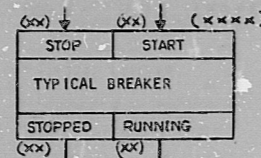
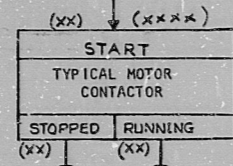


MOTOR CONTROL LOGICS: BREAKER, MOTOR CONTACTOR, OR REVERSING CONTACTOR WILL UTILIZE ONE OF THE THREE FUNCTIONAL BOXES BELOW. IN THAT THE ELECTRICAL INTERLOCKING, TRIP INDICATION AND STATUS INDICATION DEVELOPMENT ARE COMMON FOR MANY DEVICES A REFERENCE DRAWING WILL BE MADE FOR EACH BASIC TYPE AND REFERRED TO IN EACH LOGIC SHEET.

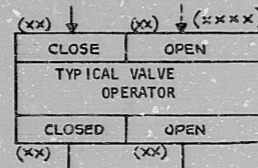
THESE BOXES REPRESENT A SIMPLIFIED FUNCTIONAL OPERATION OF THE EQUIPMENT WHICH IS DEFINED IN A REFERENCE DRAWING. THE OPERATION OF EACH DEVICE IS AS DEFINED NEXT TO EACH BOX PROVIDED THE ELECTRICAL REQUIREMENTS SHOWN ON THE REFERENCE DRAWING ARE SPECIFIED. STATUS AND TRIPPED LOGIC WILL BE PRESENT WHEN THE CONDITIONS DEFINED ON THE REFERENCE DRAWING ARE SATISFIED.



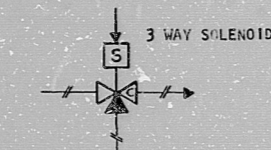
WHEN AN INPUT IS PRESENT AT THE "START" INPUT THE SWITCHGEAR BREAKER WILL CLOSE AND REMAIN CLOSED UNTIL THE INPUT IS REMOVED AND AN INPUT IS PRESENT ON THE "STOP" INPUT.



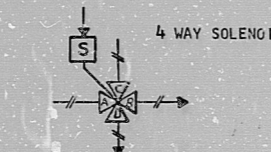
WHEN AN INPUT IS PRESENT AT THE CONTACTOR INPUT THE CONTACTOR WILL CLOSE. AS SOON AS THE INPUT IS REMOVED THE CONTACTOR WILL OPEN. (XX) INDICATES INTERFACE REFERENCE DRAWING COORDINATE.



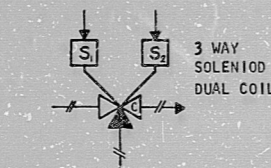
WHEN AN INPUT IS PRESENT AT THE "OPEN" INPUT THE VALVE OPERATOR WILL RUN IN THE OPEN DIRECTION. WHEN AN INPUT IS PRESENT ON THE "CLOSE" INPUT THE VALVE OPERATOR WILL RUN IN THE CLOSE DIRECTION. WITHOUT EITHER SIGNAL THE OPERATOR WILL STOP.



(xxxx) NUMBER FOR REFERENCE DRAWING SHOWING DETAILS OF OPERATION. NOTE: SEE DRAWING NO. 1-2-2993, SHT. 3 FOR SELECTION OF REFERENCE DRAWINGS. WHEN AN INPUT IS PRESENT THE SOLENOID WILL ENERGIZE. THE SOLENOID IS SHOWN DE-ENERGIZED. THE SHADED PORT IS CLOSED TO COMMON PORT 'C' AND THE UNSHADED PORT IS OPEN TO COMMON PORT 'C' WHEN DE-ENERGIZED. THE REVERSE IS TRUE WHEN THE SOLENOID IS ENERGIZED.

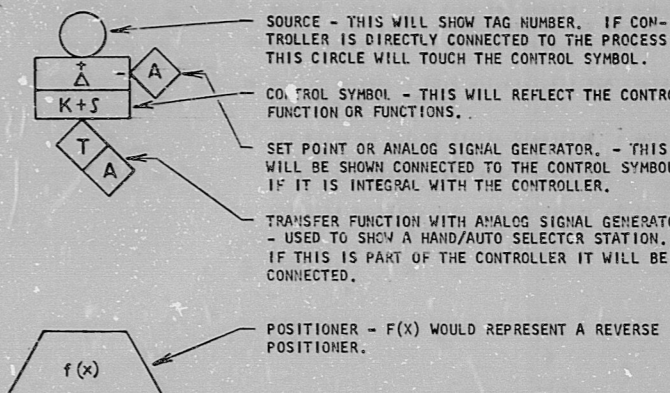


WHEN AN INPUT IS PRESENT THE SOLENOID WILL ENERGIZE. ENERGIZED - PORT 'A' IS CONNECTED TO PORT 'D' AND PORT 'C' IS CONNECTED TO PORT 'B'. DE-ENERGIZED - PORT 'A' IS CONNECTED TO PORT 'B' AND PORT 'C' IS CONNECTED TO PORT 'D'.



WHEN AN INPUT IS PRESENT EITHER SOLENOID THE SOLENOID WILL ENERGIZE. WHEN SOLENOID 'S1' IS ENERGIZED THE SHADED PORT OPENS TO PORT 'C' AND THE UNSHADED PORT CLOSURES TO PORT 'C'. THE VALVE STAYS IN THIS CONDITION AFTER 'S1' IS DEENERGIZED AND UNTIL 'S2' IS ENERGIZED.

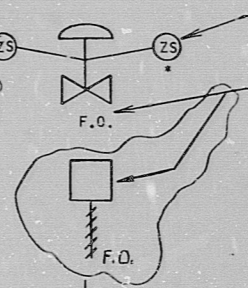
FUNCTION	SIGNAL PROCESSING SYMBOL
SUMMING	E
AVERAGING	E/n
DIFFERENCE	Δ
PROPORTIONAL	K
INTEGRAL	∫
DERIVATIVE	d/dt
MULTIPLYING	X
DIVIDING	÷
ROOT EXTRACTING	√
NON LINEAR OR UNSPECIFIED FUNCTION	f(x)
TIME FUNCTION	f(t)
HIGH SELECTING	>
LOW SELECTING	<
HIGH LIMITING	⋈
LOW LIMITING	⋋
REVERSE PROPORTIONAL	-K
BIAS	±
ANALOG SIGNAL GENERATOR	A
TRANSFER	T
SIGNAL MONITOR	H/L
VOLTAGE TO PNEUMATIC CONVERTER	E/P
CURRENT TO PNEUMATIC CONVERTER	I/P
PNEUMATIC TO VOLTAGE CONVERTER	F/E
PNEUMATIC TO CURRENT CONVERTER	P/I
ELECTRICAL ISOLATION DEVICE	E/E



SOURCE - THIS WILL SHOW TAG NUMBER. IF CONTROLLER IS DIRECTLY CONNECTED TO THE PROCESS THIS CIRCLE WILL TOUCH THE CONTROL SYMBOL.
 CONTROL SYMBOL - THIS WILL REFLECT THE CONTROL FUNCTION OR FUNCTIONS.
 SET POINT OR ANALOG SIGNAL GENERATOR - THIS WILL BE SHOWN CONNECTED TO THE CONTROL SYMBOL IF IT IS INTEGRAL WITH THE CONTROLLER.
 TRANSFER FUNCTION WITH ANALOG SIGNAL GENERATOR - USED TO SHOW A HAND/AUTO SELECTOR STATION. IF THIS IS PART OF THE CONTROLLER IT WILL BE CONNECTED.

POSITIONER - F(X) WOULD REPRESENT A REVERSE POSITIONER.

TERA APERTURE CARD



STEM MOUNTED POSITION SWITCHES
 CONTROL VALVE OR DAMPER
 F.O. FAIL OPEN - AIR TO CLOSE
 F.C. FAIL CLOSED - AIR TO OPEN
 % INDICATED HERE REPRESENTS THE STATE WHEN AN OUTPUT SIGNAL IS PRESENT.
 0% WOULD INDICATE VALVE/DAMPER CLOSED
 100% WOULD INDICATE VALVE/DAMPER OPEN
 ANY INTERMEDIATE POSITION SHOULD BE INDICATED AS < OR > THE POSITION WHERE THE OUTPUT IS PRESENT.

ELECTRICAL LOGIC OR DIGITAL SIGNAL
 PNEUMATIC SIGNAL
 ELECTRICAL ANALOG SIGNAL

INFORMATION
 THIS DOCUMENT IS SUBJECT TO REVISION WITHOUT NOTIFICATION TO THE USER OF THIS COPY

NO.	DATE	DESCRIPTION	BY	CHK	ENG	PROJ	MGR	DATE	DESCRIPTION	BY	CHK	ENG	PROJ	MGR
1	11/8/79	REVISION AS NOTED												
2		REMOVE TRIPPED STATUS FROM BREAKER												
3		ADDED COORDINATE POINTS												
4		ADDED FOR USE												
5		AS NOTED												
6		FIRST ISSUE												

Brown & Root Inc.
 ENGINEERS-CONSTRUCTORS
 HOUSTON, TEXAS

SOUTH TEXAS PROJECT

DRAWING TITLE: STANDARD LOGIC SYMBOLS
 CONTRACT NO: CR-0241
 SCALE: N/A
 DRAWING NO: 12-2993F
 SHT. 2

PKG. NO. 077 AREA C50

BROWN & ROOT INC.
 MICROFILM SERVICES

THURSDAY, NOV. 8 1979



INFORMATION PRELIMINARY REVIEW USE CONSTRUCTION

RIDS

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