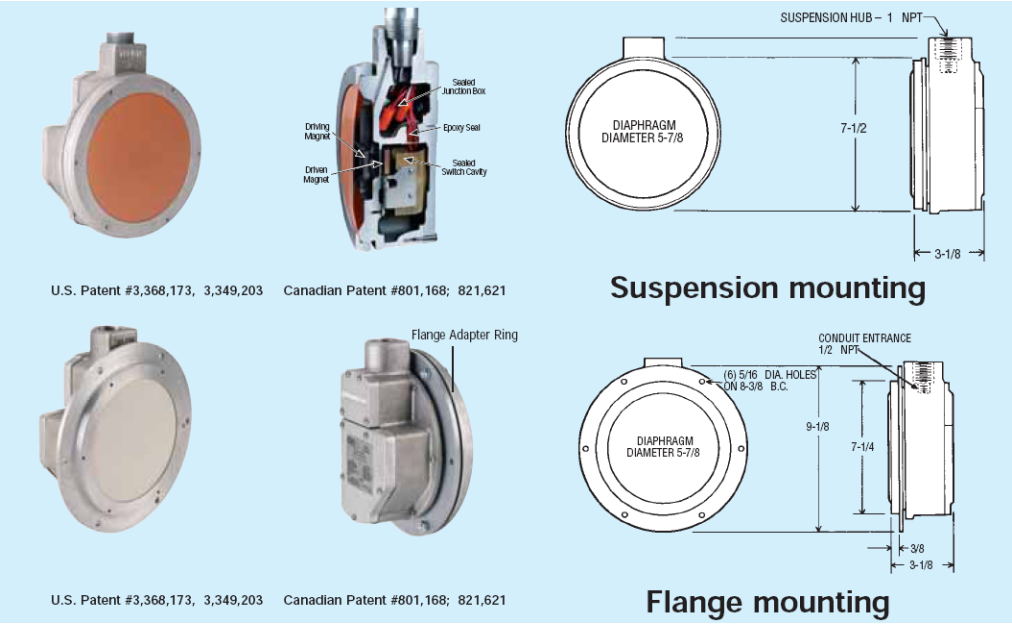
MODEL DLS
ULTRA MAG™ LEVEL SWITCH

Bulk Pro® SYSTEMS L.L.C.

Perfect for Sensing Bulk Solids and Powders



Bulk Pro Systems Model DLS Diaphragm Level Switch is ideal for level control of bulk solids and powders. The DLS Diaphragm Level Switch has a unique, patented Magnetic Linkage that isolates the electrical compartment from the controlled product, reducing maintenance and improving sensitivity. The sealed switch compartment and sealed leads yield the upmost in reliable operation. A wide selection of diaphragms and switches are available with choices of flange or suspension mounting to fit your specific application. The dry level Ultra Mag™ level switch is extremely sensitive and very economical. The magnetic linkage makes this simple explosion proof diaphragm switch the most rugged and reliable level control for a variety of products.

Mounting Selection: A choice of either suspension or flange mount is available to apply to your application. Flange mounting is the best choice for control of low and intermediate level in vessels containing granular product that does not "bridge", "rat hole" or otherwise build-up on the vessel walls. Choose suspension mounting for high level in vessels and for better operation with "bridging" product. See next page for more information on suspension and flange mounting kits**.** Note that the Mounting configuration is represented by the letter "S" for suspension or "F" for flange which is the second digit in the part number on the next page.

Diaphragm Selection: A wide variety of diaphragms are available to match product bulk density, flowability, abrasiveness and temperature requirements while providing maximum sensitivity. The best choice for vessels subject to pressure or vacuum is "breathable" fabric (P Series), requiring no venting. Non-porous elastomer (G Series) type diaphragms are the best choice for more abrasive products and broader temperature range applications. Venting is always required with the G Series and is used in pressurized vessels, venting to the tank pressure atmosphere is required to allow pressure equalization. A slide rule "Diaphragm Selector" is available from the factory to help you choose the diaphragm best suited to you application.

SPECIFICATIONS:

Service: Compatible with bulk solids or powders.
Wetted Materials:
Mounting flange: See model chart. Aluminum or 304 SS
Diaphragm: See model chart. Urethane, Buna-N, PTFE, Silicone Rubber, Polyester, Fluoroelastomers, White Buna (food grade) or EPDM.
Temperature Limits: Depends on diaphragm material, see model chart. Standard switch: -40 to 185°F (-40 to 85°C), High temperature switch: -40 to 350°F (-40 to 176°C).
Pressure Limit: 60 PSIG (4.14 bar)
Enclosure Rating: general purpose or weatherproof and explosion proof. See model chart.
Switch Type: See model chart.
Electrical Rating: See model chart
Electrical Connections: 18 guage solid core, 600 volt TEW 105°C, style 1015. Epoxy sealed at conduit entrance. 12" (304.8mm) long.
Conduit Connection: 1/2" female NPT
Process Connection: For flanged model standard is 8-3/8" (212.725mm) diameter bolt hole circle.
Mounting Orientation: Flange mount or suspend depending on application.
Set-Point Adjustment: Internal screw
Weight: 7lb (3.18 kg)
Options: Suspension kits and flange adapter rings
Agency Approvals: UL and CSA

SELECTION GUIDE

Diaphragm Selection Guide

Product	Suggested Diaphragm*
Abrasive	3D
Aggregate	3D
Alumina	3D
Ash, Dry	3D
Baking Powder	7B
Baking Soda	7B
Barite	3D
Bark, Ground	6G
Barley, Ground or Meal	17
Barley, Whole	4B
Beans, Edible,	4B
Bentonite	3D
Bond, Foundry	17
Carbon Black	7A
Cement, Klinker	8A
Cement, Portland	4B
Chips, Hogged Fuel	6G
Coal	3D
Compost	5A
Core Sand, Foundry	3D
Corn, Shelled	8A
Diatomaceous Earth	7A
Drill Mud	3D
Flour	7B
Fly Ash	3D
Glass Batch	3D
Gravel	3D
Iron Ore, Crushed	3D
Kaolin Clay	3D
Lime, Hydrated	5A
Lime, Stone	3D
Oats	4B
Peanuts in Shell	7A
Peanuts, Shelled	3D
Perlite	7A
Phosphate, Rock	3D
Polyethylene Powder	7A
Polyethylene Resin	17
Polypropylene Fluff	7A
Polypropylene Powder	7A
Polypropylene Resin	17
Polystyrene Beads	3D
Pot Ash	3D
Powdered Metal	3D
Powdered Ore	3D
PVC Powder	7A
PVC Resin	17
Rice	17
Rye	3D
Salt	3D
Sand, Dry	3D
Sand, Dry Silica	3D
Sand, Foundry Prepared	5A
Sand, Shake Out	3D
Sawdust, Dry	6G
Sea Coal	3D
Sesame Seed	3D
Shale, Crushed	3D
Silica, Flour	3D
Sludge, Sewage Dried	1A
Sludge, Sewage, Ground	1A
Soda Ash	3D
Soybeans, Cracked	3D
Soybean, Flake	7A
Soybean, Flour,	7A
Soybean Meal	3D
Soybean, Whole	3D
Sugar Beets, Whole	6H
Sugar Refined	7B
Sunflower Seed	7A
Taconite Pellets	3D
Talcum Powder	3D
Walnut Shells, Crushed	3D
Wheat	8A
Wheat, Wet	5A
Wood, Chips	6G
Wood, Dust	6G

*Diaphragm codes become 4th and 5th characters in model number.

Complete Model Chart

Consult factory for pricing on UltraMag™ switches

PREFIX - Certification

E X = Explosion-proof (UL & CSA) Class I, Div I & II, Groups C & D; Class II, Div I & II, Groups E, F & G.
X = Explosion-proof (CSA) Class II, Div I & II, Groups F & G.
= General Purpose (No Code)

1ST DIGIT-Basic Magnetic Pressure Sensing Series

G = Elastomeric Diaphragm-Venting required*. (Diaphragms 1A - 8A)
P = Breathable Fabric Diaphragm-No venting required. (Diaphragms 16 & 17 only)

2ND DIGIT-MOUNTING (Top = Suspension/Side=Flanged)

S = Suspended (G series require suspension vent fittings)* Subtract 10 lbs./cu. ft.-greater sensitivity.
F = Flanged, Aluminum standard
T = Flanged, 304 SS

3RD DIGIT-HOUSING MATERIAL

D = Aluminum
A = Aluminum, Anodized
E = Aluminum, Epoxy Coated

4TH & 5TH DIGITS-DIAPHRAGM MATERIAL (TEMPERATURE) (BULK DENSITY)

G 1 A = Fluoroelastomer, black, .025" thick, (25 to 300°F), (>30 lbs/cu. ft.)
G 2 A = Neoprene, black, .025" thick, (-30 to 220°F), (>30 lbs/cu. ft.)
G 3 D = Urethane, .031" thick, (10 to 150°F), (>30 lbs./cu. ft.)
G 3 E = Urethane, orange, .062" thick, (10 to 150°F), (>90 lbs/cu. ft.)
P 3 F = Urethane, "3D" elastomer w/bumper for removable overlays, orange, (10 to 150°F), (>90 lbs/cu. ft.)
P G 4 B = Buna-N, black, .020" thick, (-20 to 212°F), (20 to 90 lbs./cu. ft.)
G 5 A = PTFE/Glass on Sil Rubber, .024" thick, (-40 to 350°F), (>35 lbs./cu. ft.)
G 6 D = Silicone Rubber, gray, .062" thick, (-40 to 350°F), 15 to 30 lbs/cu. ft.)
G 6 E = Silicone Rubber on Glass, red, .032" thick, (-40 to 350°F), (>90 lbs/cu. ft.)
G 6 G = "6C" w/Urethane overlay, (-40 to 350°F), (wood chips diaphragm with "A2")
G 6 H = "6C" w/bumper for removable overlays 901-120, -132, -134, gray, (-40 to 350°F), (>90 lbs/cu. ft.)
G 7 A = Silcone Rubber on Glass (White), .015" thick, (-40 to 350°F), (5 to 40 lbs./cu. ft.)
G 7 B = Buna-N (Food Applications-white), .060" thick, (-20 to 212°F), (30 to 90 lbs./cu. ft.)
G 8 A = EPDM, black, .036" thick, (-40 to 275°F), (40 to 90 lbs./cu. ft.)
P 1 6 = Polyester Filter Fabric, white, 150 micron permeability, (-30 to 275°F), (30 to 90 lbs./cu. ft.)
P 1 7 = Polyester Nitex, white, 15 micron permeability (-30 to 275°F), (30 to 90 lbs./cu. ft.)

6TH DIGIT-SWITCH TYPE

A = Standard, SPDT, 15A @ 125, 250 VAC
T = High Temp, SPDT, 5A @ 125, 250 VAC; 24 VDC(**)
V = High vibration, SPDT, 15A @ 125, 250 VAC
G = Gold contacts, SPDT, 1A @ 125 VAC, ½ A @ 24 VDC

SUFFIX-SPECIAL CONTROLS

-A1 = LVP with Diaphragm cover plate
-A2 = Wood Chip Control (with "6G" diaphragm only)
-A3 = High sensitivity actuator (for very light product)

E X G S D 3 D A = EXAMPLE MODEL NUMBER*-

* GS - G series suspended controls require suspension vent fittings.
(**)Non-UL/CSA listed

Note: The "EX" prefix must he added to the 6-digit model number for "explosion-proof standard". General purpose units do not require the "EX" or other prefix. See the "Complete Model Chart" on this page.

Suspension Mounting is normally used for high level mounting in vessels. For product over 20 lb/ft³, the level switch (diaphragm face) should be located about 1/8 of the distance from the vessel wall to the fill point of the product. For product less than 20 lb/ft³, the unit should be located closer to the fill point of the product. One half the distance from the vessel wall to the fill point. Pressure required to depress the diaphragm and trip the switch is in the range of 5-15 oz in the horizontal direction (perpendicular to the diaphragm). Suspension mounting provides the easiest vertical adjustment capability, greatest sensitivity and best maintenance conditions.

Suspension Assembly Kits: Pre-assembled kits are available from the factory or you can build your own kits using standard pipe fittings. Pipes and fittings are normally galvanized steel, but aluminum and stainless steel pipes and fittings are available. Units pictured on the previous page are secured to a steel cover plate that rests on a rectangular steel flange welded to the vessel. Aluminum and stainless cover plates and flanges are also available. Standard 48" long x 1" pipe provides a working depth up to 48", longer pipe is available. GS series switches have upper (L^1 = 28" standard) and lower (L^1 = 20" standard) 1" pipes, with a tee (for stilling pot) in between. A stilling pot is required to equalize the pressure and keep dirt from building up behind the diaphragm. PS series require a 1/2" conduit in 1" suspension pipe for explosion proof applications. The 1/2" conduit (56" standard length) is a standard part of the GS series assembly.

Model Number
GSD3DA
GFD3DA
PSD16A
PFD16A

Suspension Assembly Kits

"P" and "G" Series Suspension Assembly Kits	
Model Number	**Description**
901-409	"P Series Suspension Assembly includes 1/2" pipe (56" Std length), 1" pipe (48" Std length), 1" pipe coupling, 1-1/2 NPT strain relief on 1" pipe. Galvanized mild steel pipe, explosion proof, standard.
901-412	"G" Series Suspension Assembly includes 1/2" pipe (56" Std length), watertight strain relief and 1" coupling, upper 1" pipe (28" Std length), lower 1" pipe (20" Std length), strain relief with 1-1/2" NPT, 1"x1"x1" Tee, 1" Street Ell and 1" pipe-4" long Stilling Pot. Galvanized steel pipe, explosion proof, standard.
Specials include aluminum or stainless steel assemblies. Flange port and cover assemblies are sold separately. CONSULT FACTORY for details.	

Bulk Pro Systems, LLC - 13361 Aberdeen ST NE - Ham Lake, MN 55304 USA
Ph: 763-767-0003, Fax: 763-767-3282, www.bulkprosystems.com