J - MgO insulation and metal sheath		PLC	T/C IM1 Ch 4	-	-	Yes	No	-
TE -	Temperature Element - Duratek block inner wall #1 @ horn 1 midpoint	Local	ºF	50 to 60	55	40 to 100	±2	-	-	Omega		Omegaclad Type J - MgO insulation and metal sheath		PLC	T/C IM1 Ch 5	-	-	Yes	No	-
TE -	Temperature Element - Duratek block inner wall #2 @ horn 1 midpoint	Local	ºF	50 to 60	55	40 to 100	±2	-	-	Omega		Omegaclad Type J - MgO insulation and metal sheath		PLC	T/C IM1 Ch 6	-	-	Yes	No	-
TE -	Temperature Element - Horn 1 carriage support beam @ midpoint	Local	ºF	50 to 60	55	40 to 100	±2	-	-	Omega		Omegaclad Type J - MgO insulation and metal sheath		PLC	T/C IM1 Ch 7	-	-	Yes	No	-
TE -	Temperature Element - Free air at upstream end of horn 1 carriage	Local	ºF	50 to 60	55	40 to 100	±2	-	-	Omega		Omegaclad Type J - MgO insulation and metal sheath		PLC	T/C IM1 Ch 8	-	-	Yes	No	-
TIC -	Temperature Indicating Controller - Air damper	PSR	ºF	50 to 60	55	40 to 100	-	4 to 20 mA	-					Air damper postioner	-	-	-	-	-	-
TIC -	Temperature Indicating Controller - Reheater control	PSR - Vendor panel	ºF	50 to 60	55	40 to 100	-	-	-					Reheater SCRs	-	-	-	-	-	-
TSH -	Target pile supply air temperature high - Reheater control	PSR - Vendor panel	ºF	50 to 65	65	-			0 to 24 VDC					Vendor panel wiring	-	-	-	-	-	-
TSHH -	Target pile supply air temperature high high	Local	ºF	50 to 70	70	-		-	0 to 24 VDC					PLC & Reheater Control	DIM2 Ch 2	-	-	Yes	-	-
ZI -	Position Indicator - Air damper	PSR	%			0 to 100		-						-	-	-	-	-	-	-
ZSH -	Position Indicator - Fan contactor closed	Motor contactor	-	-	-	-	-	-	0 to 24 VDC					PLC	DIM2 Ch 3	-	-	No	No	-
ZSH -	Position Indicator - Solenoid valve HV-nnn open	Local	-	-	-	-	-	-	0 to 24 VDC					PLC	DIM2 Ch 4	-	-	Yes	-	-
ZSH -	Position Indicator - Solenoid valve HV-nnn open	Local	-	-	-	-	-	-	0 to 24 VDC					PLC	DIM2 Ch 5	-	-	Yes	-	-
ZSH -	Position Indicator - Solenoid valve HV-nnn open	Local	-	-	-	-	-	-	0 to 24 VDC					PLC	DIM2 Ch 6	-	-	Yes	-	-
ZSH -	Position Indicator - Solenoid valve HV-nnn open	Local	-	-	-	-	-	-	0 to 24 VDC					PLC	DIM2 Ch 7	-	-	Yes	-	-
ZSH -	Position Indicator - Solenoid valve HV-nnn open	Local	-	-	-	-	-	-	0 to 24 VDC					PLC	DIM2 Ch 8	-	-	Yes	-	-
ZSH -	Position Indicator - Solenoid valve HV-nnn open	Local	-	-	-	-	-	-	0 to 24 VDC					PLC	DIM3 Ch 1	-	-	Yes	-	-
ZSL -	Position Indicator - Solenoid valve HV-nnn closed	Local	-	-	-	-	-	-	0 to 24 VDC					PLC	DIM3 Ch 2	-	-	Yes	-	-
ZSL -	Position Indicator - Solenoid valve HV-nnn closed	Local	-	-	-	-	-	-	0 to 24 VDC					PLC	DIM3 Ch 3	-	-	Yes	-	-
ZSL -	Position Indicator - Solenoid valve HV-nnn closed	Local	-	-	-	-	-	-	0 to 24 VDC					PLC	DIM3 Ch 4	-	-	Yes	-	-
ZSL -	Position Indicator - Solenoid valve HV-nnn closed	Local	-	-	-	-	-	-	0 to 24 VDC					PLC	DIM3 Ch 5	-	-	Yes	-	-
ZSL -	Position Indicator - Solenoid valve HV-nnn closed	Local	-	-	-	-	-	-	0 to 24 VDC					PLC	DIM3 Ch 6	-	-	Yes	-	-
ZSL -	Position Indicator - Solenoid valve HV-nnn closed	Local	-	-	-	-	-	-	0 to 24 VDC					PLC	DIM3 Ch 7	-	-	Yes	-	-
ZT -	Position Transmitter - Air damper	Local	%			0 to 100		4 to 20 mA	-					PLC	DIM3 Ch 8	ZI -	AOM1 Ch 3	Yes	-	-
Run fan	PLC logic output signal	PLC	-	-	-	-	-	-	-	-	-	-	-	-	-	Fan motor contactor	DOM1 Ch 2	-	-	-