

P/Q600 SOLENOID FAMILIES

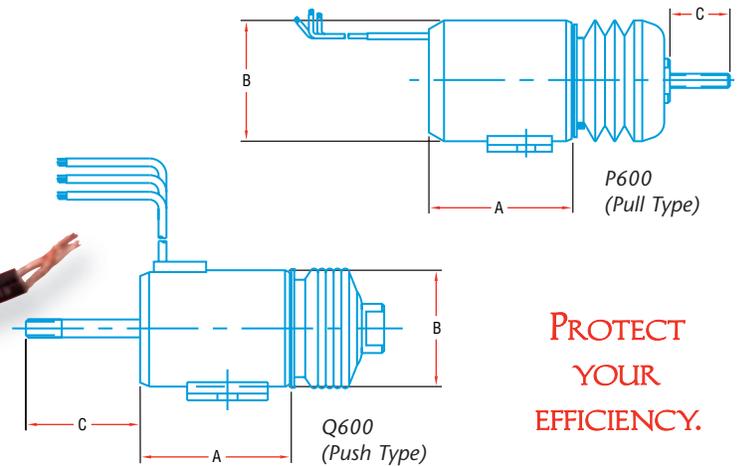
P600 (pull type) and Q600 (push type) are built to withstand high temperature and high vibration environments. Encapsulated or molded coils are used to provide additional protection. P/Q600 Solenoids are found in mobile and stationary equipment, including lawn & garden equipment, compressors, generators, and construction equipment. P/Q600 Solenoids are available in a variety of base sizes. There are a number of boot options to provide environmental protection. Trombetta can customize any product to meet specific customer requirements. P/Q600 options include various voltages, insulation classes, mounting, rods, switchers, boots, spring returns, connectors and surface finishes.

P600 Solenoid Family (Pull Type)					
SERIES	STROKE (inches)	MAX. FORCE (lbs)	A inches [mm]	B inches [mm]	C inches [mm]
P608	3/4	8	2.10 [53.3]	1.38 [35.1]	Length
P610	1	15	2.20 [55.8]	1.63 [41.4]	variable
P612	1	23	2.40 [61.0]	1.88 [47.8]	for all
P613	1 1/2	21	3.50 [88.9]	2.00 [50.8]	models.

These are general dimensions and forces only. Trombetta can customize to meet your needs.



P613



**PROTECT
YOUR
EFFICIENCY.**

Q600 Solenoid Family (Push Type)					
SERIES	STROKE (inches)	MAX. FORCE (lbs)	A inches [mm]	B inches [mm]	C inches [mm]
Q608	3/4	8	2.10 [53.3]	1.38 [35.1]	Length
Q610	1	15	2.20 [55.8]	1.63 [41.4]	variable
Q612	1	23	2.40 [61.0]	1.88 [47.8]	for all
Q613	1 1/2	21	3.50 [88.9]	2.00 [50.8]	models.

These are general dimensions and forces only. Trombetta can customize to meet your needs.



Q608



Trombetta's sample selection of electronic controls.

TROMBETTA SOLENOID CONTROLS

Trombetta Electronic Controls regulate the magnitude of electrical drive applied to the coil during the pull-in/push out and/or hold operation of the solenoid to optimize the performance of the solenoid. Using solenoid controls can show the benefit of employing smaller solenoids, maximizing space use and allowing for either AC or DC power usage.

13901 Main Street • Menomonee Falls, WI 53051
p 262.251.5454 • f 262.251.5757 • email: sales@trombetta.com

FOR MORE INFORMATION, VISIT OUR WEBSITE AT WWW.TROMBETTA.COM.

Trombetta 
MOTION TECHNOLOGIES
Strokes of Genius.

NEW MID-SIZE P612 SOLENOID ROUNDS OUT TROMBETTA'S 600 SERIES

Trombetta
P612 SERIES
Solenoids

P612 Features

Designed to satisfy mid-range force and stroke requirements, Trombetta's new P612 dual-coil, 3-wire solenoid complements the smaller 610 and larger 613 models.

- State of the art construction for problem-free operation... "3-wire" design for reliability.
- Heavy duty performance in a compact package.
- High pull-in force and continuous duty operation.
- No "mechanical" or "integral" switch problems.
- Misadjustment will not cause burn-out.
- Ideal for "on-to-run/fuel shut-down" applications.
- Easily replaces most competitive solenoids.
- Many options available; boot is standard.

P612 Applications

Trombetta's P612 is perfect for a variety of "pull" applications in generators, compressors, trucks/busses and off-highway equipment.

P612 General Specifications

RATED VOLTAGE	12 VOLTS DC	24 VOLTS DC
PULL CURRENT	60 AMPS	30 AMPS
HOLD CURRENT	0.9 AMPS	0.5 AMPS
PULL FORCE @ 1 INCH	23 POUNDS (102 NEWTONS)	23 POUNDS (102 NEWTONS)
HOLD FORCE @ RATED VOLTAGE & 25° C.	43 POUNDS (191 NEWTONS)	43 POUNDS (191 NEWTONS)
SHIPPING WEIGHT	1.7 POUNDS	1.7 POUNDS

P612 "3-Wire" Solenoid System Operation

The Trombetta P612 Solenoid Series is a state-of-the-art design for demanding engine applications. Dual coil construction delivers high pull-in force and continuous duty hold operation in the smallest possible package. The "3-Wire" solenoid system is highly reliable and puts an end to "mechanical switch" problems. Two systems are available for your specific application. Proper installation of either system will eliminate the possibility of solenoid burn out. Fouled or mis-adjusted linkage will result in the solenoid only dropping out, not burning out.

- **System #1** – Typically used for "on-to-run" engine shut down applications.

Operation: The solenoid is wired directly into the existing engine starter system eliminating the need for "internal" solenoid switches. At the engine starting phase, both coils are energized for the highest possible

pull-in force. After the engine is started, the pull-in coil is de-energized, while the hold coil remains energized providing continuous duty operation.

- **System #2** - Typically used for "RPM/Speed Control" applications.

Operation: On applications other than "on-to-run/fuel shut down" applications, a Trombetta S500 Series Electronic Control module is required to allow the solenoid to operate in a continuous duty mode. This remotely mounted electronic switching module will, when energized, power both the pull-in and hold-in coils long enough for the plunger to pull-in and hold. As the module "times out" the pull-in coil is disconnected, putting the solenoid in the "hold-in" mode.



Trombetta solenoid products have been designed and manufactured in the U.S.A. since 1932.



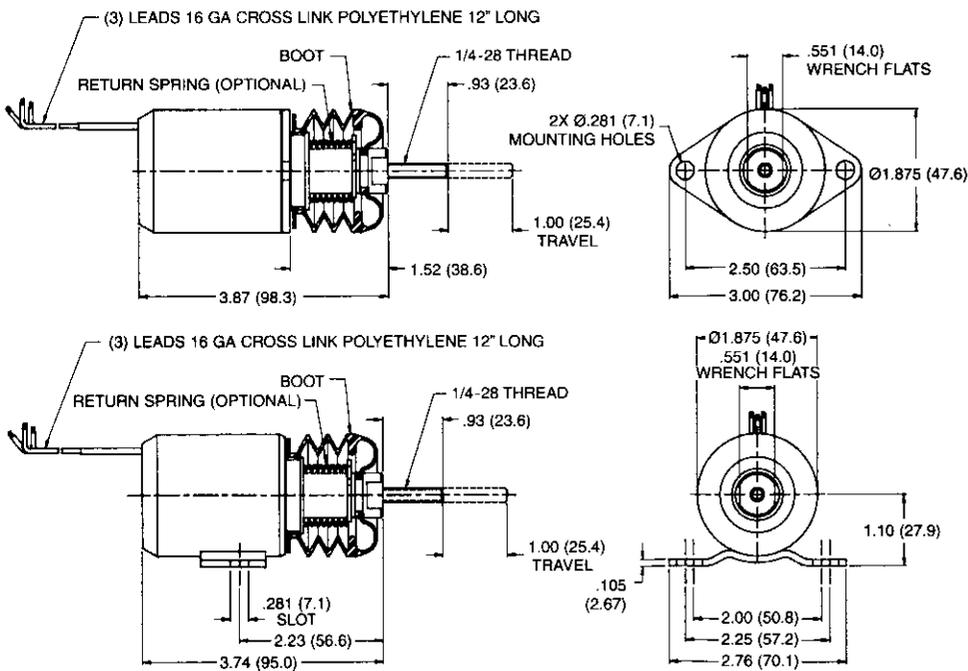
HUEGLI TECH LTD
SWITZERLAND

Tel.: +41-62-916 50 30
Fax: +41-62-916 50 35
sales@huegli-tech.com

Trombetta + -
MOTION TECHNOLOGIES

P612 Pull-Type Solenoid

(Flange Mount: top; Side Mount: bottom... all dimensions in inches and millimeters)



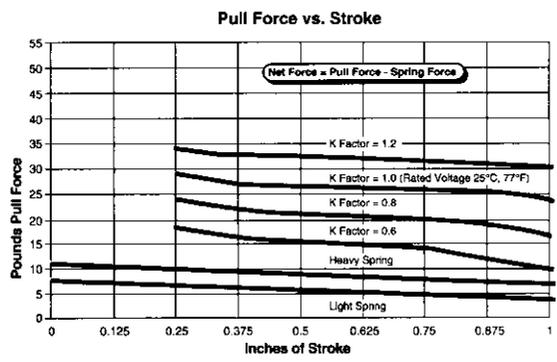
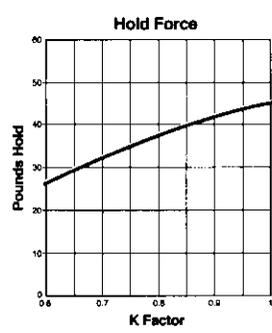
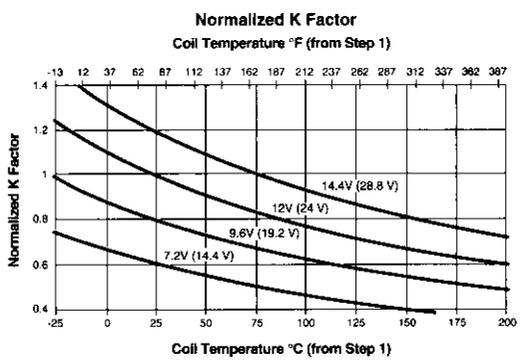
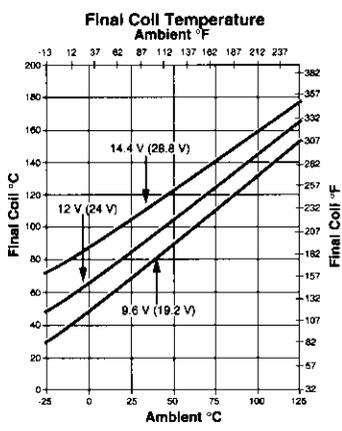
Trombetta P612 SERIES Solenoids

Determining Solenoid Performance

When a solenoid is operated in the continuous hold position, the coil temperature rises. The following steps will allow you to find the pull and hold force available at the elevated coil temperatures seen in this continuous-hold situation. K Factor is a derating constant used to find pull and hold forces at elevated temperatures. The nominal K Factor is 1.0.

- **Step 1.** Use the Final Coil Temperature chart to find coil temperature using ambient temperature and applied voltage.
- **Step 2.** Use the Normalized K Factor chart to find normalized K Factor using the temperature found in Step 1 and the voltage applied to the coil. The Normalized K Factor can be read on the left of the chart.
- **Step 3.** Use the Pull Force vs. Stroke chart to find pounds of pull force available using the Normalized K Factor found in Step 2, and the stroke in inches.
- **Step 4.** Use the Hold Force chart to find hold force available using the Normalized K Factor found in Step 2.

For an application other than described above, consult Trombetta Corporation.



P612 Series Part Numbers

Catalog Number	Volts	Mounting Type	Spring
P612-A1V12	12	SIDE	NONE
P612-A1V24	24	SIDE	NONE
P612-A2V12	12	FLANGE	NONE
P612-A2V24	24	FLANGE	NONE
P612-B1V12	12	SIDE	LIGHT
P612-B1V24	24	SIDE	LIGHT
P612-B2V12	12	FLANGE	LIGHT
P612-B2V24	24	FLANGE	LIGHT
P612-C1V12	12	SIDE	HEAVY
P612-C1V24	24	SIDE	HEAVY
P612-C2V12	12	FLANGE	HEAVY
P612-C2V24	24	FLANGE	HEAVY

- All external threads - 1/4-28 ROD
- Additional models available

P612 Series Options

Trombetta P612 solenoids offer a variety of options for customized installations.

- Return Springs
- Electrical Connectors
- Custom Modification
- Additional Voltages

See Trombetta first for long-lasting tough-duty solenoids to fit the toughest - or easiest - applications.



HUEGLI TECH LTD
SWITZERLAND
Tel.: +41-62-916 50 30
Fax: +41-62-916 50 35
sales@huegli-tech.com

A LARGER SOLENOID IN TROMBETTA'S RELIABLE 600 SERIES, THE P/Q613 PACKS A PUNCH

Trombetta
P/Q613 SERIES
Solenoids

P/Q613 Features

Trombetta's larger, more powerful P/Q613 solenoid features dual coil design and a longer stroke for maximum performance.

- Heavy duty performance with a longer stroke.
- State of the art construction for problem-free operation... "3-wire" design for reliability.
- High pull-in force and continuous duty operation.
- No "mechanical" or "integral" switch problems.
- Misadjustment will not cause burn-out.
- Ideal for "on-to-run/fuel shut-down" applications.
- Easily replaces most competitive solenoids.
- Many options available; boot is standard.

P/Q613 Applications

Trombetta's powerful P/Q613 solenoids provide maximum "pull" or "push" performance for engine speed control, diesel engine shutdown, and a variety of heavy duty industrial applications where a high power solenoid is a requirement.

P/Q613 General Specifications

RATED VOLTAGE	12 VOLT	24 VOLT
PULL CURRENT	70 AMPS	36 AMPS
HOLD CURRENT	.88 AMPS	.48 AMPS
PULL FORCE @ 1 1/2"	21 POUNDS (94 NEWTONS)	21 POUNDS (94 NEWTONS)
HOLD FORCE AT RATED VOLTAGE AND 25°C.	40 POUNDS (178 NEWTONS)	40 POUNDS (178 NEWTONS)
SHIPPING WEIGHT	2.7 POUNDS	2.7 POUNDS

P/Q613 "3-Wire" Solenoid System Operation

The Trombetta P/Q613 Solenoid Series is a state-of-the-art design for demanding engine applications. Dual coil construction delivers high pull-in force and continuous duty hold operation in a compact package. The "3-Wire" solenoid system is highly reliable and puts an end to "mechanical switch" problems. Two systems are available for your specific application. Proper installation of either system will eliminate the possibility of solenoid burn out. Fouled or misadjusted linkage will result in the solenoid only dropping out, not burning out.

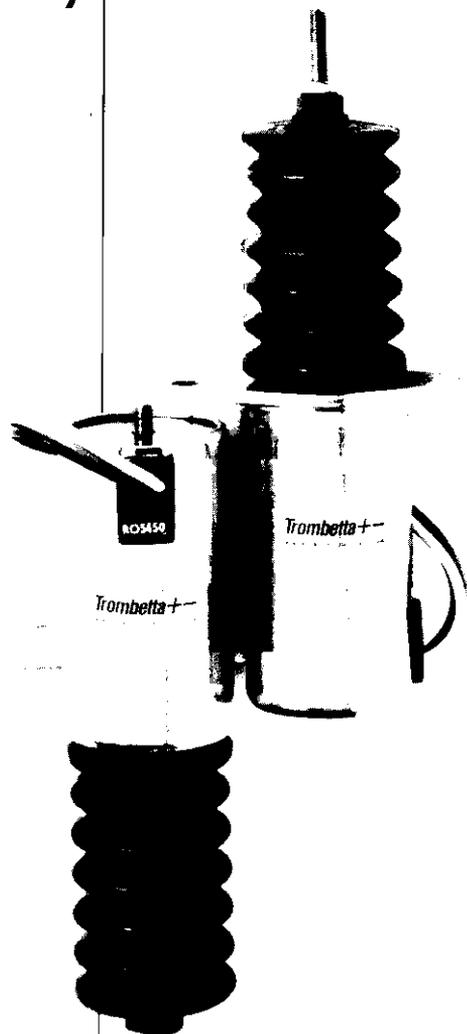
- System #1 - Typically used for "on-to-run" engine shut down applications.

Operation: The solenoid is wired directly into the existing engine starter system eliminating the need for "internal" solenoid switches. At the engine starting phase, both coils are energized for the highest possible

pull-in force. After the engine is started, the pull-in coil is de-energized, while the hold coil remains energized providing continuous duty operation.

- System #2 - Typically used for "RPM/Speed Control" applications.

Operation: On applications other than "on-to-run/fuel shut down" applications, a Trombetta S500 Series Electronic Control module is required to allow the solenoid to operate in a continuous duty mode. (See back-page for complete S500 module information.) This remotely mounted electronic switching module will, when energized, power both the pull-in and hold-in coils long enough for the plunger to pull-in and hold. As the module "times out" the pull-in coil is disconnected, putting the solenoid in the "hold-in" mode.



Trombetta solenoid products have been designed and manufactured in the U.S.A. since 1932.

See Trombetta first for long-lasting tough-duty solenoids to fit the toughest - or easiest - applications.



HUEGLI TECH LTD
SWITZERLAND

Tel.: +41-62-916 50 30
Fax: +41-62-916 50 35
sales@huegli-tech.com

Trombetta+
MOTION TECHNOLOGIES

Trombetta P/Q613 SERIES Solenoids

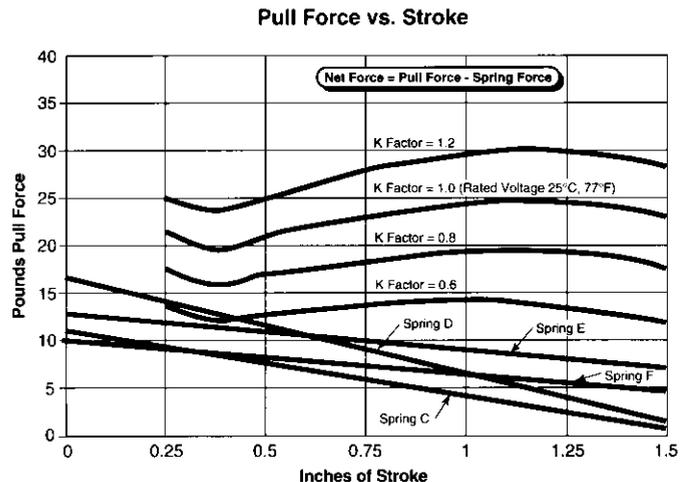
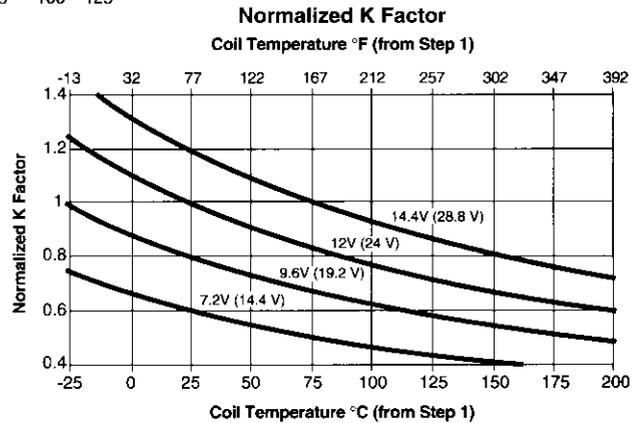
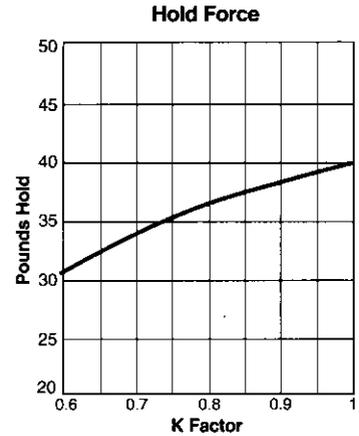
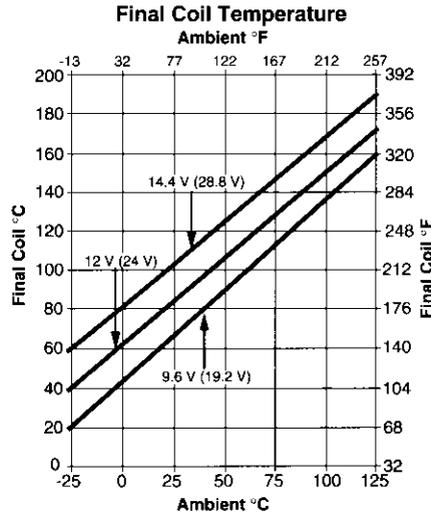


Determining Solenoid Performance

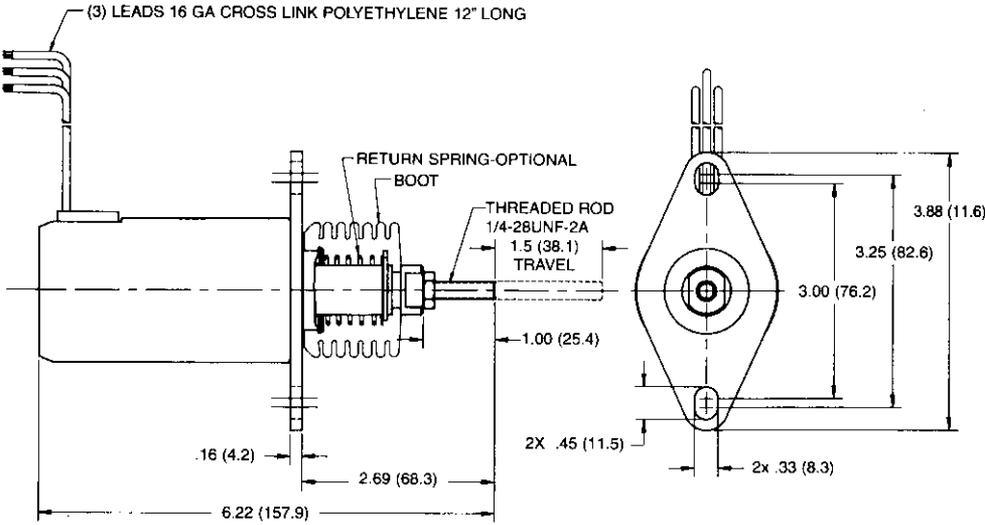
When a solenoid is used in the continuous hold position, the coil temperature rises. The following steps will allow you to find the pull and hold force available at the elevated coil temperatures seen in this situation. K Factor is a derating constant used to find the pull and hold forces at elevated temperatures. The nominal K Factor is 1.0.

- **Step 1.** Use the Final Coil Temperature chart to find coil temperature using ambient temperature and applied voltage.
- **Step 2.** Use the Normalized K Factor chart to find normalized K Factor using the temperature found in Step 1 and the voltage applied to the coil. The Normalized K Factor can be read on the left of the chart.
- **Step 3.** Use the Pull Force vs. Stroke chart to find pounds of pull force available using the Normalized K Factor found in Step 2, and the stroke in inches.
- **Step 4.** Use the Hold Force chart to find hold force available using the Normalized K Factor found in Step 2.

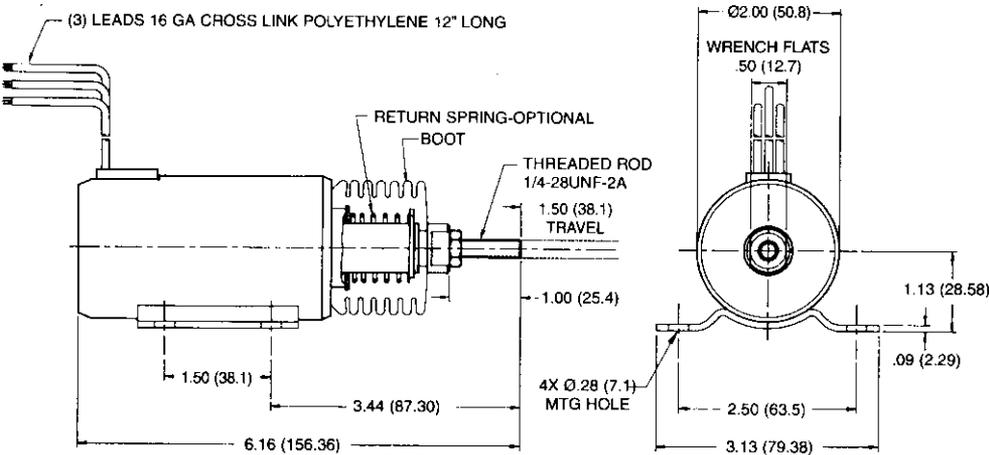
For an application other than described above, consult Trombetta Corporation.



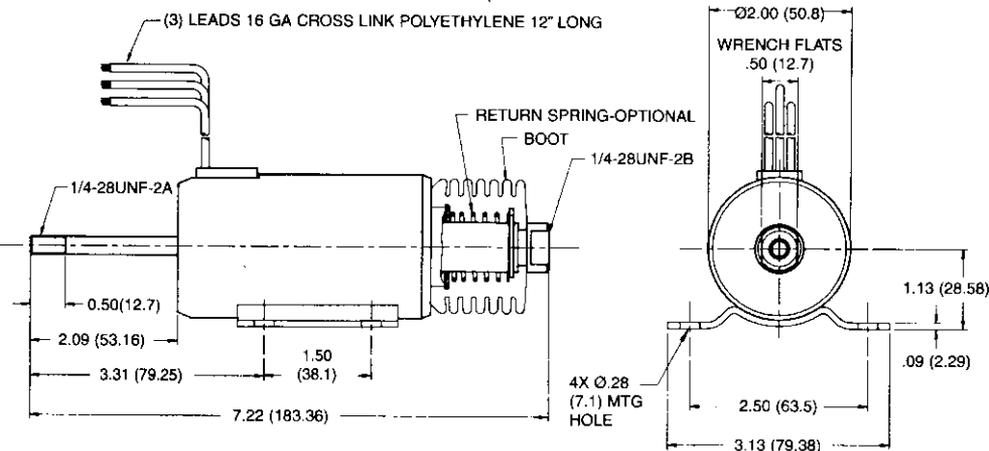
FLANGE MOUNT ("P" Model – Pull Type)



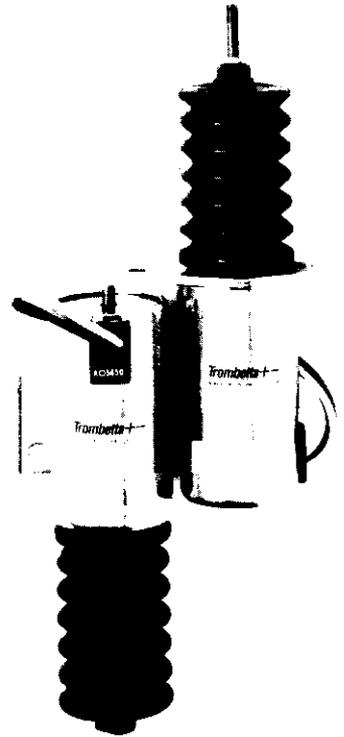
SIDE MOUNT ("P" Model – Pull Type)



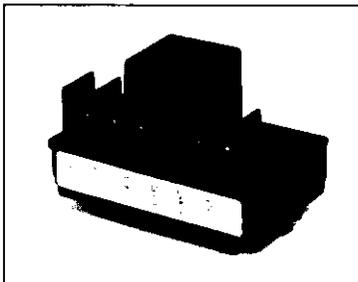
SIDE MOUNT ("Q" Model – Push Type)



Trombetta
P/Q613 SERIES
Solenoids



Trombetta S500 Series Solenoid Control Modules ... for use in continuous duty mode.



Trombetta's S500 Series Solenoid Control Modules are rugged, field proven devices which function as remotely operable, high current timing/switching controls for operating 3-wire solenoids in 2-wire systems. When utilized with Trombetta's proven 3-wire solenoids, they provide a system that can upgrade applications that previously required internally switched solenoids and/or elaborate wiring methods requiring additional costly relays/contactors. Trombetta's S500 series modules allow you to achieve today's 3-wire reliability and simplicity in yesterday's 2-wire systems. Ideal for throttle controls... ideal for remote operation requirements because they require light gage (only 1 amp capacity!) wiring to the remote control location.

Operation

Using the Trombetta S500 Series Electronic Control module allows all models of the P/Q600 Series solenoids to be operated as "continuous duty" devices, when applied to applications other than "on-to-run/fuel shut off". When 12 or 24 VDC is applied to the module, it will supply power to both the solenoid "pull-in" and "hold-in" coils simultaneously, causing the solenoid to pull in and hold. After approximately 1/2 second, the module timer/relay automatically removes voltage from the high current "pull-in" coil and leaves only the "hold-in" coil energized. The solenoid will remain in the hold mode until power is removed from the S500 module. When input voltage is re-applied, the module cycles through the "pull-in" mode again. For detailed specifications, request bulletin X232.

P/Q613 Series Part Numbers

MODEL	MOUNT		TYPE		RETURN SPRING/FORCE (LB)		MAX STROKE
	SIDE	FLANGE	PULL	PUSH	ENERGIZED	@MAX STROKE	INCHES
P613-A1V*	X		X		NONE	NONE	1.5
P613-C1V*	X		X		F10124/11.2	F10124/1.0	1.5
P613-D1V*	X		X		F09515/16.9	F09515/1.5	1.5
P613-E1V*	X		X		H10101/13.2	H10101/7.0	1.5
P613-F1V*	X		X		F10399/10.5	F10399/4.6	1.5
P613-A5V*		X	X		NONE	NONE	1.5
P613-C5V*		X	X		F10124/11.2	F10124/1.0	1.5
P613-D5V*		X	X		F09515/16.9	F09515/1.5	1.5
P613-E5V*		X	X		H10101/13.2	H10101/7.0	1.5
P613-F5V*		X	X		F10399/10.5	F10399/4.6	1.5
Q613-A1V*	X			X	NONE	NONE	1.5
Q613-C1V*	X			X	F10124/11.2	F10124/1.0	1.5
Q613-D1V*	X			X	F09515/16.9	F09515/1.5	1.5
Q613-E1V*	X			X	H10101/13.2	H10101/7.0	1.5
Q613-F1V*	X			X	F10399/10.5	F10399/4.6	1.5

- * Insert "12" for 12 Volt, and "24" for 24 Volt
- Pull plunger thread - 1/4-28 rod, removable for internal threads.
- Other options available.

Trombetta... Specializing In Innovative Solutions For Your Electromagnetic Needs

See Trombetta first for a wide variety of ultra-reliable push-or-pull solenoids, electronic control modules, throttle control kits and solenoid linkage accessories.

As a leading supplier to industry for over 60 years, Trombetta offers design and application expertise for standard or custom solenoid products for hundreds of applications. Here are just a few:

- Automotive Industry
- Diesel Engines
- Transportation
- Packaging Machinery
- Factory Automation
- Material Handling
- Food Processing
- Medical Equipment
- Automation Systems
- Security Systems
- Construction Equipment
- Agriculture Equipment
- Military Defense Equipment
- Electrical Switchgear
- Marine Equipment

Trombetta 
MOTION TECHNOLOGIES

Trombetta P/Q613 SERIES Solenoids

P/Q613 Series Options

- Custom return springs
- Electrical connectors
- Additional voltages
- Custom designs available

Trombetta solenoid products have been designed and manufactured in the U.S.A. since 1932.

See Trombetta first for long-lasting tough-duty solenoids to fit the toughest - or easiest - applications.



HUEGLI TECH LTD
SWITZERLAND
Tel.: +41-62-916 50 30
Fax: +41-62-916 50 35
sales@huegli-tech.com