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Goyen Dust Collector Valves & Cleaning System Components

Presented by - Industry Air Sales Ltd.

Guelph, Ontario (Canada)

519-823-8900 / 888-211-0171

www.industryairsales.com

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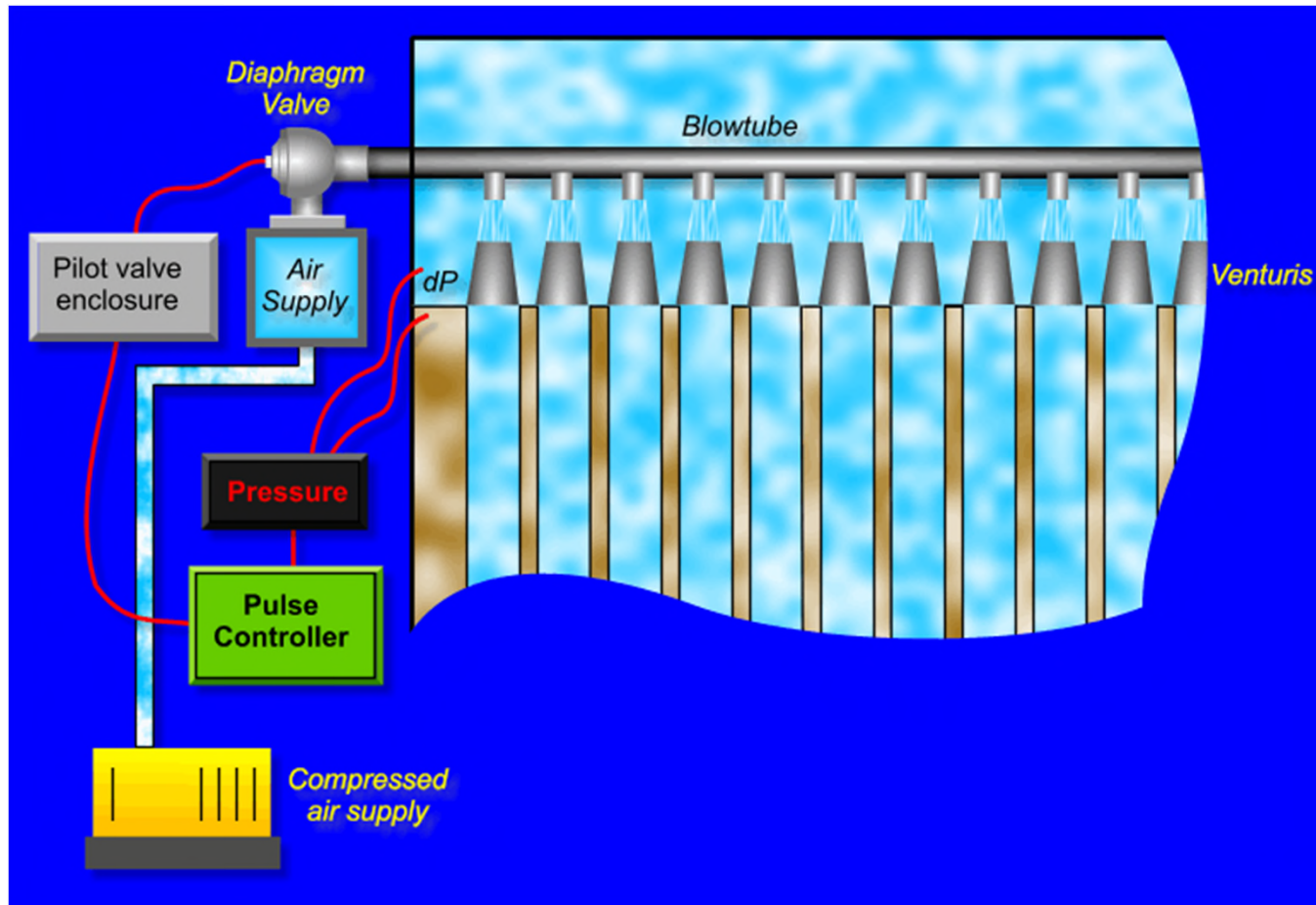
Michael, Gary or Rob -

parts@industryairsales.com





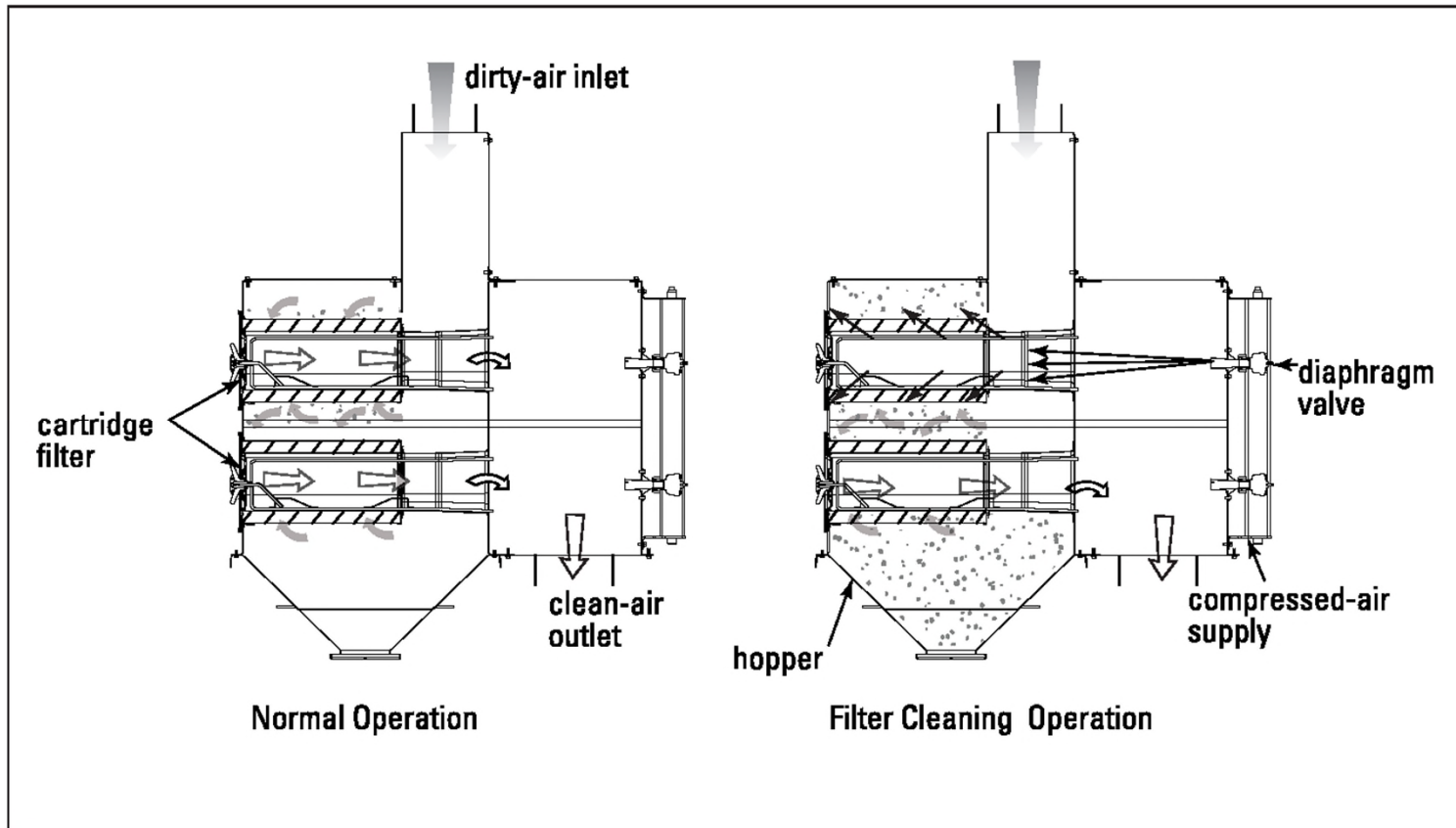
Pulse Cleaning System Components



Baghouse Pulse-Jet Cleaning System Schematic courtesy of Goyen Valve Corp.



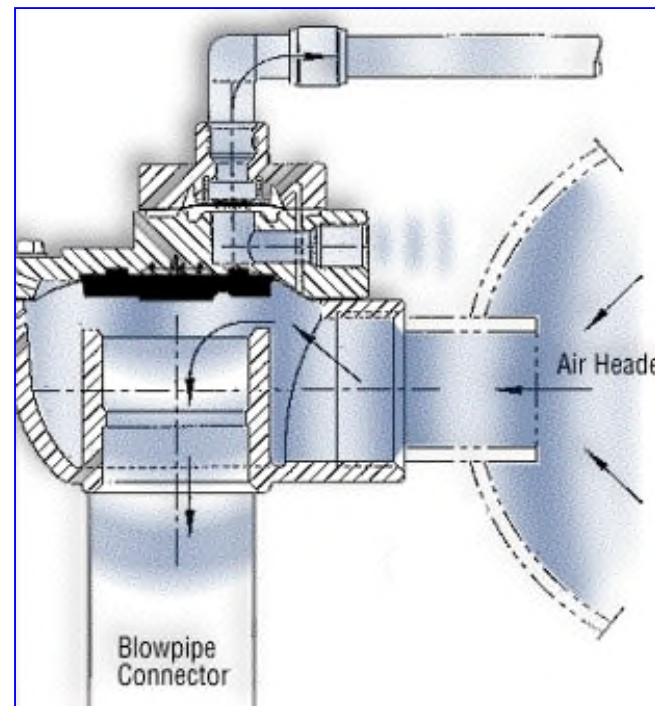
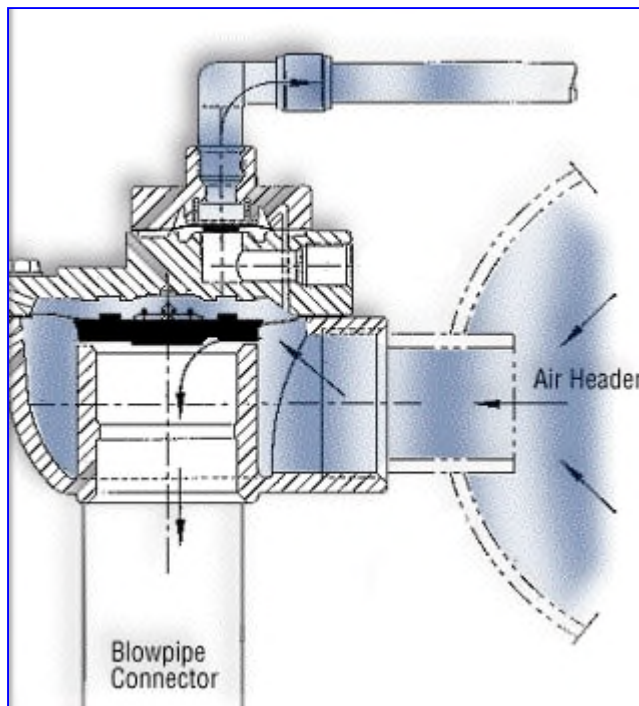
Pulse Cleaning System Components (Horizontal Cartridge Collector)



Horizontal Cartridge Collector Cleaning System Graphic courtesy of Donaldson Filters



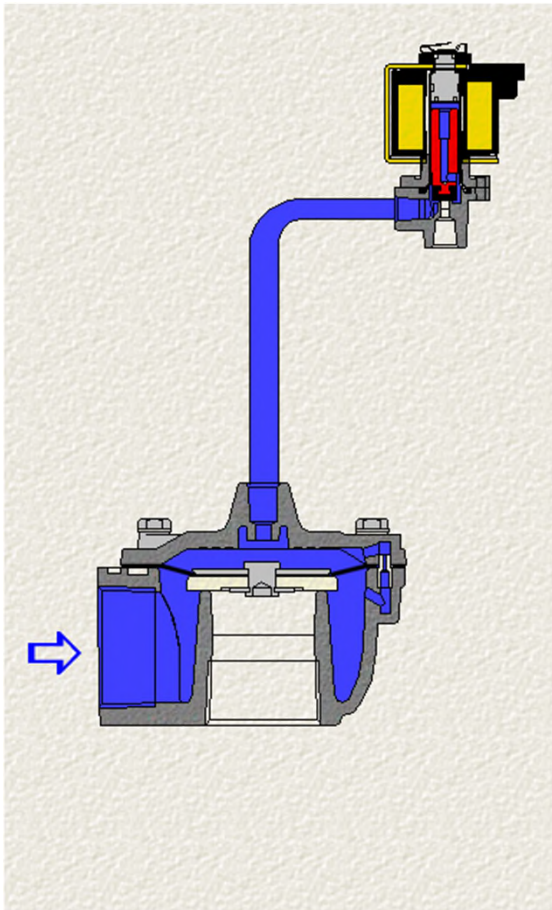
Diaphragm Valve Operation



Graphics courtesy of Goyen Valve Corp.



Operation of a Remote Pilot Valve



Opening Sequence

- Electrical signal
- Solenoid (1) energised
- Armature (2) lifts
- Pressure released through pilot tube (3) and pilot valve.
- Pressure dropped above diaphragm (4).
- Diaphragm lifts.

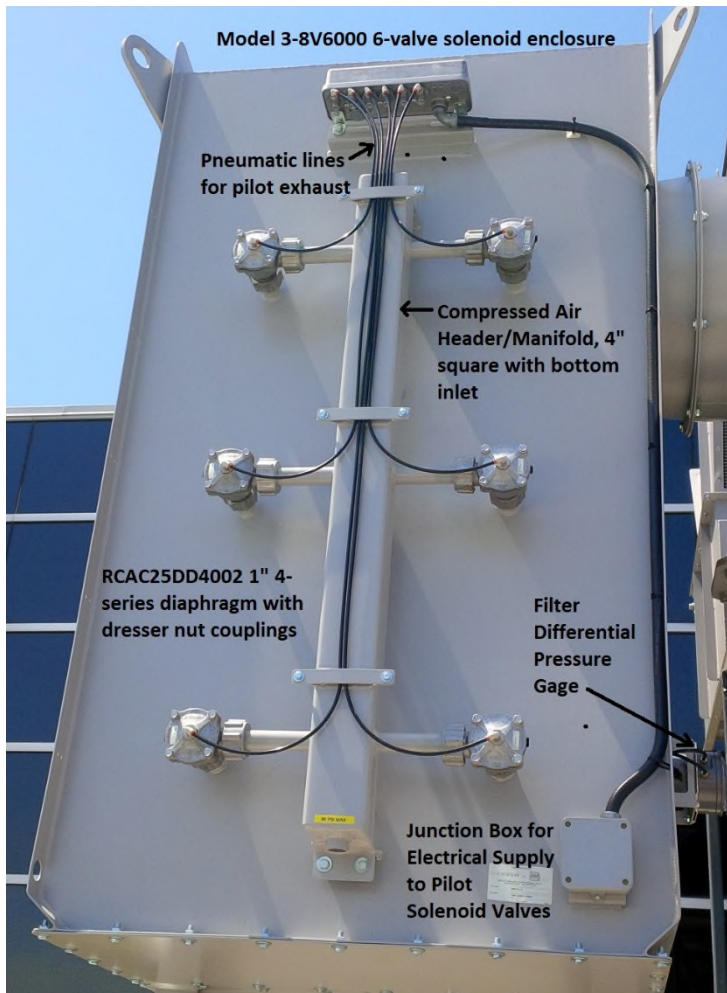
Closing Sequence

- Electrical signal ends
- Solenoid (1) de-energised
- Armature (2) closes.
- Exhaust flow stops.
- Pressure builds above diaphragm through bleed path (5).
- Diaphragm closes

Graphics courtesy of Goyen Valve Corp.



Diaphragm/Solenoid Activation



Dust Collector Pulse-Jet Valve Operating Sequence:

1. Differential pressure (DP) builds across the filter bags/cartridges as dust load increases in the collector.
2. Once DP reaches a pre-set point, the pulse-jet cleaning system is activated to go through a cleaning sequence/cycle, as programmed in the timer board or other controller.
3. The timer board (or other controller) then sends an electrical signal to the pilot solenoid valve(s), causing the coil to energize, thus pulling the valve plunger into the open position allowing the compressed air in the pneumatic line to bleed to atmosphere. (NOTE: The pilot solenoid valve can be **direct-mounted** (mounted directly on top of the diaphragm valve, or it can be **remote-mounted** (mounted in a solenoid enclosure separate from the diaphragm and connected with pneumatic tubing, as shown above.)
4. Bleeding the compressed air line to atmosphere causes an imbalance in air pressure within the diaphragm valve. In other words, the air pressure suddenly drops on the top-side of the diaphragm valve as the pneumatic line is bled to atmosphere.
5. The change in pressure difference within the diaphragm valve causes the compressed air manifold (compressed air tank) to force the diaphragm up from its seat, thus allowing compressed air to bypass the diaphragm and be expelled into the blow-tube. The “pulse” of compressed air then blows the dust off of the filter bags/cartridges.
6. The coil is quickly de-energized which causes the plunger to return to the closed position. Compressed air then bleeds through the diaphragm valve until the point where pressure is equalized on both sides of the diaphragm. Equalization of air pressure inside the diaphragm causes the diaphragm to reseat (return to closed position). The pulse cycle is then completed.



Diaphragm Valve Identification

Steps for Diaphragm Valve Identification:

1. Valve Manufacturer (Goyen, Mecair, etc)
2. Bolt pattern of cover (number of bolts, configuration/shape)
3. Inlet/Outlet Pipe Sizes: Schedule 40 pipe diameters:
 $\frac{3}{4}'' = 1.05''$; $1'' = 1.315''$; $1.5'' = 1.90''$
4. Inlet/Outlet Connections: Threaded (T), Compression Coupling (DD), Manifold Mount (MM or MMR); Flanged (FS)
5. Remote (RCA) or Integral Solenoid Valve (CA)
6. Model Numbers (on older Goyen valves, four-digit part no.)
7. Diaphragm Materials and Cover (Buna versus Viton rubber, etc.)
8. Temperature at the valve
9. Single ($\frac{3}{4}''$ to $1\text{-}1/2''$) or Double Diaphragm ($1\text{-}1/2''$ plus)

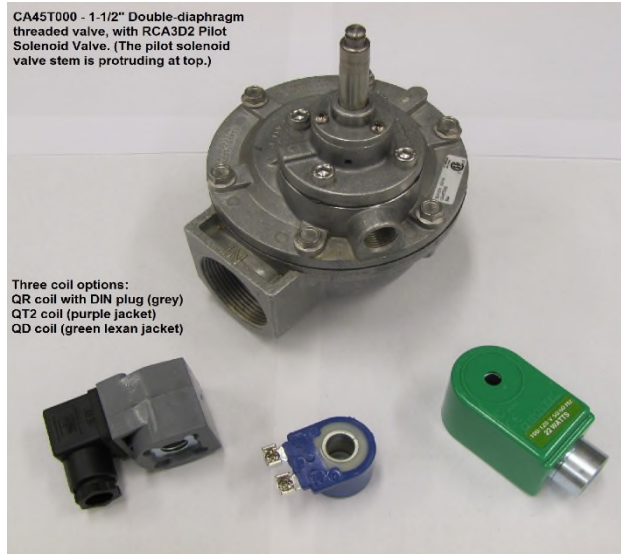


Direct Controlled (CA) vs Remote Controlled (RCA)

The original series valves, $\frac{3}{4}$ " to 3" size, were designed with two different valve tops. One valve top, "CA" style, had an integral pilot solenoid on top. The solenoid could accept any of the standard coils. (See picture at centre.) The other valve style, "RCA" style, was "Remote Control Actuated" and was piped to a remoted-mounted pilot solenoid, usually the model RCA3D or RCA5D2.

CA45T000 1-1/2" Double-Diaphragm with Integral Pilot

CA45T000 - 1-1/2" Double-diaphragm threaded valve, with RCA3D2 Pilot Solenoid Valve. (The pilot solenoid valve stem is protruding at top.)



Three coil options:
QR coil with DIN plug (grey)
QT2 coil (purple jacket)
QD coil (green lexan jacket)

Integral Piloted Valves can be fitted with these coils:
QR (DIN plug), QT2, QD or QF



RCA45DD 1-1/2" Double-Diaphragm with dresser-nut couplings. The remote pilot solenoid is typically the RCA3D solenoid valve, mounted in a multi-valve enclosure.



Direct Controlled (CA) vs Remote Controlled (RCA)

Direct Piloted (CA45T) vs Remote Piloted (RCA45T) Dust Collector Valve

RCA3D Solenoid Valve with QR-coil with DIN plug



RCA3D Solenoid Valve with plastic shroud, uses K0383 repair kit

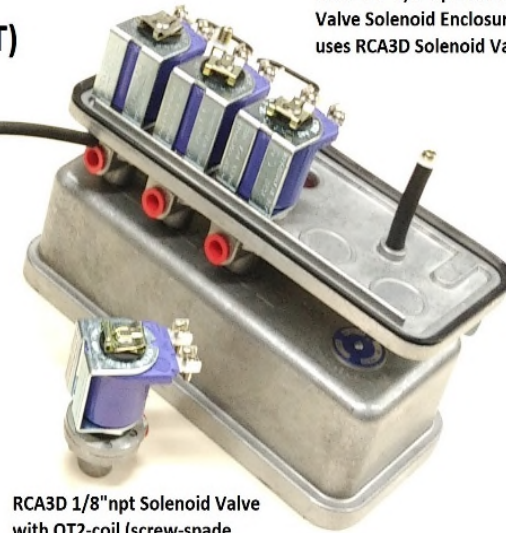


CA45T "Direct Pilot" Diaphragm Valve (shown with QD-coil on top)



RCA45T "Remote Pilot" Diaphragm Valve with 1/8" npt Pilot Connection

RCA3-5V 1/8" npt Multi-Valve Solenoid Enclosure, uses RCA3D Solenoid Valve



RCA3D 1/8" npt Solenoid Valve with QT2-coil (screw-spade connectors), typically used in multi-valve enclosures



Threaded Diaphragm Valves

(Current T & T4 Series),
3/4-inch to 3-inch



20T4 3/4"
4-series



K2034
Repair Kit
(2.75" x
2.75" with 4
bolt holes)



25T4 1"
4-series



K2546
Repair Kit
(3.63" x
3.63" with 4
bolt holes)



35T
1-1/2"
Single



K3500
Repair Kit
(4.25"
Diameter)



45T
1-1/2"
Double



K4502
Repair Kit
(4.88" Dia. &
2.5" Dia.)



50T
2" Double



K5005
3-Bleed
Repair Kit
(7.30" Dia. &
2.5" Dia.)



Dresser-Nut Diaphragm Valves (DD & DD4 Series), Effective 2012



20DD4
3/4" 4-Series



K2034
Repair Kit
(2.75" x 2.75"
with 4 bolt holes)



25DD4
1" 4-Series



K2546
Repair Kit
(3.63" x 3.63"
with 4 bolt holes)



45DD
1-1/2"



K4502
Repair Kit
(4.88" dia & 2.5" dia)



Flanged Diaphragm Valves (FS & FS4 Series), Effective 2012



20FS4
3/4"



K2034
Repair Kit
(2.75" x 2.75"
with 4 bolt holes)



25FS4
1"



K2546
Repair Kit
(3.63" x 3.63"
with 4 bolt holes)



45FS
1-1/2" Double



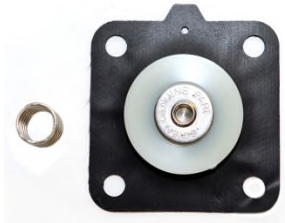
K4502
Repair Kit
(4.88" dia. x 2.50" dia.)



Immersion Diaphragm Valves (MM-Series & MMR-Series)



25MM
1" (Flat-Tank)



K2501
Repair Kit
(3.25" x 3.25"
with 4 bolt holes)



40MM
1-1/2" Flat-Tank



K4000
Repair Kit
(4.25" Dia. & 2.5" Dia.)

Immersion Diaphragm Valves
Come in two arrangements:
MM-Series – Fit Flat Tanks
MMR-Series – Fit Round
Tanks

MM-Series Sizes Include:

MM-25 (1")

MM-40 (1-1/2")

MM76 (3")

MMR-Series Sizes Include:

40MMR

62MR

76MR



Discontinued (Obsolete) Diaphragm Valves

There are many diaphragm valves that have been discontinued by Goyen years ago but are still commonly found on jet-pulse dust collectors from major OEM's. These are just the most prevalent obsolete threaded valves and their readily available repair kits:



RCA20T (3/4")
(Pentagon, 5-bolt)
RCA20DD (3/4")



K2000 (Buna)
K2007 (Viton)



RCA25T (1")
(3.25" x 3.25")
RCA25DD (1")



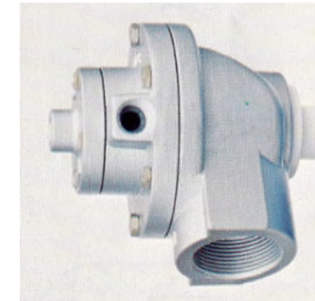
K2501 (Buna)
K2503 (Viton)



RCA32T (1-1/2")
(3.25" x 3.25")



K2500 (Buna)
K2503 (Viton)



RCA40T (1-1/2")
(4.25" dia.)



K4000 (Buna)
K4007 (Viton)



Millenium (3-Series) Diaphragm Valves (Discontinued 2012)



The **Millenium (3-Series)** Diaphragm Valves were manufactured 2000-2012. The distinction from other valve series is that they had no “bolts” thru the valve top/cover. Kits are still available for this valve series.

VALVE MODEL (SIZE)

20T3, 20DD3, 20FS3 (3/4")
25T3, 25DD3, 25FS3 (1")

REPAIR KITS

MILLENIUM ¾" KITS

3.22" (82mm) Dia.

K2016 (Buna)

K2017 (Viton)



MILLENIUM 1" KITS

4.09" (104mm) Dia.

K2529 (Buna)

K2530 (Viton)

K2549 (Springless)

Pilot Solenoid Options for the Millenium Diaphragms:

RCA3DS is the integral (screw-on) solenoid valve. It is available with all the usual coil options and voltages. (See pic far left)

For remote piloting, the Millenium diaphragms can be connected to the RCA3D in any 1/8" port enclosure.



RCA3D (1/8-inch, 3mm) Pilot Solenoid Valve

**RCA3D0-xxx,
1/8"npt Valve
with QT2 Coil**



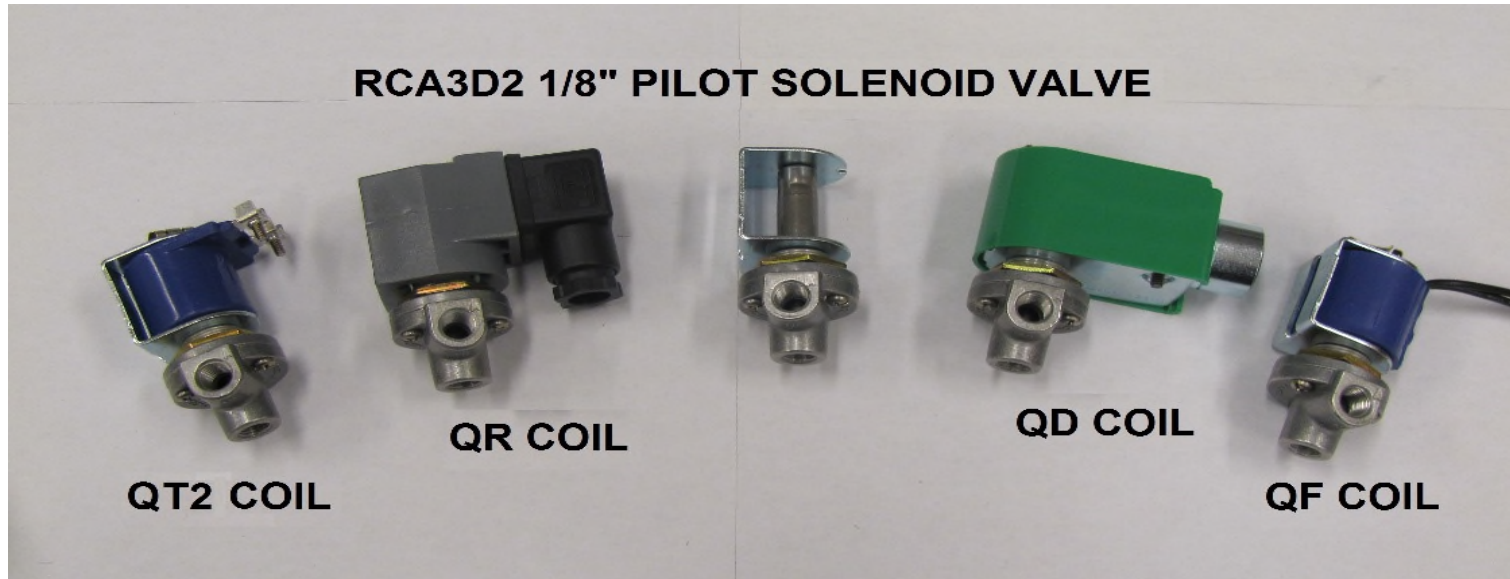
**RCA3D2 Repair Kits:
K0380 (Buna)
K0384 (Viton)**



**The RCA3D is the pilot
solenoid used in the
multi-valve NEMA4 rated
solenoid enclosures:
3-5V (3 to 5 valves)
3-8V (4 to 8 valves)
3-12V (5 to 12 valves)
These multi-valve
enclosures are UL and
CSA listed and labeled.**



RCA3D Pilot Solenoid Valve Coils (formerly RCA3D2)



RCA3D2 COIL TYPES:	RCA3D2 COIL VOLTAGE OPTIONS:	IP CLASS
QT2 = Purple with screw spades (3D2)	120VAC, 200/240VAC, 24VAC; 12VDC, 24VDC	N/A
QF = Flying Lead	120VAC, 200/240VAC, 24VAC; 12VDC, 24VDC	IP64
QR = DIN Connector, NEMA4	120VAC, 200/240VAC, 24VAC; 12VDC, 24VDC	IP64
QD = QT Coil, NEMA1 cover, conduit entry	120VAC, 200/240VAC, 24VAC; 12VDC, 24VDC	IP31



Pilot Solenoid Valves

For 3-Series (Millenium) & Older Valves



RCA5D2:
 1/4"npt
 Solenoid
 Valve was
 used for
 many

years, particularly on the 1-1/2" and larger diaphragm valves. It is available also in the **5-6V** multi-valve enclosure. Parts include the **K0580** repair kit and B2 (purple) coil.
 TRICK: How to tell the RCA5D2 from the RCA3D – the screw spades protrude on the QT2 coil, not on B2 coil.

RCA3DS:
 1/8"npt
 solenoid
 valve is
 used strict-
 ly on the
 obsolete
**Millenium
 (3-series)**



diaphragm valves. It uses the Q-series coils and the **K0380** repair kit (**K0384** viton high-temp kit). The RCA3DS is basically an "RCA3D valve with a plastic shroud".

**RCA3DS
 3-Series
 (QR coil)**

**RCA3DM
 4-Series
 (QD coil)**



TRICK: The RCA3DS and RDA3DM valves are almost identical. The only difference is the RCA3DM valve has a groove with an o-ring on the bottom; this is needed to seal the valve onto the 4-series vlv.



Pilot Solenoid Valves

(For New 4-Series Diaphragm Valves)

RCA3DM:

1/8"npt
Solenoid
Valve is
used
speci-



fically on the new **4-series diaphragm valves**. The valve uses the standard Q-series coils (the picture above shows the QR coil), and **K0380** repair kit. (The RCA3DM has an o-ring on the bottom to seal onto the 4-series diaphragm valve top.)

RCAC25DD4
compression-
coupling diaphragm;
RCA3DM pilot
solenoid with QD
coil.
(bottom left)



RCAC20T4 4-
series threaded
diaphragm with
RCA3PV pilot
valve
(bottom right)



RCA3PV:

This valve fits the new 4-series diaphragms only! This is a lower-cost, CE listed valve. It uses the new SB4 coil. NO repair kit is available.



Multi-Valve Pilot Solenoid Valve Enclosures

GOYEN VALVE offers a number of multi-valve solenoid enclosures, three 1/8" valve enclosures with NEMA4 rating, one 1/4" valve enclosure, and two NEMA7/9 dual-rated valve enclosures – one with CSA/UL certification and one with ATEX certification:



NEMA4 rated enclosures include:
3-5V
3-8V (with heater option)
3-12V
This enclosure uses RCA3D2 1/8" port solenoid valves.



1/4" Solenoid Multi-Valve Enclosure, 5-6V
This enclosure uses RCA5D2 pilot valve and is only used for replacement on older equipment.



Explosion-Rated Multi-Valve Enclosure with CSA/UL or ATEX Certification, 3-6VFD;
Uses RCA3D2 pilot valve, **K0383** repair kit, Q-series coils.



Diaphragm Valve Repair Kit Table

SIZE	DIAPHRAGM VALVE MODEL(S):	GOYEN DIAPHRAGM VALVE REPAIR KITS		
		STANDARD TEMP. RANGE (-40C to 82C)	LOW TEMP. (-60C to 82C)	HIGH TEMP. RANGE (VITON) (-29C to 232C)
3/8" Ø	SINGLE-DIAPHRAGM: RCA10T; RCA6T	K1001		K1002
3/4" Ø	4-SERIES: RCAC20T4; RCAC20DD4; RCAC20FS4; RCAC20ST4	K2034	N/A	K2033
	MILLENIUM: RCAC20T3; RCAC20DD3; RCAC20FS3	K2016	N/A	K2017
	5-BOLT: (R)CA20T; (R)CA20DD;	K2000 (M1204B)	N/A	K2007 (M2082B)
	5-BOLT: (R)CA20M	K2003	N/A	N/A
1" Ø	4-SERIES: RCAC25T4; RCAC25DD4; RCAC25FS4	K2546	N/A	K2551
	IMMERSION VALVE: RCA25MM	K2501 (M1183B)	K2522	K2503 (M1887)
	MILLENIUM: RCAC25T3; RCAC25DD3; RCAC25FS3	K2529	N/A	K2530
	4-BOLT: (R)CA25T; (R)CA25DD; (R)CA25FS	K2501 (M1183B)	K2522	K2503 (M1887)
1-1/2" Ø	DOUBLE-DIAPHRAGM: (R)CA45T; (R)CA45DD; (R)CA45FS;	K4502 (M2162)	K4522	K4503 (M2163)
	SINGLE-DIAPHRAGM: (R)CA35T	K3500 (M1581)	K3502	K3501
	SINGLE-DIAPHRAGM, 4-BOLT: (R)CA32T	K2500 (M1183)	K2522	K2503 (M1887)
	DOUBLE-DIAPHRAGM, 6-BOLT: (R)CA40T	K4000 (M1182)	N/A	K4007 (M1156)
2" Ø	DOUBLE-DIAPHRAGM: (R)CA50T	K5004 (M765A)		K5000 (M1157)
2-1/2" Ø	DOUBLE-DIAPHRAGM: (R)CA62T	K5005		K5000 (M1157)
3" Ø	DOUBLE-DIAPHRAGM: (R)CA76T	K7600		K7601

TABLE NOTES:

- 1) Valves in RED type are discontinued. Only repair kits are available for these valves.
- 2) Kits include diaphragm(s) and spring(s), where required.
- 3) Low temperature kits are only available for a few valves, as noted.



Solenoid Valve Repair Kit Table

GOYEN SOLENOID VALVE MODEL(S):	SOLENOID VALVE REPAIR KITS		COIL
	STANDARD TEMP. (-40C to 82C)	HIGH TEMP. (-29C to 232C)	
RCA3DM (4-SERIES SOLENOID VALVE)	K0380 (M1131B)	K0384 (M1167B)	QR or QD
RCA3PV (4-SERIES SOLENOID VALVE)	NONE	NONE	SB4 (IP65)
3D2 (RCA3D2), 1/8" PILOT SOLENOID (direct mount or remote mount) Fits Enclosures: 3-12V, 3-8V & 3-5V	K0380 (M1131B)	K0384 (M1167B)	QT2, QR QD or QF
RCA5D2, 1/4" PILOT SOLENOID (5-6V Encl.) CA40T1 (single diaphragm)	K0580 (AC) (M1141B) M1160 (DC)	M1168	B2
3-6VFP, 3-6VDP (Expl. Proof Encl.)	K0383		QT2, QR
RCA3DS (MILLENNIUM SERIES SOLENOID)	K0380 (M1131B)	K0384 (M1167B)	QR or QD
CA-32 (SH)	K0389 (M1197)	N/A	
CA-40-TH2	K0386	N/A	
CA-TB	M1150	N/A	
RCA5V3 - RCA5V5 (Old Style Explosion Enclosure)	M735 (AC) M769 (DC)	N/A N/A	B2 B2
CAC-45 Conversion Kit	K0381	N/A	
CAC45 Converted	K0390	N/A	
CATK (CA40TK)	M1177	N/A	
RCA25/32TAO	M1637	N/A	