NORGREN
ENGINEERING ADVANTAGE

Magnetically Operated Switches

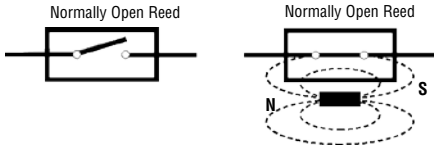
Magnetically operated, non-contact sensing system

Consists of a magnet on the piston, and a sensing switch mounted to the cylinder tube

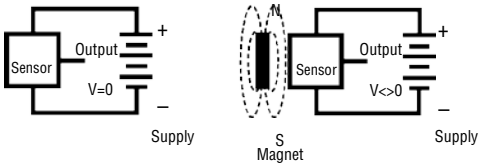
Switch types:
Read switch
Solid State -
NPN
PNP

Switch series:
CS7
CS8
CS8-2
CS9D
CD9-04
M/50

Reed Switch Working Principle
Reed switch sensors contain hermetically sealed reed elements (mechanical contacts) which are open in their normal state. When a magnetic field moves within proximity of the switch, magnetism is induced into the leads and forces the contacts to close.



Solid State/Magnetoresistive Working Principle
The solid state (no moving parts) magnetoresistive sensor responds to a parallel magnetic pole by providing a digital signal to the output control circuit. This technique enables the sensing of weak magnetic fields, with no limit to the maximum strength of the magnetic field. Norgren solid state switches are similar to the Hall effect switch.



Application Recommendations and Precautions
To provide maximum reliability.

1. Always stay within the specifications and power rating limitations of the unit installed.
2. Primary and control circuit wiring should not be mixed in the same conduit. Motors will produce high pulses that will be introduced into the control wiring if the wiring is carried in the same conduit.
3. Never connect the switch without a load present. The switch will be destroyed.
4. Some electrical loads may be capacitive. Capacitive loading may occur due to distributed capacity in cable runs over 25 feet. Use switch Model CS7-24 whenever capacitive loading may occur.

In order to obtain optimum performance and long life, magnetically operated limit switches should not be subjected to:

(1) strong magnetic fields,

(2) extreme temperature, and (3) excessive ferrous filing or chip buildup.

Improper wiring may damage or destroy the switch. The wiring diagram, along with the listed power ratings, must be carefully observed before connecting power to the switch.

Lower power switches are designed for signaling electronic circuits. Do not use on relay loads or with incandescent bulbs. Resistive loads only.

Magnetically operated switches

Switches available by Cylinder Series

A & EA Series NFPA

CS8-2-* (1-1/2"-2-1/2" Bores)
CS7-* (2" - 12" Bores)
CS9-04 (2" - 8" Bores)

J & EJ Series NFPA

CS8-2-* (1-1/2"-2-1/2" Bores)
CS7-* (2" - 12" Bores)
CS9-04 (2" - 8" Bores)

LS Series Thrusters

CS8-2-* (1-1/2" & 2" Bores)
CS7-* (2" Bores)
CS8* (1-1/2" & 2" Bores)

NEN Series NFPA

M/NEN/A
M/NEN/N

SS Series NFPA

CS8-2-* (1-1/8"-2-1/2" Bores)
CS7-* (2" - 8" Bores)

N Series

CS8-2-* (1-1/2"-2-1/2" Bores)
CS7-* (2" - 4" Bores)

Tiny Tim Series
(T,VT,ET,TA,TAV,TAE)

CS8-2-* (3/4" - 1-1/8" Bores)

Lintra Plus

M/50*

Lintra Lite

M/50* (w/ M/P72487 bracket)

ISO/VDMA (DA/8000)

M/50* (with QM/27/2/1 bracket)
TM/50* (with QM/27/2/1 bracket)

ISO/VDMA (PDA/182000)

M/50*
TM/50*

Rotary Actuators

CS8-2-* (1-1/8"-2-1/2" Bores)
CS7-* (2" - 2-1/2" Bores)

Roundline Plus

CS8-* -04,-31,-32 (9/16"-3")
CS9D* (5/16" - 3" Bores)

RPHD Magnetic

CS8-* -04,-31,-32 (9/16"-2-1/2")
CS9D* (9/16" - 2-1/2" Bores)

RPD Delrin

CS8-* -04,-31,-32 (9/16"-2")
CS9D* (9/16" - 2" Bores)

RT Thrusters

CS8-* -04,-31,-32 (9/16"-3")
CS9D* (9/16" - 3" Bores)

F-Series Plus

CS9D* (9/16" - 4" Bores)

FPT Series Twin Rod

CS9D* (3/4" - 2" Bores)

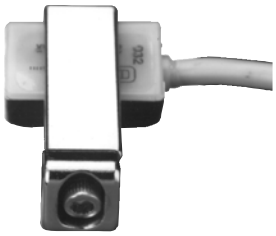
90000 Series Compact

M/50* (w/ M/P72487 bracket)
TM/50* (w/ M/P72487 bracket)

NORGREN
ENGINEERING ADVANTAGE

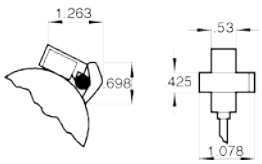
Magnetically operated switches

CS8-2-* and CS7-* Switches (tie rod mounting bracket included)

Magnetic Switch (includes mounting bracket)	*Switch P/N	Bore	Type		Function	Switching Voltage	Switching Current	Switching Power
	CS8-2-04	3/4" - 2-1/2"	Reed	*MOV & Light	SPST Normally Open	5-120 VDC/VAC 50/60 Hz	.5 Amp max. .005 Amp min.	10 VA
	CS8-2-04P	3/4" - 2-1/2"	Reed	*MOV & Light	SPST Normally Open	5-120 VDC/VAC 50/60 Hz	.5 Amp max. .005 Amp min.	10 VA
	CS8-2-31	3/4" - 2-1/2"	Solid State	Light, Sourcing PNP	Normally Open	6-24 VDC	.5 Amp max.	12 Watts max.
	CS8-2-31P	3/4" - 2-1/2"	Solid State	Light, Sourcing PNP	Normally Open	6-24 VDC	.5 Amp max.	12 Watts max.
	CS8-2-32	3/4" - 2-1/2"	Solid State	Light, Sinking NPN	Normally Open	6-24 VDC	.5 Amp max.	12 Watts max.
	CS8-2-32P	3/4" - 2-1/2"	Solid State	Light, Sinking NPN	Normally Open	6-24 VDC	.5 Amp max.	12 Watts max.
	CS7-04	2" - 6"	Reed	*MOV & Light	Normally Open	5-240 VDC/VAC 50/60 Hz	1 Amp max.	30 Watts max.
	CS7-04-12P	2" - 6"	Reed	*MOV & Light	Normally Open	5-240 VDC/VAC 50/60 Hz	1 Amp max.	30 Watts max.
	CS7-9-04	7" - 8"	Reed	*MOV & Light	Normally Open	5-240 VDC/VAC 50/60 Hz	1 Amp max.	30 Watts max.
	CS7-10-04	10"-12"	Reed	*MOV & Light	Normally Open	5-240 VDC/VAC 50/60 Hz	1 Amp max.	30 Watts max.
	CS7-31	2" - 6"	Solid State	Light, Sourcing PNP	Normally Open	6-24 VDC	1 Amp max.	24 Watts max
	CS7-31P	2" - 6"	Solid State	Light, Sourcing PNP	Normally Open	6-24 VDC	1 Amp max.	24 Watts max
	CS7-9-31	7" - 8"	Solid State	Light, Sourcing PNP	Normally Open	6-24 VDC	1 Amp max.	24 Watts max
	CS7-32	2" - 6"	Solid State	Light, Sinking NPN	Normally Open	6-24 VDC	1 Amp max.	24 Watts max.
	CS7-32P	2" - 6"	Solid State	Light, Sinking NPN	Normally Open	6-24 VDC	1 Amp max.	24 Watts max.
	CS7-9-32	7" - 8"	Solid State	Light, Sinking NPN	Normally Open	6-24 VDC	1 Amp max.	24 Watts max.
	CS7-24	2" - 6"	Reed	*MOV & Light, 3 wire	Normally Open	24-240 VAC 50/60 Hz	4 Amp max. 50 Amp Inrush	100 Watts max.
	CS7-9-24	7" - 8"	Reed	*MOV & Light, 3 wire	Normally Open	24-240 VAC 50/60 Hz	4 Amp max. 50 Amp Inrush	100 Watts max.
	CS9-04	2" - 8"	Reed		Normally Open	0-120 VAC/VDC 50/60 Hz	0.5 Amp Ma	10 Watts max.

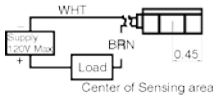
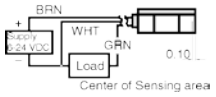
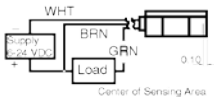
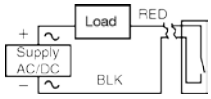
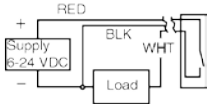
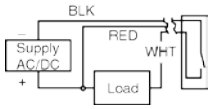
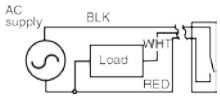
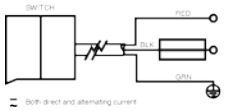
All CS- switches require a magnetic sensitivity of 85 Gauss

CS8-2 Series

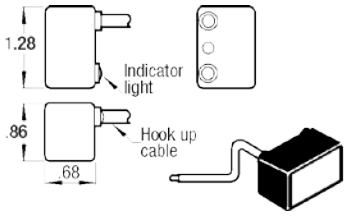


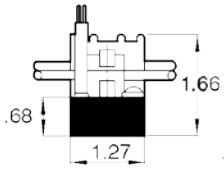
Magnetically operated switches (cont)

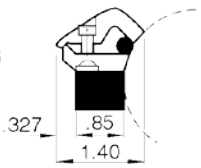
CS8-2-* and CS7-* Switches (tie rod mounting bracket included)

Max Voltage Drop	Enclosure Classification	Temperature Rating	Lead Wire Length	Plug-In Cable	Wiring Diagrams Hard Wired
3.5 Volts	NEMA 6 & CSA Approved	-22 F to + 176 F	9 Feet	N/A	
3.5 Volts	NEMA 6 & CSA Approved	-22 F to + 176 F	8 mm Plug-in	CS8-PIC-2 (2m) CS8-PIC-5 (5m)	
.5 Volts	NEMA 6 & CSA Approved	-22 F to + 176 F	9 Feet	N/A	
.5 Volts	NEMA 6 & CSA Approved	-22 F to + 176 F	8mm plug-in	CS8-PIC-2 (2m) CS8-PIC-5 (5m)	
.5 Volts	NEMA 6 & CSA Approved	-22 F to + 176 F	9 Feet	N/A	
.5 Volts	NEMA 6 & CSA Approved	-22 F to + 176 F	8mm plug-in	CS8-PIC-2 (2m) CS8-PIC-5 (5m)	
3 Volts	NEMA 6 & CSA Approved	-22 F to + 176 F	9 Feet	N/A	
3 Volts	NEMA 6 & CSA Approved	-22 F to + 176 F	12 mm plug-in	CS7-PIC-5 (5m) CS7-PIC-10 (10m)	
3 Volts	NEMA 6 & CSA Approved	-22 F to + 176 F	9 Feet	N/A	
3 Volts	NEMA 6 & CSA Approved	-22 F to + 176 F	9 Feet	N/A	
.5 Volts	NEMA 6 & CSA Approved	-22 F to + 176 F	9 Feet	N/A	
.5 Volts	NEMA 6 & CSA Approved	-22 F to + 176 F	12mm plug-in	CS7-PIC-5 (5m) CS7-PIC-10 (10m)	
.5 Volts	NEMA 6 & CSA Approved	-22 F to + 176 F	9 Feet	N/A	
.5 Volts	NEMA 6 & CSA Approved	-22 F to + 176 F	9 Feet	N/A	
.5 Volts	NEMA 6 & CSA Approved	-22 F to + 176 F	12mm plug-in	CS7-PIC-5 (5m) CS7-PIC-10 (10m)	
.5 Volts	NEMA 6 & CSA Approved	-22 F to + 176 F	9 Feet	N/A	
N/A	NEMA 6 & CSA Approved	-22 F to + 176 F	9 Feet	N/A	
N/A	NEMA 6 & CSA Approved	-22 F to + 176 F	9 Feet	N/A	
N/A	NEMA 1,4, and 13 (General Location)	-4 F to +176 F	9 Feet	N/A	

CS7 Series







NORGREN
ENGINEERING ADVANTAGE

Magnetically operated switches

M/NEN/* Switches (switch only)

Magnetic Switch (Bracket sold separately)	Switch P/N	Bore	Type		Function	Switching Voltage	Switching Current	Switching Power
	M/NEN/A	1-1/2" - 4"	Reed	Light, (Green LED)	Normally Open	5-240 VDC/VAC	100mA max.	10 Watts max.
	M/NEN/N	1-1/2" - 4"	Solid State	Light, Sinking NPN (Red LED)	Normally Open	5-30 VDC	200mA max.	6 Watts max.

CS8* Switches (strap mount included)

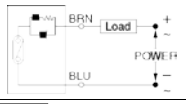
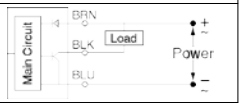
Magnetic Switch (includes mounting strap)	Switch P/N	Bore	Type		Function	Switching Voltage	Switching Current	Switching Power
	CS8-04	7/16" - 3"	Reed	*MOV & Light	SPST Normally Open	5-120 VDC/VAC 50/60 Hz	.5 Amp max. .005 Amp min.	10 VA
	CS8-04P	7/16" - 3"	Reed	*MOV & Light	SPST Normally Open	5-120 VDC/VAC 50/60 Hz	.5 Amp max. .005 Amp min.	10 VA
	CS8-31	7/16" - 3"	Solid State	Light, Sourcing PNP	Normally Open	6-24 VDC	.5 Amp max.	12 Watts max.
	CS8-31P	7/16" - 3"	Solid State	Light, Sourcing PNP	Normally Open	6-24 VDC	.5 Amp max.	12 Watts max.
	CS8-32	7/16" - 3"	Solid State	Light, Sinking NPN	Normally Open	6-24 VDC	.5 Amp max.	12 Watts max.
	CS8-32P	7/16" - 3"	Solid State	Light, Sinking NPN	Normally Open	6-24 VDC	.5 Amp max.	12 Watts max.

CS9D* Switches (switch only, mounting bracket not included)

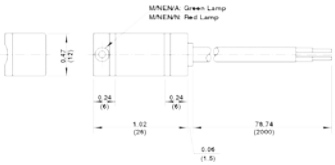
	Switch P/N	Bore	Type		Function	Switching Voltage	Switching Current	Switching Power
	CS9D-0-02	5/16" - 4"	Reed	LED	SPST Normally Open	5-120 VDC/VAC 50/60 Hz	.03 Amp max. .001 Amp min.	4 Watts max.
	CS9D-3-02	5/16" - 4"	Reed	8mm quick disconnect w/ LED	SPST Normally Open	5-120 VDC/VAC 50/60 Hz	.03 Amp max. .001 Amp min.	4 Watts max.
	CS9D-0-31	5/16" - 4"	Solid State	PNP w/ LED	Normally Open	5-28 VDC	.2 Amp max.	4.8 Watts max.
	CS9D-3-31	5/16" - 4"	Solid State	PNP 8mm quick disconnect w/ LED	Normally Open	5-28 VDC	.2 Amp max.	4.8 Watts max.
	CS9D-0-32	5/16" - 4"	Solid State	NPN w/ LED	Normally Open	5-28 VDC	.2 Amp max.	4.8 Watts max.
	CS9D-3-32	5/16" - 4"	Solid State	NPN 8mm quick disconnect w/ LED	Normally Open	5-28 VDC	.2 Amp max.	4.8 Watts max.

Magnetically operated switches (cont.)

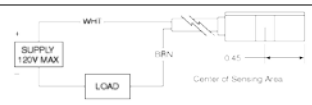
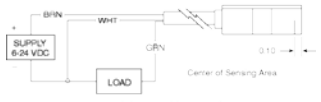
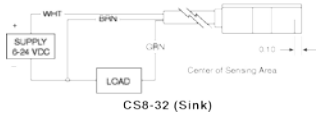
M/NEN/* Switches (switch only)

Max Voltage Drop	Enclosure Classification	Temperature Rating	Lead Wire Length	Mounting Bracket		Wiring Diagrams
2.5 Volts max.	IP 67 (NEMA 6)	14 F to 158 F	2 meters	1-1/2" bore	QM/NEN1/SB	
				2"-2-1/2" bore	QM/NEN2/SB	
.5 volts max.	IP 67 (NEMA 6)	14 F to 158 F	2 meters	3-1/4"-4" bore	QM/NEN3/SB	

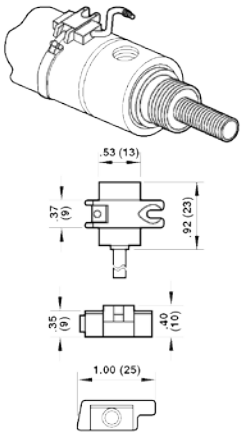
QM/NEN/* Bracket sold separately from switch



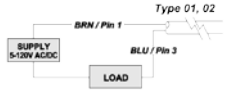
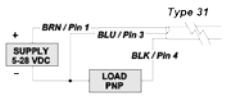
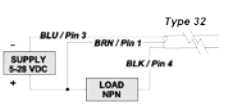
CS8* Switches (strap mount included)

Max Voltage Drop	Enclosure Classification	Temperature Rating	Lead Wire Length	Plug-In Cable	Wiring Diagrams Hard Wired
3.5 Volts	NEMA 6	-22 F to + 176 F	9 Feet	N/A	 CS8-04
3.5 Volts	NEMA 6	-22 F to + 176 F	8 mm plug-in	CS8-PIC-2 (2m) CS8-PIC-5 (5m)	
.5 Volts	NEMA 6	-22 F to + 176 F	9 Feet	N/A	 CS8-31 (Source)
.5 Volts	NEMA 6	-22 F to + 176 F	8 mm plug-in	CS8-PIC-2 (2m) CS8-PIC-5 (5m)	
.5 Volts	NEMA 6	-22 F to + 176 F	9 Feet	N/A	 CS8-32 (Sink)
.5 Volts	NEMA 6	-22 F to + 176 F	8 mm plug-in	CS8-PIC-2 (2m) CS8-PIC-5 (5m)	

CS8* Switch & Mounting strap dimensnions



CS9D* Switches (switch only, mounting bracket not included)

Max Voltage Drop	Enclosure Classification	Temperature Rating	Lead Wire Length	Plug-In Cable	Wiring Diagrams Hard Wired
3.5 Volts	NEMA 6	-20 F to + 80F		N/A	 Type 01, 02
3.5 Volts	NEMA 6	-20 F to + 80F	8 mm plug-in	CS00-00-02 (2m) CS00-00-05 (5m)	
1.0 Volts Max.	NEMA 6	-20 F to + 80F		N/A	 Type 31
1.0 Volts Max.	NEMA 6	-20 F to + 80F	8 mm plug-in	CS00-00-02 (2m) CS00-00-05 (5m)	
1.0 Volts Max.	NEMA 6	-20 F to + 80F		N/A	 Type 32
1.0 Volts Max.	NEMA 6	-20 F to + 80F	8 mm plug-in	CS00-00-02 (2m) CS00-00-05 (5m)	

CS9D-3-00 (sold separately)
Mounting Strap for:
Roundline Plus, RT, RPD, RPHD

CS9D-F-00 (sold separately)
F-Plus, FPT (9/16" - 1-1/16" Bore)

CS9D-J-00 (sold separately)
F-Plus, FPT (1-1/2" - 4" Bore)

NORGREN
ENGINEERING ADVANTAGE

Magnetically operated switches

M/50* Switches

Magnetic Switch	Switch P/N	Cable Material	Type		Wire Connection	Function	Voltage	Switching Current
 IP-66	M/50/EAN/*V	PVC	Solid State	Sinking (NPN) LED	3 Wire	Normally Open	10-30 VDC	150 mA
	M/50/EAN/CP	Plug in	Solid State	Sinking (NPN) LED	3 Wire	Normally Open	10-30 VDC	150 mA
	M/50/EAP/*V	PVC	Solid State	Sourcing (PNP) LED	3 Wire	Normally Open	10-30 VDC	150 mA
	M/50/EAP/CC	Plug in	Solid State	Sourcing (PNP) LED	3 Wire	Normally Open	10-30 VDC	150 mA
	M/50/EAP/CP	Plug in	Solid State	Sourcing (PNP) LED	3 Wire	Normally Open	10-30 VDC	150 mA
	M/50/EXP/5V (ATEX)	PVC	Solid State	Sourcing (PNP) LED	3 Wire	Normally Open	10-30 VDC	150 mA
 IP-66 with M8 plug*	M/50/LSU/*V	PVC	Reed	LED	2 Wire	Normally Open	10-240 VAC 10-170 VDC	180 mA
	M/50/LSU/5U	Polyurethane	Reed	LED	2 Wire	Normally Open	10-240 VAC 10-170 VDC	180 mA
	M/50/LSU/CC	Plug in	Reed	LED	2 Wire	Normally Open	10-240 VAC 10-170 VDC	180 mA
	M/50/LSU/CP	Plug in	Reed	LED	2 Wire	Normally Open	10-60 VAC 10-75 VDC	180 mA
	M/50/LXU/5V (ATEX)	PVC	Reed	LED	2 Wire	Normally Open	10-240 VAC 10-170 VDC	180 mA
	M/50/RAC/5V (changeover)	PVC	Reed	-	3 Wire	Changeover	10-240 VAC 10-170 VDC	180 mA
*Plug sold separately	TM/50/RAU/*S (high temp.)	Silicone	Reed	-	2 Wire	Normally Open	10-240 VAC 10-170 VDC	180 mA

The M/50 switch is supplied with an adaptor which will allow it to be used in place of QM/33, QM/34, and QM/134.

Bracket for ISO/VDMA DA/8000 Series = **QM/27/2/1**
Bracket for A44000(Lintra Lite) and 90000 Series = **M/P72487**


QM/27/2/1


M/P72487

Magnetically operated switches (cont.)

M/50* Switches

Switching Power	Contact Resistance	Operating Temperature	Protection Rating	Cable Length	Plug-in Cable
4.5 W	N/A	-20 C to +80 C	IP67 (DIN 40050)	*Insert 2 = 2 Meters *Insert 5 = 5 Meters *Insert 10 = 10 Meters	N/A
4.5 W	N/A	-20 C to +80 C	IP67 (DIN 40050)	0.3 Meters with M8 x 1 Cable Plug	M/P73001/5 (PVC) M/P73002/5 (PUR) (5 meters)
4.5 W	N/A	-20 C to +80 C	IP67 (DIN 40050)	*Insert 2 = 2 Meters *Insert 5 = 5 Meters *Insert 10 = 10 Meters	N/A
4.5 W	N/A	-20 C to +80 C	IP67 (DIN 40050)	0.3 Meters with M12 x 1 Cable Plug	M/P34614/5 (PVC) M/P34595/5 (PUR) (5 meters)
4.5 W	N/A	-20 C to +80 C	IP67 (DIN 40050)	0.3 Meters with M8 x 1 Cable Plug	M/P73001/5 (PVC) M/P73002/5 (PUR) (5 meters)
4.5 W	N/A	-20 C to +50 C	IP67 (DIN 40050)	5 Meters	N/A
10 W	150m Ohm	-20 C to +80 C	IP66 (DIN 40050)	*Insert 2 = 2 Meters *Insert 5 = 5 Meters *Insert 10 = 10 Meters	N/A
10 W	150m Ohm	-20 C to +80 C	IP66 (DIN 40050)	5 Meters	N/A
10 W	150m Ohm	-20 C to +80 C	IP66 (DIN 40050)	0.3 Meters with M12 x 1 Cable Plug	M/P34614/5 (PVC) M/P34595/5 (PUR) (5 meters)
10 W	150m Ohm	-20 C to +80 C	IP66 (DIN 40050)	0.3 Meters with M8 x 1 Cable Plug	M/P73001/5 (PVC) M/P73002/5 (PUR) (5 meters)
10 W	150m Ohm	-20 C to +80 C	IP67 (DIN 40050)	5 Meters	N/A
10 W	150m Ohm	-20 C to +80 C	IP66 (DIN 40050)	5 Meters	N/A
10 W	150m Ohm	-20 C to +150 C	IP66 (DIN 40050)	*Insert 2 = 2 Meters *Insert 10 = 10 Meters	N/A