CCS™ DUAL-SNAP® COMPOSITE CATALOG

PRESSURE AND TEMPERATURE SWITCHES
AN ADJUSTABLE STANDARD SWITCH FOR EVERY APPLICATION

INDEX-INSIDE COVER

CCS™ *ISO 9002 CERTIFIED*

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PLACE BUSINESS
CARD HERE

WHERE TO BUY

INDEX AND SELECTION GUIDE*

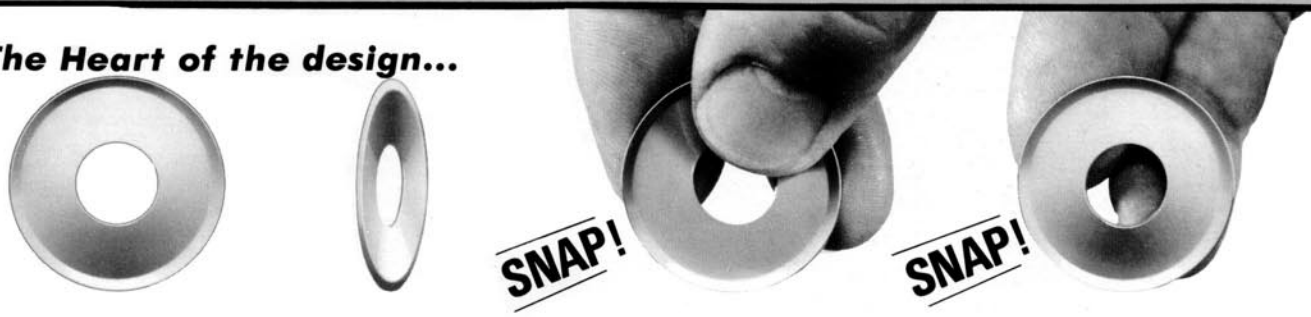
NOTE:
Patents apply to the following model switch series:
Patent No. 4,152,559 applies to all 604, 604P, 646, 646GZE, 604D, 646DZE, 604T and 646TE series.

***CAUTIONS FOR INSTALLATION AND USE OF CCS PRESSURE, TEMPERATURE, AND FLOW SENSORS:**

WARNING: If this switch is used to protect equipment or personnel from unsafe pressure or to guard against the hazardous release of contained substances, it must be installed and operated in accordance with applicable codes, regulations and standards. This switch must be used in conjunction with system design(s) or procedure(s) necessary to mitigate any hazard resulting from its failure. Conform to installation instructions accompanying this switch. Individuals who ignore this warning may suffer serious or fatal injury and do so at their own risk. Custom Control Sensors is not liable for any misuse, abuse, suitability or adequacy of user's application of the switch. Service by qualified personnel only. MEDIA: System media must be compatible with the specified wetted materials. Oxygen media cannot be utilized without special cleaning and packaging provided by the factory. OPERATING CONDITIONS: The electrical load, ambient temperature ranges, and proof pressure specified must not be exceeded. Surge pressurization should not exceed 200,000 psi per second to diaphragm switch models and 1 million psi per second to piston switch models. In installations that will be subject to severe shock, vibration, or other hostile environment conditions, contact the factory to determine suitability. Field adjustable units should be set no closer than 1/2 turn from either end of their adjustment range. UL/CSA/BASEEFA/CENELEC: Field repairs or modifications of "listed" units may void the listing of the repaired or modified unit.

How a Wide Range DUAL-SNAP® Pressure Switch Works

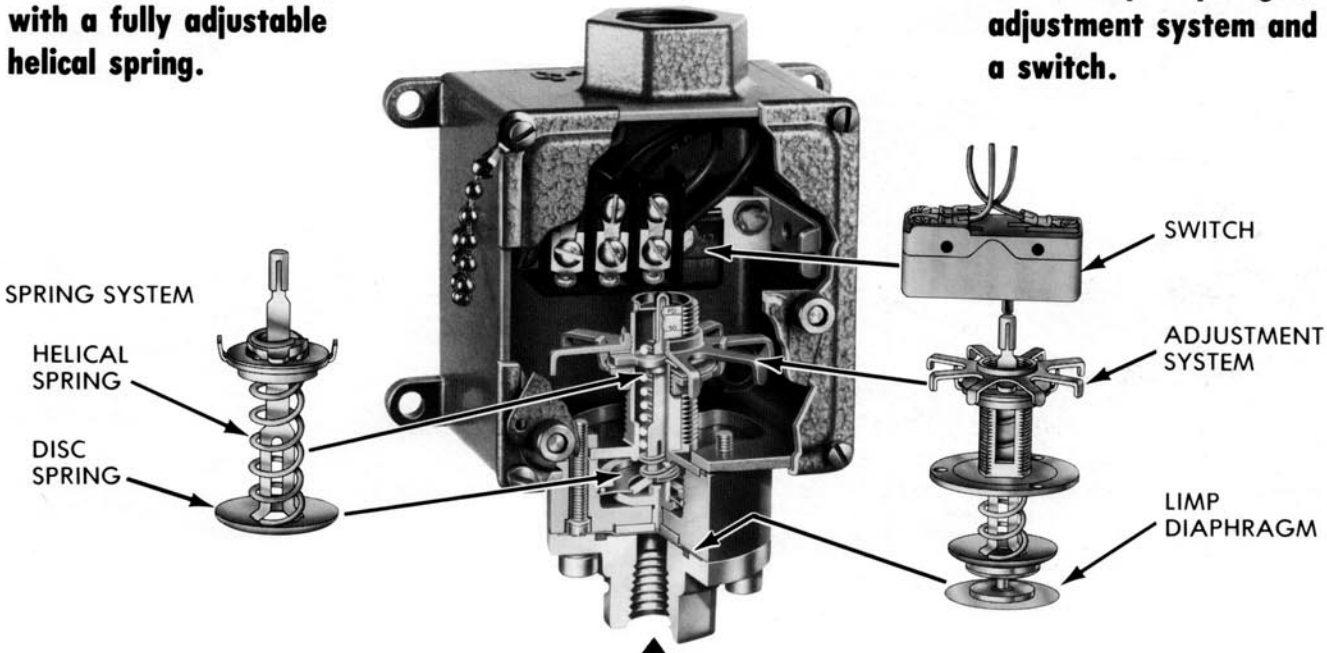
1 *The Heart of the design...*



- It's a convex disc spring with a center hole.
- It snaps to concave under pressure. And it snaps back when pressure is released.

2 Back up the disc spring with a fully adjustable helical spring.

3 Add a limp diaphragm, adjustment system and a switch.



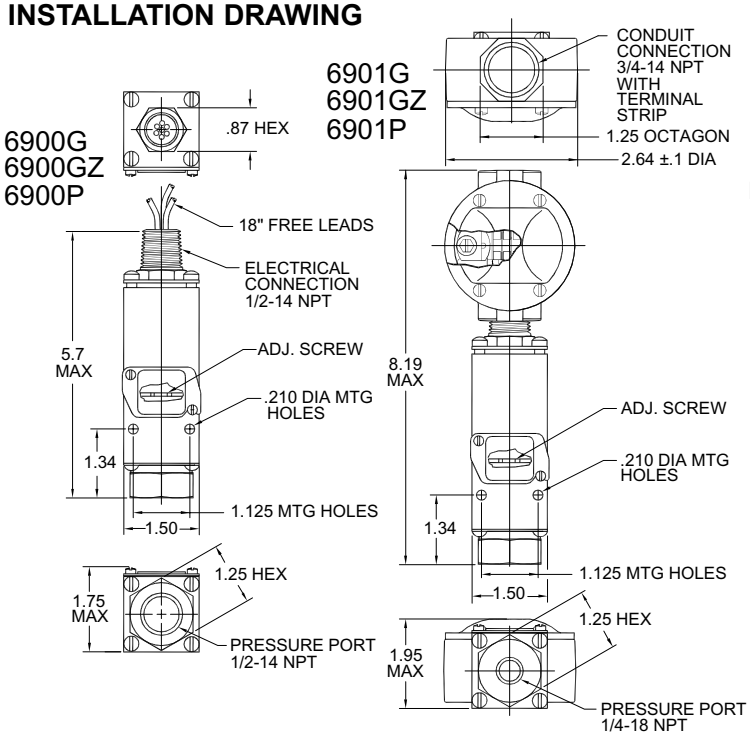
This unique application of the disc spring overcomes common switch problems. The helical spring can be compressed or elongated and locks firmly at any load. This permits precise adjustment over an extremely wide range of set points.

The diaphragm is not a sensing element. It simply seals the media and transfers pressure to the disc spring, which responds instantaneously when system pressure reaches the set point.

4 Complete the system with components suitable for specific pressures, fluids and environments...and you have a Wide Range DUAL-SNAP® Pressure Switch with these advantages:

- Set points stay set — not sensitive to shock, vibration, temperature variations, or other ambient conditions.
- No "tracing" of fluctuating pressures — no "teasing" of the electrical element. The switch is either "on" or "off."
- Reduces the adverse effects of pump ripple, contact chatter, fatigue, premature wear, and other common switch problems.
- Maximum life expectancy with lifelong reliability and precise repeatability assured.
- An exceptional range of set points in one switch.

INSTALLATION DRAWING



Pressure 1 to 6500 psi

Standard Features:

- *NEMA 4, 13*
- *Weatherproof,*
- *6900 only—CSA Certified enclosure 4 non-hazardous locations (File LR22665) ,*

Ambient Temp. Range:
-30°F to +160°F or
-34°C to +71°C.

How to Order:
1. Specify model number

OPERATING AND ORDERING DATA:

PRESSURE SWITCHES MODEL 6900G — **FREE LEADS** • **1/4" ALUMINUM PRESSURE PORT & POLYIMIDE DIAPHRAGM**

PRESSURE SWITCHES MODEL 6901G — **TERMINAL STRIP** • **1/4" ALUMINUM PRESSURE PORT & POLYIMIDE DIAPHRAGM**

Max. Sys. Press. psi	Proof (Test) Press. psi	Adj.Set-Point Range On Incr. Press. psi	Adj.Set-Point Range On Decr. Press. psi	Approx Dead-band psi	Free Leads MODEL SPDT	Free Leads MODEL DPDT	Terminal Strip MODEL SPDT	Terminal Strip MODEL DPDT	Wetted Parts
500	750	3-20	1-18	2	6900G12	6900GM12	6901G12	6901GM12	Aluminum Polyimide Buna N
500	750	6-75	2-71	4	6900G14	6900GM14	6901G14	6901GM14	
1500	2000	12-150	4-142	8	6900G16	6900GM16	6901G16	6901GM16	
1500	2000	30-375	10-355	20	6900G18	6900GM18	6901G18	6901GM18	
2000	3000	300-1000	250-950	50	6900G20	6900GM20	6901G20	6901GM20	
3000	4500	700-2500	600-2400	100	6900G22	6900GM22	6901G22	6901GM22	

PRESSURE SWITCHES MODEL 6900GZ — **FREE LEADS** • **1/2" STAINLESS STEEL PRESSURE PORT & DIAPHRAGM**

PRESSURE SWITCHES MODEL 6901GZ — **TERMINAL STRIP** • **1/2" STAINLESS STEEL PRESSURE PORT & DIAPHRAGM**

500	750	3-20	1-18	2	6900GZ12	6900GZM12	6901GZ12	6901GZM12	316 SS Viton
500	750	9-75	3-69	6	6900GZ14	6900GZM14	6901GZ14	6901GZM14	
1500	2000	18-150	6-138	12	6900GZ16	6900GZM16	6901GZ16	6901GZM16	
1500	2000	45-375	15-345	30	6900GZ18	6900GZM18	6901GZ18	6901GZM18	
2000	3000	300-1000	225-925	75	6900GZ20	6900GZM20	6901GZ20	6901GZM20	
3000	4500	700-2500	520-2320	180	6900GZ22	6900GZM22	6901GZ22	6901GZM22	

• FOR HIGH CYCLING - LONG LIFE HYDRAULIC APPLICATIONS

PRESSURE SWITCHES MODEL 6900P — **FREE LEADS** • **PISTON PRESSURE SWITCH 1/4" ALUMINUM PRESSURE PORT**

PRESSURE SWITCHES MODEL 6901P — **TERMINAL STRIP** • **PISTON PRESSURE SWITCH 1/4" ALUMINUM PRESSURE PORT**

Hyd. psi	Hyd. psi								
2000	3000	15-200	5-190	10	6900P32	6900PM32	6901P32	6901PM32	Aluminum
3000	5000	150-1600	40-1490	110	6900P34	6900PM34	6901P34	6901PM34	400 SS
5000	7500	500-3200	330-3030	170	6900P36	6900PM36	6901P36	6901PM36	Buna N
10,000	13,000	2000-6500	1500-6000	500	6900P38	6900PM38	6901P38	6901PM38	Teflon

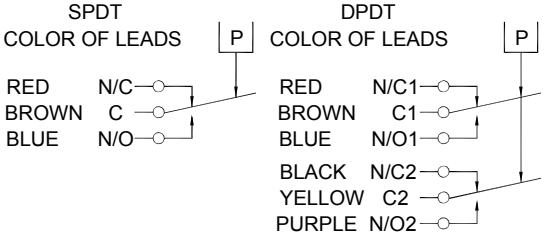
ELECTRICAL CHARACTERISTICS: Rating of Switch Element

VOLTS	AMPERES SPDT Res.	AMPERES DPDT "M" Res.
125 AC — 50/60 Hz	11.0	11.0
250 AC — 50/60 Hz	11.0	11.0
30 DC	5.0	5.0
125 DC	0.5	0.5

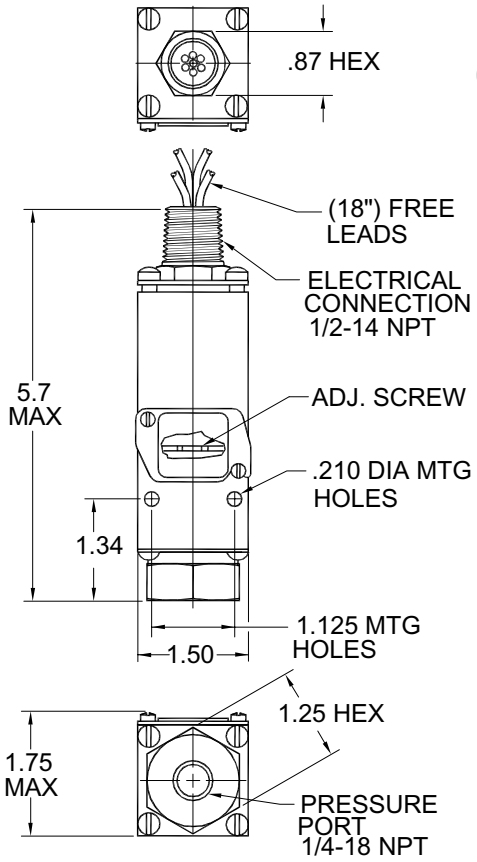
SHIPPING WEIGHTS:

Models:	Oz	Grams
6900G*	13	368
6900P*	13	368
6900GZ*	15	425
6901G*	20	567
6901P*	20	567
6901GZ*	23	652

MODELS 6900G,6900GZ & 6900P ONLY
SCHEMATIC AND WIRING CODE



INSTALLATION DRAWING



6900GE
6900PE

Pressure 1 to 6500 psi

Standard Features:

•U.L./CSA Explosion Proof: Div. 1, 2 Div. 1 explosion-proof and hermetically sealed electrical assembly P/N 46-1058 (46-1061 for "M" model option), listed by both Underwriter's Laboratories, Inc. (File No. E32961) and CSA Testing Laboratories (File No. 22921) for hazardous locations, Class 1, Groups A, B, C, and D; Class 2 Groups E, F, and G.

•NEMA 4, 7, 9, 13.

Ambient Temp. Range:

-30°F to +160°F or
-34°C to +71°C.

How to Order:
1. Specify model number

OPERATING AND ORDERING DATA:

PRESSURE SWITCHES MODEL 6900GE

1/4" ALUMINUM
- **PRESSURE PORT AND POLYMIDE DIAPHRAGM**

Max. Sys. Press. psi	Proof (Test) Press. psi	Adj.Set-Point Range		Approx Dead-band psi	Model No. and Wetted Parts		
		On Incr. Press. psi	On Decr. Press. psi		MODEL SPDT	MODEL DPDT	Wetted Parts
500	750	3-20	1-18	2	6900GE12	6900GEM12	
500	750	6-75	2-71	4	6900GE14	6900GEM14	Aluminum
1500	2000	12-150	4-142	8	6900GE16	6900GEM16	Polyimide
1500	2000	30-375	10-355	20	6900GE18	6900GEM18	Buna N
2000	3000	300-1000	250-950	50	6900GE20	6900GEM20	
3000	4500	700-2500	600-2400	100	6900GE22	6900GEM22	

PRESSURE SWITCHES MODEL 6900PE

PISTON
- **PRESSURE SWITCH WITH 1/4" ALUMINUM PRESSURE PORT**

FOR HIGH CYCLING-
- **LONG LIFE-HYDRAULIC APPLICATIONS**

Hyd. psi	Hyd. psi						
2000	3000	15-200	5-190	10	6900PE32	6900PEM32	Aluminum
3000	5000	150-1600	40-1490	110	6900PE34	6900PEM34	400 SS
5000	7500	500-3200	330-3030	170	6900PE36	6900PEM36	Buna N
10,000	13,000	2000-6500	1500-6000	500	6900PE38	6900PEM38	Teflon

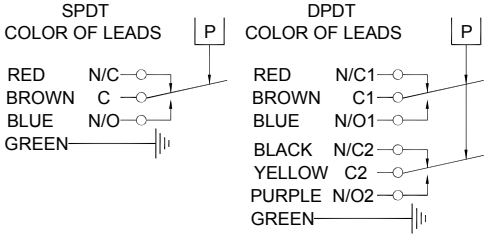
ELECTRICAL CHARACTERISTICS: Rating of Switch Element

VOLTS	AMPERES SPDT Res.	AMPERES DPDT "M" Res.
125 AC — 50/60 Hz	11.0	11.0
250 AC — 50/60 Hz	11.0	11.0
30 DC	5.0	5.0
125 DC	0.5	0.5

SHIPPING WEIGHTS:

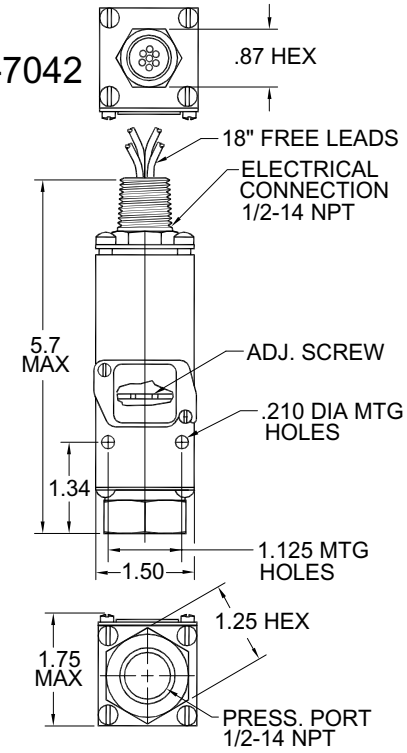
Models:	Oz	Grams
6900GE	16	467
6900PE	16	467

SCHEMATIC AND WIRING CODE



INSTALLATION DRAWING

6900GZE
6900GZE-7042



Pressure 1 to 2500 psi

Standard Features:

•U.L./CSA Explosion Proof: Div. 1, 2 Div. 1 explosion-proof and hermetically sealed electrical assembly P/N 46-1058 (46-1061 for "M" model option), listed by both Underwriter's Laboratories, Inc. (File No. E32961) and CSA Testing Laboratories (File No. 22921) for hazardous locations, Class 1, Groups A, B, C, and D; Class 2 Groups E, F, and G.

•NEMA 4, 7, 9, 13.

Ambient Temp. Range:

-30°F to +160°F or
-34°C to +71°C.

How to Order:

1. Specify model number.

OPERATING AND ORDERING DATA:

PRESSURE SWITCHES
MODEL 6900GZE

1/2" in. STAINLESS STEEL
- **PRESSURE PORT AND DIAPHRAGM.**

Max. Sys. Press. psi	Proof (Test) Press. psi	Adj.Set-Point Range		Approx Dead-band psi	Model No. and Wetted Parts		
		On Incr. Press. psi	On Decr. Press. psi		**MODEL** SPDT	**MODEL** DPDT	Wetted Parts
500	750	3-20	1-18	2	6900GZE12	6900GZEM12	
500	750	9-75	3-69	6	6900GZE14	6900GZEM14	
1500	2000	18-150	6-138	12	6900GZE16	6900GZEM16	316 SS
1500	2000	45-375	15-345	30	6900GZE18	6900GZEM18	Viton
2000	3000	300-1000	225-925	75	6900GZE20	6900GZEM20	
3000	4500	700-2500	520-2320	180	6900GZE22	6900GZEM22	

PRESSURE SWITCHES
MODEL 6900GZE-7042

1/2" in. STAINLESS STEEL
- **PRESSURE PORT AND DIAPHRAGM**

EXTERNAL PARTS STAINLESS STEEL CONSTRUCTION

Max. Sys. Press. psi	Proof (Test) Press. psi	Adj. Set-Point Range		Approx. Dead band psi	Model No. and Wetted Parts		
		On Incr. Press. psi	On Decr. Press. psi		**MODEL** SPDT	**MODEL** DPDT	Wetted Parts
500	750	3-20	1-18	2	6900GZE12-7042	6900GZEM12-7042	
500	750	9-75	3-69	6	6900GZE14-7042	6900GZEM14-7042	
1500	2000	18-150	6-138	12	6900GZE16-7042	6900GZEM16-7042	316 SS
1500	2000	45-375	15-345	30	6900GZE18-7042	6900GZEM18-7042	Viton
2000	3000	300-1000	225-925	75	6900GZE20-7042	6900GZEM20-7042	
3000	4500	700-2500	520-2320	180	6900GZE22-7042	6900GZEM22-7042	

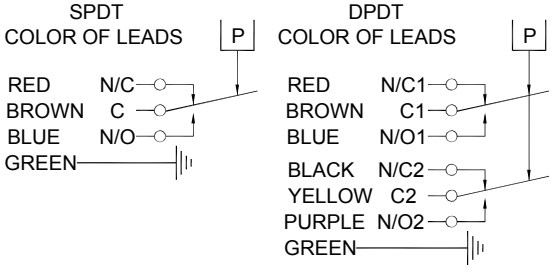
ELECTRICAL CHARACTERISTICS: Rating of Switch Element

VOLTS	AMPERES	
	SPDT Res.	DPDT "M" Res.
125 AC — 50/60 Hz	11.0	11.0
250 AC — 50/60 Hz	11.0	11.0
30 DC	5.0	5.0
125 DC	0.5	0.5

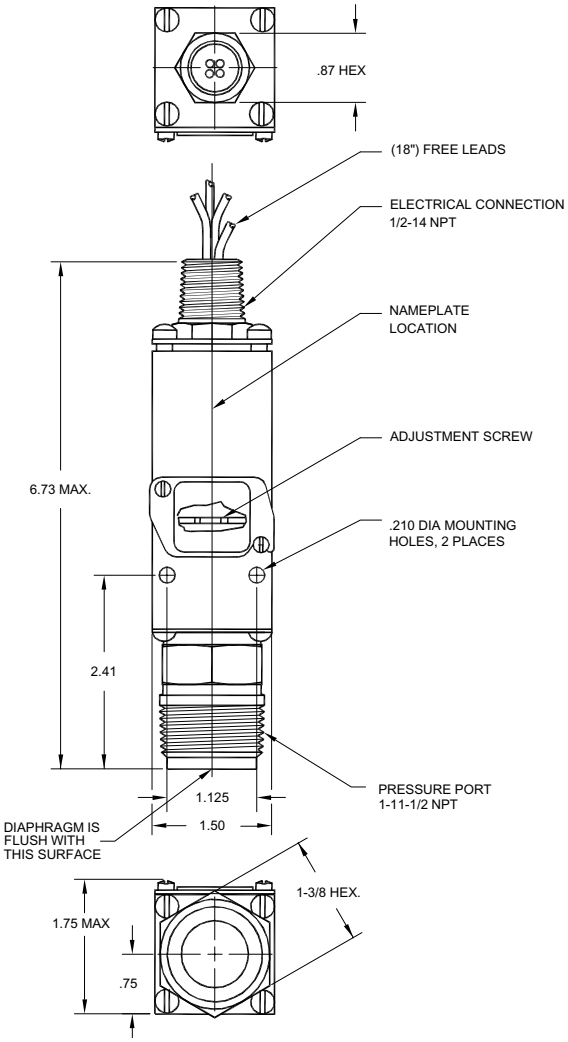
SHIPPING WEIGHTS:

Models:	Oz	Grams
6900GZE*	19	539
6900GZE*-7042	16	794

SCHEMATIC AND WIRING CODE



INSTALLATION DRAWING



6900GZE**-7066

Pressure 1 to 2500 psi

Standard Features:

•U.L./CSA Explosion Proof: Div. 1, 2 Div. 1 explosion-proof and hermetically sealed electrical assembly P/N 46-1058 (46-1061 for "M" model option), listed by both Underwriter's Laboratories, Inc. (File No. E32961) and CSA Testing Laboratories (File No. 22921) for hazardous locations, Class 1, Groups A, B, C, and D; Class 2 Groups E, F, and G.

•NEMA 4, 7, 9, 13.

Ambient Temp. Range:

-30°F to +160°F or
-34°C to +71°C..

How to Order:
1. Specify model number
Call or e-mail for addional options

OPERATING AND ORDERING DATA:

PRESSURE SWITCHES MODEL 6900GZE* • **1-11-1/2" NPT PRESSURE PORT AND DIAPHRAGM**

Max. Sys Press psig	Proof (Test) Press. psig	Adj. Set–Point Range On Incr. Press. psig	Adj. Set–Point Range On Decr. Press. psig	Approx Dead Band psig	Model and Wetted Parts MODEL SPDT	MODEL DPDT	WETTED PARTS
500	750	3 – 15	1 – 13	2	6900GZE12-7066	6900GZEM12-7066	316 SST PORT AND DIAPHRAGM
500	750	12 – 75	6 – 69	6	6900GZE14-7066	6900GZEM14-7066	
1500	2000	18 – 150	6 – 138	12	6900GZE16-7066	6900GZEM16-7066	
1500	2000	45 – 375	15 – 345	30	6900GZE18-7066	6900GZEM18-7066	
2000	3000	300 – 1000	225 – 925	75	6900GZE20-7066	6900GZEM20-7066	
3000	4500	700 – 2500	520 – 2320	180	6900GZE22-7066	6900GZEM22-7066	
500	750	3 – 15	1 – 13	2	6900GZE12-7074	6900GZEM12-7074	HASTELLOY "C" ALLOY PORT AND DIAPHRAGM
500	750	12 – 75	6 – 69	6	6900GZE14-7074	6900GZEM14-7074	
1500	2000	18 – 150	6 – 138	12	6900GZE16-7074	6900GZEM16-7074	
1500	2000	45 – 375	15 – 345	30	6900GZE18-7074	6900GZEM18-7074	
2000	3000	300 – 1000	225 – 925	75	6900GZE20-7074	6900GZEM20-7074	
3000	4500	700 – 2500	520 – 2320	180	6900GZE22-7074	6900GZEM22-7074	

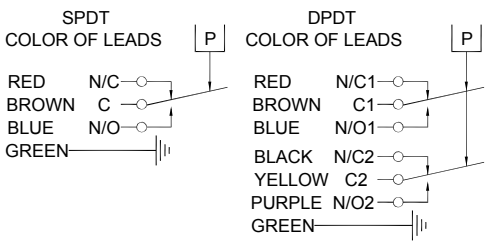
ELECTRICAL CHARACTERISTICS: Rating of Switch Element

VOLTS	AMPERES SPDT Res.	AMPERES DPDT "M" Res.
125 AC — 50/60 Hz	11.0	11.0
250 AC — 50/60 Hz	11.0	11.0
30 DC	5.0	5.0
125 DC	0.5	0.5

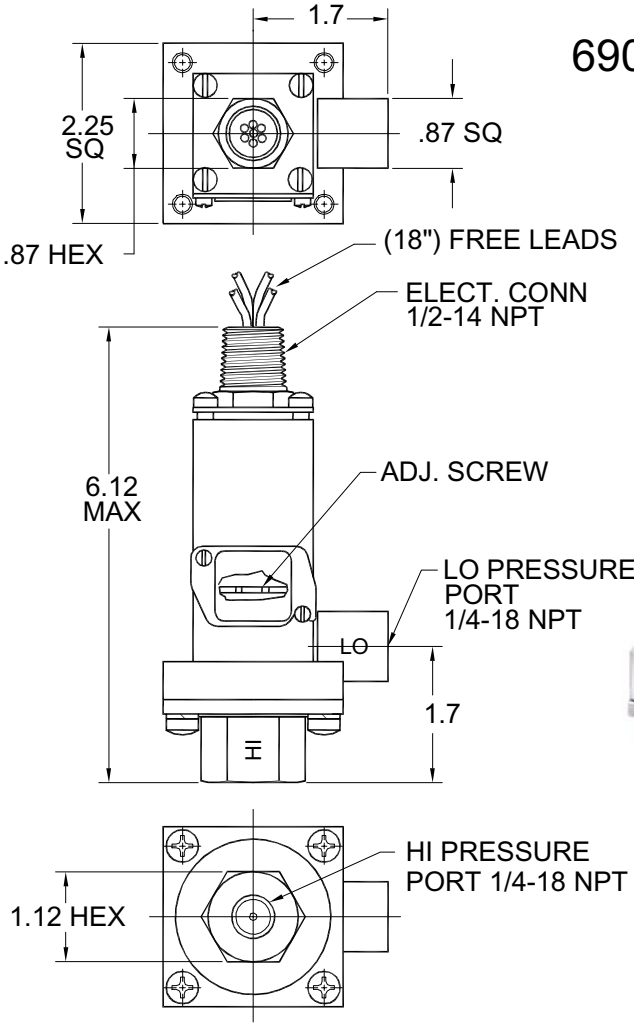
SHIPPING WEIGHTS:

Models:	Oz	Grams
6900GZE*-7066	26	737
6900GZE*-7074	26	737

SCHEMATIC AND WIRING CODE



INSTALLATION DRAWING



6900DZE**

Differential Pressure 0.5 to 75 psid

Standard Features:

•U.L./CSA Explosion Proof: Div. 1, 2 Div. 1 explosion-proof and hermetically sealed electrical assembly P/N 46-1058 (46-1061 for "M" model option), listed by both Underwriter's Laboratories, Inc. (File No. E32961) and CSA Testing Laboratories (File No. 22921) for hazardous locations, Class 1, Groups A, B, C, and D; Class 2 Groups E, F, and G.

• NEMA 4, 7, 9, 13.
• Fire Resistant Stainless Steel Body

Ambient Temp. Range:

-30°F to +160°F or
-34°C to +71°C.

OPERATING AND ORDERING DATA:

DIFFERENTIAL SWITCHES
MODEL 6900DZE
• **1/4 in. STAINLESS STEEL PRESSURE PORTS AND POLYIMIDE DIAPHRAGM**

Maximum System Pressure psi		Proof (Test) Pressure psi			Adjustable Set-Point Range		Approx. Dead-band psi	Model Number and Wetted Parts		
High Press Port	Low Press. Port	Both Ports Simul-taneous	High Over Low Low Over High		On Increasing Pressure psid	On Decreasing Pressure psid		MODEL SPDT	MODEL DPDT	Wetted Parts
			High	Low						
400		750	750	400	1.5 to 18 6 to 75	.5 to 17.2 2 to 71	1 4	6900DZE8 6900DZE10	6900DZEM8 6900DZEM10	300 SS Polyimide Viton

ELECTRICAL CHARACTERISTICS: Rating of Switch Element		
VOLTS	*AMPERES*	
	SPDT Res.	*DPDT "M" Res.*
125 AC — 50/60 Hz	*11.0*	*11.0*
250 AC — 50/60 Hz	*11.0*	*11.0*
30 DC	*5.0*	*5.0*
125 DC	*0.5*	*0.5*

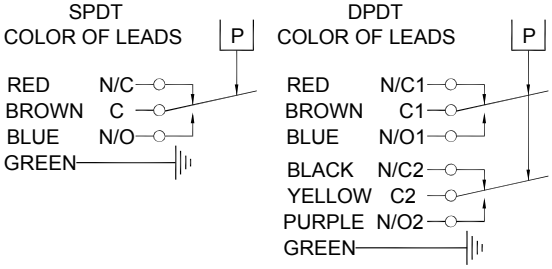
How to Order:
1. Specify model number
Call or e-mail for addional options

SHIPPING WEIGHTS:

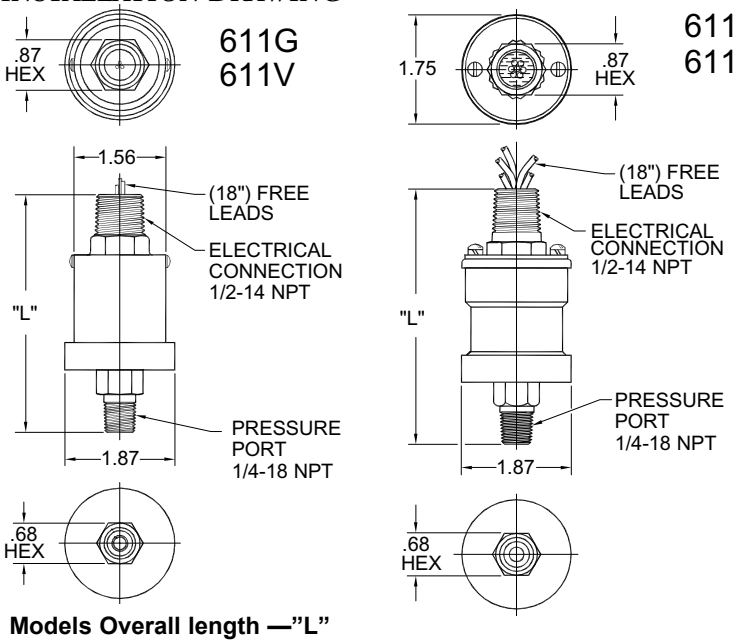
Models:	*Oz*	*Grams*
*6900DZE**	*49*	*1372*

Note:
Gold contacts available for milliamp or intrinsically safe circuits.

SCHEMATIC AND WIRING CODE



INSTALLATION DRAWING



Pressure 0.75 to 180 psi
Vacuum 1.5 to 28.5" Hg.

Standard Features:

- *Model 611GE —U.L./CSA Explosion Proof: Div. 1, 2 Div. 1 explosion-proof and hermetically sealed electrical assembly P/N 46-1058 (46-1061 for "M" model option), listed by both Underwriter's Laboratories, Inc. (File No. E32961) and CSA Testing Laboratories (File No. 22921) for hazardous locations, Class 1, Groups A, B, C, and D; Class 2 Groups E, F, and G.*
- *NEMA 4, 7, 9, 13.*
- *Weatherproof*

Ambient Temp. Range:

-30°F to +160°F or
-34°C to +71°C.

Models Overall length —"L"

611G & 611V = 4.35" Max. 611V8000 = 4.35" Max.
611GE & 611VE = 4.59" Max. 611VEM8000 = 4.84" Max.

Note: Unit can be set prior to installation. Insert 1/8" Allen wrench into adjustment screw (located in pressure port) and turn clockwise to decrease setting.

OPERATING AND ORDERING DATA:

PRESSURE SWITCHES MODEL 611G • **1/4" ALUMINUM PRESSURE PORT AND POLYIMIDE DIAPHRAGM**

Max. Sys. Press. psi	Proof (Test) Press. psi	Adj. Set-Point Range On Incr. Press. psi	Adj. Set-Point Range On Decr. Press. psi	Approx. Dead-band psi	Model Number and Wetted Parts MODEL SPDT	MODEL DPDT	Wetted Parts
250	500	1.5-12.1	.75-11.35	.75	611G8001	611GM8001	Aluminum Buna N, Polyimide Cadmium Plated Steel, 300 SS
500	1000	12.1-30	10.1-28	2.0	611G8003	611GM8003	
500	1000	30.1-70	27.1-67	3.0	611G8005	611GM8005	
500	1000	70.1-180	63.1-173	7.0	611G8007	611GM8007	

PRESSURE SWITCHES MODEL 611GE • **1/4" ALUMINUM PRESSURE PORT AND POLYIMIDE DIAPHRAGM, EXPLOSION PROOF**

250	500	1.5-12.1	.75-11.35	.75	611GE8001	611GEM8001	Aluminum Buna N, Polyimide Cadmium Plated Steel, 300 SS
500	1000	12.1-30	10.1-28	2.0	611GE8003	611GEM8003	
500	1000	30.1-70	27.1-67	3.0	611GE8005	611GEM8005	
500	1000	70.1-180	63.1-173	7.0	611GE8007	611GEM8007	

VACUUM SWITCHES MODEL 611V • **1/4" ALUMINUM PRESSURE PORT AND POLYIMIDE DIAPHRAGM**

Max. Sys. Press. psi	Proof (Test) Press. psi	Adj. Set-Point Range On Incr. Vac. In. Hg	Adj. Set-Point Range On Decr. Vac. In. Hg	Model No. and Wetted Parts Approx. Dead band In. Hg	MODEL SPDT	MODEL DPDT	Wetted Parts
150	250	4-28.5	1.5-26	2.5	611V8000	611VM8000	Aluminum, Buna N, Polyimide Cadmium Plated Steel, 300 SS

VACUUM SWITCHES MODEL 611VE • **1/4" ALUMINUM PRESSURE PORT AND POLYIMIDE DIAPHRAGM, EXPLOSION PROOF**

150	250	4-28.5	1.5-26	2.5	611VE8000	611VEM8000	Aluminum, Buna N, Polyimide Cadmium Plated Steel, 300 SS

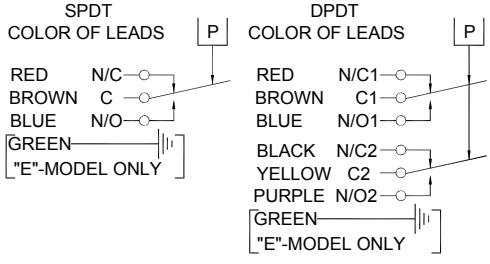
ELECTRICAL CHARACTERISTICS: Rating of Switch Element

VOLTS	AMPERES SPDT Res.	AMPERES DPDT "M" Res.
125 AC — 50/60 Hz	11.0	11.0
250 AC — 50/60 Hz	11.0	11.0
30 DC	5.0	5.0
125 DC	0.5	0.5

SHIPPING WEIGHTS:

Models:	Oz	Grams
611G	9	255
611V	9	255
611GE	12	346
611VE	12	356

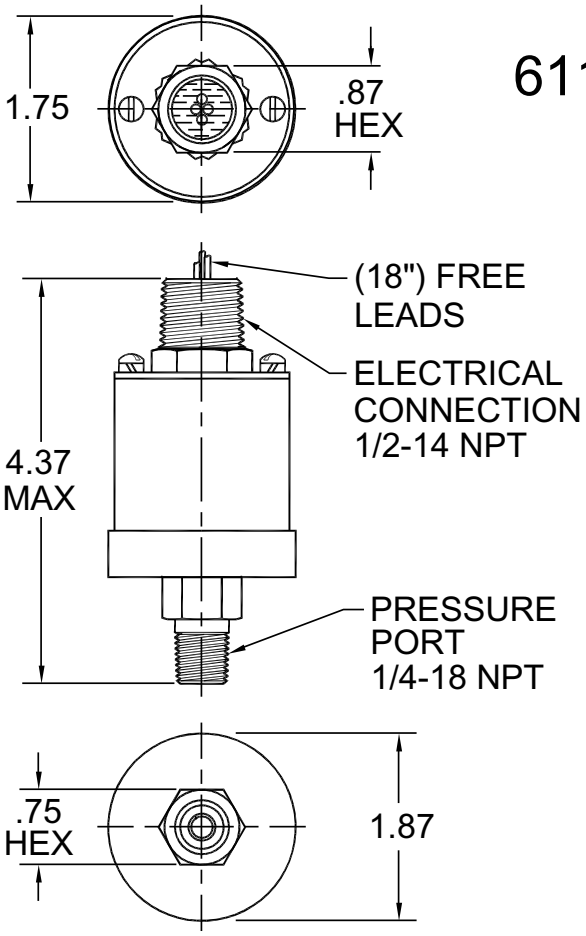
SCHEMATIC AND WIRING CODE



How to Order:

1. Specify model number.

INSTALLATION DRAWING



611GZE

Note: Unit can be set prior to installation. Insert 1/8" Allen wrench into adjustment screw (located in pressure port) and turn clockwise to decrease setting.

Pressure 1 to 180 psi

Standard Features:

•U.L./CSA Explosion Proof: Div. 1, 2 Div. 1 explosion-proof and hermetically sealed electrical assembly P/N 46-1058 (46-1061 for "M" model option), listed by both Underwriter's Laboratories, Inc. (File No. E32961) and CSA Testing Laboratories (File No. 22921) for hazardous locations, Class 1, Groups A, B, C, and D; Class 2 Groups E, F, and G.

• NEMA 4, 7, 9, 13
• Low Range

Ambient Temp. Range:

-30°F to +160°F or
-34°C to +71°C.

OPERATING AND ORDERING DATA:

PRESSURE SWITCHES MODEL 611GZE • **1/4 in. STAINLESS STEEL PRESSURE PORT AND DIAPHRAGM**

Max Sys Press psi	Proof (Test) Press. psi	Adj Set-Point Range: On Incr Press psi	Adj Set-Point Range: On Decr Press psi	Approx. Dead Band psi	Model Number and Wetterd Parts: **MODEL** SPDT Std	**MODEL** DPDT "M"	Wetted Parts
250	500	3-12	1-10	2	611GZE8101	611GZEM8101	316 SS
500	1000	12-30	9-27	3	611GZE8103	611GZEM8103	Inconel
500	1000	30-70	25-65	5	611GZE8105	611GZEM8105	Viton
500	1000	70-180	60-170	10	611GZE8107	611GZEM8107	

ELECTRICAL CHARACTERISTICS: Rating of Switch Element

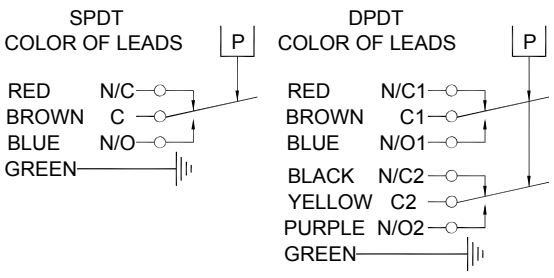
VOLTS	AMPERES SPDT Res.	AMPERES DPDT "M" Res.
125 AC — 50/60 Hz	11.0	11.0
250 AC — 50/60 Hz	11.0	11.0
30 DC	5.0	5.0
125 DC	0.5	0.5

How to Order:
1. Specify model number

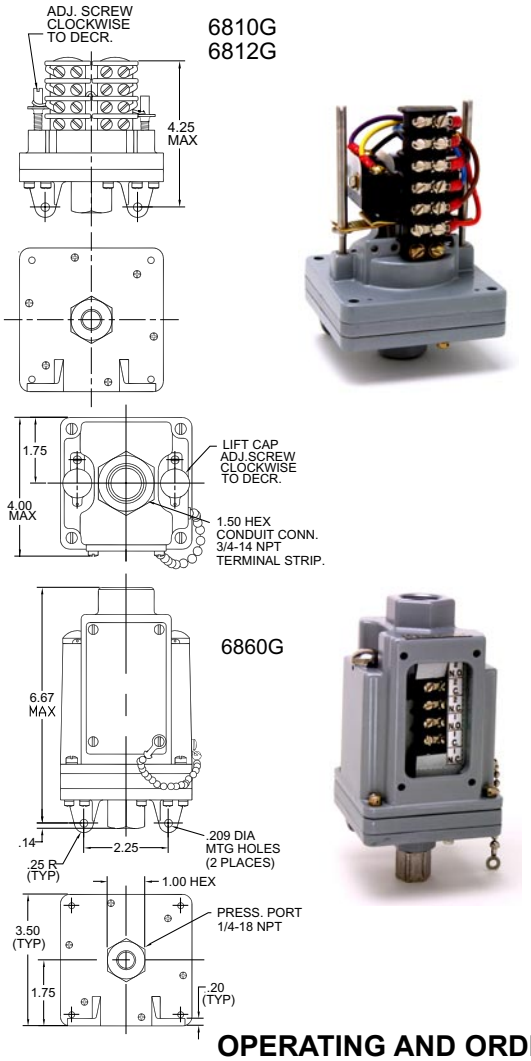
SHIPPING WEIGHTS:

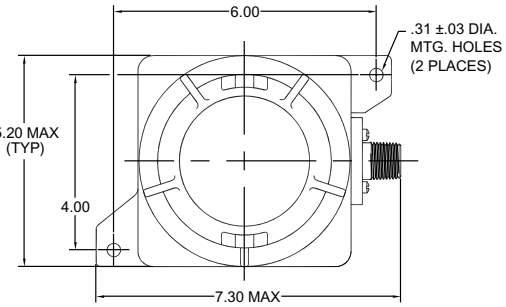
Models:	Oz	Grams
611GZE	22	623

SCHEMATIC AND WIRING CODE

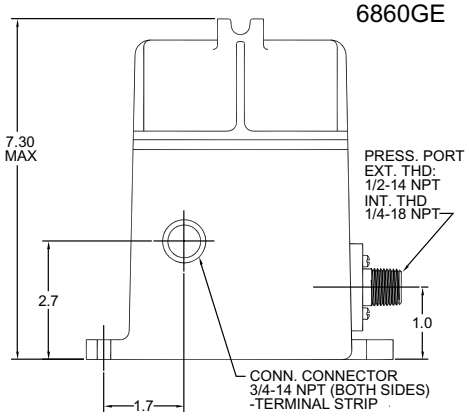


INSTALLATION DRAWING





6860GE



Pressure 1.5 H_2O to 100 psi

Standard Features:

•Model 6860GE & 6862GE — Explosion Proof Design to meet the requirements of U.L./CSA Explosion Proof: Division 1 and 2 explosion-proof for hazardous locations, Class 1, Groups C, and D; Class 2, Groups E, F, and G.

• Housed Models — NEMA 4, 13.
• Weatherproof

Ambient Temp. Range:

-30°F to +160°F or
-34°C to +71°C.

Installation Note:
Must be installed with an approved conduit seal and breather to meet the Division 1 and 2 requirements.

OPERATING AND ORDERING DATA:

PRESSURE WITCHES • 1/4" ALUMINUM PRESSURE PORT AND POLYIMIDE DIAPHRAGM								
MODEL 6810G • STRIPPED - SINGLE SETTING				**MODEL 6860G** • HOUSED - SINGLE SETTING				
MODEL 6812G • STRIPPED - DUAL SETTING				**MODEL 6862G** • HOUSED - DUAL SETTING				
Proof (Test) Pressure	Adjustable Set-Point Range		Approx Dead-Band	Model Number and Wetted Parts				
	On Increasing Pressure	On Decreasing Pressure		Single Setting	Dual Setting	Single Setting	Dual Setting	Wetted Parts
50 psi 100 psi 250 psi	5 to 80". H_2O 1 to 27 psi 3 to 100 psi	1.5 to 76.5" H_2O .95 to 26.75 psi 2.8 to 98.5 psi	2.5in. H_2O .1 to .2 psi .2 to 1.0 psi	6810G0 6810G1 6810G3	Not Avail. 6812G1 6812G3	6860GO 6860G1 6860G3	Not Avail. 6862GE1 6862G3	Aluminum Polyimide Buna N

PRESSURE SWITCHES • EXPLOSION PROOF - HOUSED -1/2" EXT. THREADS, 1/4" INT. THREADS, ALUMINUM PRESSURE PORT AND POLYIMIDE DIAPHRAGM						
MODEL 6860GE • SINGLE SETTING				**MODEL 6862GE** • DUAL SETTING		
Proof (Test) Pressure	Adjustable Set-Point Range		Approx. Dead-Band	Model Number and Wetted Parts		
	On Increasing Pressure	On Decreasing Pressure		**MODEL** Single Setting	**MODEL** Dual Setting	Wetted Parts
50 psi 100 psi 250 psi	5 to 80". H_2O 1 to 27 psi 3 to 100 psi	1.5 to 76.5". H_2O .95 to 26.75 psi 2.8 to 98.5 psi	2.5". H_2O .1 to .2 psi .2 to 1.0 psi	6860GE0 6860GE1 6860GE3	Not Avail. 6862GE1 6862GE3	Aluminum Polyimide Buna N

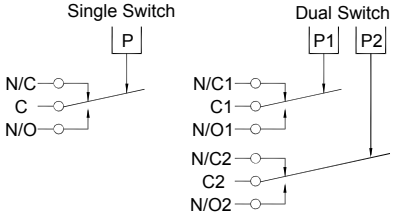
ELECTRICAL CHARACTERISTICS:	
Rating of Switch Element	
VOLTS	AMPERES
	SPDT
	Res.
125 AC - 50/60 Hz	15.0
250 AC - 50/60 Hz	15.0
28 DC	0.5

SHIPPING WEIGHTS:

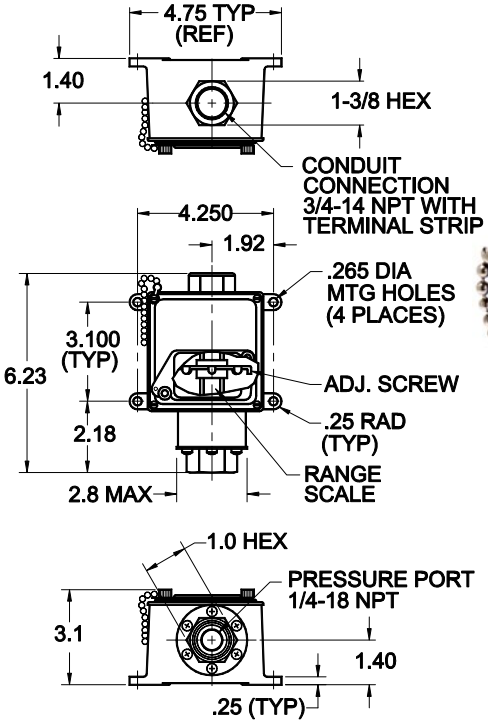
Models:	Oz	Grams
6810G & 6812G	25	709
6860G & 6862G	43	1219
6860GE & 6862GE	7LB	3.2 Kgs

How to Order:
1. Specify model number

SCHEMATIC AND WIRING CODE



INSTALLATION DRAWING



604G
604P
604V

Pressure 0.3 to 4700 psi
Vacuum: 1.0 to 28.5" Hg

Standard Features:

•All models shown are Underwriters' Laboratories, Inc. listed in the Recognized Components Index, Guide NKPZ "Motor Controllers, Float and Pressure Operated," File No. E72038.

- *NEMA 4, 13*
- *Weatherproof*
- *Internal Case Ground*

Ambient Temp. Range:

-30°F to +160°F or
-34°C to +71°C.

Note:

** Models 604GM1 & 604GX1 have an approximate dead band of 0.9 psi.*

How to Order:

1. Specify model number.
*2. Specify optional feature by inserting the letter designation of the feature after the last letter in the model number. Examples: 604G**F**1, 604P**A**1 and 604V**A**1.*

OPERATING AND ORDERING DATA:

PRESSURE SWITCHES
MODEL 604G

- **1/4 in. ALUMINUM PRESSURE PORT AND POLYIMIDE DIAPHRAGM**

Max. Sys. Press. psi	Proof (Test) Press. psi	Adj. Set-point Range: On Incr. Press. psi	Adj. Set-point Range: On Decr. Press. psi	Approx Dead-band psi	Model No. and Wetted Parts: MODEL SPDT	MODEL DPDT *	MODEL Dbl. Brk *	Wetted Parts
500	750	.9-18	.3-17.5	.6	604G1	604GM1	604GX1	
3000	4500	6-75	2-71	4	604G2	604GM2	604GX2	Aluminum
3000	4500	12-150	4-142	8	604G11	604GM11	604GX11	Polyimide
3000	4500	30-375	10-355	20	604G3	604GM3	604GX3	Buna N
3000	4500	300-1000	245-945	55	604G5	604GM5	604GX5	

PRESSURE SWITCHES
MODEL 604P

- **1/4 in. ALUMINUM PRESSURE PORT PISTON PRESSURE SWITCH WITH**
- **FOR HIGH CYCLING-LONG LIFE-HYDRAULIC APPLICATIONS**

Hyd. psi	Hyd. psi	Piston switch dead bands shown are narrowest at bottom and widest at top of adjustable range.						
2000	3000	15-200	6-189	9-11	604P12	604PM12	604PX12	Aluminum
3000	5000	150-1500	75-1350	75-150	604P15	604PM15	604PX15	400SS
5000	7500	200-3000	100-2800	100-200	604P21	604PM21	604PX21	Buna N
7500	10,000	2000-4700	1750-4250	250-450	604P31	604PM31	604PX31	Teflon

VACUUM SWITCHES
MODEL 604V

- **1/4 in. ALUMINUM PRESSURE PORT AND POLYIMIDE DIAPHRAGM**

Max. Sys. Press. psi	Proof (Test) Press. psi	Adj. Set-point Range: On Incr. Vacuum In. Hg	Adj. Set-point Range: On Decr. Vacuum In. Hg	Approx Dead-band in Hg	Model No. and Wetted Parts: MODEL SPDT	MODEL DPDT	Wetted Parts
150	250	3.5-28.5	1.0-26.0	2.5	604V1	604VM1	Aluminum Polyimide Buna N

ELECTRICAL CHARACTERISTICS: Rating of Switch Element			
VOLTS	AMPERES SPDT Res.	DPDT "M" Res.	Dbl Brk "X" Res.
125 AC — 50/60 Hz	15.0	5.0	15.0
250 AC — 50/60 Hz	15.0	5.0	15.0
480 AC — 50/60 Hz	15.0		
28 DC	6.0	5	6.0
125 DC	0.4	0.5	1.0

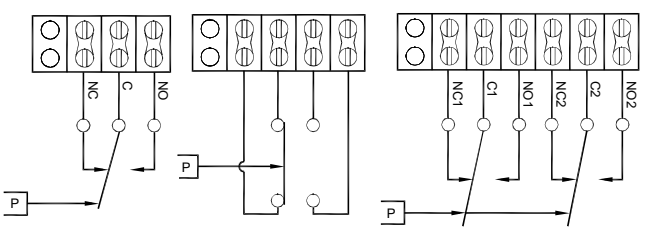
SHIPPING WEIGHTS:

Models:	Oz	Grams
604G	39	1092
604V	39	1092
604P	35	992

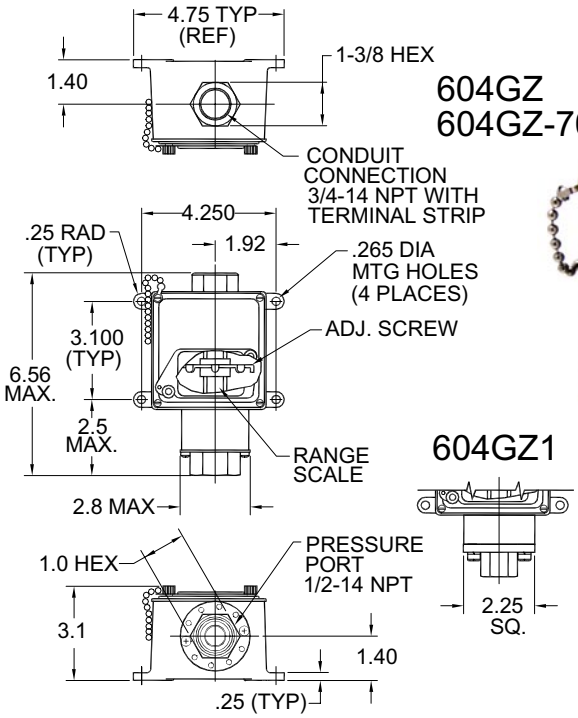
OPTIONAL FEATURES:

*"**A**" — Viton O-Ring*
*"**F**" — Ethylene Propylene O-Ring.*

SCHEMATIC AND WIRING DIAGRAM CODE



INSTALLATION DRAWING



Fire Resistant Steel Body

Pressure 0.3 to 5000 psi

Standard Features:

•All models shown are Underwriters' Laboratories, Inc. listed in the Recognized Components Index, Guide NKPZ "Motor Controllers, Float and Pressure Operated," File No. E72038.

- *NEMA 4, 13*
- *Weatherproof*
- *Internal Case Ground*
- *Fire Resistant Steel Body*

Ambient Temp. Range:

-30°F to +160°F or
-34°C to +71°C.

Note:

**Models 604GZM1 has an approximate dead band of 0.9 psi.*

How to Order:

1. Specify model number.
*2. Specify optional feature by inserting the letter designation of the feature after the last letter in the model number. Examples: 604GZ**F**1 or 604GZF1-7011.*

OPERATING AND ORDERING DATA:

PRESSURE SWITCHES
MODEL 604GZ
• 1/2" STAINLESS STEEL PRESSURE PORT AND POLYIMIDE DIAPHRAGM

Max. Sys. Press. psi	Proof (Test) Press. psi	Adj. Set-point Range		Approx Dead-band psi	Polyimide Diaphragm Model Number and Wetted Parts		
		On Incr. Press. psi	On Decr. Press. psi		**MODEL** SPDT	**MODEL** DPDT	Wetted Parts
500	750	.9-18	.3-17.5	.6	604GZ1	*604GZM1	316SS Polyimide Viton
3000	4500	6-75	2-71	4	604GZ2	604GZM2	
3000	4500	12-150	4-142	8	604GZ11	604GZM11	
3000	4500	30-375	10-355	20	604GZ3	604GZM3	
3000	4500	300-1000	245-945	55	604GZ5	604GZM5	
3000	4500	900-2300	750-2150	150	604GZ7	604GZM7	

PRESSURE SWITCHES
MODEL 604GZ-7011
• 1/2" STAINLESS STEEL PRESSURE PORT AND DIAPHRAGM

Max. Sys. Press. psi	Proof (Test) Press psi	Adj. Set-Point Range		Approx. Dead-band psi	316 SS Diaphragm Model Number and Wetted Parts		
		On Incr. Press. psi	On Decr. Press. psi		**MODEL** SPDT	**MODEL** DPDT	Wetted Parts
500	750	1.4-18	.4-17	1	604GZ1-7011	*604GZM1-7011	316 SS Viton
3000	4500	9-75	3-69	6	604GZ2-7011	604GZM2-7011	
3000	4500	18-150	6-138	12	604GZ11-7011	604GZM11-7011	
3000	4500	45-375	15-345	30	604GZ3-7011	604GZM3-7011	
3000	4500	300-1000	225-925	75	604GZ5-7011	604GZM5-7011	
3000	4500	900-2300	720-2120	180	604GZ7-7011	604GZM7-7011	
5000	7500	2000-3400	1725-3125	275	604GZ9-7011	604GZM9-7011	
5000	7500	2800-5000	2350-4550	450	604GZ10-7011	604GZM10-7011	

ELECTRICAL CHARACTERISTICS:
Rating of Switch Element

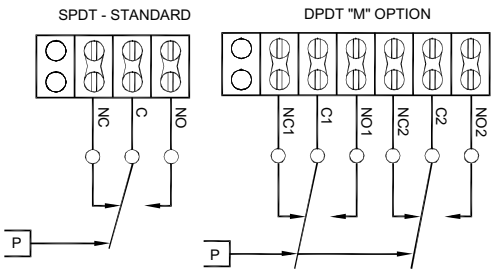
VOLTS	AMPERES	
	SPDT Res.	DPDT "M" Res.
125 AC — 50/60 Hz	15.0	5.0
250 AC — 50/60 Hz	15.0	5.0
480 AC — 50/60 Hz	15.0	
28 DC	6.0	5.0
125 DC	0.4	0.5

SHIPPING WEIGHTS:

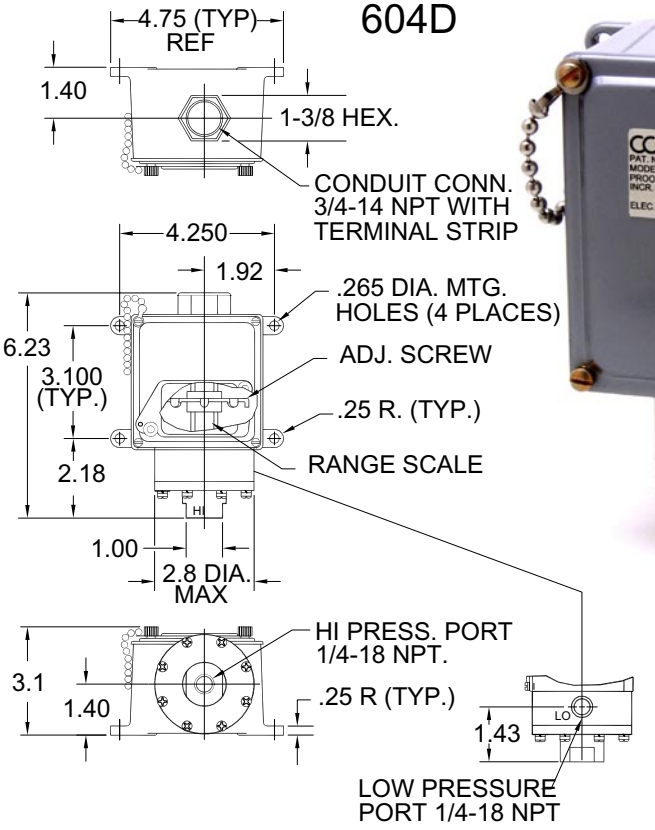
Models:	Oz	Grams
604GZ	52	1474
604GZ*-7011	52	1474

OPTIONAL FEATURES:
*"**F**" — Ethylene Propylene O-Ring.*

SCHEMATIC AND WIRING DIAGRAM CODE



INSTALLATION DRAWING



Differential 0.3 to 75 psid

Standard Features:

•All models shown are Underwriters' Laboratories, Inc. listed in the Recognized Components Index, Guide NKPZ "Motor Controllers, Float and Pressure Operated," File No. E72038.

- *NEMA 4, 13*
- *Weatherproof*
- *Internal Case Ground*

Ambient Temp. Range:

-30°F to +160°F or
-34°C to +71°C.

Note:

**Models 604DM1 has an approximate dead band of 0.9 psi.*

How to Order:

1. Specify model number.

OPERATING AND ORDERING DATA:

DIFFERENTIAL SWITCHES
MODEL 604D
• 1/4" ALUMINUM PRESSURE PORTS AND POLYIMIDE DIAPHRAGM

Maximum System Pressure psi		Proof (Test) Pressure psi		Adjustable Set-Point Range		Approx. Dead-band psi	Model Number and Wetted Parts		
High Press Port	Low Press. Port	Both Ports Simul-taneous	High Over Low Low Over High				**MODEL** SPDT	**MODEL** DPDT	**Wetted** Parts
			HIGH	LOW	On Increasing Pressure psid	On Decreasing pressure psid			
400		750	750	400	1 to 18 6 to 75	.3 to 17.5 2 to 71	.6 4	604D1 604D2	*604DM1 604DM2	Aluminum Polyimide 300SST Viton

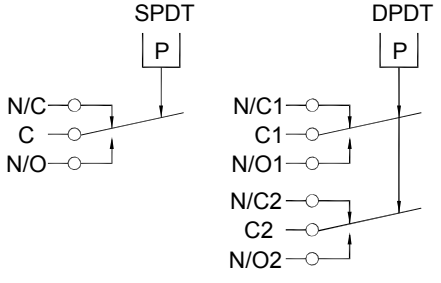
ELECTRICAL CHARACTERISTICS:
Rating of Switch Element

VOLTS	AMPERES	
	SPDT Res.	DPDT "M" Res.
125 AC — 50/60 Hz	15.0	5.0
250 AC — 50/60 Hz	15.0	5.0
480 AC — 50/60 Hz	15.0	
28 DC	6.0	5.0
125 DC	0.4	0.5

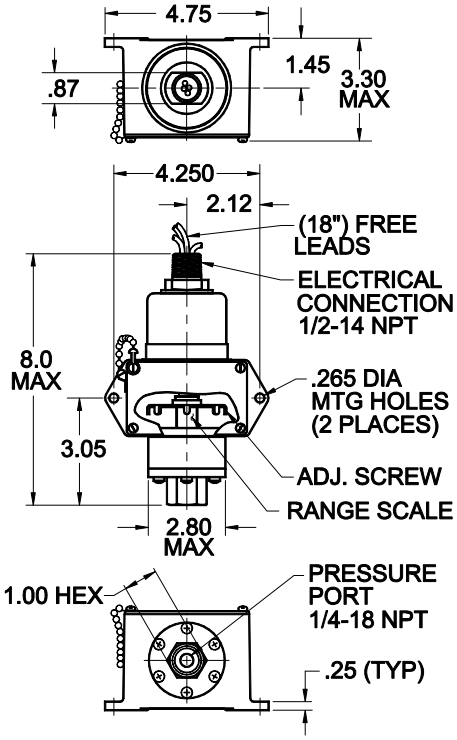
SHIPPING WEIGHTS:

Models:	Oz	Grams
604D1, D2	41	1162
604DM1, DM2	41	1162

SCHEMATIC AND WIRING CODE



INSTALLATION DRAWING



646GE
646PE
646VE

Pressure 0.4 to 4700 psi
Vacuum 1.0 to 28.5" Hg

Standard Features:

•U.L./CSA Explosion Proof: Div. 1, 2 Div. 1 explosion-proof and hermetically sealed electrical assembly P/N 17-51 (17-73 for "M" model option), listed by both Underwriter's Laboratories, Inc. (File No. E32961) and CSA Testing Laboratories (File No. 22921) for hazardous locations, Class 1, Groups A, B, C, and D; Class 2 Groups E, F, and G.

•NEMA 4, 7, 9, 13.

Ambient Temp. Range:

-30°F to +160°F or
-34°C to +71°C.

How to Order:

1. Specify model number from table below.
*2. Specify optional feature by inserting the letter designation of the feature after the last letter in the model number. Examples: 646GE**F**1, 646PE**A**1 and 646VE**A**1.*

OPERATING AND ORDERING DATA:

PRESSURE SWITCHES
MODEL 646GE
• **1/4" ALUMINUM PRESSURE PORT AND POLYIMIDE DIAPHRAGM**

Max. Sys. Press. psi	Proof (Test) Press. psi	Adj. Set-point Range: On Incr. Press. psi	Adj. Set-point Range: On Decr. Press. psi	Approx Dead-band psi	Model No. and Wetted Parts: MODEL SPDT	Model No. and Wetted Parts: MODEL DPDT	Model No. and Wetted Parts: Wetted Parts
500	750	1.2-18	.4-17.2	.8	646GE1	646GEM1	
3000	4500	6-75	2-71	4	646GE2	646GEM2	Aluminum
3000	4500	12-150	4-142	8	646GE11	646GEM11	Polyimide
3000	4500	30-375	10-355	20	646GE3	646GEM3	Buna N
3000	4500	300-1000	245-945	55	646GE5	646GEM5	

PRESSURE SWITCHES
MODEL 646PE
• **PISTON PRESSURE SWITCH WITH 1/4" ALUMINUM PRESSURE PORT**
FOR HIGH CYCLING - LONG LIFE –HYDRAULIC APPLICATIONS

Hyd. psi	Hyd. psi						
2000	3000	15-200	6-189	9-11	646PE12	646PEM12	Aluminum
3000	5000	150-1500	75-1350	75-150	646PE15	646PEM15	400 SS
5000	7500	200-3000	100-2800	100-200	646PE21	646PEM21	Buna N
7500	10,000	2000-4700	1750-4250	250-450	646PE31	646PEM31	Teflon

Piston switch dead-bands shown are narrowest at bottom and widest at top of adjustable range.

VACUUM SWITCHES
MODEL 646VE
• **1/4"ALUMINUM PRESSURE PORT AND POLYIMIDE DIAPHRAGM**

Max. Sys. Press. psi	Proof (Test) Press. psi	Adj. Set-point Range: On Incr. Vacuum In. Hg	Adj. Set-point Range: On Decr. Vacuum In. Hg	Approx Dead-band in Hg	Model No. and Wetted Parts: MODEL SPDT	Model No. and Wetted Parts: MODEL DPDT	Model No. and Wetted Parts: Wetted Parts
150	250	3.5-28.5	1.0-26.0	2.5	646VE1	646VEM1	Aluminum Polyimide Buna N

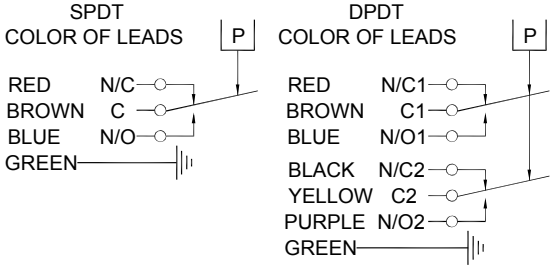
ELECTRICAL CHARACTERISTICS: Rating of Switch Element			
VOLTS		AMPERES SPDT Res.	AMPERES DPDT "M" Res.
125 AC	50/60 Hz	15.0	5.0
250 AC	50/60 Hz	15.0	5.0
480 AC	50/60 Hz	15.0	
125 DC		0.4	0.5

SHIPPING WEIGHTS:

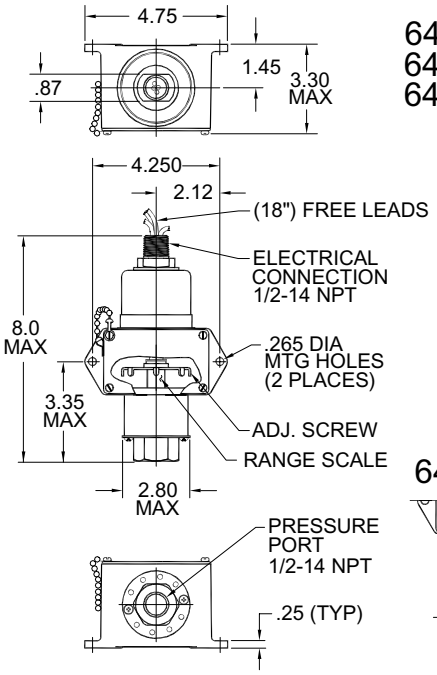
Models:	Oz	Grams
646GE	44	1247
646PE	39	1105
646VE	44	1247

OPTIONAL FEATURE:
*"**A**" — Viton O-Ring.*
*"**F**" — Ethylene Propylene O-Ring.*

SCHEMATIC AND WIRING CODE

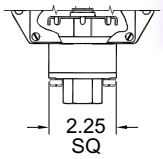


INSTALLATION DRAWING



646GZE
646GZE-7011
646VZE

646GZE1



Pressure 0.4 to 5000 psi
Vacuum 1.0 to 28.5" Hg

Standard Features:

•U.L./CSA Explosion Proof: Div. 1, 2
Div. 1 explosion-proof and hermetically sealed electrical assembly P/N 17-51 (17-73 for "M" model option), listed by both Underwriter's Laboratories, Inc. (File No. E32961) and CSA Testing Laboratories (File No. 22921) for hazardous locations, Class 1, Groups A, B, C, and D; Class 2 Groups E, F, and G.

• NEMA 4, 7, 9, 13.
• Fire Resistant Steel Body

Ambient Temp. Range:

-30°F to +160°F or
-34°C to +71°C.

Note:
**Model 646GZEM1 has an approximate dead band of 0.9 psi.*

How to Order:
1. Specify model number.
2. Specify optional feature by inserting the letter designation of the feature after the last letter in the model number.
*Examples: 646GZE**F**1 and 646GZE**F**1-7011.*

OPERATING AND ORDERING DATA:

PRESSURE SWITCHES
MODEL 646GZE • **1/2" STAINLESS STEEL PRESSURE PORT AND POLYIMIDE DIAPHRAGM**

Max. Sys. Press. psi	Proof (Test) Press psi	Adj. Set-Point Range: On Incr. Press. psi	Adj. Set-Point Range: On Decr. Press. psi	Approx. Dead-band psi	Polyimide Diaphragm Model Number and Wetted Parts: MODEL SPDT	MODEL DPDT *	Wetted Parts
500	750	1.2-18	.4-17.2	..8	646GZE1	*646GZEM1	316 SS Polyimide Viton
3000	4500	6-75	2-71	4	646GZE2	646GZEM2	
3000	4500	12-150	4-142	8	646GZE11	646GZEM11	
3000	4500	30-375	10-355	20	646GZE3	646GZEM3	
3000	4500	300-1000	245-945	55	646GZE5	646GZEM5	
3000	4500	900-2300	750-2150	150	646GZE7	646GZEM7	

PRESSURE SWITCHES
MODEL 646GZE-7011 • **1/2" STAINLESS STEEL PRESSURE PORT AND DIAPHRAGM**

500	750	1.4-18	.4-17	1	646GZE1-7011	646GZEM1-7011	316 SS Viton
3000	4500	9-75	3-69	6	646GZE2-7011	646GZEM2-7011	
3000	4500	18-150	6-138	12	646GZE11-7011	646GZEM11-7011	
3000	4500	45-375	15-345	30	646GZE3-7011	646GZEM3-7011	
3000	4500	300-1000	225-925	75	646GZE5-7011	646GZEM5-7011	
3000	4500	900-2300	720-2120	180	646GZE7-7011	646GZEM7-7011	
5000	7500	2000-3400	1725-3125	275	646GZE9-7011	646GZEM9-7011	
5000	7500	2800-5000	2350-4550	450	646GZE10-7011	646GZEM10-7011	

VACUUM SWITCHES
MODEL 646VZE • **1/2" STAINLESS STEEL PRESSURE PORT AND POLYIMIDE DIAPHRAGM**

Max. Sys. Press. psi	Proof (Test) Press. psi	Adj. Set-Point Range: On Incr. Vacuum In. Hg	Adj. Set-Point Range: On Decr. Vacuum In. Hg	Polyimide Diaphragm Model Number and Wetted Parts: Approx. Dead-band In. Hg	**MODEL** SPDT	**MODEL** DPDT	Wetted Parts
150	250	3.5-28.5	1.0-26.0	2.5	646VZE1	646VZEM1	316 SS Polyimide Viton

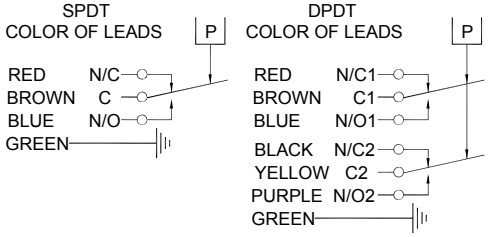
ELECTRICAL CHARACTERISTICS:		
Rating of Switch Element		
VOLTS	AMPERES	
	SPDT Res.	DPDT "M" Res.
125 AC — 50/60 Hz	15.0	5.0
250 AC — 50/60 Hz	15.0	5.0
480 AC — 50/60 Hz	15.0	
125 DC	0.4	0.5

SHIPPING WEIGHTS:

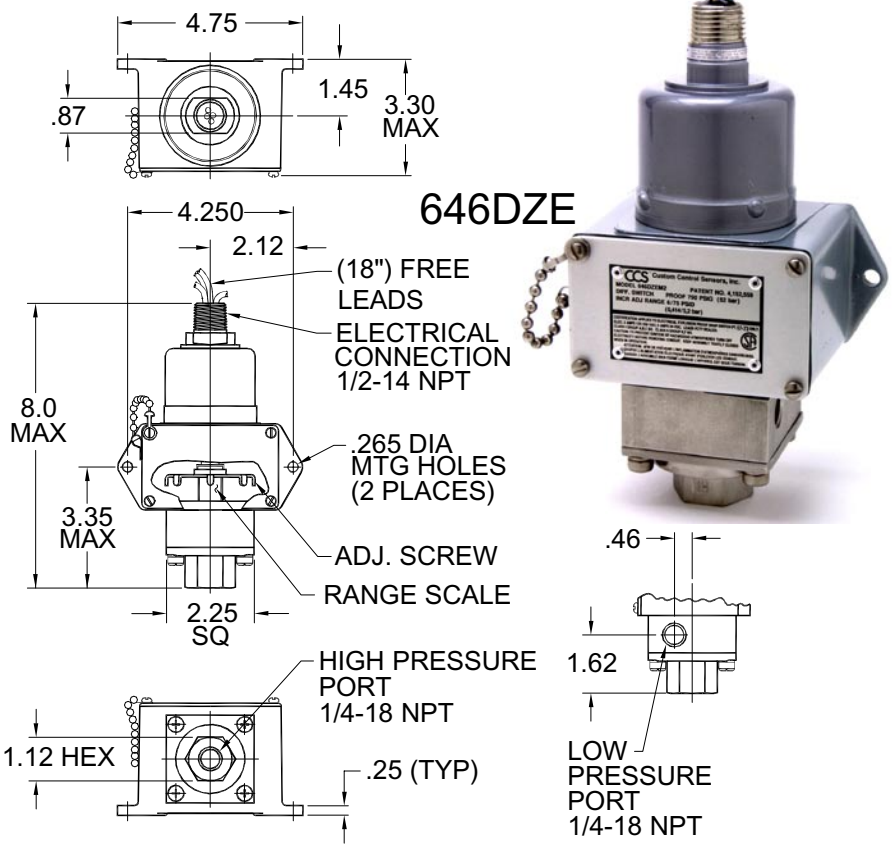
Models:	Oz	Grams
646GZE	56	1587
646GZE-7011	56	1587
646VZE	56	1587

OPTIONAL FEATURE:
*"**F**" — Ethylene Propylene O-Ring.*

SCHEMATIC AND WIRING CODE



INSTALLATION DRAWING



Differential 0.4 to 75 psid

Standard Features:

•U.L./CSA Explosion Proof: Div. 1, 2
Div. 1 explosion-proof and hermetically sealed electrical assembly P/N 17-51 (17-73 for "M" model option), listed by both Underwriter's Laboratories, Inc. (File No. E32961) and CSA Testing Laboratories (File No. 22921) for hazardous locations, Class 1, Groups A, B, C, and D; Class 2 Groups E, F, and G.

•NEMA 4, 7, 9, 13.

• Fire Resistant Stainless Steel Body

Ambient Temp. Range:

-30°F to +160°F or
-34°C to +71°C.

Note:
**Models 646DZEM1 has an approximate dead band of 0.9 psi. and low set point.*

How to Order:
1. Specify model number.

OPERATING AND ORDERING DATA:

DIFFERENTIAL SWITCHES
MODEL 646DZE
• 1/4 in. STAINLESS STEEL PRESSURE PORTS AND POLYIMIDE DIAPHRAGM

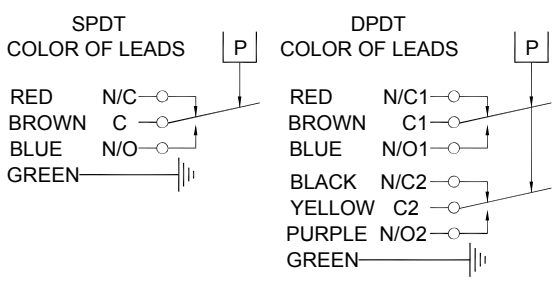
Maximum System Pressure psi		Proof (Test) Pressure psi			Adjustable Set-Point Range		Approx. Dead-band psi	Model Number and Wetted Parts		
High Press. Port	Low Press. Port	Both Ports Simul-taneous	High Over Low Low Over High		On Increasing Pressure psid	On Decreasing Pressure psid		**MODEL** SPDT	**MODEL** DPDT	Wetted Parts
			HIGH	LOW						
400		750	750	400	1.2 to 18 6 to 75	.4 to 17.2 2 to 71	.8 4	646DZE1 646DZE2	*646DZEM1 646DZEM2	300 SS Polyimide Viton

ELECTRICAL CHARACTERISTICS:		
Rating of Switch Element		
VOLTS	**AMPERES**	
	SPDT Res.	DPDT "M" Res.
125 AC — 50/60 Hz	15.0	5.0
250 AC — 50/60 Hz	15.0	5.0
480 AC — 50/60 Hz	15.0	
125 DC	0.4	0.5

SHIPPING WEIGHTS:

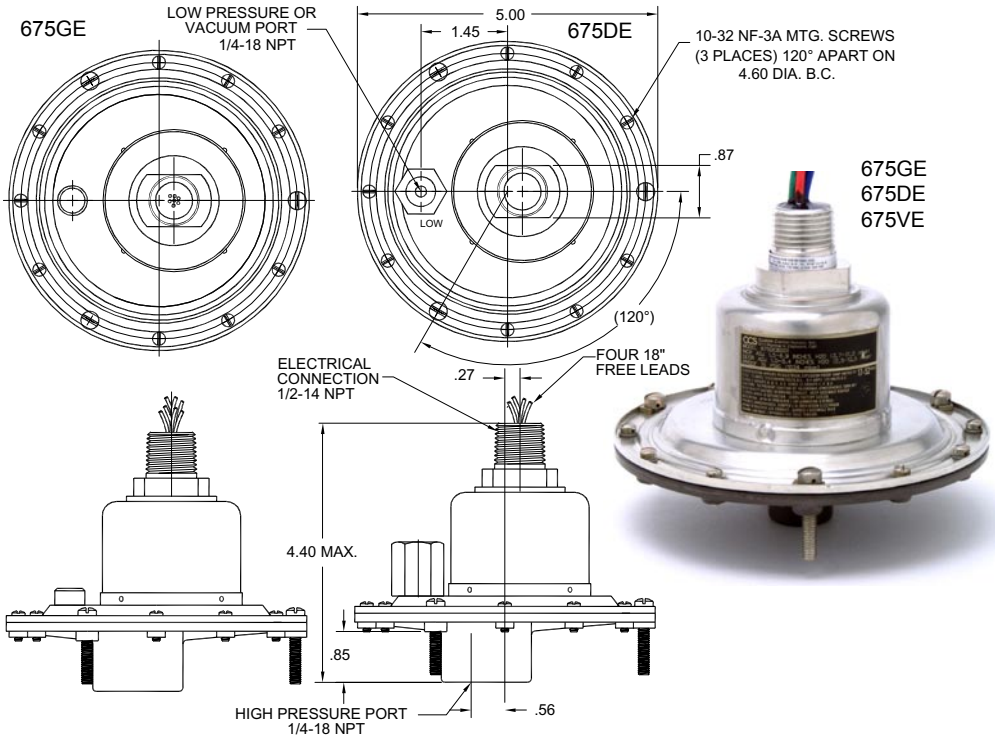
Models:	Oz	Grams
646DZE1	60	1700
646DZE2	60	1700

SCHEMATIC AND WIRING CODE



How to Order:
1. Specify model number
Call or e-mail for addional options

INSTALLATION DRAWING



Pressure 0.8 to 30.0" H_2O
Differential 0.8 to 30.0" H_2O
Vacuum 0.8 to 30.0" H_2O

Standard Features:

•U.L./CSA Explosion Proof: Div. 1, 2
Div. 1 explosion-proof and hermetically sealed electrical assembly P/N 17-52 (17-283 for "M" model option), listed by both Underwriter's Laboratories, Inc. (File No. E32961) and CSA Testing Laboratories (File No. 22921) for hazardous locations, Class 1, Groups A, B, C, and D; Class 2 Groups E, F, and G.

• NEMA 4, 7, 9, 13.

Ambient Temp. Range:

-30°F to +160°F or
-34°C to +71°C.

Note:
**Models 675GEM1, 675DEM1, and 675VEM1 have a minimum dead band of 1.5" H_20.*

How to Order*:*
1. Specify model number.
2. Specify critical set point and specify if it is on "increasing pressure" or on "decreasing pressure.

OPERATING AND ORDERING DATA:

PRESSURE SWITCHES
MODEL 675GE
• **1/4" ALUMINUM PRESSURE PORT AND POLYIMIDE DIAPHRAGM**

Maximum System Pressure psi	Proof (Test) Pressure psi	Setting Ranges - For Customer Specified Set Points: Fixed Set Point Range: On Increasing Pressure In. H2O	Fixed Set Point Range: On Decreasing Pressure In. H2O	Approx. Dead Band: At Bottom of Range In. H2O	Approx. Dead Band: At Top of Range In. H2O	Model Number and Wetted Parts: MODEL SPDT	MODEL DPDT	Wetted Parts
10	15	1.5-30	.8-27	.7	3.0	675GE1	*675GEM1	Aluminum, Polyimide Buna N, 300 SS

DIFFERENTIAL SWITCHES
MODEL 675DE
• **1/4" ALUMINUM PRESSURE PORT, TIN PLATED STEEL AND POLYIMIDE DIAPHRAGM**

High Press. Port psi	Low Press. Port psi	High Press. Port psi	Low Press. Port psi	On Increasing Pressure In. H_2O	On Decreasing Pressure In. H_2O	At Bottom of Range In. H_2O	At Top of Range In H_2O	MODEL SPDT	MODEL DPDT	Wetted Parts
10	10	15	15	1.5-30	.8-27	.7	3.0	675DE1	*675DEM1	Aluminum, Polyimide, Buna N, 300SS Tin Plated Steel Silver Plated Beryllium Copper and Brass

VACUUM SWITCHES
MODEL 675VE
• **1/4" ALUMINUM PRESSURE PORT, TIN PLATED STEEL AND POLYIMIDE DIAPHRAGM**

Maximum Sys. Press. psi	Proof (Test) Press. psi	On Incr. Vacuum In. Hg	On Decr. Vacuum In. H_2O	At Bottom of Range In. H_2O	At Top of Range In. H_2O	MODEL SPDT	MODEL DPDT
10	15	1.5-30	.8-27	.7	3.0	675VE1	*675VEM1

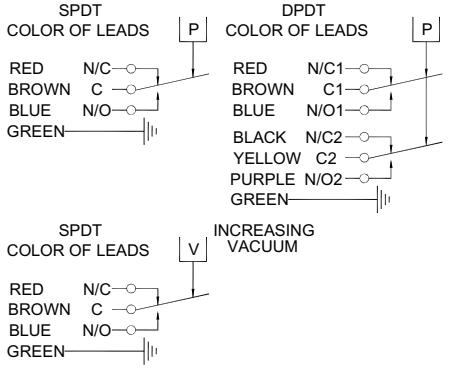
ELECTRICAL CHARACTERISTICS:
Rating of Switch Element

VOLTS	AMPERES: SPDT Res.	AMPERES: DPDT "M" Res.
125 AC — 50/60 Hz	15.0	5.0
250 AC — 50/60 Hz	15.0	5.0
480 AC — 50/60 Hz	15.0	
125 DC	0.4	0.5

SHIPPING WEIGHTS:

Models:	Oz	Grams
675GE*	25	708
675DE*	25	708
675VE*	25	708

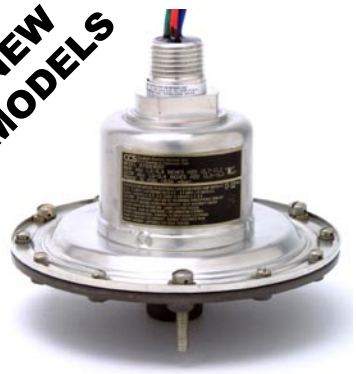
SCHEMATIC AND WIRING CODE



NOTES:

1. The new externally adjustable 675GE & 675DE 8000 series pressure switches are now available to meet your pressure setting ranges.

2. The overall dimensions are similar to the 675GE & 675DE pressure switch series



Pressure 0.8 to 31.0" H_2O
Differential 0.8 to 31.0" H_2O

Standard Features:

•U.L./CSA Explosion Proof: Div. 1, 2 Div. 1 explosion-proof and hermetically sealed electrical assembly P/N 17-52 (17-283 for "M" model option), listed by both Underwriter's Laboratories, Inc. (File No. E32961) and CSA Testing Laboratories (File No. 22921) for hazardous locations, Class 1, Groups A, B, C, and D; Class 2 Groups E, F, and G.

• NEMA 4, 7, 9, 13.

Ambient Temp. Range:

-30°F to +160°F or
-34°C to +71°C.

OPERATING AND ORDERING DATA:

PRESSURE SWITCHES MODEL 675GE8000 • **1/4" ALUMINUM PRESSURE PORT AND POLYIMIDE DIAPHRAGM**

Maximum System Pressure psi	Proof (Test) Pressure psi	Adjustable Set Point Range: On Increasing Pressure In. H_2O	Adjustable Set Point Range: On Decreasing Pressure In. H_2O	Approx. Dead Band In. H_2O	Model Number and Wetted Parts: MODEL SPDT	Model Number and Wetted Parts: Wetted Parts
10	15	1.5-6.9	0.2–5.6	1.3	675GE8001	Aluminum, Polyimide Buna N, 300 SS
		7.0-12.9	5.5-11.4	1.5	675GE8002	
		13.0-18.9	11.0-16.9	2.0	675GE8003	
		19.0-24.9	16.5-22.4	2.5	675GE8004	
		25.0-31.0	22.5-28.0	3.0	675GE8005	

PRESSURE SWITCHES MODEL 675DE8000 • **1/4" ALUMINUM PRESSURE PORT, TIN PLATED STEEL AND POLYIMIDE DIAPHRAGM**

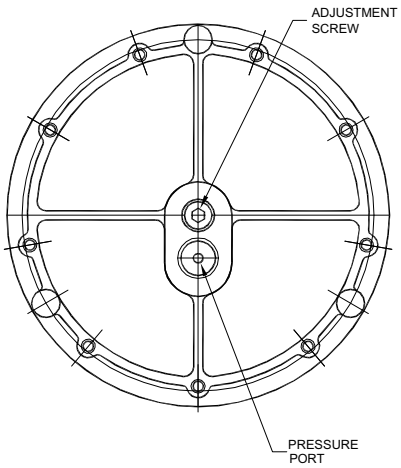
Maximum System Pressure psi	Proof (Test) Pressure psi	Adjustable Set Point Range: On Increasing Pressure In. H_2O	Adjustable Set Point Range: On Decreasing Pressure In. H_2O	Approx. Dead Band In. H_2O	Model Number and Wetted Parts: MODEL SPDT	Model Number and Wetted Parts: Wetted Parts
10	15	1.5-6.9	0.2–5.6	1.3	675DE8001	Aluminum, Polyimide, Buna N, 300 SS, Tin Plated Steel, Silver Plated Beryllium Copper & Brass
		7.0-12.9	5.5-11.4	1.5	675DE8001	
		13.0-18.9	11.0-16.9	2.0	675DE8001	
		19.0-24.9	16.5-22.4	2.5	675DE8001	
		25.0-31.0	22.5-28.0	3.0	675DE8001	

PRESSURE SWITCHES MODEL 675GEM8000 • **1/4" ALUMINUM PRESSURE PORT AND POLYIMIDE DIAPHRAGM**

Maximum System Pressure psi	Proof (Test) Pressure psi	Adjustable Set Point Range: On Increasing Pressure In. H_2O	Adjustable Set Point Range: On Decreasing Pressure In. H_2O	Approx Dead Band In. H_2O	Model Number and Wetted Parts: MODEL DPDT	Model Number and Wetted Parts: Wetted Parts
10	15	2.0.5-6.9	0.2–5.1	1.8	675GEM8001	Aluminum, Polyimide Buna N, 300 SS
		7.0-12.9	5.0-10.9	2.0	675GEM8002	
		13.0-18.9	10.8-16.7	2.2	675GEM8003	
		19.0-24.9	16.5-22.4	2.5	675GEM8004	
		25.0-31.0	22.5-28.0	3.0	675GEM8005	

PRESSURE SWITCHES MODEL 675DEM8000 • **1/4 in. ALUMINUM PRESSURE PORT, TIN PLATED STEEL AND POLYIMIDE DIAPHRAGM**

Maximum System Pressure psi	Proof (Test) Pressure psi	Adjustable Set Point Range: On Increasing Pressure In. H_2O	Adjustable Set Point Range: On Decreasing Pressure In. H_2O	Approx Dead Band In. H_2O	Model Number and Wetted Parts: MODEL DPDT	Model Number and Wetted Parts: Wetted Parts
10	15	2.0.5-6.9	0.2–5.1	1.8	675DEM8001	Aluminum, Polyimide, Buna N, 300 SS, Tin Plated Steel, Silver Plated Beryllium Copper & Brass
		7.0-12.9	5.0-10.9	2.0	675DEM8001	
		13.0-18.9	10.8-16.7	2.2	675DEM8001	
		19.0-24.9	16.5-22.4	2.5	675DEM8001	
		25.0-31.0	22.5-28.0	3.0	675DEM8001	



Note: Unit can be set prior to installation. Insert 1/8" Allen wrench into adjustment screw (located in pressure port, as shown) and turn clockwise to decrease setting.

ELECTRICAL CHARACTERISTICS:		
Rating of Switch Element		
VOLTS	AMPERES	
	SPDT Res.	DPDT "M" Res.
125 AC — 50/60 Hz	15.0	5.0
250 AC — 50/60 Hz	15.0	5.0
480 AC — 50/60 Hz	15.0	
125 DC	0.4	0.5

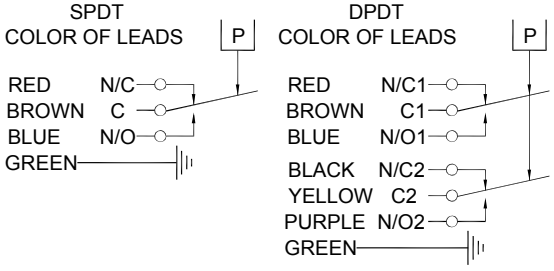
SHIPPING WEIGHTS:

Models:	Oz	Grams
675GE8000*	25	708
675DE8000*	25	708

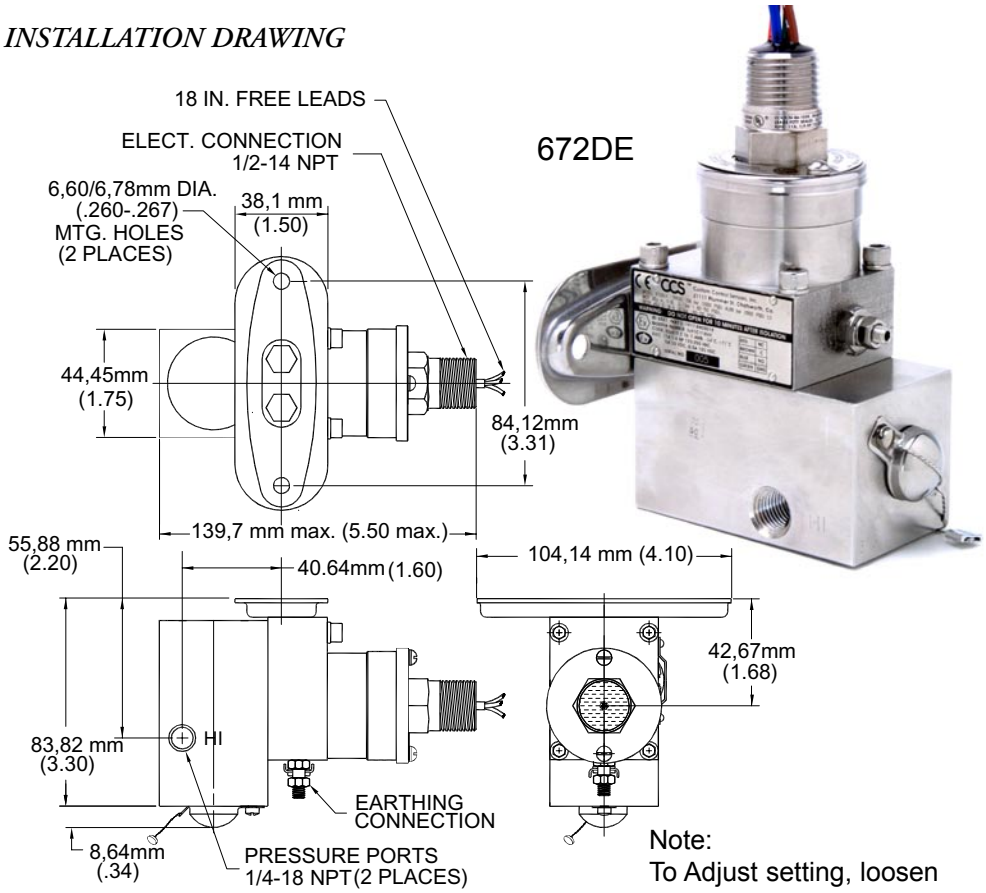
How to Order:

1. Specify model number

SCHEMATIC AND WIRING CODE



INSTALLATION DRAWING



672DE

Note:
To Adjust setting, loosen screw, lift cap, turn adjustment screw clockwise to decrease setting.

Differential 2.0 to 150 psid

Standard Features:

• U.L./CSA Explosion Proof: Div. 1, 2 Div. 1 explosion-proof and hermetically sealed electrical assembly P/N 46-1058 (46-1061 for "M" model option), listed by both Underwriter's Laboratories, Inc. (File No. E32961) and CSA Testing Laboratories (File No. 22921) for hazardous locations, Class 1, Groups A, B, C, and D; Class 2 Groups E, F, and G.

• BASEEFA & CENELEC Certified Switches conform to the harmonized European Standard: Electrical apparatus for potentially explosive atmospheres Part 5. Flameproof enclosure 'd' BS5501: Part 5: 1977 EN50018. Cenelec Code: EExdIICT5 BASEEFA No. Ex91C1184X.

• NEMA 4, 4x, 7, 9, 13
• NACE MR-0175-94
• Fire Resistant 316 SST Body
• CE Marking- UK Regulations, S1-1992/2372
• Meets requirement of IP-67-B.S.60529:1992.

Ambient Temp. Range:

T6: T.AMB -30°F to +160°F or -34°C to +71°C.
T5: T.AMB -30°F to +186°F or -34°C to +86°C.

OPERATING AND ORDERING DATA:

DIFFERENTIAL SWITCHES
MODEL 672DE
• **1/4" STAINLESS STEEL PRESSURE PORT, BODY, ELECTRICAL HOUSING AND DIAPHRAGM, VITON "O"-RING,**

Maximum System Pressure psi		Proof (Test) Pressure psi		Adjustable Set-Point Range		Approx. Dead-band psi	Model No. and Wetted Parts		
High Press. Port	Low Press. Port	Both Ports Simul-taneous	High Over Low Low Over High	On Increasing Pressure psid	On Decreasing pressure psid		**MODEL** SPDT	**MODEL** DPDT*	Wetted Parts 316 SST Viton
			High / Low						
3000		4500	2000 / 1000	7 to 65	2 to 60	5	672DE1		
				9 to 65	2 to 60	6		672DEM1	
				60 to 150	40-130	20	672DE4	672DEM4	

ELECTRICAL CHARACTERISTICS:
Rating of Switch Element

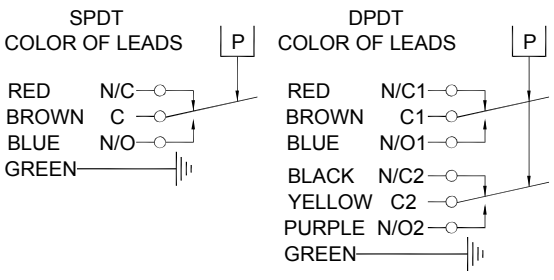
VOLTS	AMPERES SPDT Res.	AMPERES DPDT "M" Res.
125 AC — 50/60 Hz	11.0	11.0
250 AC — 50/60 Hz	11.0	11.0
30 DC	5.0	5.0
125 DC	0.5	0.5

SHIPPING WEIGHTS:

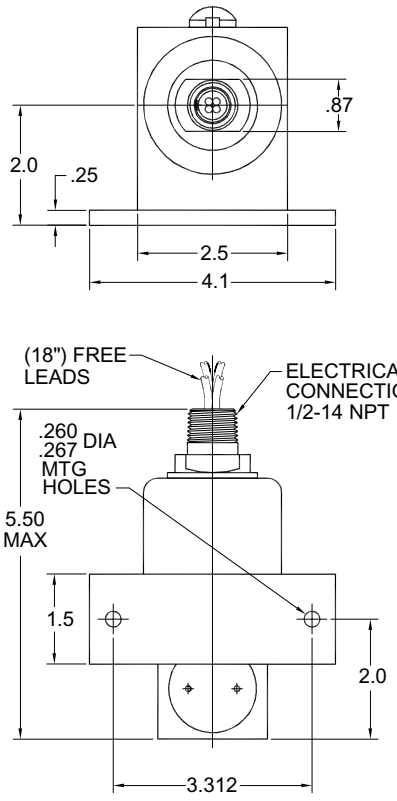
Models:	Oz	Grams
672DE*	67	1876

How to Order:
1. Specify model number
Call or e-mail for addional options

SCHEMATIC AND WIRING CODE



INSTALLATION DRAWING



673DE

Note: To Adjust setting, loosen screw, lift cap, turn adjustment screw clockwise to decrease

Differential 2.0 to 60 psid

Standard Features:

•U.L./CSA Explosion Proof: Div. 1, 2 Div. 1 explosion-proof and hermetically sealed electrical assembly P/N 17-51 (17-73 for "M" model option), listed by both Underwriter's Laboratories, Inc. (File No. E32961) and CSA Testing Laboratories (File No. 22921) for hazardous locations, Class 1, Groups A, B, C, and D; Class 2 Groups E, F, and G.

• NEMA 4, 7, 9, 13
• Fire Resistant Steel Body

Ambient Temp. Range:

-30°F to +160°F or -34°C to +71°C.

Note:
Models 673DEM8001 has an approximate dead band of 7 psi.

How to Order:
1. Specify model number.
2. Specify critical set point and specify if it is on "increasing pressure" or on "decreasing pressure

OPERATING AND ORDERING DATA:

DIFFERENTIAL SWITCHES
MODEL 673DE8011 • **1/4" STAINLESS STEEL PRESSURE PORTS, BODY AND DIAPHRAGM**

Maximum System Pressure psi		Proof (Test) Pressure psi		Adjustable Set-Point Range		Approx. Dead-band psi	Model No. and Wetted Parts		
High Press Port	Low Press. Port	Both Ports Simul-taneous	High Over Low Low Over High				**MODEL** SPDT	**MODEL** DPDT*	Wetted Parts
			High	Low	On Increasing Pressure psid	On Decreasing pressure psid			
3000		4500	2000	1000	7 to 60	2 to 55	5	673DE8011	673DEM8011	300 SST Viton

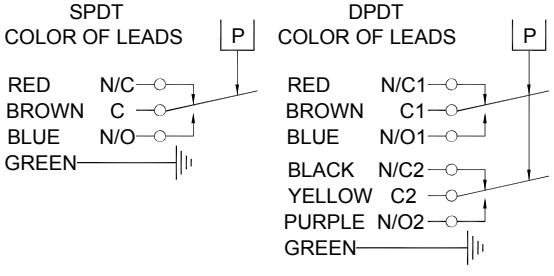
ELECTRICAL CHARACTERISTICS: *Rating of Switch Element*		
VOLTS	*AMPERES*	
	SPDT Res.	*DPDT "M" Res.*
125 AC — 50/60 Hz	*15.0*	*11.0*
250 AC — 50/60 Hz	*15.0*	*11.0*
480 AC — 50/60 Hz	*15.0*	
125 DC	*0.4*	*0.5*

SHIPPING WEIGHTS:

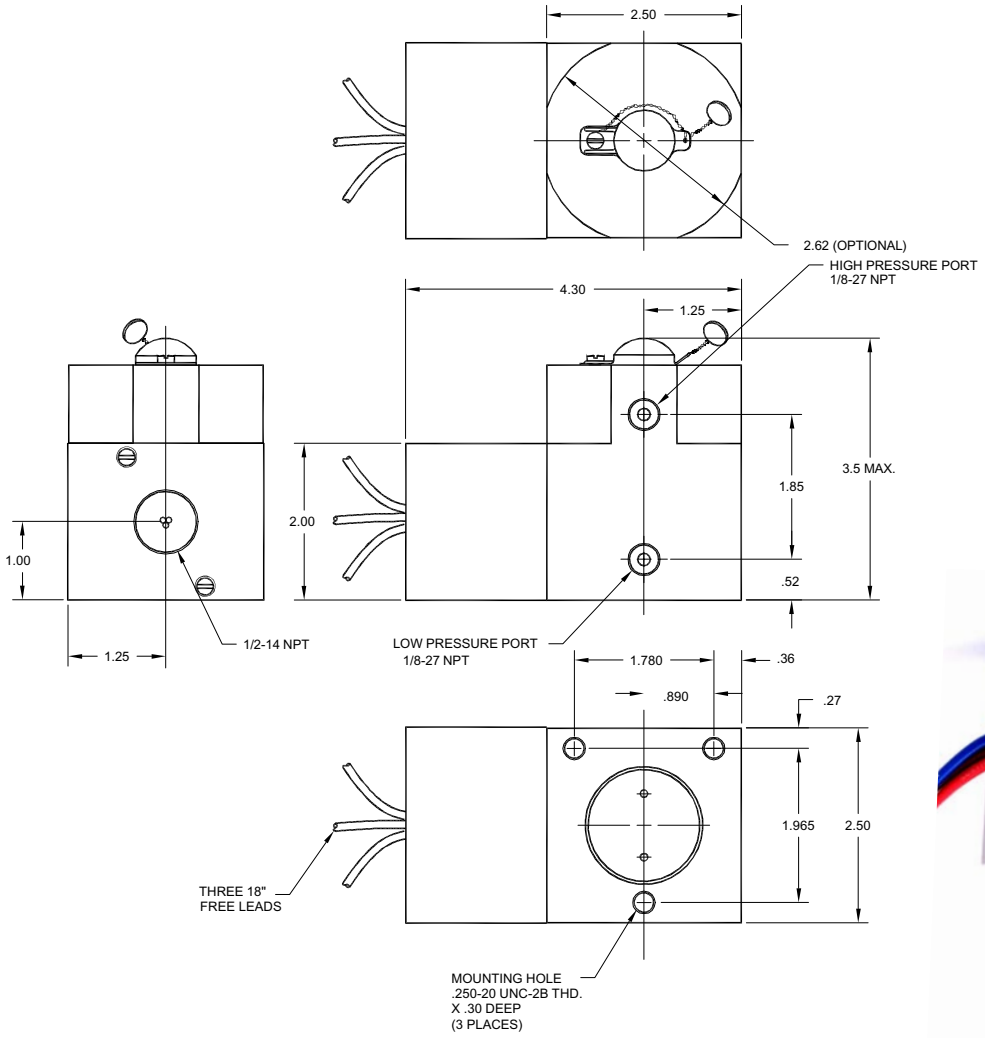
Models:	*Oz*	*Grams*
673DE8011	*60*	*1700*
673DEM8011	*60*	*1700*

*For Example 673DE**F**M8011 specified "**F**" = Ethylene Propelene "O"-Ring./*

SCHEMATIC AND WIRING CODE



INSTALLATION DRAWING



Differential 2.0 to 800 psid

Standard Features:

- *NEMA 4, 13*
- *Weatherproof*

Ambient Temp. Range:

-30°F to +160°F or
-34°C to +71°C.

How to Order:

1. Specify model number.
2. Specify critical set point and specify if it is on "increasing pressure" or on "decreasing pressure

OPERATING AND ORDERING DATA:

DIFFERENTIAL SWITCHES
MODEL 674D

- **1/4" ALUMINUM PRESSURE PORTS, BODY AND POLYIMIDE DIAPHRAGM**

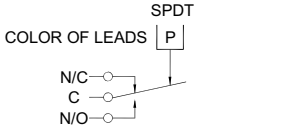
Maximum System Pressure psi	Proof (Test) Pressure, psi			Setting Ranges – For Customer Specified Set Points				Model No. and Wetted Parts	
	Both Ports Simul-taneous	High Over Low Low Over High		On Increasing Pressure psid	On Decreasing pressure psid	Approx. Dead-band psi		**MODEL** SPDT	Wetted Parts
		High	Low						
3000	4500	2500	2500	5 to 80	2 to 68	3	12	674D1	Aluminum, Polyimide, Viton, 300 SST
				81 to 350	67 to 297	14	52	674D2	
				351 to 800	299 to 680	60	120	674D3	

ELECTRICAL CHARACTERISTICS:	
Rating of Switch Element	
VOLTS	**AMPERES** SPDT Res.
125 AC - 50/60 Hz	15.0
250 AC - 50/60 Hz	15.0
480 AC - 50/60 Hz	15.0
125 DC	0.4

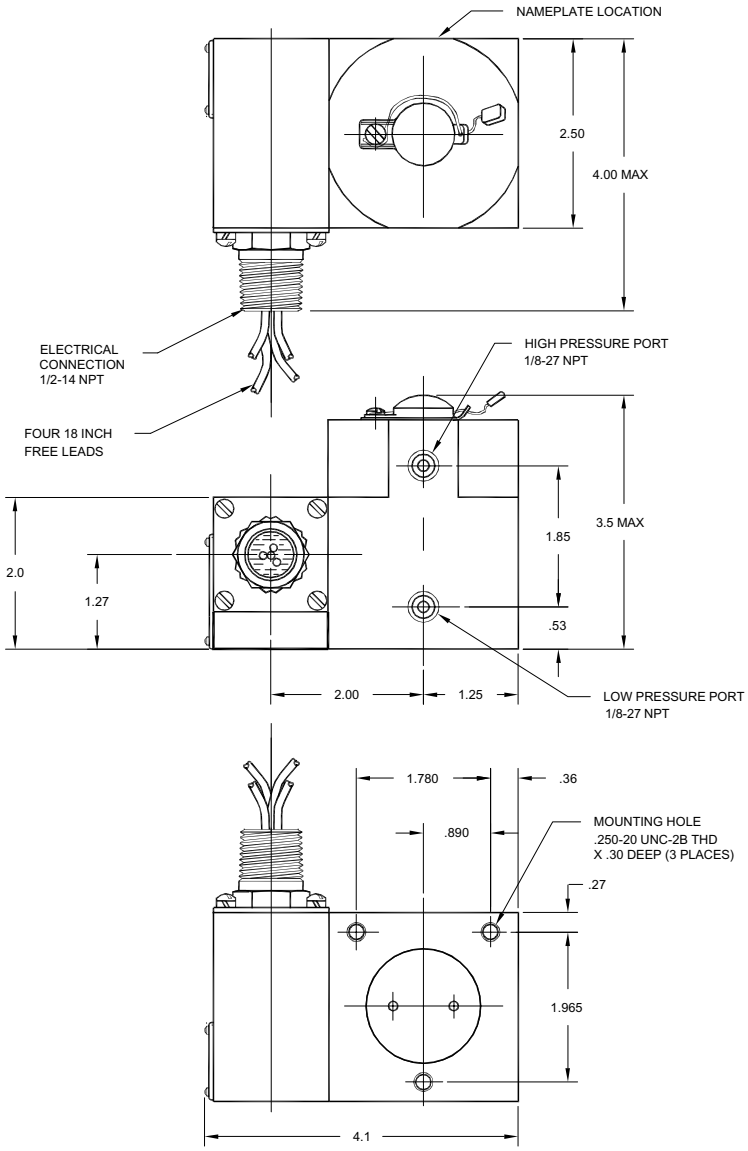
SHIPPING WEIGHTS:

Models:	*Oz*	*Grams*
674D	*45*	*1275*

SCHEMATIC AND WIRING CODE



INSTALLATION DRAWING



Differential Pressure 2.0 to 800 psid

Standard Features:

•U.L./CSA Explosion Proof: Div. 1, 2
Div. 1 explosion-proof and hermetically sealed electrical assembly P/N 46-1058 (46-1061 for "M" model option), listed by both Underwriter's Laboratories, Inc. (File No. E32961) and CSA Testing Laboratories (File No. 22921) for hazardous locations, Class 1, Groups A, B, C, and D; Class 2 Droups E, F, and G.

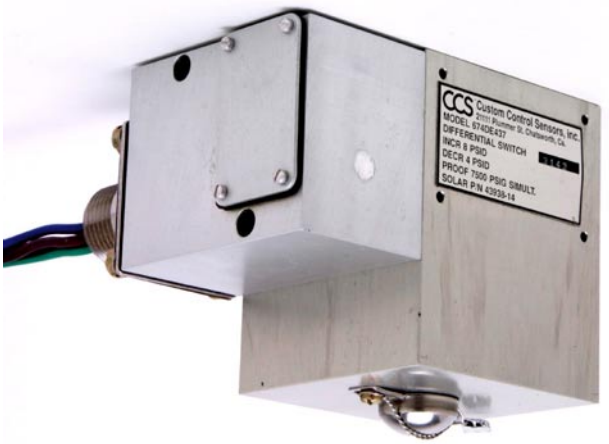
• NEMA 4, 7, 9, 13

Ambient Temp. Range:

-30°F to +160°F or
-34°C to +71°C.

How to Order:

1. Specify model number.
2. Specify critical set point and specify if it is on "increasing pressure" or on "decreasing pressure



OPERATING AND ORDERING DATA:

DIFFERENTIAL SWITCHES
MODEL 674DE
• **1/8" ALUMINUM PRESSURE PORTS, BODY AND POLYIMIDE DIAPHRAGM**

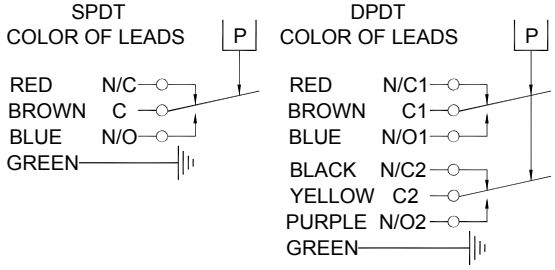
Maximum System Pressure psi	Proof (Test) Pressure, psi			Setting Ranges – For Customer Specified Set Points				Model No. and Wetted Parts		
	Both Ports Simul-taneous	High Over Low Low Over High		On Increasing Pressure psid	On Decreasing pressure psid	Approx. Dead-band psi		**MODEL** SPDT	**MODEL** DPDT "M"	Wetted Parts
		High	Low							
3000	4500	2500	2500	7 to 80	2 to 68	5	12	674DE1	674DEM1	Aluminum, Polyimide, Viton, 300 SST
				81 to 350	66 to 297	14	52	674DE2	674DEM2	
				351 to 800	291 to 680	60	120	674DE3	674DEM3	

ELECTRICAL CHARACTERISTICS: *Rating of Switch Element*		
VOLTS	*AMPERES*	
	SPDT Res.	*DPDT "M" Res.*
125 AC — 50/60 Hz	*11.0*	*11.0*
250 AC — 50/60 Hz	*11.0*	*11.0*
30 DC	*5.0*	*5.0*
125 DC	*0.5*	*0.5*

SHIPPING WEIGHTS:

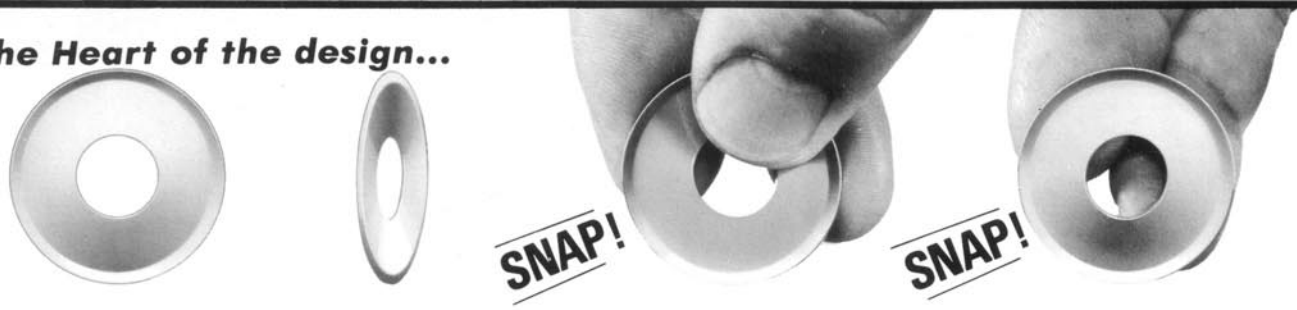
Models:	*Oz*	*Grams*
674DE	*47*	*1332*

SCHEMATIC AND WIRING CODE



How a Wide Range DUAL-SNAP® Temperature Switch Works

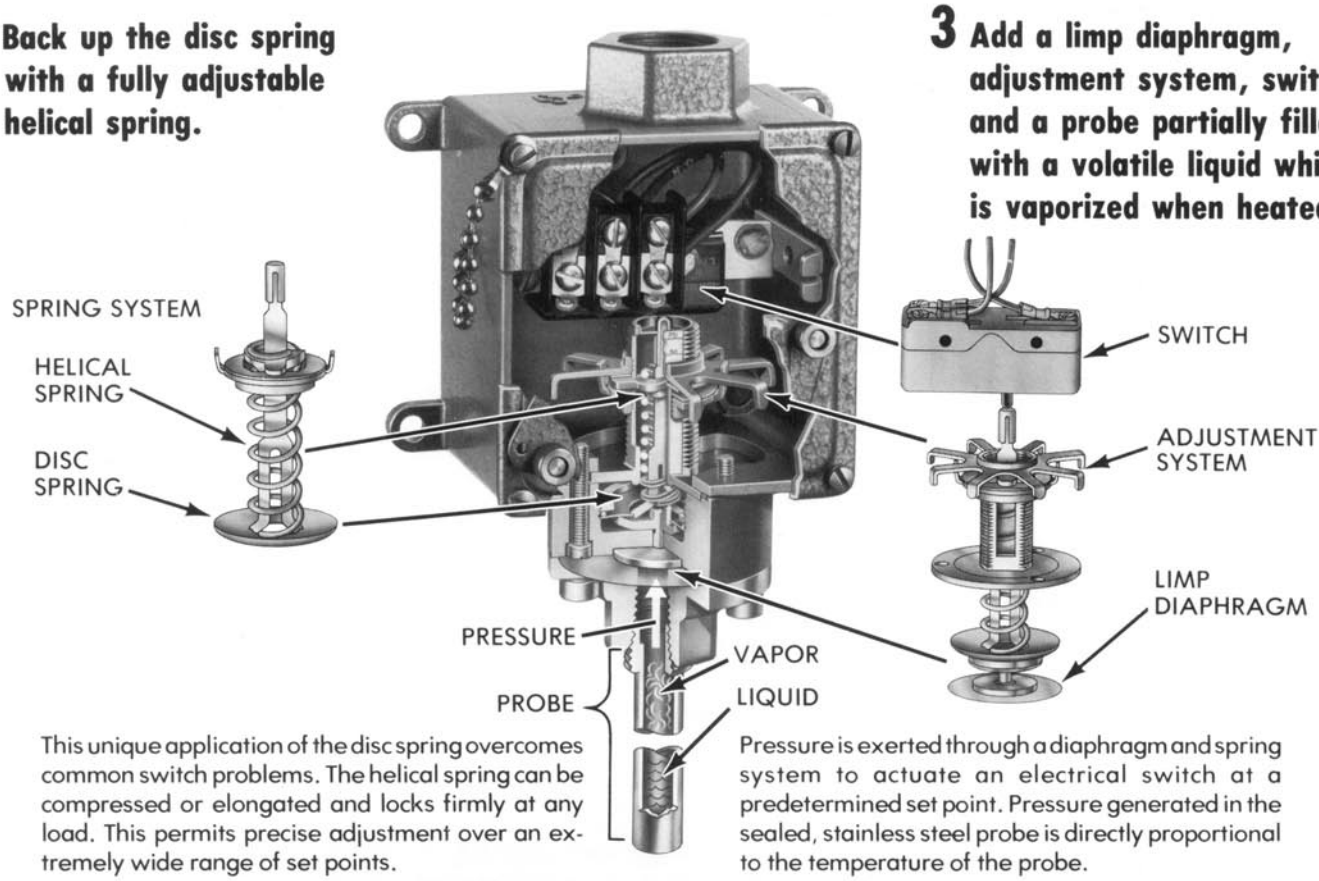
1 *The Heart of the design...*



- It's a convex disc spring with a center hole.
- It snaps to concave under pressure. And it snaps back when pressure is released.

2 Back up the disc spring with a fully adjustable helical spring.

3 Add a limp diaphragm, adjustment system, switch, and a probe partially filled with a volatile liquid which is vaporized when heated.



This unique application of the disc spring overcomes common switch problems. The helical spring can be compressed or elongated and locks firmly at any load. This permits precise adjustment over an extremely wide range of set points.

Pressure is exerted through a diaphragm and spring system to actuate an electrical switch at a predetermined set point. Pressure generated in the sealed, stainless steel probe is directly proportional to the temperature of the probe.

4 Now the system is packaged with components suitable for the specific temperature and environment...and you have a Wide Range DUAL-SNAP® Temperature Switch with these advantages:

- Extremely fast response.
- Set points stay set — not sensitive to shock, vibration, ambient temperature, or other environmental conditions. No drifting set points to cause trouble.
- Vapor type temperature sensing is more accurate than bimetallic types — simpler than thermocouples.
- No "tracing" because of fluctuations in system temperature or pressure — no "teasing" of the electrical element.
- Reduces the adverse effects of ripple, contact chatter, fatigue, premature wear, and other common switch problems.
- Maximum life expectancy with lifelong reliability and precise repeatability assured.
- Broad spectrum of temperature and system pressure ranges in one switch.

CAPILLARIES — OPTIONAL TUBE LENGHTS

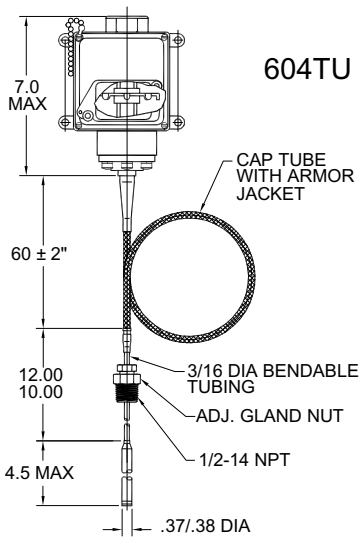
Standard model 604TU, 6400TU and 6900TU series temperature switches are furnished with a 5' capillary. Optional 10', 15', and 25' capillaries are available. Order as listed below:

10' capillary: When ordering add – 7001 to model number
15' capillary: When ordering add – 7002 to model number
25' capillary: When ordering add – 7003 to model number

HOW TO ORDER:

1. Specify standard model number of temperature switch desired.
2. Add the above number that specifies capillary tube length to end of standard model number.

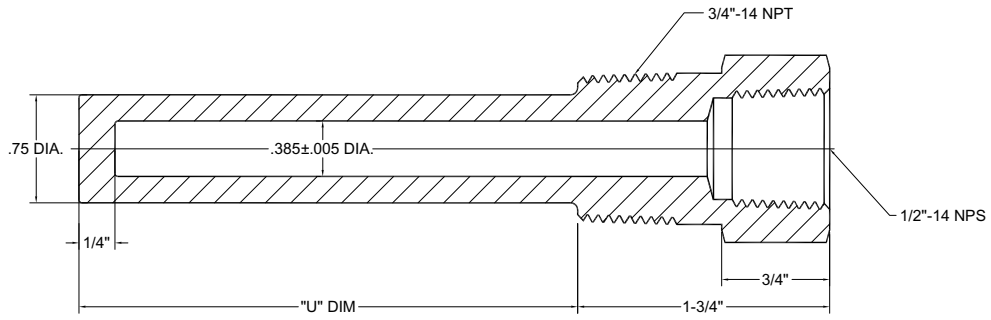
Example: To order 646TUE1 with 15' capillary, specify 646TUE1-7002



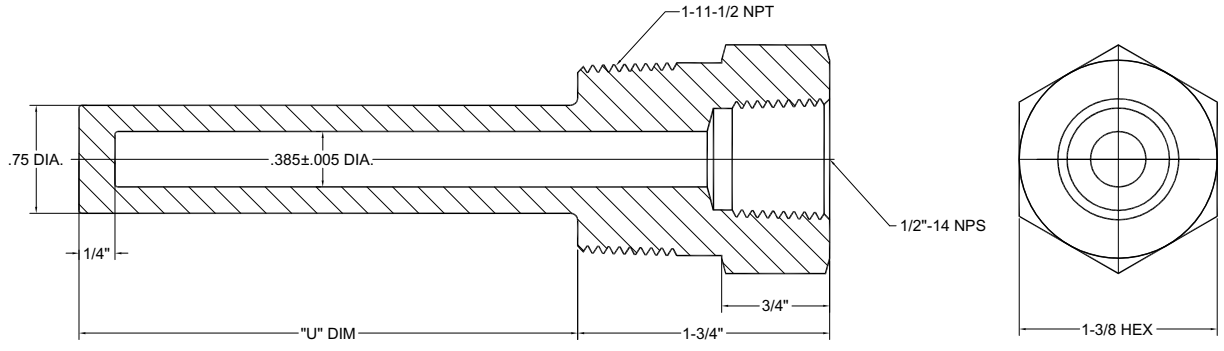
THERMOWELLS

Readily available convenience items for use with Temperature Switch Models.

THERMOWELL NO. 113-35 * 3/4" NPT * MATERIAL: SERIES 316 STAINLESS STEEL



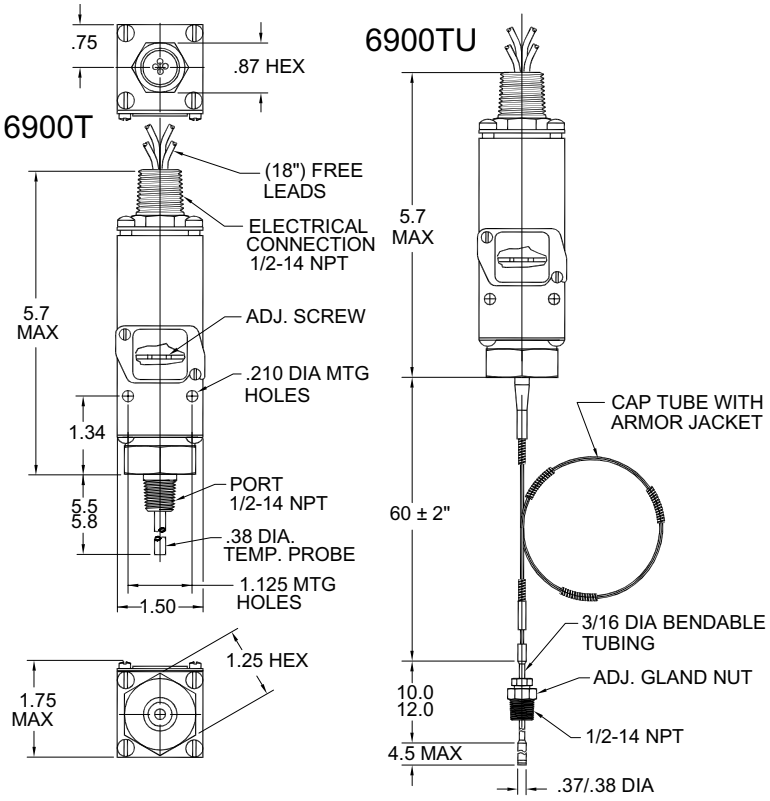
THERMOWELL NO. 113-34 * 1" NPT * MATERIAL: SERIES 316 STAINLESS STEEL



HOW TO ORDER:
Specify thermowell part number as a separate item.

"U" Dim	Part Number	Part Number
4 1/2	113-35-1	113-34-1
7 1/2	113-35-2	113-34-2
10 1/2	113-35-3	113-34-3
13 1/2	113-35-4	113-34-4

INSTALLATION DRAWING



Temperature 0 to 650 °F

Standard Features:
- *NEMA 4, 13*
- *Weatherproof,*
- *CSA Certified enclosure 4 non-hazardous locations (File LR22665)*

Ambient Temp. Range:
-30°F to +160°F or
-34°C to +71°C.

How to Order:
1. Specify model number.
2. See Page 23 for detail data on available Capillaries and Thermowells.

OPERATING AND ORDERING DATA:

Maximum Probe Temperature Degrees F	Adjustable Set-Point Range: On Increasing Temperature Degrees F	Adjustable Set-Point Range: On Decreasing Temperature Degrees F	Approx. Dead Band: At Bottom of Range Degrees F	Approx. Dead Band: At Top of Range Degrees F	Model No. and Wetted Parts: MODEL SPDT	Model No. and Wetted Parts: MODEL DPDT	Model No. and Wetted Parts: Wetted Parts
TEMPERATURE SWITCHES MODEL 6900T • **STAINLESS STEEL TEMPERATURE PROBE**							
+200°	+ 20° to +120°	0° to +113°	20°	5°	6900T12	6900TM12	300 SST
+300°	+ 80° to +205°	+60° to +198°	20°	5°	6900T14	6900TM14	
+400°	+185° to +315°	+165° to +308°	20°	5°	6900T16	6900TM16	
+500°	+280° to +405°	+260° to +398°	20°	5°	6900T18	6900TM18	
TEMPERATURE SWITCHES MODEL 6900TU • **STAINLESS STEEL TEMPERATURE PROBE WITH 5' CAPILLARY TUBE**							
+200°	+ 20° to +120°	0° to +113°	20°	5°	6900TU12	6900TUM12	300 SST and Graphite Lubricated Glass Fiber
+300°	+ 80° to +205°	+60° to +198°	20°	5°	6900TU14	6900TUM14	
+400°	+185° to +315°	+165° to +308°	20°	5°	6900TU16	6900TUM16	
+500°	+280° to +405°	+260° to +398°	20°	5°	6900TU18	6900TUM18	
+650°	+385° to +565°	+360° to +555°	25°	10°	6900TU20	6900TUM20	
+700°	+465° to +650	+440° to +640°	25°	10°	6900TU22	6900TUM22	

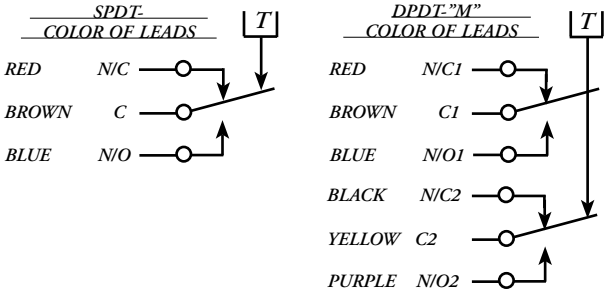
EXTERNAL PROBE PRESSURE
System Pressure: 1250 psi
Proof Pressure: 1500 psi

ELECTRICAL CHARACTERISTICS: *Rating of Switch Element*		
VOLTS	AMPERES	
	SPDT Res.	DPDT "M" Res.
125 AC—50/60 Hz	11.0	11.0
250 AC—50/60 Hz	11.0	11.0
30 DC	5.0	5.0
125 DC	5.0	0.5

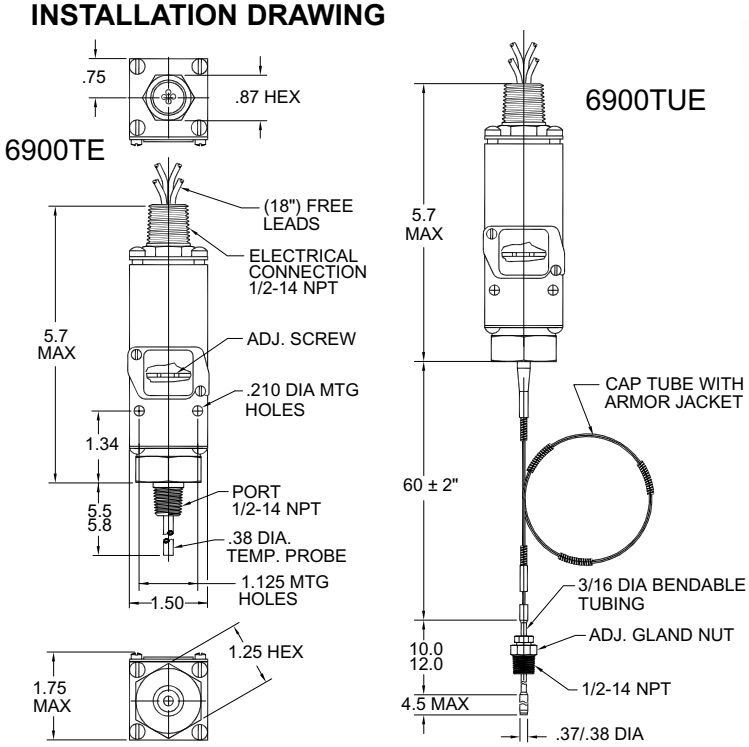
SHIPPING WEIGHTS:

Models:	Oz	Grams
6900T	18	510
6900TU	26	737

SCHEMATIC AND WIRING CODE



INSTALLATION DRAWING



Temperature 0 to 650 °F

Standard Features:

•U.L./CSA Explosion Proof: Div. 1, 2
Div. 1 explosion-proof and hermetically sealed electrical assembly P/N 46-1058 (46-1061 for "M" model option), listed by both Underwriter's Laboratories, Inc. (File No. E32961) and CSA Testing Laboratories (File No. 22921) for hazardous locations, Class 1, Groups A, B, C, and D; Class 2 Droups E, F, and G.

•NEMA 4, 7, 9, 13.

Ambient Temp. Range:

-30°F to +160°F or
-34°C to +71°C.

How to Order:

1. Specify model number.
2. See Page 23 for detail on available Capillaries and Thermowells.

EXTERNAL PROBE PRESSURE
System Pressure: 1250 psi
Proof Pressure: 1500 psi

OPERATING AND ORDERING DATA:

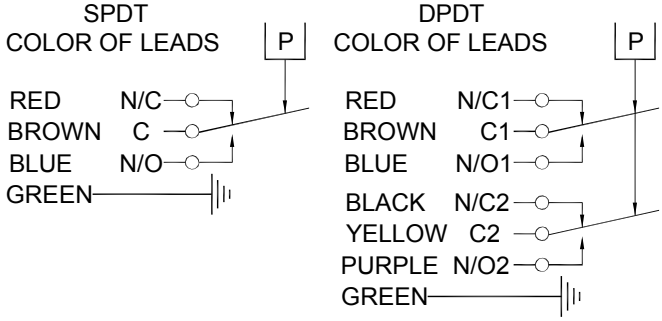
TEMPERATURE SWITCHES **MODEL 6900TE** • STAINLESS STEEL TEMPERATURE PROBE							
Maximum Probe Temperature Degrees F	Adjustable Set-Point Range		Approx. Dead Band		Model No. and Wetted Parts		
	On Increasing Temperature Degrees F	On Decreasing Temperature Degrees F	At Bottom of Range Degrees F	At Top of Range Degrees F	**MODEL** SPDT	**MODEL** DPDT	Wetted Parts
+200°	+ 20° to +120°	0° to +113°	20°	5°	6900TE12	6900TEM12	300 SS
+300°	+ 80° to +205°	+60° to +198°	20°	5°	6900TE14	6900TEM14	
+400°	+185° to +315°	+165° to +308°	20°	5°	6900TE16	6900TEM16	
+500°	+280° to +405°	+260° to +398°	20°	5°	6900TE18	6900TEM18	
TEMPERATURE SWITCHES MODEL 6900TUE • STAINLESS STEEL TEMPERATURE PROBE WITH 5' CAPILLARY TUBE							
+200°	+ 20° to +120°	0° to +113°	20°	5°	6900TUE12	6900TUEM12	300 SS and Graphite Lubricated Glass Fiber
+300°	+ 80° to +205°	+60° to +198°	20°	5°	6900TUE14	6900TUEM14	
+400°	+185° to +315°	+165° to +308°	20°	5°	6900TUE16	6900TUEM16	
+500°	+280° to +405°	+260° to +398°	20°	5°	6900TUE18	6900TUEM18	
+650°	+385° to +565°	+360° to +555°	25°	10°	6900TUE20	6900TUEM20	
+700°	+465° to +650	+440° to +640°	25°	10°	6900TUE22	6900TUEM22	

ELECTRICAL CHARACTERISTICS: Rating of Switch Element		
VOLTS	AMPERES	
	SPDT Res.	DPDT "M" Res.
125 AC — 50/60 Hz	11.0	11.0
250 AC — 50/60 Hz	11.0	11.0
30 DC	5.0	5.0
125 DC	0.5	0.5

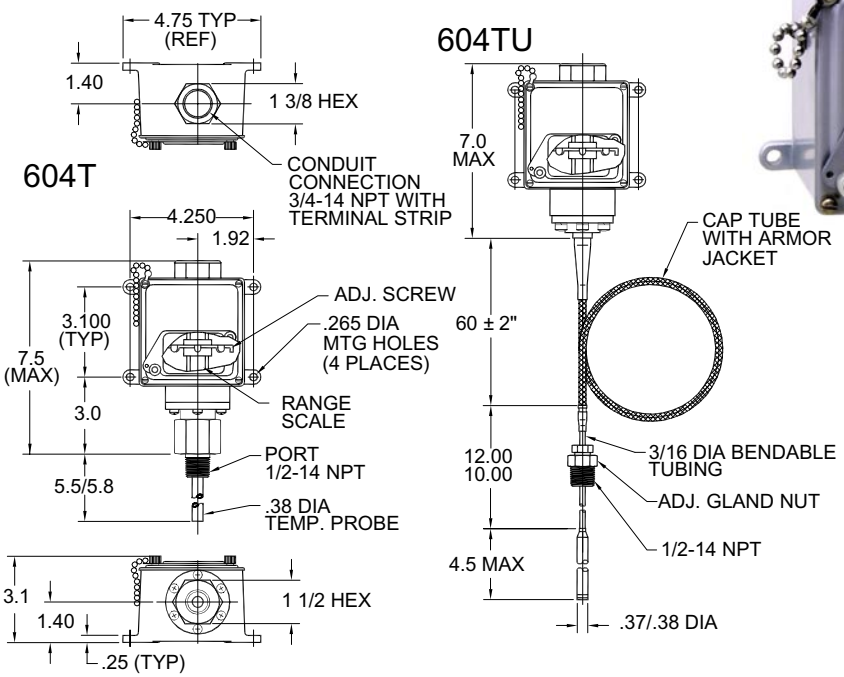
SHIPPING WEIGHTS:

Models:	Oz	Grams
6900TE	21	595
6900TUE	29	822

SCHEMATIC AND WIRING CODE



INSTALLATION DRAWING



Temperature -39 to 630°F

Standard Features:

•All models shown are Underwriters' Laboratories, Inc. listed in the Recognized Components Index, Guide NPZ "Motor Controllers, Float and Pressure Operated," File No. E72038.

- *NEMA 4, 7, 13.*
- *Weatherproof*
- *Internal Case Ground*

Ambient Temp. Range:

-30°F to +160°F or
-34°C to +71°C.

How to Order:

1. Specify model number.
2. See Page 23 for detail data on available Capillaries and Thermowells.

Optional Features:

Specify optional feature designation (from Page 23) if applicable

EXTERNAL PROBE PRESSURE

System Pressure: 1250 psi
Proof Pressure: 1500 psi

OPERATING AND ORDERING DATA:

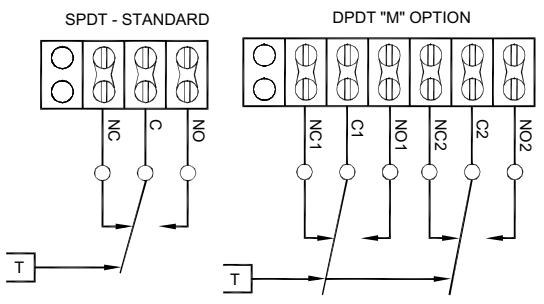
TEMPERATURE SWITCHES **MODEL 604T** — STAINLESS STEEL TEMPERATURE PROBE							
Maximum Probe Temperature Degrees F	Adjustable Set-Point Range: On Increasing Temperature Degrees F	Adjustable Set-Point Range: On Decreasing Temperature Degrees F	Approx. Dead Band: At Bottom of Range Degrees F	Approx. Dead Band: At Top of Range Degrees F	Model No. and Wetted Parts: **MODEL** SPDT	Model No. and Wetted Parts: **MODEL** DPDT	Model No. and Wetted Parts: Wetted Parts
+250°	- 30° to +55°	- 39° to + 52°	9	3°	604T1	604TM1	300 SS
+300°	+ 35° to +140°	+ 21° to +135°	14°	5°	604T2	604TM2	Nickel Plated Steel
+300°	+ 90° to +210°	+ 75° to +205°	15°	5°	604T3	604TM3	Buna N (Ranges 1-3)
+500°	+175° to +310°	+159° to +305°	16°	5°	604T4	604TM4	Silicone Rubber
+500°	+275° to +420°	+256° to +414°	19°	6°	604T5	604TM5	(Ranges 4,5)
TEMPERATURE SWITCHES MODEL 604TU — STAINLESS STEEL TEMPERATURE PROBE WITH 5' CAPILLARY TUBE							
+200°	- 30° to +55°	- 39° to + 52°	9	3°	604TU1	604TUM1	
+300°	+ 35° to +140°	+ 21° to +135°	14°	5°	604TU2	604TUM2	300 SS
+300°	+ 90° to +210°	+ 75° to +205°	15°	5°	604TU3	604TUM3	and
+500°	+175° to +310°	+159° to +305°	16°	5°	604TU4	604TUM4	Graphite
+500°	+275° to +420°	+256° to +414°	19°	6°	604TU5	604TUM5	Lubricated
+600°	+380° to +525°	+355° to +520°	25°	5°	604TU6	604TUM6	Glass Fiber
+650°	+480° to +630°	+456° to +624°	24°	6°	604TU7	604TUM7	

ELECTRICAL CHARACTERISTICS:		
Rating of Switch Element		
VOLTS	AMPERES	
	SPDT Res.	DPDT "M" Res.
125 AC — 50/60 Hz	15.0	5.0
250 AC — 50/60 Hz	15.0	5.0
480 AC — 50/60 Hz	15.0	
28 DC	6.0	5.0
125 DC	0.4	0.5

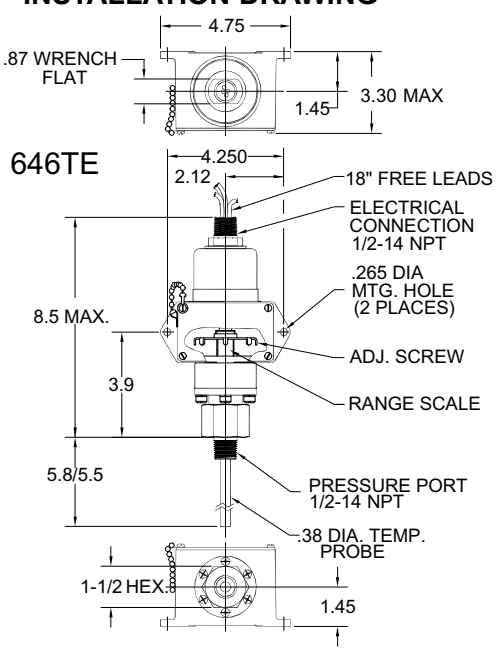
SHIPPING WEIGHTS:

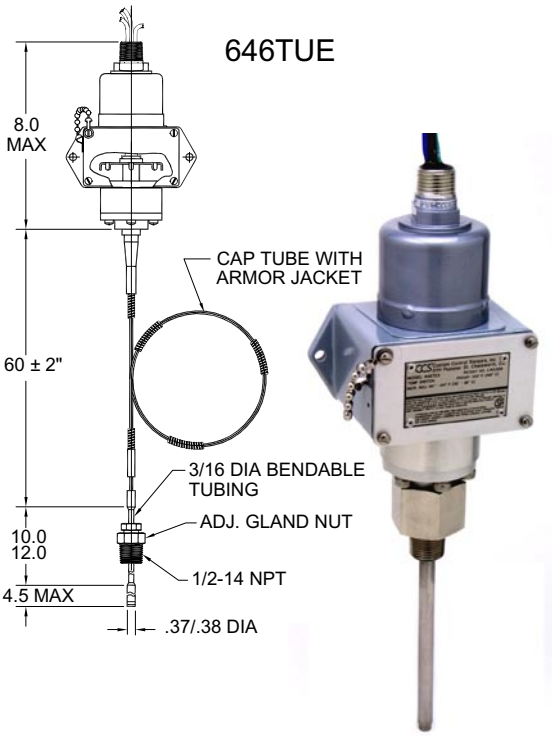
Models:	Oz	Grams
604T	66	1871
604TU	65	1843

SCHEMATIC AND WIRING DIAGRAM CODE



INSTALLATION DRAWING





Temperature -39 to 630 °F

Standard Features:

•U.L./CSA Explosion Proof: Div. 1, 2 Div. 1 explosion-proof and hermetically sealed electrical assembly P/N 17-51 (17-73 for "M" model option), listed by both Underwriter's Laboratories, Inc. (File No. E32961) and CSA Testing Laboratories (File No. 22921) for hazardous locations, Class 1, Groups A, B, C, and D; Class 2 Droups E, F, and G.

• NEMA 4, 7, 9, 13.

Ambient Temp. Range:

-30°F to +160°F or
-34°C to +71°C.

How to Order:

1. Specify model number.
2. See Page 23 for detail data on available Capillaries and Thermowells.

Optional Features:

Specify optional feature designation (from Page 23) if applicable.

EXTERNAL PROBE PRESSURE

System Pressure: 1250 psi
Proof Pressure: 1500 psi

OPERATING AND ORDERING DATA:

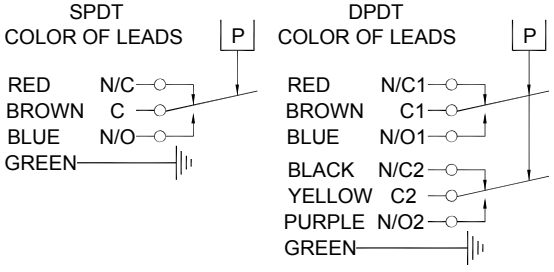
TEMPERATURE SWITCHES **MODEL 646TE**			STAINLESS STEEL TEMPERATURE PROBE				
Maximum Probe Temperature Degrees F	Adjustable Set-Point Range		Approx. Dead Band		Model No. and Wetted Parts		
	On Increasing Temperature Degrees F	On Decreasing Temperature Degrees F	At Bottom of Range Degrees F	At Top of Range Degrees F	**MODEL** SPDT	**MODEL** DPDT	Wetted Parts
+250°	- 30° to +55°	- 39° to + 52°	9	3°	646TE1	646TEM1	300 SS
+300°	+ 35° to +140°	+ 21° to +135°	14°	5°	646TE2	646TEM2	Nickel Plated Steel
+300°	+ 95° to +215°	+ 80° to +210°	15°	5°	646TE3	646TEM3	Buna N (Ranges 1-3)
+500°	+175° to +310°	+159° to +305°	16°	5°	646TE4	646TEM4	Silicone Rubber
+500°	+275° to +420°	+256° to +414°	19°	6°	646TE5	646TEM5	(Ranges 4,5)
TEMPERATURE SWITCHES MODEL 646TUE			**STAINLESS STEEL TEMPERATURE PROBE WITH 5 ft. CAPILLARY TUBE**				
+200°	- 30° to +55°	- 39° to + 52°	9	3°	646TUE1	646TUEM1	
+300°	+ 35° to +140°	+ 21° to +135°	14°	5°	646TUE2	646TUEM2	300 SS
+300°	+ 95° to +215°	+ 80° to +210°	15°	5°	646TUE3	646TUEM3	and
+500°	+175° to +310°	+159° to +305°	16°	5°	646TUE4	646TUEM4	Graphite
+500°	+275° to +420°	+256° to +414°	19°	6°	646TUE5	646TUEM5	Lubricated
+600°	+380° to +525°	+355° to +520°	25°	5°	646TUE6	646TUEM6	Glass Fiber
+650°	+480° to +630°	+456° to +624°	24°	6°	646TUE7	646TUEM7	

ELECTRICAL CHARACTERISTICS: Rating of Switch Element		
VOLTS	AMPERES	
	SPDT Res.	DPDT "M" Res.
125 AC— 50/60 Hz	15.0	5.0
250 AC— 50/60 Hz	15.0	5.0
480 AC— 50/60 Hz	15.0	5.0
125 DC	0.4	0.5

SHIPPING WEIGHTS:

Models:	Oz	Grams
646TE	71	2013
646TU	68	1928

SCHEMATIC AND WIRING CODE



If more than one option shown here is needed on any single pressure switch, contact factory for feasibility or special model number.

OPTIONAL FEATURE	ORDERING NUMBER
GOLD CONTACTS SWITCH ELEMENT .....-7008 *Available in SPDT and DPDT models.* *NOTE:* *The electrical rating is as follows:*	

HOW TO ORDER:
1. Specify standard model number of switch desired.
2. Add the above number that specifies option desired to the end of standard number.

EXAMPLE: To order 604P21 with gold contacts, specify 604P21**-7008**

MISCELLANEOUS ITEMS

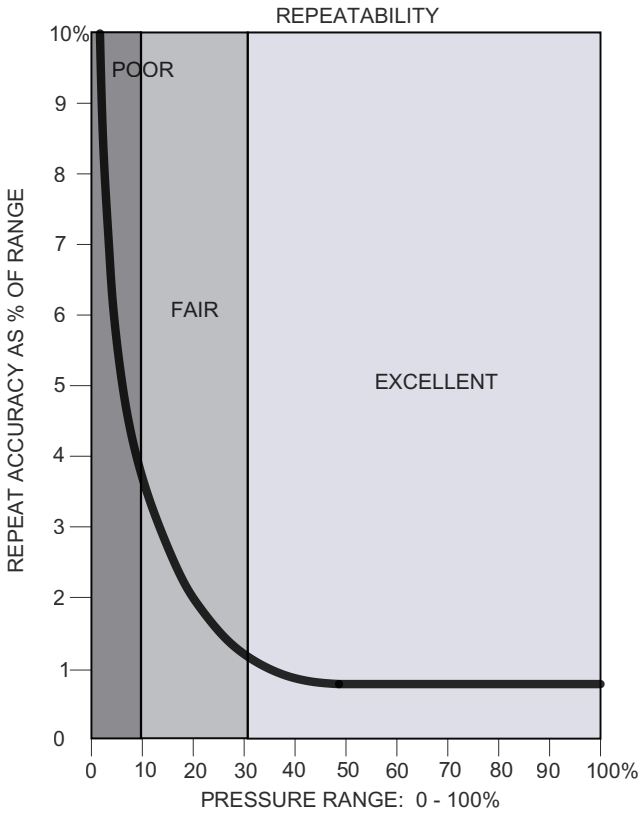
OPTIONAL FEATURE	ORDERING NUMBER
VITON O-RING .....**A** Check factory for availability and price on any specific model where it is not shown as a standard option. ETHYLENE PROPYLENE O-RINGS.....**B** Check factory for availability and price on any specific model where it is not shown as a standard option. TAGGING If tagging is required, it must be specified on the face of order by indicating whether it is Mylar or Stainless Steel.	

HOW TO ORDER:
1. Specify standard model number of switch desired.
2. Specify optional feature by inserting the letter designation of the optional feature after the last letter in the model number.

EXAMPLE: To order 604P21 with gold contacts, specify 604P**A**21

PRESSURE SWITCH

APPROXIMATE PRESSURE SENSING PERFORMANCE ARACTERISTICS



Surge and Ripples
The Disc Spring design used in DUAL-SNAP® switches makes them relatively impervious to surges or pump ripples that may be expected in conventional hydraulic systems.

This resistance to sharp pressure changes in the media has been the prime reason for many customers changing to DUAL-SNAP® pressure switches after experiencing false shutdown and failure with other competitive design principles such as flat metal diaphragms, bourdon tubes and bellows type. This makes DUAL-SNAP® switches particularly suitable for rugged applications on off the road machinery, heavy presses, and systems using pulsating piston pumps

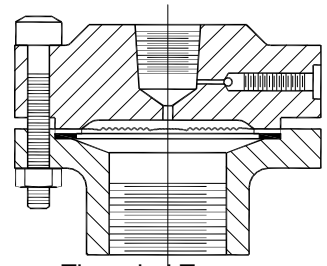
Pressure Switch - Application Conditions
Ambient Temperature: The pressure switch should be installed wherever possible in a location that has the most constant ambient temperature available.

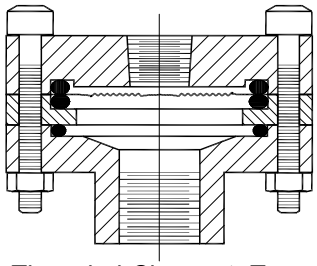
Steam Service: For steam or other high temperature applications the pressure switch should be mounted with the pressure connection up and with three or four circular loops, or pigtails, in the pressure lines. The vertical mounting allows condensate to accumulate in the dead ended pressure line and to be cooled in the pigtail which acts as a temperature buffer between the sensing element and the steam.

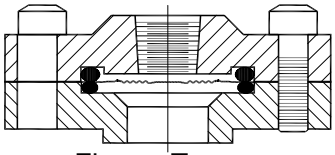
Corrosive Fluids
Occasionally liquids or gases are encountered that are not compatible with the "wetted parts" as shown in the catalog. When this occurs it is common practice to use a chemical seal as an interface between the corrosive fluid and the pressure switch. Custom Control Sensors does not manufacture or accept orders for chemical seals. The reason for this is to insure that the customer gets exactly what he needs for his application.

We will drop ship switches to any manufacturer of chemical seals that the customer may specify, or we can recommend a suitable source of supply if asked (Note: The customer can then place a purchase order with appropriate instructions directly with his source of supply so that the supplier can then coordinate the customer's wishes with the chemical seal that will be assembled, filled, calibrated and tested to fit the needs outlined).

Typical and readily available CHEMICAL SEALS


Threaded Type


Threaded-Cleanout Type


Flange Type

Pressure Switch Installation
The pressure switches can be mounted in any position. When the electrical conduit is connected, it is recommended that the conduit line (if it is over 6 feet in length) be clamped firmly close to the switch to keep thermal expansion from causing it to place a high stress load onto the housing of the pressure switch. If moisture in the conduit line is a potential problem, it is recommended that a potting Y connection be placed between the switch and the conduit. This will eliminate drainage from the electrical conduit into the pressure switch housing.

Line mounting is possible and recommended for any of our "Compact" pressure switches. Installation must not impose loads on connections.

Seismic Shock and Vibration
Due to their unique design principle, DUAL- SNAP® pressure and temperature switches will meet all the conventional seismic shock and vibration specifications now being applied to many projects such as power plants for ecological protection. These specifications by their severity eliminate the use of mercury filled switching elements and many vibration critical sensing elements found in most competitive designs.

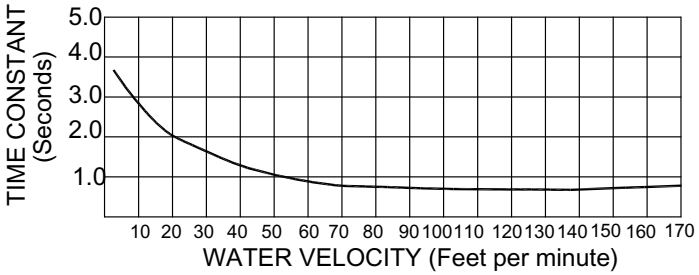
TEMPERATURE SWITCH

Fast Response

Response characteristics of CCS temperature switches are the second key feature among a host of performance benefits. DUAL-SNAP® Temperature Switches utilize a vapor pressure system, an established, reliable principle, to sense temperature changes. With the vapor pressure system, pressure is generated in a noncorrosive stainless steel probe that is partially filled with a volatile liquid and pre-selected according to temperature range requirements. The pressure generated is directly proportioned to the probe temperature according to precise vapor-pressure law; switch actuation and deactuation can thus be predetermined at precise temperatures.

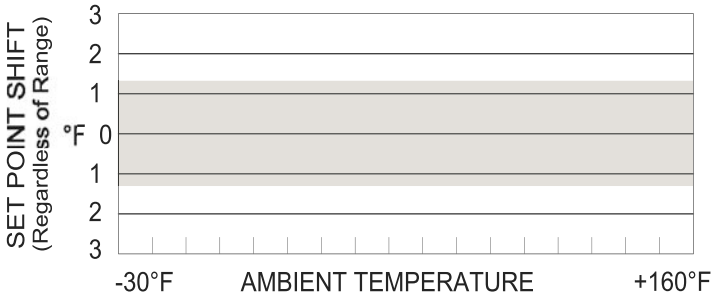
All in all, CCS temperature switches exhibit response, sensitivity and dead band characteristics that surpass competitive models in accuracy, repeatability and long- life.

FIGURE 1 - Response Characteristics
Series 604T, 646T, Only



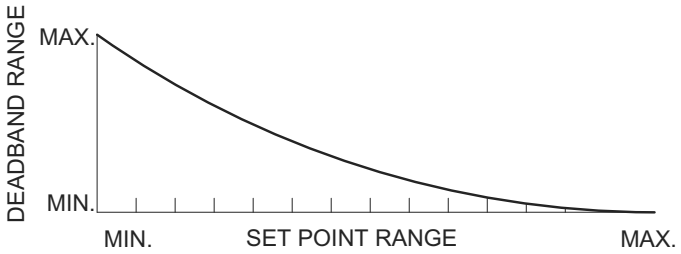
Typical Time Constant: To calculate thermal lag, (1) determine the time constant based on water velocity from Fig. 1 (Note: most oils will increase the time constant by a factor of approximately 4X); and (2) multiply the time constant by the temperature rise rate in °F/sec.
L=Tc x R where L=Lag in °F; Tc=time constant in seconds; and R=temperature rise rate in °F/sec.

FIGURE 2 - Sensitivity Characteristics



Typical ambient temperature effect on temperature settings.

FIGURE 3 - Dead Band Characteristics
Series 604T, 646T, Only



Typical effect of set point on dead band. Dead band decreases as set point is increased.

Temperature Switch Application Conditions

DUAL-SNAP® Temperature Switches may be utilized virtually anywhere. These switches may be used in systems with proof pressures up to 1500 psi, with system temperatures varying from -30°F to +630°F, and at any altitude above sea level. Typical applications include use on water and steam lines, heat exchangers, lube oil and gear box bearings. Capillary tube units permit use in hazardous or hard-to-service situations.

Temperature Switch Installation

DUAL-SNAP® Temperature Switches can be mounted in any position. However, when electrical conduit is connected, it is recommended that the conduit line (if it is over 6 feet in length) be clamped firmly and close to the switch to prevent thermal expansion from creating a high stress load onto the housing of the temperature switch. If moisture is a problem, it is recommended that a potting Y connection be placed between the switch and the conduit This will eliminate drainage from the electrical conduit into the temperature switch housing.

ACCURACY (REPEATABILITY) - Accuracy is the maximum operational set point deviation of a single sensor (a pressure, temperature, or flow switch) under one given set of environmental and operational conditions.

ACTUATION AND DEACTUATION POINT - The actuation point (sometimes called the set point) is the exact point at which the electrical circuit controlled by the switching element is opened (or closed) on increasing pressure or temperature. The deactuation point is the opposite, or the point at which the electrical circuit is closed (or opened) on decreasing pressure or temperature.

ADJUSTABLE RANGE - The total range within which the actuation point (set point) of a sensor may be adjusted.

AMBIENT TEMPERATURE RANGE - The maximum and minimum temperature that will surround the sensor during use and/or test.

ANSI (American National Standards Institute) - A federation of trade associations, professional and scientific societies, and individual company members. ANSI approves and serves as a clearinghouse for voluntary, nongovernmental American national standards.

API (American Petroleum Institute) - The national trade association that provides information in the form of standards, bulletins, and recommended practices for the petroleum industry.

BASEEFA (British Approvals Service for Electrical Equipment in Flammable Atmospheres) - The British national testing and certification authority for electrical equipment used in hazardous locations other than mines.

CENELEC (European Committee for Electrotechnical Standardization) - An organization comprised of the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom. CENELEC coordinates and approves European standards for electrical equipment. Upon approval, a European standard becomes a national standard in each of the participating countries.

CHARGE - The fluid with which the temperature sensing probe is filled.

CRITICAL SET POINT - The critical set point is the set point of the unit which is held to the closest tolerance. It can be either the actuation (increasing) or deactuation (decreasing) point.

CSA (Canadian Standards Association) - A nonprofit voluntary association engaged in standards development and certification activities. A CSA certified electrical product conforms to applicable requirements of the Canadian Electrical Code. Representative prototypes are tested prior to certification and CSA maintains a production surveillance program to ensure continuing conformity.

DOUBLE BREAK SWITCHING ELEMENT - A double break switching element has two isolated circuits; one normally open and one normally closed, the four terminals facilitate wiring.

DEAD BAND (DIFFERENTIAL, ACTUATION VALUE) - The difference between the actuation point and the dictation point of a sensor. For instance, if a pressure switch reaches its actuation point and closes the snap action switch at 100 psi, it is in an actuated condition. If the pressure then drops and the switch deactuates (returns to its normal condition) at 90 psi, it is said to have a dead band of 10 psi.

DOUBLE POLE DOUBLE THROW (DPDT) SWITCHING ELEMENT - A DPDT switching element has six electrical terminals. In simple terms, it is two SPD switches operating at the same settings. This type of switch can handle two independent circuits without using a relay.

DUAL SETTING - A dual setting pressure sensor has two independently adjustable electrical switches that are actuated by a shared pressure source. Equivalent to two field adjustable pressure switches in one package.

FACTORY SET - Tamperproof sensor which can be set only at the factory to customer's requirements.

FIELD ADJUSTABLE - A pressure switch design that provides for adjustment of set points in the field.

FIELD SET (611G8000 series only) - A pressure switch design that provides for field adjustment of set points. Adjustment is accomplished by turning an adjustment screw located inside of pressure port prior to installation. After unit is installed, set points can be adjusted by removing pressure fittings to access adjustment screw.

FIRE RESISTANT - A pressure sensor that is designed with a high melting point barrier (steel) that will prevent full flow of sensed flammable fluid from feeding on externally caused fire.

FLUID - A liquid or gas that alters its shape in response to any applied force and that tends to conform to the outline of its container.

GOLD CONTACTS - Gold contact switching elements are characterized by high corrosion resistance and high reliability in switching low voltage and amperage circuits. They are recommended for intrinsically safe and computer interface circuits.

HERMETIC SEAL - A method of sealing the electrical switching element in a sensor so that it is unaffected by all ambient external corrosive agents and explosive gases. Sealing must be accomplished by soldering, brazing, welding, and glass to metal fusion.

JIC (Joint Industrial Council) - A voluntary organization of industrial equipment producers and users that developed standards for industrial equipment. This organization is presently inactive and the standards are soon to be superseded by new standards written by the National Fire Protection Association and the National Fluid Power Association.

LIMP DIAPHRAGM - An elastomer or plastic diaphragm which is used in a pressure sensor. This type of diaphragm conforms to the shape of the sensing pressure plate and has no rigid structure itself. CCS uses polyimide or viton/dacron limp diaphragms.

NACE (National Association of Corrosion Engineers) Nonprofit technical association that develops and maintains standards that deal exclusively with protection and performance of materials in corrosive environments. The membership represents a cross-section of industry concerned with corrosion prevention and control.

NEC (National Electrical Code) - The American national standard that contains provisions considered necessary for safeguarding persons and property from hazards arising from the use of electricity. Generally, the code covers electric conductors and equipment installed within or on public and private buildings or other structures.

NEMA (National Electrical Manufacturers Association) - A voluntary organization that adopts standards for electrical equipment. NEMA standards are designed to eliminate misunderstandings between the manufacturer and the purchaser and to assist the purchaser in selecting and obtaining the proper product for a particular need.

NFPA (National Fire Protection Association) - An organization that promotes the science and improves methods of fire protection. NFPA codes, standards, and recommended practices are intended to prescribe reasonable measures for minimizing losses of life and property by fire. NFPA sponsors the National Electrical Code under auspices of the American National Standards Institute.

NFPA (National Fluid Power Association) - A nonprofit national trade association that coordinates and develops voluntary standards for manufacturers of hydraulic and pneumatic systems and components.

NORMALLY CLOSED SWITCHING ELEMENT - Is one in which the terminals are wired so that current can flow through the switching element until the plunger pin is actuated to open the circuit.

NORMALLY OPEN SWITCHING ELEMENT - Is one in which the terminals are wired so that no current can flow through the switching element until the plunger pin is actuated to close the circuit.

POLYIMIDE - A polymeric film possessing a unique combination of physical and mechanical properties which include long life, excellent deformation/set resistance, high resistance to temperature extremes, good tensile strength, and outstanding resistance to organic compounds. Polyimide is not recommended for water service above 140°F (60°C).

PRESET - A factory set pressure switch available from stock, set to a predetermined set point.

PRESSURE, ABSOLUTE - The difference between zero pressure (a perfect vacuum) and some known pressure. It may be arrived at by adding barometric pressure to gage pressure.

PRESSURE, AMBIENT - The pressure (usually, but not necessarily atmospheric) surrounding a pressure sensor.

PRESSURE, ATMOSPHERIC - The actual weight per unit area of the earth's atmosphere at a given locale and altitude. Atmospheric pressure at sea level is approximately 14.7 psi or 30 inches of mercury or 408 inches of water.

PRESSURE, DIFFERENTIAL - The difference between a reference pressure and a variable pressure.

PRESSURE, GAGE - Gage pressure uses atmospheric pressure as a reference, and therefore will vary according to the barometric reading.

PRESSURE, PROOF - Proof pressure (normally 1½ times system pressure) is the maximum pressure which may be applied to any pressure sensor without causing permanent damage.

PRESSURE, SYSTEM - The nominal pressure level that a system will operate at including work load.

PRESSURE SENSING ELEMENT - That portion of the pressure switch that is in contact with and moves as a result of a in pressure of the fluid. The most common type of sensing elements are diaphragms, accordion bourdon tubes, and pistons.

PRESSURE SWITCH - A sensor that upon the increase or decrease of a pressure or vacuum, opens or closes one or more electrical switching elements at a predetermined set point.

PROOF TEMPERATURE - The maximum temperature of the media which the sensing portion of the switch can be subjected to without causing permanent damage.

RESPONSE TIME OR TIME CONSTANT - The amount of time (in seconds) in which the sensor operates after being subjected to a step temperature increase where the difference between the initial soak temperature and actuation temperature equals 63% of the step temperature. The response time is expressed for a designated flow (feet per second), media and system pressure (PSIG).

RISE RATE OR RAMP RATE - The number of degrees (Fahrenheit or Celsius) that the media will increase in a unit of time (minute or second).

SEISMIC SHOCK AND VIBRATION - Low frequency, high amplitude waves produced as a result of earth movement. CCS pressure sensors are generally unaffected by seismic shock and vibration.

SINGLE POLE DOUBLE THROW (SPDT) SWITCHING ELEMENT - A SPDT switching element has one normally open, one normally closed and one common terminal. Three terminals mean that the switch can be wired with the circuit either normally open (N/O) or normally closed (N/C).

TEMPERATURE LAG - The number of degrees above the actuation point that the media will be when the sensor operates. The log is expressed for a designated rise rate (degrees per second), flow (feet per second), and system pressure (PSIG). The log is determined by multiplying the rise rate by the response time. Example: If a system with a constant flow, pressure, and rise rate of 10°F per second incorporated a sensor with a response time of 3 seconds, the log would be 30 degrees.

TEMPERATURE SWITCH - A temperature switch is a sensor that upon the increase or decrease of a temperature, opens or closes one or more electrical switching elements at a predetermined set point.

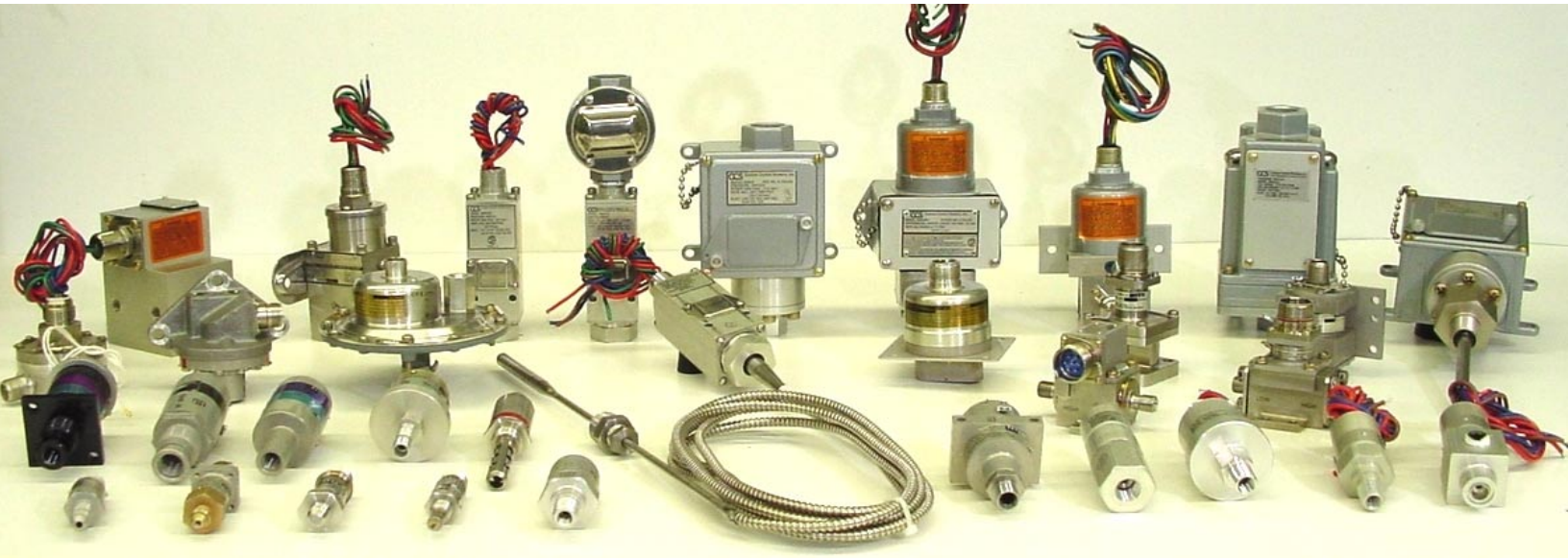
THERMOWELL - A housing that can be provided with temperature switches to isolate the temperature probe from the media.

UL (Underwriters Laboratories) - A nonprofit corporation engaged in developing standards and testing for safety. Products bearing UL labels have been tested for conformity to UL standards. UL maintains a product surveillance program to ensure continuing conformity to UL standards.

UL LISTED PRODUCT - A product that has been tested and complies to UL requirements for reasonably foreseeable hazards associated with the product and is subject to continuing UL product surveillance. UL authorizes the manufacturer to use the UL Listing mark.

UL RECOGNIZED COMPONENT - A part or subassembly that has been tested and complies to UL requirements for components used in an end product which complies with UL requirements. The component is subject to continuing UL surveillance. UL authorizes the manufacturer to use the UL Recognized mark.

WETTED PARTS-Materials in a sensor that are directly exposed to the media.



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