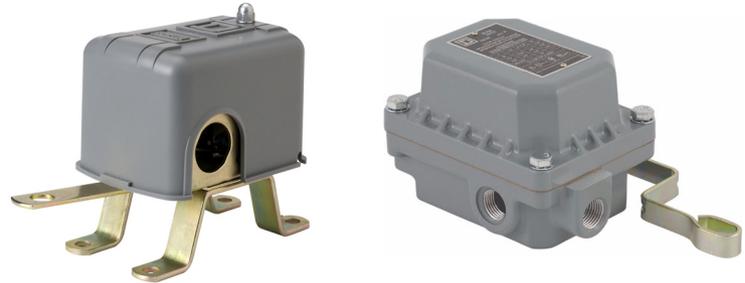


**Commercial Pressure and Float Switches for Power Circuits
Selection Guide—Float Switches**

Selection Guide—Float Switches

Class 9036 Type D—Open Tank, General Purpose

| | |
|-----------------------------|---|
| Type of Installation | Horsepower rated |
| Product Features | 2-pole switch, lever operated Standard action—contacts close on liquid rise Reverse action—contacts open on liquid rise |



| | | | |
|------------------------------|---|--|----------------|
| Fluids Controlled | Water, hydraulic oils, corrosive fluids | | |
| Fluid Characteristics | Fresh water, sea water, hydraulic oils, and corrosive fluids with a density ≥ 0.8 | | |
| Contact Arrangement | Standard: 2 N.O. (DPST), Form R: 2 N.C. (DPST), Form H: 1 N.O. and 1 N.C. (SPDT) | | |
| Degree of Protection | NEMA Type 1 | NEMA Type 4 | NEMA Type 7, 9 |
| Electrical Connection | 4 screw terminals, 3 knockouts for 1/2 in. conduit entry | 4 screw terminals, 2 cable entries, 3/4-14 conduit entry | |
| Ambient Temperature | -22 to +220 °F (-30 to +105 °C) | | |
| Catalog Numbers | 9036DG | 9036DW | 9036DR |
| Page | 49 | | |

Float Switches—Class 9036, 9037, and 9038

Introduction



9036DG2

Square D™ brand offers a wide range of electromechanical level control products.

- **Class 9036, Open Tank**
- **Class 9037, Closed Tank**
- **Class 9038, Mechanical Alternators**

Class 9036 Open Tank

Type D and G

The Class 9036 Type D and G float switches are lever operated and designed for open tank applications. These switches are floor mounted, or they can be pedestal mounted using mounting plate 9049UMS1. They are available in NEMA Type 1, Type 4, or Type 7 and 9 enclosures.



9036GG

Type FG

The Class 9036 Type FG30 pedestal-style sump pump switch is designed for liquid level control with electric-motor operated pumps, either directly or through a magnetic starter. It can also be used to activate alarms in liquid level control systems. The upward or downward movement of the lever arm of the float switch controls the On and Off positions corresponding to the water level changes required to turn the pump or alarm on and off.

NOTE: The rod for this device is 33.75 in. long. It cannot be lengthened.



9036FG
9049A60
9049A61



9036DG2



9036GG2

Selecting a Float Switch

Standard float switches have two contacts that close when the liquid rises above the designated level. This contact configuration is used for tank emptying applications. Float switches are also available with reverse (Form R) and double throw (Form H) contacts. Form R switches, used for tank filling applications, have two contacts that open when the liquid rises above the designated level. Form H switches, which can be used for both applications, have one normally open (N.O.) and one normally closed (N.C.) contact.

To select the proper Square D™ float switch, determine the following:

- Type and shape of tank (open, closed, sump, etc.)
- Enclosure requirements
 - **NEMA Type 1:** For general purpose applications intended for indoor use.
 - **NEMA Type 4:** For watertight and dusttight applications for either indoor or outdoor use.
 - **NEMA Type 7 and 9:** For explosion proof applications. Suitable for Class I, Division 1 and 2, Groups C and D and Class II, Division 1 and 2, Groups E, F, and G hazardous locations.
- Total level change required
- Mounting requirements (such as flange mounting or screw-in bushing)
- Horsepower, phase, and voltage requirements
- Float material
 - Stainless steel (SS)
 - Plastic (available on 9036FG30 and as a Form for use with diesel fuel)
- Rod material
 - Brass
 - Stainless steel (SS)
 - Aluminum (Al)

In direct motor control applications, float switch ratings must be greater than or equal to the pump motor ratings.

NOTE: Contact the Sensor Competency Center when using float switches in liquids with a specific gravity different than water (1.0).

Specify the Class and Type when ordering float switches or accessory kits.

Selecting Floats and Rods

Class 9036 and Class 9038 Type A float switches are actuated with the Class 9049 Type A line of accessories. Select the float and rod material according to the corrosiveness of the liquid used in the application. Two types of float kits are offered:

- Tapped-at-top float (Class 9049 Type A6, A6S, and A6A)
- Center-hole float (Class 9049 Type A6C, A6CS, and A6CA)

The tapped-at-top float is for applications requiring short lengths of tubing and small liquid level changes. The maximum tubing length is 12 ft (3.66 m). Adequate space must be available to allow for ceiling clearance when the level changes. The float must be buoyant enough to lift the tubing, stop collars, and switch lever. The rod has two stops, one above and one below the switch lever. The position of the stops determines the amount of water level change.

Commercial Pressure and Float Switches for Power Circuits

Float Switches—Class 9036, 9037, and 9038

The center-hole float is used in applications requiring long lengths of tubing and large liquid level changes. A compensating spring, used for longer lengths of tubing, supports the weight of the tubing and stops. When a compensating spring is used, the float must be buoyant enough to lift up the switch lever and heavy enough to trip the switch lever down. The rod has four stops. The position of the stops on the rod above and below the float determines the amount of water level change.

Temperature Ratings

Table 8: Temperature Limitations for all Float Switches

| | | |
|---------|------|-----------------|
| Ambient | Min. | -30 °C (-22 °F) |
| | Max. | 105 °C (220 °F) |

Electrical Ratings

Table 9: Class 9036, 9037, and 9038 Electrical Ratings

| Class | Type | Single Phase AC Ratings (hp) | | | Polyphase AC Ratings (hp) | | | DC (hp) | | | Control Circuit Rating |
|-------|---------------------------|------------------------------|-------|-----------|---------------------------|-------|-----------|---------|-------|-------|------------------------|
| | | 115 V | 230 V | 460/575 V | 115 V | 230 V | 460/575 V | 32 V | 115 V | 230 V | |
| 9036 | D (2 pole) | 2 | 3 | — | 3 | 5 | 1 | 0.25 | 0.5 | 0.5 | A600 |
| | G (2 pole) | 2 | 3 | 5 | 3 | 5 | 5 | 0.5 | 1 | 1 | A600 |
| | G Form H (1 N.O., 1 N.C.) | 1 | 2 | 2 | — | — | — | — | 0.5 | 0.5 | A300 |
| 9037 | E, H (2 pole) | 2 | 3 | — | 3 | 5 | 1 | 0.25 | 0.5 | 0.5 | A600 |
| 9038 | All (2 pole) | 2 | 3 | — | 3 | 5 | 1 | 0.25 | 0.5 | 0.5 | A600 |

The following float switches are UL Listed under file E12158, CCN NKPZ:

- Class 9036 Types DG, DW, GG, GW
- Class 9037 Types EG, EW, HG, HW
- Class 9038 Types AG, AW, CG, CW, DG, DW

The following float switches are UL Listed under file E12443, CCN NOWT:

- Class 9036 Types DR, GR
- Class 9037 Types ER, HR

Table 10: Control Duty Circuit Ratings (Form N5 or N25 only)

| Contacts | AC—50 or 60 Hz | | | | | | DC | | | AC or DC Continuous Carrying Amperes |
|------------------|----------------|-----------------------------|-------|-----------------------------|------------------------|-----|-------------------------|--------------|------|---|
| | V | Inductive, 35% Power Factor | | Resistive, 75% Power Factor | | V | Inductive and Resistive | | | |
| | | Make | Break | Make and Break Amperes | Make and Break Amperes | | Single Throw | Double Throw | | |
| SPDT Form N5 | 120 | 60 | 7200 | 6 | 720 | 6 | 120 | 0.55 | 0.22 | 10 |
| | 240 | 30 | 7200 | 3 | 720 | 3 | 250 | 0.27 | 0.11 | 10 |
| | 480 | 15 | 7200 | 1.5 | 720 | 1.5 | 600 | 0.10 | — | 10 |
| | 600 | 12 | 7200 | 1.2 | 720 | 1.2 | — | — | — | — |
| DPDT Form N25 | 120 | 60 | 7200 | 6 | 720 | 6 | 125 | 0.22 | 0.22 | 10 |
| | 240 | 30 | 7200 | 3 | 720 | 3 | 250 | 0.11 | 0.11 | 10 |
| | 480 | 15 | 7200 | 1.5 | 720 | 1.5 | 600 | — | — | 10 |
| | 600 | 12 | 7200 | 1.2 | 720 | 1.2 | — | — | — | — |

Commercial Pressure and Float Switches for Power Circuits

Float Switches—Class 9036, 9037, and 9038

Class 9036 Type D and G Open Tank Float Switches

Table 11 lists Class 9036 float switches and modifications.

- When ordering a **factory installed modification**, add the Form number to the end of the float switch catalog number. For example, to select a 9036DG2 switch with reverse action, order 9036DG2R.
- **Field installed modifications**, when available, are ordered as kits.

Table 11: Class 9036 Float Switches

| Specifications | |
|---------------------|--|
| Description | 2-pole, single-lever operated float switches |
| Applications | Open industrial tanks and sump applications |

General Purpose



Heavy Duty



Catalog Numbers

| Contact Action | Close on Liquid Rise | Open on Liquid Rise | Close on Liquid Rise | Open on Liquid Rise |
|-----------------------------------|----------------------|---------------------|-------------------------------|--------------------------------|
| NEMA Type 1 ^[1] | 9036DG2 | 9036DG2R | 9036GG2 | 9036GG2R |
| NEMA Type 4 | 9036DW31 | 9036DW31R | 9036GW1 ^[2] | 9036GW1R ^[2] |
| NEMA Type 7, 9 | 9036DR31 | 9036DR31R | 9036GR1 ^[2] | 9036GR1R ^[2] |

NOTE: A **compensating spring** supports the weight of long rods that cannot be supported by center-hole floats. A compensating spring is standard on Types GR and GW, and can be ordered as a modification (Form C) on other Class 9036 Type D and G float switches.

| Modifications | Factory Installed | Field Installed |
|---|-------------------|--------------------|
| | Class 9036 Form | Kit Catalog Number |
| For Type D (General Purpose) | | |
| Reverse action (Type DG) | R | 9049A58 |
| Compensating spring (Type DG) | C | 9049A19 |
| Compensating spring (Types DR and DW) | C | 9049A20 |
| Compensating spring and reverse action (Types DG, DR, and DW) | CR | — |
| For Type G (Heavy Duty) | | |
| Reverse action ^[3] | R | — |
| Compensating spring (Type GG) ^[4] | C | 9049A13 |
| Compensating spring and reverse action (Type GG) | CR | 9049A13 |
| 1 N.O.—1 N.C. contact configuration | H | — |
| Compensating spring and 1 N.O.—1 N.C. contact configuration (Type GG) | CH | — |

¹ Contact action can be converted in the field by installing the appropriate float rod lever.

² Compensating spring standard. Use center-hole float accessories.

³ Type GG is field convertible without the use of a kit. Types GR and GW are not field convertible.

⁴ Compensating spring standard on Types GR and GW.

Commercial Pressure and Float Switches for Power Circuits

Float Switches—Class 9036, 9037, and 9038

Table 12 lists the trip forces and compensating spring requirements for Class 9036 Type D and G float switches. The trip force can be adjusted on the Type G switches by changing the lever length position.

Table 12: Maximum Trip Forces for Class 9036 Float Switches

| Class 9036 Type and Form | | DG2 | DG2R | DW31 | DW31R | DR31 | DR31R | GG2 | | GG2R | | GR1, GW1 | | |
|-------------------------------|-----------------------------|-----|------|------|-------|------|-------|-------|------|-------|------|----------|--------|------|
| Lever Length Position | | — | — | — | — | — | — | Short | Long | Short | Long | Short | Medium | Long |
| Force Up to Trip (oz) | | 9 | 8 | 8 | 8 | 8 | 8 | 33 | 21 | 30 | 22 | 24 | 22 | 20 |
| Force Down to Trip (oz) | | 8 | 8 | 8 | 8 | 8 | 8 | 39 | 27 | 24 | 16 | 31 | 29 | 27 |
| Maximum Supported Weight (oz) | Without Compensating Spring | 6 | 4 | 5 | 5 | 5 | 5 | 25 | 13 | 18 | 11 | 19 | 17 | 16 |
| | With Compensating Spring | 60 | 60 | 66 | 66 | 66 | 66 | [1] | 100 | [1] | 150 | 80 | 72 | 64 |

¹ The compensating spring is not effective in combination with short lever length position.

Figure 3: Lever Length

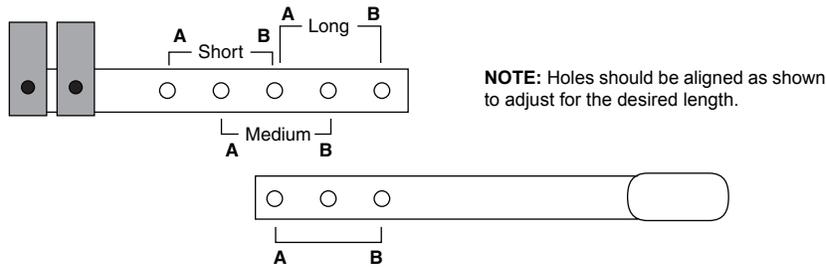


Table 13 lists Class 9049 accessory kits, which are ordered separately from Class 9036 Type D and G float switches. A **float kit** is required; a tubing kit and replacement float do not provide all needed parts.

Table 13: Class 9049 Accessories for Class 9036 Type D and G Float Switches (weight in oz)

| Accessory Kits | Tapped-at-Top Floats (#304 SS) | | | Center-Hole Floats (#304 SS) [1] | | | Additional Tubing (#303 SS) [2] | | |
|--|--------------------------------|---------|---------|----------------------------------|----------|----------|---------------------------------|-----------|-----------|
| | All Except GW, GR, and Form C | | | GW, GR, and Form C | | | All | | |
| Used on Class 9036 Float Switch Types | All Except GW, GR, and Form C | | | GW, GR, and Form C | | | All | | |
| Catalog Number | 9049A6 | 9049A6A | 9049A6S | 9049A6C | 9049A6CA | 9049A6CS | 9049T1 | 9049T1A | 9049T1S |
| Tubing (rod) | 5 ft brass | 5 ft Al | 5 ft SS | 5 ft brass | 5 ft Al | 5 ft SS | 2.5 ft brass | 2.5 ft Al | 2.5 ft SS |
| Net buoyancy in water, 7 in. float [3] | 60 | 60 | 60 | 70 | 70 | 70 | — | — | — |
| Combined weight of stops | 3 | 3 | 3 | 6 | 6 | 6 | — | — | — |
| Number of stops | 2 | 2 | 2 | 4 | 4 | 4 | — | — | — |
| Weight of 5 ft rod, included | 18.5 | 6 | 16.9 | 18.5 | 6 | 16.9 | — | — | — |
| Weight per ft of extra rod | 3.7 | 1.2 | 3.4 | 3.7 | 1.2 | 3.4 | 3.7 | 1.2 | 3.4 |

¹ Require the use of the 9049A6, 9049A6A, or 9049A6S kit. The additional tubing only attaches to other lengths of tubing.

² Additional tubing kits add on to the float accessory kits and include a connector. Maximum recommended tubing length: **Tapped-at-top** float: 12.5 ft (3810 mm); **Center-hole float**: 30 ft (9144 mm).

³ Net buoyancy calculated with float 80% submerged, allowing for a 20% operating margin. Buoyancy data calculated for use in water. Consult the Sensor Competency Center for buoyancy data in media having specific gravity different than water (1.0).

When ordering, first specify the desired accessory kit, then as a second item give the number of additional tubing kits required. For example, to get a 9049A6C kit with 15 ft of tubing, specify:

- A. 9049A6C, quantity = 1 (includes 5 ft of tubing)
- B. 9049T1, quantity = 4 (2.5 ft of tubing each, for a total of 10 additional ft)

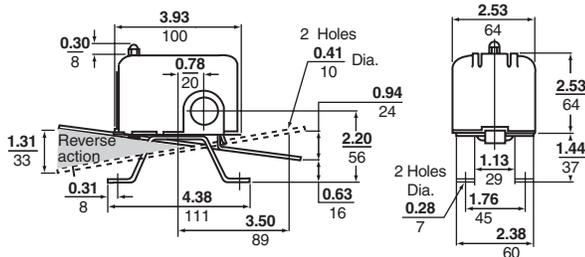
Example

| | | |
|--|--|-----------|
| Calculation example Measuring 15 ft of tank depth System has 15 ft of brass rod, 4 stops, and a center hole float. Buoyancy is positive, so no compensating spring is required | Float buoyancy | 70.0 oz |
| | Total weight | (61.5 oz) |
| | Weight of stops: | (6.0 oz) |
| | Weight of 5 ft of brass rod (included): | (18.5 oz) |
| | Weight of 10 ft of brass rod (separate): | (37.0 oz) |
| Buoyancy | 8.5 oz | |

Commercial Pressure and Float Switches for Power Circuits

Float Switches—Class 9036, 9037, and 9038

Figure 4: Type DG Dimensions



Dual Dimensions: $\frac{\text{in.}}{\text{mm}}$

Figure 5: Types DR/DW Dimensions

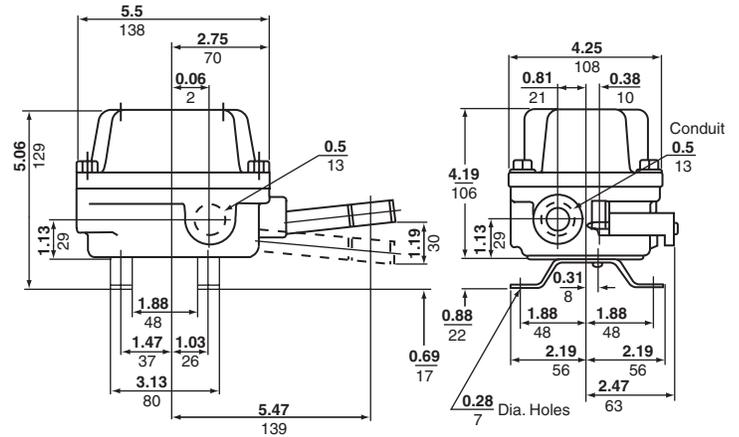
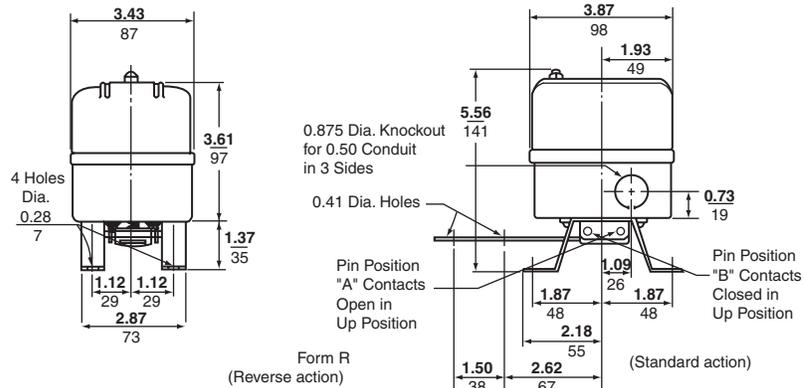
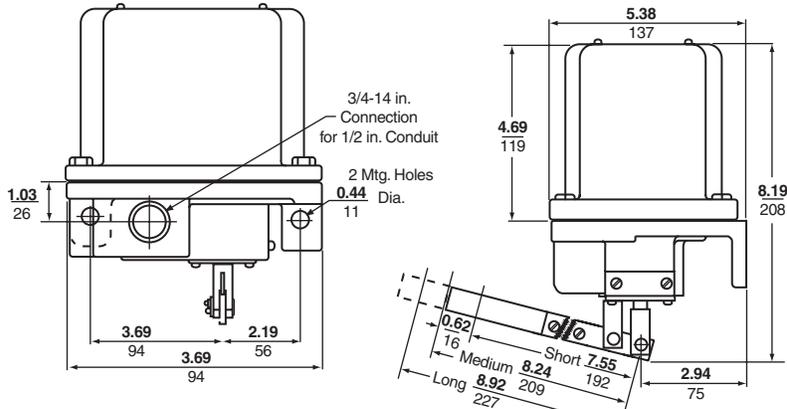


Figure 6: Type GG Dimensions



Lever Arm Travel between Closing and Opening of Contacts
Standard: short = 0.375 in. (10 mm), long = 0.625 in. (16 mm)
Form R: short = 0.5 in. (13 mm), long = 0.75 in. (19 mm)

Figure 7: Types GR/GW Dimensions



Float Lever Travel between Closing and Opening of Contacts:
 short = 1 in. (25 mm), medium = 1.12 (28 mm), long = 1.25 in. (31.8)