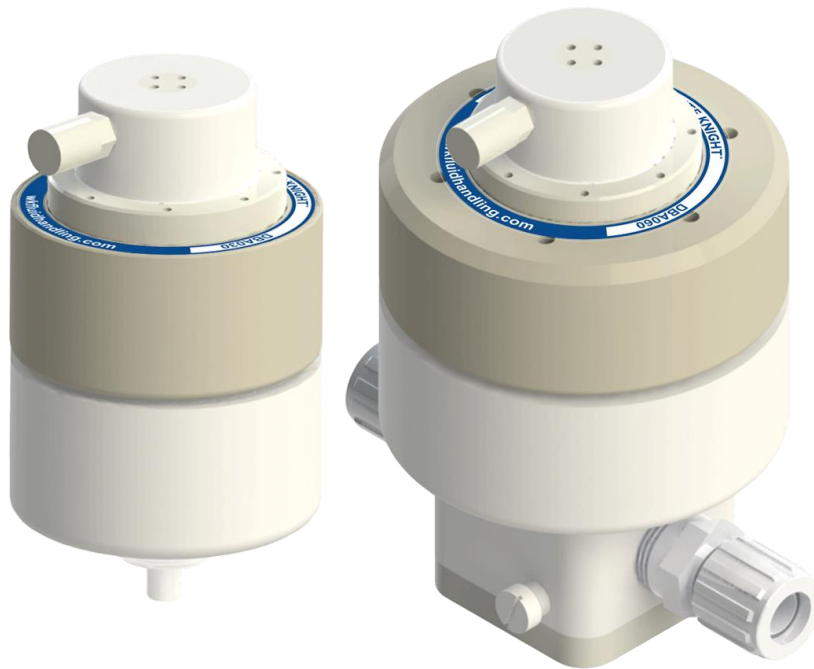


DB Series Pulsation Dampeners

Top Mount and Inline versions available in all sizes



Manuals available online at: wkfluidhandling.com/owners-manuals

Manual Part #18200-LM-0031

Product Line



DBA030-I030



DBH030-I030



DBU030-I030



DBA060-I060



DBH060-I060



DBU060-I060



DBA140-I140



DBH140-I140



DBA030-T030



DBH030-T030



DBU030-T030



DBA060-T060



DBH060-T060



DBU060-T060



DBA140-T140



DBH140-T140



DBU140-T140

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1 Introduction

Dear valued customer,

Thank you for purchasing a White Knight pulsation dampener.

Our dedicated team designs products to meet your exacting specifications with the highest commitment to quality.

White Knight provides the highest quality fluid handling products through controlled, consistent in-house engineering and manufacturing. Our safe, reliable products offer superior performance, optimized efficiency, and simplified maintenance. We continue to lead the industry with new technologies and products.

Our patented designs offer a variety of size and material options to meet stringent requirements of high-pressure chemical delivery systems; high-temperature re-circulation processes; chemical reclaim and bulk transport applications; as well as slurry systems.

White Knight has received many prestigious awards for innovation and manufacturing programs. We rigorously manage our quality assurance processes to ensure consistency and reliability. Our quality controls include strict cleanliness procedures and consistent manufacturing processes. For example, product assembly and testing are done in a temperature and humidity-controlled cleanroom.

Please peruse this manual before installing your White Knight product. It details installation requirements and setup instructions, and provides additional information and accessories to enhance the product's functionality.

Our team has gone to great lengths to ensure our products serve your needs and meet your requirements.

Further, we provide the highest quality products at the best value, and we back them up with excellent warranties and world class support.

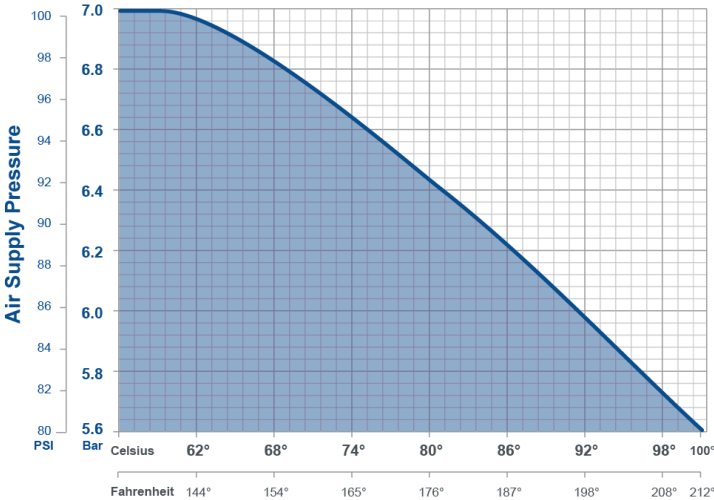
Sincerely,

Brian Callahan, President
White Knight Fluid Handling

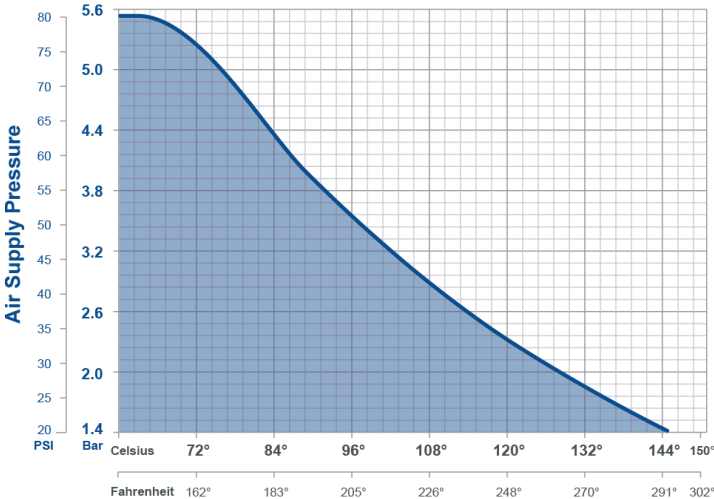
2 Product Specifications

2.1 Air Supply/Fluid Temperature Limitations

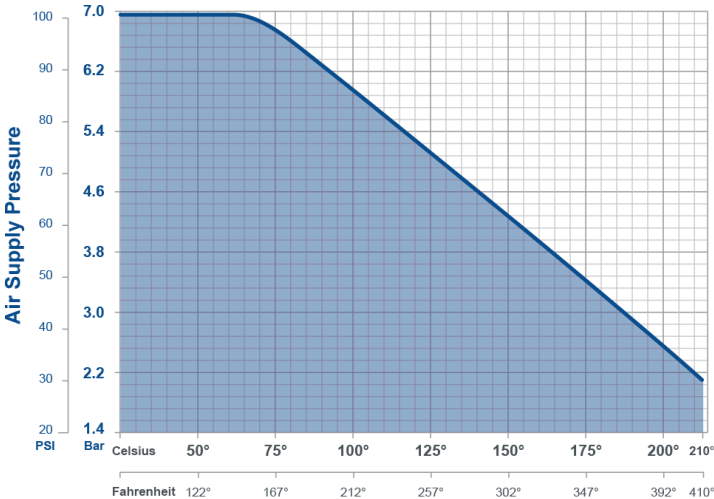
A Series Dampeners



H Series Dampeners



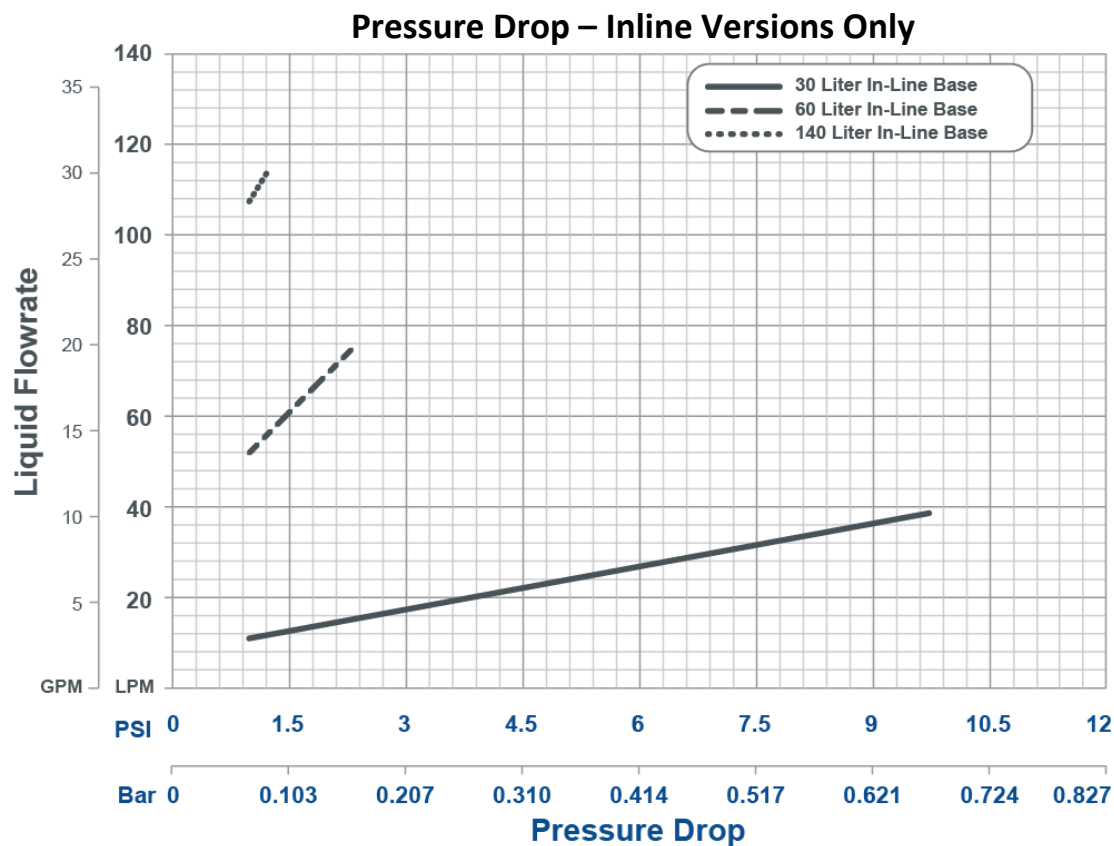
U Series Dampeners



2.2 Product Specifications

Model	Max Temperature	Max Pressure	Cv – Inline Models	Fluid Path Material	Air Consumption SCFM (max/min)*
DBA030	100°C	100 PSI	3	PTFE/PFA	3.5/0.2
DBH030	145°C	80 PSI	3	PTFE/PFA	3.5/0.2
DBU030	210°C	100 PSI	3	PTFE/PFA	3.5/0.2
DBA060	100°C	100 PSI	14	PTFE/PFA	4.0/0.2
DBH060	145°C	80 PSI	14	PTFE/PFA	4.0/0.2
DBU060	210°C	100 PSI	14	PTFE/PFA	4.0/0.2
DBA140	100°C	100 PSI	28	PTFE/PFA	5.62/0.57
DBH140	145°C	80 PSI	28	PTFE/PFA	5.62/0.57
DBU140	210°C	100 PSI	28	PTFE/PFA	5.62/0.57

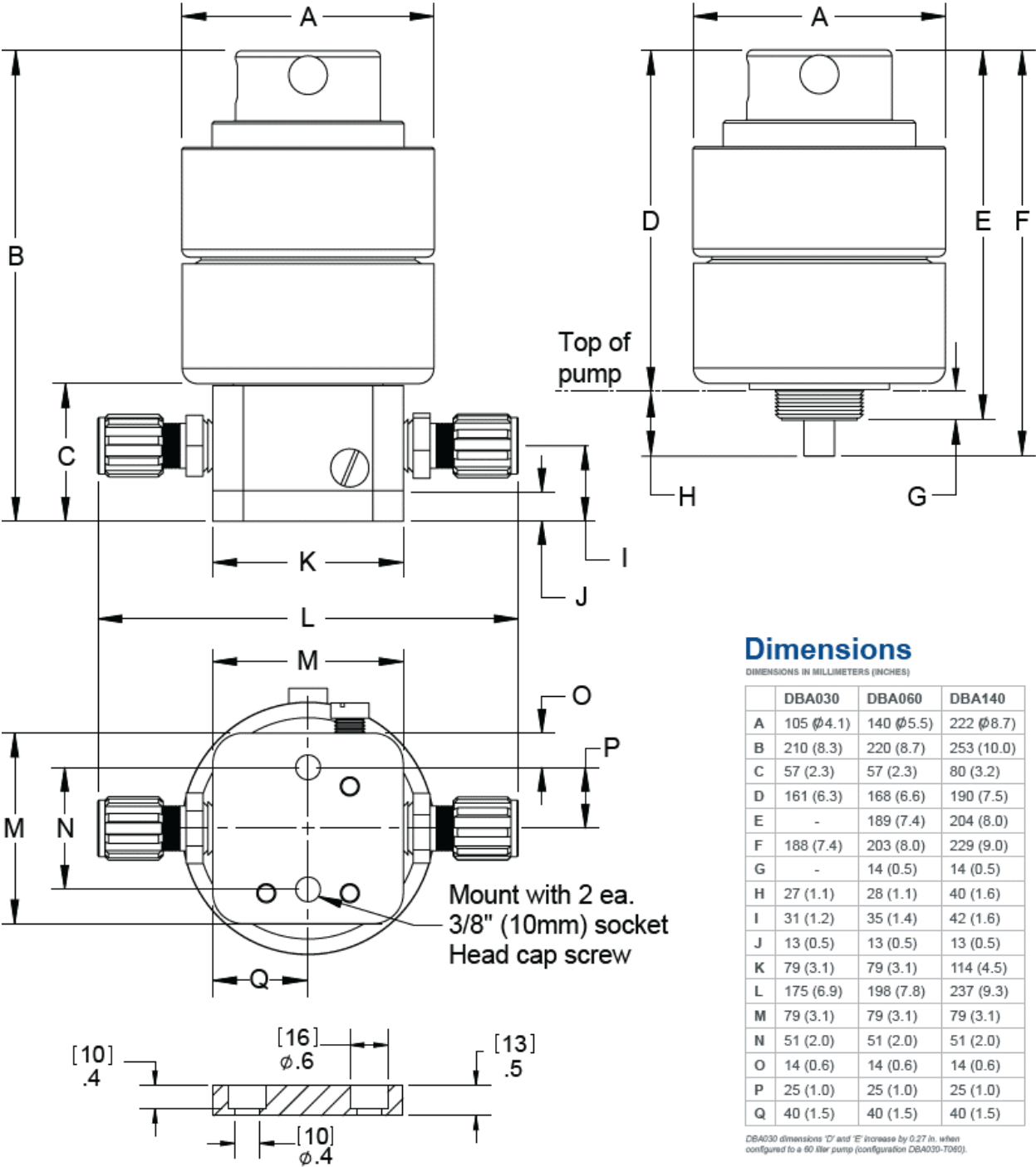
*Minimum value represents pump operation of same size pump, operating at 20 PSI



2.3 Dimensional

A Series Dimensional

[MM] INCHES



Dimensions

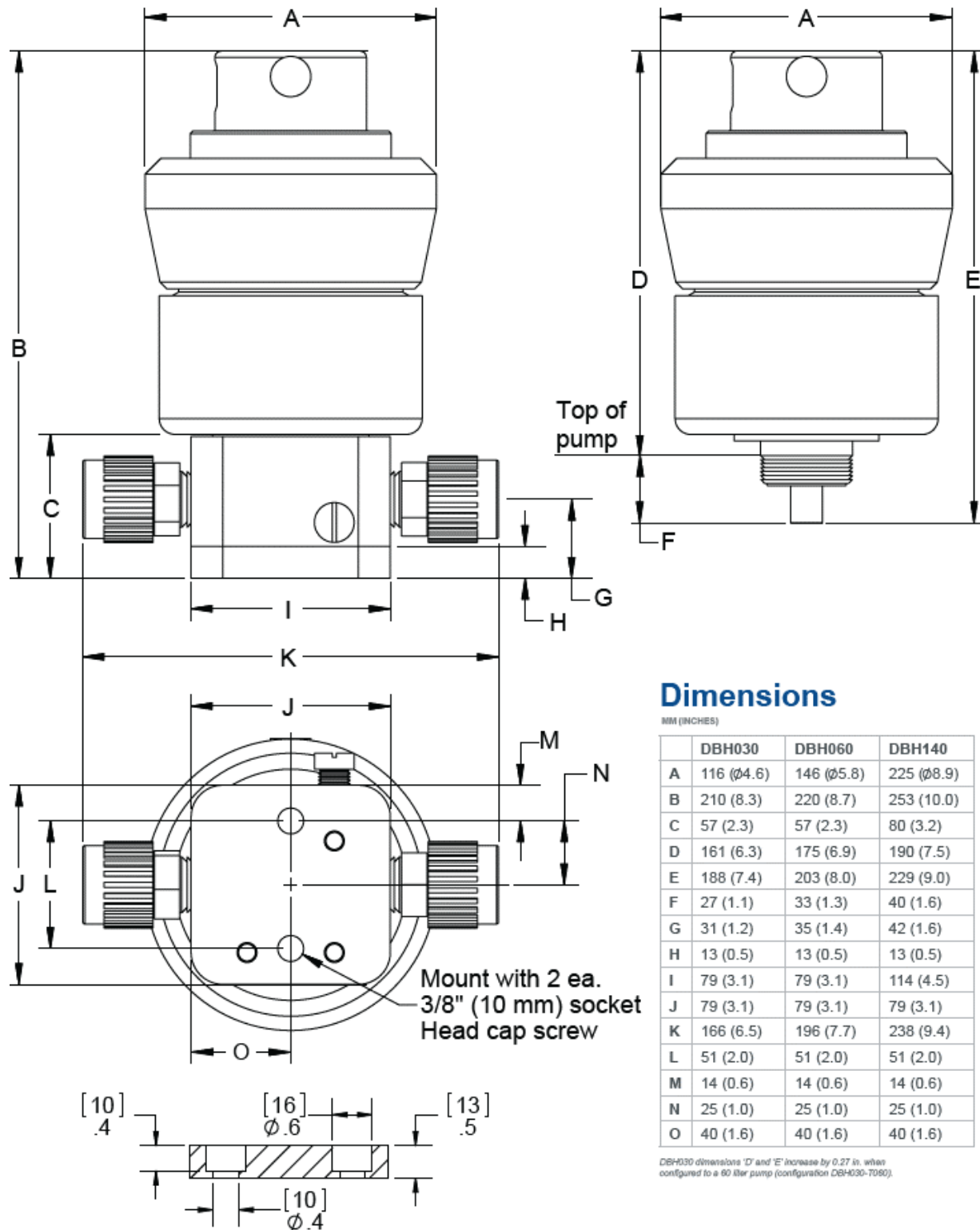
DIMENSIONS IN MILLIMETERS (INCHES)

	DBA030	DBA060	DBA140
A	105 (4.1)	140 (5.5)	222 (8.7)
B	210 (8.3)	220 (8.7)	253 (10.0)
C	57 (2.3)	57 (2.3)	80 (3.2)
D	161 (6.3)	168 (6.6)	190 (7.5)
E	-	189 (7.4)	204 (8.0)
F	188 (7.4)	203 (8.0)	229 (9.0)
G	-	14 (0.5)	14 (0.5)
H	27 (1.1)	28 (1.1)	40 (1.6)
I	31 (1.2)	35 (1.4)	42 (1.6)
J	13 (0.5)	13 (0.5)	13 (0.5)
K	79 (3.1)	79 (3.1)	114 (4.5)
L	175 (6.9)	198 (7.8)	237 (9.3)
M	79 (3.1)	79 (3.1)	79 (3.1)
N	51 (2.0)	51 (2.0)	51 (2.0)
O	14 (0.6)	14 (0.6)	14 (0.6)
P	25 (1.0)	25 (1.0)	25 (1.0)
Q	40 (1.5)	40 (1.5)	40 (1.5)

DBA030 dimensions 'D' and 'E' increase by 0.27 in. when configured to a 60 liter pump (configuration DBA030-T060).

H Series Dimensional

[MM] INCHES



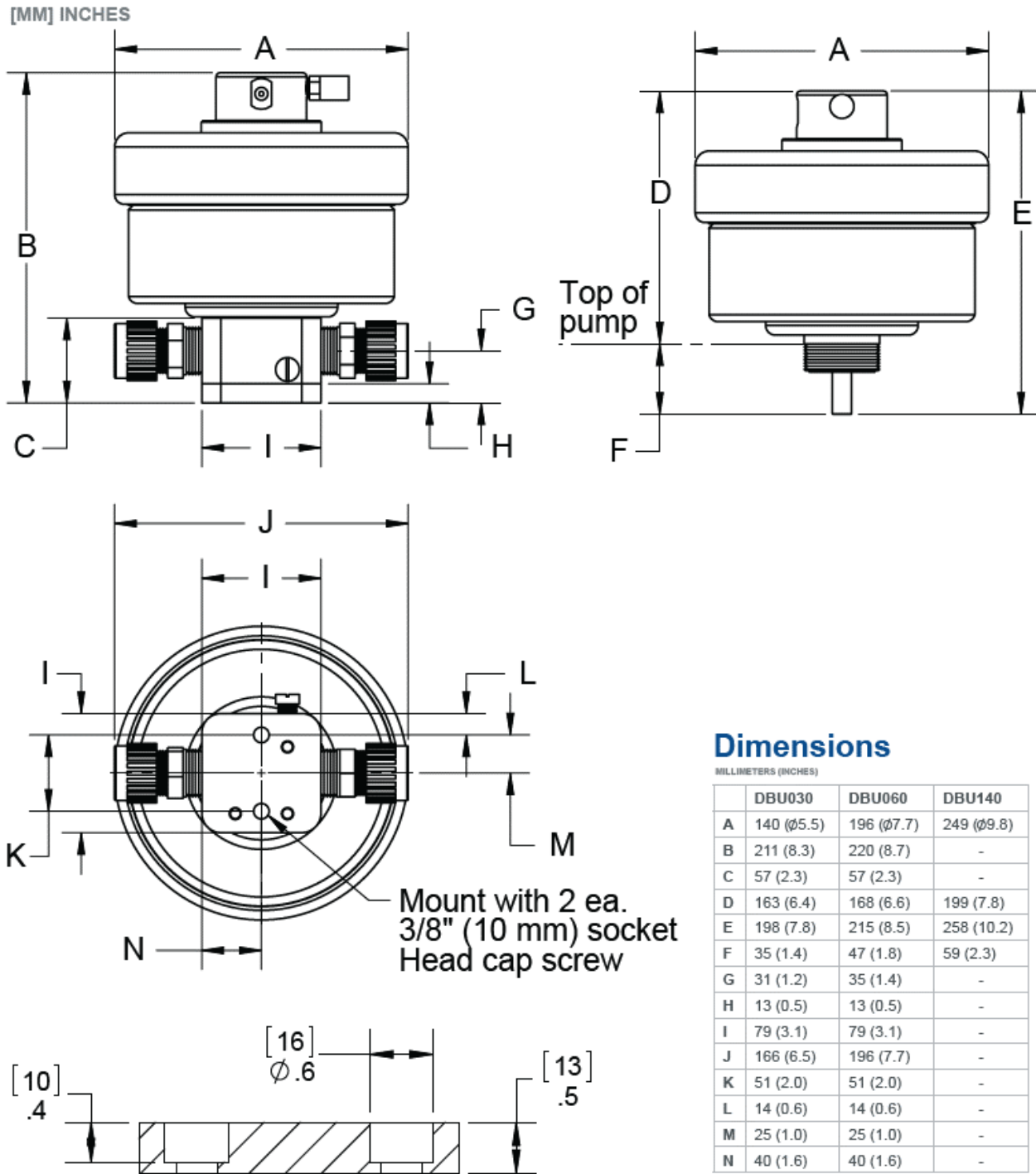
Dimensions

MM (INCHES)

	DBH030	DBH060	DBH140
A	116 ($\phi 4.6$)	146 ($\phi 5.8$)	225 ($\phi 8.9$)
B	210 (8.3)	220 (8.7)	253 (10.0)
C	57 (2.3)	57 (2.3)	80 (3.2)
D	161 (6.3)	175 (6.9)	190 (7.5)
E	188 (7.4)	203 (8.0)	229 (9.0)
F	27 (1.1)	33 (1.3)	40 (1.6)
G	31 (1.2)	35 (1.4)	42 (1.6)
H	13 (0.5)	13 (0.5)	13 (0.5)
I	79 (3.1)	79 (3.1)	114 (4.5)
J	79 (3.1)	79 (3.1)	79 (3.1)
K	166 (6.5)	196 (7.7)	238 (9.4)
L	51 (2.0)	51 (2.0)	51 (2.0)
M	14 (0.6)	14 (0.6)	14 (0.6)
N	25 (1.0)	25 (1.0)	25 (1.0)
O	40 (1.6)	40 (1.6)	40 (1.6)

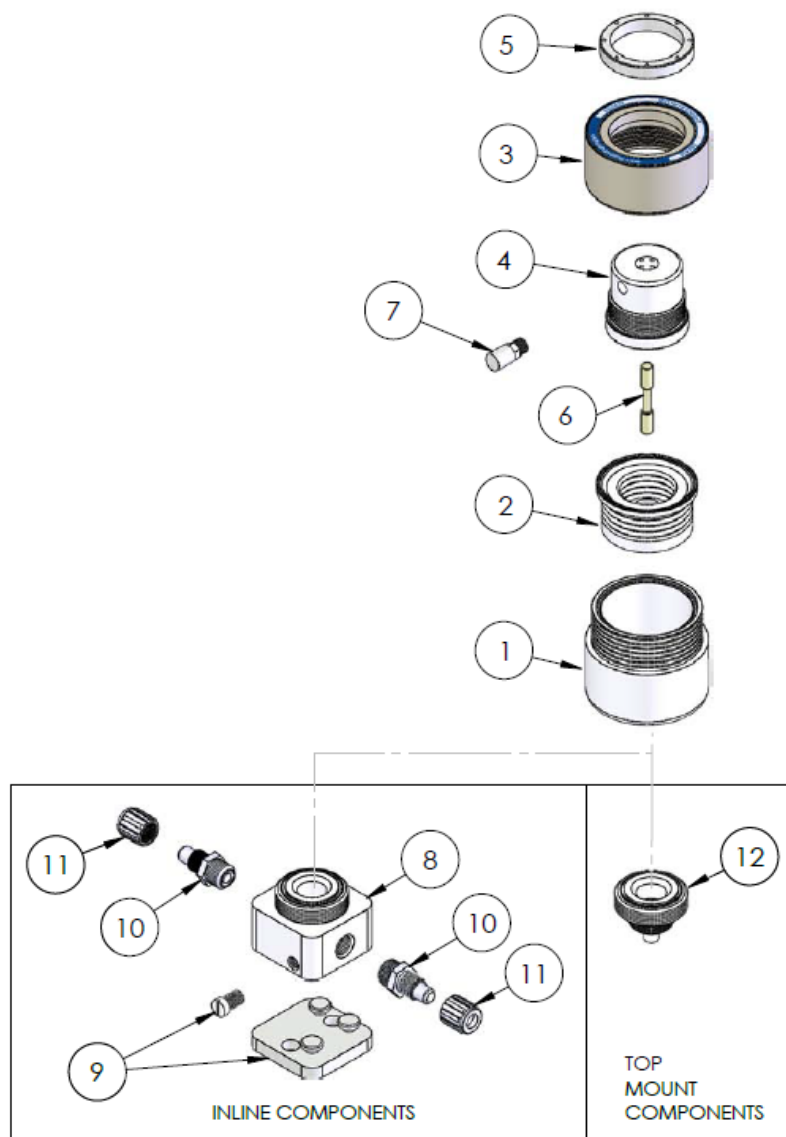
DBH030 dimensions 'D' and 'E' increase by 0.27 in. when configured to a 60 liter pump (configuration DBH030-7060).

U Series Dimensional



2.4 Exploded Views

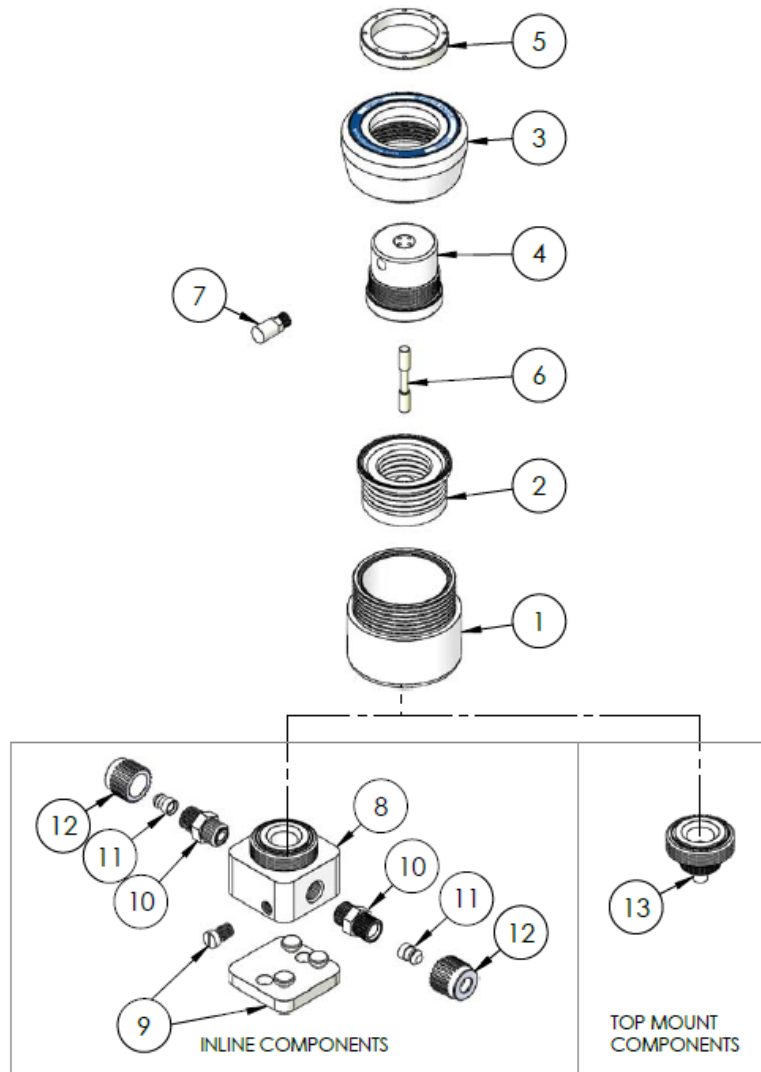
DBA030 Exploded View



DBA030 Bill of Materials			
Item	Part	Description	Qty
1	9400-TE-0001	Body	1
2	14300-MP-0032	Bellows Assembly	1
3	2127-EP-0036	Head	1
4	14860-XX-0001	Pd Air Motor Assembly	1
5	9300-NP-0001	Ring, Retaining	1
6	6560-CE-0005	Spool	1
7	6110-PP-0004	Muffler	1
8	9100-TE-0008	Inline Base	1
9	14200-NP-0009	Baseplate Assembly	1
10	7200-PF-0003	Body, Flaretek®, 1/2"	2
11	7210-PF-0003	Nut, Flaretek®, 1/2"	2
12	9200-TE-0008	Adapter, Top Mount, 030	1

Fittings (Type, Size, Option)		Assemblies	Body Inlet Only (Nut not included)
Flaretek Compatible	1/4 in. F04	14510-PF-0016	7200-PF-0001
	3/8 in. F06	14510-PF-0001	7200-PF-0002
	1/2 in. F08	14510-PF-0002	7200-PF-0003
	3/4 in. F12	14510-PF-0003	7200-PF-0004
Tube Out	3/8 in. T06	7120-PF-0001	
	1/2 in. T08	7120-PF-0002	
	3/4 in. T12	7120-PF-0003	
Weldable	1/2 in. W08	7300-PF-0001	
	3/4 in. W12	7300-PF-0002	
Pillar S-300	1/4 in. P04	14530-PF-0025	7400-TE-0031
	3/8 in. P06	14530-PF-0012	7400-TE-0023
	1/2 in. P08	14530-PF-0001	7400-TE-0001
	3/4 in. P12	14530-PF-0002	7400-TE-0002
FNPT	1/4 in. N04	7100-TE-0001	
	3/8 in. N06	7100-TE-0002	
	1/2 in. N08	7100-TE-0003	
	3/4 in. N12	7100-TE-0007	
Synchro-Flare	3/8 in. S06	14520-TE-0009	7010-TE-0001
	1/2 in. S08	14520-TE-0001	7010-TE-0003
	3/4 in. S12	14520-TE-0002	7010-TE-0002
PrimeLock	1/4 in. L04	14570-PF-0013	7800-TE-0013
	3/8 in. L06	14570-PF-0014	7800-TE-0014
	1/2 in. L08	14570-PF-0001	7800-TE-0001
	3/4 in. L12	14570-PF-0002	7800-TE-0002
Plugged	B00	7130-TE-0001	

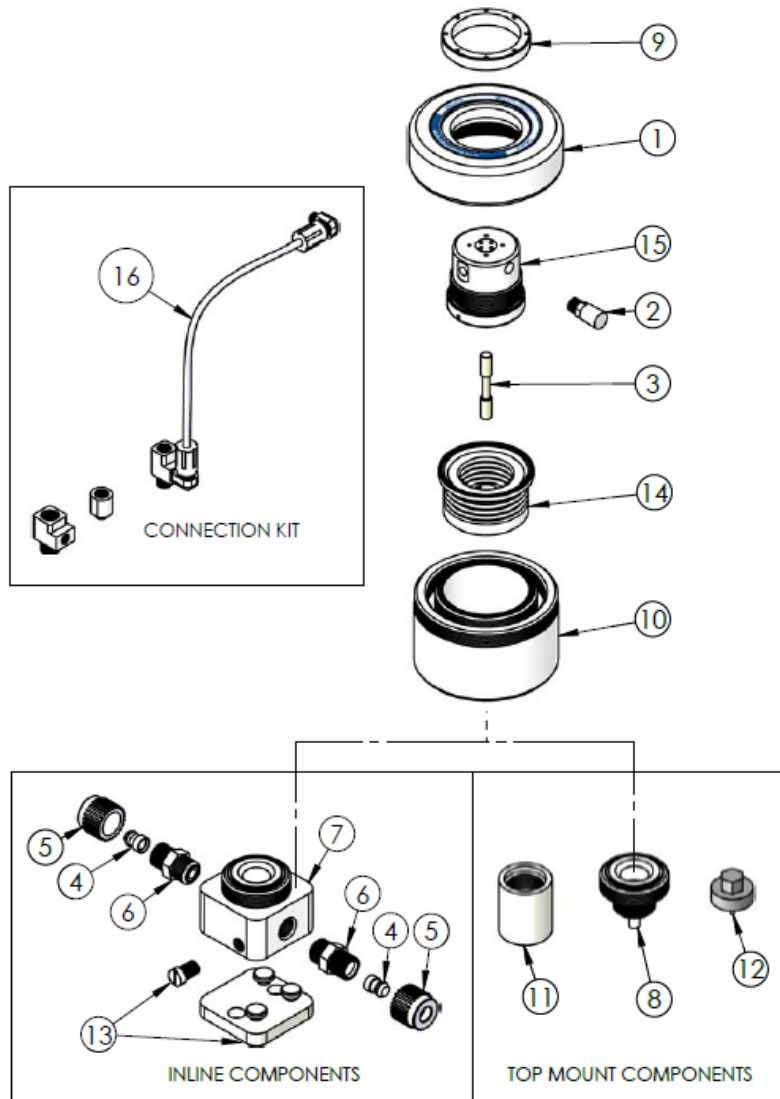
DBH030 Exploded View



DBH030 Bill Of Materials				
Item	Part	Description	Qty	
1	9400-TE-0001	Body, Dampener	1	
2	14300-MP-0032	Bellows Assembly	1	
3	2127-TE-0060	Head Dbh030	1	
4	14860-XX-0001	Pd Air Motor Assembly	1	
5	9300-TE-0006	Ring, Retaining	1	
6	6560-CE-0005	Spool	1	
7	6110-PP-0004	Muffler	1	
8	9100-TE-0008	Base, Inline, 030	1	
9	14200-NP-0009	Baseplate Assembly	1	
10	7400-TE-0001	Body, S-300®, 1/2"	2	
11	7400-PF-0001	Insert, S-300®, 1/2"	2	
12	7400-PF-0005	Nut, S-300®, 1/2"	2	
13	9200-TE-0008	Adapter, Top Mount, 030	1	

Fittings (Type, Size, Option)			Assemblies	Body Inlet Only (Nut not included)
	1/4 in.	F04	14510-PF-0016	7200-PF-0001
	3/8 in.	F06	14510-PF-0001	7200-PF-0002
	1/2 in.	F08	14510-PF-0002	7200-PF-0003
	3/4 in.	F12	14510-PF-0003	7200-PF-0004
	3/8 in.	T06	7120-PF-0001	
	1/2 in.	T08	7120-PF-0002	
	3/4 in.	T12	7120-PF-0003	
	1/2 in.	W08	7300-PF-0001	
	3/4 in.	W12	7300-PF-0002	
	1/4 in.	P04	14530-PF-0025	7400-TE-0031
	3/8 in.	P06	14530-PF-0012	7400-TE-0023
	1/2 in.	P08	14530-PF-0001	7400-TE-0001
	3/4 in.	P12	14530-PF-0002	7400-TE-0002
	1/4 in.	N04	7100-TE-0001	
	3/8 in.	N06	7100-TE-0002	
	1/2 in.	N08	7100-TE-0003	
	3/4 in.	N12	7100-TE-0007	
	3/8 in.	S06	14520-TE-0009	7010-TE-0001
	1/2 in.	S08	14520-TE-0001	7010-TE-0003
	3/4 in.	S12	14520-TE-0002	7010-TE-0002
	1/4 in.	L04	14570-PF-0013	7800-TE-0013
	3/8 in.	L06	14570-PF-0014	7800-TE-0014
	1/2 in.	L08	14570-PF-0001	7800-TE-0001
	3/4 in.	L12	14570-PF-0002	7800-TE-0002
Plugged		B00	7130-TE-0001	

DBU030 Exploded View

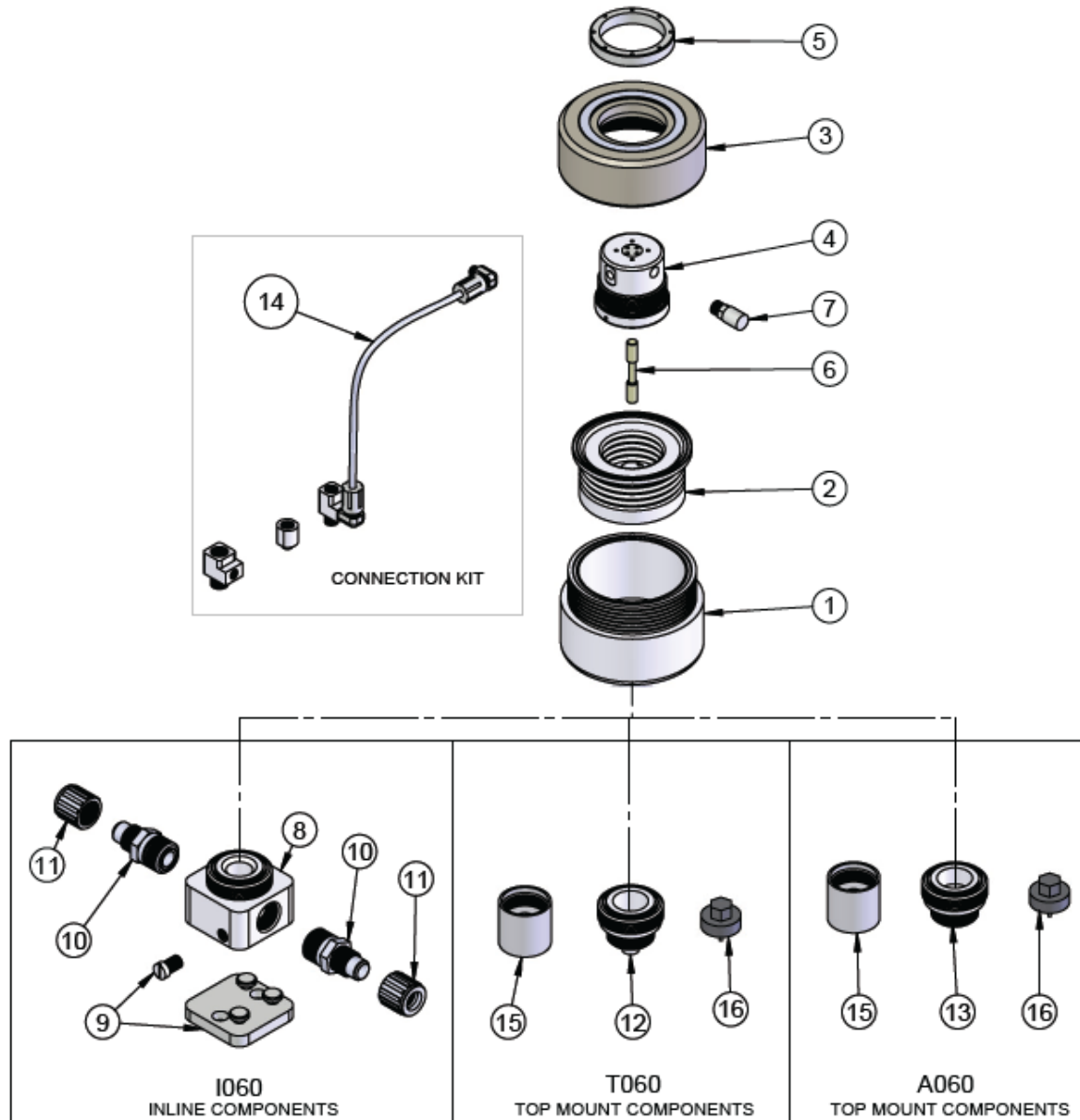


DBU030 BILL OF MATERIALS

Item	Part	Description	Qty
1	2127-TE-0071	Head	1
2	6110-PP-0004	Muffler	1
3	6560-CE-0005	SPOOL	1
4	7400-PF-0001	Insert, S-300®, 1/2"	2
5	7400-PF-0005	Nut, S-300®, 1/2"	2
6	7400-TE-0001	Body, S-300®, 1/2"	2
7	9100-TE-0008	Inline Base	1
8	9200-TE-0011	Top Mount Adapter	1
9	9300-TE-0006	Retaining Ring	1
10	9400-TE-0004	Body	1
11	9500-NP-0004	Dust Cover / Tool	1
12	12100-PV-0041	Torque Wrench Adapter	1
13	14200-NP-0009	Baseplate Assembly	1
14	14300-MP-0032	Bellows Assembly	1
15	14860-XX-0002	Pd Air Motor Assembly	1
16	14870-TE-0001	Connection Kit	1

Fittings (Type, Size, Option)	Assemblies	Body Inlet Only (Nut not included)
Flaretek Compatible	1/4 in. F04	14510-PF-0016 7200-PF-0001
	3/8 in. F06	14510-PF-0001 7200-PF-0002
	1/2 in. F08	14510-PF-0002 7200-PF-0003
	3/4 in. F12	14510-PF-0003 7200-PF-0004
Tube Out	3/8 in. T06	7120-PF-0001
	1/2 in. T08	7120-PF-0002
	3/4 in. T12	7120-PF-0003
Weldable	1/2 in. W08	7300-PF-0001
	3/4 in. W12	7300-PF-0002
Pillar S-300	1/4 in. P04	14530-PF-0025 7400-TE-0031
	3/8 in. P06	14530-PF-0012 7400-TE-0023
	1/2 in. P08	14530-PF-0001 7400-TE-0001
	3/4 in. P12	14530-PF-0002 7400-TE-0002
FNPT	1/4 in. N04	7100-TE-0001
	3/8 in. N06	7100-TE-0002
	1/2 in. N08	7100-TE-0003
	3/4 in. N12	7100-TE-0007
Synchro-Flare	3/8 in. S06	14520-TE-0009 7010-TE-0001
	1/2 in. S08	14520-TE-0001 7010-TE-0003
	3/4 in. S12	14520-TE-0002 7010-TE-0002
PrimeLock	1/4 in. L04	14570-PF-0013 7800-TE-0013
	3/8 in. L06	14570-PF-0014 7800-TE-0014
	1/2 in. L08	14570-PF-0001 7800-TE-0001
	3/4 in. L12	14570-PF-0002 7800-TE-0002
Plugged	B00	7130-TE-0001

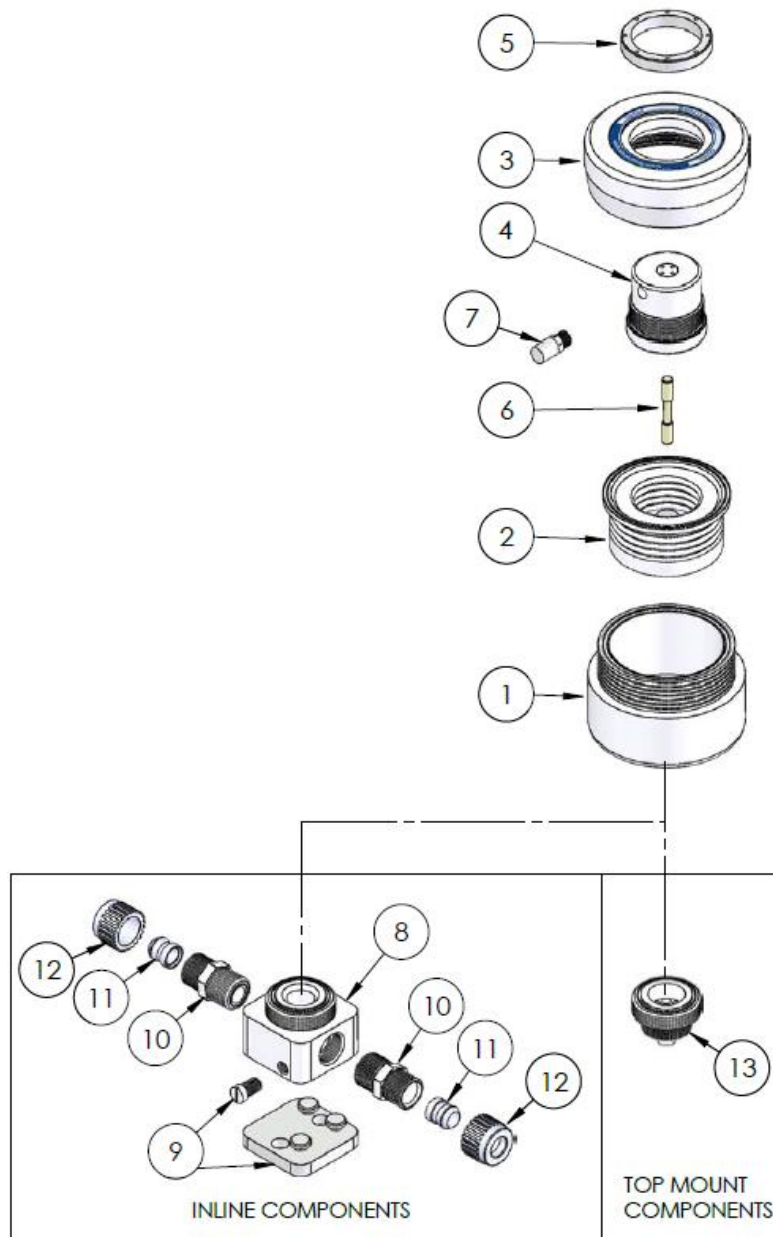
DBA060 Exploded View



DBA060 BILL OF MATERIALS

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	9400-TE-0002	BODY, DAMPENER	1
2	14300-MP-0033	BELLOWS ASSEMBLY	1
3	2127-EP-0037	HEAD, DBA060	1
4	14860-XX-0001	MOTOR, AIR, P.D.	1
5	9300-NP-0001	RING, RETAINING	1
6	6560-CE-0005	SPOOL	1
7	6110-PP-0004	MUFFLER	1
8	9100-TE-0009	BASE, INLINE, 060	1
9	14200-NP-0009	BASEPLATE ASSEMBLY	1
10	7200-PF-0006	BODY, FLARETEK®, 3/4"	2
11	7210-PF-0004	NUT, FLARETEK®, 3/4"	2
12	9200-TE-0009	ADAPTER, TOP MOUNT, 060	1
13	9200-TE-0019	TOP CHECK PLUG, LOW CAV. PD ADAPTER, 60L	1
14	14870-NP-0001	KIT, CONNECTION, PULSE DAMPENER	1
15	9500-NP-0002	DUST COVER / TOOL	1
16	12100-PV-0041	ADAPTER, TORQUE WRENCH, DAMPENER	1

DBH060 Exploded View

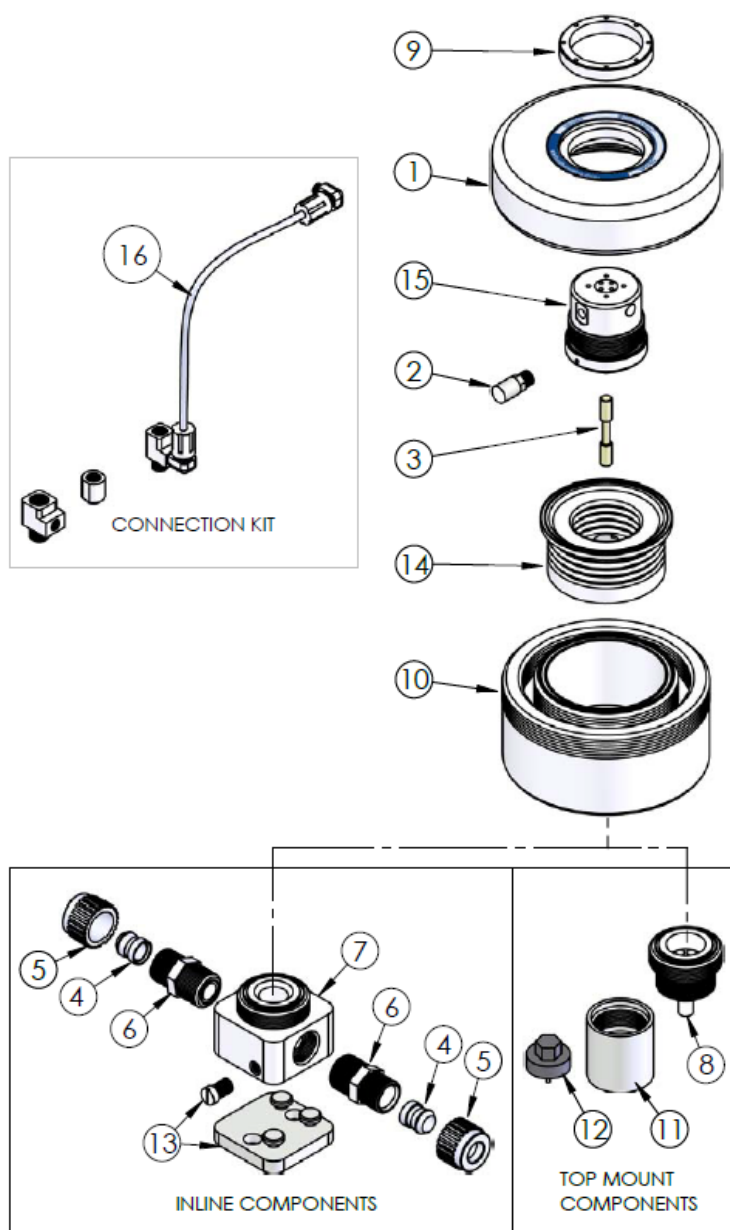


DBH060 BILL OF MATERIALS

Item	Part	Description	Qty
1	9400-TE-0002	Body, Dampener	1
2	14300-MP-0033	Bellows Assembly	1
3	2127-TE-0061	Head, Dbh060	1
4	14860-XX-0001	Pd Air Motor Assembly	1
5	9300-TE-0006	Ring, Retaining	1
6	6560-CE-0005	Spool	1
7	6110-PP-0004	Muffler	1
8	9100-TE-0009	Base, Inline, 060	1
9	14200-NP-0009	Baseplate Assembly	1
10	7400-TE-0004	Body, S-300®, 3/4"	2
11	7400-PF-0002	Insert, S-300®	2
12	7400-PF-0006	Nut, S-300®, 3/4"	2
13	9200-TE-0009	Adapter, Top Mount, 060	1

Fittings (Type, Size, Option)		Assemblies	Body Inlet Only (Nut not included)
 Flaretek Compatible	1/2 in. F08	14510-PF-0004	7200-PF-0005
	3/4 in. F12	14510-PF-0005	7200-PF-0006
	1 in. F16	14510-PF-0006	7200-PF-0007
	1-1/4 in. F20	14510-PF-0007	7200-PF-0008
 Tube Out	1/2 in. T08	7120-PF-0004	
	3/4 in. T12	7120-PF-0005	
	1 in. T16	7120-PF-0006	
	1-1/4 in. T20	7120-PF-0011	
 Weldable	3/4 in. W12	7300-PF-0003	
	1 in. W16	7300-PF-0004	
 Pillar S-300	3/8 in. P06	14530-PF-0028	7400-TE-0036
	1/2 in. P08	14530-PF-0003	7400-TE-0003
	3/4 in. P12	14530-PF-0004	7400-TE-0004
	1 in. P16	14530-PF-0005	7400-TE-0005
	1-1/4 in. P20	14530-PF-0009	7400-TE-0012
 FNPT	1/2 in. N08	7100-TE-0006	
	3/4 in. N12	7100-TE-0004	
	1 in. N16	7100-TE-0008	
 Synchro- Flare	1/2 in. S08	14520-TE-0003	7010-TE-0005
	3/4 in. S12	14520-TE-0004	7010-TE-0004
	1 in. S16	14520-TE-0006	7010-TE-0006
 PrimeLock	1/2 in. L08	14570-PF-0003	7800-TE-0003
	3/4 in. L12	14570-PF-0004	7800-TE-0004
	1 in. L16	14570-PF-0005	7800-TE-0005
	1-1/4 in. L20	14570-PF-0012	7800-TE-0012
Plugged	B00	7130-TE-0003	

DBU060 Exploded View

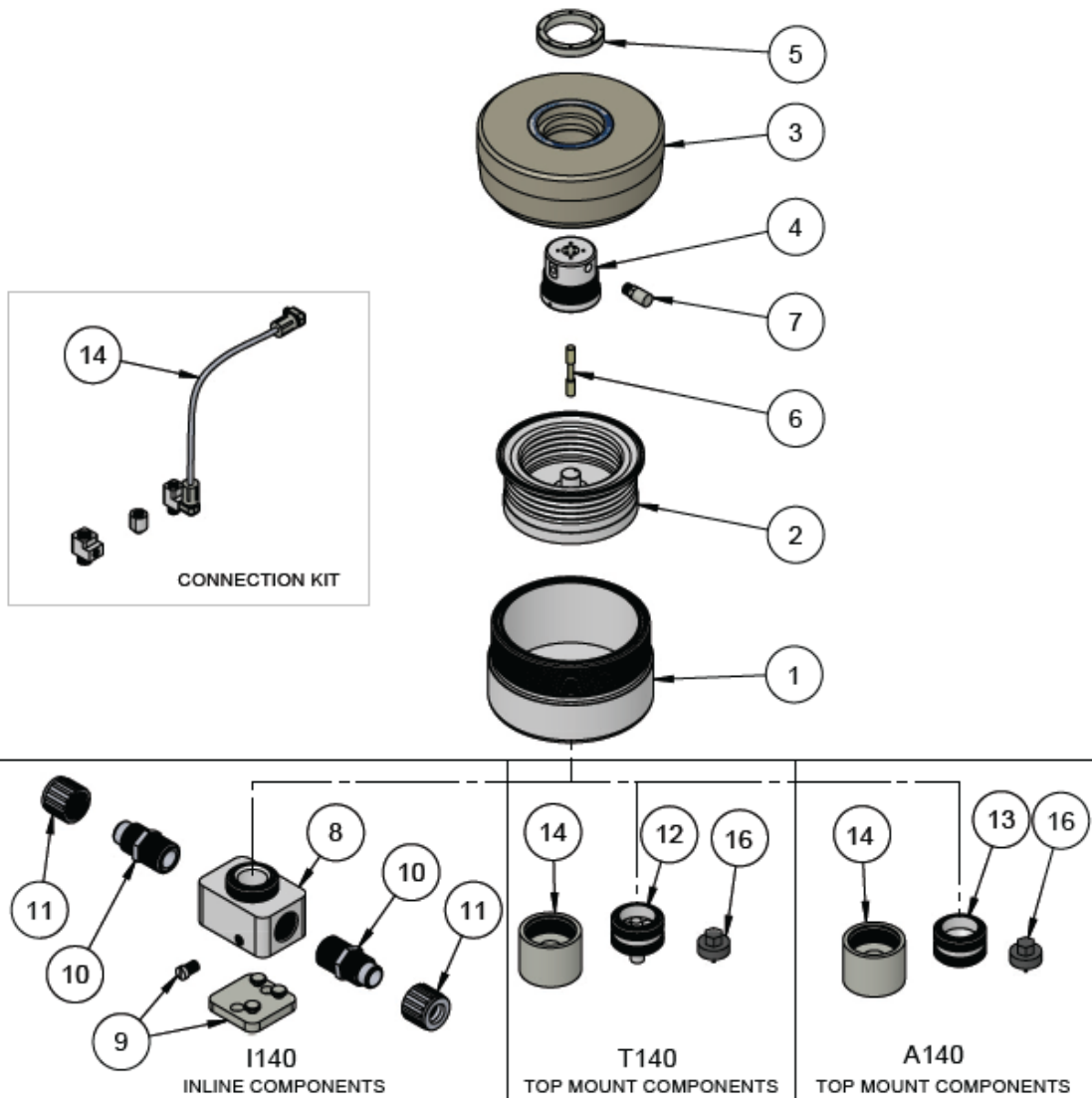


DBU060 BILL OF MATERIALS

Item	Part	Description	Qty
1	2127-TE-0072	Head, DbU060	1
2	6110-PP-0004	Muffler	1
3	6560-CE-0005	Spool	1
4	7400-PF-0002	Insert, S-300®	2
5	7400-PF-0006	Nut, S-300®, 3/4"	2
6	7400-TE-0004	Body, S-300®, 3/4"	2
7	9100-TE-0009	Base, Inline, 060	1
8	9200-TE-0012	Adapter, Top Mount, 060, U	1
9	9300-TE-0006	Ring, Retaining	1
10	9400-TE-0005	Body, Dampener	1
11	9500-NP-0005	Dust Cover / Tool	1
12	12100-PV-0041	Adapter, Torque Wrench	1
13	14200-NP-0009	Baseplate Assembly	1
14	14300-MP-0033	Bellows Assembly	1
15	14860-XX-0002	Pd Air Motor Assembly	1
16	14870-TE-0001	Kit, Connection	1

Fittings (Type, Size, Option)			Assemblies	Body Inlet Only (Nut not included)
Flaretek Compatible	1/2 in.	F08	14510-PF-0004	7200-PF-0005
	3/4 in.	F12	14510-PF-0005	7200-PF-0006
	1 in.	F16	14510-PF-0006	7200-PF-0007
	1-1/4 in.	F20	14510-PF-0007	7200-PF-0008
Tube Out	1/2 in.	T08	7120-PF-0004	
	3/4 in.	T12	7120-PF-0005	
	1 in.	T16	7120-PF-0006	
	1-1/4 in.	T20	7120-PF-0011	
Weldable	3/4 in.	W12	7300-PF-0003	
	1 in.	W16	7300-PF-0004	
Pillar S-300	3/8 in.	P06	14530-PF-0028	7400-TE-0036
	1/2 in.	P08	14530-PF-0003	7400-TE-0003
	3/4 in.	P12	14530-PF-0004	7400-TE-0004
	1 in.	P16	14530-PF-0005	7400-TE-0005
	1-1/4 in.	P20	14530-PF-0009	7400-TE-0012
FNPT	1/2 in.	N08	7100-TE-0006	
	3/4 in.	N12	7100-TE-0004	
	1 in.	N16	7100-TE-0008	
Synchro- Flare	1/2 in.	S08	14520-TE-0003	7010-TE-0005
	3/4 in.	S12	14520-TE-0004	7010-TE-0004
	1 in.	S16	14520-TE-0006	7010-TE-0006
PrimeLock	1/2 in.	L08	14570-PF-0003	7800-TE-0003
	3/4 in.	L12	14570-PF-0004	7800-TE-0004
	1 in.	L16	14570-PF-0005	7800-TE-0005
	1-1/4 in.	L20	14570-PF-0012	7800-TE-0012
Plugged		B00	7130-TE-0003	

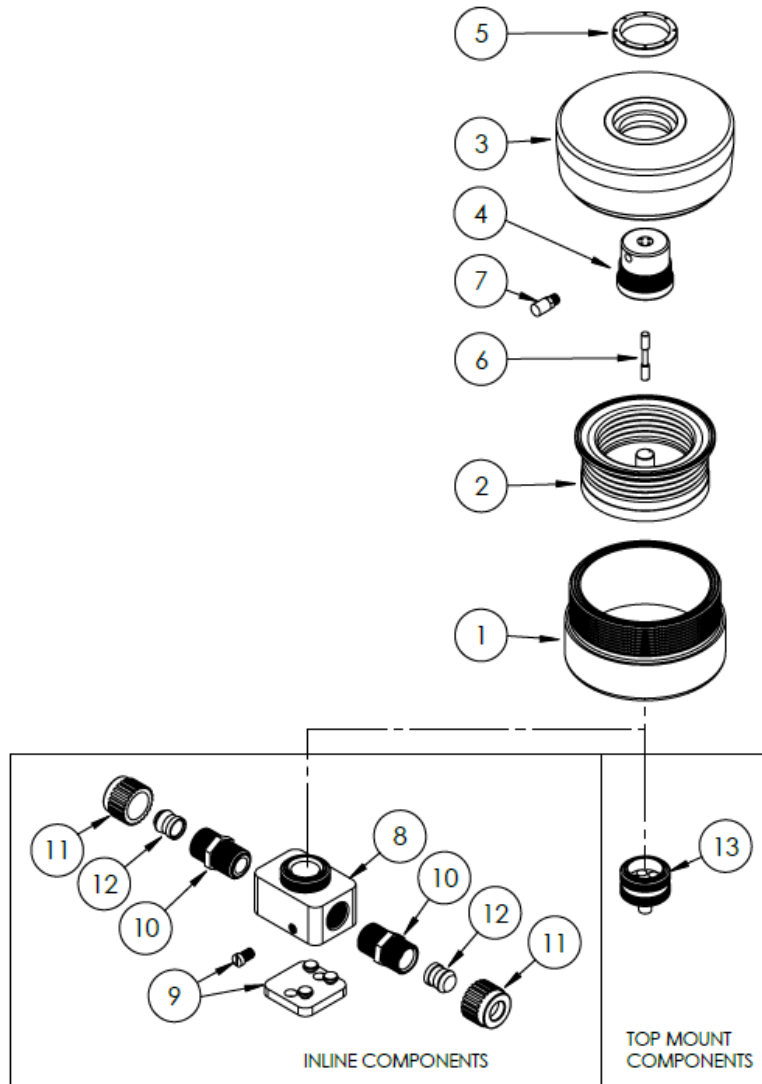
DBA140 Exploded View



DBA140 BILL OF MATERIALS

ITEM	PART NUMBER	DESCRIPTION	QTY.
1	9400-TE-0003	BODY, DAMPENER	1
2	14300-MP-0039	BELLOWS ASSEMBLY	1
3	2127-EP-0038	HEAD, DBA140	1
4	14860-XX-0001	MOTOR, AIR, P.D.	1
5	9300-NP-0001	RING, RETAINING	1
6	6560-CE-0005	SPOOL	1
7	6110-PP-0004	MUFFLER	1
8	9100-TE-0010	BASE, INLINE, 140	1
9	14200-NP-0009	BASEPLATE ASSEMBLY	1
10	7200-PF-0010	BODY, FLARETEK®, 1"	2
11	7210-PF-0005	NUT, FLARETEK®, 1"	2
12	9200-TE-0010	TOP CHECK PLUG, PD, ADAPTER 140L	1
13	9200-TE-0018	TOP CHECK PLUG, LOW CAV, PD ADAPTER	1
14	9500-NP-0003	DUST COVER / TOOL	1
15	14870-NP-0001	KIT, CONNECTION, PULSE DAMPENER	1
16	12100-PV-0041	ADAPTER, TORQUE WRENCH, DAMPENER	1

DBH140 Exploded View



DBH140 BILL OF MATERIALS			
Item	Part	Description	Qty
1	9400-TE-0003	Body, Dampener	1
2	14300-MP-0039	Bellows Assembly	1
3	2127-TE-0062	Head, Dbh140	1
4	14860-XX-0001	Pd Air Motor Assembly	1
5	9300-TE-0006	Ring, Retaining	1
6	6560-CE-0005	Spool	1
7	6110-PP-0004	Muffler	1
8	9100-TE-0010	Base, Inline, 140	1
9	14200-NP-0009	Baseplate Assembly	1
10	7400-TE-0007	Fitting S-300@ Body 1" 140	2
11	7400-PF-0007	Nut S-300@ 1"	2
12	7400-PF-0003	Insert S-300@ 1"	2
13	9200-TE-0010	Adapter, Top Mount, 140	1

Fittings (Type, Size, Option)		Assemblies		Body Inlet Only (Nut not included)
	1/2 in.	F08	14510-PF-0011	7200-PF-0015
	3/4 in.	F12	14510-PF-0008	7200-PF-0009
	1 in.	F16	14510-PF-0009	7200-PF-0010
	1-1/4 in.	F20	14510-PF-0010	7200-PF-0011
	3/4 in.	T12	7120-PF-0007	
	1 in.	T16	7120-PF-0008	
	1-1/4 in.	T20	7120-PF-0009	
	1-1/2 in.	T24	7120-PF-0010	
	3/4 in.	W12	7300-PF-0005	
	1 in.	W16	7300-PF-0006	
	1/2 in.	P08	14530-PF-0011	7400-TE-0019
	3/4 in.	P12	14530-PF-0006	7400-TE-0006
	1 in.	P16	14530-PF-0007	7400-TE-0007
	1-1/4 in.	P20	14530-PF-0008	7400-TE-0008
	1-1/2 in.	P24	14530-PF-0026	7400-TE-0035
	3/4 in.	N12	7100-TE-0009	
	1 in.	N16	7100-TE-0005	
	1-1/4 in.	N20	7100-TE-0010	
	1/2 in.	S08	TBD	7010-TE-0008
	3/4 in.	S12	14520-TE-0008	7010-TE-0007
	1 in.	S16	14520-TE-0007	7010-TE-0009
	3/4 in.	L12	14570-PF-0006	7800-TE-0006
	1 in.	L16	14570-PF-0007	7800-TE-0007
	1-1/4 in.	L20	TBD	7800-TE-0008
		B00	7130-TE-0005	7130-TE-0005

3 Installation and Precautions

3.1 Precautions

Liquid Inlet/Outlet	
THESE LIQUID PORTS ARE NOT NPT OR ANY OTHER STANDARD. Attempting to use connectors other than those supplied by White Knight will damage the dampener, and will void the warranty.	
Required Air Pressure	
Maximum air pressure for the dampener should not exceed 10 psi above air supply pressure sent to the pump, and must not exceed 100 psi at 60 °C. For temperatures above 60 °C reduce air pressure rating. Please refer to the specified temperature curves in this manual (section 2.1).	
Operating a Pulsation Dampener with a White Knight Pump	
While the dampener is effective when operating at the same air pressure as the pump, White Knight pulse dampeners are most effective with the air supply pressure 10 psi greater than the average liquid line pressure. This requires that the dampener have its own air source. If a second air source is not available, White Knight provides a t-fitting which allows the dampener to be supplied by the CDA line plumbed to the pump.	
Orientation	
White Knight does not recommend installing your dampener in any position other than its upright position.	
Cross Contamination	
PTFE and many other plastics are very porous and may retain chemicals in the pores of the material. Record chemistries used in pumps and dampeners to avoid cross contamination.	
WARNING: Liquids and Gasses Under Pressure	
	While in a live system, pumps and dampeners contain pressurized liquids and gasses. All pressure, liquid and air must be eliminated via shut off valves before the pump or dampener may be removed or detached from the system.
WARNING: Potential for High Surface Temperatures	
	When dampeners are operated with high temperature fluids, heat may transfer to the exterior surfaces of the dampener. Avoid direct contact with the dampener when high temperature fluids are present.
WARNING: Handling of Chemicals	
	In the event that hazardous chemicals are used in or around the pump or dampener, ensure that appropriate personal protective equipment is used before handling. Reference the chemistry's Material Safety Data Sheet (MSDS) for handling instructions or other information specific to that chemical.
WARNING: Noise Potential	
	The exiting of exhaust air from the dampener will contribute to a work area's noise level. Always operate White Knight dampeners with the approved muffler media. When working in noisy conditions, use the necessary ear protection.

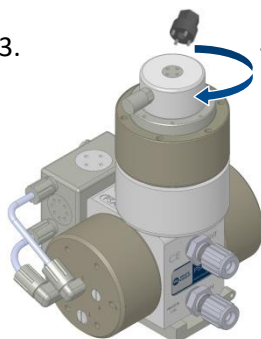
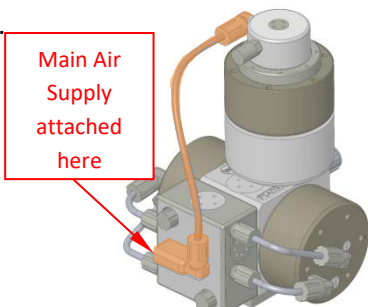
3.2 System and Pump Environment Recommendations/Requirements

Clean Supply Air (CDA)
White Knight high purity dampeners require the use of class 2 air for particles and moisture per ISO 8573-1. (Maximum particle size 10 microns, -40° C dew point)
Location in System
Pulsation dampeners operate most effectively in close proximity to the pump. As such inline versions of the dampeners should be placed on the outlet line, relatively close to the pump to maximize efficiency.
Flammable Solvents
White Knight high purity dampeners are not constructed from conductive materials. Any system used to pump flammable solvents should be properly grounded to avoid ignition by static charge. A test from River's Edge on using isolative pumps to pump flammable liquids indicated that the liquid itself must be grounded and that other procedures should be followed. A copy of the test is available upon request from White Knight.
Environmental Temperature
The A series dampeners are rated to environmental temperatures of 50°C. H and U series dampeners are rated to environmental temperatures of 85°C.

3.3 Installation Advantages

Thermal Cycling
When operated within their respective temperature to pressure applications, White Knight DBA, DBH and DBU series dampeners require no maintenance even when used in thermal cycling applications.
Passing Solids
White Knight offers a complete line of pre-pump filters (White Knight Catcher™) to protect system components from debris that could damage the products.

3.4 Installation Instructions (Top Mounted Configuration)

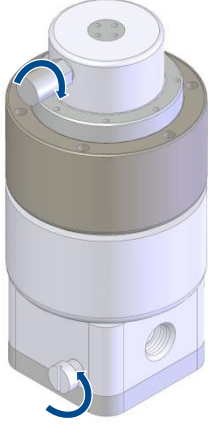
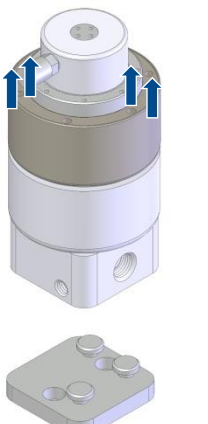
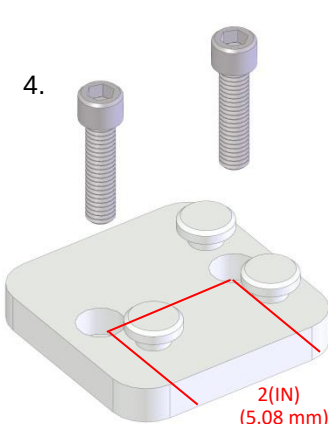
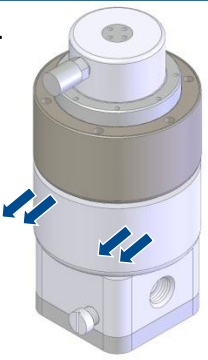
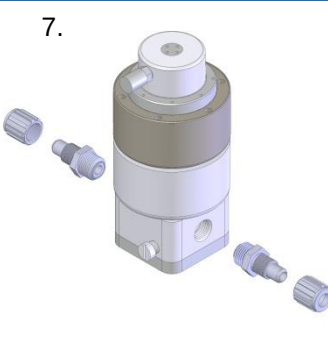
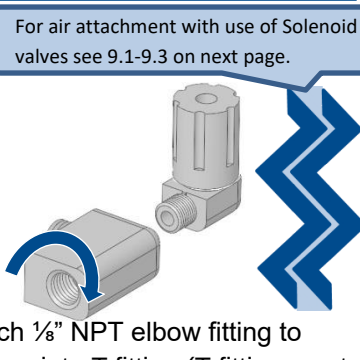
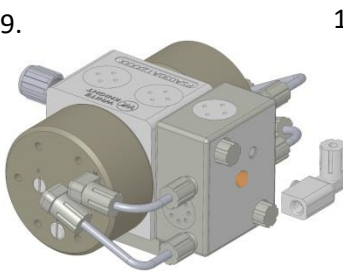
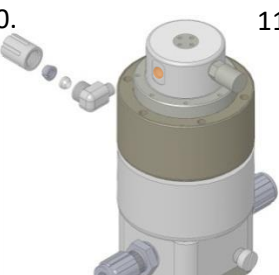
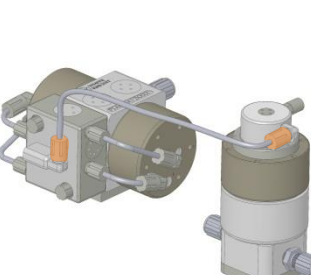
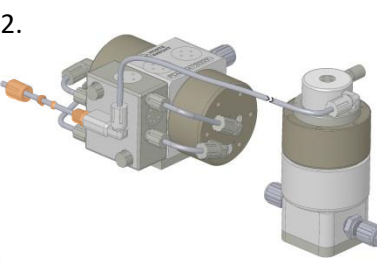
- 
 - 
 - 
 - 
- Remove dust cover from dampener
 - Remove top check plug using included PVC tool, or the dust cover if pins are found on the end of the cover.
 - Attach dampener to pump via top check plug port. Using included PVC tool, tighten to:
 - Affix air supply following steps 8-12 in section 3.5.

Pump	in/LBS	N-m
030	50-60	5.6-6.8
060	65-75	7.3-8.5
140	105-120	11.9-13.6

Safety First

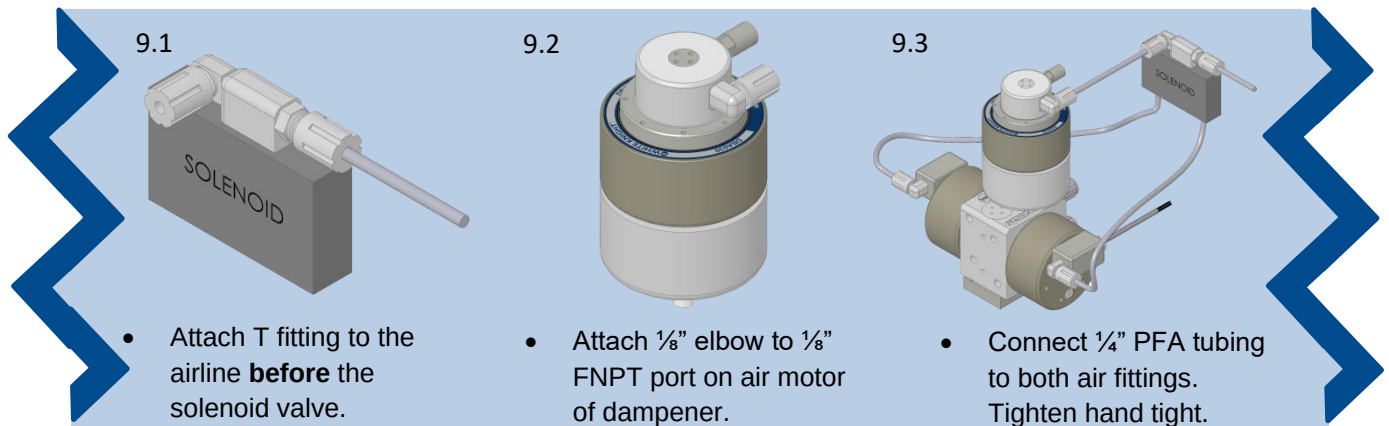
Pumps must be isolated from the system before servicing them for any reason, installing a pulse dampener included, to avoid the risk of chemical exposure.

3.5 Installation Instructions (Inline Configuration)

1. 
 - Loosen lock screw on front of base and attach muffler.
2. 
 - Slide base plate forward (dampener backward).
3. 
 - Lift dampener off of base plate.
4. 
 - Fix base plate to work station with $\frac{3}{8}$ " or 10mm socket screws, screwed into pre-drilled/tapped holes.
5. 
 - Place dampener onto mating base knobs. Slide dampener forward.
6. 
 - Tighten lock screw on front of base. Attach muffler to $\frac{1}{4}$ " NPT port on Air Motor.
7. 
 - Attach liquid fittings per manufacturer's instructions.
8. 
 - Attach $\frac{1}{8}$ " NPT elbow fitting to appropriate T fitting (T fitting must match pump air supply port, $\frac{3}{8}$ " NPT for 140 LPM series pumps, $\frac{1}{4}$ " NPT for 30 and 60 LPM series pumps)
9. 
 - Attach T fitting to pump air supply port.
10. 
 - Attach $\frac{1}{8}$ " elbow to $\frac{1}{8}$ " FNPT port on air motor of dampener.
11. 
 - Connect $\frac{1}{4}$ " PFA tubing to both $\frac{1}{8}$ " NPT elbows.
12. 
 - Affix air supply to T fitting attached to pump.

Liquid Inlet/Outlet

LIQUID PORTS TO DAMPENER ARE NOT NPT OR ANY OTHER STANDARD. Attempting to use connectors other than the ones supplied by White Knight will damage the dampener, and void the warranty



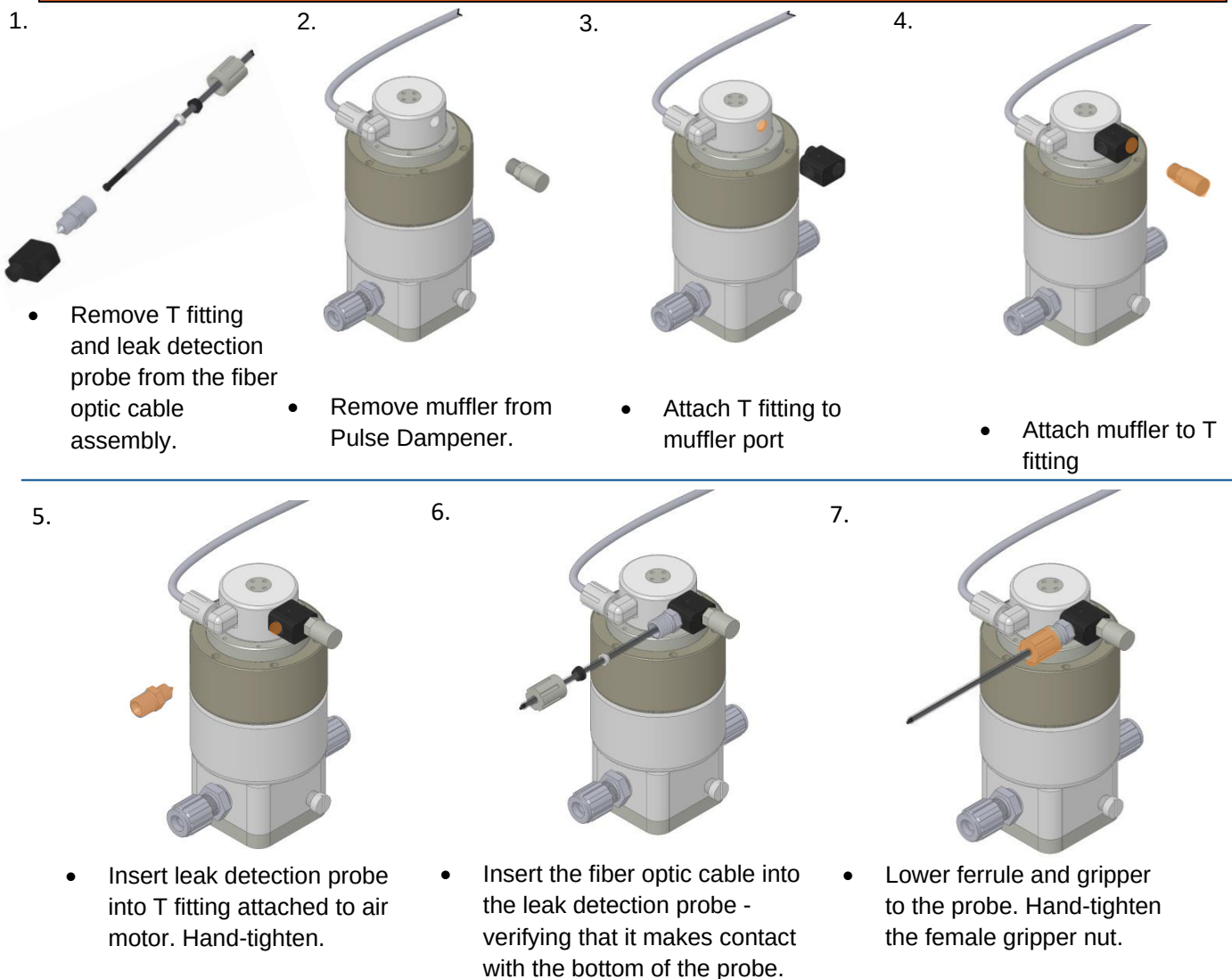
Supply air to Dampener

Air supply to the dampener must be shut off when air supply to the pump is shut off or the dampener may be damaged and the warranty voided.

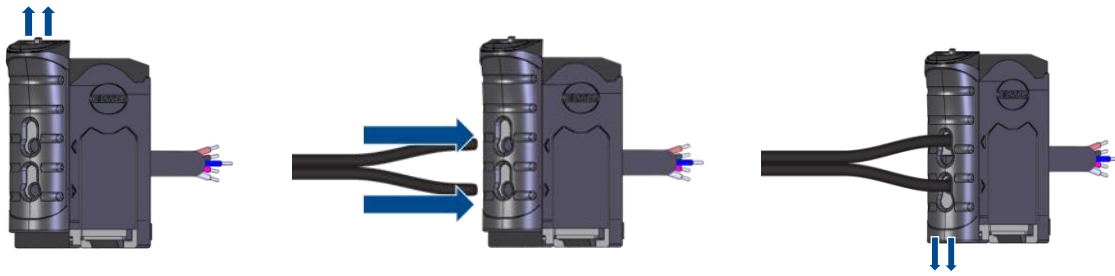
4 Fiber Optic Leak Detection

4.1 Fiber Optic Leak Detection Attachment Instructions

D10 amplifier must be calibrated before attaching fiber optic probe to the dampener. (See section 4.2)



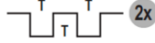
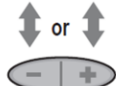
8.



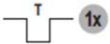
- Open the top and slide the front face of the D10 amplifier up. Press the fiber optic ends into the holes on the front face of the amplifier. Slide the face down to lock cables in place.

4.2 Calibrating D10 Amplifier for Leak Detection

1. Powering up the D10 amplifier and ensure that the amplifier is set to “Dark Operate” mode.

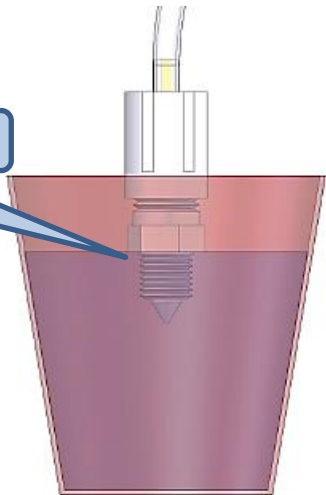
	Push Button 0.04 seconds ≤ “Click” ≤ 0.8 seconds	Remote Line 0.04 seconds ≤ T ≤ 0.8 seconds	Result																																								
Access SETUP Mode	Press and hold both push buttons > 2 seconds. 	Double-pulse remote line. 	- Green Power LED turns OFF. - Output LED remains active. - Icons continue to display current setup. - Bargraph turns OFF. 																																								
Select Setting Combination	Click either push button until LEDs show desired settings. 	Pulse the remote line until LEDs show desired settings.  NOTE: Double-pulsing the remote line will cause the setting to “back up” one step.	Sensor toggles through eight setting combinations, in the following order: <table><tr><td>LO</td><td>-</td><td>Normal Speed</td><td>-</td><td>No Delay (default)</td></tr><tr><td>DO</td><td>-</td><td>Normal Speed</td><td>-</td><td>No Delay</td></tr><tr><td>LO</td><td>-</td><td>High Speed</td><td>-</td><td>No Delay</td></tr><tr><td>DO</td><td>-</td><td>High Speed</td><td>-</td><td>No Delay</td></tr><tr><td>LO</td><td>-</td><td>Normal Speed</td><td>-</td><td>Delay</td></tr><tr><td>DO</td><td>-</td><td>Normal Speed</td><td>-</td><td>Delay</td></tr><tr><td>LO</td><td>-</td><td>High Speed</td><td>-</td><td>Delay</td></tr><tr><td>DO</td><td>-</td><td>High Speed</td><td>-</td><td>Delay</td></tr></table>	LO	-	Normal Speed	-	No Delay (default)	DO	-	Normal Speed	-	No Delay	LO	-	High Speed	-	No Delay	DO	-	High Speed	-	No Delay	LO	-	Normal Speed	-	Delay	DO	-	Normal Speed	-	Delay	LO	-	High Speed	-	Delay	DO	-	High Speed	-	Delay
LO	-	Normal Speed	-	No Delay (default)																																							
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DO	-	Normal Speed	-	Delay																																							
LO	-	High Speed	-	Delay																																							
DO	-	High Speed	-	Delay																																							
Return to RUN Mode	Press and hold both push buttons > 2 seconds. 	Hold remote line low > 2 seconds. 	- Green Power LED turns ON. - Sensor returns to RUN mode with new settings. 																																								

2. Access “Single-Point Dark Set” mode.

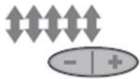
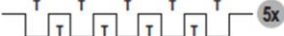
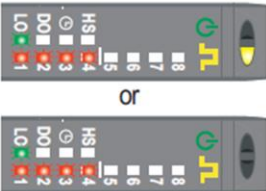
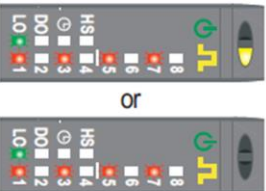
	Push Button 0.04 seconds ≤ “Click” ≤ 0.8 seconds	Remote Line 0.04 seconds ≤ T ≤ 0.8 seconds	Result
Access SET Mode	Press and hold Static push button > 2 seconds 	Single-pulse remote line 	Power LED: OFF Output LED: ON (push button) OFF (remote line) Static LEDs: LO & DO alternately flashing  or 

- Place leak detect probe in cup of liquid sensing condition as shown.

Probe tip is fully inserted in liquid.



- While still holding the leak detect probe tip in the liquid, set “leak detected”

	Push Button 0.04 seconds ≤ “Click” ≤ 0.8 seconds	Remote Line 0.04 seconds ≤ T ≤ 0.8 seconds	Result
SET Sensing Condition	- Present sensing condition - Five-click Static push button 	- Present sensing condition - Five-pulse remote line 	Threshold Condition Accepted Power LED: ON Output LED: ON (push button) OFF (remote line) Bargraph: 4 indicators flash together  Sensor returns to RUN mode with new settings Threshold Condition Unacceptable Power LED: ON Output LED: ON (push button) OFF (remote line) Bargraph: #1, 3, 5, 7 flash to show failure  Sensor returns to “SET Sensing Condition.”

- Leak probe can now be removed from liquid and reinserted into the T fitting. The amplifier will now send a signal when moisture is detected on the leak detect probe tip.

5 Ordering Instructions

wkfluidhandling.com/ordering-instructions

In-line Configuration

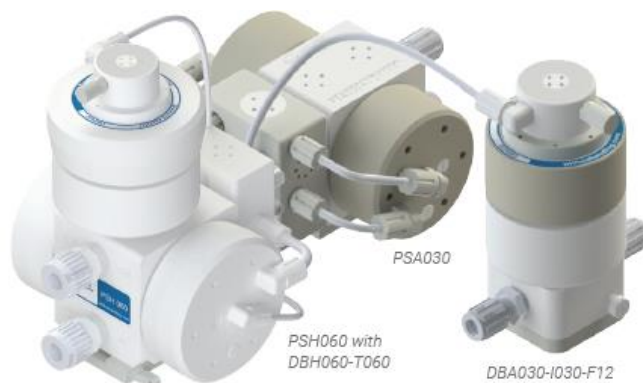
DBA 030 - I030- P12 - LF0- P08

0. Model 1. Size 2. Mount 3. Inlet 4. Leak Detect 5. Outlet

Pump-Mounted

DBA 030 - T030 - LF0

0. Model 1. Size 2. Mount 4. Leak Detect



0. Model	
Maximum fluid temperature	
≤ 100°C (212°F)	DBA
≤ 145°C (293°F)	DBH
≤ 210°C (410°F)	DBU

DBA are for PSA, PFA, PXA pumps.
DBH are for PSH, PFH, PXH pumps.
DBU are for PSU, PFU, PXU pumps.

1. Size	
Size of internal bellows	
30 lpm bellows	030
60 lpm bellows	060
140 lpm bellows	140



2. Mount		Size Compatibility		
		030	060	140
In-Line	30 lpm base	I030	✓	✓
	60 lpm base	I060	✓	✓
	140 lpm base	I140	-	✓
Pump-Mount	030 adapter	T030	✓	-
	060 adapter	T060	✓	✓
	140 adapter	T140	-	✓
	PA060 adapter	A060	✓	✓
	PA140 adapter	A140	-	✓



4. Leak Detection	
No leak detection	blank
15 ft fiber optic cable with no amplifier	LF0
15 ft fiber optic cable with D10 amplifier	LF1
25 ft fiber optic cable with no amplifier	LF2
25 ft fiber optic cable with D10 amplifier	LF3
15 ft conductivity cable	LC0
25 ft conductivity cable	LC1

Liquid Fittings		3. Inlet 5. Outlet	Mount Compatibility		
Only define outlet if different			I030	I060	I140
Plugged		B00	✓	✓	✓
	Flaretek Compatible	1/4 in F04	✓	-	-
		3/8 in F06	✓	-	-
		1/2 in F08	✓	✓	✓
		3/4 in F12	✓	✓	✓
		1 in F16	-	✓	✓
Pillar S-300		1-1/4 in F20	-	✓	✓
		1/4 in P04	✓	-	✓
		3/8 in P06	✓	✓	-
		1/2 in P08	✓	✓	✓
		3/4 in P12	✓	✓	✓
		1 in P16	✓	✓	✓
PrimeLock		1-1/4 in P20	-	✓	✓
		1-1/2 in P24	-	-	✓
		1/4 in L04	✓	-	-
		3/8 in L06	✓	-	-
		1/2 in L08	✓	✓	-
		3/4 in L12	✓	✓	✓
FNPT		1 in L16	-	✓	✓
		1-1/4 in L20	-	✓	✓
		1/4 in N04	✓	-	-
		3/8 in N06	✓	-	-
		1/2 in N08	✓	✓	✓
		3/4 in N12	✓	✓	✓
Tube Out		1 in N16	-	✓	✓
		1-1/4 in N20	-	-	✓
		3/8 in T06	✓	-	-
		1/2 in T08	✓	✓	-
		3/4 in T12	✓	✓	✓
		1 in T16	-	✓	✓
Weldable		1-1/4 in T20	-	✓	✓
		1-1/2 in T24	-	-	✓
		3/4 in W12	-	✓	✓
		1 in W16	-	✓	✓

6 Dampener Warranty

White Knight follows strict manufacturing, assembly and testing procedures to ensure consistency and reliability.

White Knight warrants DBA, DBH, and DBU pulse dampeners and components are free from defects in materials and workmanship for two years from our shipment date or your installation date if provided within 90 days of shipment from our facility.

Failures due to normal wear, misuse, abuse or unauthorized disassembly nullify this warranty.

White Knight does not guarantee the suitability of products for specific applications. White Knight is not liable for any damage or expense resulting from use or misuse of its products in any application. Responsibility is limited solely to repair or replacement of defective products or components.

Prior written, faxed or emailed approval must be obtained from White Knight before returning any product or component for warranty consideration. All determinations regarding cause of failure are made by White Knight, and all decisions regarding warranty fulfillment or nullification are made by White Knight.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING ANY GUARANTEE OF SUITABILITY FOR ANY PURPOSE. NO VARIATIONS OF THIS WARRANTY SHALL BE HONORED NOR CONSIDERED LEGALLY BINDING, EXCEPT WRITTEN AGREEMENTS SIGNED BY THE CEO OF WHITE KNIGHT FLUID HANDLING.

Brian Callahan, President

White Knight Fluid Handling

7 Dampener Service

7.2 Return Dampener to Factory

Should your dampener need to be returned to White Knight for whatever reason, please follow the instructions below.

1. After removing the dampener from the station, the dampener must be flushed as described in the "Attention" section of this document, decontaminations instructions and certificate of decontamination in section 6.3.
2. Remaining DI water should be drained from the inlet and outlet liquid tubing connectors.
3. The dampener liquid outlets must then be plugged as described in the "Removal of Dampener from Station" section of this document on line two
4. Dry the dampener.
5. Double-bag the dampener - **sealing it** in thick polyethylene bags.
6. Return the dampener to its original packaging.
7. Include Material Safety Data Sheet (hereafter MSDS) for the chemical that the dampener was exposed to, in the box with the dampener.
8. Obtain RMA number from White Knight, and write it on the outside of the box.
9. Ship to White Knight following all rules, regulations and laws regarding the shipping of dangerous materials. Ship freight pre-paid. No collect or coo shipments will be accepted. Unauthorized use of White Knight shipping accounts will result in additional freight costs to the bill as well as a service charge. Follow all shipping instructions in reference to sending your dampener to its appropriate suite.

7.3 Decontamination Instructions & Certificate of Decontamination

Attention:

White Knight products are used with dangerous liquids. Therefore, every product must be handled as if it contains dangerous chemicals. White Knight specifies that a pulse dampener must have DI water pumped from the inlet through the outlet for 40 minutes before disassembly and double-bagging for shipment. Only those who have been adequately trained in safety with the handling of acids and other dangerous chemicals should attempt to handle product that has been exposed to dangerous chemicals. Adequate safety gear for chemicals in the product must be used and no attempt should be made to handle the product until SDS for the appropriate chemical have been reviewed. Ph papers, showers, antidotes, clean-up equipment, neutralizers, and any other safety devices that could be used for detecting, neutralizing or minimizing effects from the chemical described in SDS must be present along with emergency numbers for use in the event of an accident. Take care in the handling of liquids and/or residues contained in the product or any other chemical handling equipment. Remember, **Safety First**.

Note: Any product returned to White Knight for warranty evaluation or repair must be complete with all parts and components including but not limited to tubing connectors, tubing connector caps, flare noses, shuttle valves, mufflers and tubing. Any missing parts will be added to the product and charged to the customer in the event of repair or replacement, warranty or otherwise.

Removal of Dampener from Station:

1. Disconnect air supply from the dampener.
2. Disconnect liquid lines.
3. Plug liquid fittings per manufactures instructions or plug the dampener inlet/outlet ports with a White Knight buttress plug.
4. Remove the dampener from its base plate (in-line models only).
5. Return all removed parts with the dampener.

DO NOT REMOVE PAGE FROM
MANUAL. Copy page or
download and print page from
manual at:
www.wkfluidhandling.com/ownersmanuals



RMA#: _____

I, the undersigned, employee of _____ certify that all decontamination and safety procedures outlined in the White Knight document labeled "White Knight Product Decontamination Instructions" have been followed for the product listed below.

Product Serial Number: _____

Please check one of the following: (If Known/Applicable)

- ☐ 1. The product has not been used in metal processes (I.E. Copper and Bumping Processes).
☐ 2. The product has been used in Metal Processes.

2a. The Metal Process that it was used in is: _____
(Insert type of process I.E. Copper, Gold, Lead Bumping, Tin Bumping, Aluminum Etch, Other (please describe))

Failure Mode: _____

Specific Failure Details: _____

Application Parameters: Air Supply: _____ Flow Rate: _____

Process Chemistry: _____ Process Temperature: _____

Duty Cycle: _____ Installation Date (if known): _____

Contact Information to send RMA# and Evaluation Report to: Name: _____

Phone: _____ Email: _____

Customer Reference # (if needed): _____

SPECIAL INSTRUCTIONS:

Products that have been exposed to metal processes must be returned to White Knight in packaging or containers which are clearly and conspicuously marked on the outside that the enclosed item has been exposed to metal processes and to which metal they may have been exposed!

Attention

Products **not exposed** to Metal Process must be returned to White Knight via the following address:
White Knight Fluid Handling Inc.
187 East 670 South Suite C

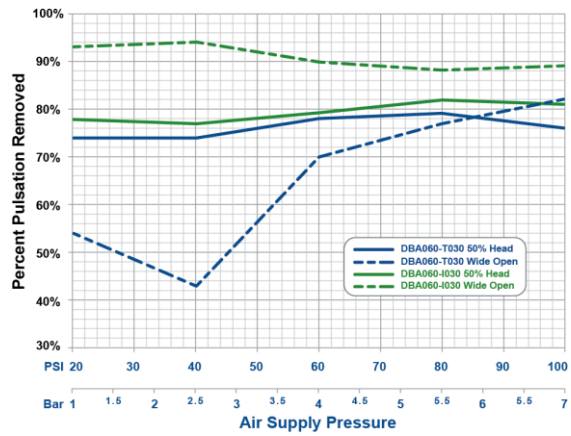
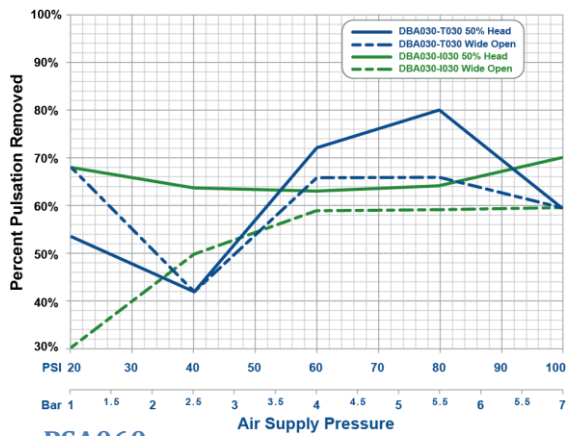
Attention

Products **exposed** to Metal Processes must be returned to White Knight via the following address:
White Knight Fluid Handling Inc.
187 East 670 South Suite B

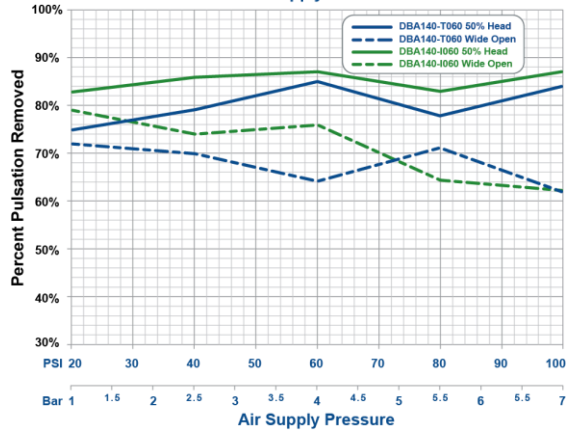
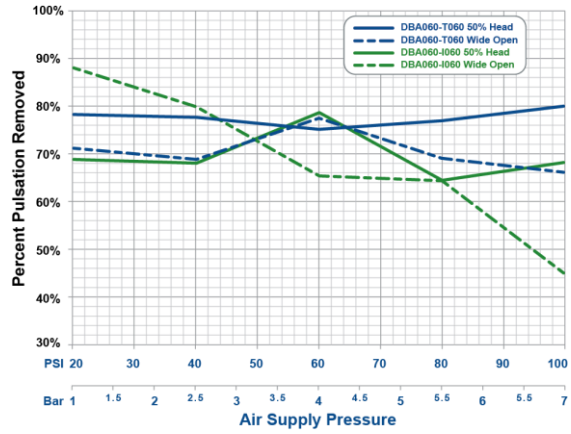
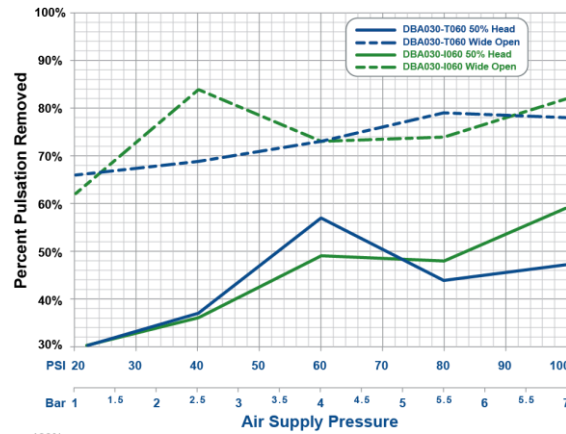
7 Performance Charts

7.1 Percentage of Pulsation Removed per Dampener

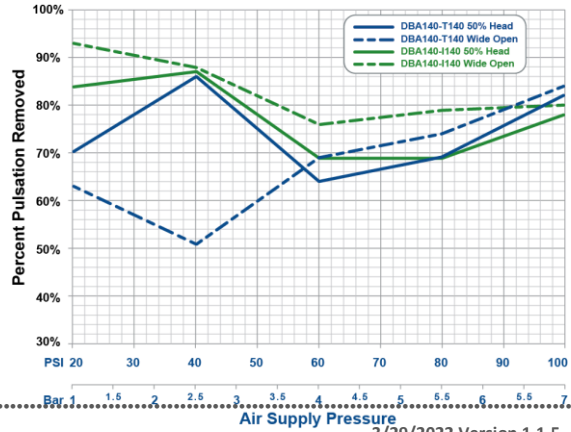
PSA030



PSA060



PSA140



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White Knight Support

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support@wkfluidhandling.com

<https://wkfluidhandling.com/support/>