

MR221-MR222

Heavy Duty Geared Limit Switches, UL Approved

MICRONOR
automation components

Product

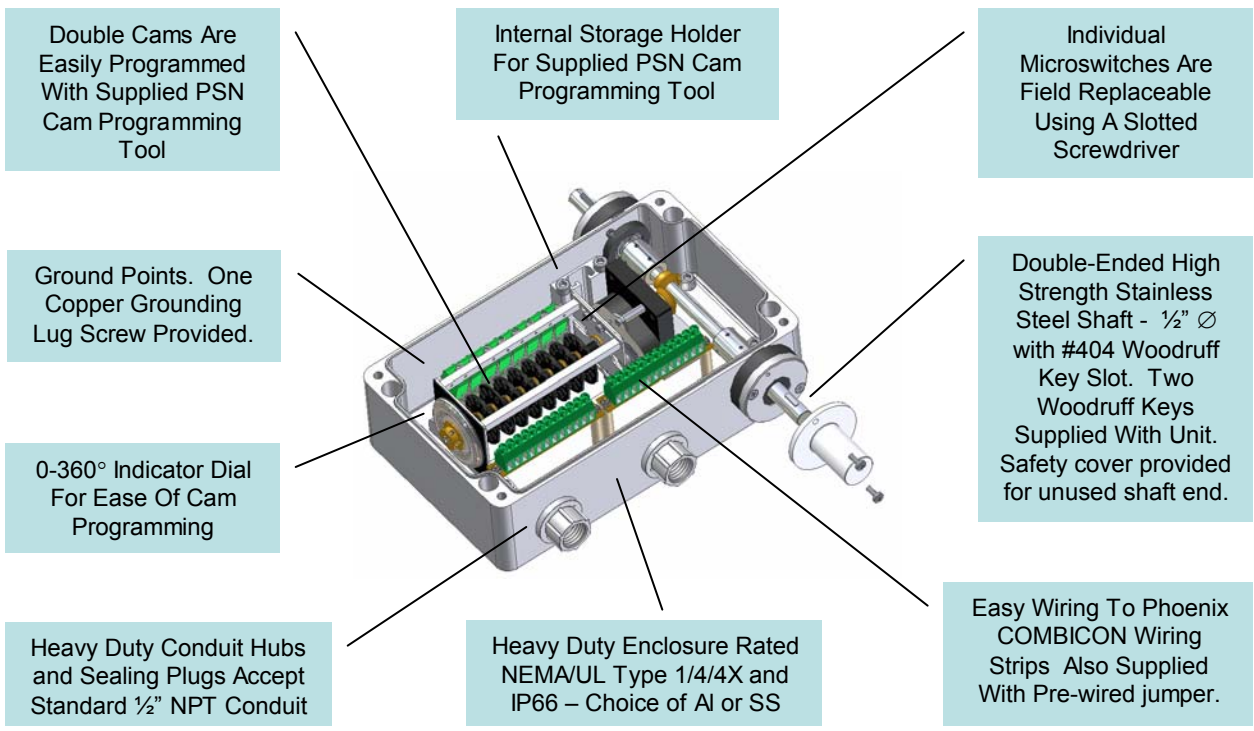
MICRONOR MR221 and MR222 series Heavy Duty Geared Limit Switches are for use in the most demanding industrial applications – including cranes, hoists, presses, packers, machine tools, handling devices, and other similar operations where motion is expressed in shaft rotation.

The primary purpose of the switch is to control the intermediate or end limits of linear or rotary rotation. The switch is often used as a safety device to protect against accidental damage to the equipment. Each cam switch channel is independently programmable from 4°-356°. Wiring to the COM, NO and NC contacts is via easy to use, COMBICON screw-down wiring blocks.



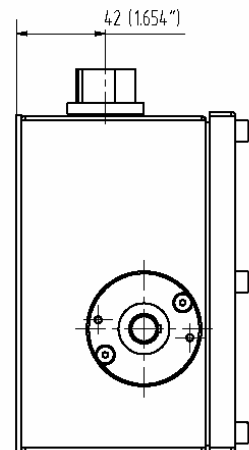
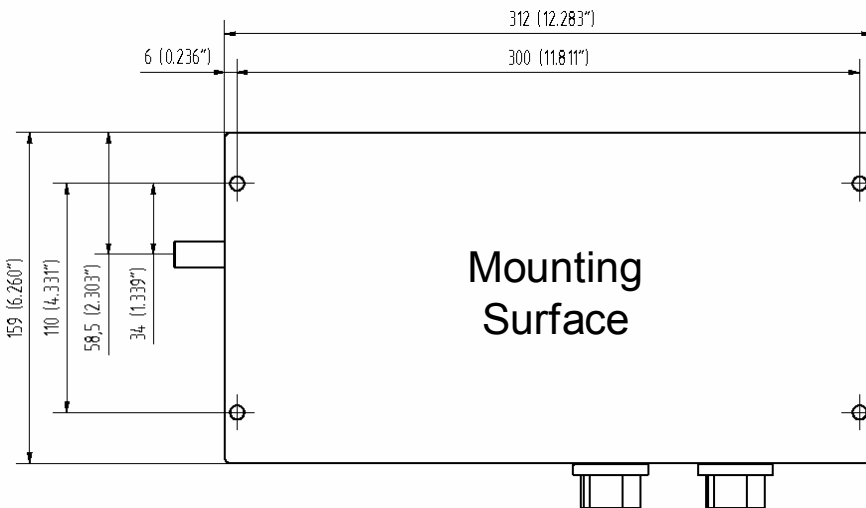
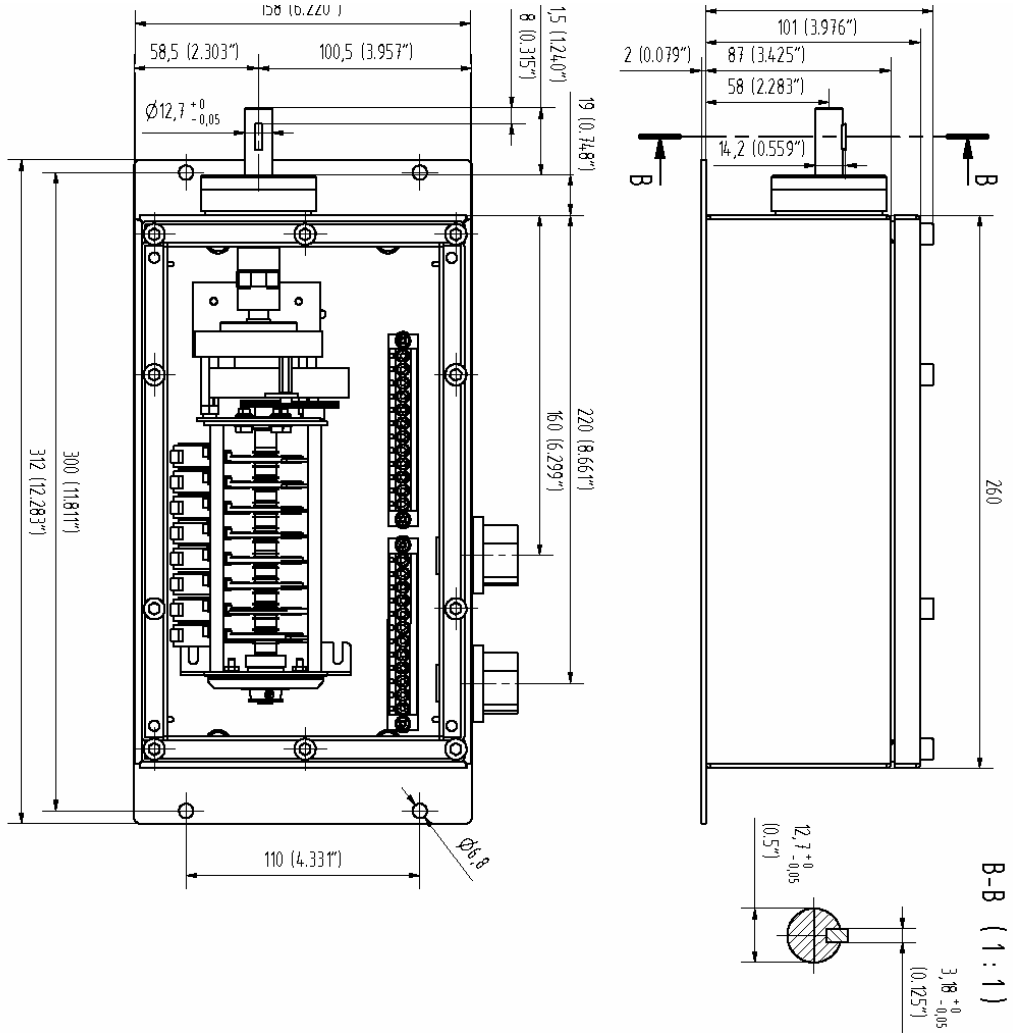
Features

- Combines gear reducer, coupling and cam switches into one compact unit
- NEMA/UL Type 1/4/4X/IP66 rated enclosures
- Choice of die cast aluminum or stainless steel enclosure
- Choice of single-ended (MR221) or double-ended (MR222)
- Shafts are standard 1/2"Ø stainless steel with #404 Woodruff Key slot. Keys are provided with unit.
- Industrial grade, heavy duty sealed bearings
- Protective shaft cover provided for installations where only one end of MR222 double-ended shaft is used
- 2, 4, 6 or 8 cam switch channels
- Easy to replace, heavy duty limit switches
- Conduit hubs provided for direct use of 1/2" NPT conduit



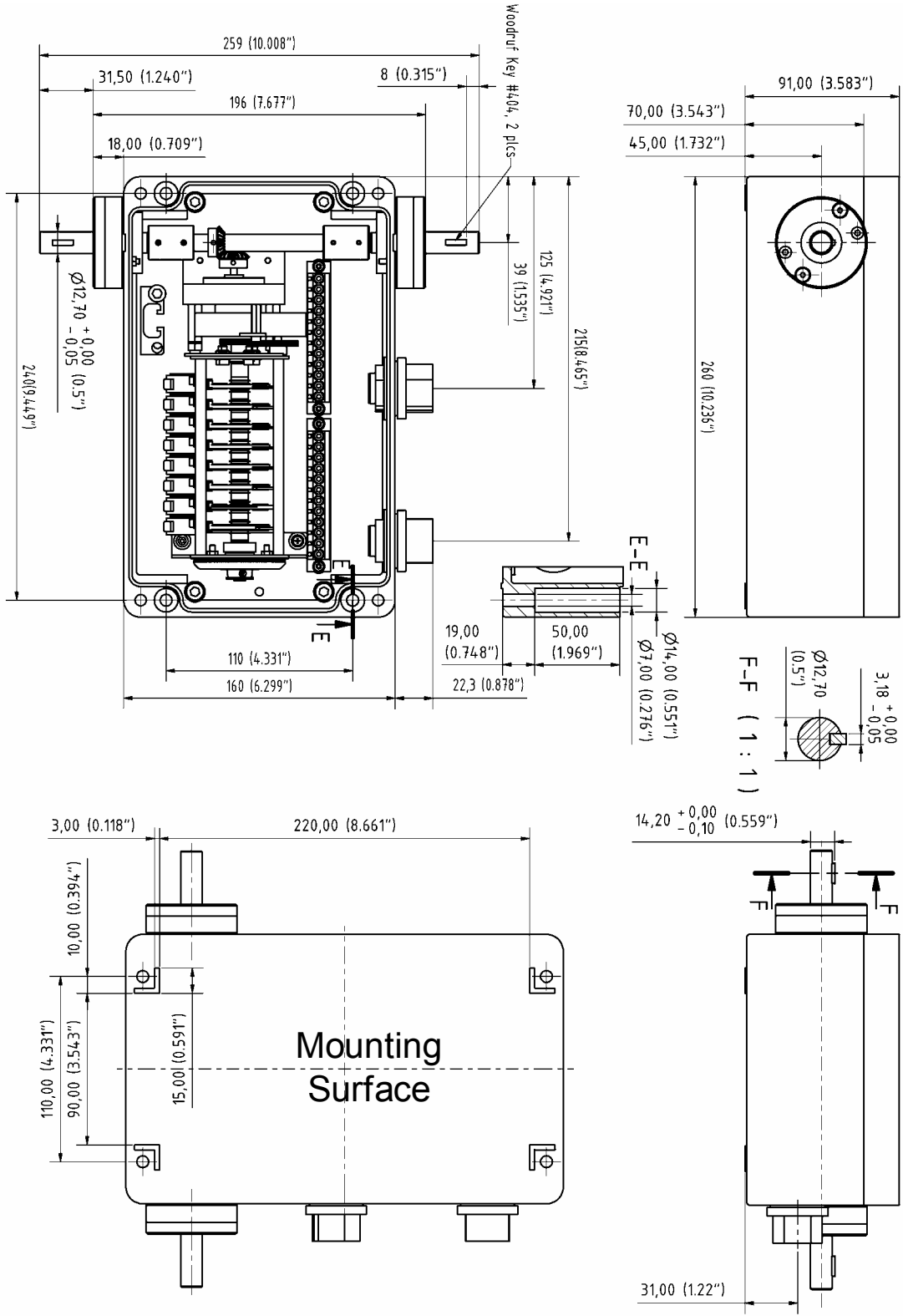
MR221.X Models

Stainless Steel Housing, Single-Ended Shaft Configuration
(Internal 8-Channel Configuration Shown)



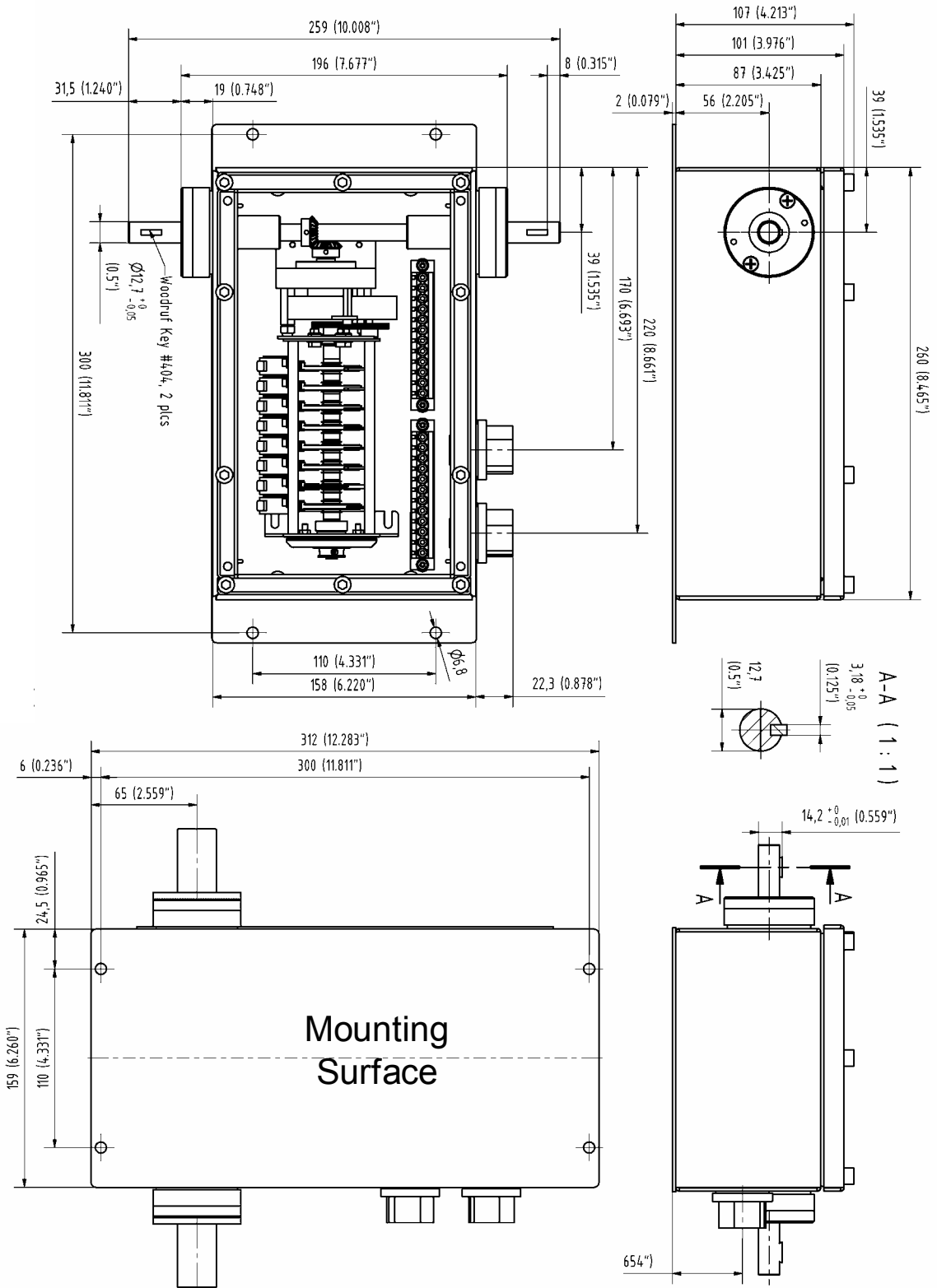
MR222 Standard Models

Die Cast Aluminum Housing, Two-Ended Shaft Configuration
(Internal 8-Channel Configuration Shown)



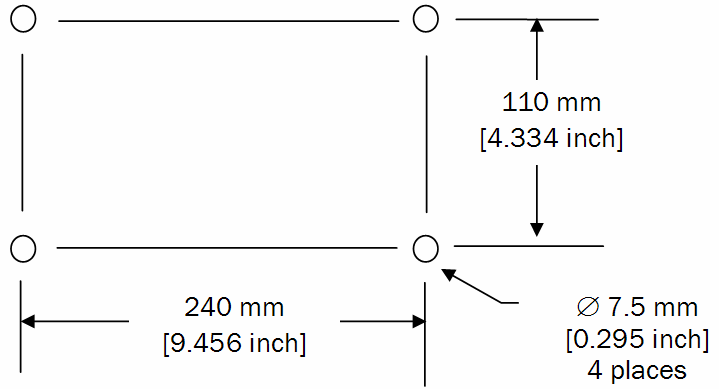
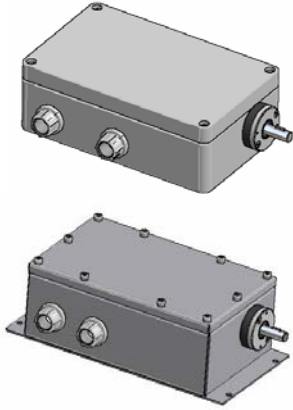
MR22.X Models

Stainless Steel Housing, Two-Ended Shaft Configuration
(Internal 8-Channel Configuration Shown)

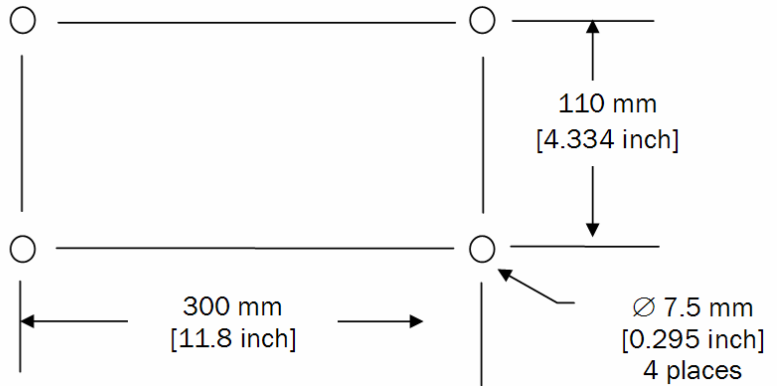
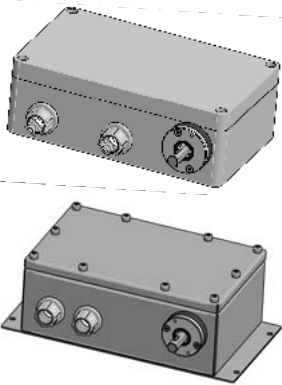


MR222 Mounting Dimensions

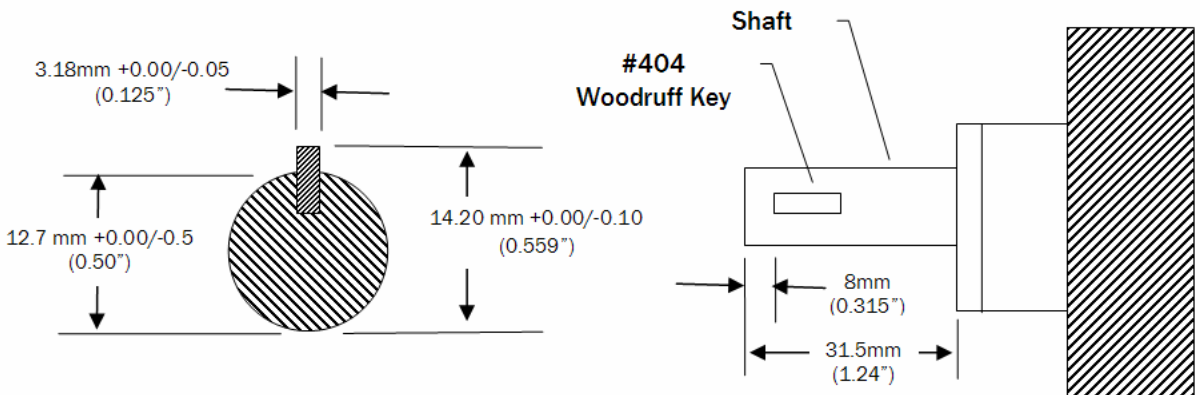
Standard MR221/MR222 Models (Aluminum Housing)



MR221.X/MR222.X Models (Stainless Steel Housing)



Detailed Shaft Dimensions For All Models



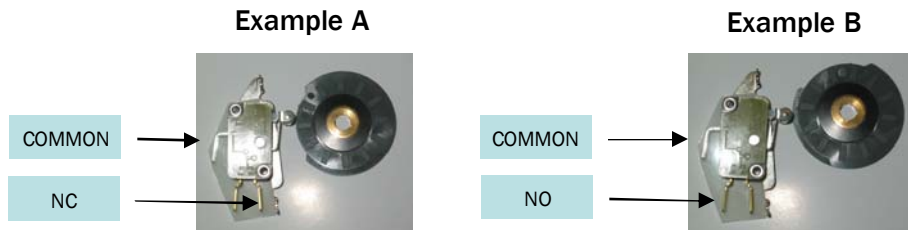
The MR221-MR222 limit switches are pre-wired to PHOENIX Screw-Down Wiring Strips. Each limit switch has three connections which are pre-wired with AMP FASTON crimp-on receptacles and brought out to the wiring blocks:

- COMMON (labeled 1 on the switch)
- NC (labeled 2 on the switch)
- NO (labeled 4 on the switch)

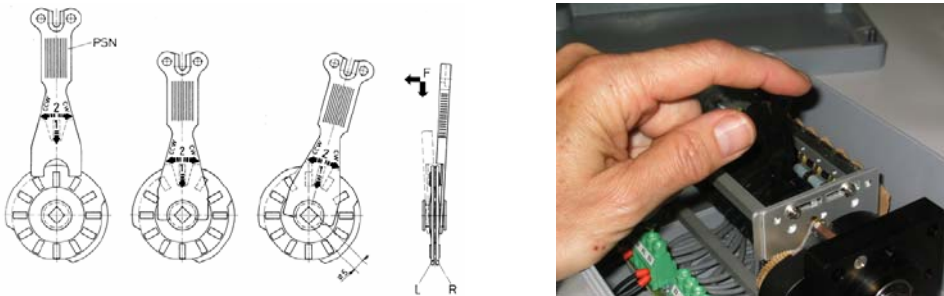
The Micronor Programmable Cam Switches are designed to be both versatile and easy to operate. However, initial planning is required for cams to be programmed to function as desired. Due to the design of the cam, switches cannot be engaged for more than 180°. If the system requires that the switch does not make contact for more than 180°, the normally closed (NC) contact must be wired.

As shown in Example A, a system might require that the connection for a switch be made from 0° to 70° and there be no connection from 71° to 359°. To accomplish this, the switch must be wired in the normally closed position.

As shown in Example B, a system that requires a connection for 290°, the normally open contact must be wired so that a connection is made when the switch is engaged, and no connection is made when the switch is disengaged.



The following instructions may be used to program the start and stop times of each switch using the supplied PSN (black) cam programming tool.



- Step 1 Turn external shaft to the desired START position via dial setting. Insert PSN key with the numbered side away from the cam and the notched side towards the cam.
- Step 2 While gently applying pressure against the cam with the key; rotate the cam to the desired position.
- Step 3 Turn external shaft to the desired STOP position, flip over the PSN key and repeat steps 1 and 2 on the other side of the cam.
- Step 4 Test the unit to confirm that the switches engage (START) and disengage (STOP) at the appropriate positions.

Specifications Subject To Change Without Notice

Enclosure Ratings	Type 1/4/4X + IP66	NOTE: IP rating only applies when unit installed, connected and torqued properly. Die cast aluminum housing with powder coat finish
	Type 1/4/4X + IP66	Stainless steel housing
Switch Rating	Mechanical Life	10 x 10 ⁶ Cycles (typical)
	Resistive Load	230 VAC/6 A Continuous/10 A Momentary
		24 VDC/6 A Continuous/10 A Momentary
	Inductive Load	230 VAC/Power Factor 0.7/3 A
		125 VDC/0.5 A
		80 VDC/0.75 A
	40 VDC/1 A	
	24 VDC/3 A	
	Motor Load	230 VAC/Power Factor 0.85/10A
	Temperature	-40°C to +85°C
Cam Programming	1 - 2 (COM - NC)	With Cam Valley Profile: 4° ...180° (1 ...50%)
	1 - 3 (COM - NO)	With Cam Peak Profile: 4° ...356° (1 ...99%)
	Repeatability	1.8°
Mechanical Rating	Max RPM	3000 rpm
	Mechanical Life	10 x 10 ⁶ Cycles (typical)
	Max Side Load	890 N (200 lbf) to 500 RPM, 445 N (100 lbf) to 1800 RPM
	Max Axial (Thrust) Load	360 N (80 lbf) to 500 RPM, 185 N (40 lbf) to 1800 RPM
	Bearing Life	10 years (87,660 hours) continuous running with 350 N (78 lbf) side load at 1000 RPM
Wire Range	24-10 AWG	Via Phoenix MKDS 5/3-6,35 COMBICON modular wiring blocks with screw connection
Temperature	-30°C to +70°C	Storage Temperature
	-15°C to +60°C	Operating Temperature

List of Contents	1.	One geared limit switch unit
	2.	#404 Woodruff Key(s) (installed on shafts)
	3.	One protective safety shaft cover (MR222 Only, for use when only one shaft end is used)
	4.	One PSN cam programming tool (stored in internal holder)
	5.	One Wire Jumper (installed across all COMMONS on terminal block)
	6.	One copper grounding screw and split washer (installed inside unit)
	7.	Waterproof plugs (installed in threaded conduit holes)
	8.	MR221-MR222 Series Geared Limit Switch User Guide

Summary of UL/cUL Testing

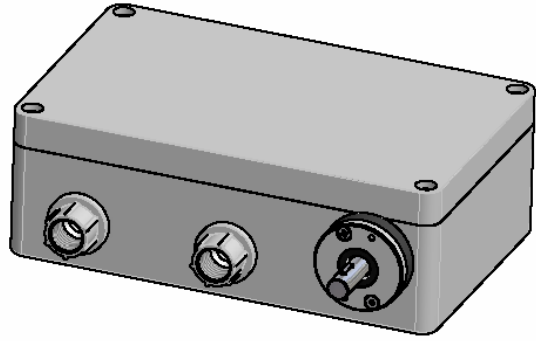
Temperature Test	Standard	Per UL508, Section 43
Dielectric Voltage Withstand Test	Standard	Per UL508, Section 49
Resistive Load Test	Standard	Per UL508, Sections 45 (Overload) and 46 (Endurance)
	AC	Endurance Test at 240 VAC/6 A and Overload Test at 240 VAC/9 A
	DC	Endurance Test at 24 VDC/6 A and Overload Test at 24 VDC/9 A
Inductive Load Test	Standard	Per UL508, Sections 45 (Overload) and 46 (Endurance)
	AC	240 VAC and 120 VAC (Standard Duty B300 Rating)
	DC	24 VDC/2 A (Pilot Duty Rating)
Hosedown Test	Standard	Per UL50, Section 35, Type 1/4/4X
Bending Test	Standard	Per UL50, Section 46
Torque Test	Standard	Per UL50, Section 46
UL Product Category	UL Category	Auxiliary Devices (NKCR, NKCR7)
UL Test Report	UL File No.	E302565 (Certified for US and Canada)
UL Product Identify	UL ID Code	Industrial Control Equipment
UL Control No.	UL Control No.	37V8

General Installation Instructions:

Instructions	1.	Use copper conductors rated 60°C
	2.	Tighten terminal torque is 5-7 in-lbs
	3.	Unused conduit ports must be properly sealed to prevent moisture and water leakage into the unit

Ordering Info

This ordering example specifies a MR222 double-ended unit in NEMA 4/4X die cast aluminum case. Gear Ratio to be 100:1. with 8 switch channels.



MR222 - L 8 M 1 0 0

Shaft

Options

MR221 One-Ended
MR222 Two-Ended

No. of

Switches

2
4
6
8

Gear

Ratio

D1: X Step Up (Contact factory)

Single Stage-Step Down (UX:1)

U1	U1.25	U2.0	U2.6
U2.75	U3.5	U:4.0	U5.0
U6.5			

Multistage-Step Down (MX:1)

M12.5	M20	M25	M30
M37.5	M40	M50	M52.5
M75	M100	M200	M300
M420	M600	M750	M1600
M2250	M2500		

Other gear ratios available upon request

Enclosure

Option

(Blank) Die Cast Aluminum (Std)
X Stainless Steel

Replacement Parts:

PSN Cam Programming Key:
Micronor P/N PSN

Microswitch:
Micronor P/N 6099.22.846

For additional technical information, contact Micronor and request:

- MR221-MR222 Series Geared Limit Switch User Guide

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