

36C and 36D Gas Control Product Information

The 36C and 36D combination gas control valves are compact multifunction controls designed to meet requirements for use with Standing Pilot systems and all types of intermittent ignition systems (Direct Spark, Hot Surface, Proven Pilot,

and Cycle Pilot). Along with its compact size, all control adjustments and features, as well as the system interface wiring panel, have been designed on the top surface of the control for simplified application and easy accessibility.

Information in this manual is provided to qualified HVAC Professionals Only for the installation and replacement of gas valves. Homeowners must contact their local HVAC Contractor for gas valve replacement.

Any gas valve suspected of damage or if it has been flooded with water must be replaced immediately. There are no serviceable parts on a gas valve.

General Specifications

Standard Features

- Inlet screen
- Automatic valves seal with in-line pressure
- Ambient temperature (most models) -40° to 175°F
- Mounting - horizontal, vertical, and 90° from horizontal
- Pilot filter
- Manual shut-off valve
- Top mounted components
- Easily accessible pilot and outlet pressure tap
- Easy grip pipe boss

CURRENT REQUIREMENTS

VOLTAGE FREQUENCY	WITHOUT REDUNDANT SOLENOID	WITH REDUNDANT SOLENOID
24V, 60HZ	.190/.230 AMPS	.550/.650 AMPS
120V, 60HZ	.030/.042 AMPS	.102/.138 AMPS
240V, 60HZ	.016/.020 AMPS	.054/.067 AMPS
24V, 50HZ	.230/.270 AMPS	.450/.550 AMPS
120V, 50HZ	.030/.042 AMPS	.100/.200 AMPS
240V, 50HZ	.017/.021 AMPS	.050/.070 AMPS

Optional Features

- Pressure switch
- Thermocouple operated safety valve
- Negative pressure regulator
- Natural to LP regulator selector (convertible)
- Step opening-regulated (non-convertible)
- 2 stage (Relay or Bi-metal operated)
- Slow opening
- Delay opening
- Conduit connection
- Inlet pressure tap
- Right/left angle outlets
- Solenoid operated redundant valve
- Adjustable pilot pressure (non-regulated)
- Mounting holes for 8-32 screws

Regulator Information

ADJUSTMENT RANGE:

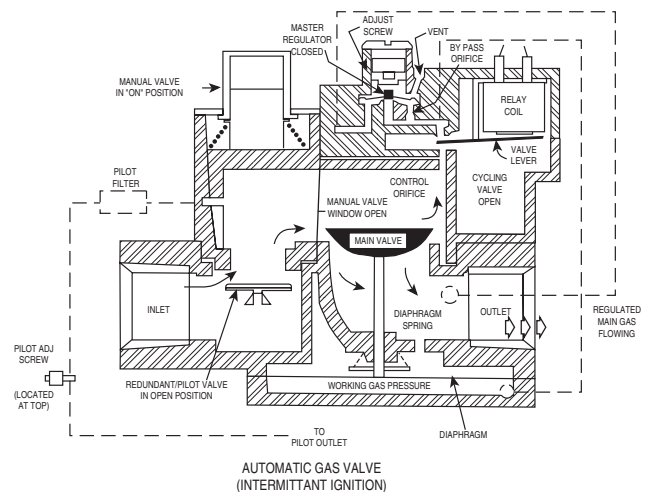
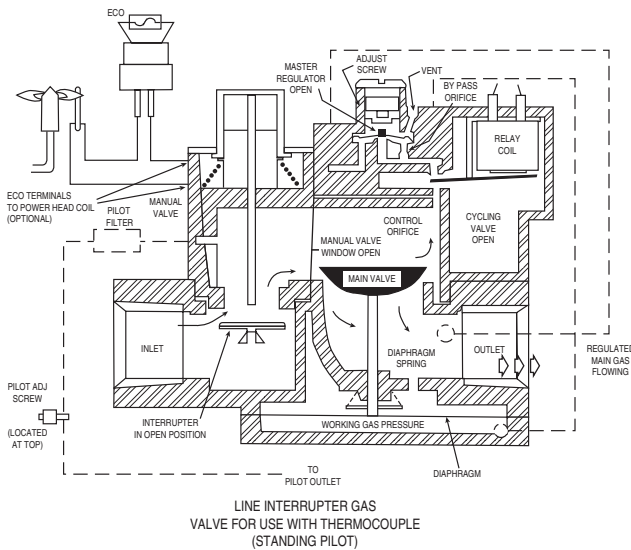
Natural Gas: 2.5" to 5" W.C.

LP Gas: 4.2" to 11.0" W.C.
7.5" to 12.0" W.C.

Maximum Pressure: 1/2 PSI

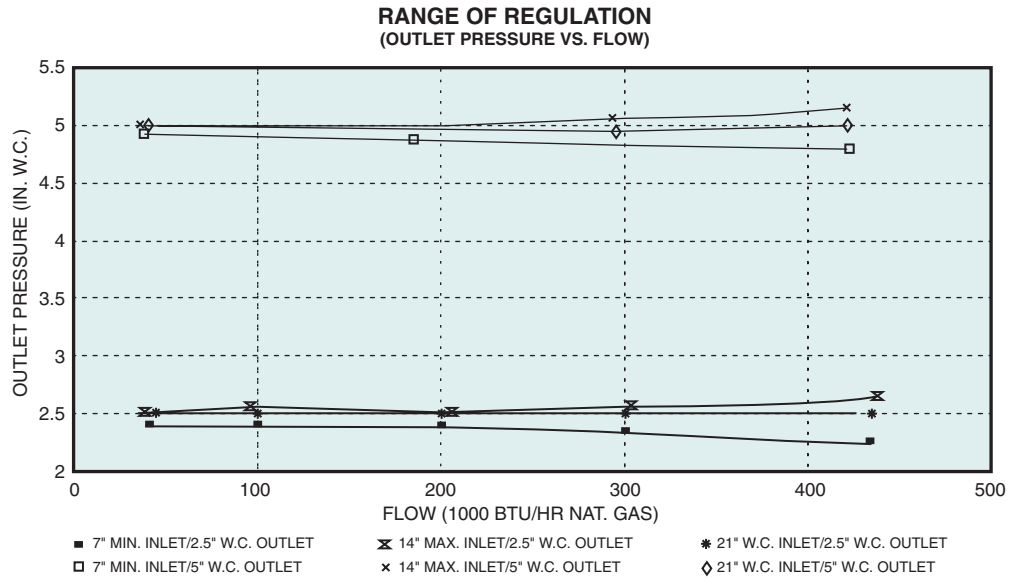
Agency Approved: -AGA all models
-CGA all models
-UL as required

36C/36D Schematic Gas Flow Diagram



Performance Curves

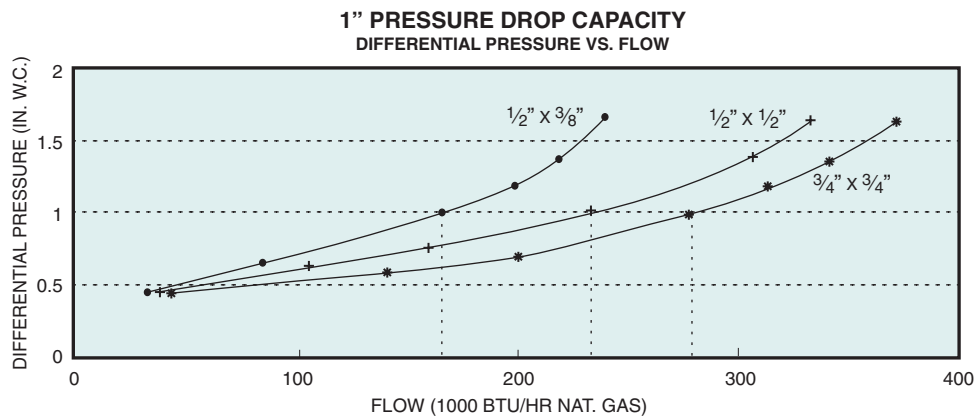
Range of Regulation Capacity



RANGE OF REGULATION

PIPE SIZES AVAILABLE	AGA STD. NAT. GAS .64 SP. GR. (1,000 BTU/CU. FT.)	LP GAS 1.53 SP. GR. (2,500 BTU/CU. FT.)
$\frac{1}{2}$ " X $\frac{3}{8}$ "	15,000 - 100,000	15,000 - 162,000
$\frac{1}{2}$ " X $\frac{1}{2}$ "	30,000 - 290,000	30,000 - 469,000
$\frac{1}{2}$ " X $\frac{3}{4}$ "	30,000 - 290,000	30,000 - 469,000
$\frac{3}{4}$ " X $\frac{3}{4}$ "	50,000 - 400,000	50,000 - 648,000

1" Pressure Drop Capacity

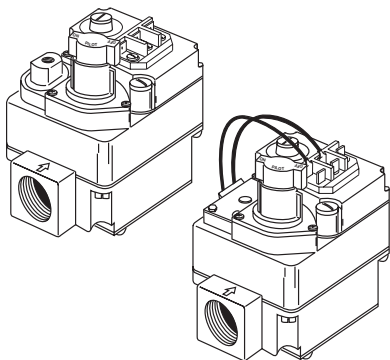


1" PRESSURE DROP CAPACITY RATING

PIPE SIZES AVAILABLE	BTU/HR	
	AGA STD. NAT. GAS (1,000 BTU/CU. FT.)	LP GAS (2,500 BTU/CU. FT.)
$\frac{1}{2}$ " X $\frac{3}{8}$ "	100,000	162,000
$\frac{1}{2}$ " X $\frac{1}{2}$ "	230,000	372,600
$\frac{1}{2}$ " X $\frac{3}{4}$ "	230,000	372,600
$\frac{3}{4}$ " X $\frac{3}{4}$ "	280,000	453,600

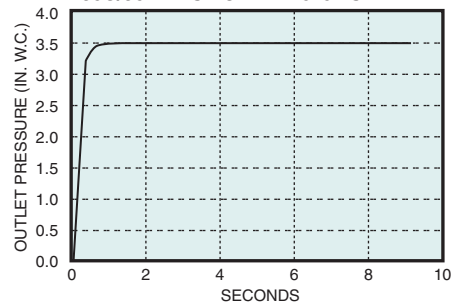
Features and Options

Fast Open Control



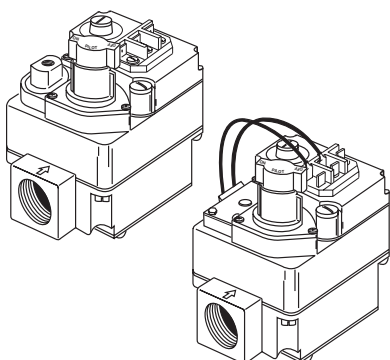
This control has a fast opening characteristic which is suitable for a wide range of applications. It provides a fast rise to full pressure upon energizing the automatic valves. Regulator spring conversion kits are available for most models.

36C/36D FAST OPENING GAS VALVE



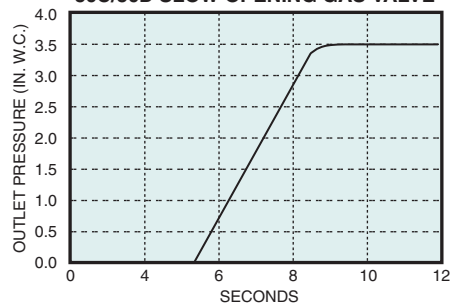
NOTE: TYPICAL OPENING CURVE NATURAL GAS 200,000 BTU/HR. 7" W.C. INLET / 3.5" W.C. OUTLET.

Slow Open Control



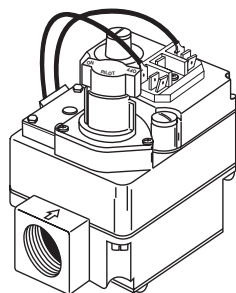
This control has slow opening characteristic. It provides a slow increase of gas to full pressure for smoother ignition, as may be required. The control can be a fast or slow close as well.

36C/36D SLOW OPENING GAS VALVE



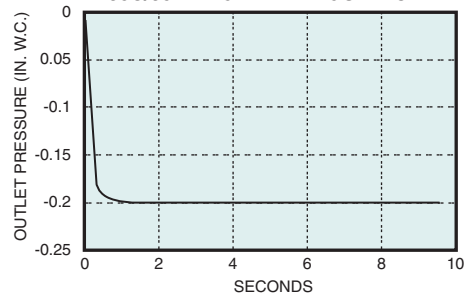
NOTE: TYPICAL OPENING CURVE NATURAL GAS 120,000 BTU/HR. 7" W.C. INLET / 3.5" W.C. OUTLET.

Negative Regulator Control



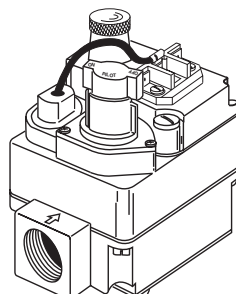
This control is designed for direct burner ignition applications with appliances having premix type burners using a combustion air blower requiring regulated negative outlet pressure. The control is equipped with dual automatic valves that control gas flow to the main burner, a two position manual valve for manual gas shut off, and a negative pressure regulator. A variety of models are available to suit voltage, pipe size and pressure regulator requirements.

36C/36D NEGATIVE REGULATOR



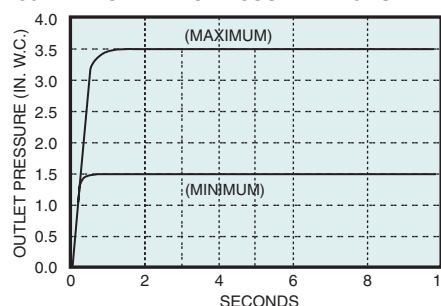
NOTE: TYPICAL OPENING CURVE NATURAL GAS 200,000 BTU/HR. 7" W.C. INLET / -2" W.C. AT -2 W.C. VACUUM PRESSURE.

Manual HI-LO Adjustable Control



This control has a manual outlet pressure adjustment characteristic. It provides a fast rise of gas to the manually adjusted outlet pressure for a preferred flame setting in gas fireplace and gas log applications.

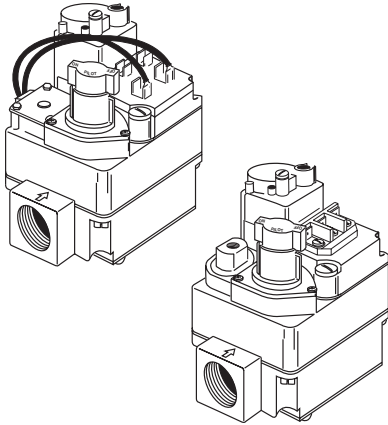
36D MANUAL HI-LO ADJUSTABLE GAS VALVE



NOTE: TYPICAL OPENING CURVE NATURAL GAS 25,000 BTU/HR. 7" W.C. INLET / 1.5" W.C. MINIMUM / 3.5" W.C. MAXIMUM.

Features and Options

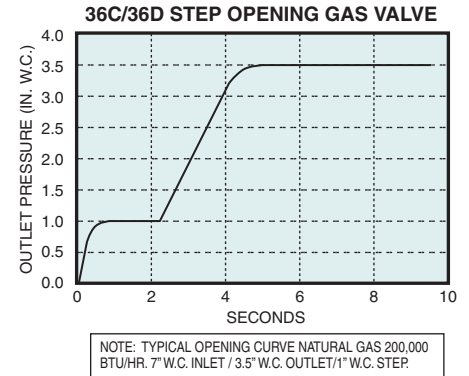
Step Open Control



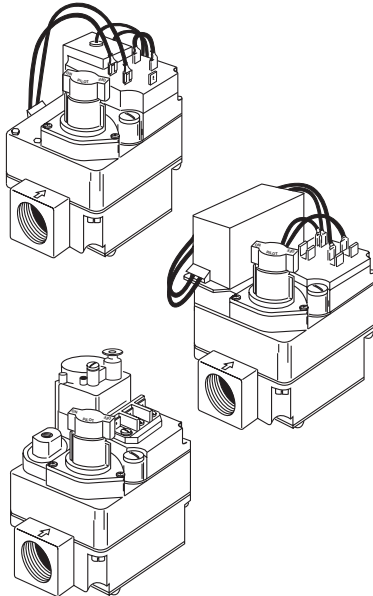
This control has a step open feature that regulates the outlet to an initial step pressure (non-field adjustable) and rises to the full outlet pressure. It provides a step pressure for softer ignition.

Options:

1. Regulated step factory set to a predetermined step pressure.
2. Fixed orifice step internally orificed for a step pressure based upon inlet pressure and flow.



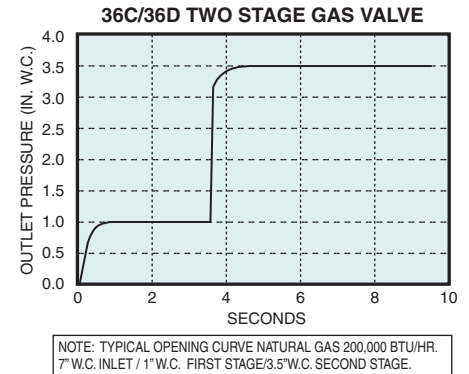
Two Stage Control



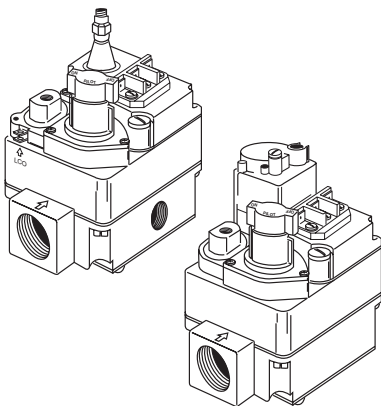
This control has a two-stage feature. Upon energizing the main and redundant control valves, the servo regulator will provide a low fire rate until the high fire relay or bi-metal heater is energized or manual selection is made. (Adjustable high fire.)

Options:

1. Bi-metal operated for a gradual change from the first stage to second stage.
2. Relay operated for an instantaneous change from the first stage to the second stage.
3. Manually operated from first to second stage with step at first stage when in second stage position.



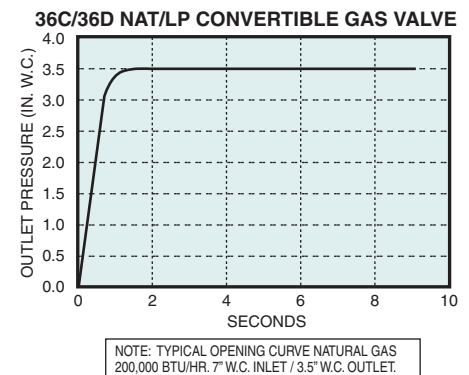
Convertible Regulator



The convertible regulator option involves a construction which permits easy Natural to LP conversion (or vice versa) by removing, inverting and replacing the regulator cap screw or by a mechanical adjustment. This feature easily lends itself to use in mobile homes and infra-red applications.

Options:

1. Fixed orifice step internally orificed for a step pressure based upon inlet pressure.
2. Fast open to full outlet pressure.

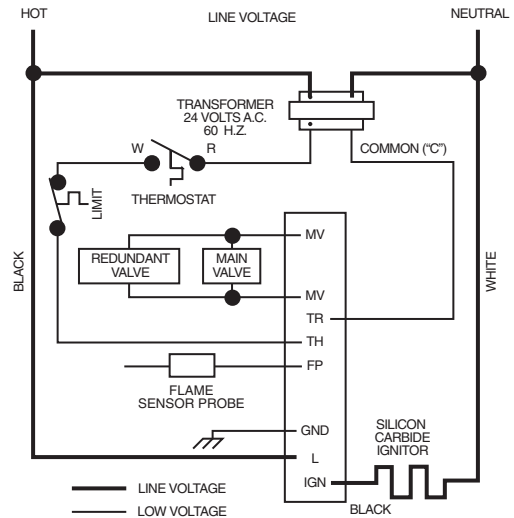


System Applications

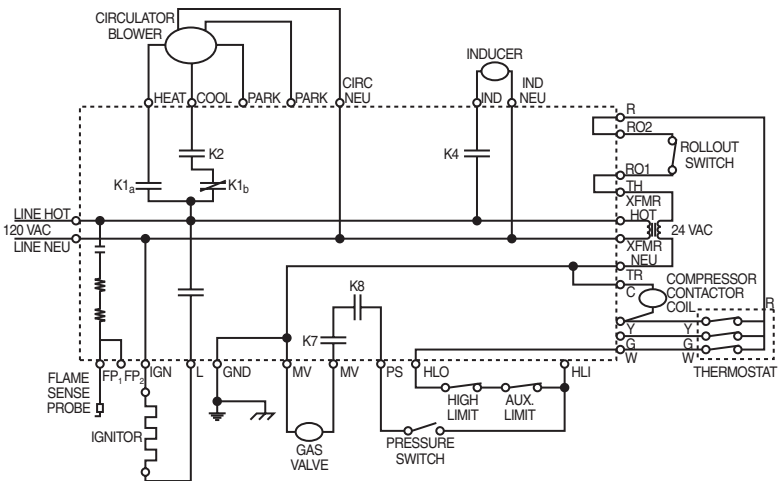
Hot Surface Ignition Systems

HSI CONTROL. The thermostat calls for heat and energizes the HSI control. If the system is equipped with prepurge, the purge fan is energized and power will be delayed thirty seconds before application to the silicon carbide igniter. If prepurge is not selected, the igniter is powered within one second. The igniter heats up and at the end of the heating period, the redundant and main valves are opened. A flame must be detected within a fixed time period or both valves close, the igniter is turned off and the HSI control locks out unless the system is equipped with retry. Retry indicates the ignition sequence will be repeated for a total of three tries if flame is undetected or lost within 30 seconds of ignition.

Accessories: HSI Control, Sense Electrode, Silicon Carbide Igniter.



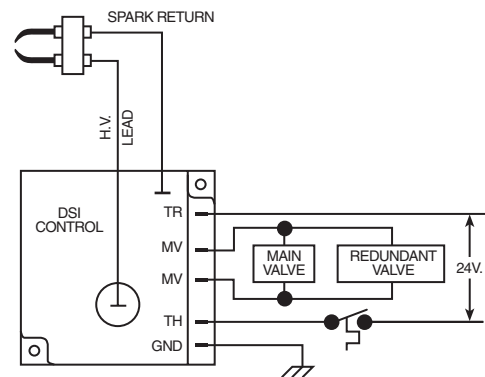
INTEGRATED CONTROL. The 50A50 integrated Hot Surface Ignition control employs a microprocessor to continuously monitor, analyze, and control the proper operation of the gas burner, inducer, and fan. Signals interpreted during continual surveillance of the thermostat and flame sensing element initiate automatic ignition of the burner, sensing of the flame, and system shut-off during normal operation. The control incorporates system fault analysis for quick gas flow shut-off, coupled with automatic ignition retry upon sensing a fault correction.



Direct Spark Ignition System

The thermostat calls for heat and simultaneously energizes the DSI control module and both redundant and main gas valves. Sparks at the ignition electrodes ignite the gas at the main burner. Flame is sensed through the electrodes by the flame detection circuit and shuts off the sparking. If flame is not established within a fixed time period (lock-out time) both valves close, sparking ceases and the control module locks out.

Accessories: DSI Control, Electrodes.

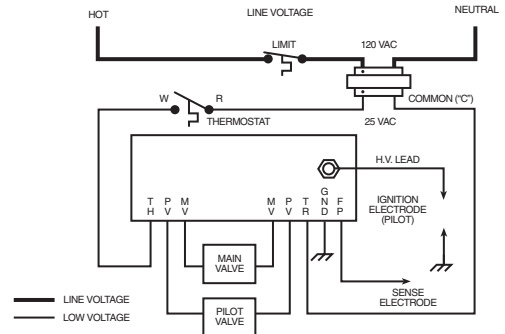


System Applications

Proven Pilot System

The thermostat calls for heat and simultaneously energizes the pilot valve and the Proven Pilot control. Sparking from the ignition electrode to the pilot burner ignites the gas at the pilot burner. Flame is sensed by the flame detection circuit which energizes the main valve. Main burner gas is ignited and sparking ceases once a pilot flame is detected.

Accessories: Proven Pilot Control, Pilot Burner Assembly.

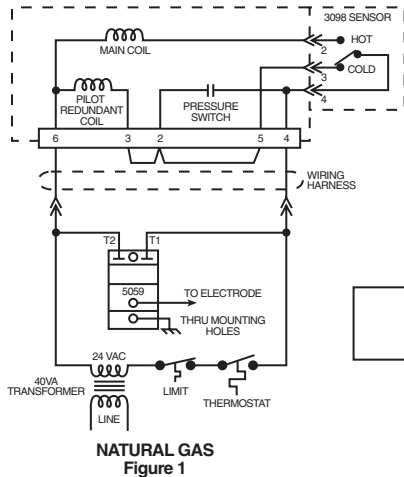


Cycle Pilot System

The thermostat calls for heat and simultaneously energizes pilot solenoid and pilot relight control. Pilot valve opens and relight begins sparking. Gas flow activates the pressure switch. Sparks ignite pilot gas. Once the flame is detected, the sparks stop. After sufficient heat is sensed by the Mercury Flame Sensor, the main valve is energized and the system is in operating mode. (Fig. 1)

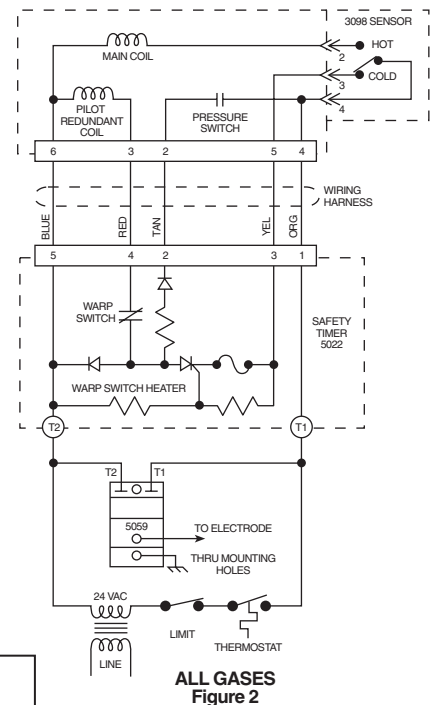
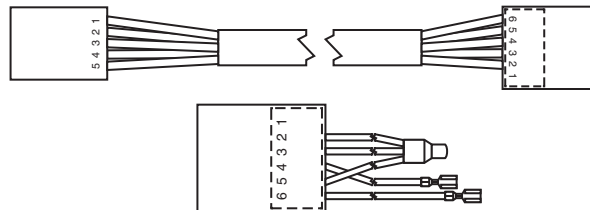
The schematic for "ALL GASES," Figure 2, includes a safety timer which acts to close the main gas valve, turns off the pilot redundant coil and locks out the system should a flame not be detected within a fixed period of time.

Accessories: Mercury Flame Sensor, Pilot Burner/Electrode Assembly, Pilot Relight Control, Safety Timer (for all gas systems).



NATURAL GAS
Figure 1

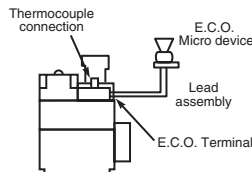
CYCLE PILOT HARNESSES	
HARNESS LENGTH	TYPE NO.
36"	F115-0059
36"	F115-0064



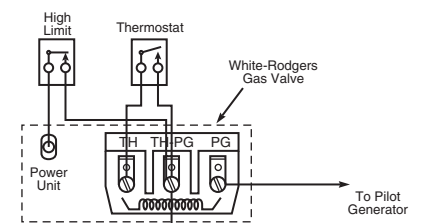
ALL GASES
Figure 2

Standing Pilot System

Gas flow to the pilot burner is controlled by a safety valve which is manually operated and held in by current generated from a thermocouple placed in the pilot flame. When the thermostat calls for heat the main valve is energized.



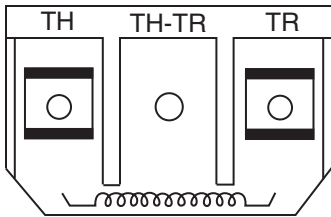
Wiring for Energy Cut-Off (E.C.O.) connection



Wiring for 36C03U/36C13U/36D34U (.750 Volt)

Electrical Panels/Connections

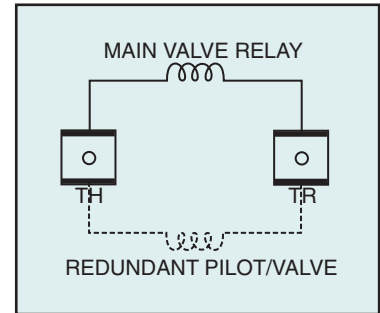
2 Terminal Panel



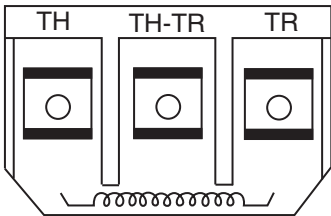
Options:

- * - 1/4" dual male terminals
- 1/4" single male terminals
- 1/4" combination tab/screw
- Conduit connector with (2) flying leads

Note: Redundant/Pilot valve leads terminated on panel if applicable.



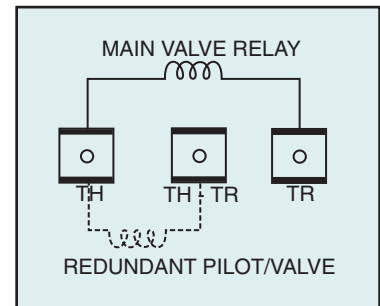
3 Terminal Panel



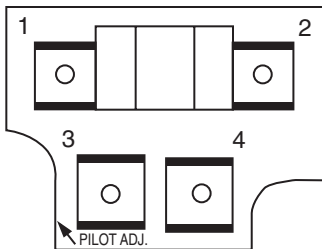
Options:

- * - 1/4" dual male terminals
- 1/4" single male terminals
- 1/4" combination tab/screw terminals
- Conduit connector with (3) flying leads

Note: Redundant/Pilot valve leads terminated on panel if applicable.



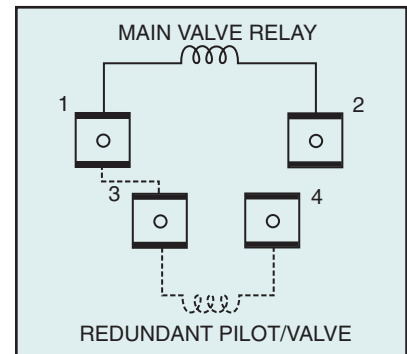
4 Terminal Panel



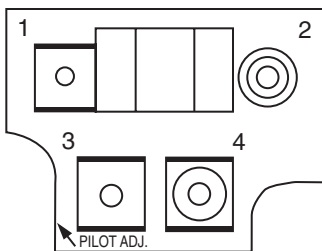
Options:

- * - 1/4" dual male terminals
- 1/4" single male terminals
- Conduit connector with (4) flying leads

Note: Redundant/Pilot valve leads terminated on panel.



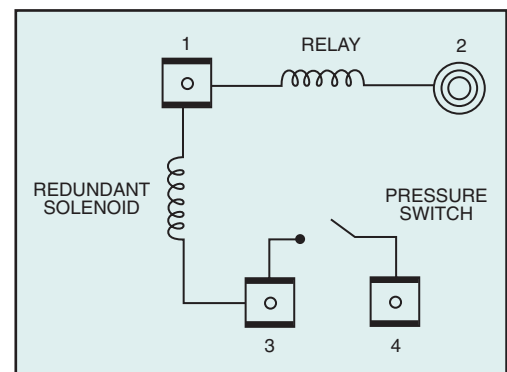
Cycle Pilot With 4 Terminal Panel



Options:

- * - 1/4" dual male terminals with 3/16" pin terminal on #2

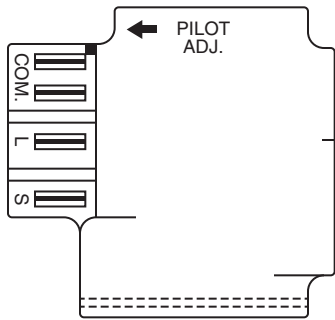
Note: Redundant/Pilot valve leads terminated on panel.



* Indicates optional terminals shown

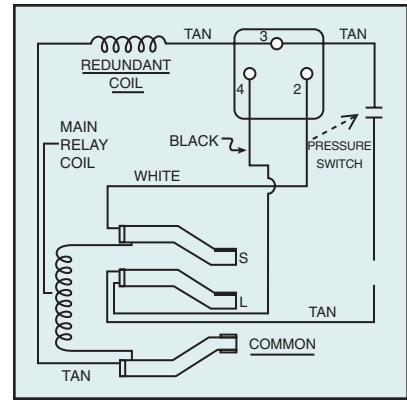
Electrical Panels/Connections

Cycle Pilot With Plug In Receptacle

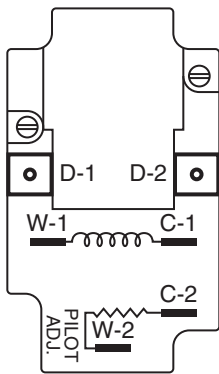


Options:

- Edge connector
- Wiring harness with connector
- Flying leads
- * - 1/4" male "Com, L, S" terminals
- Plug in receptacle on top or outlet side



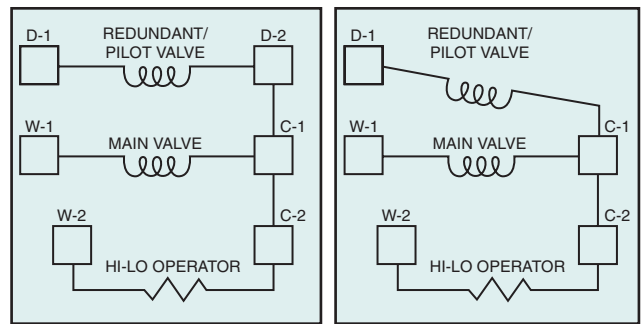
Bi-metal 2 Stage



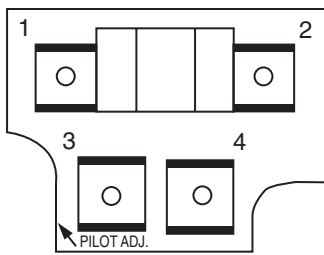
Options:

- * - (6) 1/4" male terminals
- (5) 1/4" male terminals

Note: Redundant/Pilot valve leads terminated on panel.



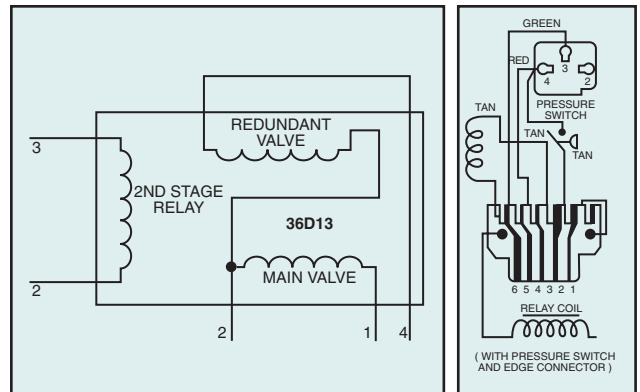
Relay 2 Stage



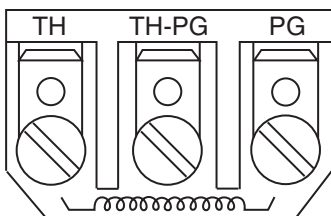
Options:

- * - 1/4" dual male terminals
- Edge connector
- Flying leads

Note: Second stage relay leads and redundant valve leads terminated on panel.



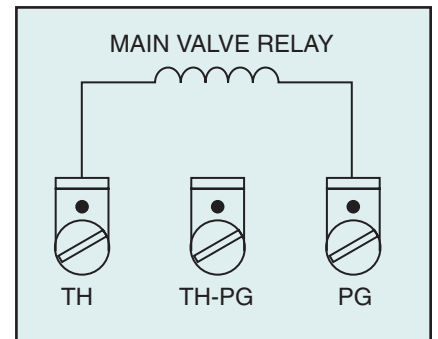
Millivolt 3 Terminal Panel



Options:

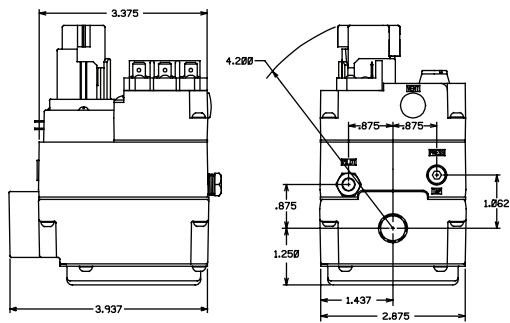
- * - 1/4" combination tab/screw terminals

* Indicates optional terminals shown



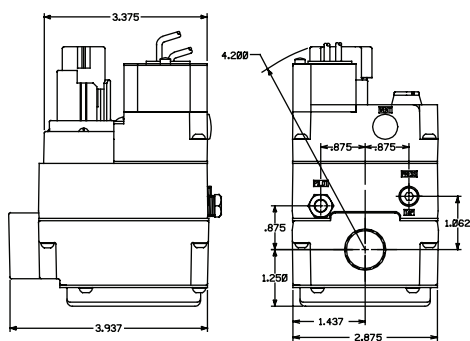
Dimensions

Basic Model (24V or Millivolt)



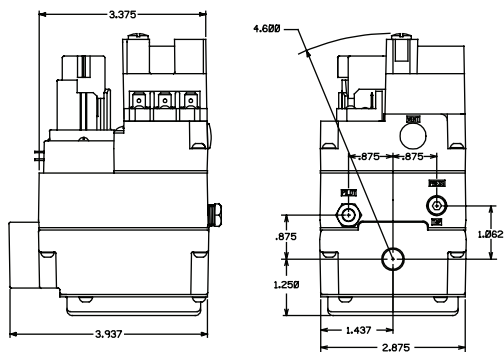
Includes all basic 24V or 750 millivolt as well as negative regulator models.

Basic Model (120V or 240V)



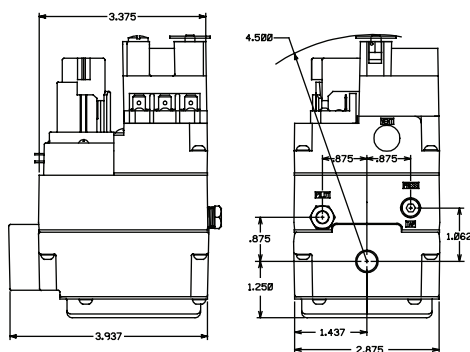
Includes all 120V or 240V basic models with a conduit connector.

Regulated Step



For all regulated step models including convertible models with a natural/LP gas selector feature.

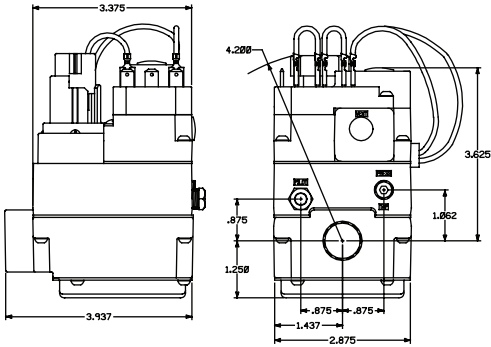
Manual 2 Stage With Regulated Step



For manual Hi-Lo two stage type models.

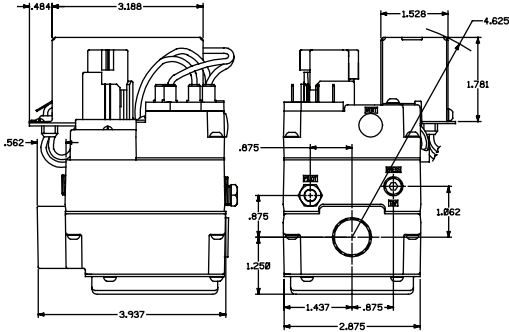
Dimensions

Bi-metal Operated 2 Stage



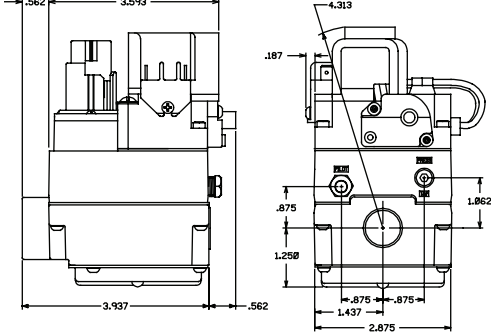
Includes all bi-metal operated 2 stage type models.

Relay Operated 2 Stage



Includes all relay operated 2 stage type models.

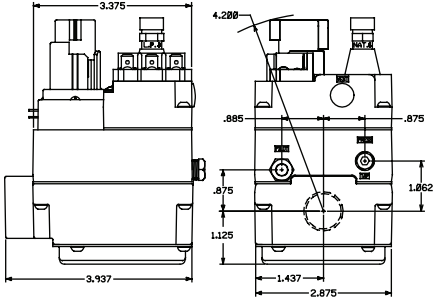
Plug In Pilot Types



Includes all plug in pilot type pressure switch models.

Note: Gas valve shown has plug in pilot receptacle on top.

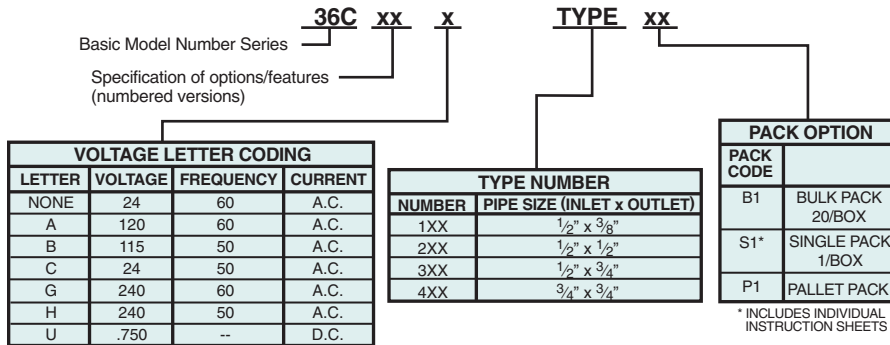
Convertible Regulator (Natural/LP Selector)



Includes all natural/LP gas convertible regulator models with the "Flip-Flop" type selector.

Models Available

Each valve is uniquely defined by a model number succeeded by the type number as follows:



Accessories

REGULATOR CONVERSION KITS AVAILABLE	
F92-0656	LP to NAT GAS (2.5"-5.0")
F92-0659	NAT to LP GAS (7.5"-12.0")
F92-0737	NAT to LP GAS (Non-regulated)
F92-0866	NAT to LP GAS (4.2"-11.0")
F69-0727	1/4" brass compression fitting for pilot line conversions
F92-0514	One 3/4" x 1/2" N.P.T. and one 1/2" x 3/8" N.P.T. reducer bushings

MODEL NO.*	TYPE GAS	REGULATOR	LINE INTERRUPTER	STEP	OPERATOR	SPECIAL FEATURES
36C01	NAT	YES	NO	NO	RELAY	NO LINE INTERRUPTER, RELAY OPERATOR, REGULATOR
36C02	NAT/LP	YES	YES	NO	RELAY	NAT/LP FLIP-FLOP SELECTOR
36C03	NAT	YES	YES	NO	RELAY	STANDARD STANDING PILOT
36C04	NAT	YES	YES	REGULATED	RELAY	REGULATED STEP OPENING
36C05	NAT	YES	YES	REGULATED	RELAY	MANUAL HI-LO (TWO STAGE), NATURAL GAS
36C10	ALL	NO	YES	NO	RELAY	36C03 WITH OUT REGULATOR
36C12	NAT/LP	YES	YES	REGULATED	RELAY	NAT/LP SELECTOR, REGULATED STEP OPENING W/NAT/LP SELECTOR
36C13	LP	YES	YES	NO	RELAY	36C03 ONLY LP GAS
36C14	LP	YES	YES	REGULATED	RELAY	36C04 ONLY LP GAS
36C15	LP	YES	YES	REGULATED	RELAY	MANUAL HI-LO (TWO STAGE), LP GAS
36C21	ALL	NO	NO	NO	RELAY	NO MANUAL VALVE, NO PILOT
36C27	NAT	YES	NO	REGULATED	RELAY	36C04 WITH OUT LINE INTERRUPTER
36C36	NAT/LP	YES	NO	NO	RELAY	PLUG-IN-PILOT
36C38	NAT	YES	NO	NO	RELAY	BI-METAL 2 STAGE
36C40	NAT	YES	YES	NO	RELAY	BI-METAL 2 STAGE
36C41	LP	YES	YES	NO	RELAY	BI-METAL 2 STAGE
36C53	NAT.LP	YES	YES	NO	RELAY	SLOW OPENING
36C67	NAT/LP	YES	YES	FIXED	RELAY	NAT/LP SELECTOR ("FLIP-FLOP"), STEP OPENING
36C68	NAT/LP	YES	SOLENOID	NO	RELAY	36C03/C13 WITH REDUNDANT
36C74	NAT/LP	YES	SOLENOID	REGULATED	RELAY	36C04/C14 WITH REDUNDANT
36C76	NAT/LP	YES	SOLENOID	NO	RELAY	BI-METAL 2 STAGE
36C77	NAT/LP	YES	SOLENOID	FIXED	RELAY	NAT/LP SELECTOR ("FLIP-FLOP"), STEP OPENING
36C78	NAT/LP	YES	SOLENOID	NO	RELAY	36C77 WITH OUT STEP OPENING
36C81	NAT/LP	YES	SOLENOID	NO	RELAY	36C53 WITH REDUNDANT, SLOW OPENING
36C84	NAT/LP	YES	SOLENOID	NO	RELAY	PRESSURE SWITCH, PLUG IN PILOT
36C87	NAT/LP	YES	SOLENOID	REGULATED	RELAY	PRESSURE SWITCH
36C90	NAT/LP	YES	SOLENOID	NO	RELAY	36C68 LESS MANUAL VALVE
36C92	NAT/LP	YES	SOLENOID	NO	RELAY	36C76 WITH PRESSURE SWITCH
36C94	NAT/LP	YES	SOLENOID	SLOW	RELAY	SLOW OPEN, PRESSURE SWITCH WITH PLUG IN PILOT
36D01	NAT/LP	YES	NO	FIXED	RELAY	36C67 WITH OUT LINE INTERRUPTER
36D11	ALL	NO	SOLENOID	NO	RELAY	36C90 WITH OUT REGULATOR
36D13	NAT/LP	YES	SOLENOID	NO	RELAY	RELAY OPERATED 2 STAGE
36D14	NAT/LP	YES	SOLENOID	NO	RELAY	36D13 WITH PRESSURE SWITCH
36D22	NAT	YES	YES	NO	RELAY	36C03 WITH BRITISH THREADS
36D23	NAT/LP	YES	SOLENOID	NO	RELAY	36D13 WITH OUT MANUAL VALVE
36D24	NAT/LP	YES	SOLENOID	NO	RELAY	NEGATIVE REGULATOR WITH DELAYED OPENING
36D27	NAT/LP	YES	SOLENOID	NO	RELAY	NEGATIVE REGULATOR
36D29	NAT/LP	YES	SOLENOID	NO	RELAY	36C76 WITH OUT MANUAL VALVE
36D32	NAT/LP	YES	YES	NO	RELAY	MANUAL HI-LO ADJUSTMENT

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