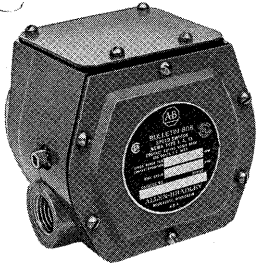
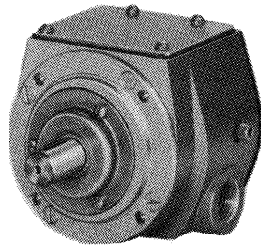


SPEED SWITCHES



Rear View of Speed Switch
Less Lockout Solenoid and
Mounting Bracket

NEMA Type 1, 4 and 13 Enclosure



Front View of Speed Switch
Less Lockout Solenoid and
Mounting Bracket

NEMA Type 1, 4 and 13 Enclosure

DESCRIPTION— The Bulletin 808 speed switch is a pilot device which is used with an automatic starter arranged for reversing or plugging duty to provide plugging or antiplugging of squirrel cage motors. This device can also be used as a speed sensing switch, or to indicate direction of rotation of a driven shaft.

Plugging is a control function that provides braking by reversing the motor. The phase sequence is reversed so that the motor develops a counter-torque that exerts a retarding force. Antiplugging protection is the effect of a control device that operates to prevent the application of counter-torque by the motor until the motor speed has been reduced to an acceptable value.

PLUGGING — When applied in a suitable plugging application such as the circuit shown in Figure 1, the switch with normally open contacts is used. The Bulletin 808 speed switch is designed to automatically interrupt reverse braking power as the motor approaches zero speed. The speed at which the contacts operate can be adjusted so as to avoid coasting or reverse rotation of the motor. The contacts can be wired for plugging in either or both directions.

TYPICAL PLUGGING CIRCUIT — Bulletin 808 speed switch used with a reversing starter to bring a motor to a fast stop.

NOTE: See applicable standards, codes, and laws for all applications.

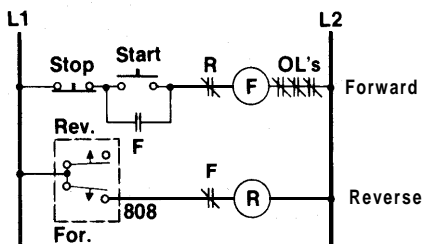


FIGURE 1

PRECAUTIONS IN PLUGGING APPLICATIONS — There are many advantages in plugging a motor to a stop, however, care must be taken that these advantages are not lost through misapplications. The following information should be considered before deciding to use a plugging control.

1. When plugging a motor to a stop, full load motor current may be greatly exceeded. The electrical supply must be able to handle the excess load.
2. The resultant forces of a plugged stop may be too great for the driven machine to withstand. For example, a twisted or broken shaft may result.
3. The motor may not withstand braking duty. The duty cycle and load must be considered and the motor manufacturer should be consulted to determine if a particular motor is adequate for plugging duty.

NOTE: See applicable standards, codes, and laws for all applications.

ANTIPLUGGING — For this application, the switch with normally closed contacts is used. The speed switch is designed to keep the reverse circuit open until the speed of the driven machine has decreased to a predetermined value. At this speed the contacts are designed to close, permitting reverse energization to be applied manually, or automatically when using a second speed switch arranged for plugging duty. Mechanical braking can also be used. The speed switch can be used for antiplugging control in either or both directions. See Figure 2.

PRECAUTIONS IN ANTIPLUGGING APPLICATIONS — The speed switch must be adjusted so that contact closure does not occur before the speed of the machine is reduced to a safe level for secondary braking.

TYPICAL ANTIPLUGGING CIRCUIT— This circuit is used in cases where damage would result from a sudden reversal of power. The speed switch contacts are designed to keep the reverse circuit open until the motor has coasted to a preset speed.

NOTE: See applicable standards, codes, and laws for all applications.

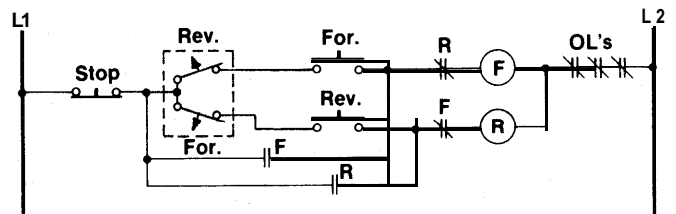


FIGURE 2

SPEED SENSING AND DIRECTION OF ROTATION — In these applications, the device with either normally open or normally closed contacts can be used depending upon the requirements of the circuit. For example, when connected to an alarm circuit, the speed switch can be used to sense belt breakage. The speed switch can also be used to sequence conveyors where it is essential for one conveyor to be in motion or up to a preselected speed before a second conveyor is started. See Figure 3. The switch will also indicate the directional movement of a conveyor by monitoring the rotation of a suitable driven shaft. See Figure 4.

PRECAUTIONS — The shaft of the speed switch should be driven at the highest available speed within the maximum speed specified in Table 1 below. The continuous driven speed should be at least 2 times the speed at which the contacts are set to operate. This will provide high contact force and reduce the possibility of contact "chatter" and erratic operation of the switch.

TYPICAL CONVEYOR SEQUENCING CIRCUIT — M2 starts automatically when M1 comes up to speed.

NOTE: See applicable standards, codes, and laws for all applications.

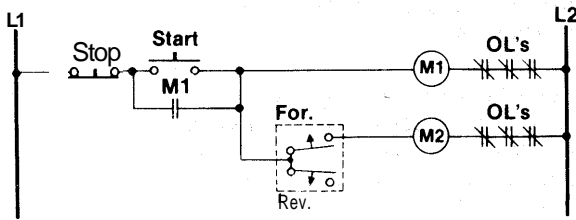


FIGURE 3

TYPICAL DIRECTION OF ROTATION CIRCUIT

NOTE: See applicable standards, codes, and laws for all applications.

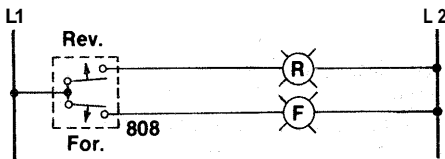


FIGURE 4

TABLE 1 — SPEED SWITCH CHARACTERISTICS

	J	M
Styles with Normally Open Contacts		
Styles with Normally Closed Contacts	K	R
Contact Operating Speed Range (RPM)	15 1 - 80	50-1000
Maximum Shaft Operating Speed (RPM)	1200	2000
Maximum Driving Torque (Inch-Pounds)	3.5	3.5
Temperature Rise (Degrees F)	120	140

□ When mounted with adjustment screws not at the same level, minimum adjustable speed is 20 RPM

IMPORTANT: Do not run the speed switch at any time at a speed higher than the indicated maximum speed since permanent damage to the switch may result.

TABLE 2 - CONTACT RATING

AC NEMA Rating Designation 8600

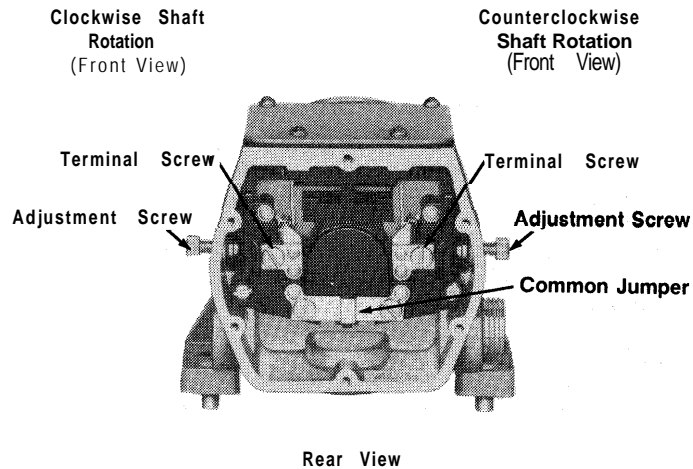
Max. AC Voltage	Amperes		Voltamperes	
	Make	Break	Make	Break
120	30	3	3600	360
240	15	1.5	3600	360
480	7.5	0.75	3600	360
600	6.0	0.6	3600	360

COUPLING — Speed switch coupling must be positive to avoid slippage. A direct flexible coupling is best. This type of coupling also minimizes bearing wear on both the speed switch and the driven shaft of the machine due to the unavoidable difficulties of accurate alignment of separate shafts. Gears, chain, or timing belt can be used successfully. A rigid coupling should not be used. (See Table 1 for driving torque and maximum speed specifications.)

PRECAUTIONS — It is important not to overload the shaft of the speed switch or shortened bearing life may result. Radial loads on the NEMA Type 1,4, 13 speed switch should not exceed 50 pounds and axial loads (thrust loads) should not exceed 20 pounds. Radial loads on the NEMA Type 7 & 9 speed switch should not exceed 25 pounds and axial loads (thrust loads) should not exceed 20 pounds.

In speed sensing or direction of motion applications, a timing or V belt may be used. Proper belt tension must be maintained to keep slippage at a minimum. The maximum belt tension must not exceed 25 pounds.

SPEED SWITCH WITH COVER REMOVED



ADJUSTMENT — The speed switch is easily adjusted by means of two external adjusting screws — one for each set of contacts. One screw controls clockwise rotation, the other counterclockwise. Use 5/32" hex wrench.

Prior to adjustment run the speed switch at operating speed until the switch reaches its normal operating temperature.

PLUGGING — Turn adjusting screw(s) in or out to achieve stopping at zero speed. Adjust both screws when circuit requires switch to be wired for plug stopping in both directions. Adjustment depends upon the speed of the machine. Improper adjustment will cause the machine to either:

1. Coast to a stop, caused by not providing enough counter-torque;
2. Permit a back-spin (shaft rotating in opposite direction), caused by providing too much counter-torque.

Adjustment of the speed switch must be made between these two conditions to achieve zero shaft speed.

ANTIPLUGGING — Turn adjusting screw(s) out 7/16", measuring from end of hex socket head to enclosure (lowest speed setting). When circuit requires switch to be wired for antiplugging control in both directions, both screws will require adjusting.

1. Turning screw(s) in will permit reverse energization to be applied manually or automatically at a higher shaft speed.
2. Adjust to desired speed as determined by trial runs.

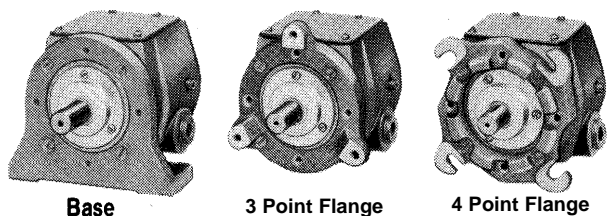
CAUTION: Do not apply reverse energization during trial runs until it has been determined that the speed switch contacts in the reverse circuit are re-closing at a safe speed for the particular application.

SPEED SENSING AND DIRECTION OF ROTATION — Turn adjusting screw(s) out for lower speed, and in for higher speed sensing of shaft. Adjust both screws when contacts are wired for sensing shaft speed in each direction of rotation.

WIRING INSTRUCTIONS — Remove cover with nameplate, exposing contact block. Use wire suitable for at least 90° C. Check application notes for recommended wiring diagrams.

NOTE: Contact blocks are supplied with a common jumper which may be removed if isolated contacts are desired. Replace cover, torque cover screws 8-10 in.-lbs.

INTERCHANGEABLE MOUNTING BRACKETS



MOUNTING — Three types of interchangeable mounting brackets are available for NEMA Type 1, 4 and 13 speed switches. NEMA Type 7 & 9 switches are available with base type mounting bracket only. (See Table 3.)

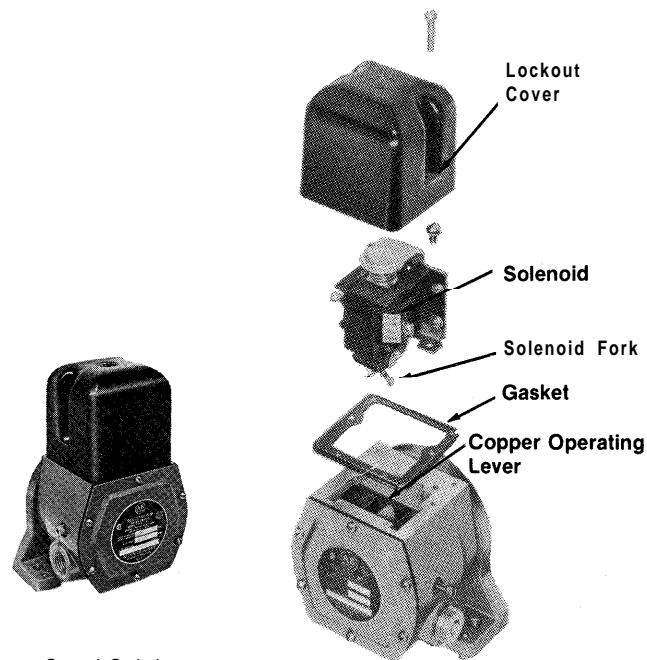
Brackets, except on NEMA Type 7 & 9 switches, can be mounted to the switch in any of eight positions, one position of which is used to locate the conduit opening in the most convenient position for the electrical connection. Bracket X-268875 used on NEMA Type 7 & 9 switch is mounted in one position. Mounting brackets are attached with four slotted screws and lock washers. These screws should be torqued to 20-24 in.-lbs.

Description	Catalog Number
Base Mounting (NEMA Type 1, 4 and 13)	808-N1
3 Point Flange Mounted	808-N2
4 Point Flange Mounted	808-N3
	Part Number
Base Mounting (NEMA Type 7 & 9)	X-268875

MAINTENANCE — Periodic inspection of the shaft seal is suggested. If seal wear is evident, replace with external bearing seal kit. Catalog Number 808-N5. Installation instructions are included with replacement kit.

CAUTION: Do not attempt to disassemble the shaft assembly. Any such attempt may permanently damage the speed switch.

Bearings are sealed and are of the permanently lubricated type. In severe environments, such as cement dust, the shaft seal should be cleaned and lubricated with "Anderol 757" or equivalent. "Anderol 757" is a synthetic diester multi-purpose grease.



Speed Switch With Lockout Solenoid NEMA Type 1, 4 and 13 Enclosure

Exploded View of Speed Switch with Lockout Solenoid

LOCKOUT SOLENOID — The Bulletin 808 can be equipped with a lockout solenoid which consists of solenoid and cover mounted on top of the switch. To add a lockout solenoid, remove the top plate (4 screws) and mount the solenoid bracket to the housing with two #10-32 x 3/8" screws provided. These screws should be torqued to 20-24 in.-lbs. The lockout solenoid fork must straddle the copper operating lever (see exploded view). Mount cover as shown in exploded view with two #8-32 x 1" screws provided. Be sure the top plate gasket is in place before torquing cover screws, 8-10 in.-lbs.

Volts	Hz	Catalog Number	Volts	Hz	Catalog Number
120	60	808-NLA1	480	60	808-N LA4
110	50		440	50	
208	60	808-NLA20	600	60	808-NLA6
240	60	808-NLA2	550	50	
220	50				

TYPICAL LOCKOUT SOLENOID CONNECTIONS
(if used)

NOTE: See applicable standards, codes, and laws for all applications.

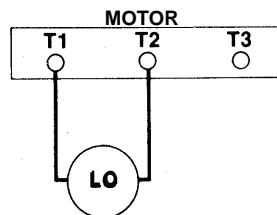


FIGURE 5