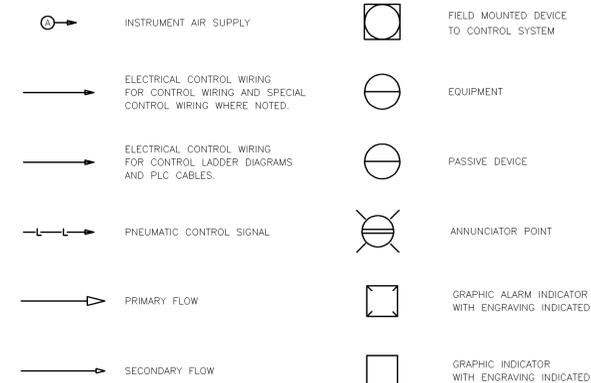
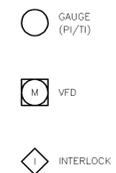


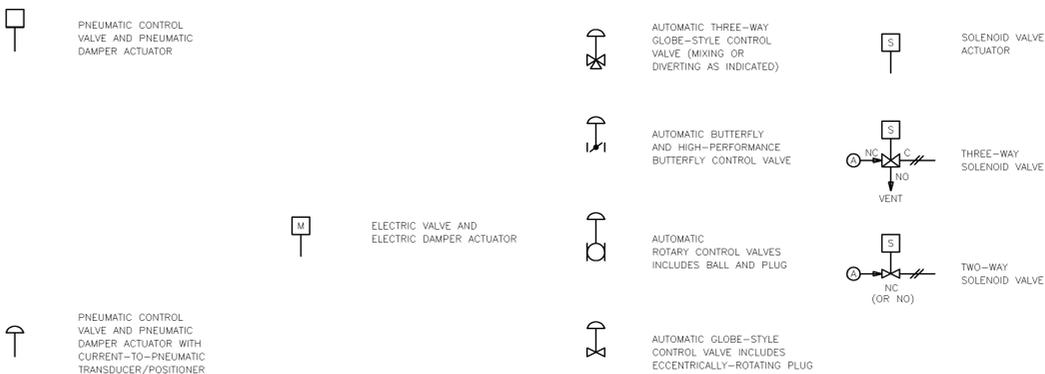
CONTROL SYMBOLS – GENERAL



FIELD DEVICE (LOCAL)



CONTROL VALVE AND DAMPER ACTUATOR SYMBOLS



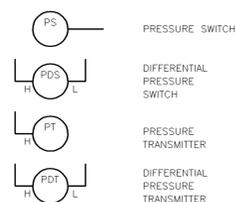
FLOW DEVICES



LEVEL DEVICES

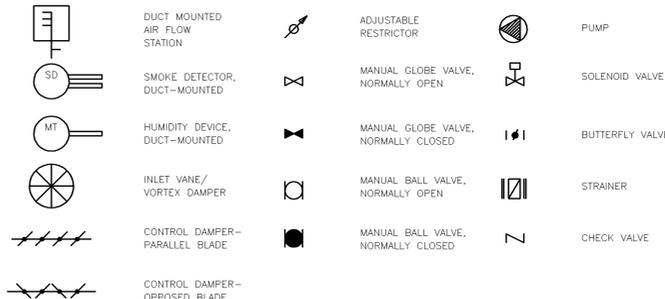


PRESSURE DEVICES

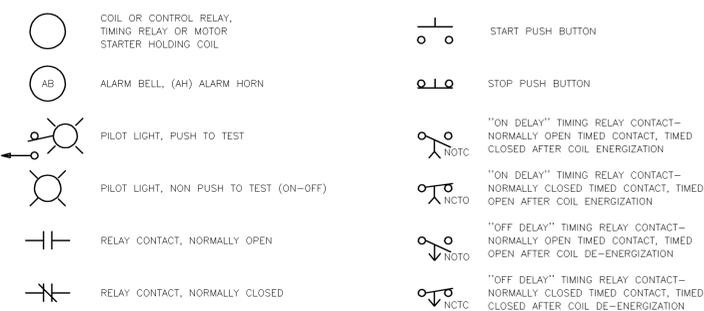


TEMPERATURE DEVICES

MISCELLANEOUS CONTROL SYMBOLS



ELECTRICAL CONTROL SYMBOLS FOR CONTROL WIRING DIAGRAMS



INSTRUMENTATION AND CONTROL DEVICE DESIGNATORS & ABBREVIATIONS

INSTRUMENT AND CONTROL DEVICE DESIGNATORS

AE	ANALYSIS ELEMENT, AS DEFINED	LS	LEVEL SWITCH	TAH	TEMPERATURE ALARM HIGH
AIC	ANALYSIS INDICATING CONTROLLER	LSHH	LEVEL SWITCH HIGH HIGH	TAL	TEMPERATURE ALARM LOW
AIT	ANALYSIS INDICATING TRANSMITTER, AS DEFINED	LSH	LEVEL SWITCH HIGH	TALH	TEMPERATURE ALARM LIGHT HIGH
AY	ANALYSIS LOGIC, COMPUTATION OR OUTPUT DEVICE	LSL	LEVEL SWITCH LOW	TALL	TEMPERATURE ALARM LIGHT LOW
CV	CONTROL VALVE (LIMITED USE)	LSLL	LEVEL SWITCH LOW LOW	TC	TEMPERATURE CONTROLLER
D	DAMPER	LT	LEVEL TRANSMITTER	TE	TEMPERATURE ELEMENT
DDC	DIRECT DIGITAL CONTROLLER	LCV	LEVEL CONTROL VALVE, SELF-CONTAINED	TI	TEMPERATURE INDICATOR
DM	DAMPER ACTUATOR	LV	LEVEL CONTROL VALVE	TR	TEMPERATURE RECORDER
DV	DRAIN VALVE (LIMITED USE)	LY	LEVEL LOGIC, COMPUTATION OR OUTPUT DEVICE	TS	TEMPERATURE SWITCH
FAH	FLOW ALARM HIGH	MC	MOISTURE CONTROLLER	TSH	TEMPERATURE SWITCH HIGH
FAL	FLOW ALARM LOW	ME	MOISTURE ELEMENT	TSL	TEMPERATURE SWITCH LOW
FALH	FLOW ALARM LIGHT HIGH	MOVC	MAKE UP VALVE CLOSED	TT	TEMPERATURE TRANSMITTER
FALL	FLOW ALARM LIGHT LOW	MOVO	MAKE UP VALVE OPEN	TCV	TEMPERATURE CONTROL VALVE, SELF-CONTAINED
FE	FLOW ELEMENT	MT	RELATIVE HUMIDITY TRANSMITTER	TV	TEMPERATURE CONTROL VALVE
FI	FLOW INDICATOR	MTT	DEWPOINT OR SPECIFIC HUMIDITY TRANSMITTER, AS INDICATED	TY	TEMPERATURE LOGIC, COMPUTATION OR OUTPUT DEVICE
FIC	FLOW INDICATING CONTROLLER	MY	MOISTURE LOGIC, COMPUTATION OR OUTPUT DEVICE	UA	MULTI-VARIABLE ALARM FUNCTION (DEFINED ON DRAWING)
FIT	FLOW INDICATING TRANSMITTER	NI	TONNAGE INDICATOR, REFRIGERATION	UR	MULTI-VARIABLE RECORDER
FQI	FLOW TOTALIZER	NY	TONNAGE LOGIC OR COMPUTATION DEVICE	UY	MULTI-VARIABLE COMPUTATION OR LOGIC FUNCTION
FQY	FLOW INTEGRATOR	PAH	PRESSURE ALARM HIGH	VAH	VIBRATION ALARM HIGH
FR	FLOW RECORDER	PAL	PRESSURE ALARM LOW	VSH	VIBRATION SWITCH HIGH
FS	FLOW SWITCH	PALH	PRESSURE ALARM LIGHT HIGH	ZS	POSITION SWITCH
FSH	FLOW SWITCH HIGH	PALL	PRESSURE ALARM LIGHT LOW	ZSC	POSITION SWITCH, CLOSED (POSITION)
FSL	FLOW SWITCH LOW	PDI	PRESSURE DIFFERENTIAL INDICATOR	ZSO	POSITION SWITCH, OPEN (POSITION)
FT	FLOW TRANSMITTER	PDIC	PRESSURE DIFFERENTIAL INDICATING CONTROLLER	ZY	POSITION LOGIC, COMPUTATION OR OUTPUT DEVICE
FCV	FLOW CONTROL VALVE, SELF-CONTAINED	PDIS	PRESSURE DIFFERENTIAL INDICATING SWITCH	I/P	CURRENT-TO-PNEUMATIC TRANSDUCER OR CURRENT-TO-PNEUMATIC TRANSDUCER/POSITIONER AS INDICATED BY THE DAMPER SYMBOL
FV	FLOW CONTROL VALVE	PDS	PRESSURE DIFFERENTIAL SWITCH	P/I	PNEUMATIC-TO-CURRENT TRANSDUCER
FY	FLOW LOGIC, COMPUTATION OR OUTPUT DEVICE	PDSH	PRESSURE DIFFERENTIAL SWITCH HIGH	P/P	PNEUMATIC POSITIONER
LC	LEVEL ELEMENT	PDSL	PRESSURE DIFFERENTIAL SWITCH LOW		
LI	LEVEL INDICATOR	PDT	PRESSURE DIFFERENTIAL TRANSMITTER		
LIT	LEVEL INDICATING TRANSMITTER	PDCV	PRESSURE DIFFERENTIAL CONTROL VALVE, SELF-CONTAINED		
		PDI	PRESSURE DIFFERENTIAL CONTROL VALVE		
		PI	PRESSURE INDICATOR		
		PIC	PRESSURE INDICATING CONTROLLER		
		PS	PRESSURE SWITCH		
		PSH	PRESSURE SWITCH HIGH		
		PSL	PRESSURE SWITCH LOW		
		PST	PRESSURE TRANSMITTER		
		PCV	PRESSURE CONTROL VALVE, SELF-CONTAINED		
		PV	PRESSURE CONTROL VALVE		
		PY	PRESSURE LOGIC, COMPUTATION OR OUTPUT DEVICE		
		SD	SMOKE DETECTOR		
		SV	SOLENOID VALVE		
		TAH	TEMPERATURE ALARM HIGH		
		TAL	TEMPERATURE ALARM LOW		

CONTROL, OPERATIONAL OR FUNCTIONAL DESIGNATORS

ATC	AIR-TO-CLOSE	ATD	AIR-TO-OPEN	C	COMMON
CC	CONTACT CLOSURE	CA	CRITICAL ALARM	MA	MAINTENANCE ALARM
DA	DIRECT ACTING	RA	REVERSE ACTING	I	INTERLOCK
L	LATCH	U	UNLATCH	M	MOTOR STARTER (OR MOTOR)
FC	FAIL CLOSED	FO	FAIL OPEN	OL	OVERLOAD
NC	NORMALLY CLOSED	NO	NORMALLY OPEN	NCHO	NORMALLY CLOSED, HELD OPEN
NCHO	NORMALLY OPEN, HELD OPEN	NCTO	NORMALLY CLOSED, TIMED OPEN	NCTC	NORMALLY CLOSED, TIMED CLOSED
NOTO	NORMALLY OPEN, TIMED OPEN	NOTC	NORMALLY OPEN, TIMED CLOSED	PB	PUSHBUTTON
NOTC	NORMALLY CLOSED, TIMED CLOSED	PV	PROPORTIONAL BAND	TR	TEMPERATURE SWITCH
TR	THROTTLING RANGE	RA	REMOTE/LOCAL	TRH	TRIP
		SP	SETPOINT	TRV	TEMPERATURE TRANSDUCER
		TR	THROTTLING RANGE	TRP	TEMPERATURE RECORDER
				TRV	TEMPERATURE TRANSDUCER
				TRW	TEMPERATURE TRANSDUCER
				VTR	VOLTAGE TRANSDUCER
				WHM	WATT HOUR METER
				HOA	HAND/OFF/AUTO SELECTOR SWITCH
				OCA	OPEN/CLOSE/AUTO SELECTOR SWITCH

ELECTRICAL CONTROL DEVICE DESIGNATORS

AB	ALARM BELL	AH	ALARM HORN	CB	CIRCUIT BREAKER
CR	CONTROL RELAY	CRL	LATCHING RELAY	CT	CURRENT TRANSFORMER
DISC	DISCONNECT	SPDT	SINGLE POLE, DOUBLE THROW	SPST	SINGLE POLE, SINGLE THROW
DPDT	DOUBLE POLE, DOUBLE THROW	FU	FUSE	M	MOTOR STARTER (OR MOTOR)
OL	OVERLOAD	PL	PUSHBUTTON	PL	POTENTIAL TRANSFORMER
PT	POTENTIAL TRANSFORMER	SHLD	SHIELDED	SS	SELECTOR SWITCH
SV	SOLENOID VALVE	T	THERMOSTAT	TB	TERMINAL BLOCK
TC	TIME CLOCK	TR	TEMPERATURE SWITCH	TRA	TEMPERATURE TRANSDUCER
TR	TEMPERATURE SWITCH	TRH	TEMPERATURE SWITCH HIGH	TRP	TEMPERATURE RECORDER
TRV	TEMPERATURE TRANSDUCER	TRW	TEMPERATURE TRANSDUCER	VTR	VOLTAGE TRANSDUCER
WHM	WATT HOUR METER	HOA	HAND/OFF/AUTO SELECTOR SWITCH	OCA	OPEN/CLOSE/AUTO SELECTOR SWITCH

EQUIPMENT AND DEVICE LOCATION DESIGNATORS

A	ANNUNCIATOR	AI	ANALOG INPUT
DDC	DIRECT DIGITAL CONTROLLER PANEL	AO	ANALOG OUTPUT
F	FIELD LOCATED EQUIPMENT	DI	DIGITAL INPUT
EMAC	FACILITIES MONITORING AND CONTROL (SYSTEM)	DO	DIGITAL OUTPUT
G	GRAPHIC	I/O	INPUT/OUTPUT
ICP	LOCAL CONTROL PANEL	CHS	CHILLED WATER SUPPLY
M	MOTOR STARTER	CHR	CHILLED WATER RETURN
MCC	MOTOR CONTROL CENTER	CWS	CONDENSER WATER SUPPLY
MCP	MASTER CONTROL PANEL	CWR	CONDENSER WATER RETURN
MECP	MAIN ELECTRICAL CONTROL PANEL	CAI	COMPRESSED AIR (INSTRUMENT)
PLC	PROGRAMMABLE LOGIC CONTROLLER	MUVC	MAKE-UP WATER VALVE CLOSED
PCP	REMOTE CONTROL PANEL	MUVU	MAKE-UP WATER VALVE OPEN
RST	REMOTE STATION, DIGITAL INPUT/OUTPUT PANEL		

GENERAL NOTES

ALL SYMBOLS AND ABBREVIATIONS SHOWN ON THIS SHEET MAY NOT BE USED ON THIS PROJECT. ONLY THOSE SYMBOLS SHOWN ON PLANS AND DIAGRAMS APPLY.

This drawing has been prepared solely for the use of Brookhaven National Laboratory and there are no representations of any kind made by Giffels, Partnership to any party with whom Giffels, Partnership has not entered into a contract.

This drawing shall not be used for construction purposes until the seal and signature of the responsible registrant appears on the drawing, and proper permit forms and related fees are transmitted by the Owner, Owner's Agent or Contractor to the Authority Having Jurisdiction.

BROOKHAVEN NATIONAL LABORATORY

UNDER CONTRACT WITH
UNITED STATES DEPARTMENT OF ENERGY
PLANT ENGINEERING DIVISION
UPTON, NEW YORK 11973

JOB TITLE: CENTRAL CHILLED WATER FAC PHASE II
DWG. TITLE: CONTROLS SYMBOLS & ABBREVIATIONS LIST

SCALE	NO SCALE	DATE	11/705	ACCT. NO.		SHEET OF	
ESHD RISK LEVEL	APP'D BY	W. HARRISON	BLDG. NO.	600		M-620	

Giffels, Partnership
25200 Telegraph Road, Suite 200
Southfield, Michigan 48033 USA
Tel: 248-936-8000
Fax: 248-936-8111

Approved By: **B. NEWMAN**
Project Manager: **G. KAPLAN**
Project Engineer/Architect: **E. PHENDEL**
Project No.: **SF070003**