

## General Industrial Control Valves



Goyen's process and fluid control valves. Solenoid pilot operated, normally closed or normally open general purpose control valves available to suit gas, water, steam and light oil application.

Solenoid actuated, direct lift valves in normally open or normally closed configurations, stainless steel valves and PTFE plastic valves for corrosive applications.

Goyen manufactures and distributes valves that are designed for specific applications relating to the control of gas, fuel, air or water. There are two principal types of operation for solenoid valves – direct lift and pilot operated.

### Direct Lift Valves

In these models, movement of the plunger directly opens or closes the valve as the sealing disc is attached to the plunger. The valve will operate from zero pressure differential to its maximum rated pressure.

### Pilot Operated Valves

These models are equipped with a diaphragm or piston which provides the seal for the main valve orifice. These valves are used to handle much greater flow or pressure requirements than direct acting valves.

Two designs of pilot operated valves are available, either a floating diaphragm which requires a small pressure drop across the main valve orifice to remain in the open position, or a coupled diaphragm which is mechanically held open via a direct linkage to the solenoid plunger. The coupled design will operate with zero pressure drop across the main valve orifice.

Both Direct Lift and Pilot Operated Valves are available in normally open or normally closed configuration.

### 2-way Valves

These valves have one inlet port and one outlet port and are used as an on/off valve to control the flow of liquids or gases.

### 3-way Valves

These valves enable the application and release of pressure from closed end systems, such as single acting cylinders.

## General Industrial Control Valves - Direct Lift

### Q3M Series - 2 way - Normally Closed

Model	Pipe Size		Pressure		Orifice Size		Cv	Kv
	mm	inch	kPa	psi	mm	inch		
1Q3M	3	1/8	0-2550	0-370	1.6	0.062	0.1	0.09
2Q3M	3	1/8	0-1000	0-150	2.4	0.093	0.2	0.17
3Q3M	3	1/8	0-700	0-100	2.8	0.109	0.3	0.26
4Q3M	3	1/8	0-500	0-75	3.2	0.125	0.3	0.26

### B6M and BL Series - 2 way - Normally Closed

Model	Pipe Size		Pressure		Orifice Size		Cv	Kv
	mm	inch	kPa	psi	mm	inch		
1B6M	6	1/4	0-2100	0-300	1.6	0.062	0.1	0.09
2B6M	6	1/4	0-1200	0-175	2.4	0.093	0.2	0.17
4B6M	6	1/4	0-1000	0-150	3.2	0.125	0.3	0.26
5B6M	6	1/4	0-400	0-60	4.8	0.187	0.5	0.43
6B6M	6	1/4	0-200	0-30	6.0	0.235	0.7	0.6
10BL2	10	3/8	0-70	0-10	9.5	0.375	2.1	1.81
12BL2	12	1/2	0-40	0-6	12.7	0.500	3.5	3.01

### B6M and Q3M Series - 2 way - Normally Open

Model	Pipe Size		Pressure		Orifice Size		Cv	Kv
	mm	inch	kPa	psi	mm	inch		
1Q3M	3	1/8	0-860	0-125	1.6	0.062	0.1	0.09
2Q3M	3	1/8	0-400	0-60	2.4	0.093	0.2	0.17
4Q3M	3	1/8	0-200	0-30	3.2	0.125	0.3	0.26
1B6M	6	1/4	0-2100	0-300	1.6	0.062	0.1	0.09
2B6M	6	1/4	0-1200	0-175	2.4	0.093	0.2	0.17
4B6M	6	1/4	0-1000	0-150	3.2	0.125	0.3	0.26

### Q3M and B6M Series - 3 way - Normally Closed and Normally Open

Model	Pipe Size		Pressure		Orifice Size		Cv	Kv
	mm	inch	kPa	psi	mm	inch		
1Q3M3	3	1/8	0-860	0-125	1.6	0.062	0.1	0.09
2Q3M3	3	1/8	0-400	0-60	2.4	0.093	0.2	0.17
4Q3M3	3	1/8	0-200	0-30	3.2	0.125	0.3	0.26
1B6M3	6	1/4	0-860	0-125	1.6	0.062	0.1	0.09
2B6M3	6	1/4	0-400	0-60	2.4	0.093	0.2	0.17
4B6M3	6	1/4	0-200	0-30	3.2	0.125	0.3	0.26

Port threads standard in 'RC' and 'NPT'. Others available on request.

## General Industrial Control Valves



### BW-BWJ Series - Operation and Installation

#### Installation

Check the valves identification label for correct part number, working pressure and power supply requirements. Only suitably qualified personnel should install and maintain this product.

#### Mounting

These valves are designed to be mounted in any position or orientation. It is preferable to mount the valve horizontally with the solenoid coil vertically uppermost. This will minimise the accumulation of sediment in the moving parts of the valve.

Goyen strongly recommend the use of a strainer or filter immediately upstream of the valve to ensure optimum life and performance.

#### Piping Connections

Ensure that the valve is installed with the arrow pointing in the direction of flow. Thread sealant or tape should be applied sparingly to the male threads only. Excessive use of sealant is wasteful and could lead to blockage or valve failure.

When tightening pipework into the valve do not use the valve or solenoid as a lever. Minimise strain on the valve body by ensuring that pipework is well aligned and supported.

#### Safety

Before commencing any service to a valve always ensure that electrical power is isolated from the valve and the valve is relieved from fluid pressure.

### Pilot Operated Control Valves

#### BW Series - Brass Body - Normally Closed

Model	Pipe Size		Pressure		Orifice Size		Cv	Kv
	mm	inch	kPa	psi	mm	inch		
6BW2	6	1/4	20-1000	3-150	6.4	0.25	1.1	0.95
10BW2	10	3/8	20-1000	3-150	9.5	0.38	2.1	1.81
12BW2	12	1/2	20-1000	3-150	12.7	0.50	3.5	3.01
20BW2	20	3/4	20-1000	3-150	19.0	0.75	7.7	6.62
25BW3	25	1	20-1000	3-150	25.4	1.00	13.2	11.35
40BW2	40	1 1/2	20-1000	3-150	38.1	1.50	24.0	20.64

#### QW Series - Brass Body - Normally Closed

Model	Pipe Size		Pressure		Orifice Size		Cv	Kv
	mm	inch	kPa	psi	mm	inch		
6QW2	6	1/4	20-1000	3-150	6.4	0.25	1.1	0.95
10QW2	10	3/8	20-1000	3-150	9.5	0.38	2.1	1.81
12QW2	12	1/2	20-1000	3-150	12.7	0.50	3.5	3.01

#### BWJ Series - Brass Body - Normally Closed

Model	Pipe Size		Pressure		Orifice Size		Cv	Kv
	mm	inch	kPa	psi	mm	inch		
6BWJ2	6	1/4	0-1000	0-150	6.4	0.25	1.1	0.95
10BWJ2	10	3/8	0-1000	0-150	9.5	0.38	2.1	1.81
12BWJ2	12	1/2	0-1000	0-150	12.7	0.50	3.5	3.01
20BWJ2	20	3/4	0-700	0-100	19.0	0.75	7.7	6.62
25BWJ2	25	1	0-400	0-60	25.4	1.00	13.2	11.35

#### QWJ Series - Brass Body - Normally Closed

Model	Pipe Size		Pressure		Orifice Size		Cv	Kv
	mm	inch	kPa	psi	mm	inch		
6QWJ2	6	1/4	0-1000	0-150	6.4	0.25	1.1	0.95
10QWJ2	10	3/8	0-1000	0-150	9.5	0.38	2.1	1.81
12QWJ2	12	1/2	0-1000	0-150	12.7	0.50	3.5	3.01

#### BW Series - Brass Body - Normally Open

Model	Pipe Size		Pressure		Orifice Size		Cv	Kv
	mm	inch	kPa	psi	mm	inch		
12BW2-NO	12	1/2	20-1000	3-150	12.7	0.50	3.5	3.01
20BW2-NO	20	3/4	20-1000	3-150	19.0	0.75	7.7	6.62
25BW3-NO	25	1	20-1000	3-150	25.4	1.00	13.2	11.35
40BW2-NO	40	1 1/2	20-1000	3-150	38.1	1.50	24.0	20.64

#### BXX Series - Brass Body - Normally Open - Air to Close

Model	Pipe Size		Pressure		Orifice Size		Cv	Kv
	mm	inch	kPa	psi	mm	inch		
6BXX2	6	1/4	70-1000	10-150	6.4	0.25	1.1	0.95
10BXX2	10	3/8	70-1000	10-150	9.5	0.38	2.1	1.81
12BXX2	12	1/2	70-1000	10-150	12.7	0.50	3.5	3.01
20BXX2	20	3/4	70-1000	10-150	19.0	0.75	7.7	6.62
25BXX2	25	1	70-1000	10-150	25.4	1.00	13.2	11.35

Port threads standard in 'RC' and 'NPT'. Others available on request.

### Wiring

Wiring installation must comply with your local electrical codes, within Australia this code is AS/NZS 3000:2001.

Valves designed for use in hazardous locations are covered by further standards such as AS/NZS 2381.1:2005 and AS/NZS 2381.2:2006.

Only approved conduits or cable seals should be used in these installations. Never remove covers or seals from hazardous rated equipment before isolating the power supply.

*Note: Most solenoid valves are designed for either AC or DC power supply and are so constructed that conversion from one type to the other may require changing the whole top section of the valve.*

The normally open range of BW valves do not differ in AC versus DC construction.

### Troubleshooting

Valve fails to open when power is applied:

- No power to the coil due to faulty wiring or a blown fuse.
- Open circuit coil or internally shorted to earth.
- Supply voltage may be less than 85% of nominal rating.
- Fluid pressure may exceed maximum rating.

Valve leaks or fails to close:

- Debris caught in moving parts of valve or bleed hole in diaphragm is blocked.

Valve noisy (humming) with AC operation:

- Debris caught between plunger and iron top.

*Note: A metallic click should be heard when power is applied. This should indicate correct solenoid function.*

### Maintenance

Ensure that fluids flowing through the valve are as free from dirt and foreign matter as conditions allow.

Operate the valve on a regular basis and at least monthly.

Periodic inspection and cleaning of the valve's internal components is highly recommended. Maintenance periods will be dictated by individual situations and the type of fluids handled.

Only genuine Goyen repair kits are recommended.

### Spare Parts

(Kits consist of plunger, spring, seals and diaphragm)

#### BW Normally Closed Series

Valve Model Seal Kits	Diaphragm and Seal Material		
	NBR (Nitrile)	FMK (Viton)	EPDM
6BW2(AC)	KM1628	KM1721	KM1725
6BW2(DC)	KM1656	KM1660	KM1892
10BW2(AC)	KM1628	KM1721	KM1725
10BW2(DC)	KM1656	KM1660	KM1892
12BW2(AC)	KM1626	KM1722	KM1726
12BW2(DC)	KM1657	KM1661	KM1893
20BW2(AC)	KM1627	KM1723	KM1727
20BW2(DC)	KM1658	KM1662	KM1894
25BW3(AC)	KM3013	KM3010	KM3011
25BW3(DC)	KM3017	KM3014	KM3016
40BW2(AC)	KM1459	KM1460	KM1462
40BW2(DC)	KM2423	KM2424	KM2425

#### BW Normally Open Series

Valve Model Seal Kits:	Diaphragm and Seal Material		
	NBR (Nitrile)	FMK (Viton)	EPDM
12BW2-NO	KM1783	KM1784	KM1785
20BW2-NO	KM1928	KM1929	KM1930
25BW3-NO	KM1647	KM1648	KM1649
40BW2-NO	KM1786	KM1787	KM1788

#### Pilot Kits:

All Models	KM1789	KM1790	KM1791
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#### BWJ Normally Closed Series

Valve Model Seal Kits	Diaphragm and Seal Material		
	NBR (Nitrile)	FMK (Viton)	EPDM
6BWJ2(AC)	KM1584	KM1596	KM1600
6BWJ2(DC)	KM1664	KM1668	KM1918
10BWJ2(AC)	KM1584	KM1596	KM1600
10BWJ2(DC)	KM1664	KM1668	KM1918
12BWJ2(AC)	KM1585	KM1597	KM1601
12BWJ2(DC)	KM1665	KM1669	KM1919
20BWJ2(AC)	KM1586	KM1598	KM1602
20BWJ2(DC)	KM1666	KM1670	KM1920
25BWJ2(AC)	KM1587	KM1599	KM1603
25BWJ2(DC)	KM1667	KM1671	KM1921

#### BW - Normally Closed - Hazardous

Valve Model Seal Kits	Diaphragm and Seal Material		
	NBR (Nitrile)	FMK (Viton)	EPDM
12BW2-H(AC)	KM1827	KM1828	KM1829
12BW2-H(DC)	KM1830	KM1831	KM1832
20BW2-H(AC)	KM1833	KM1834	KM1835
20BW2-H(DC)	KM1836	KM1837	KM1839
25BW3-H(AC)	KM1838	KM1840	KM1841
40BW2-H(AC)	KM1845	KM1846	KM1847

**Special notes:** The pressure ratings shown in this catalogue are intended to cover both AC and DC voltages, with hot coils and -15% supply voltages. If your particular requirement exceeds the pressure ratings shown, please contact your nearest Goyen Sales Office for advice. In all cases ambient temperature is taken to be 25°C (77°F). The Cv factor denotes the number of US Gallons of water per minute at 60°F that a valve can pass, with a pressure drop of 1psi across the main seat.

The metric equivalent of Cv is Kv - cubic metres of water per hour at 20°C with a pressure drop of 1 bar. Kv = 0.86Cv

## General Industrial Control Valves

### Spare Parts (cont'd)

(Kits consist of plunger, spring, seals and diaphragm)

#### BXX Series

Valve Model Seal Kits:	Diaphragm and Seal Material		
	NBR (Nitrile)	FMK (Viton)	EPDM
6BXX2	KM1208A	KM1521	KM2392
10BXX2	KM1208A	KM1521	KM2392
12BXX2	KM1211A	KM1773	KM1991
20BXX2	KM1212A	KM 1523	KM 1992
25BXX2	KM2551	KM 1524	KM 1993

#### Direct Lift Valves - 3 way

Valve Model Seal Kits:	Seal Material		
	NBR (Nitrile)	FMK (Viton)	EPDM
Q3M3 NC	KM2450	KM2452	KM2454
Q3M3 NO	KM2551	KM2552	KM2553
B6M3 NC	KM1337	KM1416	KM1418
B6M3 NO	KM1336	KM1413	KM1415

#### Direct Lift Valves - 2 way - Normally Open

Valve Model Seal Kits:	Seal Material		
	NBR (Nitrile)	FMK (Viton)	EPDM
Q3M	KM2551	KM2552	KM2553
B6M	KM1336	KM1413	KM1415

#### Direct Lift Valves - 2 Way - Normally Closed

Valve Model Seal Kits:	Seal Material		
	NBR (Nitrile)	FMK (Viton)	EPDM
Q3M (AC/DC)	KM1347	KM1348	KM1469
B6M (AC)	KM1349	KM1350	KM1408
B6M (DC)	KM2447	KM2448	KM2449
10BL2 (AC)	KM1423	KM2403	KM2404
10BL2 (DC)	KM2402	KM2411	KM2412
12BL2 (AC)	KM1427	KM2405	KM2406
12BL2 (DC)	KM3015	KM2413	KM2414

## Solenoid Coil Options



### Solenoid Coils

All coils are continuously rated within +10 to -15 of nominal voltage and encapsulated in a moisture and abrasion resistant self extinguishing nylon.

Coil insulation is 'Class B' rated at 130°C.

### B Series Coils

**BD:** Basic Coil and Enclosure  
Coil and junction box enclosure provides 8 UNC, coil and earth terminals with M20 x 1.5 or 1/2" NPSC conduit entry.

Protection Class: IP31; NEMA 1

**BC:** Open frame coil with exposed 8 UNC screw terminals, for connection within a cabinet or other enclosure.

**BR:** Plug in coil and DIN40050 socket with PG11 cable gland, for internal or external installation. Weather, dust and hose proof. Protection Class: IP65; NEMA4

**BH:** Explosion proof enclosure for hazardous locations. Protection Class: ExdIIB Class I Zone 1, Class II; IP65; DIP.

### AC - B Coils

Volts	Hz	Inrush mA	Holding mA	Watts
12	50	4040	1670	10
24	50	2000	830	10
24	60	1720	660	10
32	50	1260	520	8
48	50	980	380	8
48	60	1070	410	10
110	50	405	157	9
110	60	496	195	11
120	60	370	142	9
240	50	172	70	9
415	50	80	30	7

### DC - B Coils

Volts	Hz	Holding mA	Watts
12	DC	1200	15
24	DC	596	15
32	DC	322	11
48	DC	302	15
74	DC	148	11
110	DC	113	13
240	DC	54	13

Coils not available in 32 Volts 60 Hz AC



### Q Series Coils

**Q2:** Basic Coil  
6mm [1/4"] spade terminals for push on connections within a cabinet or other enclosure.

**QD:** Coil and junction box enclosure provides 6 UNC coil and 8 UNC earth terminals, with an M20 x 1.5 or 1/2" NPSC conduit entry. Protection Class: IP31; NEMA 1

**QR:** Plug in coil and DIN40050 socket with PG11 cable gland, for internal or external installation. Weather, dust and hose proof. Protection Class: IP65, NEMA4.

**QF:** 450mm [18"] integral flying leads for direct connection to terminal strip, controller or junction box.

**QE:** Electronic module incorporating a pulse and hold circuit. Coil features low power consumption, low heat rise and zero hum. Available in 240VAC, 24VDC and 12VDC. Standard 6mm spade connector.

**QT2:** 6 UNC screw terminals for direct wiring within a cabinet or other enclosure.

### AC - Q Coils

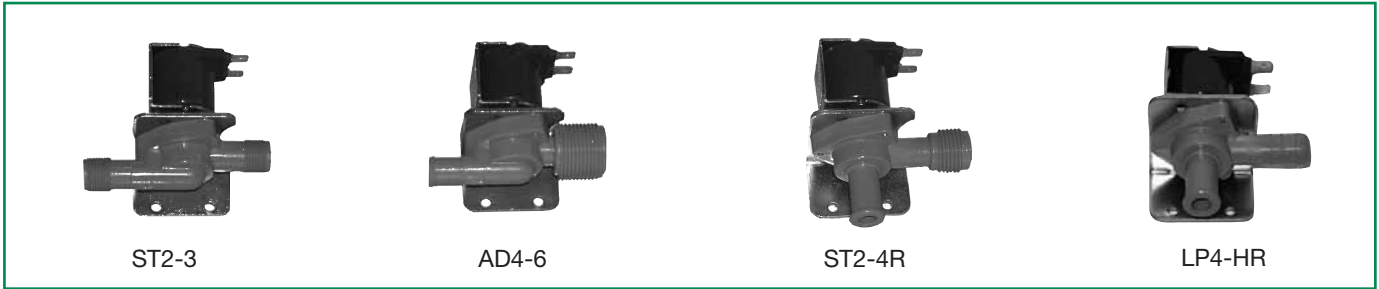
Volts	Hz	Inrush mA	Holding mA	Watts
12	50	1238	788	8
24	50	800	520	8
24	60	822	510	8
32	50	590	370	8
32	60	490	285	8
110	50	192	123	8
110	60	160	94	8
120	60	180	110	8
240	50	86	55	8
415	50	36	22	5

### DC - Q Coils

Volts	Hz	Holding mA	Watts
12	DC	719	9
24	DC	364	9
32	DC	262	9
48	DC	188	9
74	DC	116	9
110	DC	81	9
240	DC	39	10

Coils not available in 48 Volts 50 Hz AC and 48 Volts 60 Hz AC

## General Industrial Control Valves



### Moulded Plastic Valves

#### Description and Typical Applications

Goyen manufactures three basic series of moulded plastic solenoid valves - ST2, LP4 and AD4.

The ST2 series are normally closed, pilot operated diaphragm valves, with typical applications on dish and glass washing machines, agricultural spraying equipment and vending machines.

The LP4 series are normally closed, direct lift solenoid valves with typical applications in vending machines.

The AD4 series are also a normally closed, direct lift solenoid valve, but a sealed diaphragm has been included to isolate the upper sections of the valve from the media being controlled.

Typical applications are dispensing and vending equipment.

#### Construction

The ST2, the LP4 and the AD4 are available in either a 'straight through', or a 'right angle' configuration. The inlet connections can be either:

- 1/2" hose [-H]
- RP 3/8 [-3]
- RP 1/2 [-4]
- RP 3/4 [-6]

The outlet connections can be either:

- 1/2" hose
- RP 3/8

The ST2 is available in Nylon 6/6. The LP4 and AD4 are available in Nylon 6/6 [Blue], Polysulphone [Beige] and ABS [Black]. Diaphragm and/or seal materials may be Nitrile [BunaN], Viton or EPDM depending on the valve - see table.

#### Electrical

Coil types Q2, QT2 and QF are available [see page 6 for details], in AC and DC voltages. The duty cycle of the ST2 is 50% with maximum 'on' time of 30 minutes at 25°C ambient. The AD4 and LP4 have 100% duty cycle.

#### Spare parts

Kits contain plunger, spring seals and diaphragm if required. Kit numbers are listed below.

### Valve Performance Data

Base Series	Orifice		Working Pressure		Diaphragm and/or Seal Material		Cv
	mm	inch	kPa	psi			
ST2	9.5	3/8	20-1000	3-150	Nitrile/Viton		1.9
LP4	9.5	3/8	0-21	0-3	EPDM		1.9
AD4	9.5	3/8	0-7	0-1	EPDM		1.9

Max. Fluid Temperature = 82°C

Max. ambient 25°C for this fluid temperature

### Repair Kit

Base Series	Diaphragm and/or Seal Material	Repair Kit	
		AC	DC
ST2	Nitrile	KM1673	KM1673
ST2	Viton	KM1682	KM1682
LP4	EPDM	KM2139	KM2545
AD4	EPDM	KM2134	KM2135
AD4	Silicone	KM3121	KM3122

## Gas Control Valves



### Gas Control Valves

#### Low pressure

Goyen manufacture a range of normally closed, direct lift valves for use as shut-off valves for appliances and combustion burner systems.

#### Application

Principally used as safety shut-off valves for fuel gases such as town gas, L.P.G. and natural gas. Also used in industrial gas applications such as nitrogen, argon, carbon dioxide and acetylene. Typical product applications include:

**Domestic:** Gas cooking appliances, gas heaters, water heaters.

**Industrial:** Furnaces, boilers, water heaters, laboratory applications and welding equipment.

**Commercial:** Commercial gas appliances. Also used in marine, motor vehicle, campervan and mobile home gas installations.

#### High pressure

This range of pilot operated diaphragm valves are built specifically to handle compressed air or gases up to pressures of 1000 kPa (150 psi).

#### Application

Used as isolating valves in compressed air lines or in gas lines where the pressure exceeds the capability of the direct lift valves.

#### Construction

Bodies and covers are pressure diecast aluminium. Ferrule tubes, plungers, and springs are of 300 & 400 series stainless steel. Seals and diaphragms are Nitrile rubber, suitable for temperature ranges of -40°C (-40°F) to +60°C (+140°F). Coils are either Q or B series depending on the model. QLS2 valves are only available with the QE series coil.

#### Low Pressure Valves

Model	Pipe Size		Pressure		Orifice Size		Flow Factor		Approvals
	mm	inch	kPa	psi	mm	inch	Cv	Kv	
6QLS	6	1/4	0-7	0-1	6.4	0.250	1.1	0.95	1, 3
10QLS	10	3/8	0-7	0-1	9.5	0.375	2.1	1.81	1, 3
6QLS2	6	1/4	0-7	0-1	6.4	0.250	1.1	0.95	1, 3
10QLS2	10	3/8	0-7	0-1	9.5	0.375	2.1	1.81	1, 3
6QG	6	1/4	0-20	0-3	6.4	0.250	1.1	0.95	UL
10QG	10	3/8	0-20	0-3	9.5	0.375	2.1	1.81	UL
12BAL	12	1/2	0-7	0-1	12.7	0.500	3.5	3.01	
20BAL	20	3/4	0-10	0-1.5	19	0.750	7.7	6.62	3, UL

Approvals:

1 = Australian Gas Association AS4629-2005 Class 1

3 = Australian Gas Association AS4629-2005 Class 3

UL = UL429 Safety Shut-off valve

#### High Pressure Valves

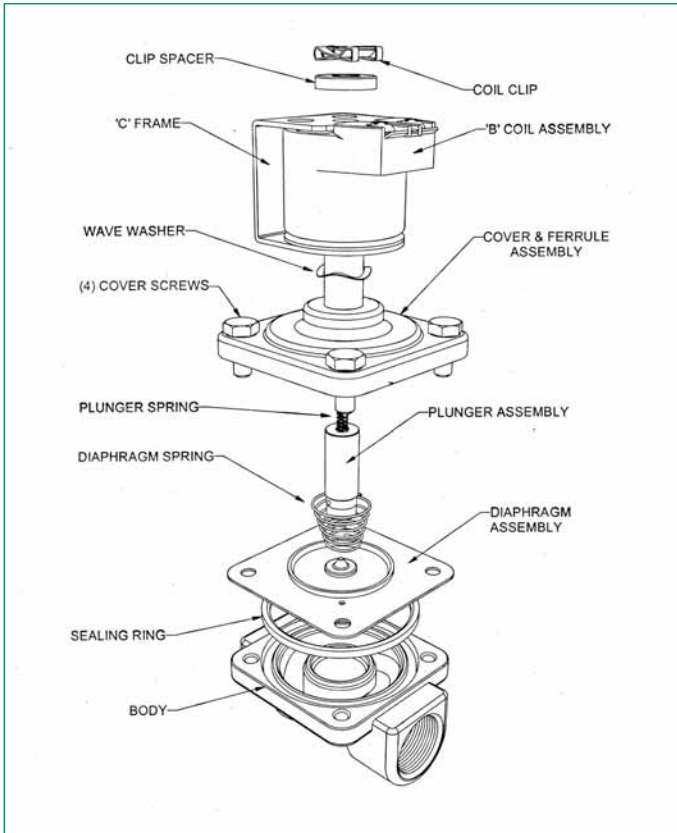
Model	Pipe Size		Pressure		Orifice Size		Flow Factor	
	mm	inch	kPa	psi	mm	inch	Cv	Kv
12QA2	12	1/2	20-1000	3-150	12.7	0.500	3.5	3.01
12BA2	12	1/2	20-1000	3-150	12.7	0.500	3.5	3.01
20BG	20	3/4	20-225	3-36	19.0	0.750	7.7	6.62

#### Repair Kits

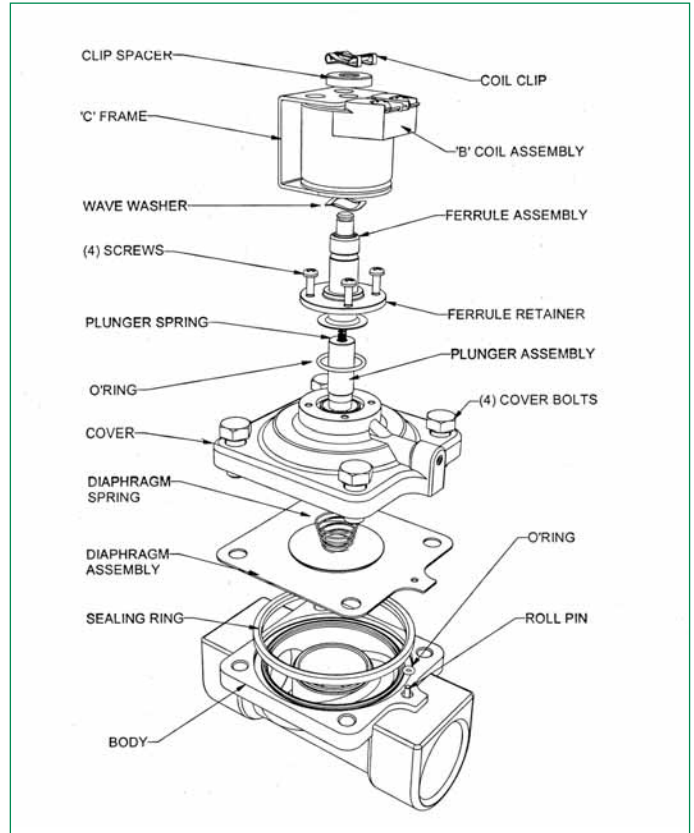
Model	Gas Class	Kits AC	Kits DC
6QLS/10QLS	Class 1	KM3088	KM3088
6QLS/10QLS	Class 3	KM2654	KM2654
6QLS2/10QLS2	Class 1	KM2374	KM2374
6QLS2/10QLS2	Class 3	KM3089	KM3089
6QG	-	KM1975	-
10QG	-	KM1975	-
12BAL	-	KM2038	KM2359
20BAL	-	KM3109	KM2512
12QA2	-	KM1905	KM2499
12BA2	-	KM1626	KM1657
20BG	-	KM2157	KM2545

**Construction**

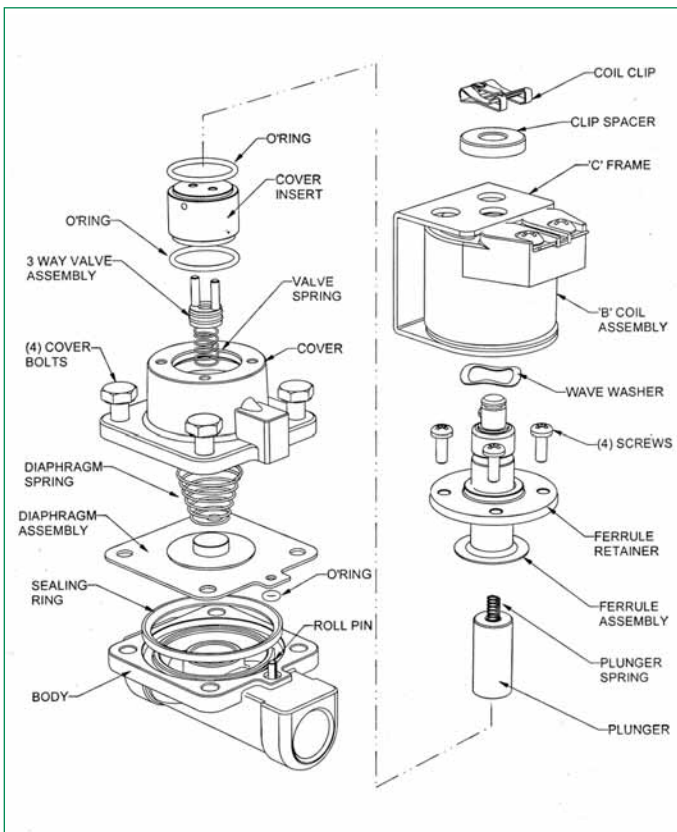
**6, 10, 12, 20BW2 Valves Normally Closed Typical Construction**



**25BW3 and 40BW2 Valves Normally Closed Typical Construction**



**BW2 Valves Normally Open - Typical Construction**



**BWJ2 Series Normally Closed - Typical Construction**

