



Engineered to perform

EATON

Powering Business Worldwide

Control & signal solutions:

Signal Switch Quick Selector Chart

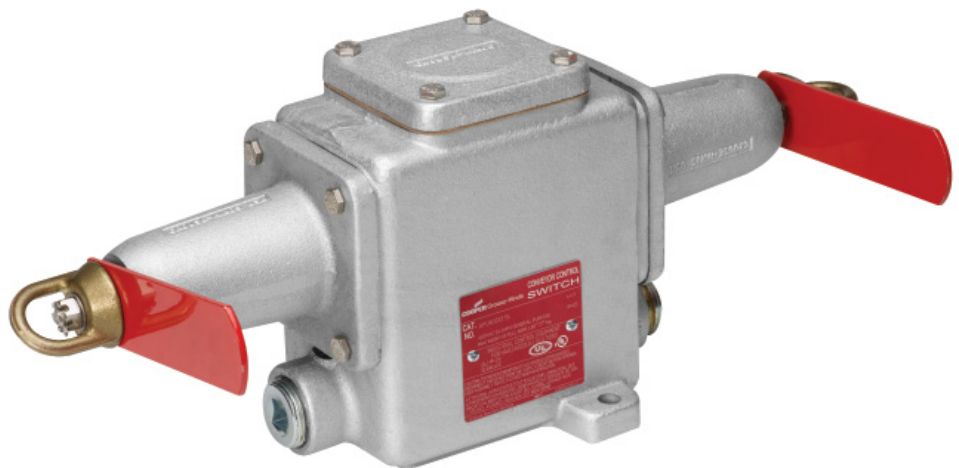
Feature	Series				
	AFU	AFC	AFK	AFS	AFM
Remote signaling	●	●	●	●	●
Audible signaling	×	×	●	×	●
Visible signaling	×	×	●	×	×
Magnetic motor control	●	×	×	×	×
Heavy-duty 600 VAC Max	●	×	×	×	×
Heavy-duty 125 VAC Max	×	●	●	●	●
Water shedding cover	×	×	●	●	●
Water shedding enclosure	●	●	×	×	×

● Feature available × Feature not available

Alignment, control & signal solutions

Crouse-Hinds belt alignment, control and signal devices for mining are designed to be a safe, rugged, worry-free answer to your productivity needs. Durable materials, innovative design and a focus on safety let you concentrate on other parts of your plant while your conveyor system stays running.

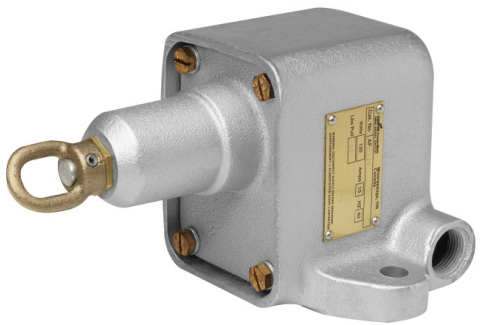
- **Visual & directional indicators**
Quick and easy identification to get you safely running again
- **Multiple conduit entry points**
Provide flexibility in retro-fit or new build applications
- **Multiple material options**
Tough, durable enclosures designed to stand up to your needs



Belt control switch application

Single-end units are used at the ends of the conveyor system and spaced maximum 30 meters (100 ft) between switches. Double-end units are used along the conveyor and spaced maximum 30 meters (100 ft) from each side of unit. Double-end units contain two red painted indicator arms on each side for actuating indication.

Engineered to perform in the harshest environments

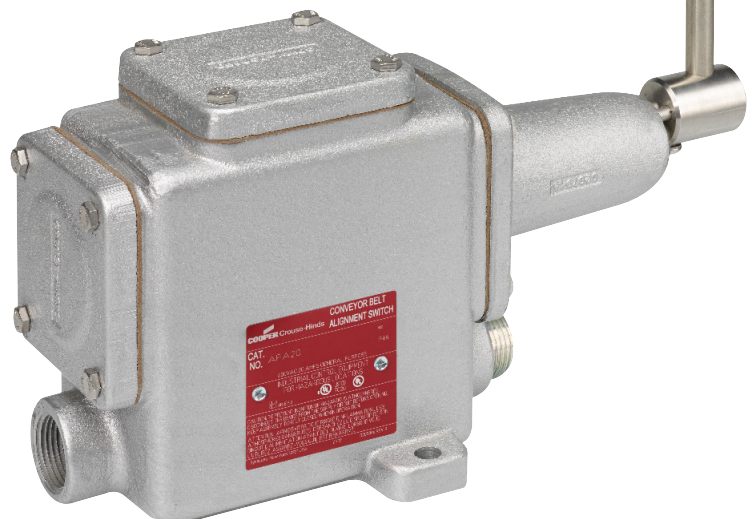


Conveyor belt alignment switch application

15Amp, 600VAC switch with two normally open and two normally closed contact arrangements. The operating arm actuates the normally closed contacts within a 7° to 15° travel of the arm (for signaling) and actuates the normally open contacts (for shut-off) within 23° to 31° of the arm's vertical position.

Over-travel protection of 85° prevents severe run-off damage to switch mechanism. The spring loaded operating arm returns the switch to normal position when belt interference is removed.

Conveyor belt alignment switches are installed on both sides of conveyor system and spaced maximum 90 meters (300ft) from each side of unit.



AFU & AFUX conveyor belt control switch

APPLICATIONS:

AFU and AFUX conveyor control switches are used:

- As emergency or normal "STOP" switch for conveyor lines, cranes, unloaders, bulk handling systems and similar equipment
- In steel mills, mining and ore and coal handling operations, automotive and other assembly lines, warehouses, loading docks and various process industry facilities
- In the control circuit of magnetic motor starters to shut down motor-driven conveyors or other machinery when switch is actuated

AFU series complies with requirements for use in Class II areas having combustible dusts that may or may not be electrically conductive.

AFU series are also gasketed for use in hosedown areas even when combustible dusts are present.

AFUX series complies with requirements for use in NEC Class I areas which are hazardous due to the presence of flammable vapors or gases. AFUX series also complies with requirements for use in NEC Class I areas which are hazardous due to the presence of flammable vapors or gases. AFUX series also complies with NEC requirements for use in Class II hazardous areas, or for use in NEC hazardous areas classified simultaneously as Class I and Class II.

FEATURES:

- Furnished with one or two end units, each containing 2-NO and 2-NC contact arrangements.
- Precision switches provide maintained contact (switches have a snap action mechanism).
- Enclosure has three 1" conduit hubs – two for horizontal through feed and one at the bottom. Cast mounting lugs on 1-1/2" centers permit attachment to the web of a standard 3" angle iron.
- In installation, the actuating line or cable is connected from a fixed point to the loop on the end unit. A pull on the line of the required operating force and with a total movement of 1/2" actuates the plunger, opens the switch and trips the red painted indicating arm forward, which locks the plunger in the actuated (switch open) position. Returning the indicating arm to its normal position resets the mechanism. A typical installation would include single end switch units at each end of the conveyor with double end switch units between.
- Depending on the size and length of line, supports at properly spaced intervals may be necessary to ensure that the line or cable weight alone will not actuate switch.

ORDERING INFORMATION:

Description	Maximum Weight of Unsupported Line or Cable Without Actuating Switch† (lbs)	Total Operating Force Required (lbs)	Contact Arrangements With 2-NO, 2-NC in Each End Unit	
			Cat#	Cat#
Single end left	15	25	AFU0333 50	AFUX0333 50
Single end left	25	50	AFU0333 60	AFUX0333 60
Single end right	15	25	AFU0333 05	AFUX0333 05
Single end right	25	50	AFU0333 06	AFUX0333 06
Double end	15	25	AFU0333 55	AFUX0333 55
Double end	25	50	AFU0333 66	AFUX0333 66

† A galvanized steel aircraft cable, supported every 10' is recommended

OPTIONS:

Description	Suffix
Finish: Corro-free™ epoxy powder coat – for coating outside only.	S752

CERTIFICATIONS AND COMPLIANCES:

AFU Series

- NEC/CEC: Class II, Division 1, Groups E, F, G
Class II, Division 2, Groups F, G
Class III
- Encl. 3, 5
- NEMA: 3, 4, 9EFG
- IP66
- UL Standard: 698
- CSA Standard: 22.2 No. 30

AFUX Series

- NEC: Class I, Division 1 & 2, Groups C, D
Class II, Division 1, Groups E, F, G
Class II, Division 2, Groups F, G
Class III
- NEMA: 3, 7CD, 9EFG
- IP65
- UL Standard: 698
- cUL

STANDARD MATERIALS:

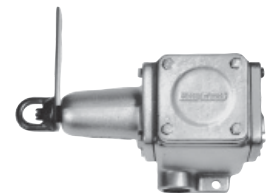
- Enclosure – Feraloy® iron alloy
- Plunger – stainless steel
- Loop – bronze
- Indicating arm – steel

STANDARD FINISHES:

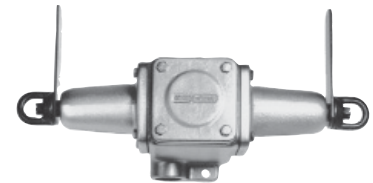
- Feraloy® iron alloy – electrogalvanized and aluminum acrylic paint
- Steel – electrogalvanized with chromate finish (red acrylic paint on indicating arm)
- Bronze – natural

ELECTRICAL RATING:

- Control circuit switch – 15 AMP, 600 VAC max.

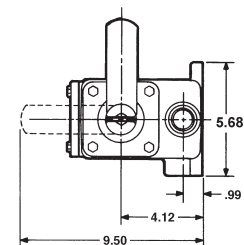
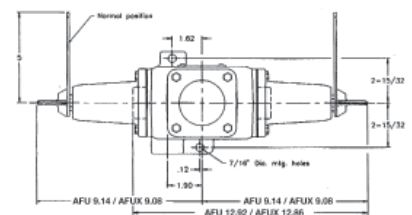


AFU0333-50 Single end left



AFU0333-66 Double end

DIMENSIONS (IN INCHES*):



*Dimensions are approximate, not for construction purposes.

AFA & AFAX conveyor belt alignment switch

APPLICATIONS:

AFA, AFAX conveyor belt alignment switches are used:

- As emergency or normal “STOP” switch for conveyor belts whenever they become misaligned or run off their tracks due to excessive speed, uneven load, leveling, breakage and/or other problems.
- In steel mills, mining and ore and coal handling operations, automotive and other assembly lines, warehouses, loading docks, grain loading and handling facilities, and various other bulk handling operations.
- In the control circuit of magnetic motor starters to shut down motor-driven conveyors in case of abnormal belt misalignment or run-off.

AFA series complies with requirements for use in Class II areas having combustible dusts that may or may not be electrically conductive.

AFA series are also gasketed for use in hosedown areas even when combustible dusts are present.

AFAX series complies with requirements for use in NEC Class I areas which are hazardous due to the presence of flammable vapors or gases. AFAX series also complies with NEC requirements for use in Class II hazardous areas, or for use in NEC hazardous areas classified simultaneously as Class I and Class II.

FEATURES:

- Furnished with precision switches that provide normally open and normally closed contacts (switches have a snap action mechanism).
- Housing consists of a center section which can be mounted either vertically or horizontally, and a switch housing with an attached switch operating arm.
- Enclosure has three 1” conduit hubs. Cast mounting lugs on 1-1/2” center permit attachment to the web of a standard 3” angle iron.
- Operating arm has 3-1/2” long stainless steel protective roller. Approximately 3/4” lateral movement of operating arm actuates switch.
- Spring loaded operating arm will automatically return switch to normal position when belt interference is removed.
- A severe conveyor belt run-off can rotate the operating arm counter-clockwise up to 85 degrees without damage to the switch mechanism.
- Installation of AFA or AFAX unit on either side of a conveyor belt allows approximately 1” or a predetermined allowable belt misalignment before switch is actuated. A typical installation would include a pair of AFA or AFAX units at each end of the conveyor belt where belt returns.

ORDERING INFORMATION:

Contact Arrangement	Diagram	Cat #
2 normally open		AFA20
2 normally closed		AFAX20

OPTIONS:

Description	Suffix
Finish: Corro-free™ epoxy powder coat – for coating outside only.	S752

CERTIFICATIONS AND COMPLIANCES:

AFA Series

- NEC/CEC:
Class II, Division 1, Groups E, F, G
Class II, Division 2, Groups F, G
Class III
- NEMA: 3, 4, 9EFG
- IP66
- UL Standard: 698
- CSA Standard: 22.2 No. 25

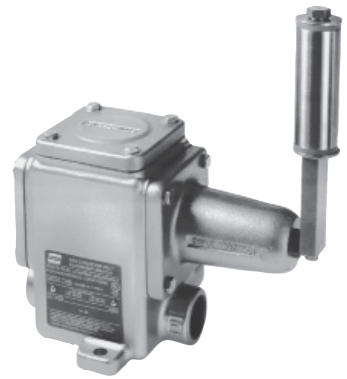
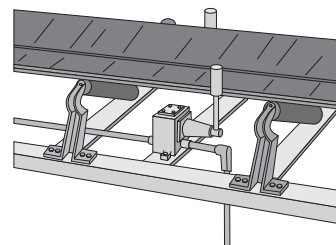
AFAX Series

- NEC:
Class I, Division 1 & 2, Groups C, D
Class II, Division 1, Groups E, F, G
Class II, Division 2, Groups F, G
Class III
- NEMA: 3, 7CD, 9EFG
- IP65
- UL Standard: 1203
- CSA Standard: 22.2 No. 30

STANDARD MATERIALS:

- Enclosure – Feraloy® iron alloy
- Bearing and operating arm – stainless steel with plastic end caps

TYPICAL AFA SWITCH APPLICATION:



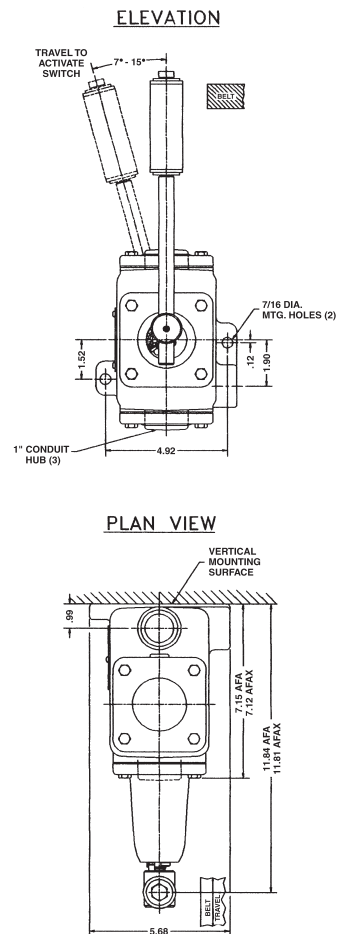
STANDARD FINISHES:

- Feraloy® iron alloy – electrogalvanized and aluminum acrylic paint
- Stainless steel – natural

ELECTRICAL RATING:

- Control circuit switch – 15 AMP, 600 VAC max.

DIMENSIONS (IN INCHES*):



*Dimensions are approximate, not for construction purposes.

AFU mine signal switch

APPLICATIONS:

AFU mine signal switches are used:

- For signalling circuits or remote control of magnetic motor starters
- In non-hazardous areas of mines or process industry facilities where a rugged enclosure is needed for protection from falling ore and other material or dripping water
- Mounted on walls or in shaft ways and actuated by pulling line or cable attached to the loop at the bottom

FEATURES:

- Sturdy rain-tight enclosure with heavy mounting lugs
- Wires enter enclosure through clearance holes in the underside
- Switches are actuated by a spring-loaded plunger which returns to the normal position when the operating force is removed
- Units are furnished with heavy duty motor control push buttons. Several of these may be interconnected electrically for remote control of a magnetic motor starter from more than one location

CERTIFICATIONS AND COMPLIANCES:

AFU Series

- NEMA: 3

STANDARD MATERIALS:

- Enclosure – Feraloy® iron alloy
- Plunger – steel
- Loop – bronze

STANDARD FINISHES:

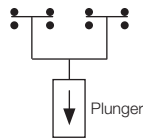
- Feraloy® iron alloy – electrogalvanized and aluminum acrylic paint
- Steel – electrogalvanized
- Bronze – natural



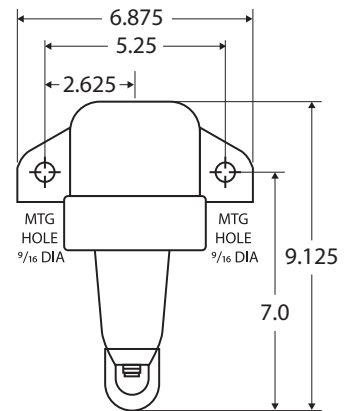
AFU mine signal switch with push button switch (cover removed)

ORDERING INFORMATION:

Maximum Weight of Line or Cable Without Actuating Switch (lbs.)	Total Operating Force Required (lbs.)	With Pushbutton Heavy Duty 600 VAC Max. Cat #
25	50	AFU254
15	25	AFU154



DIMENSIONS (IN INCHES*):



*Dimensions are approximate, not for construction purposes.

AFC mine signal switch

APPLICATIONS:

AFC mine signal switches are used:

- For remote control of signaling circuits
- In non-hazardous areas of mines or process industry facilities where a rugged enclosure is needed for protection from falling ore and other material or dripping water
- Mounted on walls or in shaft ways and actuated by pulling line or cable attached to the loop at the bottom

FEATURES:

- Cast Feraloy[®] housing
- Mounting lugs for ½" bolts or lag screws
- Single pole normally open double break switch contacts
- Switch is actuated by a spring-loaded plunger which returns to the normal position when the operating force is removed
- Standard pull spring on switch unit is 10 lbs
- Terminal block with heavy wire terminals is mounted in the box and readily accessible for ease of wiring
- Housing has ¾" NPT feed-through conduit hubs
- Intended for use with separate howlers, bells, horns or other signaling devices
- Heavy cast water shedding enclosure

STANDARD MATERIALS:

- Enclosure – Feraloy[®] iron alloy
- Cover – sheet steel
- Plunger – steel
- Loop – bronze

STANDARD FINISHES:

- Feraloy[®] iron alloy – electrogalvanized and aluminum acrylic paint
- Steel – electrogalvanized
- Bronze – natural

ELECTRICAL RATING:

- Control circuit switch – 15 AMP, 125 VAC max.



AFC mine signal switch

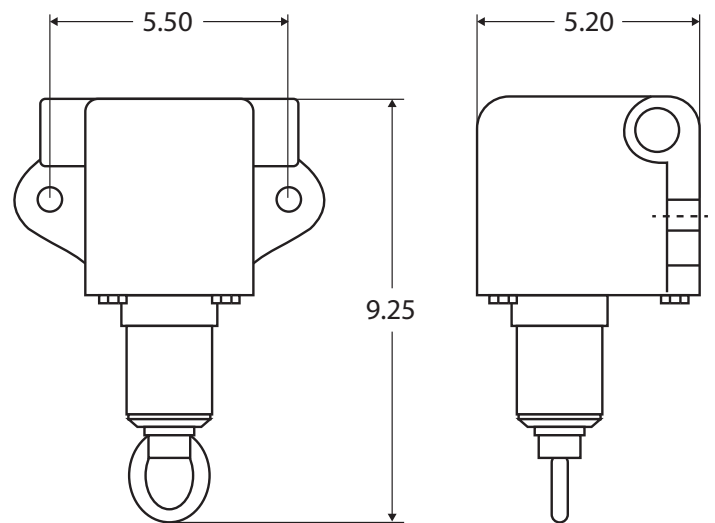
ORDERING INFORMATION

Maximum Weight of Line or Cable Without Actuating Switch (lbs.)	Total Operating Force Required (lbs.)	Cat #
7	10	AFC210
10	15	AFC215
25	50	AFC250
75	100	AFC2100

OPTIONS:

Description	Suffix
Finish: Corro-free™ epoxy powder coat – for coating outside only.	S752

DIMENSIONS (IN INCHES*):



*Dimensions are approximate, not for construction purposes.

AFS mine signal switch

APPLICATIONS:

AFS mine signal switches are used:

- For remote control of signaling circuits
- In non-hazardous areas of mines or process industry facilities where a rugged enclosure is needed for protection from falling ore and other material or dripping water
- Mounted on walls or in shaft ways and actuated by pulling line or cable attached to the loop at the bottom

FEATURES:

- Cast Feraloy® housing with water shedding cover
- Mounting lugs for ½" bolts or lag screws
- Single pole normally open double break switch contacts
- Switch is actuated by a spring-loaded plunger which returns to the normal position when the operating force is removed
- Standard pull spring on switch unit is 10 lbs
- Terminal block with heavy wire terminals is mounted in the box and readily accessible for ease of wiring
- Housing has ¾" NPT conduit hub on the bottom and slide-on steel, water shedding cover for convenient access
- No tools required, no screws to remove, no wiring to disturb for inspection or switch replacement

STANDARD MATERIALS:

- Enclosure – Feraloy® iron alloy
- Cover – sheet steel
- Plunger – steel
- Loop – bronze

STANDARD FINISHES:

- Feraloy® iron alloy – electrogalvanized and aluminum acrylic paint
- Steel – electrogalvanized
- Bronze – natural

ELECTRICAL RATING:

- Control circuit switch – 15 AMP, 125 VAC max.



AFS mine signal switch

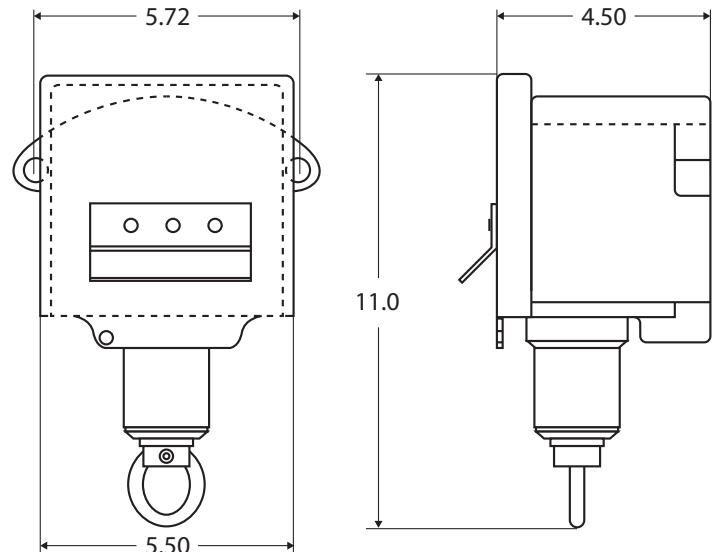
ORDERING INFORMATION:

Maximum Weight of Line or Cable Without Actuating Switch (lbs.)	Total Operating Force Required (lbs.)	Cat #
7	10	AFS210-CD
10	15	AFS215-CD
25	50	AFS250-CD
75	100	AFS2100-CD

OPTIONS:

Description	Suffix
Finish: Corro-free™ epoxy powder coat – for coating outside only.	S752

DIMENSIONS (IN INCHES*):



*Dimensions are approximate, not for construction purposes.

AFM mine signal switch

APPLICATIONS:

AFM mine signal switches are used:

- For audible signaling and remote signaling
- In non-hazardous areas of mines or process industry facilities where a rugged enclosure is needed for protection from falling ore and other material or dripping water
- Mounted on walls or in shaft ways and actuated by pulling line or cable attached to the loop at the bottom

FEATURES:

- Cast Feraloy[®] housing with sheet steel water shedding cover
- Mounting lugs for ½" bolts or lag screws
- Single pole normally open double break switch contacts
- Switch is actuated by a spring-loaded plunger which returns to the normal position when the operating force is removed
- Standard pull spring on switch unit is 10 lbs
- Buzzer provides audible signal
- Terminal block with heavy wire terminals is mounted in the box for ease of wiring
- Housing has ¾" conduit hub on bottom and slide-on steel, water shedding cover for convenient access
- No tools required, no screws to remove, no wiring to disturb for inspection or replacement of internal units
- 10 watt continuous duty resistor mounted in panel to keep interior dry

STANDARD MATERIALS:

- Enclosure – Feraloy[®] iron alloy
- Cover – sheet steel
- Plunger – steel
- Loop – bronze

STANDARD FINISHES:

- Feraloy[®] iron alloy – electrogalvanized and aluminum acrylic paint
- Steel – electrogalvanized
- Bronze – natural

ELECTRICAL RATING:

- Control circuit switch – 15 AMP, 125 VAC max.



AFM mine signal switch

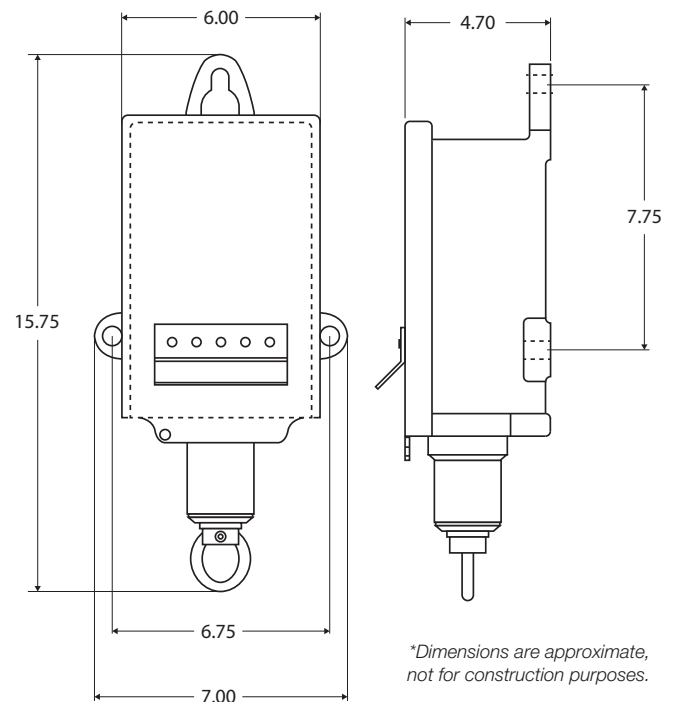
ORDERING INFORMATION:

Maximum Weight of Line or Cable Without Actuating Switch (lbs.)	Total Operating Force Required (lbs.)	Cat #
7	10	AFM211060
10	15	AFM2110605
25	50	AFM21106050
75	100	AFM211060100

OPTIONS:

Description	Suffix
Finish: Corro-free™ epoxy powder coat – for coating outside only.	S752

DIMENSIONS (IN INCHES*):



AFK mine signal switch

APPLICATIONS:

AFK mine signal switches are used:

- For visible, audible and remote control of signaling circuits
- In non-hazardous areas of mines or process industry facilities where a rugged enclosure is needed for protection from falling ore and other material or dripping water
- Mounted on walls or in shaft ways and actuated by pulling line or cable attached to the loop at the bottom

FEATURES:

- Cast Feraloy® housing with water shedding cover
- Mounting lugs for ½" bolts or lag screws
- Single pole normally open double break switch contacts
- Switch is actuated by a spring-loaded plunger which returns to the normal position when the operating force is removed
- Standard pull spring on switch unit is 10 lbs
- Visible signal observable from the front and both sides through portholes
- Buzzer provides audible signal
- Terminal block with heavy wire terminals is mounted in the housing and readily accessible for ease of wiring
- Housing has ¾" conduit hub on bottom and slide-on steel, water shedding cover for convenient access
- No tools required, no screws to remove, no wiring to disturb for inspection or replacement of internal units
- 10 watt continuous duty resistor mounted in panel to keep interior dry

ORDERING INFORMATION:

Maximum Weight of Line or Cable Without Actuating Switch (lbs.)	Total Operating Force Required (lbs.)	Cat #
7	10	AFK211060
10	15	AFK2110605
25	50	AFK21106050
75	100	AFK211060100

OPTIONS:

Description	Suffix
Finish: Corro-free™ epoxy powder coat – for coating outside only.	S752

STANDARD MATERIALS:

- Enclosure – Feraloy® iron alloy
- Cover – sheet steel
- Plunger – steel
- Loop – bronze

STANDARD FINISHES:

- Feraloy® iron alloy – electrogalvanized and aluminum acrylic paint
- Steel – electrogalvanized
- Bronze – natural

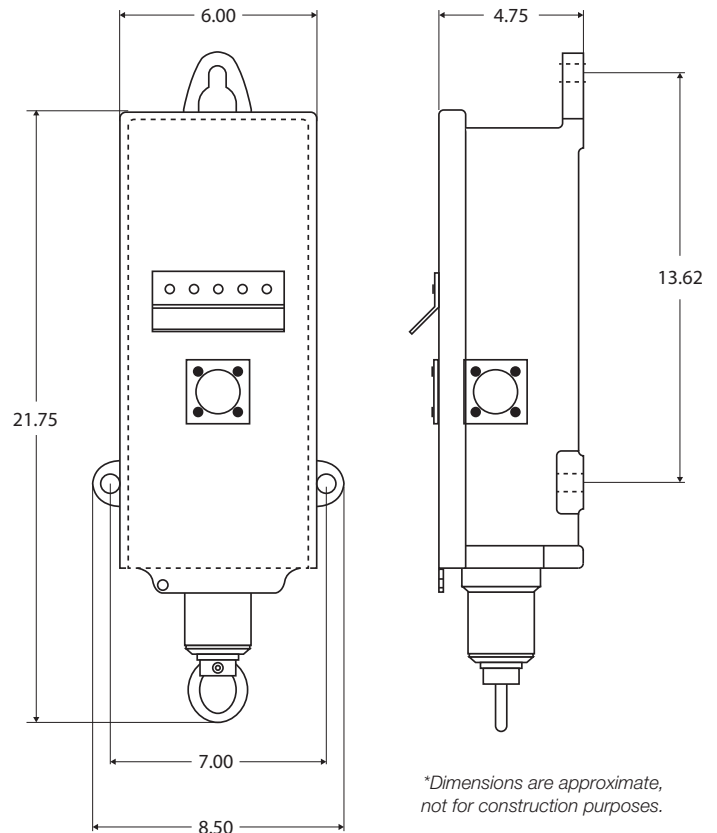
ELECTRICAL RATING:

- Control circuit switch – 15 AMP, 125 VAC max.



AFK mine signal switch

DIMENSIONS (IN INCHES*):



*Dimensions are approximate, not for construction purposes.

Hazardous areas & equipment tables

AREA CLASSIFICATION

REGULATORY ORGANIZATION	HAZARD	FLAMMABLE MATERIAL PRESENT CONTINUOUSLY	FLAMMABLE MATERIAL PRESENT INTERMITTENTLY	FLAMMABLE MATERIAL PRESENT ABNORMALLY
IEC/ATEX	Gas/Vapor	Zone 0	Zone 1	Zone 2
	Dust	Zone 20	Zone 21	Zone 22
NEC® 501	Gas/Vapor	Class I, Division 1	Class I, Division 1	Class I, Division 2
NEC® 505	Gas/Vapor	Class I, Zone 0	Class I, Zone 1	Class I, Zone 2
NEC® 502	Dust	Class II, Division 1	Class II, Division 1	Class II, Division 2
NEC® 506	Dust	Zone 20	Zone 21	Zone 22
CA CEC Sec. 18	Gas/Vapor	Class I, Zone 0	Class I, Zone 1	Class I, Zone 2
CA CEC Sec. 18	Dust	Class II, Division 1	Class II, Division 1	Class II, Division 2

- Items suitable for hazardous areas are indicated as such
- CA Classification PER CSAC22.1 Canadian Electrical Code (CEC Section 18 or Anex J)
- EU Classification per EN 60079-10
- US Classification per ANSI/NFPA 70 National Electrical Code® (NEC®) Article 500 or Article 505

GAS/EQUIPMENT GROUPING

TYPICAL GAS	US (NEC® 505) • CA (CEC SECTION 18) • EU • IEC	US (NEC® 500) • CA (CEC ANNEX J)
Acetylene	Group IIC	Class I Group A
Hydrogen	(Group IIB + H ₂)	Class I Group B
Ethylene	Group IIB	Class I Group C
Propane	Group IIA	Class I Group D
Methane	Group I*	Mining*

*Not within scope of NEC®. under jurisdiction of MSHA. Not within scope of CEC

INGRESS PROTECTION (IP) CODES

CODE	FIRST CHARACTERISTIC NUMERAL	SECOND CHARACTERISTIC NUMERAL
1 ST OR 2 ND Numeral	Protection Against Solid Bodies	Protection Against Liquid
0	No protection	No protection
1	Objects greater than 50 mm	Vertical (90°) dripping water
2	Objects greater than 12 mm	70° to 90° dripping water
3	Objects greater than 2.5 mm	Sprayed water
4	Objects greater than 1 mm	Splashed water
5	Dust-protected	Water jets
6	Dust-tight	Heavy seas
7	–	Effects of immersion
8	–	Indefinite immersion

APPROXIMATE U.S. ENCLOSURE TYPE EQUIVALENT TO IP RATING*

Type > IP		Type > IP		Type > IP	
1	10	3S	54	6 and 6P	67
2	11	4 and 4X	55	12 and 12K	52
3	54	5	52	13	54
3R	14	–	–	–	–

*NEMA Enclosure Type can be converted to IP Code Rating, but IP Codes cannot be converted to NEMA Enclosure Type

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