

Industrial Electrical Symbols

Contact Us

Barish Pump Company Inc. offers this guide to common industrial electrical symbols to help you correctly identify components and spot potential hazards. Bookmark this page as a handy reference for future electrical projects. Safety first!

... INDUSTRIAL ELECTRICAL SYMBOLS ...							
TRANSFORMERS							
AUTO	AIR CORE	CURRENT	CONTROL TRANSFORMER		AUTOTRANSFORMER FOR REDUCED-VOLTAGE STARTING		
			SINGLE-VOLTAGE	DUAL-VOLTAGE			
AC MOTORS							
SINGLE-PHASE	SEPARATE PHASE, TWO-SPEED	THREE-PHASE	SEPARATE WINDING, TWO-SPEED	CONSTANT-TORQUE, TWO-SPEED			
VARIABLE-TORQUE, TWO-SPEED	CONSTANT-HORSEPOWER, TWO-SPEED	WYE/DELTA, REDUCED-VOLTAGE	WYE-CONNECTED, PART WINDING, REDUCED-VOLTAGE				
DC MOTORS				WIRING			CONNECTIONS
ARMATURE	SHUNT FIELD	SERIES FIELD	COMM OR COMPENS FIELD	NOT CONNECTED	POWER	WIRING TERMINAL	MECHANICAL
				CONNECTED	CONTROL	GROUND	MECHANICAL INTERLOCK
CONTROL AND POWER CONNECTIONS-600 V OR LESS ACROSS-THE-LINE STARTERS							
				1ø	2ø, 4-WIRE	3ø	
LINE MARKINGS				L1, L2	L1, L3 PHASE 1 L2, L4 PHASE 2	L1, L2, L3	
GROUND WHEN USED				L1 IS ALWAYS UNGROUNDING	—	L2	
MOTOR RUNNING OVERCURRENT UNITS IN	{ 1 ELEMENT 2 ELEMENT 3 ELEMENT			L1 — —	— L1, L4 —	— — L1, L2, L3	
CONTROL CIRCUIT							

CONTROL CIRCUIT CONNECTED TO	L1, L2	L1, L3	L1, L2
FOR REVERSING INTERCHANGE LINES	—	L1, L3	L1, L3

CONTACTS								OVERLOAD RELAYS	
INSTANT OPERATING				TIMED CONTACTS - CONTACT ACTION RETARDED AFTER COIL IS:				THERMAL	MAGNETIC
WITH BLOWOUT		WITHOUT BLOWOUT		ENERGIZED		DE-ENERGIZED			
NO	NC	NO	NC	NOTC	NCTO	NOTO	NCTC		

SUPPLEMENTARY CONTACT SYMBOLS						TERMS
SPST NO		SPST NC		SPDT		
SINGLE BREAK	DOUBLE BREAK	SINGLE BREAK	DOUBLE BREAK	SINGLE BREAK	DOUBLE BREAK	SPST SINGLE-POLE, SINGLE-THROW SPDT SINGLE-POLE, DOUBLE-THROW DPST DOUBLE-POLE, SINGLE-THROW
DPST, 2NO		DPST, 2NC		DPDT		DPDT DOUBLE-POLE, DOUBLE-THROW NO NORMALLY OPEN NC NORMALLY CLOSED
SINGLE BREAK	DOUBLE BREAK	SINGLE BREAK	DOUBLE BREAK	SINGLE BREAK	DOUBLE BREAK	

METER (INSTRUMENT)				PILOT LIGHTS	
INDICATE TYPE BY LETTER	TO INDICATE FUNCTION OF METER OR INSTRUMENT, PLACE SPECIFIED LETTER OR LETTERS WITHIN SYMBOL.			INDICATE COLOR BY LETTER	
	NON PUSH-TO-TEST	PUSH-TO-TEST			
	AM or A	AMMETER	VA	VOLTMETER	
	AH	AMPERE HOUR	VAR	VARMETER	
	μA	MICROAMMETER	VARH	VARHOUR METER	
	mA	MILLAMMETER	W	WATTMETER	
	PF	POWER FACTOR	WH	WATTHOUR METER	
	V	VOLTMETER			

INDUCTORS		COILS		
IRON CORE		DUAL-VOLTAGE MAGNET COILS		BLOWOUT COIL
AIR CORE		HIGH-VOLTAGE	LOW-VOLTAGE	

DISCONNECT	CIRCUIT INTERRUPTER	CIRCUIT BREAKER WITH THERMAL OL	CIRCUIT BREAKER WITH MAGNETIC OL	CIRCUIT BREAKER W/ THERMAL AND MAGNETIC OL

LIMIT SWITCHES		FOOT SWITCHES	PRESSURE AND VACUUM SWITCHES	LIQUID LEVEL SWITCH	TEMPERATURE-ACTUATED SWITCH	FLOW SWITCH (AIR, WATER, ETC.)
NORMALLY OPEN	NORMALLY CLOSED					
		NO	NO	NO	NO	NO
HELD CLOSED	HELD OPEN	NC	NC	NC	NC	NC

SPEED (PLUGGING)		ANTI-PLUG	SYMBOLS FOR STATIC SWITCHING CONTROL DEVICES			
			<p>STATIC SWITCHING CONTROL IS A METHOD OF SWITCHING ELECTRICAL CIRCUITS WITHOUT USE OF CONTACTS, PRIMARILY BY SOLID-STATE DEVICES. USE SYMBOLS SHOWN IN TABLE AND ENCLOSE THEM IN A DIAMOND.</p>			
			INPUT COIL	OUTPUT NO	LIMIT SWITCH NO	LIMIT SWITCH NC

SELECTOR																																
TWO-POSITION	THREE-POSITION	TWO-POSITION SELECTOR PUSHBUTTON																														
			<table border="1"> <tr> <th rowspan="4">CONTACTS</th> <th colspan="4">SELECTOR POSITION</th> </tr> <tr> <th colspan="2">A</th> <th colspan="2">B</th> </tr> <tr> <th colspan="2">BUTTON</th> <th colspan="2">BUTTON</th> </tr> <tr> <th>FREE</th> <th>DEPRESSED</th> <th>FREE</th> <th>DEPRESSED</th> </tr> <tr> <td>1-2</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3-4</td> <td></td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> </tr> </table>	CONTACTS	SELECTOR POSITION				A		B		BUTTON		BUTTON		FREE	DEPRESSED	FREE	DEPRESSED	1-2	X					3-4		X	X	X	X
CONTACTS	SELECTOR POSITION																															
	A		B																													
	BUTTON		BUTTON																													
	FREE	DEPRESSED	FREE	DEPRESSED																												
1-2	X																															
3-4		X	X	X	X																											
X-CONTACT CLOSED	X-CONTACT CLOSED	X - CONTACT CLOSED																														

PUSHBUTTONS						
MOMENTARY CONTACT				MAINTAINED CONTACT		ILLUMINATED
SINGLE CIRCUIT	DOUBLE CIRCUIT	MUSHROOM HEAD	WOBBLE STICK	TWO SINGLE CIRCUIT	ONE DOUBLE CIRCUIT	
	NO AND NC					
NO						
NC						

RESISTORS			CAPACITORS		
FIXED	ADJUSTABLE BY FIXED TAPS	RHEOSTAT, POT, OR ADJUSTABLE TAP	FIXED	ADJUSTABLE	POLARIZED
RES					
HEATING ELEMENT	RES	RES			

FUSE	BELL	BUZZER	HORN, SIREN, ETC.	HALF-WAVE RECTIFIER	FULL-WAVE RECTIFIER
POWER OR CONTROL					

BATTERY	THERMOCOUPLE	IGNITRON TUBE	SEMICONDUCTORS . . .		
			DIODE	TUNNEL DIODE	UNIDIRECTIONAL BREAKDOWN (ZENER) DIODE

... SEMICONDUCTORS ...					
BIDIRECTIONAL BREAKDOWN DIODE	PHOTOSENSITIVE CELL	TRIAC (BIDIRECTIONAL TRIODE THYRISTOR)	SILICON CONTROLLED RECTIFIER	PROGRAMMABLE UNIT - JUNCTION TRANSISTOR (PUT)	
... SEMICONDUCTORS					
TRANSISTOR			UNIUNCTION TRANSISTOR		
PNP BASE	NPN BASE	P BASE	N BASE		

Partial Glossary

Resistor: Resistors restrict the flow of current. Used with a capacitor in a timing circuit.

Ground: Connection to the actual ground or other "grounding" structure. Used to provide electrical shock protection and for zero potential reference.

Capacitor: Stores electric charge. Can be used to filter or block DC signals while passing AC signals. Used with a resistor in a timing circuit.

Battery: Generates constant voltage and supplies electrical energy.

Fuse: Sacrificial overcurrent protection device. This symbol represents low power/low voltage fuses.

Inductor: Coil of wire that generates a magnetic field when electrical current is passed through it. Passive two-terminal electrical component used to store energy in the resulting magnetic field. Can also be used as a transducer to convert electrical energy into mechanical energy.

Iron Core Inductor: Same as above, but with an iron core beneath the coiled wire.

Circuit Breaker: Automatically operated electrical switch that protects electrical circuits from damage caused by short circuits or overloads.

Voltmeter: Very high resistance device used to measure electrical voltage. Must be connected in parallel.

Ammeter: Zero resistance device used to measure electrical current. Must be connected serially.

Wattmeter: Device used to measure electric power.

Bell: Electric bell, makes a single tone or repeated ringing sound when activated.

Buzzer: Similar to an electric bell, an electric buzzer makes a constant buzz when activated.

SPST (Single-Pole, Single-Throw): A simple switch with one input and one output. Switch will be either closed or completely disconnected. Requires only two terminals. Ideal for on/off switching.

SPDT (Single-Pole, Double-Throw): A switch utilizing three terminals: one common pin, two pins vying for connection to the common (only one can be connected at a time). Ideal for selecting between two power sources or swapping inputs. Can be made into an SPST switch by simply leaving one of the throw pins unconnected.

DPST (Double-Pole, Single-Throw): Essentially a doubled SPST. A switch with two inputs and two outputs; each input corresponds to one of the outputs. DPST switches provide versatility, as they can accept two inputs and drive two different outputs to the same circuit.

DPDT (Double-Pole, Double-Throw): Essentially two SPDT switches, controlling two different circuits, and always switched on together from a single actuator. Require six terminals.

NO (Normally Open): The "normal" state for a switch is its nonactuated position. Depending on its construction, a switch's normal state can produce an open circuit or a short circuit. When open until actuated, a switch is a normally open (NO) switch; when activated, a NO switch closes the circuit.

NC (Normally Closed): Essentially the "opposite" of an NO switch. A switch that creates a short circuit when not actuated. Normally closed (NC) switches create a short circuit when actuated.

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