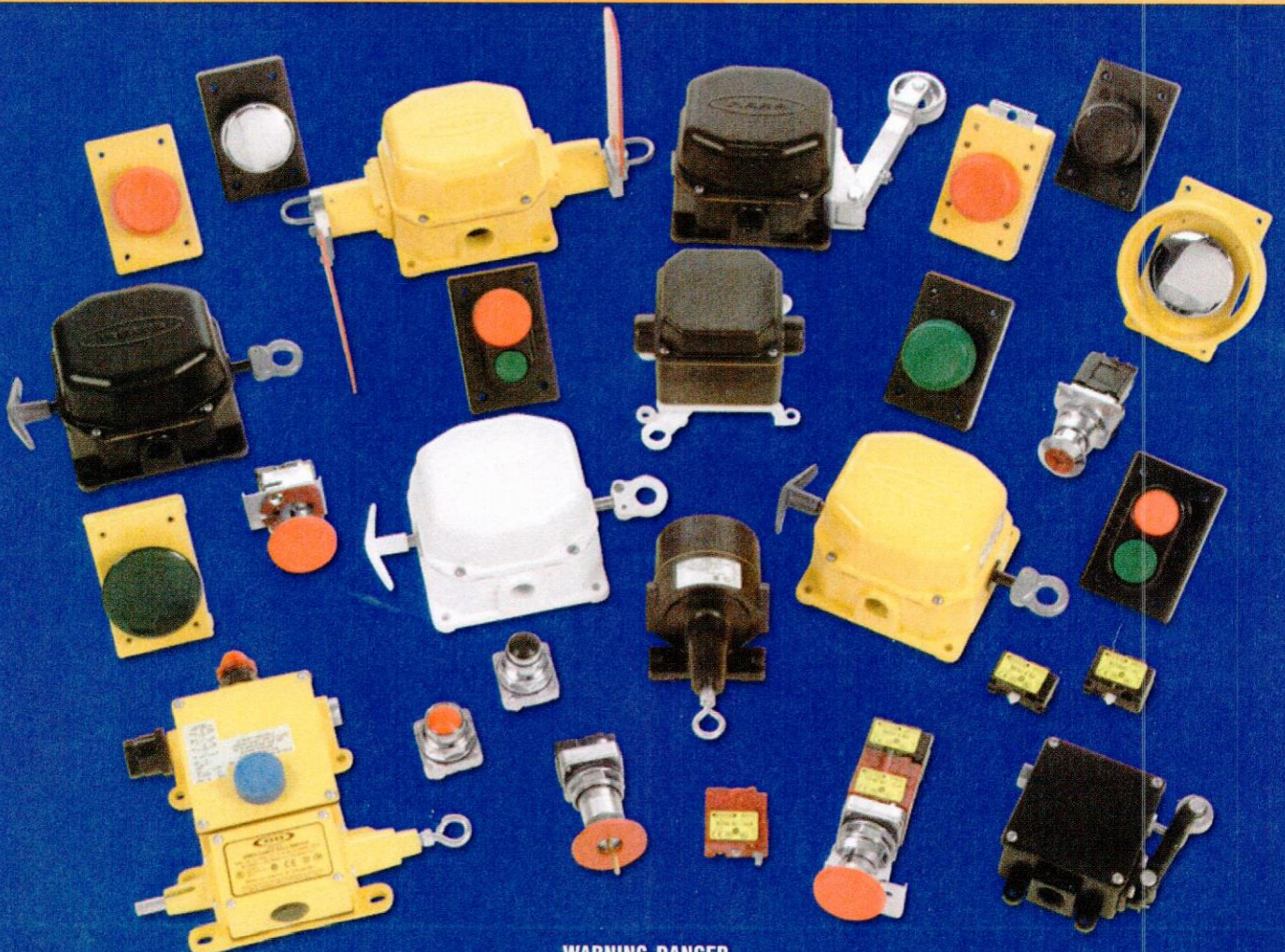


7
0
3



SINCE
1 • 9 • 2 • 9

REES, Inc. Specifier's Guide • No. 703



WARNING-DANGER

These products should only be used where point-of-operation guarding devices have been properly installed and maintained so that all appropriate OSHA and ANSI B.11 regulations and standards are met. Misapplication of these products on machinery lacking effective point-of-operation safeguards can cause serious injury to the operator of that machinery.



P.O. Box 652 • Fremont, IN • 46737
www.reesinc.com

P: 260-495-9811 • F: 260-495-2186



REES, Inc. is dedicated to serving the special product needs of end users with a full line of top quality, reliable, heavy duty electro-mechanical switches. We have provided solutions to unique customer problems for over seventy years.

By emphasizing quality and pursuing excellence through empowerment of all of our employees, REES strives to be a leader in the design, assembly and testing of all our products thereby promoting growth and profitability as a measure of success. Our goal is to exceed customer expectations and service their special needs for many years to come.

Our Quality Management System is ISO 9001:2000 registered and as such we are committed to compliance with the standard and will continually improve the effectiveness of our system.

REES QUALITY STATEMENT

RELIABLE PRODUCTS

EXCELLENT QUALITY

EMPLOYEES
DEDICATED

SERVICE
EXCEPTIONAL

REES switches are designed to function within electrical control circuits. They can be connected to specific circuitry and used in conjunction with other devices (electrical and/or manual) to become part of a safety system. REES switches themselves are not to be classified as safety devices because they cannot detect or react to a condition on their own that requires a safety response.

The primary function of our devices is achieved when an electrical circuit is closed and a current is allowed to flow, OR, when an electrical circuit is opened and a current flow is stopped.



TERMS

AND CONDITIONS OF SALE



P.O. Box 652 • Fremont, IN • 46737
www.reesinc.com

P: 260-495-9811 • F: 260-495-2186

Orders

All orders are subject to acceptance by REES.

Terms

2% 10th Proximo, Net 25th Proximo, from date of invoice. Invoices dated the 26th and later are considered the following month's business.

Minimum Billing

Orders for less than \$75.00 net value will be invoiced at \$75.00 to cover processing costs.

Freight

Freight charges will be prepaid and allowed on a single order of standard items worth \$2,500.00 list or more which is to be routed in one shipment to a single destination. Method and route of shipment will be at the discretion of REES unless purchaser shall specify otherwise. Orders specifying a more expensive routing must be received in writing. An allowance will be made equal to the least expensive routing, provided the order meets the conditions for freight allowed. A 3% of list charge may be added to orders with less than \$2,500.00 list to cover processing.

Customer requests for billing of UPS charges other than prepay and add will be honored when possible but may be subject to an additional handling charge. Any additional charges incurred due to customer supplied information, such as incorrect/invalid UPS account number or shipping address will be the responsibility of the customer.

On orders for shipment to Alaska, Hawaii or destinations outside the continental United States, freight on qualifying order will be prepaid and allowed to the U.S. port of export ONLY.

No allowance will be made for cartage at destination.

Air or rail express shipments by special routing are F.O.B. shipping point.

Packing and Marking

Customer-specified packing or marking may be subject to additional charges not otherwise included in the price of the products.

Return Goods

RETURN MERCHANDISE WILL NOT BE ACCEPTED WITHOUT PRIOR WRITTEN AUTHORIZATION. REES will consider for return, only standard catalog items in original package and materials of current design. Upon approval, the terms of credit for such returns are:

1. The original purchase price.
2. Less 20% restocking charge.
3. Less all freight charges paid by REES.
4. Less all rework costs incurred in placing the goods in salable condition.

Transport charges on the returned goods must be prepaid. REES will accept return of merchandise which is defective or was supplied in error by REES for full credit. REES reserves the right to determine the receiving point of such return goods regardless of the original shipping point.

Rework

Under no circumstances will credit be allowed, without written authorization by an officer of REES, for rework on any material.

Cancellation

All or any part of any order of standard items accepted by REES may be cancelled without charge if written instructions are received at the factory prior to shipment.

Orders for SPECIALS are not cancelable, unless purchaser agrees to remit to REES an amount, determined by REES, cover cost, etc., incurred up to

the point that such cancellation notice is received in writing.

Warranties

REES warrants goods manufactured by it to be free from defects in materials and workmanship for a period of one (1) year from the date of shipment from its plant. If within such period any such goods shall be proven to REES' satisfaction to be defective, then and in that event such equipment shall be repaired or replaced at REES' option. Such correction or replacement of defective goods shall constitute a fulfillment of all liabilities in respect to such goods. User shall determine the suitability of the product for its intended use and assume all risk and liability in connection therewith. REES' only obligation shall be to replace such quantity of the product proved to be defective as shipped by REES.

Loss or Damage in Transit

Our responsibility ceases with the delivery to the carrier, at which time title passes to the purchaser and all claims for loss, damage, and delay must be made to the carrier by the purchaser. Assistance in the form of shipping document copies is available upon request.

Prices

Orders are accepted with the understanding that the goods will be billed at prices, in U.S. dollars or funds, in effect at the time of shipment, unless otherwise specified in quotation.

Taxes

The amount of any present or future sales or other similar tax applicable to the material sold hereunder shall be added to the prices contained herein and paid by the purchaser in the same manner and with the same effect as if originally added thereto.

Promise Dates

Any promise dates toward shipment of all or any part of any order, whether given prior to or after placement of said order, are determined to the best of our ability, but are in NO WAY GUARANTEED. REES, therefore, is not indemnifier for any damages, losses, or claims whatsoever due to inability to meet such promises.

Clerical Errors

All clerical errors are subject to correction.

Shipping Errors

Any shipping errors must be reported to the factory within 30 days from receipt of shipment.

Catalog Specifications

Catalog weights, dimensions, and operating forces etc. are careful estimates but are NOT GUARANTEED.

Consequential Damage

Anything to the contrary, herein contained notwithstanding REES shall not be liable for any consequential, contingent or incidental damages whatsoever.

Changes

We reserve the right to make any technical improvements that may alter price, size, appearance, packaging and or design without notice.



PRODUCT APPLICATION **WARNING - DANGER**

These products should only be used where point-of-operation guarding devices have been properly installed and maintained so that all appropriate OSHA and ANSI B 11.1 regulations and standards are met. Misapplication of these products on machinery lacking effective point-of-operation safeguards can cause serious injury to the operator of that machinery.

PRODUCT LISTINGS / CHOICES

This catalog and other information from REES, Inc., and its authorized distributors provides product options (choices) for further investigation by users having technical expertise. It is important that you analyze all aspects of your application and review the information concerning the product in the current catalog. Due to the variety of operating conditions and applications for the products, the user, through their own analysis and testing, is solely responsible for making the final selection of the product and assuring that all performance, safety and warning requirements of the application are met. We endeavor to apply our design and manufacturing expertise through the development of products that have high value added content and to that end we reserve the right to modify designs in the course of improvements of the quality of our products or extending their field of application to facility production. This does not commit us to replace earlier versions.

REPAIR PARTS POLICY

In order to maintain the electrical, mechanical and legal integrity of our devices we DO NOT generally offer for sale any part that requires any disassembly of any portion of any switch. A "Field Repair Waiver" is available to cover simple repair for those companies willing to assume responsibility for the work. It is only issued for the replacement of parts judged to be field replaceable after review. Major overhauls will NOT be considered. We do sell those EXTERNAL items (i.e.: arm assemblies, knobs, springs, handles, lamps, lenses etc.) that are designed for field replacement. Also, we provide a reasonable "in Factory" repair service subject to part inspection.

Please call a sales representative for details.

TABLE OF CONTENTS



P.O. Box 652 • Fremont, IN • 46737
www.reesinc.com

P: 260-495-9811 • F: 260-495-2186

Cable/Rope Operated Switches

Product Line Review	4-5
Temperature Effects on Cable	6
Cable Operated w/Broken Cable Detection	7
Cable Operated Switch	8
Cable Operated with Flag Indicator(s)	9-10
Rope Operated Sequence Switch	11
Rope Operated Switch	12-13
Accessory Items for Cable/Rope Operated	14-15

Single Plunger Push Button Switches

Product Line Review	16-17
Push Button Switches w/Larger Mounting Patterns	18
Flat Chrome Plunger Push Button Switches	19
2.25 in Plastic Mushroom Plunger	20
2.25 in Metal Mushroom Plunger	21
2.25 in Mushroom Plunger w/Shield and Weatherproof	22
2.25 in Mushroom Plunger w/Shield	23
1.00 in and 2.25 in Push Buttons w/Key Lock	24
1.00 in Plastic Plunger and 1.75 in Mushroom Push-Pull	25
2.25 in Mushroom Plunger w/Spring Latch	26-27

Double Plunger Push Button Switches

Product Line Review	28-29
1.00 in Double Plastic Plunger	30
1.00 in and 1.75 in Double Plastic Plunger	31
1.38 in Double Plastic Plunger	32
Double Plastic Plunger w/Padlock Latch	33

Associated Control Switches and Accessories

Product Line Review	34-35
Rotary Contact Selector Switches	36
Heavy Duty Selector Switches	37
Weatherproof and 1.00 in Flush Plunger w/Lockout	38
Standard and Large Enclosures	39
Ring Guards	40
Palm Switch Guard Actuator	41
Standard Legend Plates	42
Accessory Items for Palm Switches/Enclosures	43

30.5mm Control Units

Product Line Review	44-45
30.5 mm Push Buttons	46
30.5 mm Mushroom and Rope Pull Operators	47
Push-Pull, 3 in 1 Lockable and Illuminated Operators	48
30.5 mm Selector Operators	49
Combined Selector Push Button Control	50
Contact Blocks	51
Selector Switch Operator Cams	52
Instructions for 30.5 mm Contact Units	53
Standard Pilot Lights	54
Miniature Pilot Lights	55
Lenses for Pilot Lights and Operators	56
30.5 mm and Miniature Legend Plates	57
Accessory Items for 30.5 mm Control Units	58-59
Pilot Light Schematics	60

Supplemental Industrial Switches

Product Line Review	61
Cylindrical Push Button	62
Machine and Universal Limit Switches	63

Data and Index

Contact Arrangements	64-65
Glossary	66-67
Environmental Ratings	68-69
Cross Reference by Old Catalog Number	70
Numerical Index	71

CABLE/ROPE OPERATED SWITCHES



P.O. Box 652 • Fremont, IN • 46737
www.reesinc.com

P: 260-495-9811 • F: 260-495-2186



Definition

A cable pull switch is a mechanical device used to make and/or break one or more electrical circuits from a semi-remote location through pulling or pushing of a cable or rope.

Operation

The cable, attached to the operating ring or lever of the switch, is installed with multiple supports in close proximity to the individuals who require control of the circuit. The pulling of the cable anywhere along its entire length will actuate the switch and either turn on or turn off the circuit it is wired into. One switch and cable can cover a distance of up to two hundred feet. This is especially useful when trying to guard conveyors.

Selection

The selection and use of a cable pull switch involves knowing the details of the particular installation. The following questions must be answered in order to make the proper selection. Does a circuit need to be made and/or broken? Does the circuit need to be manually or automatically reset? Are visual indicators required? What operating force is desired? How much cable slack (pre-travel) is acceptable? Will shorter cable runs increase operator reaction time? Are longer runs adequate?

Installation

Every installation is unique, therefore there are only a very few hard and fast rules to follow. First of all, observe all SAFETY REQUIREMENTS, PROCEDURES and LOCAL CODES. Secondly, the cable switch MUST be mounted on a flat surface. Bolting the switch to an irregular surface can cause the housing to be twisted and alter the function of the switch. The first cable support MUST be located 6 to 12 inches from the switch and in line with the switch shaft within 5 degrees. It is recommended that the balance of the cable supports be spaced at intervals not exceeding 10 feet. Long unsupported spans of cable will sag causing the operator at a different location to "pull up" that slack before actuating the switch. Unmanned sections of the cable can be run through open ended conduit affording maximum support and protection. This is also a very good way to route the cable around a corner if necessary. A larger radius curve can be bent into a short piece of conduit than can be obtained with a pulley. The operating force of a cable switch is dependent upon the distance between the cable supports and the total distance the cable has to be pulled to actuate the switch. Our switch "Instruction Sheets" chart these forces and can be used as a guide for the desired installation. It is recommended that the cable length does not exceed 200 feet and be in as straight a line as possible. This recommendation, as with the others given can be circumvented by the experience, knowledge and good sense of the installation supervisor. Cable weight is another factor to consider, as a too heavy cable may impair the system function by placing too great a pre-load on the switch. The use of a turnbuckle and/or an anchor spring in line with the cable will facilitate the installation and adjustment of the cable system. All cable materials will stretch with use and when subjected to varying temperature swings. This is more of a problem on longer runs than on shorter ones, so the cable must be regularly checked and re-adjusted to maintain the desired cable tension. These switches, as all mechanical devices, will wear out and eventually need to be replaced. The estimated minimum mechanical life is 150,000 operations. Regularly scheduled Preventive Maintenance inspections are strongly recommended for these switches. Some items to watch for are:

Physical damage to the switch.

Damage to the cable, particularly at the points that it passes through its supports.

Loose connections or components.

The cable out of adjustment!

If other assistance is desired please contact the factory.

On pages 7 through 13 you will find almost fifty different models of cable/rope pull switches that should satisfy any installation requirements. They cover a wide range of functions and operating forces from light to heavy duty. Also included are a number of accessory items to facilitate the installation or operation of these switches.

REES cable switches are designed and manufactured to surpass the minimal standards of industry. On the facing page is a brief look at some of these regulations and how our switches conform. The testing done by independent facilities (UL, CSA and DEMKO) are the minimum requirements that the REES switches far exceed. We also conform to published standards by OSHA, NEMA, The Low Voltage Directory and ASME.

See "WARNING ON PRODUCT APPLICATION" page (2)

Federal Regulations

Following are references and excerpts from Federal Regulations that have applicability to Cable Switches.

29 CFR 1910.216 (c) (2)

"On both sides of the calendar and near each end of the face of the roll there should be a cable or wire center cord connected to the safety trip. They shall operate readily when pushed or pulled."

29 CFR 1910.216 (e)

"All trip and emergency switches shall not be of the automatically resetting type, but shall require manual resetting."

29 CFR 1910.218 (j) (3)

"Conveyor power transmission equipment shall be guarded in accordance with ANSI B20.1 -1992."

29 CFR 1910.261 (c) (15) (iv)

"Every belt conveyor shall have an emergency stop cable extending the length of the conveyor so that it may be stopped from any location along the line, or conveniently located stop buttons within 10 feet of each work station, in accordance with ANSI B20.1-1992."

29 CFR 1910.262 (aa)

"A safety trip rod, cable, or wire center cord shall be provided across the front and back of all palmer cylinders, extending the length of the face of the cylinder. It shall operate readily whether pushed or pulled. This safety trip shall be not more than 72 inches above the level on which the operator stands and shall be readily accessible."

29 CFR 1910.262 (bb)(2)

"A safety trip rod, cable or wire center cord shall be provided across the front and back of all rope washers extending the length of the face of the washer. This safety trip shall be not more than 72 inches above the level on which the operator stands and shall be readily accessible."

29 CFR 1910.263 (i)(7)(iii)

"Where hazard of getting caught exists a sufficient number of stop buttons shall be provided to enable quick stopping of the conveyor."

OSHA Sources of standards:

Sec. 1910.216 is derived from ANSI B 28.1 - 1967

Sec. 1910.218 is derived from ANSI B 24.1 - 1971

Sec. 1910.261 is derived from ANSI P 1.1 - 1969

Sec. 1910.262 is derived from ANSI Z 8.1 - 1961

Sec. 1910.263 is derived from ANSI Z 50.1 - 1947

ASME B 20.1 - 1992 (5.11.2) (c)

"Remotely and automatically controlled conveyors, and conveyors where operator stations are not manned or are beyond voice or visual contact from drive areas, loading areas, transfer points, and other potentially hazardous locations on the conveyor path not guarded by location, position, or guards, shall be furnished with emergency stop buttons, pull cords, limit switches or similar emergency stop devices."

The majority of REES switches exceed the following:

Listed by Underwriters Laboratories per Standard UL 508
File No. E 58589

Certified by Canadian Standards Association
per Standard C 22.2 File No. LR 3648

Certified by DEMKO to IEC/EN 60947-5-5 or IEC/EN 60947-5-1
Third party certified under DEMKO File No. FI-17205

NEMA ICS 2-1988

ASME B 20.1

DEMKO A/S is a body notified to the Member States and Commission of the European Communities according to the provisions of Article 8 of the Low Voltage Directive.


IEC/EN 60947-5-5: Standard which applies to electrical emergency stop devices with a mechanical latching function. This standard also encompasses all requirements of regular electromechanical switches (60947-5-1)

IEC/EN 60947-5-1: Standard which applies to low-voltage switchgear and controlgear such as the electromechanical switches manufactured by REES, Inc.

Following are terms as relating to Cable Switches:

Reset (A) Auto - After the cable tension is removed, the switch will automatically return to its normal state.

Reset (M) Manual - After the cable tension is removed, the switch will remain in that state until manually returned to its normal condition.

Positive Break -  The achievement of Normally Closed contact separation is the direct result of a specified movement of the switch actuator through non-resilient members. (e.g., NOT dependent upon springs)

Positive Transfer - A contact system so designed that it remains in one state (NO or NC) until the switch actuator moves to a "point of no return," then the contacts transfer and cannot be teased.

Slow-Make / Slow-Break - A contact system that opens and/or closes at the same rate (speed and time) that the actuator is moved.

Snap Action - A rapid motion of the contacts from one state to another, that is independent of the rate of travel of the actuator. Similar to "Positive Transfer."

Emergency Stop - A device that can be actuated in an emergency situation (one that arises from a sudden and unexpected need) and utilizes a positive mechanical action to function as a "stop category 0" device [i.e., stopping by immediate removal of power to the machine or mechanical disconnection between the hazardous elements and their machine actuator(s)].

Latching Contacts - After the cable tension has been removed, the mechanical trip mechanism will return to its normal state; the contacts then require resetting through an independent means.

Broken Cable Detection - After the switch has been setup, if for any reason the actuator cable is broken or becomes unattached from the switch or is intentionally pulled, the switch will trip and latch.

Temperature Effects on Cable

All common metal parts are subject to size variations due to a change in the ambient temperature. This is referred to as its "Coefficient of Linear Expansion." With respect to the cable used with our switches, this physical attribute is mostly an insignificant number except when cable lengths are in the excess of 150 feet (~50m). This is especially critical on a switch that utilizes a taut cable for actuation. In actual dimensions the coefficient is 6.89×10^{-6} inches per degree per inch for steel cable. This is indeed a very small dimension (in fact, it is 400 to 500 times smaller than a human hair), and many people will overlook its effect on the operation of a switch, but it can and often does become the source of numerous nuisance tripping.

As an example let us consider an installation that has a cable run of 150 feet and is subjected to a temperature range of 50°F to 100°F. When we calculate the effect of temperature based on these numbers we find the following:

$[0.00000689 \text{ inches / degree / inch} \times 50^\circ \times 150 \text{ feet} \times 12 \text{ inches / foot} = 0.62 \text{ inches}]$

This means that in the above installation the cable will change its length by 0.62 inches just from the effects of a temperature change. Additionally, steel cable is known to stretch with use adding to the length of the actuating cable. With a switch that only requires a linear movement of its shaft in the range of 0.20" to 0.60," the temperature related change is a significant figure and must be addressed. See the chart below for calculated variations. As can be seen the range is from near zero to over 1.65."

This is the formula to calculate the cable variations.

$$K \text{ times } D \text{ times } L = \text{Variation Length}$$

K = constant = 0.00000689 D = Degrees of Temperature Change expressed in Fahrenheit (°F) L = Length of Cable Run expressed in Inches

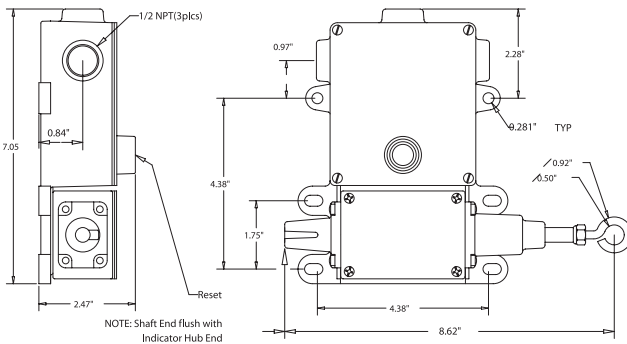
Cable Length

Degrees of Change	1 foot (.30m)	5 feet (1.52m)	10 feet (3.05m)	20 feet (6.10m)	50 feet (15.24m)	100 feet (30.48m)	150 feet (45.72m)	200 feet (60.96m)
1°F	--	--	--	0.002"	0.003"	0.008"	0.012"	0.017"
2°F	--	--	0.002"	0.003"	0.008"	0.017"	0.025"	0.033"
3°F	--	0.001"	0.003"	0.005"	0.012"	0.025"	0.038"	0.050"
4°F	--	0.002"	0.003"	0.007"	0.017"	0.033"	0.045"	0.066"
5°F	--	0.002"	0.004"	0.008"	0.021"	0.041"	0.062"	0.083"
10°F	--	0.004"	0.008"	0.017"	0.041"	0.083"	0.124"	0.165"
20°F	0.002"	0.008"	0.017"	0.033"	0.083"	0.166"	0.248"	0.330"
30°F	0.003"	0.012"	0.025"	0.050"	0.124"	0.248"	0.372"	0.496"
40°F	0.003"	0.017"	0.033"	0.066"	0.166"	0.331"	0.496"	0.661"
50°F	0.004"	0.021"	0.041"	0.083"	0.207"	0.413"	0.620"	0.827"
60°F	0.005"	0.025"	0.050"	0.099"	0.248"	0.497"	0.744"	0.993"
70°F	0.006"	0.029"	0.058"	0.166"	0.289"	0.579"	0.868"	1.157"
80°F	0.007"	0.033"	0.066"	0.132"	0.331"	0.661"	0.992"	1.323"
90°F	0.008"	0.037"	0.074"	0.149"	0.372"	0.744"	1.116"	1.488"
100°F	0.008"	0.041"	0.083"	0.165"	0.413"	0.827"	1.240"	1.657"
Virtually no effect on switch performance.			Possibly some effect on switch performance.		Potentially a significant effect on switch performance.			

Cable/Rope Operated Switches with Broken Cable Detection



Approximate shipping weight is 3.5 lbs.
For accessories see pages 14 and 15.
Refer to the Glossary (pgs. 66-67) for a definition of terms.



Features/Applications

The following switches are "taut cable" style with positive break and positive transfer features which make them particularly competent for Emergency Stop applications as well as ordinary circuit control. They are only offered in manual reset configuration with 2 NO + 2 NC gold plated contacts. The housing is made from high quality die-cast aluminum and painted with a yellow dry powder paint. Set-up position is easily attained without removal of the cover. Cable is stretched tightly until shaft end is flush with indicator hub end. Switch will trip and latch if the cable breaks, comes loose or is pulled. Blue bootied reset button is pushed to reset contacts back to their normal operating configuration. These switches have been designed to reduce "nuisance tripping" from cable expansion and stretch often associated with taut cable switches. The mounting pattern coincides with other standard REES cable switches. Additional mounting holes are provided to match competitive devices. Direction of pull is field convertible except part numbers 04962-101 & -201 due to use of tamper resistance screws for cover attachment. Three 1/2" NPT conduit openings are provided. Maximum recommended cable length is 200 feet with a maximum interval support of 10 feet. These switches are available pre-wired with 10 or 12 pin connectors and red 24 volt indicator lights as listed below. The maximum mechanical life of these devices is 250,000 operations. These switches are typically found on process applications such as conveyors, transfer machines or assembly lines within the automotive, machine tool, foundry and pharmaceutical industries. Switches are rated NEMA 12/13; IP 65. Their rugged construction and long term reliability make them well suited to function within various industrial environments and pharmaceutical industries.

Environmental

Temperature Range

Operating: +32°F to +131°F (0°C to +55°C)

Storage: -40°F to +185°F (-40°C to +85°C)

Note: Operating temperatures at 0°C are based on the absence of freezing moisture and liquids.

Electrical Ratings

"HEAVY DUTY - A600 / N300"

Listed under UL 508 - File #E58589

Certified under CSA C22.2 - File #LR 3648

CE Compliant IEC/EN 60947-5-5

Third party certified under DEMKO File # FI-17205

Normal Potential	Normal Current	Inrush Current
110-120 ac ^a volts	6.0 amp.	60.0 amp.
220-240 ac ^a	3.0 amp.	30.0 amp.
440-480 ac ^a	1.5 amp.	15.0 amp.
550-600 ac ^a	1.2 amp.	12.0 amp.
115-125 dc ^b	2.2 amp.	—
230-250 dc ^b	1.1 amp.	—

^a Power factor 0.35 or less

^b Inductive loads as specified in Section 125 of Industrial Control Devices, Controllers and Assemblies, ANSI/NEMA ICS 2-1988

Contact assemblies are not field replaceable

Catalog No.	Trip Force	Operating Force Between 10 ft Supports	Connector	Indicator Light	Direction of Pull
04962-100	52 lb.	15 lb.	none	yes	⊕ right
04962-200					⊖ left
04962-101 FW*			10-pin		⊕ right
04962-201 FW*					⊖ left
04962-102 FW*			12-pin		⊕ right
04962-202 FW*					⊖ left

*FW indicates "field wired" for easy installation. These assembly part numbers are not DEMKO certified.

See "WARNING ON PRODUCT APPLICATION" page (2)

CABLE/ROPE OPERATED SWITCHES



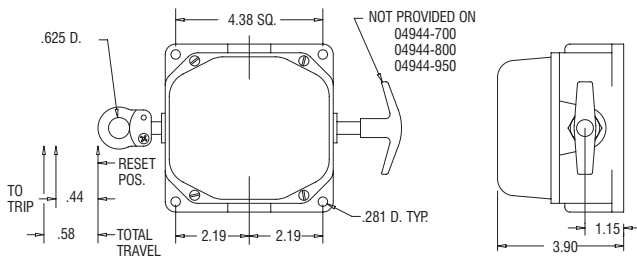
P.O. Box 652 • Fremont, IN • 46737
www.reesinc.com

P: 260-495-9811 • F: 260-495-2186

Cable Operated Switch



Approximate shipping weight is 3.5 lbs.
For accessories see pages 14 and 15.
Refer to the Glossary (pgs. 66-67) for a definition of terms.



Environmental

Temperature Range

Operating: +32°F to +131°F (0°C to +55°C)

Storage: -40°F to +185°F (-40°C to +85°C)

Note: Operating temperatures at 0°C are based on the absence of freezing moisture and liquids.

Features/Applications

The following switches are “slack cable” style with ‘Positive Break’ features. This makes them particularly competent for use in Emergency Stop applications (see page 5) as well as for ordinary circuit control. They are offered in manual and automatic reset configuration. The housing is made from high quality die-cast aluminum and painted with a dry powder paint. White powder paint is USDA approved in food service areas, without direct contact to the product. The 4X indoor type has stainless steel cover screws and shaft. Each captive terminal will accept (2) #14 AWG stranded wires and the contacts are gold plated to eliminate high resistance tarnishing. Units with NO + NC contact arrangements are provided with two 1/2 NPT conduit openings. Units with 2 NO + 2 NC contact arrangements are provided with two 3/4" NPT openings. The maximum recommended cable length is 200 feet with a maximum interval support of 10 feet. The mechanical life of these devices is 150,000 operations. These switches can be found on automated transfer machines and on various conveyor installations. Their rugged construction and long term reliability make these cable switches extremely well suited to function within various industrial environments.

Electrical Ratings

“HEAVY DUTY - A600 / N300”

Listed under UL 508 - File # E 58589

Certified under CSA C22.2 - File # LR 3648

CE Compliant IEC/EN 60947-5-1

Third party certified under DEMKO File # FI-17205

Normal Potential	Normal Current	Inrush Current
110-120 ac ^a volts	6.0 amp.	60.0 amp.
220-240 ac ^a	3.0 amp.	30.0 amp.
440-480 ac ^a	1.5 amp.	15.0 amp.
550-600 ac ^a	1.2 amp.	12.0 amp.
115-125 dc ^b	2.2 amp.	—
230-250 dc ^b	1.1 amp.	—

^a Power factor 0.35 or less

^b Inductive loads as specified in Section 125 of Industrial Control Devices, Controllers and Assemblies, ANSI/NEMA ICS 2-1988

Contact assemblies are not field replaceable

Catalog No.	Color	Trip Force	Operating Force Between 10 ft. Supports	NEMA, UL IP Class	Reset Type	Contact Arrangement	
04944-000	Black	15 lb.	3.0 lb.	12/13 IP 65	Manual	⊖ NO + NC	
04944-040	Yellow		3.8 lb.			⊖ NO + NC	
04944-200	Black					⊖ 2NO + 2NC	
04944-240	Yellow		⊖ 2NO + 2NC				
04944-500	Black	10 lb.	1.2 lb.		Automatic	⊖ NO + NC	
04944-600			1.8 lb.			⊖ 2NO + 2NC	
04944-700	Yellow	40 lb.	11.0 lb.		4X Indoor IP 66	Manual	NO + NC
04944-800			15.0 lb.				Automatic
04944-900	White	15 lb.	3.0 lb.	4X Indoor IP 66	Manual	⊖ NO + NC	
04944-950			40 lb.			11.0 lb.	Automatic

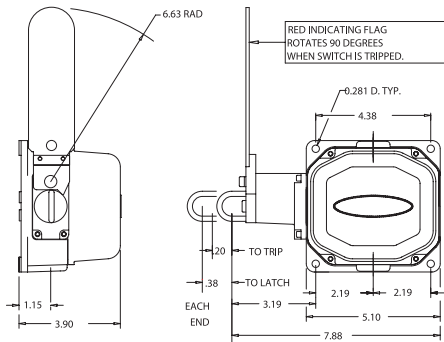
See “WARNING ON PRODUCT APPLICATION” page (2)

Cable Operated Switches with Single Flag Indicators or Latch Plates



04953-121

Approximate shipping weight is 4.5 lbs.
For accessories see pages 14 and 15.
Refer to the Glossary (pgs. 66-67) for a definition of terms.



Environmental

Temperature Range

Operating: +32°F to +131°F (0°C to +55°C)

Storage: -40°F to +185°F (-40°C to +85°C)

Note: Operating temperatures at 0°C are based on the absence of freezing moisture and liquids

Features/Applications

The following switches are a “slack cable” style with ‘Slow-Make’ and ‘Positive Break’ contacts. These switches can be used for Emergency Stop applications as well as for ordinary circuit control. The housing is made from high quality die-cast aluminum and painted with a yellow dry powder paint. The independently operating red indicating flag rotates 90 degrees when tripped. Manually returning the flag to its normal position resets the switch. Switch enclosures are provided with two 1/2" NPT conduit openings. The maximum recommended cable length is 200 feet with a maximum interval support of 10 feet. The mechanical life of these devices is 150,000 operations. Each captive terminal on the replaceable contact block (see page 51) will accept (2) #14 AWG stranded wires and the contacts are gold plated to eliminate high resistance tarnishing. These devices can be found on various conveyor installations. Their rugged construction and long term reliability make these cable switches extremely well suited to function within various industrial environments.

Electrical Ratings

“HEAVY DUTY - A600 / N150”

Listed under UL 508 - File # E 58589

Certified under CSA C22.2 - File # LR 3648

CE Compliant IEC/EN 60947-5-1

Third party certified under DEMKO File # FI-17205

Normal Potential	Normal Current	Inrush Current
110-120 ac ^a volts	6.0 amp.	60.0 amp.
220-240 ac ^a	3.0 amp.	30.0 amp.
440-480 ac ^a	1.5 amp.	15.0 amp.
550-600 ac ^a	1.2 amp.	12.0 amp.
115-125 dc ^b	2.2 amp.	—

^a Power factor 0.35 or less

^b Inductive loads as specified in Section 125 of Industrial Control Devices, Controllers and Assemblies, ANSI / NEMA ICS 2-1988

Contact blocks and flags are field replaceable

Catalog No.	Trip Force per End	Flag End Replaceable	Operating Force Between 10 ft. Supports	NEMA, UL IP Class	Reset Type	Contact Arrangement
04953-111	25 lb.	Right	6.0 lb.	4X, IP65	Manual	⊖ NO + NC
04953-112						⊖(2) NO / NC
04953-113						NO + NO
04953-114						⊖ NC + NC
04953-432*						⊖(2) NO + NC (make - before - break)
04953-121	25 lb.	Left	6.0 lb.	4X, IP65	Manual	⊖ NO + NC
04953-122						⊖(2) NO / NC
04953-123						NO + NO
04953-124						⊖ NC + NC
04953-442*						⊖(2) NO + NC (make - before - break)

Switches listed below are supplied with Latch Plates instead of Flags (see page 10 for photo of latch plate switch)

Catalog No.	Trip Force per End	Flag End Replaceable	Operating Force Between 10 ft. Supports	NEMA, UL IP Class	Reset Type	Contact Arrangement
04953-132	25 lb.	Right	6.0 lb.	4X, IP65	Manual	⊖(2) NO + NC (make - before - break)
04953-142	25 lb.	Left	6.0 lb.	4X, IP65	Manual	⊖(2) NO + NC (make - before - break)

* Switches are not UL Listed or CSA/DEMKO certified.

See “WARNING ON PRODUCT APPLICATION” page (2)

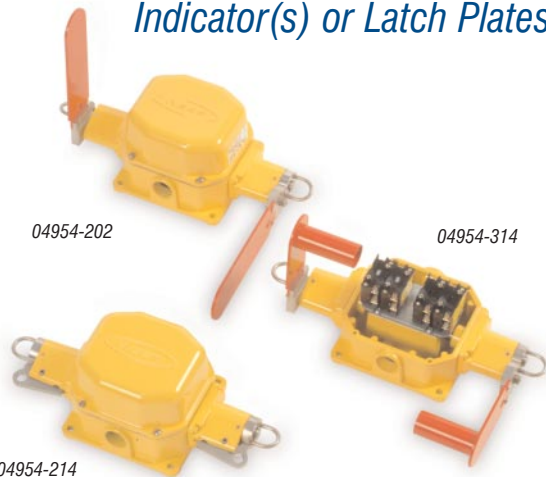
CABLE/ROPE OPERATED SWITCHES



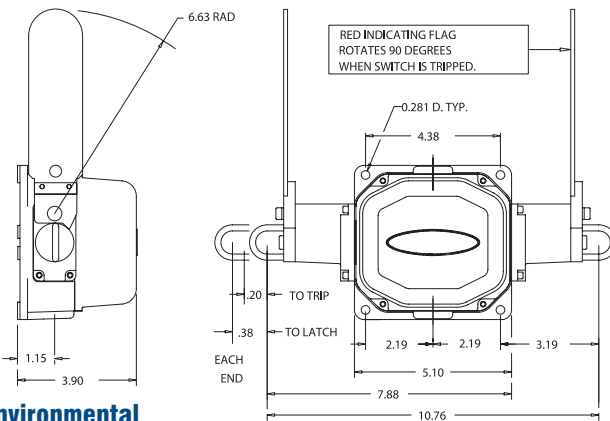
P.O. Box 652 • Fremont, IN • 46737
www.reesinc.com

P: 260-495-9811 • F: 260-495-2186

Cable Operated Switches with Double Flag Indicator(s) or Latch Plates



Approximate shipping weight is 7.0 lbs.
For accessories see pages 14 and 15.
Refer to the Glossary (pgs. 66-67) for a definition of terms.



Environmental

Temperature Range

Operating: +32°F to +131°F (0°C to +55°C)

Storage: -40°F to +185°F (-40°C to +85°C)

Note: Operating temperatures at 0°C are based on the absence of freezing moisture and liquids

Features/Applications

The following switches are a “slack cable” style with ‘Slow-Make’ and ‘Positive Break’ contacts. These switches can be used for Emergency Stop applications as well as for ordinary circuit control. The housing is made from high quality die-cast aluminum and painted with a yellow dry powder paint. The independently operating red indicating flag rotates 90 degrees when tripped. Manually returning the flag to its normal position resets the switch. Switches with less than 6 terminals are provided with two 1/2" NPT conduit openings and switches with 6 or more terminals are provided with two 3/4" NPT conduit openings. The maximum recommended cable length is 200 feet on each end with a maximum interval support of 10 feet. The mechanical life of these devices is 150,000 operations. Each captive terminal on the replaceable contact block (see page 51) will accept (2) #14 AWG stranded wires and the contacts are gold plated to eliminate high resistance tarnishing. These devices can be found on various conveyor installations. Their rugged construction and long term reliability make these cable switches extremely well suited to function within various industrial environments.

Electrical Ratings

“HEAVY DUTY - A600 / N150”

Listed under UL 508 - File # E 58589

Certified under CSA C22.2 - File # LR 3648

CE Compliant IEC/EN 60947-5-1

Third party certified under DEMKO File # FI-17205

Normal Potential	Normal Current	Inrush Current
110-120 ac ^a volts	6.0 amp.	60.0 amp.
220-240 ac ^a	3.0 amp.	30.0 amp.
440-480 ac ^a	1.5 amp.	15.0 amp.
550-600 ac ^a	1.2 amp.	12.0 amp.
115-125 dc ^b	2.2 amp.	—

^a Power factor 0.35 or less

^b Inductive loads as specified in Section 125 of Industrial Control Devices, Controllers and Assemblies, ANSI / NEMA ICS 2-1988

Contact blocks and flags are field replaceable

Catalog No.	Trip Force per End	Flag End Replaceable	Operating Force Between 10 ft. Supports	NEMA, UL IP Class	Reset Type	Contact Arrangement Each End
04954-201	25 lb.	Both	6.0 lb.	4X, IP65	Manual	(2) NO
04954-202						⊕ NO + NC
04954-203						⊕ (2) NC
04954-204						⊕ (2) NO/NC
04954-414*						⊕ (2) NO/NC (make - before - break)
04954-314*	25 lb.	Both**	6.0 lb.	4X, IP65	Manual	⊕ (2) NO/NC (make - before - break)

* Not UL Listed or CSA/DEMKO Certified.

** Indicator flags measure 3-7/8" in length compared to 6" standard. Switches with shorter flags also have handles for easier reset.

Switches listed below are supplied with Latch Plates instead of Indicator Flags (Ideal for overhead installation)

Catalog No.	Trip Force per End	Flag End Replaceable	Operating Force Between 10 ft. Supports	NEMA, UL IP Class	Reset Type	Contact Arrangement Each End
04954-214	25 lb.	Both	6.0 lb.	4X, IP65	Manual	⊕ (2) NO/NC (make - before - break)

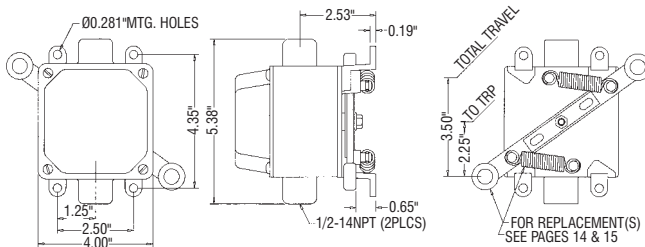
See “WARNING ON PRODUCT APPLICATION” page (2)

Rope Operated Sequence Switch



04945-000

Approximate shipping weight is 3.0 lbs.
For accessories see pages 14 and 15.
Refer to the Glossary (pgs. 66-67) for a definition of terms.



Features/Applications

These switches are "slack cable" style with 'Slow-Make' contacts. The switches are not 'Positive Transfer' and they do not latch in any position. They should NOT be used for any Emergency Stop applications. The action of these devices is that when the switch actuating arm is pulled by a cable the switch contacts will change state, that is, the NO will be closed and the NC will go open. When the force on the cable is removed from the actuator arm, spring pressure will return it to its normal position, while the contacts are held in position through a ratchet mechanism. The next time the cable is pulled, the action is repeated with the contacts returned to their original state. The housing and cover are made from a glass filled black polycarbonate. The mounting base and double end actuator arm are die cast from a high strength zinc alloy. All exterior steel components are made from #303 Stainless. Switches are provided with two 1/2 NPT conduit openings. The total maximum cable length recommended is 200 feet with a maximum interval support of 10 feet. The life of these devices is in excess of 150,000 mechanical and 1,000,000 electrical operations. Each captive terminal on the replaceable block (see page 51) will accept (2) #14 AWG stranded wires and the contact are gold plated to eliminate high resistance tarnishing. These devices can be found on various conveyor installations as well as other stations that require the "pull-on", "pull-off" function that this being provides. Their rugged construction and long term reliability make these cable switches extremely well suited to function within various industrial environments.

Electrical Ratings

"HEAVY DUTY - A600 / N150"

Listed under UL 508 - File # E 58589
Certified under CSA C22.2 - File # LR 3648
CE Compliant IEC/EN 60947-5-1
Third party certified under DEMKO File # FI-17205

Environmental

Temperature Range

Operating: +32°F to +131°F (0°C to +55°C)

Storage: -40°F to +185°F (-40°C to +85°C)

Note: Operating temperatures at 0°C are based on the absence of freezing moisture and liquids.

Note: The only difference between the 04945-000 and the 04945-500 is the relationship of the conduit entrances to the mounting feet, which is a 90 degree rotation.

Normal Potential	Normal Current	Inrush Current
110-120 ac ^a volts	6.0 amp.	60.0 amp.
220-240 ac ^a	3.0 amp.	30.0 amp.
440-480 ac ^a	1.5 amp.	15.0 amp.
550-600 ac ^a	1.2 amp.	12.0 amp.
115-125 dc ^b	2.2 amp.	—

^a Power factor 0.35 or less

^b Inductive loads as specified in Section 125 of Industrial Control Devices, Controllers and Assemblies, ANSI / NEMA ICS 2-1988

Actuating arms and contact blocks are field replaceable

Catalog No.	Trip Force	Operating Force between 10 ft. Supports	NEMA, UL IP Class	Reset Type	Contact Arrangement
04945-000	10 lb.	1.2 lb.	4X, IP65	Manual	NO + NC
04945-100*					(2) NO
04945-500					NO + NC
04945-800*					NO + NC (make- before - break)

* Not UL or CE listed. Not CSA or DEMKO certified.

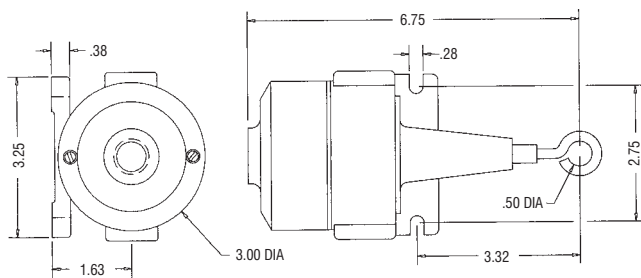
See "WARNING ON PRODUCT APPLICATION" page (2)

Rope Operated Switch



04958-100

Approximate shipping weight is 1.0 lbs.
For accessories see pages 14 and 15.
Refer to the Glossary (pgs. 66-67) for a definition of terms.



Environmental

Temperature Range

Operating: +32°F to +131°F (0°C to +55°C)

Storage: -40°F to +185°F (-40°C to +85°C)

Note: Operating temperatures at 0°C are based on the absence of freezing moisture and liquids.

Features/Applications

These switches are a slack cable style with Slow-Make - Slow-Break contacts. The switches are not 'Positive Break' or 'Positive Transfer.' These devices should NOT be used for any Emergency Stop application. The function of these switches is such that a device that is listed as NO uses a NC contact Block which is held open by a spring in the switch body. Pulling of the ring eye collapses that spring, allowing the Contact Block to close and actuate the circuit it is connected to. Releasing of the rope then allows the spring to expand thereby opening the contacts. The reverse is true for a NC listed switch. The contact cavity of the switch has provision for the addition of one more contact block. Each captive terminal on the replaceable contact block (see page 51) will accept (2) #14 AWG stranded wires and the contacts are gold plated to eliminate high resistance tarnishing. The life of these switches is in excess of 1,000,000 mechanical operations. The momentary version of this light to medium duty switch can most often be found being used with a rope hanging down for control of an overhead door. The maintained style requires that resetting take place at the switch so access must be considered when installing it. The housing and cover are molded from high impact glass-filled polycarbonate plastic. The NEMA/UL/IP classification (Raintight) allows these switches to be used outside. The maximum recommended rope (not supplied) length is 33 feet with a maximum interval support of 10 feet when horizontal. Switches are provided with three 1/2" NPT conduit openings.

Electrical Ratings

"HEAVY DUTY - A600 / N150"

Listed under UL 508 - File # E 58589

Certified under CSA C22.2 - File # LR 3648

Normal Potential	Normal Current	Inrush Current
110-120 ac ^a volts	6.0 amp.	60.0 amp.
220-240 ac ^a	3.0 amp.	30.0 amp.
440-480 ac ^a	1.5 amp.	15.0 amp.
550-600 ac ^a	1.2 amp.	12.0 amp.
115-125 dc ^b	2.2 amp.	—

^a Power factor 0.35 or less

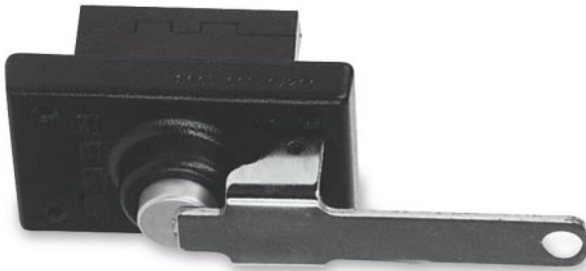
^b Inductive loads as specified in Section 125 of Industrial Control Devices, Controllers and Assemblies, ANSI / NEMA ICS 2-1988

Contact blocks are field replaceable

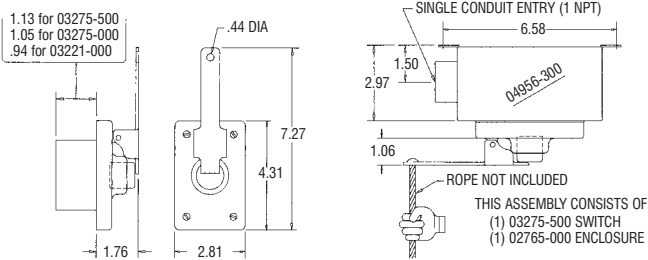
Catalog No.	Operating Trip Force	Force between 10 ft. Supports	NEMA, UL IP Class	Operation Type	Contact Arrangement
04958-100	10 lb.	1.2 lb.	4 (Raintight) IP66	Momentary	Held NO Block #50702-000
04958-125	5 lb.	0.6 lb.			Held NC Block #50701-000
04958-150	10 lb.	1.2 lb.		Maintained	Held NO Block #50702-000
04958-175	5 lb.	0.6 lb.			Held NC Block #50701-000
04958-200	12 lb.	1.4 lb.			
04958-250	12 lb.	1.4 lb.			

See "WARNING ON PRODUCT APPLICATION" page (2)

Rope Operated Switch



Approximate shipping weight is 1.0 lbs.
For accessories see pages 14 and 15.
Refer to the Glossary (pgs. 66-67) for a definition of terms.



Environmental

Temperature Range

Operating: +32°F to +131°F (0°C to +55°C)

Storage: -40°F to +185°F (-40°C to +85°C)

Note: Operating temperatures at 0°C are based on the absence of freezing moisture and liquids.

Features/Applications

These switches are a low force slack cable style with 'Slow-Make' - 'Slow-Break' and 'Snap Action' contacts. Only the 03275-000 is 'Positive Break' and can be recommended for use as an Emergency Stop switch. The switches are basically push button devices operated through a nickel plated operating lever attached to the cover. Care must be taken when choosing and installing the operating rope because the low operating forces can be easily overcome and the switches will not trip or reset properly. The open style switches must be secured to a suitable enclosure. A sealing gasket and four mounting screws are supplied with each switch. The 04956-300 is a complete assembly consisting of (1) 03275-500 switch and (1) 02765-000 sheet metal enclosure powder coated black. On all the switches, each captive terminal will accept (2) # 14 AWG stranded wires. The silver composite contacts are gold plated to eliminate high resistance tarnishing. The life of these switches is in excess of 1,000,000 mechanical operations. These low force switches can be used for door control, signal devices, automation systems and warning devices etc. The maximum recommended rope (not supplied) length is 33 feet with a maximum interval support of 10 feet when horizontal.

Electrical Ratings

"HEAVY DUTY - A600 / N300"

Listed under UL 508 - File # E 58589

Certified under CSA C22.2 - File # LR 3648

CE Compliant IEC/EN 60947-5-1

Third party certified under DEMKO File # FI-17205

Normal Potential	Normal Current	Inrush Current
110-120 ac ^a volts	6.0 amp.	60.0 amp.
220-240 ac ^a	3.0 amp.	30.0 amp.
440-480 ac ^a	1.5 amp.	15.0 amp.
550-600 ac ^a	1.2 amp.	12.0 amp.
115-125 dc ^b	2.2 amp.	—
220-250 dc ^b	1.1 amp.	—

^a Power factor 0.35 or less

^b Inductive loads as specified in Section 125 of Industrial Control Devices, Controllers and Assemblies, ANSI / NEMA ICS 2-1988

Catalog No.	Trip Force	Operating Force between 10 ft. supports	NEMA, UL IP Class	Operation Type	Contact Arrangement
03221-000	3 lb.	0.4 lb.	12/13 IP65	Momentary Slow Make/Slow Break	#10 2 NO
03275-000	6 lb.	0.7 lb.			⊕ #9 NO + NC
03275-500	5 lb.	0.6 lb.		Momentary Snap Action	#64 2(NO + NC)
04956-300*	5 lb.	0.6 lb.	#64 2(NO + NC)		

*Consists of 03275-500 mounted in REES enclosure #02765-000. Assembly not listed with UL, CSA or DEMKO.

CABLE/ROPE OPERATED SWITCHES



P.O. Box 652 • Fremont, IN • 46737
www.reesinc.com

P: 260-495-9811 • F: 260-495-2186

Accessory Items for Cable/Rope Switches

Catalog No.	Drawing
<p>02005-501 Swivel Eye Assembly</p> <p>Replacement parts for use on 04944 switches. Included are 2 eye halves and screws.</p>	
<p>02005-530 Arm Kit</p> <p>Replacement parts for use on 04945 switches. Included is the arm and ALL associated hardware.</p>	
<p>02005-551 Tee Handle</p> <p>Replacement part for use on 04944 switches. Included is the handle and screw.</p>	
<p>02005-605 Turnbuckle</p> <p>For tension adjustment on cable runs.</p>	

Catalog No.	Drawing
<p>02005-610 Red Vinyl Covered</p>	
<p>02005-611 Blue Vinyl Covered</p>	
<p>02005-614 Yellow Vinyl Covered</p> <p>Galvanized Steel (7x7) Aircraft Cable Used for cable runs. 3/16" O.D. 0.028 lbs./Ft.</p>	
<p>02005-615 Thimble, Strain Relief</p> <p>Use with aircraft cable to reduce breakage at the end.</p>	
<p>02005-620 Rope Clip</p> <p>Use with aircraft cable to secure the cable end.</p>	
<p>02005-625 Stainless Steel Cable Clip Assembly</p> <p>Use with aircraft cable to extend, splice the cable.</p>	
<p>02005-630 Tension Spring</p> <p>Used in cable run to reduce slack between supports. Spring Rate = 50 lbs./in.</p>	

See "WARNING ON PRODUCT APPLICATION" page (2)

Accessory Items for Cable/Rope Switches

Catalog No.	Drawing
02005-635 Eye Bolt Assembly Used to support the cable run at regular intervals. The kit includes one eyebolt, two nuts and a lock washer.	
02005-640 Spring Kit Replacement parts for use on 04945 switches. The kit includes two stainless steel springs.	
02005-645 Flag Kit Replacement parts for use on 04953 and 04954 switches. The kit includes one flag and two mounting screws.	
02005-650 Padlock Attachment Use on 04944 switches to lock in tripped position.	
02005-660 Padlock Attachment Use on 04953 and 04954 switches to lock in tripped position.	
02005-540 Neoprene Gasket May replace the fibreflex gaskets on cable switch series 04944, 04953 and 04954 for use in areas where switches may be exposed to hose down conditions	

Catalog No.	Drawing
01004-010 Adapter Plate Use with 04944 and 04962 switches to mount in place of old styles 02669; 03030; or 04935.	
40100-002 Full Voltage Pilot Light	Lamp #80507-075 (#120 MB) Red Lens #40431-002 included 1/2" NPT mounting See page 54 for a complete listing
40500-000 Transformer Type Pilot Light without Lens (see pg. 56)	120 volt input - 6 volt lamp 1/2 NPT mounting
40500-002 40500-000 Pilot light with Red Lens #40431-002 Lexan 500® housing	Lamp #80507-050 (#755) See page 54 for a complete listing
40100-102 24 Volt DC Pilot Light	Lamp #80507-037 (#1819 24vdc) Red Lens #40431-002 included 1/2" NPT mounting See page 54 for complete listing
 40100-012 Pilot Light w/ LED Lamp	120 Volt - Bi-Polar Red LED with Red Lens #40431-002 LED bulb #80507-074 1/2 NPT mounting See page 54 for complete listing
 40100-112 Pilot Light w/ LED Lamp	24 Volt DC - Bi-Polar Red LED with Red Lens #40431-002 LED bulb #80507-034 1/2 NPT mounting See page 54 for complete listing
 40100-000 Pilot Light Housing	Lexan housing only No bulb, no lens 1/2 NPT mounting

See "WARNING ON PRODUCT APPLICATION" page (2)

SINGLE PLUNGER

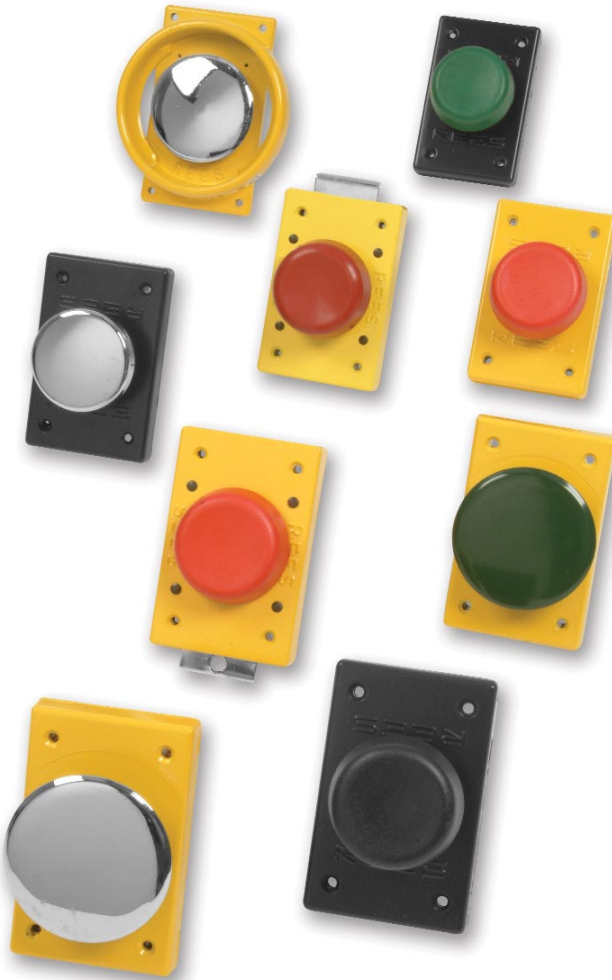
PUSH BUTTON SWITCHES



P.O. Box 652 • Fremont, IN • 46737
www.reesinc.com

P: 260-495-9811 • F: 260-495-2186

Single Plunger
Push Button Switches



Definition

A push button switch is a mechanical device used to make and/or break one or more electrical circuits. They are designed to be solely operated by human hands.

Operation

REES single plunger push button switches have contact arrangements ranging from one normally open contact or one normally closed contact to two normally open contacts plus two normally closed contacts. By pushing the plunger (by hand) the contacts will change state and either start or stop the circuit they are connected to. When the plunger is released, the contacts of the momentary style switches will return to their normal at rest state. The maintained and latching style will stay as pushed until they are either pulled open or the latch is released to allow the plunger to return to its normal position. Another type available is the keylock style which takes the added action of turning the key to lock the plunger in the depressed position and then turning the key back again to release the plunger.

Selection

The selection and use of a push button switch involves knowing the details of the particular installation. The following questions should be answered in order to make the proper selection.

- Does a circuit need to be made and/or broken?
- Are there multiple circuits?
- What operating force is desired?
- What color plunger is required or requested?
- What style plunger is necessary?
- Does the button need to be guarded from unintentional operation?
- What is the switch environment?(Exposed to weather?)

Installation

Every installation is unique, therefore there are only a very few hard and fast rules to follow. Above all, observe all SAFETY REQUIREMENTS, PROCEDURES and LOCAL CODES. To mount these devices it will be necessary to have a suitable enclosure. These are available from REES (see page 39) or they will mount on Condulet® “FS” style cast enclosures. Switches found on page 18 must be mounted on enclosures with large openings (series 04938) found on page 39. On pages 18 through 27 you will find more than ninety different models of single plunger push button switches that should satisfy any installation requirements. They cover a full range of functions and operating forces from ~ 2.0 lbs to 6.0 lbs. In the fourth section of this catalog you can find a number of accessory items to facilitate in the installation or operation of these switches. These switches, as all mechanical devices, will wear out and eventually need to be replaced. The estimated minimum mechanical life is 1,000,000 operations. Regular scheduled Preventive Maintenance inspections are strongly recommended for these switches. Some items to look for are:

- Physical damage to the switch.
- Loose connections or components.
- Broken or weak springs.
- Burnt or very worn contacts.

REES push button switches are designed and manufactured to surpass the minimal standards of industry. On the facing page is a brief look at some of these regulations and how our switches conform. The testing done by independent facilities is the minimum requirement that the REES switches far exceed. If other assistance is desired please contact the factory.

See “WARNING ON PRODUCT APPLICATION” page (2)

SINGLE PLUNGER

PUSH BUTTON SWITCHES



P.O. Box 652 • Fremont, IN • 46737
www.reesinc.com

P: 260-495-9811 • F: 260-495-2186

Regulations

Following are references and excerpts from Federal and Foreign Regulations that have applicability to Push button Switches.

29 CFR 1910.217 (b) (6) (i)

"A two hand trip shall have the individual operator's hand controls protected against unintentional operation and have the individual operator's hand controls arranged by design and construction and/or separation to require the use of both hands to trip the press and use a control arrangement requiring concurrent operation of the individual operator's hand control."

29 CFR 1910.217 (b) (7) (ii)

"A red color stop control shall be provided with the clutch/brake control system. Momentary operation of the stop control shall immediately deactivate the clutch and apply the brake. The stop control shall override any other control, and reactivation of the clutch shall require use of the operating (tripping) means which has been selected."

29 CFR 1910.217 (b) (7) (iii)

"A means of selecting Off, Inch, Single Stroke, and Continuous (when the continuous function is furnished) shall be supplied with the clutch/brake control to select type of operation of the press. Fixing of selection shall be by means capable of supervision by the employer."

OSHA Sources of Standards:

Sec. 1910.217 is derived from ANSI B 11.1 - 1971

ANSI B 11.3 - 1982 (4.4.4.2.1)

"Emergency Stop Control. An emergency stop control shall be provided. This control shall immediately stop the ram movement by momentary actuation of this control. The emergency stop control shall override every other control. Reactuation of the ram movement shall require the use of the predetermined operator's control station which has been selected."

NEMA ICS 2 - 1988 (2-216.22)

"Heavy-duty push buttons and selector switches shall have contact rating designations of A600, A300, A150, N600, N300, or N150 as shown in Table 2-125-1 for alternating current and Table 2-125-2 for direct current."

NEMA ICS 2 - 1988 (2-216.62)

"The color of those push buttons which perform a stop function shall be red."

CEN (European Committee for Standardization) EN 418 :1992 (4.1.2)

"The control device and its actuator shall apply the principle of positive mechanical action."

CEN (European Committee for Standardization) EN 418 :1992 (4.4.3)

"The emergency stop actuators shall be coloured red. As far as a background exists behind the actuator and as far as it is practicable, it shall be coloured yellow."

REES switches exceed the following:

Listed by Underwriters Laboratories per Standard UL 508
File No. E 58589

Certified by Canadian Standards Association per Standard C 22.2
File No. LR 3648

Certified by DEMKO to IEC/EN 60947-5-5 or IEC/EN 60947-5-1

Third party certified under DEMKO File #FI-17205


NEMA ICS 2-1988

IEC/EN 60947-5-5: Standard which applies to electrical emergency stop devices with a mechanical latching function. This standard also encompasses all requirements of regular electromechanical switches (60947-5-1)

IEC/EN 60947-5-1: Standard which applies to low-voltage switchgear and controlgear such as the electromechanical switches manufactured by REES, Inc.

Following are definitions of terms as relating to Push Button Switches:

Push Button - A push button switch (push button) is a switch having a manually operable plunger, rocker or button for actuating the switch.

Positive Break -  The achievement of contact separation as the direct result of a specified movement of the switch actuator through non-resilient members. (e.g. NOT dependent upon springs)

Positive Transfer - A contact system so designed that, it remains in one state (NO or NC) until the switch actuator moves to a "point of no return" then the contacts transfer and cannot be teased.

Slow-Make / Slow-Break - A contact system that opens and/or closes at the same rate (speed and time) that the actuator is moved.

Snap Action - A rapid motion of the contacts from one state to another, that is independent of the rate of travel of the actuator. Similar to "Positive Transfer".

Emergency Stop - A device that can be actuated in an emergency situation (one that arises from a sudden and unexpected need) and utilizes a positive mechanical action to function as a "stop category 0" device [i.e. stopping by immediate removal of power to the machine or mechanical disconnection between the hazardous elements and their machine actuator(s)].

Operating Force - The amount of pushing or pulling force (in pounds) necessary to change the state of the switch from an **at rest** condition to one of contact change, that is, to **make** a set of Normally Open contacts or **break** a set of Normally Closed contacts.

Two-Hand Control (anti-tie down) - Each hand control shall be protected against unintended initiation and shall be arranged by design, construction, or separation so that the concurrent use of both hands is required to trip the press. The safety distance (Dm) between the two hand trip and the point of operation shall be greater than the following formula:

Dm = 63 inches/second X Tm

Dm = minimum safety distance (inches); 63 inches/second = hand speed constant; and
Tm = the maximum time the press takes for the die closure after it has been tripped (seconds).

Reference OSHA 1910.217(c)(3)(iii)(e) for additional safety distance information.
OSHA website is www.OSHA.gov

SINGLE PLUNGER

PUSH BUTTON SWITCHES



P.O. Box 652 • Fremont, IN • 46737
www.reesinc.com

P: 260-495-9811 • F: 260-495-2186

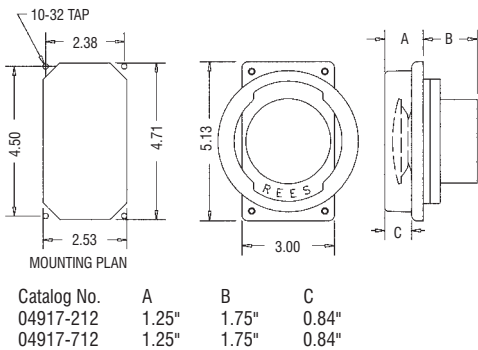
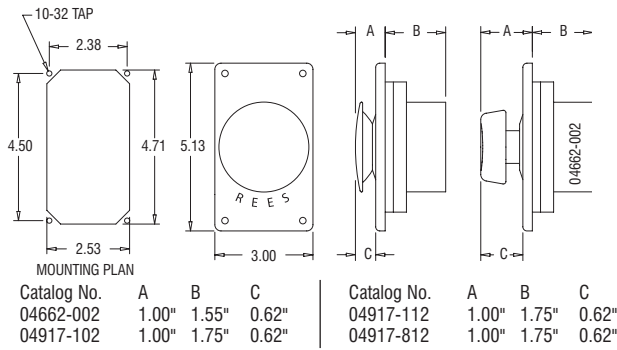
Push Button Switches with Larger Mounting Pattern

Single Plunger
Push Button Switches



04917-712

For accessories see pages 42 - 43.
Refer to the Glossary (pgs.66-67) for a definition of terms.
See pages 64-65 for contact arrangement information.



Can be mounted in REES 04938 series enclosures found on page 39.

Features/Applications

The following switches are hand operated, control circuit devices, rated 'Heavy Duty' normally for use with electromagnetic equipment. The body, painted with a dry powder paint, is made from die-cast zinc. The plunger head is powder painted or chrome plated die-cast zinc. The plunger head of the 04662 is plastic. Each captive terminal will accept (2) #14 AWG stranded wires and the contacts are gold plated to eliminate high resistance tarnishing. Each switch is supplied with all mounting hardware and a solid neoprene rubber gasket which provides an oil tight seal upon installation. The mechanical life of these devices is 1,000,000 operations. These switches can be found on a variety of machines such as punch presses, press brakes, and spot-welding equipment as "RUN", "START" or "STOP" buttons. They are also used on transfer machines. The 04662-002 complies with standards for 'emergency stop' applications. Their rugged construction and long term reliability make these switches extremely well suited to function within various industrial / commercial environments.

Electrical Ratings

"HEAVY DUTY - A600 / N300"

Listed under UL 508 - File # E 58589
Certified under CSA C22.2 - File # LR 3648
CE Compliant IEC/EN 60947-5-1
Third party certified under DEMKO File # FI-17205

Normal Potential	Normal Current	Inrush Current
110-120 ac ^a volts	6.0 amp.	60.0 amp.
220-240 ac ^a	3.0 amp.	30.0 amp.
440-480 ac ^a	1.5 amp.	15.0 amp.
550-600 ac ^a	1.2 amp.	12.0 amp.
115-125 dc ^b	2.2 amp.	—
230-250 dc ^b	1.1 amp.	—

^a Power factor 0.35 or less

^b Inductive loads as specified in Section 125 of Industrial Control Devices, Controllers and Assemblies, ANSI / NEMA ICS 2-1988

Environmental

Temperature Range

Operating: +32°F to +131°F (0°C to +55°C)

Storage: -40°F to +185°F (-40°C to +85°C)

Note: Operating temperatures at 0°C are based on the absence of freezing moisture and liquids.

Plungers and contacts are not field replaceable.

Use legend plates series 09005 found on page 42.

Must order #04917-212 or #04917-712 if ring guard is required.

Ring guard for these switches cannot be added in the field.

Catalog No.	Plunger/Color	Cover Color	Operating Force	NEMA UL, IP Class	Approx. Shipping Weight	Positive Break	Integral Ring Guard	Contact Type	Contact Arrangements (All Momentary)
04662-002	2.25" dia. Red Plastic	Yellow	5.0 lb.	12/13 IP65	1.60 lb.	Yes	No	Slow Make Slow-Break	#09 NO-NC
04917-102	2.75" dia. Red Painted Die Cast	Black	3.5 lb.		1.65 lb.	No		Yes	Snap-Action
04917-112	2.75" dia. Chrome Plated Die Cast	Black	3.5 lb.		1.65 lb.				
04917-212		Yellow	3.5 lb.		2.50 lb.				
04917-712		Black	2.0 lb.		2.50 lb.				
04917-812		Black	2.0 lb.		1.65 lb.				

See "WARNING ON PRODUCT APPLICATION" page (2)

SINGLE PLUNGER

PUSH BUTTON SWITCHES



P.O. Box 652 • Fremont, IN • 46737
www.reesinc.com

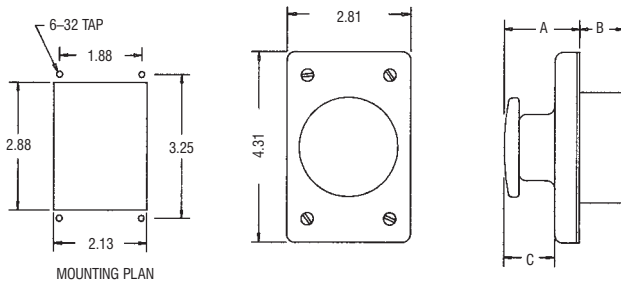
P: 260-495-9811 • F: 260-495-2186

Flat Chrome Plunger Push Button Switches



02653-012

For accessories see pages 39 thru 43.
Refer to the Glossary (pgs. 66-67) for a definition of terms.



Catalog No.	A	B	C	Catalog No.	A	B	C
02653-012	1.92"	1.05"	1.22"	04917-312	1.63"	1.13"	0.93"
02653-112	1.92"	1.05"	1.22"	04957-001	1.63"	1.13"	0.93"
03727-012	1.77"	0.91"	1.07"	04957-003	1.63"	1.13"	0.93"
04917-012	1.92"	1.13"	1.22"	04957-012	1.63"	1.13"	0.93"

Features/Applications

The following switches are hand operated, control circuit devices, rated 'Heavy Duty' normally for use with electromagnetic equipment. The cover, painted with a dry powder paint, and the chrome plated/painted plunger are made from die-cast zinc. Each captive terminal will accept (2) #14 AWG stranded wires and the contacts are gold plated to eliminate high resistance tarnishing. Each switch is supplied with all mounting hardware and a solid neoprene rubber gasket which provides an oil tight seal upon installation. The mechanical life of these devices is 1,000,000 operations. These switches can be found on a variety of machines such as punch presses, press brakes, and spot-welding equipment as "RUN" or "START" buttons. Their rugged construction and long term reliability make these switches extremely well suited to function within various environments.

Electrical Ratings

"HEAVY DUTY - A600 / N300"

Listed under UL 508 - File # E 58589
Certified under CSA C22.2 - File # LR 3648
CE Compliant IEC/EN: 60947-5-1
Third party certified under DEMKO File # FI-17205

Normal Potential	Normal Current	Inrush Current
110-120 ac ^a volts	6.0 amp.	60.0 amp.
220-240 ac ^a	3.0 amp.	30.0 amp.
440-480 ac ^a	1.5 amp.	15.0 amp.
550-600 ac ^a	1.2 amp.	12.0 amp.
115-125 dc ^b	2.2 amp.	—
230-250 dc ^b	1.1 amp.	—

^a Power factor 0.35 or less
^b Inductive loads as specified in Section 125 of Industrial Control Devices, Controllers and Assemblies, ANSI / NEMA ICS 2-1988

Environmental

Temperature Range

Operating: +32°F to +131°F (0°C to +55°C)

Storage: -40°F to +185°F (-40°C to +85°C)

Note: Operating temperatures at 0°C are based on the absence of freezing moisture and liquids.

Can be mounted in standard REES enclosures shown on page 39.
Plungers and contacts are not field replaceable.
See pages 64 and 65 for contact arrangement information.

Catalog No.	Plunger/Color	Cover Color	Operating Force	NEMA UL, IP Class	Approx. Shipping Weight	Positive Break	Contact Type	Contact Arrangements (All Momentary)
02653-012	2.25" dia. Chrome	Black Dry Powder Paint	5.5 lb.	12/13 IP65	1.35 lb.	Yes	Slow-Make	#09 NO-NC
02653-112			2.5 lb.		1.30 lb.			
03727-012			3.3 lb.		1.29 lb.			
04917-012			3.7 lb.		1.32 lb.			
04917-312*	2.75" dia. Chrome	3.7 lb.	1.27 lb.		No	Snap-Action	#64 2NO-2NC	
04957-001*a	2.75" dia. Black	1.9 lb.	1.35 lb.					
04957-003*a	2.75" dia. Green	1.9 lb.	1.35 lb.					
04957-012*a	2.75" dia. Chrome	1.9 lb.	1.35 lb.					

* Auxiliary rubber boot under plunger head.

^a LOW OPERATING FORCE – ERGONOMIC DESIGN.

See "WARNING ON PRODUCT APPLICATION" page (2)

SINGLE PLUNGER

PUSH BUTTON SWITCHES



P.O. Box 652 • Fremont, IN • 46737
www.reesinc.com

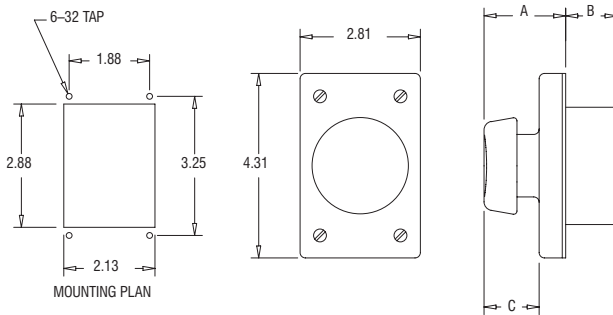
P: 260-495-9811 • F: 260-495-2186

2.25 inch Plastic Mushroom Plunger

Single Plunger
Push Button Switches



For accessories see pages 39 thru 43.
Refer to the Glossary (pgs. 66-67) for a definition of terms.



Catalog No.	A	B	C	Catalog No.	A	B	C
00222-002	2.53"	1.06"	1.80"	01461-101	2.39"	0.91"	1.69"
00222-004	2.53"	1.06"	1.80"	01461-102	2.39"	0.91"	1.69"
00662-001	2.50"	1.05"	1.80"	01461-104	2.39"	0.91"	1.69"
00662-002	2.50"	1.05"	1.80"	01461-202	2.40"	1.07"	1.70"
00662-003	2.50"	1.05"	1.80"	04948-001	2.18"	1.13"	1.48"
00662-004	2.50"	1.05"	1.80"	04948-002	2.18"	1.13"	1.48"
00662-101	2.50"	1.05"	1.80"	04948-003	2.18"	1.13"	1.48"
00662-103	2.50"	1.05"	1.80"	04948-004	2.18"	1.13"	1.48"

Environmental

Temperature Range

Operating: +32°F to +131°F (0°C to +55°C)

Storage: -40°F to +185°F (-40°C to +85°C)

Note: Operating temperatures at 0°C are based on the absence of freezing moisture and liquids.

Features/Applications

The following switches are hand operated, control circuit devices, rated 'Heavy Duty' normally for use with electromagnetic equipment. The body, painted with a dry powder paint, is made from die-cast zinc. The mushroom ergonomic shaped plungers are molded from DuPont Delrin 100ST Acetal for improved impact resistance, improved colors and on the 00662 models improved DC performance. The plunger heads are solid colors throughout. Each captive terminal will accept (2) #14 AWG stranded wires and the contacts are gold plated to eliminate high resistance tarnishing. Each switch is supplied with all mounting hardware and a solid neoprene rubber gasket which provides an oil tight seal upon installation. The mechanical life of these devices is 1,000,000 operations. These switches can be found on a variety of machines such as punch presses, press brakes, and spot-welding equipment as "RUN", "START" or "STOP" buttons. They are also used on transfer machines. Their rugged construction and long term reliability make these switches extremely well suited to function within various industrial/commercial environments.

Electrical Ratings

"HEAVY DUTY - A600 / N300"

Listed under UL 508 - File # E 58589;

Certified under CSA C22.2 - File # LR 3648

CE Compliant IEC/EN: 60947-5-1

Third party certified under DEMKO File # FI-17205



Normal Potential	Normal Current	Inrush Current
110-120 ac ^a volts	6.0 amp.	60.0 amp.
220-240 ac ^a	3.0 amp.	30.0 amp.
440-480 ac ^a	1.5 amp.	15.0 amp.
550-600 ac ^a	1.2 amp.	12.0 amp.
115-125 dc ^b	2.2 amp.	—
230-250 dc ^b	1.1 amp.	—

^a Power factor 0.35 or less

^b Inductive loads as specified in Section 125 of Industrial Control Devices, Controllers and Assemblies, ANSI / NEMA ICS 2-1988

Can be mounted in REES standard enclosures found on page 39.

Plungers and contacts are not field replaceable.

See pages 64 & 65 for contact arrangement information.

Catalog No.	Plunger/Color	Cover Color	Operating Force	NEMA UL, IP Class	Approx. Shipping Weight	Positive Break	Contact Type	Contact Arrangements (All Momentary)
00222-002	Red	Yellow	4.3 lb.	12/13 IP65	1.25 lb.	Yes	Slow-Break	#66 NC
00222-004	Yellow	Black						
00662-001	Black	Black	4.3 lb.					
00662-002	Red	Yellow	4.8 lb.					
00662-003	Green	Black	4.3 lb.					
00662-004	Yellow	Black						
00662-101	Black	Black	3.0 lb.					
00662-103	Green	Black						
01461-101	Black	Black	5.5 lb.					
01461-102	Red	Black						
01461-104	Yellow	Black	3.0 lb.					
01461-202	Red	Yellow	5.5 lb.					
04948-001	Black	Black	3.5 lb.	1.16 lb.	No	Snap-Action	#64 2NO-2NC	
04948-002	Red	Yellow						
04948-003	Green	Black						
04948-004	Yellow	Black						

See "WARNING ON PRODUCT APPLICATION" page (2)

SINGLE PLUNGER

PUSH BUTTON SWITCHES



P.O. Box 652 • Fremont, IN • 46737
www.reesinc.com

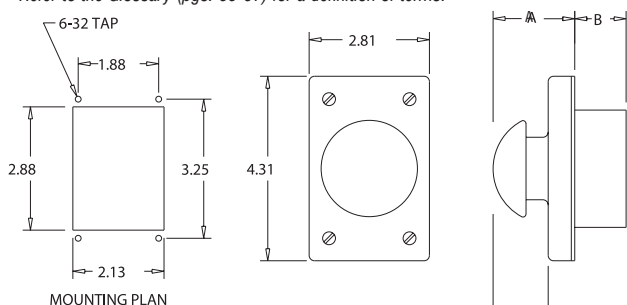
P: 260-495-9811 • F: 260-495-2186

2.25 inch Metal Mushroom Plunger



01371-012

For accessories see pages 39 thru 43.
Refer to the Glossary (pgs. 66-67) for a definition of terms.



Catalog No.	A	B	C	Catalog No.	A	B	C
01307-012	2.59"	0.96"	1.89"	02761-002	2.00"	1.13"	1.30"
01371-012	1.96"	0.96"	1.26"	02761-003	2.00"	1.13"	1.30"
01371-112	1.96"	0.96"	1.26"	02761-004	2.00"	1.13"	1.30"
01508-012	1.84"	0.91"	1.14"	02911-001	2.00"	0.96"	1.31"
02049-001	2.59"	0.96"	1.89"	02911-002	2.01"	0.96"	1.31"
02049-002	2.59"	0.96"	1.89"	02911-004	2.01"	0.96"	1.31"
02761-001	2.00"	1.13"	1.30"	02911-102	2.01"	0.96"	1.31"
				02912-001	1.84"	0.91"	1.14"
				02919-012	2.00"	1.13"	1.30"

Environmental

Temperature Range

Operating: +32°F to +131°F (0°C to +55°C)

Storage: -40°F to +185°F (-40°C to +85°C)

Note: Operating temperatures at 0°C are based on the absence of freezing moisture and liquids.

Features/Applications

The following switches are hand operated, control circuit devices, rated 'Heavy Duty' normally for use with electromagnetic equipment. The body, painted with a dry powder paint, is made from die-cast zinc. The plunger heads are powder painted or chrome plated zinc die-cast. Styles 01307 and 02049 have an additional internal diaphragm for added protection. Each captive terminal will accept (2) #14 AWG stranded wires and the contacts are gold plated to eliminate high resistance tarnishing. Each switch is supplied with mounting hardware and a solid neoprene rubber gasket which provides an oil tight seal upon installation. The mechanical life of these devices is 1,000,000 operations. These switches can be found on a variety of machines such as punch presses, press brakes and spot-welding equipment as "RUN", "START" or "STOP" buttons. The "Positive Break" styles comply with all standards for 'emergency stop' applications. The rugged construction and long term reliability make these switches extremely well suited to function within various industrial / commercial environments.

Electrical Ratings

"HEAVY DUTY - A600 / N300"

Listed under UL 508 - File # E 58589;

Certified under CSA C22.2 - File # LR 3648

CE Compliant IEC/EN 60947-5-1

Third party certified under DEMKO File # FI-17205

Normal Potential	Normal Current	Inrush Current
110-120 ac ^a volts	6.0 amp.	60.0 amp.
220-240 ac ^a	3.0 amp.	30.0 amp.
440-480 ac ^a	1.5 amp.	15.0 amp.
550-600 ac ^a	1.2 amp.	12.0 amp.
115-125 dc ^b	2.2 amp.	—
230-250 dc ^b	1.1 amp.	—

a Power factor 0.35 or less

b Inductive loads as specified in Section 125 of Industrial Control Devices, Controllers and Assemblies, ANSI / NEMA ICS 2-1988

Can be mounted in REES standard enclosures found on page 39.
Plungers and contacts are not field replaceable.
See pages 64 & 65 for contact arrangement information.

Catalog No.	Plunger/Color	Cover Color	Operating Force	NEMA UL, IP Class	Approx. Shipping Weight	Positive Break	Contact Type	Contact Arrangements (All Momentary)
01307-012 ^b	Chrome	Black	9.0 lb.	12/13 IP65	1.55 lb.	Yes	Slow-Make/Slow-Break	# 09 NO-NC
01371-012		Black	5.2 lb.		1.35 lb.			
01371-112 ^a		Black	2.5 lb.		1.30 lb.	No	Slow-Make	# 10 2NO
01508-012	Black	Black	10.0 lb.		1.55 lb.	Yes	Slow-Make/Slow-Break	# 09 NO-NC
02049-001 ^b		Yellow						
02049-002 ^b	Red	Black	3.7 lb.		1.35 lb.	No	Snap-Action	# 64 2NO-2NC
02761-001	Black	Black						
02761-002	Red	Yellow						
02761-003	Green	Black						
02761-004	Yellow	Black	5.0 lb.		1.40 lb.	Yes	Slow-Make/Slow-Break	# 09 NO-NC
02911-001	Black	Black						
02911-002	Red	Yellow	8.5 lb.		No	Slow-Make	# 10 2NO	
02911-102*			5.0 lb.					
02911-004	Yellow	Black	5.0 lb.	No	Snap-Action	# 64 2NO-2NC		
02912-001	Black	Black	4.0 lb.					
02919-012	Chrome	Black	3.7 lb.					

* Not DEMKO certified

a SS Mounting Screws

b Assembled with an additional internal diaphragm for added protection.

See "WARNING ON PRODUCT APPLICATION" page (2)

SINGLE PLUNGER

PUSH BUTTON SWITCHES



P.O. Box 652 • Fremont, IN • 46737
www.reesinc.com

P: 260-495-9811 • F: 260-495-2186

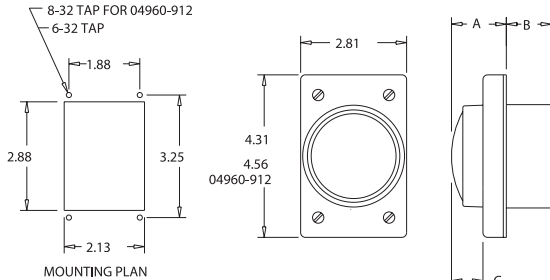
2.25 inch Mushroom Plunger with Shield and Weatherproof

Single Plunger
Push Button Switches



04960-412

For accessories see pages 39 thru 43.
Refer to the Glossary (pgs. 66-67) for a definition of terms.



Catalog No.	A	B	C	Catalog No.	A	B	C
04960-112	1.52"	1.05"	0.85"	04960-415	1.40"	1.05"	0.73"
04960-212	1.52"	1.05"	0.85"	04960-442	1.40"	1.05"	0.73"
04960-302	1.52"	1.05"	0.85"	04960-512	1.52"	1.13"	0.85"
04960-412	1.40"	1.05"	0.73"	04960-602	1.55"	1.05"	0.88"
				04960-912	1.59"	.86"	.84"

Environmental

Temperature Range

Operating: -22°F to +131°F (-30°C to +55°C)

Storage: -40°F to +185°F (-40°C to +85°C)

Note: Operating temperatures at 0°C are based on the absence of freezing moisture and liquids.

Features/Applications

The following switches are hand operated, control circuit devices, rated 'Heavy Duty' normally for use with electromagnetic equipment. The body with shield, painted with a dry powder paint, is made from die-cast zinc. The plunger head is powder painted or chrome plated steel. Each captive terminal will accept (2) #14 AWG stranded wires and the contacts are gold plated to eliminate high resistance tarnishing. Each switch is supplied with all mounting hardware and a solid neoprene rubber gasket which provides an oil tight seal upon installation. The mechanical life of these devices is 1,000,000 operations. These switches can be found on a variety of machines such as punch presses, press brakes, and spot-welding equipment as "RUN", "START" or "STOP" buttons. They also are used for "Pedestrian Cross-walks" and even found in parking garages and car wash applications. Model numbers 04960-412, 04960-415, 04960-442 and 04960-912 comply with ADA guidelines defined in Federal Register Vol. 59, No. 117, Section 14.2.5 "Pedestrian Street Crossings." Their rugged construction and long term reliability make these switches extremely well suited to function within various industrial / commercial environments.

Electrical Ratings

"HEAVY DUTY - A600 / N300"

Listed under UL 508 - File # E 58589;

Certified under CSA C22.2 - File # LR 3648

CE Compliant IEC/EN: 60947-5-1

Third party certified under DEMKO File # FI-17205

Can be mounted in REES standard enclosures found on page 39.

Plungers and contacts are not field replaceable.

See pages 64 & 65 for contact arrangement information.

Catalog No.	Plunger/Color	Cover Color	Operating Force	NEMA UL, IP Class	Approx. Shipping Weight	Positive Break	Contact Type	Contact Arrangements (All Momentary)
04960-112	Chrome	Black	3.8 Lb.	4 IP66	1.42 lb.	Yes	Slow-Make/ Slow-Break	#09 NO-NC ⊕
04960-212	Red		2.5 Lb.			No	Slow-Make	#10 NO-NO
04960-302			4.5 Lb.			Yes	Slow-Break	#11 NC-NC ⊕
04960-412	Chrome	Yellow	1.5 Lb.			No	Slow-Make	#63 NO
04960-415*a			Black			3.8 Lb.	Yes	Snap-Action
04960-442*	Red	Black				1.5 Lb.	Yes	Slow-Break
04960-512			1.5 Lb.			No	Slow-Make	#63 NO
04960-602	Chrome							
04960-912*b								

* Not DEMKO certified

a Provided with tamper resistance cover screws

b Please note mounting distance dimensions on this model. Does not fit in REES enclosures.

See "WARNING ON PRODUCT APPLICATION" page (2)

SINGLE PLUNGER

PUSH BUTTON SWITCHES



P.O. Box 652 • Fremont, IN • 46737
www.reesinc.com

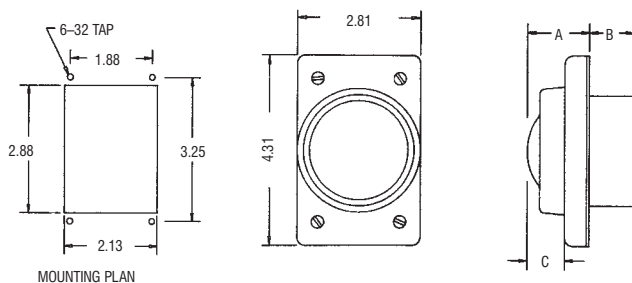
P: 260-495-9811 • F: 260-495-2186

2.25 inch Mushroom Plunger with Shield



01371-212

For accessories see pages 39 thru 43.
Refer to the Glossary (pgs. 66-67) for a definition of terms.



Catalog No.	A	B	C	Catalog No.	A	B	C
01371-212	1.96"	1.05"	1.26"	01371-412	1.72"	1.05"	1.02"
01371-312	1.64"	1.05"	0.94"	01371-512	1.64"	1.05"	.94"

Environmental

Temperature Range

Operating: +32°F to +131°F (0°C to +55°C)

Storage: -40°F to +185°F (-40°C to +85°C)

Note: Operating temperatures at 0°C are based on the absence of freezing moisture and liquids.

Features/Applications

The following switches are hand operated, control circuit devices, rated 'Heavy Duty' normally for use with electromagnetic equipment. The body with integral shield, is made from die-cast zinc. Styles 01371-212 and 01371-412 are painted with a black dry powder paint. The 01371-312 is a natural sealed finish. The plunger head is chrome plated die-cast zinc. Each captive terminal will accept (2) #14 AWG stranded wires and the contacts are gold plated to eliminate high resistance tarnishing. Each switch is supplied with mounting hardware and a solid neoprene rubber gasket which provides an oil tight seal upon installation. The mechanical life of these devices is 1,000,000 operations. These switches can be found on a variety of machines such as punch presses, press brakes, spot-welding equipment, and in parking garages as "RUN", "START" or "CYCLE" push buttons. The shield around the plunger head helps to reduce the amount of contaminants entering the switch. Their rugged construction and long term reliability make these switches extremely well suited to function within various industrial / commercial environments

Electrical Ratings

"HEAVY DUTY - A600 / N300"

Listed under UL 508 - File # E 58589;

Certified under CSA C22.2 - File # LR 3648

CE Compliant IEC/EN 60947-5-1

Third party certified under DEMKO File # FI-17205

Normal Potential	Normal Current	Inrush Current
110-120 ac ^a volts	6.0 amp.	60.0 amp.
220-240 ac ^a	3.0 amp.	30.0 amp.
440-480 ac ^a	1.5 amp.	15.0 amp.
550-600 ac ^a	1.2 amp.	12.0 amp.
115-125 dc ^b	2.2 amp.	—
230-250 dc ^b	1.1 amp.	—

^a Power factor 0.35 or less

^b Inductive loads as specified in Section 125 of Industrial Control Devices, Controllers and Assemblies, ANSI / NEMA ICS 2-1988

Can be mounted in REES standard enclosures found on page 39.
Plungers and contacts are not field replaceable.
See pages 64 & 65 for contact arrangement information.

Catalog No.	Plunger/Color	Cover Color	Operating Force	NEMA UL, IP Class	Approx. Shipping Weight	Positive Break	Contact Type	Contact Arrangements (All Momentary)
01371-212	Chrome	Black	5.3 Lb.	12/13 IP65	1.35 lb.	Yes	Slow-Make Slow-Break	# 09 NO-NC Ⓢ
01371-312		Natural Zinc				No	Slow-Make	# 63 NO
01371-412		Black						
01371-512*		Yellow						

* Not DEMKO certified

See "WARNING ON PRODUCT APPLICATION" page (2)

SINGLE PLUNGER

PUSH BUTTON SWITCHES



P.O. Box 652 • Fremont, IN • 46737
www.reesinc.com

P: 260-495-9811 • F: 260-495-2186

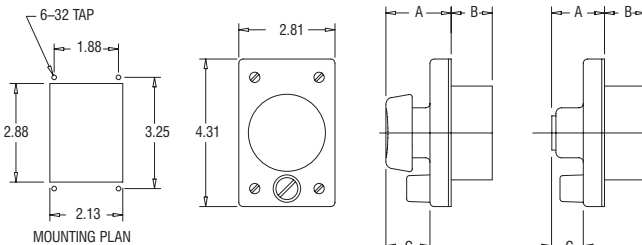
1.00 inch and 2.25 inch Push Button with Key Lock

Single Plunger
Push Button Switches



04161-002

For accessories see pages 39 thru 43.
Refer to the Glossary (pgs. 66-67) for a definition of terms.



Catalog No.	A	B	C	Catalog No.	A	B	C
01501-012	2.54"	1.52"	1.68"	03855-003	2.30"	1.44"	1.44"
01760-012	2.23"	1.48"	1.37"	04161-001	2.34"	1.81"	1.48"
01920-001	1.74"	1.47"	0.88"	04161-002	2.34"	1.81"	1.48"
03855-001	2.30"	1.44"	1.44"	04801-012	2.18"	1.48"	1.32"
03855-002	2.30"	1.44"	1.44"				

Environmental

Temperature Range

Operating: +32°F to +131°F (0°C to +55°C)

Storage: -40°F to +185°F (-40°C to +85°C)

Note: Operating temperatures at 0°C are based on the absence of freezing moisture and liquids.

#5 Keys are included, extra or replacement keys can be ordered by using part number 80508-121, as shown on page 43.

Features/Applications

The following NEMA 12/13 switches are hand operated, key lockable, control circuit devices, rated 'Heavy Duty' normally for use with electromagnetic equipment. The body and some of the plunger heads are painted with a dry powder paint, and made from die-cast zinc. The plastic plunger heads (see chart below) are solid colors throughout. Each captive terminal will accept (2) #14 AWG stranded wires and the contacts are gold plated to eliminate high resistance tarnishing. Each switch is supplied with mounting hardware and a solid neoprene rubber gasket which provides an oil tight seal upon installation. The mechanical life of these devices is 500,000 operations. These switches can be found on a variety of machines such as punch presses and press brakes as "RUN", "START" or "STOP" buttons. The switches marked BY-PASS are designed with the normal operation of one NO and one NC, when the switch is "Locked Out" BOTH sets of contacts are closed, producing an electrical by-pass condition. This switch is normally found on multiple operator presses. The red plunger "Positive Break" styles comply with all standards for 'emergency stop' applications. The rugged construction and long term reliability of these switches makes them extremely well suited to function within various industrial /commercial environments.

Electrical Ratings

"HEAVY DUTY - A600 / N300"

Listed under UL 508 - File # E 58589;

Certified under CSA C22.2 - File # LR 3648

CE Compliant IEC/EN 60947-5-1

Third party certified under DEMKO File # FI-17205

Normal Potential	Normal Current	Inrush Current
110-120 ac ^a volts	6.0 amp.	60.0 amp.
220-240 ac ^a	3.0 amp.	30.0 amp.
440-480 ac ^a	1.5 amp.	15.0 amp.
550-600 ac ^a	1.2 amp.	12.0 amp.
115-125 dc ^b	2.2 amp.	—
230-250 dc ^b	1.1 amp.	—

^a Power factor 0.35 or less

^b Inductive loads as specified in Section 125 of Industrial Control Devices, Controllers and Assemblies, ANSI / NEMA ICS 2-1988

Can be mounted in REES standard enclosures found on page 39.
Plungers and contacts are not field replaceable.
See pages 64 & 65 for contact arrangement information.

Catalog No.	Plunger Style	Plunger Color	Cover Color	Operating Force	Approx. Shipping Wt.	Key / Plunger Operation Key Removable Locked/Unlocked	Contact Arrangement Slow Make/Slow Break
01501-012 ^a	2.25" Mushroom	Chrome	Black	2.2 Lb.	1.90 lb.	Key locks plunger in normal or depressed position	# 09 NO-NC ⊕
01760-012 ^a	2.25" Mushroom	Chrome	Black	8.4 Lb	1.90 lb.	BY-PASS operation (See Above)	# 54 NO-NC ⊕
01920-001 ^b	1.00" Flat	Black	Black	2.2 Lb.	1.55 lb.	Key locks plunger in depressed position ONLY	# 09 NO-NC ⊕
03855-001 ^b		Black	Black				# 62 NO-NC
03855-002 ^b	2.25" Mushroom	Red	Yellow	4.0 Lb	1.75 lb.	Key locks plunger in depressed position ONLY	Make before Break ⊕
03855-003 ^b		Green	Black				Positive Break
04161-001 ^{*a}	2.25" Mushroom	Black	Black	3.2 Lb	1.95 lb.	Key locks plunger in normal or depressed position	#14 2 (NO-NC) ⊕
04161-002 ^{*a}		Red	Yellow				Positive Break
04801-012 ^a	2.25" Flat	Chrome	Black	8.4 Lb	1.90 lb.	BY-PASS operation (See Above)	# 54 NO-NC ⊕

^a Metal Plunger Head; ^b Plastic Plunger

* CSA Only.

See "WARNING ON PRODUCT APPLICATION" page (2)

SINGLE PLUNGER

PUSH BUTTON SWITCHES



P.O. Box 652 • Fremont, IN • 46737
www.reesinc.com

P: 260-495-9811 • F: 260-495-2186

1.00 inch Plastic Plunger and 1.75 inch Mushroom Push-Pull

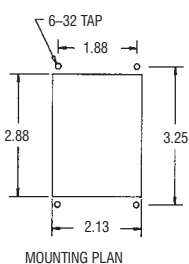


00294-004



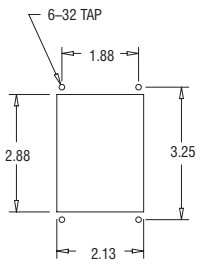
04596-002

For accessories see pages 39 thru 43.
Refer to the Glossary (pgs. 66-67) for a definition of terms.



MOUNTING PLAN

Catalog No.	A	B	C	Catalog No.	A	B	C
00294-001	1.64"	1.10"	0.94"	00294-004	1.64"	1.10"	0.94"
00294-002	1.64"	1.10"	0.94"	02221-001	1.33"	1.18"	0.63"
00294-003	1.64"	1.10"	0.94"	02221-002	1.33"	1.18"	0.63"



MOUNTING PLAN

Catalog No.	A	B	C	Catalog No.	A	B	C
04596-001	2.16"	1.69"	1.46"	04596-232	2.16"	1.69"	1.46"
04596-002	2.16"	1.69"	1.46"				

Features/Applications

The following switches are hand operated, control circuit devices, rated 'Heavy Duty' normally for use with electromagnetic equipment. The body, painted with a dry powder paint, is made from die-cast zinc. The plastic plunger heads are solid colors throughout. Each captive terminal will accept (2) #14 AWG stranded wires and the contacts are gold plated to eliminate high resistance tarnishing. Each switch is supplied with mounting hardware and a solid neoprene rubber gasket which provides an oil tight seal upon installation. The mechanical life of these devices is 1,000,000 operations. These switches can be found on a variety of machines in all types of applications. Their rugged construction and long term reliability make these switches extremely well suited to function within various industrial or commercial environments.

1.00 inch Plastic Plunger

The 00294's have a slightly extended plunger while the 02221's are flush type models. The small plunger diameter requires activation by either finger or thumb reducing the possibility of accidental tripping.

1.75 inch Plastic Mushroom Plunger PUSH-PULL

Push "OFF" (Contacts are both open) Pull "ON" (Contacts are both closed)

Electrical Ratings

"HEAVY DUTY - A600 / N300"

Listed under UL 508 - File # E 58589;

Certified under CSA C22.2 - File # LR 3648

CE Compliant IEC/EN 60947-5-1

Third party certified under DEMKO File #FI-17205

Environmental

Temperature Range

Operating: +32°F to +131°F (0°C to +55°C)

Storage: -40°F to +185°F (-40°C to +85°C)

Note: Operating temperatures at 0°C are base on the absence of freezing moisture and liquids.

Normal Potential	Normal Current	Inrush Current
110-120 ac ^a volts	6.0 amp.	60.0 amp.
220-240 ac ^a	3.0 amp.	30.0 amp.
440-480 ac ^a	1.5 amp.	15.0 amp.
550-600 ac ^a	1.2 amp.	12.0 amp.
115-125 dc ^b	2.2 amp.	—
230-250 dc ^b	1.1 amp.	—

^a Power factor 0.35 or less

^b Inductive loads as specified in Section 125 of Industrial Control Devices, Controllers and Assemblies, ANSI / NEMA ICS 2-1988

1.00 inch Plastic Plunger

Catalog No.	Plunger Color	Cover Color	Operating Force	NEMA, UL, IP Class	Approx. Shipping Wt.	Positive Break	Contact Type	Contact Arrangement
00294-001	Black	Black	4.3 Lb.	12/13 IP65	1.20 lb.	Yes	Slow-Make Slow-Break	⊖ # 09 NO-NC Momentary
00294-002	Red	Yellow	4.8 Lb.					
00294-003	Green	Black	4.3 Lb.					
00294-004	Yellow	Black	4.3 Lb.					
02221-001	Black	Yellow	4.8 Lb.					
02221-002	Red	Yellow	4.8 Lb.					

1.75 inch Plastic Mushroom Plunger PUSH-PULL

Catalog No.	Plunger Color	Cover Color	Operating Force	NEMA, UL, IP Class	Approx. Shipping Wt.	Positive Break	Contact Type	Contact Arrangement
04596-001	Black	Black	10 Lb.	12/13 IP65	1.40 lb.	Yes	Slow-Make Slow-Break	⊖ # 07 NC-NC Pull to Make
04596-002	Red	Yellow						6 Lb.
04596-232*	Red	Yellow	6 Lb.					⊖ # 69 (2) NO-NC - Maintained - Pull to Make

*Not DEMKO Certified.

See "WARNING ON PRODUCT APPLICATION" page (2)

SINGLE PLUNGER

PUSH BUTTON SWITCHES

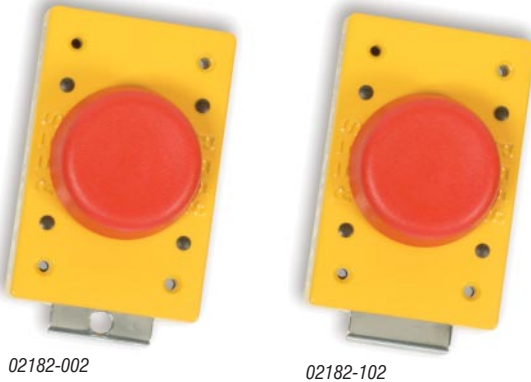


P.O. Box 652 • Fremont, IN • 46737
www.reesinc.com

P: 260-495-9811 • F: 260-495-2186

2.25 inch Mushroom Plunger with Spring Latch

Single Plunger
Push Button Switches

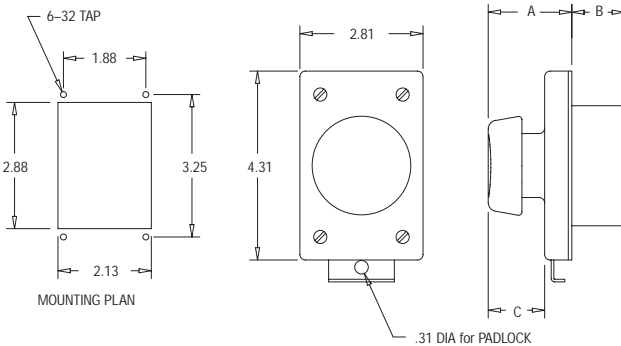


For accessories see pages 39 thru 43.
Refer to the Glossary (pgs. 66-67) for a definition of terms.

Features/Applications

The following switches are hand operated, spring latchable, control circuit devices, rated 'Heavy Duty' normally for use with electromagnetic equipment. The body and some of the plunger heads are painted with a dry powder paint, and made from die-cast zinc. The plastic plungers are molded from DuPont Delrin 100ST Acetal for improved impact resistance and are solid colors throughout. Each captive terminal will accept (2) #14 AWG stranded wires and the contacts are gold plated to eliminate high resistance tarnishing. Each switch is supplied with mounting hardware and a solid neoprene rubber gasket which provides an oil tight seal upon installation. The mechanical life of these devices is 500,000 operations. These switches can be found in a variety of uses on industrial machines. Presses and press brakes use them as "STOP" buttons. The switches marked BY-PASS are designed with the normal operation of one NO and one NC, when the switch is "Locked Out" BOTH sets of contacts are closed producing an electrical by-pass condition. This switch is normally found on multiple operator presses. The red plunger "Positive Break" styles comply with all standards for 'emergency stop' applications. The plated steel latch plate has either a 0.29" dia. hole for insertion of a multi-padlock hasp or a .31" hole for insertion of a padlock. Five devices have had the padlock hole omitted, see the chart on following page.

WARNING: USER MUST VERIFY COMPATIBILITY OF ANY LOCKING DEVICE USED WITH THESE SWITCHES



Catalog No.	A	B	C	Catalog No.	A	B	C
01919-012	2.25"	1.48"	1.39"	02510-002	2.46"	1.46"	1.60"
01981-001	2.38"	1.35"	1.52"	02510-101	2.46"	1.46"	1.60"
01981-002	2.38"	1.35"	1.52"	02510-102	2.46"	1.46"	1.60"
02182-001	2.56"	1.46"	1.70"	02650-002	2.55"	1.43"	1.69"
02182-002	2.56"	1.46"	1.70"	02650-102	2.55"	1.43"	1.69"
02182-101	2.56"	1.46"	1.70"	03476-001	2.19"	1.46"	1.33"
02182-102	2.56"	1.46"	1.70"	03476-002	2.19"	1.46"	1.33"
02182-202	2.56"	1.46"	1.70"	03476-004	2.19"	1.46"	1.33"
02510-001	2.46"	1.46"	1.60"	04161-102	2.56"	1.81"	1.70"

Electrical Ratings

"HEAVY DUTY - A600 / N300"

Listed under UL 508 - File # E 58589;
Certified under CSA C22.2 - File # LR 3648
CE Compliant IEC/EN : 60947-5-1 or 60947-5-5
Third party certified under DEMKO File #FI-17205

Environmental

Temperature Range

Operating: +32°F to +131°F (0°C to +55°C)
Storage: -40°F to +185°F (-40°C to +85°C)

Note: Operating temperatures at 0°C are based on the absence of freezing moisture and liquids.

Normal Potential	Normal Current	Inrush Current
110-120 ac ^a volts	6.0 amp.	60.0 amp.
220-240 ac ^a	3.0 amp.	30.0 amp.
440-480 ac ^a	1.5 amp.	15.0 amp.
550-600 ac ^a	1.2 amp.	12.0 amp.
115-125 dc ^b	2.2 amp.	—
230-250 dc ^b	1.1 amp.	—

^a Power factor 0.35 or less

^b Inductive loads as specified in Section 125 of Industrial Control Devices, Controllers and Assemblies, ANSI / NEMA ICS 2-1988

Can be mounted in REES standard enclosures found on page 39.
Plungers and contacts are not field replaceable.
See pages 64 & 65 for contact arrangement information.

See "WARNING ON PRODUCT APPLICATION" page (2)



Switches comply with IEC/EN 60947-5-1

Catalog No.	Plunger Color	Cover Color	Operating Force	Lock Hole Dia.	Approx. Shipping Wt.	Latch / Plunger Operation	Contact Type	Contact Arrangement
01919-012a	Chrome	Black	5.0 lb.	.31"	1.80 lb.	BY-PASS operation (see above)	Slow-Make/ Slow-Break	#54 NO-NC
01981-001b	Black		11.5 lb.	.31"	1.65 lb.	Latches when depressed Operate latch to release		#62 NO-NC ⊕
02182-001b			12.5 lb.	None				#09 NO-NC ⊕
02182-101b			None					Positive Break
02510-001b	Black	Black	9.5 lb.	.31"	1.55 lb.	Push to Latch, Travel limited from neutral to depressed. Push latch to return to normal		# 09 NO-NC ⊕
02510-101b				None				# 09 NO-NC ⊕
03476-001a			Yellow	11.5 lb.	0.31"	1.80 lb.		Latches when depressed Operate latch to release
03476-004a	Red			7.8 lb.				
04161-102b *		None						

a Metal Plunger Head

b Plastic Plunger

* CSA Only

Switches comply with IEC/EN 60947-5-5 for Emergency Stop Applications

Catalog No.	Plunger Color	Cover Color	Operating Force	Lock Hole Dia.	Approx. Shipping Wt.	Latch / Plunger Operation	Contact Type	Contact Arrangement	
01981-002b	Red	Yellow	11.5 lb.	.31"	1.65 lb.	Latches when depressed Operate latch to release	Slow-Make/ Slow-Break	#09 NO-NC ⊕	
02182-002b			12.5 lb.	None				Positive Break	
02182-102b			9.5 lb.	.29"	1.55 lb.	Push to Latch, Travel limited from neutral to depressed. Push latch to return to normal		# 09 NO-NC ⊕	
02182-202b				.31"				None	# 09 NO-NC ⊕
02510-002b				None					
02510-102b			10.5 lb.	0.31"	1.60 lb.	Latches when depressed Operate latch to release		#11 NC-NC ⊕	
02650-002b				None				Positive Break	
02650-102b				11.5 lb.				0.31"	1.80 lb.
03476-002a	None	Positive Break							

a Metal Plunger Head

b Plastic Plunger

DOUBLE PLUNGER

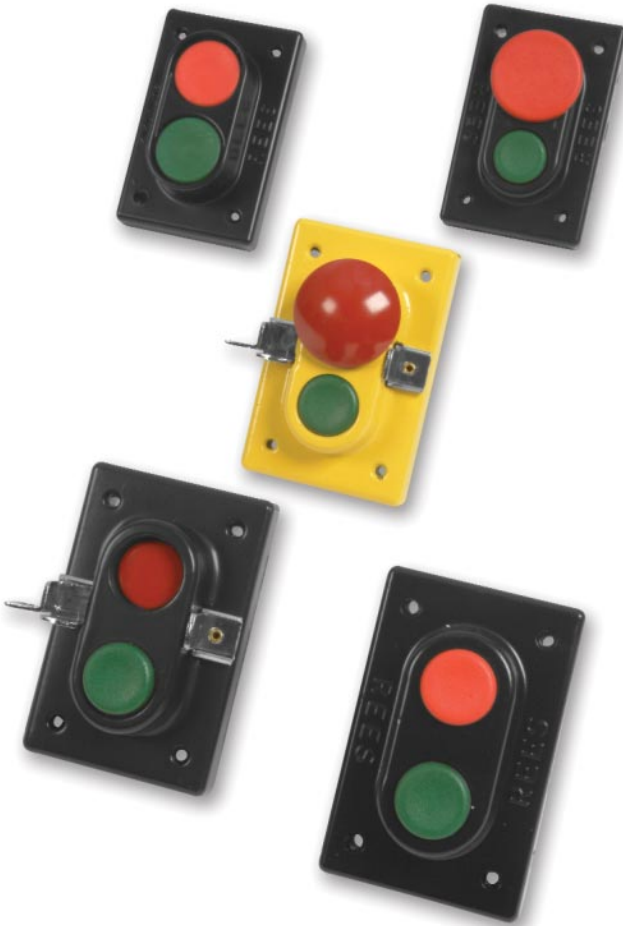
PUSH BUTTON SWITCHES



P.O. Box 652 • Fremont, IN • 46737
www.reesinc.com

P: 260-495-9811 • F: 260-495-2186

Double Plunger
Push Button Switches



Definition

A push button switch is a mechanical device used to make and/or break one or more electrical circuits. They are designed to be solely operated by human hands.

Operation

These double plunger push button switches have contact arrangements from one normally open contact and one normally closed contact to two normally open contacts plus two normally closed contacts. By pushing the plunger (by hand) the contacts will change state and either start or stop the circuit they are connected to. When the plunger is released, the contacts of the momentary style switches will return to their normal at rest state. The maintained and latching style will stay as pushed until the other plunger is pushed or the latch is released and then the plunger is pushed returning to its normal position. The latching style shown will accept a padlock with a 0.313" dia. or smaller hasp.

Selection

The selection and use of a push button switch involves knowing the details of the particular installation. The following questions should be answered in order to make the proper selection.

Does a circuit need to be made and/or broke?

Are there multiple circuits?

What color plunger is required or requested?

What style plunger is necessary?

Does the button need to be guarded from unintentional operation?

What is the switch environment? (Exposed to weather?)

Installation

Every installation is unique, therefore there are only a very few hard and fast rules to follow. Above all, observe all SAFETY REQUIREMENTS, PROCEDURES and LOCAL CODES. To mount these devices it will be necessary to have a suitable enclosure. These are available from REES (see page 39) or they will mount on Condulet® "FS" style cast enclosures. On pages 30 through 33 you will find over thirty different models of double plunger push button switches that should satisfy any installation requirements. In the fourth section of this catalog you can find a number of accessory items to facilitate in the installation of these switches.

All mechanical devices, these switches included, will wear out and eventually need to be replaced. The estimated minimum mechanical life is 500,000 operations. Regular scheduled Preventative Maintenance inspections are strongly recommended. Some conditions to look for are:

Physical damage to the switch.

Loose connections or components.

Broken or weak springs.

Burnt or very worn contacts.

REES push button switches are designed and manufactured to surpass the minimal standards of industry. On the facing page is a brief look at some of these regulations and how our switches conform. The testing done by independent facilities is the minimum requirement that the REES switches far exceed. If other assistance is desired please contact the factory.

See "WARNING ON PRODUCT APPLICATION" page (2)

DOUBLE PLUNGER

PUSH BUTTON SWITCHES



P.O. Box 652 • Fremont, IN • 46737
www.reesinc.com

P: 260-495-9811 • F: 260-495-2186

Regulations

Following are references and excerpts from Federal and Foreign Regulations that have applicability to Push button Switches.

- **ANSI B 11.1 - 1988 (4.13.3.1)**

“Stop Control • A red stop control shall be provided at each operator station. Momentary operation of the stop control shall immediately deactivate the clutch and apply the brake. The stop control shall override any other control, and reactivation of the clutch shall require the use of the actuating (tripping) means which has been selected. A TOP STOP control, if provided, shall be yellow to distinguish it from the STOP control.”

- **ANSI B 11.3 - 1982 (4.4.4.2.1)**

“Emergency Stop Control. An emergency stop control shall be provided. This control shall immediately stop the ram movement by momentary actuation of this control. The emergency stop control shall override every other control. Reactuation of the ram movement shall require the use of the predetermined operator’s control station which has been selected.”

- **NEMA ICS 2 - 1988 (2-216.22)**

“Heavy-duty push buttons and selector switches shall have contact rating designations of A600, A300, A150, N600, N300, or N150 as shown in Table 2-125-1 for alternating current and Table 2-125-2 for direct current.”

- **NEMA ICS 2 - 1988 (2-216.62)**

“The color of those push buttons which perform a stop function shall be red.”

- **CEN (European Committee for Standardization) EN 418 :1992 (4.1.2)**

“The control device and its actuator shall apply the principle of positive mechanical action.”

- **CEN (European Committee for Standardization) EN 418 :1992 (4.4.3)**

“The emergency stop actuators shall be coloured red. As far as a background exists behind the actuator and as far as it is practicable, it shall be coloured yellow.”

REES switches exceed the following:

Listed by Underwriters Laboratories per Standard UL 508
File No. E 58589

Certified by Canadian Standards Association per Standard C 22.2
File No. LR 3648

Certified by DEMKO to IEC/EN 60947-5-5 or IEC/EN 60947-5-1

Third party certified under DEMKO File #FI-17205


NEMA ICS 2-1988

IEC/EN 60947-5-5: Standard which applies to electrical emergency stop devices with a mechanical latching function. This standard also encompasses all requirements of regular electromechanical switches (60947-5-1)

IEC/EN 60947-5-1: Standard which applies to low-voltage switchgear and controlgear such as the electromechanical switches manufactured by REES, Inc.

Following are definitions of terms as relating to Push Button Switches:

Push Button - A push button switch (push button) is a switch having a manually operable plunger, rocker or button for actuating the switch.

Positive Break -  The achievement of contact separation as the direct result of a specified movement of the switch actuator through non-resilient members. (e.g. NOT dependent upon springs)

Positive Transfer - A contact system so designed that, it remains in one state (NO or NC) until the switch actuator moves to a “point of no return” then the contacts transfer and cannot be teased.

Slow-Make / Slow-Break - A contact system that opens and/or closes at the same rate (speed and time) that the actuator is moved.

Snap Action - A rapid motion of the contacts from one state to another, that is independent of the rate of travel of the actuator. Similar to “Positive Transfer”.

Emergency Stop - A device that can be actuated in an emergency situation (one that arises from a sudden and unexpected need) and utilizes a positive mechanical action to function as a “stop category 0” device [i.e. stopping by immediate removal of power to the machine or mechanical disconnection between the hazardous elements and their machine actuator (s)].

Operating Force - The amount of pushing or pulling force (in pounds) necessary to change the state of the switch from an at rest condition to one of contact change, that is, to make a set of Normally Open contacts or break a set of Normally Closed contacts.

DOUBLE PLUNGER

PUSH BUTTON SWITCHES



P.O. Box 652 • Fremont, IN • 46737
www.reesinc.com

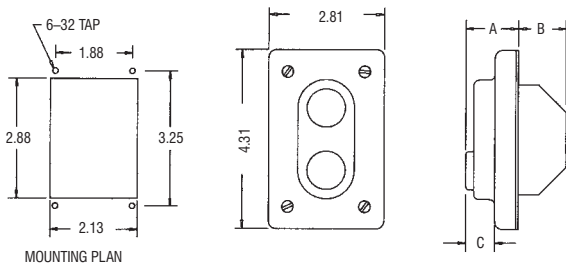
P: 260-495-9811 • F: 260-495-2186

1.00 inch Double Plastic Plunger

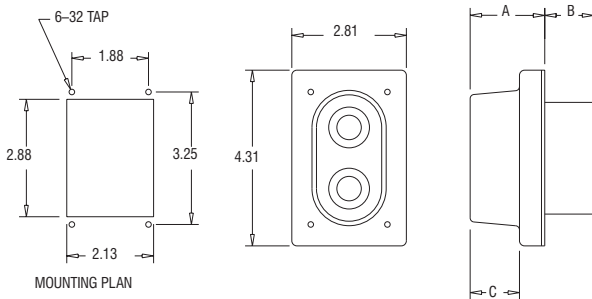
00579-132



For accessories see pages 39 thru 43.
Refer to the Glossary (pgs. 66-67) for a definition of terms.



Catalog No.	A	B	C	Catalog No.	A	B	C
00579-101	1.54"	1.20"	0.84"	01531-032	1.47"	1.69"	0.77"
00579-132	1.54"	1.20"	0.84"	02140-032	1.40"	1.10"	0.70"
00580-001	1.59"	1.72"	0.89"	02883-032	1.54"	1.73"	0.84"
00580-032	1.58"	1.72"	0.89"	03924-000	2.19"	1.87"	1.49"



Catalog No.	A	B	C
04947-032	2.19"	1.13"	1.49"

Features/Applications

The following switches are hand operated, control circuit devices, rated 'Heavy Duty' normally for use with electromagnetic equipment. The bodies are made from die-cast zinc, and painted with a dry powder paint. Each captive terminal will accept (2) #14 AWG stranded wires and the contacts are gold plated to eliminate high resistance tarnishing. Each switch is supplied with mounting hardware and a solid neoprene rubber gasket which provides an oil tight seal upon installation. The mechanical life of these devices is 500,000 operations. These switches can be found on a variety of machines such as: punch presses and press brakes as "START" and "STOP" or "FORWARD" and "REVERSE" buttons and with material handling equipment as "UP" and "DOWN" or "RAISE" and "LOWER" controls. The rugged construction and long term reliability of these switches makes them extremely well suited to function within various industrial / commercial environments.

Electrical Ratings

"HEAVY DUTY - A600 / N300"

Listed under UL 508 - File # E 58589
Certified under CSA C22.2 - File # LR 3648
CE Compliant IEC/EN 60947-5-1
Third party certified under DEMKO File #FI-17205

Environmental

Temperature Range

Operating: +32°F to +131°F (0°C to +55°C)
Storage: -40°F to +185°F (-40°C to +85°C)

Note: Operating temperatures at 0°C are based on the absence of freezing moisture and liquids.

Normal Potential	Normal Current	Inrush Current
110-120 ac ^a volts	6.0 amp.	60.0 amp.
220-240 ac ^a	3.0 amp.	30.0 amp.
440-480 ac ^a	1.5 amp.	15.0 amp.
550-600 ac ^a	1.2 amp.	12.0 amp.
115-125 dc ^b	2.2 amp.	—
230-250 dc ^b	1.1 amp.	—

^a Power factor 0.35 or less

^b Inductive loads as specified in Section 125 of Industrial Control Devices, Controllers and Assemblies, ANSI / NEMA ICS 2-1988

Can be mounted in REES standard enclosures found on page 39.
Plungers and contacts are not field replaceable.
See pages 64 & 65 for contact arrangement information.

Catalog No.	1.00" Plunger Color	1.00" Plunger Color	Cover Color	Approx. Shipping Wt.	Operation	Contact Type	Contact Arrangement
00579-101	Black	Black	Black	1.35 lb.	Momentary	Slow-Make/ Slow-Break	#17 NO+NO /NC ⊕
00579-132	Green	Red			Maintained		#04 NO+NC ⊕
00580-001	Black	Black			Momentary		#23 NO+NO/NC ⊕
00580-032	Green	Red		Maintained	#02 NO + NC ⊕		
01531-032				Momentary	#60 NO-NC ⊕		
02140-032				Maintained	Make before Break		
02883-032	Satin Aluminum	Satin Aluminum	Black	1.40 lb.	Momentary w/ Contact Overlap Barrier	Anti-tease Snap-Action	#06 NO + NO
03924-000*				1.35 lb.	Maintained		#64 2NO +2NC
04947-032	Green	Red	Black	1.65 lb.	Positive Transfer		

* Assembled with an additional internal diaphragm for added protection.

See "WARNING ON PRODUCT APPLICATION" page (2)

DOUBLE PLUNGER

PUSH BUTTON SWITCHES



P.O. Box 652 • Fremont, IN • 46737
www.reesinc.com

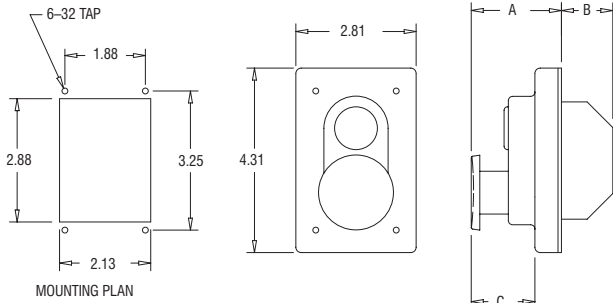
P: 260-495-9811 • F: 260-495-2186

1.00 inch and 1.75 inch Double Plastic Plunger

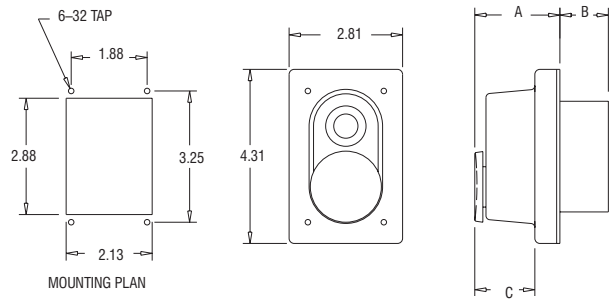


04947-132

For accessories see pages 39 thru 43.
Refer to the Glossary (pgs. 66-67) for a definition of terms.



Catalog No.	A	B	C	Catalog No.	A	B	C
01619-014	2.37"	1.17"	1.67"	01968-232	2.26"	1.70"	1.56"
01619-032	2.37"	1.17"	1.67"	03605-032	2.21"	1.81"	1.51"
01896-032	2.37"	1.76"	1.67"	03605-132	2.30"	1.70"	1.60"
01968-032	2.26"	1.70"	1.56"	03605-232	2.30"	1.70"	1.60"
01968-132	2.26"	1.70"	1.56"				



Catalog No.	A	B	C
04947-132	2.82"	1.13"	2.12"

Features/Applications

The following switches are hand operated, control circuit devices, rated 'Heavy Duty' normally for use with electromagnetic equipment. The bodies are made from die-cast zinc, and painted with a dry powder paint. Each captive terminal will accept (2) #14 AWG stranded wires and the contacts are gold plated to eliminate high resistance tarnishing. Each switch is supplied with mounting hardware and a solid neoprene rubber gasket which provides an oil tight seal upon installation. The mechanical life of these devices is 500,000 operations. These switches can be found on a variety of machines such as: punch presses and press brakes as "START" and "STOP" or "FORWARD" and "REVERSE" buttons and with material handling equipment as "UP" and "DOWN" or "RAISE" and "LOWER" controls. The rugged construction and long term reliability of these switches makes them extremely well suited to function within various industrial / commercial environments.

Electrical Ratings

"HEAVY DUTY - A600 / N300"

Listed under UL 508 - File # E 58589
Certified under CSA C22.2 - File # LR 3648
CE Compliant IEC/EN 60947-5-1
Third party certified under DEMKO File # FI-17205

Environmental

Temperature Range

Operating: +32°F to +131°F (0°C to +55°C)

Storage: -40°F to +185°F (-40°C to +85°C)

Note: Operating temperatures at 0°C are based on the absence of freezing moisture and liquids.

Normal Potential	Normal Current	Inrush Current
110-120 ac ¹ volts	6.0 amp.	60.0 amp.
220-240 ac ¹	3.0 amp.	30.0 amp.
440-480 ac ¹	1.5 amp.	15.0 amp.
550-600 ac ¹	1.2 amp.	12.0 amp.
115-125 dc ²	2.2 amp.	—
230-250 dc ²	1.1 amp.	—

a Power factor 0.35 or less

b Inductive loads as specified in Section 125 of Industrial Control Devices, Controllers and Assemblies, ANSI / NEMA ICS 2-1988

Can be mounted in REES standard enclosures found on page 39.

Plungers and contacts are not field replaceable.

See pages 64 & 65 for contact arrangement information.

Catalog No.	1.00" Plunger Color	1.75" Plunger Color	Cover Color	Approx. Shipping Wt.	Operation	Contact Type	Contact Arrangement
01619-032	Green	Red	Black	1.40 lb.	Momentary	Slow- Make/ Slow- Break	#02 NO + NC ⊕
01619-014	Black	Yellow					#04 NO + NC ⊕
01896-032	Red	Green					#68 2NO + 2NC ⊕
01968-032	Green	Red		1.50 lb.	Maintained		#60 NO + NC ⊕
01968-232*							Make before Break ⊕
01968-132							29 NO + NO/NC ⊕
03605-032							29 NO + NO/NC ⊕
03605-132	1.45 lb.	NO - Momentary NO/NC Maintained		1.70 lb.	Maintained		#69 2NO + 2NC ⊕
03605-232**							Make before Break ⊕
04947-132					Maintained Positive Transfer	Anti-tease Snap Action	#64 2NO + 2NC ⊕

* Painted Red Metal Plunger Head

** Not DEMKO certified

See "WARNING ON PRODUCT APPLICATION" page (2)

DOUBLE PLUNGER

PUSH BUTTON SWITCHES



P.O. Box 652 • Fremont, IN • 46737
www.reesinc.com

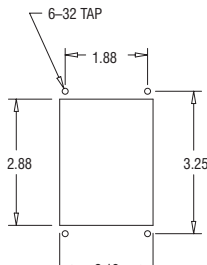
P: 260-495-9811 • F: 260-495-2186

1.38 inch Double Plastic Plunger



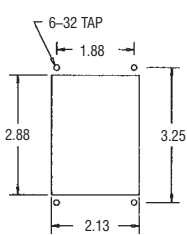
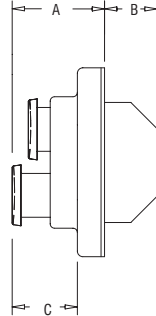
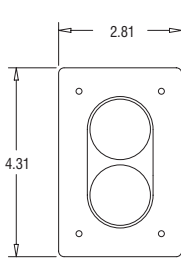
02169-032

For accessories see pages 39 thru 43.
Refer to the Glossary (pgs. 66-67) for a definition of terms.



MOUNTING PLAN

Catalog No.	A	B	C
01957-032	2.39"	1.75"	1.69"
02712-032	2.35"	1.69"	1.65"



MOUNTING PLAN

Catalog No.	A	B	C	Catalog No.	A	B	C
02169-032	1.66"	1.75"	0.96"	02810-032	1.65"	1.16"	0.96"
02276-032	1.66"	1.18"	0.96"	02810-132	1.65"	1.16"	0.96"
02810-001	1.65"	1.16"	0.96"				

Features/Applications

The following switches are hand operated, control circuit devices, rated 'Heavy Duty' normally for use with electromagnetic equipment. The bodies are made from die-cast zinc, and painted with a dry powder paint. Each captive terminal will accept (2) #14 AWG stranded wires and the contacts are gold plated to eliminate high resistance tarnishing. Each switch is supplied with mounting hardware and a solid neoprene rubber gasket which provides an oil tight seal upon installation. The mechanical life of these devices is 500,000 operations. These switches can be found on a variety of machines such as: punch presses and press brakes as "START" and "STOP" or "FORWARD" and "REVERSE" buttons and with material handling equipment as "UP" and "DOWN" or "RAISE" and "LOWER" controls. The rugged construction and long term reliability of these switches makes them extremely well suited to function within various industrial / commercial environments.

Electrical Ratings

"HEAVY DUTY - A600 / N300"

Listed under UL 508 - File # E 58589;
Certified under CSA C22.2 - File # LR 3648
CE Compliant IEC/EN 60947-5-1
Third party certified under DEMKO File # FI-17205

Environmental

Temperature Range

Operating: +32°F to +131°F (0°C to +55°C)
Storage: -40°F to +185°F (-40°C to +85°C)

Note: Operating temperatures at 0°C are based on the absence of freezing moisture and liquids.

Normal Potential	Normal Current	Inrush Current
110-120 ac ^a volts	6.0 amp.	60.0 amp.
220-240 ac ^a	3.0 amp.	30.0 amp.
440-480 ac ^a	1.5 amp.	15.0 amp.
550-600 ac ^a	1.2 amp.	12.0 amp.
115-125 dc ^b	2.2 amp.	—
230-250 dc ^b	1.1 amp.	—

^a Power factor 0.35 or less

^b Inductive loads as specified in Section 125 of Industrial Control Devices, Controllers and Assemblies, ANSI / NEMA ICS 2-1988

Can be mounted in REES standard enclosures found on page 39.
Plungers and contacts are not field replaceable.
See pages 64 & 65 for contact arrangement information.

Catalog No.	1.38" Plunger Color	1.38" Plunger Color	Cover Color	Approx. Shipping Wt.	Operation	Contact Type	Contact Arrangement
01957-032	Green Mushroom	Red Mushroom	Black	1.50 lb.	Maintained	Slow-Make / Slow-Break Make before Break	#68 NO+NC+NO/NC
02169-032	Green Flush	Red Flush		1.35 lb.	Maintained		#04 NO+ NC
02276-032	Green Flush	Red Flush		1.30 lb.	Momentary		#02 NO+NC
02712-032	Green Mushroom	Red Mushroom		1.45 lb.	Maintained		# 60 NO+ NC
02810-001	Black Flush	Black Flush		1.35 lb.	Momentary		#67 NO/NC+NO/NC
02810-032	Green Flush	Red Flush		1.35 lb.	Momentary		#67 NO/NC+NO/NC
02810-132	Green Flush	Red Flush		1.35 lb.	Maintained		#68 NO/NC+NO/NC

See "WARNING ON PRODUCT APPLICATION" page (2)

DOUBLE PLUNGER

PUSH BUTTON SWITCHES



P.O. Box 652 • Fremont, IN • 46737
www.reesinc.com

P: 260-495-9811 • F: 260-495-2186

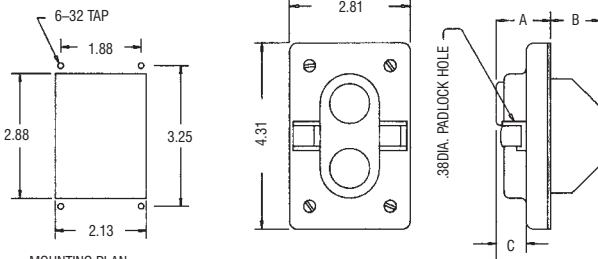
Double Plastic Plunger with Padlock Latch



04062-032

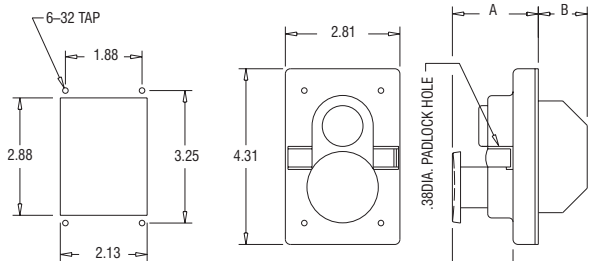
04932-532

For accessories see pages 39 thru 43.
Refer to the Glossary (pgs. 66-67) for a definition of terms.



MOUNTING PLAN

Catalog No.	A	B	C
04062-032	1.59"	1.20"	0.89"
04062-132	1.59"	1.20"	0.89"
04062-432	1.59"	1.75"	0.89"



MOUNTING PLAN

Catalog No.	A	B	C	Catalog No.	A	B	C
04087-032	2.30"	1.18"	1.60"	04932-432	2.26"	1.70"	1.56"
04932-032	2.39"	1.78"	1.69"	04932-532	2.29"	1.72"	1.59"
04932-132	2.29"	1.72"	1.59"	04932-632	2.26"	1.70"	1.56"
04932-232	2.29"	1.72"	1.59"				

Features/Applications

The following switches are hand operated, lockable, control circuit devices, rated 'Heavy Duty' normally for use with electromagnetic equipment. The bodies are made from die-cast zinc, and painted with a dry powder paint. Each captive terminal will accept (2) #14 AWG stranded wires and the contacts are gold plated to eliminate high resistance tarnishing. Each switch is supplied with mounting hardware and a solid neoprene rubber gasket which provides an oil tight seal upon installation. The mechanical life of these devices is 500,000 operations. These switches can be found on a variety of machines such as: punch presses and press brakes as "START" and "STOP" or "FORWARD" and "REVERSE" buttons and with material handling equipment as "UP" and "DOWN" or "RAISE" and "LOWER" controls. The rugged construction and reliability of these switches makes them extremely well suited to function within various industrial / commercial environments. The padlock slide latches the red plunger in the depressed position.

Electrical Ratings

"HEAVY DUTY - A600 / N300"

Listed under UL 508 - File # E 58589;
Certified under CSA C22.2 - File # LR 3648
CE Compliant IEC/CN 60947-5-1
Third party certified under DEMKO File # FI-17205

Environmental

Temperature Range

Operating: +32°F to +131°F (0°C to +55°C)
Storage: -40°F to +185°F (-40°C to +85°C)

Note: Operating temperatures at 0°C are based on the absence of freezing moisture and liquids.

Normal Potential	Normal Current	Inrush Current
110-120 ac ^a volts	6.0 amp.	60.0 amp.
220-240 ac ^a	3.0 amp.	30.0 amp.
440-480 ac ^a	1.5 amp.	15.0 amp.
550-600 ac ^a	1.2 amp.	12.0 amp.
115-125 dc ^b	2.2 amp.	—
230-250 dc ^b	1.1 amp.	—

^a Power factor 0.35 or less

^b Inductive loads as specified in Section 125 of Industrial Control Devices, Controllers and Assemblies, ANSI / NEMA ICS 2-1988

Catalog No.	Plunger Color	Plunger Color	Cover Color	Approx. Shipping Wt.	Operation	Contact Type	Contact Arrangement
04062-032	1.00" Green	1.00" Red (NC)	Black	1.40 lb.	Momentary	Slow- Make / Slow- Break	#15 NO/NC+NC
04062-132*	1.00" Green	1.00" Red (NC/NO)		1.50 lb.	Momentary		#17 NO/NC - NO
04062-432	1.00" Green	1.00" Red		1.50 lb.	Maintained		#68 2NO + 2NC
04087-032	1.00" Green	1.75" Red (NC)		1.40 lb.	Momentary		#02 NO + NC
04932-032	1.00" Green	1.75" Red		1.50 lb.	NO-Momentary NO/NC-Maintained		#29 NO+NO/NC
04932-132	1.00" Green(NO)	1.75" Red		1.50 lb.	NO-Momentary NO/NC-Maintained		#29 NO+NO/NC Make before Break
04932-232**	1.00" Green	1.75" Red		1.50 lb.	Maintained		#69 2NO+2NC Make before Break
04932-432	1.00" Green	1.75" Red	Yellow	1.50 lb.	Maintained	#68 2NO+2NC	
04932-532	1.00" Green(NO)	1.75" Red		1.50 lb.	NO-Momentary NO/NC-Maintained	# 29 NO+NO/NC	
04932-632	1.00" Green(NO)	1.75" Red		1.50 lb.	NO-Momentary NO/NC-Maintained	# 29 NO+NO/NC Make before Break	

* Not DEMKO certified or CE compliant

** Not DEMKO certified

See "WARNING ON PRODUCT APPLICATION" page (2)

**Definition**

These switches are mechanical devices used to make and/or break one or more electrical circuits. They are designed to be solely operated by human hands.

Operation

These switches have contact arrangements from one normally closed contact to a variable selector with up to five positions and sixteen poles. Included in this section are the enclosures that will accept all of the switches on the previous pages. A 'Die Safety Block Switch' is offered on page 36 which is normally used on presses with the removable switch key attached to a die safety block (Not Included). In order to place the die block in the die area the key must be removed from the switch thereby breaking and isolating the control circuit. Also included in this section are ring guards, legend plates and adapter plates etc.

Selection

The selection and use of a switch etc. involves knowing the details of the particular installation. The following rotary contact selector switches are offered with two positions, two poles or three positions, four poles or two position. Another style comes with two or four poles with a latch and provision for padlock security. Also, a custom order selector switch with or without a keylock is available. It can be produced in two through five positions and two through sixteen poles. These are specials and require a factory quote. For the fastest service, complete the worksheet on page 37 and FAX it to our Customer Service Department at 260-495-2186. The palm switch guard/actuator is available to reduce the operating force of the palm buttons. There are two advantages to using this device.

First of all, there is a mechanical advantage which means it takes less external force to actuate the switch it is mounted to. Secondly, the hand contact area is very large (approx. 20 sq. in.) which dissipates the pushing force into a much lower psi.

Installation

Every installation is unique, therefore there are only a very few hard and fast rules to follow. Above all, observe all SAFETY REQUIREMENTS, PROCEDURES and LOCAL CODES. To mount these devices it will be necessary to have a suitable enclosure. These are available from REES (see page 39). On pages 36 through 43 you will find many different items that should satisfy any installation requirements. At the end of this section of this catalog you can find a number of accessory items to facilitate in the installation of these devices.

All mechanical devices, these units included, will wear out and eventually need to be replaced. The estimated minimum mechanical life is 500,000 operations. Regular scheduled Preventative Maintenance inspections are strongly recommended. Some conditions to look for are:

- Physical damage to the device.
- Loose connections or components.
- Broken or weak springs.

REES switches are designed and manufactured to surpass the standards of industry. On the facing page is a brief look at some of these regulations. The testing done by independent facilities is the minimum requirement that the REES switches far exceed. If other assistance is desired please contact the factory.

Regulations

Following are excerpts from Domestic and Foreign Regulations that have applicability to Selector Switches, Guards and Enclosures.

- **ANSI B 11.1 - 1988 (4.13.4.1)**

“Stroking Selector . A means of selecting OFF, INCH, SINGLE STROKE, CONTINUOUS, MAINTAINED CONTINUOUS, or other operating modes when such functions are furnished shall be supplied with the clutch/brake control to select the mode of operation of the press. If more than one stroking selector is provided, each shall have a “remote” position, and the design shall require that all except the controlling selector be in the “remote” position before operation can be enabled. Moving any stroking selector from its “remote” position shall result in a stopping action.”

- **NEMA ICS 2 - 1988 (2-216.06)**

“Heavy-duty push button stations shall consist of push buttons and/or selector switches rated in accordance with ICS 2-216.22, and/or indicating lights in accordance with ICS 2-216.23, mounted in a suitable enclosure.”

- **NEMA ICS 2 - 1988 (2-216.08)**

“Standard-duty selector switches shall have either two or three positions. Heavy-duty selector switches shall have two, three or more positions.”

- **NEMA ICS 2 - 1988 (2-216.22)**

“Heavy-duty push buttons and selector switches shall have contact rating designations of A600, A300, A150, N600, N300, or N150 as shown in Table 2-125-1 for alternating current and Table 2-125-2 for direct current.”

- **CEN (European Committee for Standardization) EN 418 :1992 (4.1.2)**

“The control device and its actuator shall apply the principle of positive mechanical action.”

- **CEN (European Committee for Standardization) EN 418 :1992 (4.4.3)**

“The emergency stop actuators shall be coloured red. As far as a background exists behind the actuator and, as far as it is practicable, it shall be coloured yellow.”

- **Ford Manufacturing Standards EA 3 - March 1995 (3.1.6)**

“Enclosure Design & Guarding: Units shall not have any sharp corners or edges, and shall be suitable for use with either a bare or gloved hand. All units shall have integral guards or shall be capable of being fitted with commonly available ring guards. Guards on Mechanical units shall extend a minimum of 3/16-inch, and guards on Capacitive electronic units shall extend a minimum of 1/2 inch, above the top surface of the button in its unactuated state to prevent bridging the buttons with commonly found objects. On Electronic Units, the units configuration and/or guards shall prevent inadvertent operation from small objects and loose clothing (ref: ANSI B11.19, 4.2.4.2.3). All guards required in this Standard shall be either permanently attached to the unit or otherwise removable only with tools. All ring guards shall provide the above stated height above the top of the button without the use of any separate spacers or standoffs. Additionally, units with separate or integral guards shall not be capable of being twisted in their mountings so that a rodlike object can be used to simultaneously actuate both Units used in a Two-Hand Trip or Control Circuit.”

REES switches exceed the following:

Listed by Underwriters Laboratories per Standard UL 508
File No. E 58589

Certified by Canadian Standards Association per Standard C 22.2
File No. LR 3648

Certified by DEMKO to IEC/EN 60947-5-5 or IEC/EN 60947-5-1

Third party certified under DEMKO File #FI-17205

NEMA ICS 2-1988

IEC/EN 60947-5-5: Standard which applies to electrical emergency stop devices with a mechanical latching function. This standard also encompasses all requirements of regular electromechanical switches (60947-5-1)

IEC/EN 60947-5-1: Standard which applies to low-voltage switchgear and controlgear such as the electromechanical switches manufactured by REES, Inc.

Following are definitions of terms as relating to Push Button and Selector Switches:

Push Button - A push button switch (push button) is a switch having a manually operable plunger, rocker or button for actuating the switch.

Selector Switch - a switch having a manually operated lever and shaft arrangement on which is mounted cams that actuate the contacts in different unique sequences.

Positive Break - The achievement of contact separation as the direct result of a specified movement of the switch actuator through non-resilient members. (e.g., NOT dependent upon springs)

Positive Transfer - A contact system so designed that it remains in one state (NO or NC) until the switch actuator moves to a “point of no return,” then the contacts transfer and cannot be teased.

Slow-Make / Slow-Break - A contact system that opens and/or closes at the same rate (speed and time) that the actuator is moved.

Snap Action - A rapid motion of the contacts from one state to another, that is independent of the rate of travel of the actuator. Similar to “Positive Transfer.”

Safety Block - means a prop that, when inserted between the upper and lower dies or between the bolster plate and the face of the slide, prevents the slide from falling of its own deadweight.”

Stroking Selector - means the part of clutch/brake control that determines the type of stroking when the operating means is actuated. The stroking selector generally includes positions for “Off” (Clutch Control), “Inch,” “Single Stroke,” and “Continuous” (when Continuous is furnished).

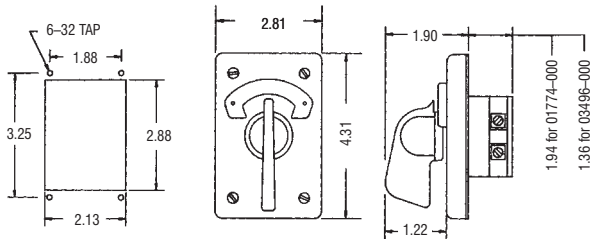
Operating Force - The amount of pushing or pulling force (in pounds) necessary to change the state of the switch from an at rest condition to one of contact change; that is, to make a set of Normally Open contacts or break a set of Normally Closed contacts.

Rotary Contact Selector Switches



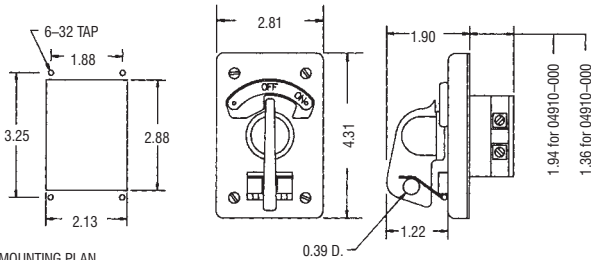
01774-000

For accessories see pages 39 thru 43.
Refer to the Glossary (pgs. 66-67) for a definition of terms.
Rotary Contact Selector Switches 01774-000; 03496-000



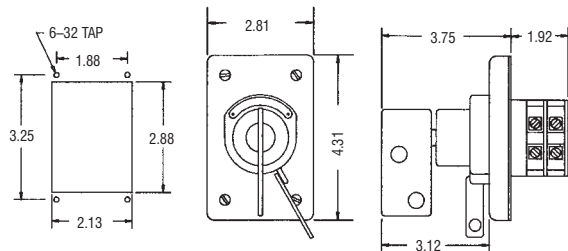
MOUNTING PLAN

Rotary Contact Selector Switches 04910-000; -100, -125



MOUNTING PLAN

Rotary Contact Selector Switches 04775-000



MOUNTING PLAN

Features/Applications

The following selector switches are hand operated, control circuit devices, rated 'Heavy Duty' normally for use with electromagnetic equipment. The die-cast zinc body, is painted with a dry powder paint. The die-cast zinc wing lever is either painted black or nickel plated. Each terminal will accept (2) #14 AWG stranded wires. The switches are supplied with all mounting hardware and a solid neoprene rubber gasket which provides an oil tight seal upon installation. The mechanical life of these devices is 500,000 operations. These switches can be found on a wide variety of machinery. Their rugged construction and long term reliability make these switches extremely well suited to function within various industrial conditions.

Electrical Ratings

"HEAVY DUTY - A600 / N300"

Listed under UL 508 - File # E 58589;
Certified under CSA C22.2 - File # LR 3648

Environmental

Temperature Range

Operating: +32°F to +131°F (0°C to +55°C)
Storage: -40°F to +185°F (-40°C to +85°C)

Note: Operating temperatures at 0°C are based on the absence of freezing moisture and liquids.

Normal Potential	Normal Current	Inrush Current
110-120 ac ^a volts	6.0 amp.	60.0 amp.
220-240 ac ^a	3.0 amp.	30.0 amp.
440-480 ac ^a	1.5 amp.	15.0 amp.
550-600 ac ^a	1.2 amp.	12.0 amp.
115-125 dc ^b	2.2 amp.	—
230-250 dc ^b	1.1 amp.	—

^a Power factor 0.35 or less

^b Inductive loads as specified in Section 125 of Industrial Control Devices, Controllers and Assemblies, ANSI / NEMA ICS 2-1988

#45	1	3	5	7
	2	4	6	8
Left		X	X	
Center				
Right	X			X

#55	1	3	5	7
	2	4	6	8
Center			X	X
Right	X	X		

#56	1	3	5	7
	2	4	6	8
Center				X
Right	X	X	X	

#65	1	3
	2	4
Center		X
Right	X	

Catalog No.	Wing Lever Color	Body Color	Lockable Latch	Approx. Shipping Wt.	NEMA UL, IP Class	Special Features	Contact Arrangement (All Maintained)
01774-000	Black	Black	No	1.50 lb	12/13 IP65	None	# 45- 3 Pos./ 4 Poles
03496-000			Yes- Left Pos.	1.35 lb.		"Lock-Off-On" Legend Plate	# 65- 2 Pos./ 2 Poles
04775-000**	Nickel***		Yes- Center Pos.	2.10 lb.		"Off-On" Legend Plate	# 45- 3 Pos./ 4 Poles
04910-000				1.40 lb.			# 65- 2 Pos./ 2 Poles
04910-100*	Black	Yellow		1.45 lb.			# 55- 2Pos./ 4 Poles
04910-125*			No			"Lock"-Unlock	# 56- 2Pos./ 4 Poles

* Custom built requiring an extended lead time. Please contact factory for price and delivery.

** Die Safety Block Switch

*** Nickel Plated Key Removable in OFF position only.

See "WARNING ON PRODUCT APPLICATION" page (2)

ACCESSORIES AND ASSOCIATED CONTROL SWITCHES



P.O. Box 652 • Fremont, IN • 46737
www.reesinc.com

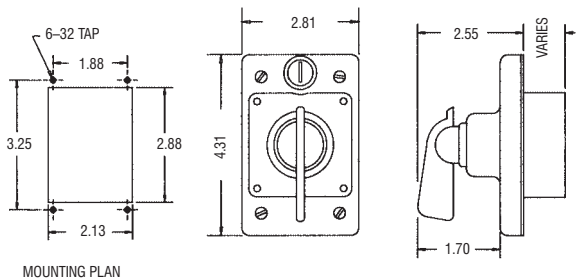
P: 260-495-9811 • F: 260-495-2186

Heavy Duty Selector Switches



04925-557 with
09004-054 legend plate

For accessories see pages 39 thru 43.
Refer to the Glossary (pgs. 66-67) for a definition of terms.



Features/Applications

The following switches are hand operated, control circuit devices, rated 'Heavy Duty' normally for use with electromagnetic equipment. The bodies are made from die-cast zinc, and painted with a dry powder paint. Each captive terminal will accept (2) #14 AWG stranded wires. Each switch is supplied with mounting hardware and a solid neoprene rubber gasket which provides an oil tight seal upon installation. The mechanical life of these devices is 500,000 operations. These switches can be found on machines such as punch presses as "OFF"; "INCH"; "SINGLE STROKE" and "CONTINUOUS" selector switches. The rugged construction and long term reliability of these switches makes them extremely well suited to function within various industrial /commercial environments. These are custom built switches requiring additional lead times. Please contact the factory for price and delivery. These are custom built switches requiring additional lead times. **Please contact the factory for price and delivery.**

Electrical Ratings

"HEAVY DUTY - A600 / N300"

(See Chart Below)

Certified under CSA C22.2 - File # LR 3648

Environmental

Temperature Range

Operating: +32°F to +131°F (0°C to +55°C)

Storage: -40°F to +185°F (-40°C to +85°C)

Note: Operating temperatures at 0°C are based on the absence of freezing moisture and liquids.

Catalog No.	Operator	Key	Operation	Contact Ratings	Contact Arrangement
04925-xxx (with Lock)	Black Wing Lever	CH 501 80508-126	Switch locks and Key is removable in all positions	500vDC thru 60Hz 20 amps. @ 100% P.F.	As specified by customer. See Target Worksheet Example below.
04926-xxx (without Lock)		None	Switch contacts are maintained in all positions	16 amps. @ 40% P.F. Contacts will break 160 amps.	

HEAVY DUTY SELECTOR TARGET WORKSHEET

Type of switch 04925 (with Lock) 04926 (without Lock)

Note: Legend Plates are REQUIRED and CANNOT be added after the switch is assembled.

Legend wording MUST be specified when ordering the switch.

Legend "OFF, INCH, SINGLE STROKE, CONT." is a Standard - ALL others are Specials.

To use this worksheet:

Determine from your circuit diagram the number of positions desired and the number of circuits to be controlled. Place an "X" to indicate what contacts should be closed in which position. Contacts are normally continuously closed in consecutive positions. Refer to the example above. Omit the vertical line if contacts are open between consecutive positions. See circuit #8 in example.

Example:

Heavy Duty Selector, 4 Positions, 8 Contacts

Pos	Legend	1	2	3	4	5	6	7	8
1	Off								
2	Inch	X			X			X	
3	Sing. Stroke	X	X		X		X		X
4	Continuous	X	X	X		X	X		X

X = Contacts Closed Continuously in Consecutive Positions.

Pos	Legend (Please Specify)	Contact Number											
		1	2	3	4	5	6	7	8	9	10	11	12
1													
2													
3													
4													
5													

NOTE: Position #1 is always the LEFT position.

See "WARNING ON PRODUCT APPLICATION" page (2)

Weatherproof and 1.00 inch Flush Plunger with Lockout



03845-000

For accessories see pages 39 thru 43.
Refer to the Glossary (pgs. 66-67) for a definition of terms.
See pages 64 and 65 for contact arrangement information.

Features/Applications

The following switches are hand operated, control circuit devices, rated 'Heavy Duty' normally for use with electromagnetic equipment. The body, painted with a dry powder paint, is made from die-cast zinc. Each captive terminal will accept (2) #14 AWG stranded wires and the contacts are gold plated to eliminate high resistance tarnishing. Each switch is supplied with mounting hardware and a solid neoprene rubber gasket which provides an oil tight seal upon installation. The mechanical life of these devices is 1,000,000 operations. These switches can be found on a variety of machines in all types of applications. Their rugged construction and long term reliability make these switches extremely well suited to function within various industrial or commercial environments.

Electrical Ratings

(See Charts Below)
Listed under UL 508 - File # E 58589;
Certified under CSA C22.2 - File # LR 3648

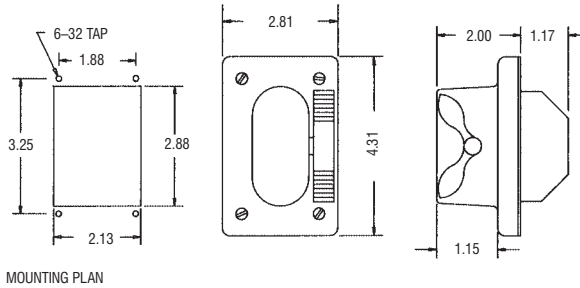
Environmental

Temperature Range

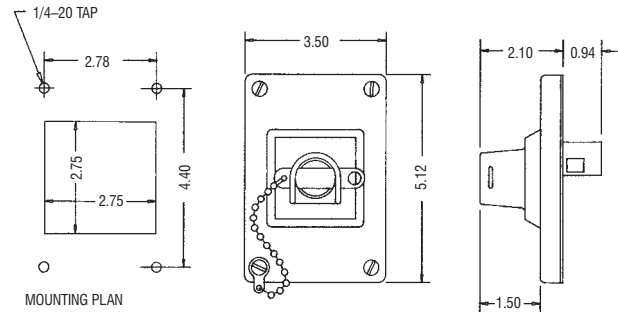
Operating: +32°F to +131°F (0°C to +55°C)
Storage: -40°F to +185°F (-40°C to +85°C)

Note: Operating temperatures at 0°C are based on the absence of freezing moisture and liquids.

Weatherproof Switch 03845-000



1.00" Flush Plunger w/ Lockout 04943-002



Weatherproof Switch

Catalog No.	Handle/Plunger Color	Electrical Rating	NEMA UL, IP Class	Approx. Shipping Wt.	Positive Break	Contact Type	Contact Arrangement
03845-000	Extruded Aluminum Lever	HEAVY DUTY A600 / N300	4 IP66	1.85 lb.	No	Slow-Make	# 03 NO-NO Momentary

Listed below is the 1.00 inch Flush Plunger with Manual Lockout

NOTE: This switch will NOT mount into any REES enclosure.

This switch comes with stainless steel chain, connectors and locking bar. Replaceable N.C. contact block (50702-000) can be found on page 55.

Catalog No.	Handle/Plunger Color	Electrical Rating	NEMA UL, IP Class	Approx. Shipping Wt.	Positive Break	Contact Type	Contact Arrangement
04943-002*	Chrome w/ Red Insert	HEAVY DUTY A600 / N150	12/13 IP65	1.90 lb.	Yes	Slow-Break	# 66 NC Momentary

*NOT UL Listed or CSA Certified

ACCESSORIES AND ASSOCIATED CONTROL SWITCHES



P.O. Box 652 • Fremont, IN • 46737
www.reesinc.com

P: 260-495-9811 • F: 260-495-2186

Standard and Large Enclosures



04938-100



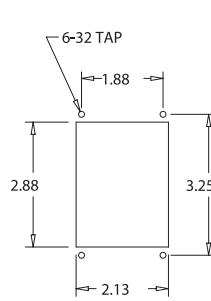
02765-000

02261-000

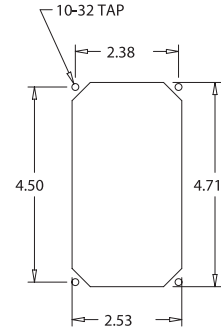
For accessories see page 43.

Features/Applications

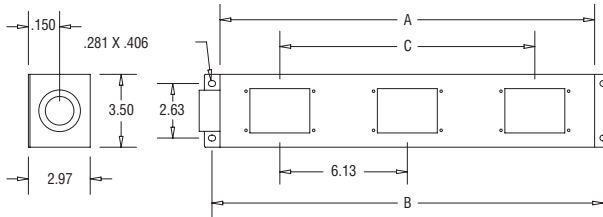
The following enclosures are made from 14 GA. sheet steel painted with a dry powder paint. The first group will accept all standard size REES push button switches. The second group (the 04938-'s) are designed to fit the larger style switches from page 18. The 02765-100 one opening, painted yellow, is suitable for holding an "Emergency Stop" switch. These enclosures can be used to house any switch that has the same mounting pattern.



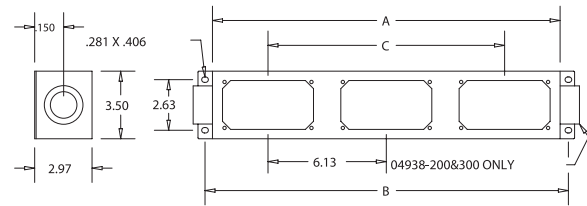
MOUNTING PLAN (STANDARD)



MOUNTING PLAN (LARGE)



Catalog No.	Openings	A	B	C
02261-000	3	18.00"	18.81"	12.26"
02715-000	2	11.88"	12.69"	6.13"
02718-000	4	24.13"	24.94"	18.39"
02765-000	1	5.75"	6.56"	N/A
02765-100	1	5.75"	6.56"	N/A
03007-000	5	30.25"	31.06"	24.52"

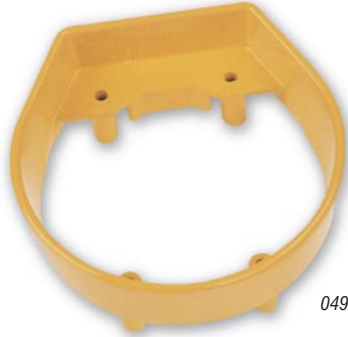


Catalog No.	Openings	A	B	C
04938-100	1	5.75"	6.56"	N/A
04938-200	1	5.75"	6.56"	N/A
04938-300	3	30.25"	31.06"	24.52"

Catalog No.	Number of Switch Openings	End Coupling Conduit Size	Color	NEMA UL, IP Class	Approx. Shipping Wt.
02261-000	3 Standard	1" NPT	Orange	12/13 IP65	4.90 lbs.
02715-000	2 Standard	1" NPT			3.55 lbs.
02718-000	4 Standard	1.25" NPT			6.15 lbs.
02765-000	1 Standard	1" NPT	Black		1.95 lbs.
02765-100			Yellow		1.95 lbs.
03007-000	5 Standard	1.25" NPT	Orange		8.10 lbs.
04938-100	1 Large	1" NPT	Black		1.90 lbs.
04938-200		(2) 1" NPT		2.10 lbs.	
04938-300		(2) 1.25" NPT		7.95 lbs.	

See "WARNING ON PRODUCT APPLICATION" page (2)

Ring Guards



04933-091

Features/Applications

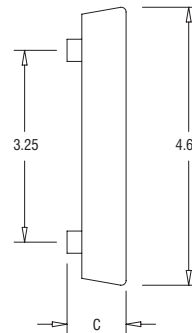
The following guards are designed to mount to the single or double plunger push buttons found on pages 19 through 33. They are die cast from a high strength zinc alloy (Zamac #3). Additional length mounting screws are provided with each guard.

The usage chart below shows the minimum recommended guard (see page 35 for selection criteria) to use to provide protection against inadvertent actuation caused by accidental contact of the switch plunger. Use of a taller guard is an acceptable alternate method.

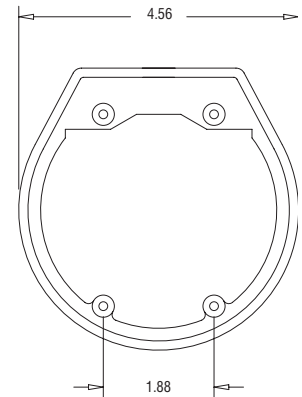
Series 09002 legend plates found on page 42 can be mounted on these ring guards

Catalog No.	Color	"C" Height Dimension
04933-091		1.00 in.
04933-092	Powder	1.25 in.
04933-093	Painted	1.50 in.
04933-094	Yellow	1.75 in.
04933-095		2.00 in.

Catalog No.	Color	"C" Height Dimension
04933-191		1.00 in.
04933-192	Natural	1.25 in.
04933-193	Zinc	1.50 in.
04933-194	Die Cast	1.75 in.
04933-195		2.00 in.



Catalog No.	C Height
04933-091	1.00"
04933-092	1.25"
04933-093	1.50"
04933-094	1.75"
04933-095	2.00"



Catalog No.	C Height
04933-191	1.00"
04933-192	1.25"
04933-193	1.50"
04933-194	1.75"
04933-195	2.00"

The usage chart below shows the minimum recommended guard (see page 35 for selection criteria) to use to provide protection against inadvertent actuation caused by accidental contact of the switch plunger. Use of a taller guard is an acceptable alternate method.

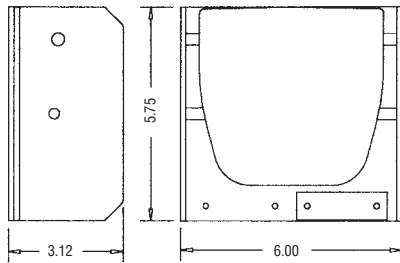
Switch No.	Guard No.	Page
00222-004	04933-095	20
00294-001->004	04933-092	25
00579-101	04933-092	30
00579-132	04933-092	30
00580-001	04933-092	30
00580-032	04933-092	30
00662-001->103	04933-095	20
01307-012	04933-095	21
01371-012	04933-093	21
01371-112	04933-093	21
01371-212	04933-093	23
01371-312	04933-092	23
01371-412	04933-092	23
01461-101	04933-095	20
01461-102	04933-095	20
01461-104	04933-095	20
01501-012	04933-095	24
01508-012	04933-093	21
01531-032	04933-091	30
01619-014	04933-095	31

Switch No.	Guard No.	Page
01619-032	04933-095	31
01760-012	04933-094	24
01896-032	04933-095	31
01919-012	04933-094	27
01920-012	04933-092	24
01957-032	04933-095	32
01968-032;-132	04933-094	31
01968-232	04933-094	31
01981-001	04933-094	27
02049-001	04933-095	21
02140-032	04933-091	30
02182-001->102	04933-095	27
02510-001->101	04933-095	27
02653-012;-112	04933-093	19
02712-032	04933-095	32
02761-001->004	04933-093	21
02883-032	04933-092	30
02911-001;-002	04933-093	21
02912-001	04933-093	21
02919-012	04933-093	21

Switch No.	Guard No.	Page
03476-001,004	04933-094	27
03605-032	04933-094	31
03605-132	04933-095	31
03727-012	04933-092	19
03855-001->003	04933-094	24
03924-000	04933-094	30
04062-032;-432	04933-092	33
04087-032	04933-095	33
04161-001	04933-095	24
04596-001	04933-094	25
04801-012	04933-093	24
04917-012	04933-093	19
04917-312	04933-092	19
04932-032;-132	04933-095	33
04948-001->004	04933-094	20
04957-001->012	04933-093	19
04960-112	04933-092	22
04960-212	04933-092	22
04960-412	04933-092	22
04960-512	04933-092	22

See "WARNING ON PRODUCT APPLICATION" page (2)

Palm Switch Guard/Actuator



Features/Applications


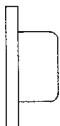
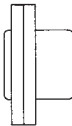
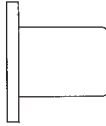
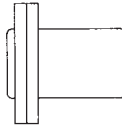
The Palm Switch Guard / Actuator is designed to replace the ring guard on REES palm operated switches. It features sturdy zinc die cast and steel, both are painted with dry powder paint. It has a large operating pad which reduces the activation force on the center of the hand and directly on the ulnar artery and median nerve where they pass through the palm. There is less potential compression to the hand if the outer part of the palm is used to depress the switch. A study by the ergonomic consulting firm "Human Dynamics, Lancaster, OH," found that both resistance and travel play important roles in control design. Travel provides the user with sense of movement and position. When associated with resistance, such movement provides tactile feedback about control activation. This feedback helps the operators perception and increases accuracy, safety and efficiency. Tactile feed back lets the operator know that the switch has been activated because they can 'feel' the switch working. On switching devices without feedback operators tend to push harder causing muscle fatigue and increasing the risk of injury. Also, a comfortable and lower trip force is created by the mechanical advantage of the actuator's design.

Catalog No.	Operating Pad Color	Guard Color	Approx. Shipping Wt.
04949-000	Yellow	Orange	4.60 lbs.

Guard Actuator and Actuator Extension Usage Chart

(See instruction sheet for complete assembly details.) All necessary mounting hardware is included.

Additional mounting hardware kits may be purchased as part # 01004-015

 "A" 0.25" Lg.	 "B" 0.65" Lg.	 "A" + "B" 0.80" Lg.	 "C" 1.28" Lg.	 "A" + "C" 1.43" Lg.
01307-012 02049-001	00222-004 00662-001 00662-003 00662-004	01371-012, -112 01371-212, -312 01371-412, -512 01508-012	00294-001 00294-003 00294-004 04917-312	02221-001 04917-112 04917-812
	00662-101 00662-103 01461-101 01461-104	02653-012 02653-112 02761-001, -003 02761-004	04960-112 04960-212 04960-412 04960-415	
		02911-001, -004 02912-001 02919-012 03727-012	04960-442 04960-512 04960-912	
		04948-001, -003 04948-004 04917-012		
		04957-001, -003 04957-012		

Standard Legend Plates

To Order Legend Plates:

Standards

Specify the 5 digit plate number plus the 3 digit suffix number from the chart below. Example: "START" = 09001-005

Specials

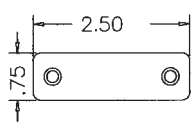
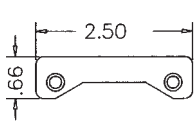

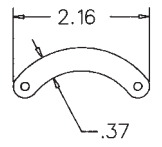
Specify the 5 digit plate number plus the suffix number -000 plus your special marking. Example: "BY-PASS" = 09001-000

Features/Applications

The following legend plates are designed to mount to the single or double plunger pushbuttons and ring guards found on pages 18 through 33. Legend Plates are made from clear anodized aluminum with black lettering.

Legend Plates are NOT included in the price of devices.

Legend Plate Selection Chart

Catalog No.	09001 -	09002 -	09003 -	09005 -
Dimensions →		Top Mounting 	Bottom Mounting 	
Use →	Single Plunger Switches	Double Plunger Switches Ring Guards	Double Plunger Switches	Selector Large Mtg. Switches
(Blank)	001	001	001	001
OFF	002	002	002	
STOP	003	003	003	003
EMERGENCY STOP	004	004	004	
START	005	005	005	005
ON	006	006	006	
RUN	007	007	007	007
INCH	008	008	008	008
RESET	009	009	009	
JOG	010	010	010	
OPEN	011	011	011	
CLOSE	012	012	012	
UP	013	013	013	
DOWN	014	014	014	
RAISE	015	015	015	
LOWER	016	016	016	
FORWARD	021	021	021	
REVERSE	022	022	022	
TOP STOP	023	023		
OFF ON				029
ON OFF				050
HAND OFF AUTO				042
MAN OFF AUTO				043
LONG OFF SHORT				051
AUTO OFF MAN				052
LOCK OFF ON				053

Accessory Items for Palm Switches / Enclosures

Catalog No.	Drawing
<p>00100-125 Neoprene Gasket, Switch Mounting</p> <p>These gaskets are used when mounting REES standard size switches.</p>	
<p>00100-130 Gasket, Switch Mounting</p> <p>These gaskets are used when mounting REES large size switches.</p>	
<p>01004-002 Blank Cover Kit</p> <p>For use on REES standard switch enclosures. Black dry powder paint. Gasket and mounting screws included.</p>	
<p>01004-003 (Black) 01004-043 (Yellow) Adapter Plate Kit</p> <p>For use with 30.5 mm control units to be mounted onto standard enclosures. Dry powder paint. Gasket and mounting screws included.</p>	

Catalog No.	Drawing
<p>01004-005 Adapter Plate Kit</p> <p>For use in mounting standard switches onto large switch enclosures. Black dry powder paint. Gasket and mounting screws included.</p>	
<p>01004-012 Blank Cover Kit</p> <p>For use on REES large switch enclosures. Black dry powder paint. Gasket and mounting screws included.</p>	
<p>01007-121 Replacement Key</p> <p>For use with REES "Die Safety Block" switch # 04775-000.</p>	
<p>80508-121 Replacement Key # 5 Key</p> <p>Used on REES palm switches and on 30.5 mm devices.</p>	
<p>80508-126 Replacement Key # CH-501 Key</p> <p>Used on REES palm switches and on 30.5 mm devices.</p>	
<p>00100-135 Viton Gasket, Switch Mounting</p> <p>Used with REES standard size switches when deterioration of neoprene gasket is a concern due to use of certain chemicals.</p>	

Accessories



Selection/Operation

The selection and use of a switch involves knowing the details of the particular installation. These control units are offered as push button operators (4 styles), two, three, and four position selector operators (3 styles each), push-pull units (4 styles), an illuminated push button and a variety of lockable devices. These devices will meet NEMA 12/13 requirements when properly installed in an appropriate enclosure. Each style of push button operator comes in a variety of colors. The selector switch styles are knob, wing lever and key operated. There are a number of different cams available to customize any installation. The nine standard contact blocks are modular in design and almost any combination is possible up to the recommended limit of three tiers of blocks on any operator. This recommendation is made to reduce the effects of standard tolerance deviation and ensure the devices will not produce intermittent operations. Also included in this section are pilot lights, lenses, and legend plates. The pilot lights are offered in two mounting configurations, 30.5mm and 18.0mm. The inputs to the lights range from 12vDC to 120vAC. Also, many of the pilot lights have built in transformers and/or miniature relays to provide any circuit compatibility.

Installation

Every installation is unique and specific instructions for installation and ordering can be found on page 53. Above all, observe all SAFETY REQUIREMENTS, PROCEDURES and LOCAL CODES. Only qualified electrical technicians should be allowed to perform an installation or replacement. On pages 46 through 57 you will find many different items that should satisfy any installation requirements. At the end of this section you can find a number of accessory items to facilitate in the installation of these devices. All mechanical devices, these units included, will wear out and eventually need to be replaced. The estimated minimum mechanical life is 1,000,000 operations. Regular scheduled Preventative Maintenance inspections are strongly recommended. Some conditions to look for are:

- Physical damage to the device.
- Loose connections or components.
- Broken or weak springs.

REES switches are designed and manufactured to surpass the standards of industry. On the facing page is a brief look at some of these regulations. The testing done by independent facilities is the minimum requirement that the REES switches far exceed. If other assistance is desired please contact the factory.

Definition

These switches are mechanical devices used to make and/or break one or more electrical circuits. They are single hole mounted devices designed to be solely operated by human hands.

Regulations

Following are excerpts from Domestic and Foreign Regulations that have applicability to Selector Switches, Guards and Enclosures.

• NEMA ICS 2 - 1988 (2-216.02) "GUARDED PUSH BUTTON"

A guarded push button is a push button so constructed that when properly mounted, the chance of inadvertent operation will be minimal. Recognized constructions are listed below.

- Recessed Push Button - A push button which has its surface for applied force below the surrounding surface in its initial and operated positions.
- Shrouded Push Button - A push button which has the relationship between the guard and the actuating means specified by the manufacturer.
- Shielded Push Button - A push button which requires some movement to operate which is essentially perpendicular to the movement required to enter the shield.
- Covered Push Button - A push button having an automatically returnable cover which must be displaced prior to operating the push button.
- Lockable Push Button - A push button which includes provision for locking in specified positions.

Push Button

A push button switch (push button) is a switch having a manually operable plunger, rocker or button for actuating the switch."

• NEMA ICS 2 - 1988 (2-216.06)

"Heavy-duty push button stations shall consist of push buttons and/or selector switches rated in accordance with ICS 2-216.22, and/or indicating lights in accordance with ICS 2-216.23, mounted in a suitable enclosure."

• NEMA ICS 2 - 1988 (2-216.08)

"Standard-duty selector switches shall have either two or three positions. Heavy-duty selector switches shall have two, three or more positions."

• NEMA ICS 2 - 1988 (2-216.22)

"Heavy-duty push buttons and selector switches shall have contact rating designations of A600, A300, A150, N600, N300, or N150 as shown in Table 2-125-1 for alternating current and Table 2-125-2 for direct current."

• CEN (European Committee for Standardization) EN 418 :1992 (4.1.2)

"The control device and its actuator shall apply the principle of positive mechanical action."

• CEN (European Committee for Standardization) EN 418 :1992 (4.4.3)

"The emergency stop actuators shall be coloured red. As far as a background exists behind the actuator and as far as it is practicable, it shall be coloured yellow."

• Ford Manufacturing Standards EA 1 - Sept. 1994 (1.1)

"This Standard applies primarily to standard size, heavy duty, one-hole mounted, oil-tight push buttons and accessory devices such as selector switches, pilot lights, etc., for mounting as described in Section 2.1.1."

• Ford Manufacturing Standards EA 1 - Sept. 1994 (1.4.1)

"A "unit" as used throughout this Standard means any push button, selector switch, pilot light, etc., suitable for single hole mounting."

REES switches exceed the following:

Listed by Underwriters Laboratories per Standard UL 508
File No. E 58589

Certified by Canadian Standards Association per Standard C 22.2
File No. LR 3648

Certified by DEMKO to IEC/EN 60947-5-5 or IEC/EN 60947-5-1

Third party certified under DEMKO File #FI-17205

NEMA ICS 2-1988

IEC/EN 60947-5-5: Standard which applies to electrical emergency stop devices with a mechanical latching function. This standard also encompasses all requirements of regular electromechanical switches (60947-5-1)


IEC/EN 60947-5-1: Standard which applies to low-voltage switchgear and controlgear such as the electromechanical switches manufactured by REES, Inc.

Following are definitions of terms as relating to Push Button and Selector Switches:

Emergency Stop - Function which is intended: to avert arising or to reduce existing hazards to persons, damage to machinery or to work in progress; to be initiated by a single human action when the normal stopping function is inadequate for this purpose. Hazards for the purpose of this standard are those which may arise from: functional irregularities (malfunctioning of the machinery, unacceptable properties of the processed material, human errors); normal operation.

Push Button - A push button switch (push button) is a switch having a manually operable plunger, rocker or button for actuating the switch.

Selector Switch - is a switch having a manually operated lever and shaft arrangement on which is mounted cams that actuate the contacts in different unique sequences.

Positive Break -  The achievement of contact separation as the direct result of a specified movement of the switch actuator through non-resilient members. (e.g. NOT dependent upon springs)

Positive Transfer - A contact system so designed that, it remains in one state (NO or NC) until the switch actuator moves to a "point of no return" then the contacts transfer and cannot be teased.

Slow-Make / Slow-Break - A contact system that opens and/or closes at the same rate (speed and time) that the actuator is moved.

Snap Action - A rapid motion of the contacts from one state to another, that is independent of the rate of travel of the actuator. Similar to "Positive Transfer".

Operating Force - The amount of pushing or pulling force (in pounds) necessary to change the state of the switch from an at rest condition to one of contact change, that is, to make a set of Normally Open contacts or break a set of Normally Closed contacts.

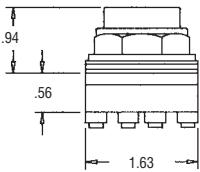
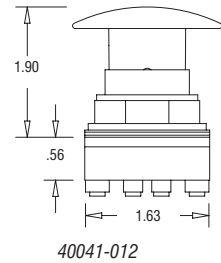
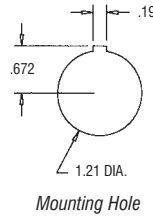
30.5mm Push Buttons



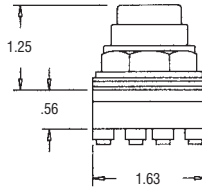
Features/Applications

The following switches are hand operated, control circuit devices, rated 'Heavy Duty' normally for use with electromagnetic equipment. The body is made from die-cast zinc. The plungers are also made from diecast zinc with the 1.00 in. diameter style having a colored plastic (poly-carbonate) insert. The mushroom style plastic plunger heads are solid colors throughout. Each operator will accept up to three tiers of two contact blocks for a total of six separate circuits. Each operator is supplied with all mounting hardware and a solid neoprene rubber gasket which provides an oil tight seal upon installation. The mechanical life of these units is 1,000,000 operations. These devices can be found on a variety of machinery, used to perform such operations as 'start', 'stop', 'top stop', 'inch', 'on', 'off', 'forward', 'reverse' etc.

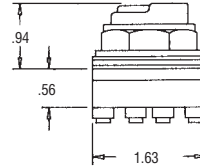
For accessories see pages 56 thru 59.
Refer to the Glossary (pgs. 66-67) for a definition of terms.



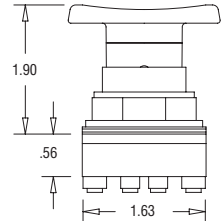
40001-001, 40001-002
40001-003, 40001-004



40011-001, 40011-002
40011-003, 40011-004



40031-001
40031-002



40041-001, 40041-002
40041-003, 40041-004

NOTE: The following devices are MOMENTARY type units.

See Page 51 For Contact Blocks

Catalog No.	Plunger Color	Plunger Material	Plunger Size, Style	Operating Force	NEMA UL, IP Class	Approx. Shipping Wt.	Plunger Head Replacement
40001-001	Black	Chrome w/ Plastic Insert	1.00 in. Standard	2.00 Lb plus 0.75 lb. per contact block	12/13 IP 65	0.35 Lb.	None
40001-002	Red						
40001-003	Green						
40001-004	Yellow		1.00 in. Extended			0.36 Lb.	
40011-001	Black						
40011-002	Red						
40011-003	Green		1.00 in. Half Shroud			0.32 Lb.	
40011-004	Yellow						
40031-001	Black						
40031-002	Red	Solid Plastic (DuPont Derlin 100ST Acetal)	2.00 in. Mushroom	0.46 Lb.	43200-041 43200-042 43200-043 43200-044		
40041-001	Black						
40041-002	Red						
40041-003	Green						
40041-004	Yellow	Zinc Alloy	0.50 Lb.	43006-152			
40041-012	Chrome						

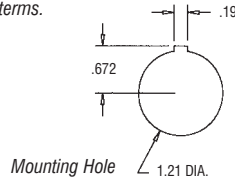
See "WARNING ON PRODUCT APPLICATION" page (2)

30.5mm Mushroom and Rope Pull Operators

NEW
product



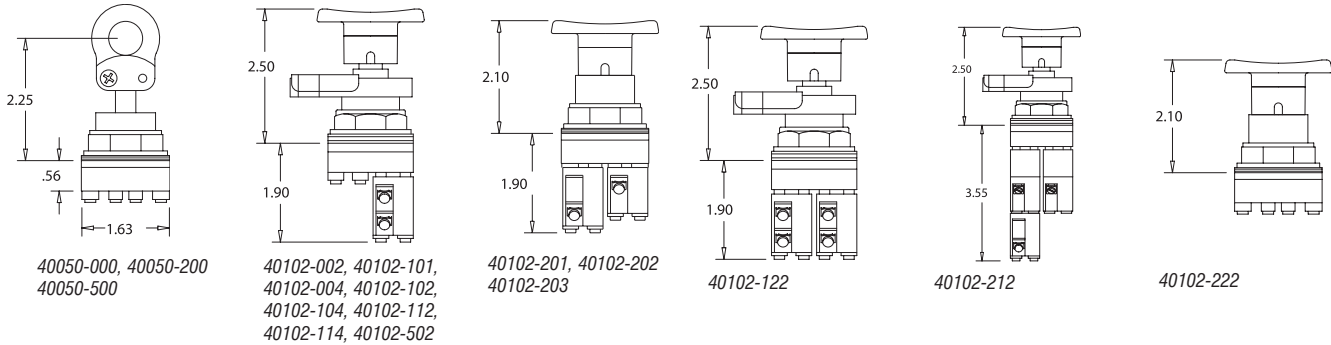
For accessories see pages 56 thru 59.
Refer to the Glossary (pgs. 66-67) for a definition of terms.



Features/Applications

The following switches are hand operated, control circuit devices, rated 'Heavy Duty' normally for use with electromagnetic equipment. The body is made from die-cast zinc. The zinc plated ring eye operator is also made from die-cast zinc. The mushroom ergonomic shaped plungers are molded from DuPont Derlin 100ST Acetal for improved impact resistance and are solid colors throughout. Each operator will accept up to three tiers of two contact blocks for a total of six separate blocks. Each operator is supplied with all mounting hardware and a solid neoprene rubber gasket which provides an oil tight seal upon installation. The mechanical life of these units is 1,000,000 operations. These devices can be found on a variety of machinery, used to perform such operations as 'start', 'stop', 'top stop', 'inch', 'jog', 'on', 'off', 'forward', 'reverse', etc.

The 40102 series satisfies the requirements of IEC 60947-5-5 - 3.9 direct opening action (positive opening action) (of a contact element) when fitted with one or more of any of our normally closed contact blocks. This is commonly referred to as "Positive Break", meaning the breaking of the normally closed contacts is not dependant upon springs.



40050-000, 40050-200
40050-500

40102-002, 40102-101,
40102-004, 40102-102,
40102-104, 40102-112,
40102-114, 40102-502

40102-201, 40102-202
40102-203

40102-122

40102-212

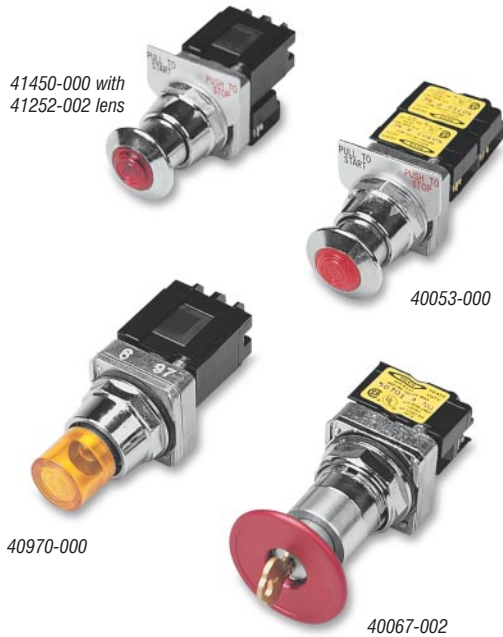
40102-222

Catalog No.	Operator Color	Operator Material Size, Style	Padlock Feature	Switch Type	Contact Block(s) Included	Operating Force	NEMA UL, IP Class	Approx. Shipping Wt.	Plunger Head Operator Replacement	
40050-000	Zinc	Zinc Alloy Ring Eye	No	Momentary	None	15.00 Lb.	12/13 IP 65	0.31 Lb.	02005-501	
40050-200					50702-NC ⊕			0.52 Lb.		
40050-500					None			0.47 Lb.		
40102-002	Red	2.00 in. Plastic Mushroom	Yes	Momentary	None	2.00 Lb.	12/13 IP 65	0.73 Lb.	43200-042	
40102-004	Yellow				None			0.85 Lb.		43200-041
40102-101	Black				None			0.80 Lb.		
40102-102	Red			50703-NO/NC ⊕	8.00 Lb.	0.83 Lb.		43200-044		
40102-104	Yellow			50701	9.00 Lb.	0.85 Lb.			43200-042	
40102-112	Red			50702-NO/NC ⊕						
40102-114	Yellow			50716						
40102-122	Red			50723-NO/NC ⊕	8.00Lb.	0.80 Lb.		43200-042		
40102-124	Yellow			Make before Break					0.83 Lb.	43200-044
40102-201	Black			(2) 50703					43200-041	
40102-202	Red			50716	9.00 Lb.	0.57 Lb.		43200-042		
40102-203	Green			50723-NO/NC ⊕					43200-043	
40102-212*	Red			Make before Break						
40102-222	Red			(2) 52702 + 50724	12.00Lb.	0.80 Lb.		43200-042		
40102-502	Red	None	8.00Lb.	0.50 Lb.						

* The 52702 block assembled on this switch consists of a B block (50702) attached to an adapter. This adapter Opens the NC contact of the B block Upon Removal from the switch operator. The OUR action provides an added level of security for instances where a NC block may be removed from the operator.

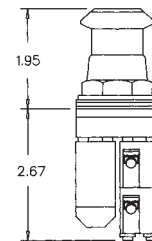
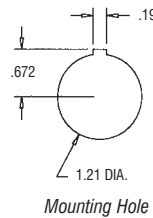
See "WARNING ON PRODUCT APPLICATION" page (2)

Push-Pull, 3 in 1 Lockable and Illuminated Operators

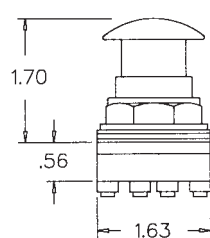


Features/Applications

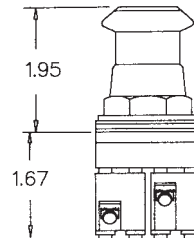
The following switches are hand operated, control circuit devices, rated 'Heavy Duty' normally for use with electromagnetic equipment. The body is made from die-cast zinc. The zinc plated ring eye operator is also made from die-cast zinc. The plastic mushroom style plunger heads are solid colors throughout. Each operator will accept up to three tiers of two contact blocks for a total of six separate blocks. Each operator is supplied with all mounting hardware and a solid neoprene rubber gasket which provides an oil tight seal upon installation. The mechanical life of these units is 1,000,000 operations. These devices can be found on a variety of machinery, used to perform such operations as 'start', 'stop', 'top stop', 'inch', 'jog', 'on', 'off', 'forward', 'reverse' etc.



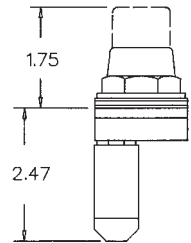
41150-000, 41450-000,
41450-302



40053-000, 40055-000



40067-002



40970-000

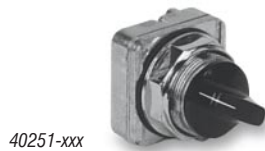
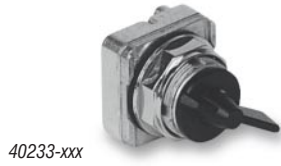
For accessories see pages 56 thru 59.
Refer to the Glossary (pgs. 66-67) for a definition of terms.

See page 51 for additional information on contact blocks.

Catalog No.	Operator Color	Operator Material Size, Style	Pilot Light (Xfmr)	Switch Type	Contact Block(s) Included	Features	NEMA UL, IP Class	Approx. Shipping Wt.
40053-000	Chrome with Red Insert	1.50 in. Zinc Mushroom	No	Momentary	50702	Legend Plate 09017-049 Included	12/13 IP 65	0.62 Lb.
40055-000					50716			0.57 Lb.
40067-002	Red	2.00 in. Flat Aluminum locks when depressed		Maintained	50701	# 5 key, removable locked or unlocked, required to reset.		0.61 Lb.
40970-000	Less Lens see page 56	1.00 in. Plastic Stovepipe	Yes 120 VAC Input Lamp No. 755	Momentary	None	Will accept up to (3) REES contact blocks. Legend Plate 09017-049 Included		0.54 Lb.
41150-000		1.50 in. Zinc Mushroom			50702			0.68 Lb.
41450-000	Chrome with Red Insert			Yes 120 VAC Input Lamp No. 755	Maintained	50702		0.62 Lb.
41450-102		50703/50703				0.90 Lb.		
41450-302					50703			

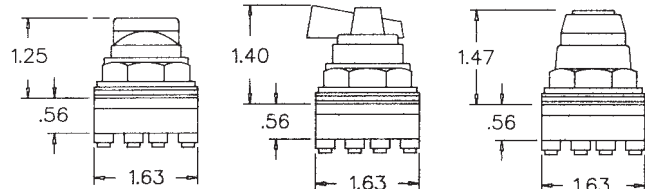
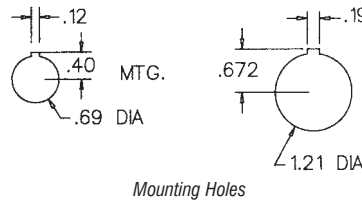
See "WARNING ON PRODUCT APPLICATION" page (2)

30.5mm Selector Operators



Features/Applications

The following switches are hand operated, control circuit devices, rated 'Heavy Duty' normally for use with electromagnetic equipment. The chrome plated body and mounting nut are made from die-cast zinc. Each operator will accept up to three tiers of two contact blocks for a total of six separate circuits. Each operator is supplied with all mounting hardware and a solid neoprene rubber gasket which provides an oil tight seal upon installation. The mechanical life of these units is 250,000 operations. These devices can be found on a variety of machinery, used to perform such operations as 'start-stop', 'off-on', 'hand-off-auto', 'jog-stop-run', 'up-down', 'forward-reverse' etc.



40201-, 40211-, 40251-,
40256-, 40258-, 40281-

40233-, 40273-,
40274-, 40282-

40224-, 40225-, 40226-,
40230-, 40231-, 40250-,
40265-, 40266-, 40290-,
40291-

For accessories see pages 56 thru 59.
Refer to the Glossary (pgs. 66-67) for a definition of terms.

See page 51, 52, and 53 for blocks, cams, and instructions.
Only available with keys listed. Cannot be keyed differently.

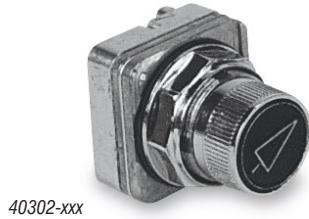
Catalog No.	Positions	Operator Style	Switch Features	NEMA UL, IP Class	Approx. Shipping Wt.	
40201-xxx	2	Knob	Maintained in both positions	12/13 IP 65	0.40 Lb.	
40211-xxx			Spring return Right to Left. (ONLY use cam 136)			
40233-xxx		Key	Maintained in both positions		0.55 Lb.	
40224-xxx			Maintained in both positions, #5 Key removable in both positions.			
40225-xxx			Maintained in both positions, #5 Key removable in Left position.			
40226-xxx			Maintained in both positions, #5 Key removable in Right position.			
40230-xxx			Maintained in both positions, #CH 501 Key removable in both positions.			
40231-xxx	Spring return R to L. (ONLY use cam 136) #5 Key removable Left pos.					
40251-xxx	3	Knob	Maintained in all positions		0.40 Lb.	
40256-xxx			Spring return R and L, maintained C (ONLY use cams 143, 177, or 182)			
40258-xxx			Spring return R to Center, maintained L and Center position			
40273-xxx		Wing	Maintained in all positions			0.45 Lb.
40274-xxx			Spring return R and L, maintained C (ONLY use cams 143, 177, or 182)			
40250-xxx		Key	Maintained in all positions, #CH 501 Key removable in all positions.			0.55 Lb.
40265-xxx			Maintained in all positions, #5 Key removable in all positions.			
40266-xxx	Spring return R and L, maintained C, #5 Key removable Center pos. (ONLY use cams 143, 177, or 182)					
40281-xxx	4	Knob	Maintained in all positions	0.40 Lb.		
40282-xxx			Maintained in all positions			
40290-xxx		Key	Maintained in all positions, #CH 501 Key removable in #1 & #4 pos.		0.55 Lb.	
40291-xxx			Maintained in all positions, #5 Key removable in all positions.			

See "WARNING ON PRODUCT APPLICATION" page (2)

Combined Selector Push button Control

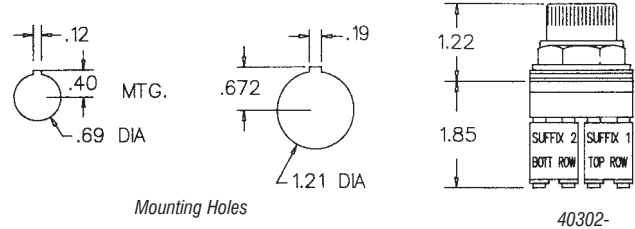
Features/Applications

The following switches are hand operated, control circuit devices, rated 'Heavy Duty' normally for use with electromagnetic equipment. The body is made from die-cast zinc. The chrome plated knob and plunger are also made from die-cast zinc. Each operator will accept up to three tiers of two contact blocks for a total of six separate circuits. The device is supplied with all mounting hardware and a solid neoprene rubber gasket which provides an oil tight seal upon installation. The mechanical life of these units is 250,000 operations. A selector-push button operator combines the function of a single push button device with that of a selector in a single unit. Contact operation sequences are selected by rotating the knurled guard in the two available positions. When the position is selected, depressing the plunger will give contact operation as shown in the sequence chart below.



40302-xxx

For accessories see pages 56 thru 59.
Refer to the Glossary (pgs. 66-67) for a definition of terms.



See page 51 for contact blocks.

Catalog No.	Positions	Operator Size, Style	Pilot Light	Push Button	Selector	NEMA UL, IP Class	Approx. Shipping Wt.
40302-xxx	2	1.00 in.	No	Momentary	Maintained	12/13; IP 65	0.43 Lb.

CAUTION: NEVER EXCEED THREE TIERS IN STACKING BLOCKS

Cam No.	Contact Location	Operator	A1		A2		B1		B2	
			L	R	L	R	L	R	L	R
- 501	Top (1)	Selected					X	X		
		Depressed		X			X			
	Bottom (2)	Selected				X			X	
		Depressed			X	X				
- 502	Top (1)	Selected					X	X		
		Depressed		X			X			
	Bottom (2)	Selected							X	X
		Depressed			X					X
- 506	Top (1)	Selected					X	X		
		Depressed		X			X			
	Bottom (2)	Selected				X			X	
		Depressed				X			X	

Note: "X" indicates a contact closure

TO ORDER CORRECTLY SPECIFY THE FOLLOWING:

Specify _____> the Selector-Pushbutton operator

Specify ____> the choice of Cam (-501; or -502; or -506)

Specify _____> the Contact Block(s) - see page 51

EXAMPLE: 40302-501 Qty. 1
50701-000 Qty. 1

See "WARNING ON PRODUCT APPLICATION" page (2)

Contact Blocks



Features/Applications

These contact blocks are designed for use on ALL REES push button operators and selector switches as shown on the preceding pages. The mechanical life of these devices is 1,000,000 operations. Each captive terminal on the contact block will accept (2) # 14 AWG stranded wires and the contacts are gold plated to eliminate high resistance tarnishing.



The 52702 block consists of a B block (50702) attached to an adapter. This adapter opens the NC contact of the B block upon removal from the switch operator. The OUR action provides an added level of security for instances where a NC block may be removed from the operator.

Refer to the Glossary (pgs. 66-67) for a definition of terms.

Electrical Ratings

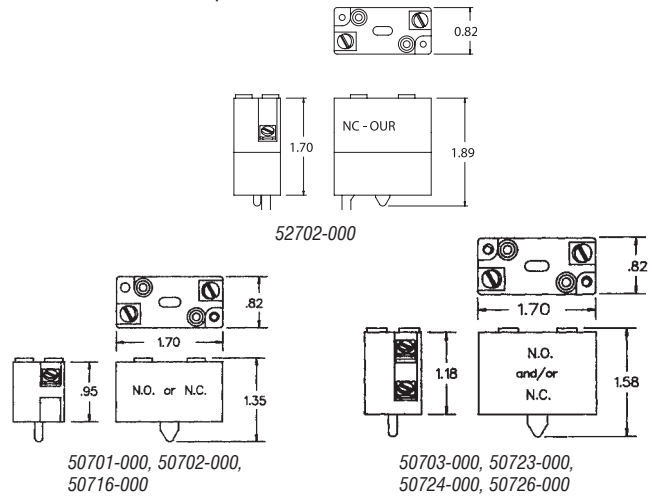
“HEAVY DUTY - A600 / N150”

- Listed under UL 508 - File # E 58589;
- Certified under CSA C22.2 - File # LR 3648
- CE Compliant IEC/EN: 60947-5-1
- Third party certified under DEMKO File #FI-17205

Environmental

Temperature Range

Operating: +32°F to +131°F (0°C to +55°C)
Storage: -40°F to +185°F (-40°C to +85°C)
Note: Operating temperatures at 0°C are based on the absence of freezing moisture and liquids.



Catalog No.	Contact Designation	Circuits	Normal Function	Stroke	Block Height	Approx. Shipping Wt.
50701-000	A	1	Open	0.20 in. to Close	0.95 in.	0.08 Lb.
50702-000	B		Closed	0.10 in. to Open		
50703-000	C	2	Open and Closed	0.20 in. to Close 0.10 in. to Open	1.18 in.	0.10 Lb.
50716-000	P	1	Closed	0.24 in. to Open	0.95 in.	0.08 Lb.
50723-000	W		Open	0.14 in. to Close	1.18 in.	0.10 Lb.
50724-000	X			0.08 in. to Close		
50726-000	Z			0.06 in. to Close		
51703-000 (make-before-break)	C	2	Open and Closed	0.06 in. to Close 0.10 in. to Open	1.70 in.	0.10 Lb.
52702-000*	B OUR	1	Closed	0.10 in. to Close		

*Not DEMKO certified.

CAUTION: NEVER EXCEED THREE TIERS IN STACKING BLOCKS

The following chart shows the replacement of the previous catalog series with the current production models.

Previous No.	Contact Designation	Can be Replaced with Current Catalog No.(s)
40701-000	A	50701-000
40702-000	B	50702-000
40703-000	C	(1) 50701-000 + (1) 50702-000
40704-000	D	(2) 50701-000
40705-000	E	(2) 50702-000
40706-000	F	(1) 50701-000 + (1) 50702-000

Previous No.	Contact Designation	Can be Replaced with Current Catalog No.(s)
40710-000	J	(1) 50701-000 + (1) 50723-000
40712-000	L	(1) 50716-000 + (1) 50723-000
40716-000	P	50716-000
40723-000	W	50723-000
40724-000	X	50724-000
40726-000	Z	50726-000

See “WARNING ON PRODUCT APPLICATION” page (2)

Selector Switch Operator Cams

CAUTION: NEVER EXCEED THREE TIERS IN STACKING BLOCKS

2 Position Selector Cams

Contact Sequence							
CAM No.	Position	A1	A2	B1	B2	P1	P2
136	1 Left			X	X	X	X
	2	X	X				

Contact Sequence							
CAM No.	Position	A1	A2	B1	B2	P1	P2
141	1 Left	X	X				
	2			X	X	X	X

X = Contact Closure

3 Position Selector Cams

Contact Sequence							
CAM No.	Position	A1	A2	B1	B2	P1	P2
131	1 Left			X	X	X	X
	2					X	X
	3	X	X				

Contact Sequence							
CAM No.	Position	A1	A2	B1	B2	P1	P2
132	1 Left			X	X	X	X
	2			X		X	X
	3	X	X				

Contact Sequence							
CAM No.	Position	A1	A2	B1	B2	P1	P2
133	1 Left			X	X	X	X
	2	X			X		X
	3	X	X				

Contact Sequence							
CAM No.	Position	A1	A2	B1	B2	P1	P2
138	1 Left			X	X	X	X
	2	X			X		X
	3		X	X		X	

Contact Sequence							
CAM No.	Position	A1	A2	B1	B2	P1	P2
142	1 Left			X	X	X	X
	2		X			X	
	3	X	X				

Contact Sequence							
CAM No.	Position	A1	A2	B1	B2	P1	P2
143	1 Left		X	X		X	
	2			X	X	X	X
	3	X			X		X

Contact Sequence							
CAM No.	Position	A1	A2	B1	B2	P1	P2
145	1 Left				X	X	X
	2	X					X
	3		X	X		X	

Contact Sequence							
CAM No.	Position	A1	A2	B1	B2	P1	P2
146	1 Left			X	X	X	X
	2	X		X			X
	3		X			X	

Contact Sequence							
CAM No.	Position	A1	A2	B1	B2	P1	P2
156	1 Left	X	X				
	2	X					X
	3				X	X	X

Contact Sequence							
CAM No.	Position	A1	A2	B1	B2	P1	P2
161	1 Left			X	X	X	X
	2	X					X
	3		X	X		X	

Contact Sequence							
CAM No.	Position	A1	A2	B1	B2	P1	P2
177	1 Left		X	X		X	
	2			X	X	X	X
	3	X					X

Contact Sequence							
CAM No.	Position	A1	A2	B1	B2	P1	P2
180	1 Left	X			X		X
	2					X	X
	3		X	X		X	

Contact Sequence							
CAM No.	Position	A1	A2	B1	B2	P1	P2
181	1 Left			X	X	X	X
	2	X	X				
	3		X			X	

Contact Sequence							
CAM No.	Position	A1	A2	B1	B2	P1	P2
182	1 Left	X					X
	2			X	X	X	X
	3		X			X	

4 Position Selector Cams

Contact Sequence							
CAM No.	Position	A1	A2	B1	B2	P1	P2
134	1 Left		X			X	
	2	X					X
	3				X	X	X
	4			X		X	X

Contact Sequence							
CAM No.	Position	A1	A2	B1	B2	P1	P2
144	1 Left				X	X	X
	2	X					X
	3	X	X				
	4		X			X	

Contact Sequence							
CAM No.	Position	A1	A2	B1	B2	P1	P2
151	1 Left				X	X	X
	2	X					X
	3		X			X	
	4			X		X	X

Contact Sequence							
CAM No.	Position	A1	A2	B1	B2	P1	P2
152	1 Left		X			X	
	2			X		X	X
	3	X					X
	4				X	X	X

Contact Sequence							
CAM No.	Position	A1	A2	B1	B2	P1	P2
155	1 Left		X			X	
	2			X		X	X
	3				X	X	X
	4	X					X

Contact Sequence							
CAM No.	Position	A1	A2	B1	B2	P1	P2
186	1 Left	X					X
	2	X	X				
	3			X		X	X
	4				X	X	X

See "WARNING ON PRODUCT APPLICATION" page (2)

Instructions for 30.5mm Contact Units

CAUTION: NEVER EXCEED THREE TIERS IN STACKING BLOCKS

To Order:

Specify the Following

- 1 The selector operator (from page 49)
- 2 The cam (from page 52)
- 3 The contact block(s) (from page 51)
- 4 The arrangement of the blocks (see example)

Example:

	C	C	C
	R	R	R
	1	2	3
OFF		X	
ON	X		X

From the circuit requirements above, an order should read as follows:

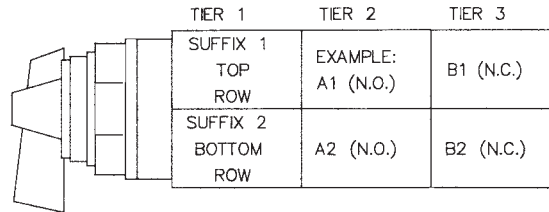
Catalog No.	Quantity	Description
40201-136	1	(selector operator with cam)
50701-000	2	(contact blocks)
50702-000	1	(contact block)

Arrange Blocks to: A1 B1 A2

Arrangement of Blocks:

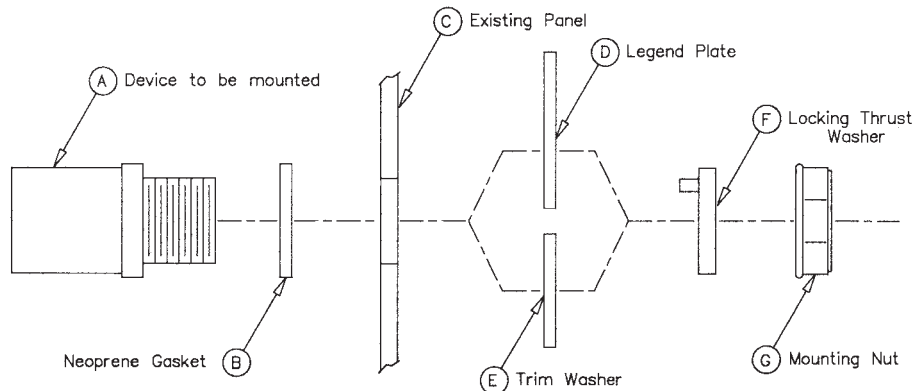
The drawing below shows the stacking or location arrangement of blocks.

Suffix # 1 denotes the top row and suffix # 2 denotes the bottom row.



Mounting Procedure:

1. Remove operator and make sure gasket "B" is on device "A".
2. Insert device "A" through panel "C".
3. Place legend plate "D" OR trim washer "E" (as legend plate substitute) on device "A".
4. Place locking thrust washer "F" over housing. Engage tab in slot of housing and notches of legend plate and panel.
5. Screw mounting nut "G" on housing. Torque to 15 ft. lbs. (1.21 in. dia.); 8 ft. lbs. (0.69 in. dia.)
6. Replace any knobs, lever, plunger heads or lenses which were removed to facilitate mounting.



See "WARNING ON PRODUCT APPLICATION" page (2)

Standard Pilot Lights



See page 60 for schematic drawings.

Electrical Ratings

Listed under UL 508 - File # E 58589
Certified under CSA C22.2 - File # LR 3648

Environmental

Temperature Range

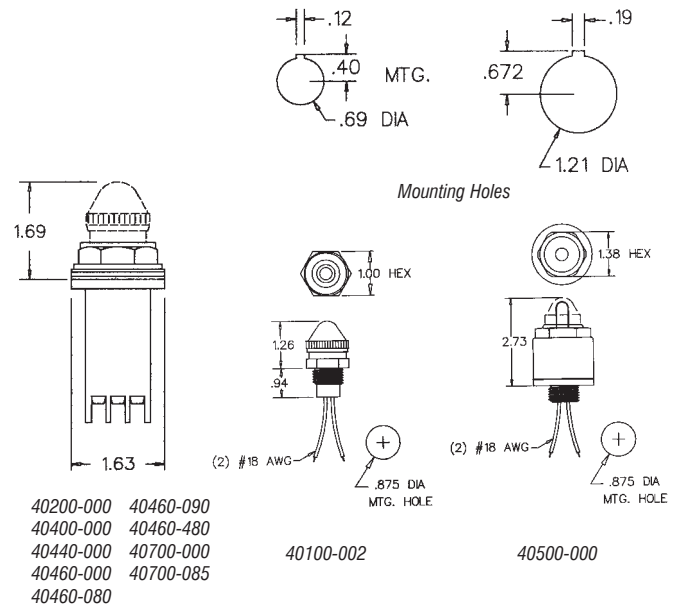
Operating: +32°F to +131°F (0°C to +55°C)
Storage: -40°F to +185°F (-40°C to +85°C)

Note: Operating temperatures at 0°C are based on the absence of freezing moisture and liquids.

NOTE: Except where noted Lenses are NOT included with the pilot lights.
See page 56 for selection.

Features/Applications

The pilot light bodies are made from polycarbonate and are sonically welded together. The chrome plated zinc die cast housings will mount in a standard 30.5mm hole. They are environmentally rated NEMA 12/13. Each captive terminal on the terminal block will accept (2) # 14 AWG stranded wires. These lights are generally found on machine control panels as circuit/function indicators. The NPT mount styles compliment the self contained cable switches and are used extensively in that function. Replacement lamps and lenses can be found in the accessories section for 30.5mm devices.



Pilot lights for Panel Mounting in 1.21 in. (30.5mm) dia. hole.

Catalog No.	Input Voltage	Lamp Type/No.	Lamp Design Volts	Lamp Design Amps	Type/Style	Length Behind Panel	Approx. Shipping Wt.
40200-000 ^c	120v AC @ 60Hz	60MB	60	50 mA	Solid State Flasher, (~ 1 / sec.)	2.58 in.	0.34 Lb.
40400-000		755	6.3	150 mA	Transformer, non-press-to-test		0.40 Lb.
40440-000					Transformer, press-to-test		0.41 Lb.
40460-000	120 volts	120MB ^a	120	25 mA	Full Voltage, non-press-to-test	1.60 in	0.31 Lb.
40460-080	12 volts	1815	14	200 mA			
40460-090	24 volts	1819	28	40 mA			
40460-480	120 volts	B2A	120	1.2mA			
40700-000 ^b	120v @ 60Hz	755	6	150 mA	Remote-press-to-test	3.14 in	0.46 Lb.
40700-085 ^c	120v @ 60Hz				Dual Input Voltage		0.43 Lb.

Pilot lights for Mounting in 1/2 in. NPT hole.

Catalog No.	Input Voltage	Lamp Type/No.	Lamp Design Volts	Lamp Design Amps	Type/Style	Length Behind Panel	Approx. Shipping Wt.
40100-000	(None)	(None)	(None)	(None)	Lexan housing only	(None)	0.06 Lb.
40100-002 ^a	120 volts	120MB	120	25mA	Full Voltage, non-press-to-test		0.08 Lb.
40100-012 ^a		LED Bulb		9.5mA			
40100-112 ^a	24 volts	Bi-Polar	24	30mA			
40100-102 ^a		#1819		40mA			
40500-000	120v @ 60Hz	755	6	150mA	Transformer, non-press-to-test	0.32 Lb.	
40500-002 ^a							

^a This pilot light is supplied with a red lens, for additional colors see page 56.

^b Covered by U.S. Patent # 4,019,128.

^c CSA Only

See "WARNING ON PRODUCT APPLICATION" page (2)

Miniature Pilot Lights

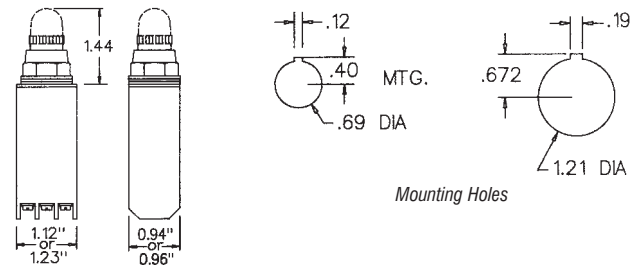
Features/Applications

The pilot light bodies are made from polycarbonate and are sonically welded together. The zinc die cast housings will mount in a 0.69 in. dia. hole. They are environmentally rated NEMA 12/13. Each captive terminal on the terminal block will accept (2) # 14 AWG stranded wires. These lights are generally found on machine control panels as circuit / function indicators. Replacement lamps and lenses can be found in the accessories, section, on pages 56 and 59, for 30.5mm devices.



44200-000
w/ 44290-007 lens

See page 60 for schematic drawings.



Electrical Ratings

Listed under UL 508 - File # E 58589
Certified under CSA C22.2 - File # LR 3648

Environmental

Temperature Range

Operating: +32°F to +131°F (0°C to +55°C)
Storage: -40°F to +185°F (-40°C to +85°C)

Note: Operating temperatures at 0°C are based on the absence of freezing moisture and liquids.

44200-000	44700-103
44200-090	44700-104
44220-000	44700-105
44300-000	44700-106
44300-090	44700-107
44500-000	44700-108
44700-000	44800-000
44700-090	44800-085
44700-102	

NOTE: Except where noted Lenses are NOT included with the pilot lights.
See page 56 for selection.

Pilot lights for Panel Mounting in 0.69 in. dia. hole.

Catalog No.	Input Voltage	Lamp Type/No.	Lamp Design Volts	Lamp Design Amps	Type/Style	Length Behind Panel	Approx. Shipping Wt.	
44200-000	120v @ 60Hz	755	6.3	150 mA	Transformer, press-to-test	2.44 in.	0.16 Lb.	
44200-090	24 volts				Resistor Load, press-to-test			
44220-000	120v @ 60Hz				Transformer, non-press-to-test			
44300-000	120 volts	120MBa	120	25 mA	Full Voltage, press-to-test	1.45 in.	0.13 Lb.	
44300-090	24 volts	1819	28	40 mA				
44500-000	120v @ 60Hz	60MB	60	50 mA	Solid State Flasher (~ 1 / sec.)	2.44 in.	0.16 Lb.	
44700-000 ^c	120v @ 60Hz	755	6.3	150 mA	Remote-press-to-test, resistor load	3.00 in.	0.30 Lb.	
44700-090	24 v DC				Remote-press-to-test		0.20 Lb.	
44700-102 ^b					Remote-press-to-test with Red Lens		0.30 Lb.	
44700-103 ^b					Remote-press-to-test with Green Lens			
44700-104 ^b					Remote-press-to-test with Yellow Lens			
44700-105 ^b					Remote-press-to-test with Blue Lens			
44700-106 ^b					Remote-press-to-test with White Lens			
44700-107 ^b					Remote-press-to-test with Amber Lens			
44700-108 ^b					Remote-press-to-test with Clear Lens			
44800-000					Memory Indicator, Xfmr, Remote Reset			0.20 Lb.
44800-085 ^d	12v DC				1815			

^a Lamp number 120 MB is not recommended for use in vibration conditions.

^b This pilot light is supplied with a Lens.

^c Covered by U.S. Patent # 4,019,128.

^d CSA Only

Lenses for Pilot Lights and Operators

FEATURES

The one piece translucent plastic lenses are molded from high impact polycarbonate.

The two piece (41252's) lenses have a chrome plated zinc die cast base with a polycarbonate lens pressed into the end.

Catalog No.	Color	Usage	Dimensional Drawing	Approximate Shipping Weight
40070-002 40070-003 40070-007	Red Green Amber	40970-000		0.04 Lb.
40431-002 40431-003 40431-004 40431-005 40431-006 40431-007 40431-008	Red Green Yellow Blue White Amber Clear	All "Standard" Pilot Lights		0.01 Lb.
41252-002 41252-003 41252-005 41252-006 41252-007 41252-008	Red Green Blue White Amber Clear	40055-000 41150-000 41450-000 41450-302		0.12 Lb.
41252-102	Opaque Red	40053-000 & 40055-000		
44290-002 44290-003 44290-004 44290-005 44290-006 44290-007 44290-008	Red Green Yellow Blue White Amber Clear	All "Miniature" Pilot Lights		0.01 Lb.

30.5mm and Miniature Legend Plates

APPLICATIONS

The following legend plates are designed to mount to the pilot lights or operators found on pages 46 through 55. Legend Plates are made from clear, red or black anodized aluminum.

Legend Plate Selection Chart

To Order Legend Plates:

Standards

Specify the 5 digit plate number plus the 3 digit suffix number from the chart below. Example: "START" = 09017-005

Specials

Specify the 5 digit plate number plus the suffix number -000 plus your special marking. Example: "CLAMP" = 09013-000

NOTE: Legend Plates are NOT included in the price of devices.

Dimensions							The Miniature legend plates available as "Standard" are BLANK ONLY
	Catalog No.	09012-Black	09013-Red	09014-Clear	09015-Black	09016-Red	
(Blank)	001	001	001	001	001	001	09006-Black
OFF		002	002			002	
STOP		003	003			003	
EMERGENCY STOP		004	004			004	09007-Red-
START			005			005	
ON			006			006	
RUN			007			007	09008-Clear
INCH			008			008	
RESET			009			009	
JOG			010			010	
OPEN			011				
CLOSE			012			012	
UP			013			013	
DOWN			014			014	
RAISE			015			015	
LOWER			016			016	
JOG FORWARD			017			017	
JOG REVERSE			018			018	
IN			019			019	
OUT			020			020	
FORWARD			021			021	
REVERSE			022			022	
HIGH			023			023	
LOW			024			024	
SLOW			025			025	
FAST			026			026	09009-Black
TEST			027			027	
CYCLE START			028			028	
OFF ON			029			029	09010-Red
START STOP			030			030	
OPEN CLOSE			031			031	
FORWARD REVERSE			032			032	09011-Clear
HAND AUTO			033			033	
MAN AUTO			034			034	
HIGH LOW			035			035	
JOG RUN			036			036	
RAISE LOWER			037			037	
SLOW FAST			038			038	
UP DOWN			039			039	
OPEN OFF CLOSE			040			040	
FORWARD OFF REVERSE			041			041	
HAND OFF AUTO			042			042	
MAN OFF AUTO			043			043	
HIGH OFF LOW			044			044	
JOG STOP RUN			045			045	
RAISE OFF LOWER			046			046	
SLOW OFF FAST			047			047	
UP OF DOWN			048			048	
(PULL TO START PUSH TO STOP)						049	

See "WARNING ON PRODUCT APPLICATION" page (2)

Accessory Items for 30.5mm Control Units

Catalog No.	Color	Usage	Dimensional Drawing
09020-004 Plastic Legend Plate	Yellow	"Emergency Stop" Legend for use with 30.5 mm Operators on pages 46 & 47	
40601-004 Plastic Ring Guard	Yellow	For guarding 1.50 in. and 2.00 in Mushroom P.B. Operators on page 46.	
40612-000 Illuminated Pushbutton Guard	Aluminum	For guarding 40970-000 Illuminated P.B. on page 48.	
40624-001 40624-002 40624-003 Rubber Boot	Black Red Green	For all 1.00 in. Standard and Extended pushbutton Operators on page 46.	
40622-000 40632-000 Panel, Hole Closer	Black	1.21 in. Dia. for 30.5 mm devices. 0.69 in. Dia. for Miniature devices.	