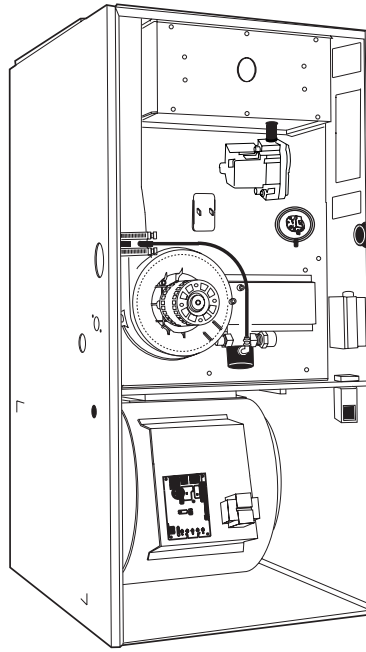
Service Reference Handbook



G1D91(A,B)U/G1D91BT
G1D93(A,B)U/G1D93(A,B)C
Gas-Fired Furnace

SRH-G1D91/93 9/04

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Disclaimer

This manual presents information and guidelines for proper installation, adjustment, operation, and maintenance of gas-fired G1D91AU, G1D91BU, G1D91BT, G1D93AU, G1D93BU, G1D93AC, and G1D93BC furnaces. Read this manual before attempting assembly, installation, start-up, adjustment, or operation of the furnace unit. If you have any questions about the operation of the unit or a particular safety device, call or write us at:

A.A.C.
421 Monroe Street
Bellevue, Ohio USA 44811
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Fax: 419-483-3557

The documentation and drawings contained in this manual are intended as a general guide, and may not reflect exactly the current designs, or all of the options available to our customers. Please call or write A.A.C. regarding specific details of a particular furnace model, configuration, or installation.

The information and specifications contained in this manual are subject to change without notice. A.A.C. reserves the right to change such specifications at any time without incurring obligation. Every effort has been made to ensure the accuracy of the information in this manual. For the most current information, please contact the A.A.C. Customer Service Department.

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Furnace Models Covered By This Handbook:

G1D91AU, G1D91BU (Upflow only)
G1D91BT (Upflow/Horizontal)
G1D93AU, G1D93BU (Upflow only)
G1D93AC, G1D93BC (Counterflow only)

Product Serial Numbers, Beginning 1993

84 95 A 12345

84 = Factory Number

95 = Year (ex: 1995)

A = Month (see list below)

12345 = Sequential Number

A = Jan **B** = Feb **C** = Mar **D** = Apr

E = May **F** = June **G** = July **H** = Aug

J = Sept **K** = Oct **L** = Nov **M** = Dec

Model Number Guide

G 1D 91 A U 100 D 20 D -1A

G = Product Family (i.e., Gas)

1D = Single Stage Heat, Direct Vent

91 = Nominal AFUE

A = Series

U = Upflow
C = Counterflow
T = Upflow/Horizontal

100 = Nominal Input BTUH/1000 (100 = 100,000 BTUH)

D = Direct Drive, Constant Speed

20 = Nominal Maximum CFM/100 (20 = 2000 CFM)

B = 17.5" Cabinet Width
C = 21" Cabinet Width
D = 24.5" Cabinet Width

1A = Revision Code

Table 1-1 Model Revisions/Variations – A Series

Model	Configuration	AFUE	Vent Category	Ignition/ Blower Control	Ignition Type
G1D91AU	Upflow Only	91	Category IV Direct or Non-Direct Vent	Honeywell Smart Valve II SV9520H8018/ SV9520H8034 (P/N 45390-001) with Honeywell ST9160B1068 Blower Control (P/N 45692-001)	Hot Surface Ignition (HSI)
G1D93AU	Upflow Only	92.5	Category IV Direct or Non-Direct Vent	Honeywell Smart Valve II SV9520H8018/ SV9520H8034 (P/N 45390-001) with Honeywell ST9160B1068 Blower Control (P/N 45692-001)	Hot Surface Ignition (HSI)
G1D93AC	Counterflow Only	92.5	Category IV Direct or Non-Direct Vent	Honeywell Smart Valve II SV9520H8018/ SV9520H8034 (P/N 45390-001) with Honeywell ST9160B1068 Blower Control (P/N 45692-001)	Hot Surface Ignition (HSI)

Table 1-2 Model Revisions/Variations – B Series

Model	Configuration	AFUE	Vent Category	Ignition/ Blower Control	Ignition Type
G1D91BU	Upflow Only	91	Category IV Direct or Non-Direct Vent	Honeywell Gas Valve VR8205 (P/N 47484-002) with U-Tech 1012-967 Ignition/Blower Control (P/N 47582-001)	Hot Surface Ignition (HSI)
G1D91BT	Upflow/ Horizontal	91	Category IV Direct or Non-Direct Vent	Honeywell Gas Valve VR8205 (P/N 47484-002) with U-Tech 1012-967 Ignition/Blower Control (P/N 47582-001)	Hot Surface Ignition (HSI)
G1D93BU	Upflow Only	92.5	Category IV Direct or Non-Direct Vent	Honeywell Gas Valve VR8205 (P/N 47484-002) with U-Tech 1012-967 Ignition/Blower Control (P/N 47582-001)	Hot Surface Ignition (HSI)
G1D93BC	Counterflow Only	92.5	Category IV Direct or Non-Direct Vent	Honeywell Gas Valve VR8205 (P/N 47484-002) with U-Tech 1012-967 Ignition/Blower Control (P/N 47582-001)	Hot Surface Ignition (HSI)

G1D91AU

Upflow
91% AFUE
Input Range: 50,000 – 125,000 BTUH
Direct Drive Circulating Blower
Motor HP: 1/3, 3/4, 0.9

Physical

Model	Input (Btuh)	Output (Btuh)	AFUE	Nom. Cooling Cap.	Gas Inlet (in.)	Appr. Weight (lbs.)*
G1D91AU050D12B	50,000	45,500	91.0	1.5 - 3.0	1/2	160
G1D91AU075D12B	75,000	68,250	91.0	1.5 - 3.0	1/2	185
G1D91AU075D16C	75,000	68,250	91.0	2.5 - 4.0	1/2	195
G1D91AU100D16C	100,000	91,000	91.0	2.5 - 4.0	1/2	195
G1D91AU100D20C	100,000	91,000	91.0	3.0 - 5.0	1/2	205
G1D91AU100D22D	100,000	91,000	91.0	3.0 - 5.0	1/2	205
G1D91AU125D20D	125,000	113,750	91.0	3.0 - 5.0	1/2	220

* Unit weights based on approximate shipping weight

Electrical

Model	Volts/ Hz/ Ph	Minimum Time Delay Breaker or Fuse	Nominal FLA	Transformer (VA)
G1D91AU050D12B	120/60/1	15	6.1	40
G1D91AU075D12B	120/60/1	15	6.1	40
G1D91AU075D16C	120/60/1	15	7.4	40
G1D91AU100D16C	120/60/1	15	7.2	40
G1D91AU100D20C	120/60/1	15	10.4	40
G1D91AU100D22D	120/60/1	15	9.6	40
G1D91AU125D20D	120/60/1	15	9.6	40

Blower Performance

Model	Motor HP	Blower Size	Temp. Rise	Blower Speed	CFM @ ext. Static Pressure - in. W.C. w/Filter(s)*							
					.20	.30	.40	.50	.60	.70	.80	.90
G1D91AU050D12B	1/3	10 x 8	40-70	High	1518	1446	1366	1297	1219	1122	1003	834
				Med/Hi	1340	1298	1234	1182	1101	1018	903	752
				Med	1099	1084	1060	1019	952	883	783	709
				Low	942	935	896	868	829	760	651	553
G1D91AU075D12B	1/3	10 x 8	45-75	High	1390	1337	1270	1207	1138	1063	949	858
				Med/Hi	1230	1176	1137	1082	1012	931	838	718
				Med	1008	984	956	912	872	806	722	587
				Low	872	847	834	800	758	690	600	495
G1D91AU075D16C	3/4	12 x 10	35-65	High	1921	1888	1831	1759	1668	1624	1549	1445
				Med/Hi	1750	1720	1682	1661	1625	1494	1397	1327
				Med	1515	1491	1462	1421	1397	1330	1258	1185
				Med/Low	1315	1300	1255	1213	1188	1159	1103	1017
				Low	1033	982	962	652	906	851	804	721
G1D91AU100D16C	3/4	12 x 10	45-75	High	1976	1924	1866	1806	1745	1667	1582	1494
				Med/Hi	1707	1666	1620	1584	1536	1476	1399	1301
				Med	1481	1455	1423	1395	1347	1302	1240	1182
				Med/Low	1260	1239	1217	1184	1139	1098	1047	973
				Low	969	943	911	892	858	791	743	674
G1D91AU100D20C	0.9	12 x 10	45-75	High	2134	2080	1944	1943	1856	1779	1682	1619
				Med/Hi	1973	1932	1902	1832	1763	1672	1571	1520
				Med	1877	1843	1795	1726	1687	1586	1577	1334
				Med/Low	1732	1742	1715	1653	1582	1520	1410	1339
				Low	1633	1586	1555	1504	1462	1385	1308	1250
G1D91AU100D22D	0.9	12 x 10	45-75	High	2395	2330	2260	2185	2112	2024	1965	1844
				Med/Hi	2200	2150	2093	2044	1994	1895	1827	1736
				Med	2053	1996	1963	1913	1860	1799	1712	1605
				Med/Low	1722	1700	1660	1614	1575	1525	1449	1395
				Low	1488	1471	1449	1400	1358	1322	1248	1171
G1D91AU125D20D	0.9	12 x 10	45-75	High	2184	2121	2046	1980	1890	1743	1685	1623
				Med/Hi	2035	1961	1897	1845	1783	1706	1611	1548
				Med	1871	1841	1802	1738	1657	1614	1535	1419
				Med/Low	1725	1685	1642	1613	1567	1486	1385	1342
				Low	1591	1549	1532	1475	1447	1363	1279	1206

* .50 in. W.C. maximum approved external static pressure

Filter Requirements

Airflow Descriptor	Disposal Filters			Permanent Filters		
	Min. Area (sq. in)	Size (in.)	Quantity	Min. Area (sq. in)	Size (in.)	Quantity
12	576	16 x 20	2	288	16 x 20	1
14	672	20 x 20	2	336	20 x 20	1
16	768	20 x 20	2	384	20 x 20	1
20, 22	960	20 x 25	2	480	20 x 25	1

Note: The airflow descriptor is the two digit number following the "D" in the model number, e.g., "20" is the airflow descriptor for model G1D91AU100D20C. Areas and dimensions shown for permanent filters are based on filters rated at 600 feet per minute face velocity. Typical filter sizes are shown; however, any combination of filters whose area equals or exceeds the minimum area shown is satisfactory.

Vent Length Specifications – Maximum

Model	Pipe Size (in.)		
	2	2.5	3
G1D91AU050	60 ft.	90 ft.	90 ft.
G1D91AU075	60 ft.	90 ft.	90 ft.
G1D91AU100	20 ft.	50 ft.	60 ft.
G1D91AU125	NR	50 ft.	60 ft.

Allowance for vent and air intake terminals included in lengths shown. One 90° elbow equals 5' of pipe. Min. length 5' and one elbow not including the vent and air intake terminals.

NR = Not Recommended

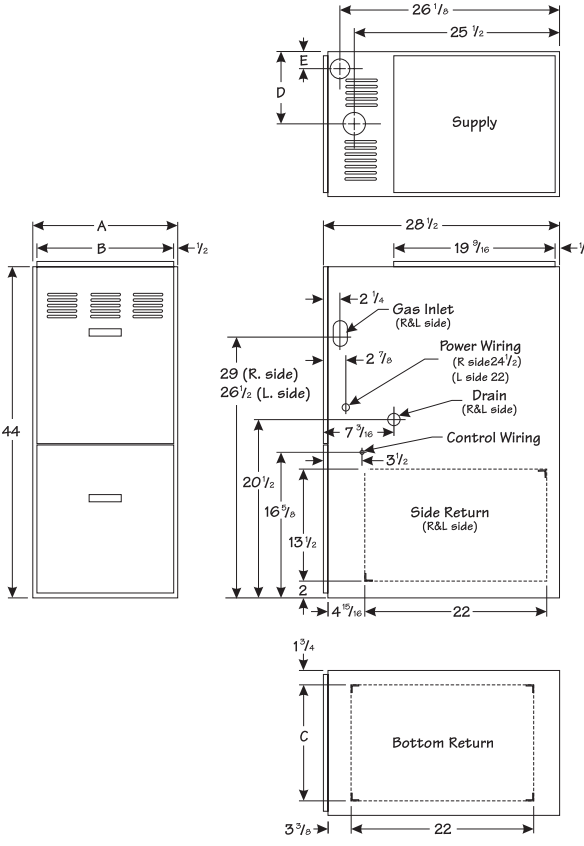
Clearances (in.)

Model	Top	Right Side	Left Side	Front	Back	Vent
G1D91AU050D12B	1	0	0	2	0	0
G1D91AU075D12B						
G1D91AU075D16C						
G1D91AU100D16C						
G1D91AU100D20C						
G1D91AU100D22D						
G1D91AU125D20D						

Dimensions (in.)

G1D91AU

Model	A	B	C	D	E
G1D91AU050D12B	17-1/2	16-1/2	14	10-1/8	2
G1D91AU075D12B	17-1/2	16-1/2	14	11-3/4	2
G1D91AU075D16C	21	20	17-1/2	13-3/8	3-5/8
G1D91AU100D16C	21	20	17-1/2	15	2
G1D91AU100D20C					
G1D91AU100D22D	24-1/2	23-1/2	21	18	2
G1D91AU125D20D					



G1D91BU

Upflow
91% AFUE
Input Range: 50,000 – 125,000 BTUH
Direct Drive Circulating Blower
Motor HP: 1/3, 3/4, 0.9

Physical

Model	Input (Btuh)	Output (Btuh)	AFUE	Nom. Cooling Cap.	Gas Inlet (in.)	Appr. Weight (lbs.)*
G1D91BU050D12B	50,000	45,500	91.0	1.5 - 3.0	1/2	160
G1D91BU075D12B	75,000	68,250	91.0	1.5 - 3.0	1/2	185
G1D91BU075D16C	75,000	68,250	91.0	2.5 - 4.0	1/2	195
G1D91BU100D16C	100,000	91,000	91.0	2.5 - 4.0	1/2	195
G1D91BU100D20C	100,000	91,000	91.0	3.0 - 5.0	1/2	205
G1D91BU100D22D	100,000	91,000	91.0	3.0 - 5.0	1/2	205
G1D91BU125D20D	125,000	113,750	91.0	3.0 - 5.0	1/2	220

* Unit weights based on approximate shipping weight

Electrical

Model	Volts/ Hz/ Ph	Minimum Time Delay Breaker or Fuse	Nominal FLA	Transformer (VA)
G1D91BU050D12B	120/60/1	15	5.4	40
G1D91BU075D12B	120/60/1	15	6.1	40
G1D91BU075D16C	120/60/1	15	7.4	40
G1D91BU100D16C	120/60/1	15	7.2	40
G1D91BU100D20C	120/60/1	15	10.4	40
G1D91BU100D22D	120/60/1	15	9.6	40
G1D91BU125D20D	120/60/1	15	9.6	40

Blower Performance

Model	Motor HP	Blower Size	Temp. Rise	Blower Speed	CFM @ ext. Static Pressure - in. W.C. w/Filter(s)*							
					.20	.30	.40	.50	.60	.70	.80	.90
G1D91BU050D12B	1/3	10 x 8	40-70	High	1354	1307	1253	1200	1120	1060	980	880
				Med/Hi	1087	1075	1044	1010	965	615	840	750
				Med	823	854	840	816	780	738	678	607
				Low	740	730	720	680	665	620	573	500
G1D91BU075D12B	1/3	10 x 8	45-75	High	1390	1337	1270	1207	1138	1063	949	858
				Med/Hi	1230	1176	1137	1082	1012	931	838	718
				Med	1008	984	956	912	872	806	722	587
				Low	872	847	834	800	758	690	600	495
G1D91BU075D16C	3/4	12 x 10	35-65	High	1921	1888	1831	1759	1668	1624	1549	1445
				Med/Hi	1750	1720	1682	1661	1625	1494	1397	1327
				Med	1515	1491	1462	1421	1397	1330	1258	1185
				Med/Low	1315	1300	1255	1213	1188	1159	1103	1017
				Low	1033	982	962	652	906	851	804	721
G1D91BU100D16C	3/4	12 x 10	45-75	High	1976	1924	1866	1806	1745	1667	1582	1494
				Med/Hi	1707	1666	1620	1584	1536	1476	1399	1301
				Med	1481	1455	1423	1395	1347	1302	1240	1182
				Med/Low	1260	1239	1217	1184	1139	1098	1047	973
				Low	969	943	911	892	858	791	743	674
G1D91BU100D20C	0.9	12 x 10	45-75	High	2134	2080	1944	1943	1856	1779	1682	1619
				Med/Hi	1973	1932	1902	1832	1763	1672	1571	1520
				Med	1877	1843	1795	1726	1687	1586	1577	1334
				Med/Low	1732	1742	1715	1653	1582	1520	1410	1339
				Low	1633	1586	1555	1504	1462	1385	1308	1250
G1D91BU100D22D	0.9	12 x 10	45-75	High	2395	2330	2260	2185	2112	2024	1965	1844
				Med/Hi	2200	2150	2093	2044	1994	1895	1827	1736
				Med	2053	1996	1963	1913	1860	1799	1712	1605
				Med/Low	1722	1700	1660	1614	1575	1525	1449	1395
				Low	1488	1471	1449	1400	1358	1322	1248	1171
G1D91BU125D20D	0.9	12 x 10	45-75	High	2184	2121	2046	1980	1890	1743	1685	1623
				Med/Hi	2035	1961	1897	1845	1783	1706	1611	1548
				Med	1871	1841	1802	1738	1657	1614	1535	1419
				Med/Low	1725	1685	1642	1613	1567	1486	1385	1342
				Low	1591	1549	1532	1475	1447	1363	1279	1206

* .50 in. W.C. maximum approved external static pressure

Filter Requirements

Airflow Descriptor	Disposal Filters			Permanent Filters		
	Min. Area (sq. in)	Size (in.)	Quantity	Min. Area (sq. in)	Size (in.)	Quantity
12	576	16 x 20	2	288	16 x 20	1
14	672	20 x 20	2	336	20 x 20	1
16	768	20 x 20	2	384	20 x 20	1
20, 22	960	20 x 25	2	480	20 x 25	1

Note: The airflow descriptor is the two digit number following the "D" in the model number, e.g., "20" is the airflow descriptor for model G1D91BU100D20C. Areas and dimensions shown for permanent filters are based on filters rated at 600 feet per minute face velocity. Typical filter sizes are shown; however, any combination of filters whose area equals or exceeds the minimum area shown is satisfactory.

Vent Length Specifications – Maximum

Model	Pipe Size (in.)		
	2	2.5	3
G1D91BU050	60 ft.	90 ft.	90 ft.
G1D91BU075	60 ft.	90 ft.	90 ft.
G1D91BU100	20 ft.	50 ft.	60 ft.
G1D91BU125	NR	50 ft.	60 ft.

Allowance for vent and air intake terminals included in lengths shown. One 90° elbow equals 5' of pipe. Min. length 5' and one elbow not including the vent and air intake terminals.

NR = Not Recommended

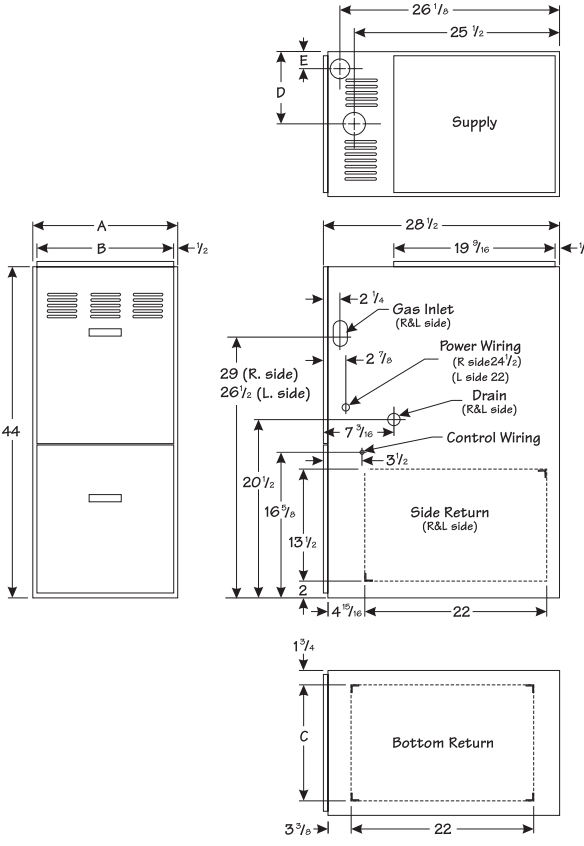
Clearances (in.)

Model	Top	Right Side	Left Side	Front	Back	Vent
G1D91BU050D12B	1	0	0	2	0	0
G1D91BU075D12B						
G1D91BU075D16C						
G1D91BU100D16C						
G1D91BU100D20C						
G1D91BU100D22D						
G1D91BU125D20D						

G1D91BU

Dimensions (in.)

Model	A	B	C	D	E
G1D91BU050D12B	17-1/2	16-1/2	14	10-1/8	2
G1D91BU075D12B	17-1/2	16-1/2	14	11-3/4	2
G1D91BU075D16C	21	20	17-1/2	13-3/8	3-5/8
G1D91BU100D16C	21	20	17-1/2	15	2
G1D91BU100D20C					
G1D91BU100D22D	24-1/2	23-1/2	21	18	2
G1D91BU125D20D					



G1D91BT

Upflow/Horizontal
91% AFUE
Input Range: 50,000 – 125,000 BTUH
Direct Drive Circulating Blower
Motor HP: 1/3, 3/4, 0.9

Physical

Model	Input (Btuh)	Output (Btuh)	AFUE	Nom. Cooling Cap.	Gas Inlet (in.)	Appr. Weight (lbs.)*
G1D91BT050D12B	50,000	45,500	91.0	1.5 - 3.0	1/2	160
G1D91BT075D12B	75,000	68,250	91.0	1.5 - 3.0	1/2	185
G1D91BT075D16C	75,000	68,250	91.0	2.5 - 4.0	1/2	195
G1D91BT100D16C	100,000	91,000	91.0	2.5 - 4.0	1/2	195
G1D91BT100D20C	100,000	91,000	91.0	3.0 - 5.0	1/2	205
G1D91BT125D20C	125,000	113,750	91.0	3.0 - 5.0	1/2	215

* Unit weights based on approximate shipping weight

Electrical

Model	Volts/ Hz/ Ph	Minimum Time Delay Breaker or Fuse	Nominal FLA	Transformer (VA)
G1D91BT050D12B	120/60/1	15	5.4	40
G1D91BT075D12B	120/60/1	15	6.1	40
G1D91BT075D16C	120/60/1	15	7.4	40
G1D91BT100D16C	120/60/1	15	7.2	40
G1D91BT100D20C	120/60/1	15	10.4	40
G1D91BT125D20C	120/60/1	15	10.4	40

Vent Length Specifications – Maximum

Model	Pipe Size (in.)		
	2	2.5	3
G1D91BT050	60 ft.	90 ft.	90 ft.
G1D91BT075	60 ft.	90 ft.	90 ft.
G1D91BT100	20 ft.	50 ft.	60 ft.
G1D91BT125	NR	50 ft.	60 ft.

Allowance for vent and air intake terminals included in lengths shown. One 90° elbow equals 5' of pipe. Min. length 5' and one elbow not including the vent and air intake terminals.

NR = Not Recommended

Blower Performance

Model	Motor HP	Blower Size	Temp. Rise	Blower Speed	CFM @ ext. Static Pressure - in. W.C. w/Filter(s)*							
					.20	.30	.40	.50	.60	.70	.80	.90
G1D91BT050D12B	1/3	10 x 8	40-70	High	1354	1307	1253	1200	1120	1060	980	880
				Med/Hi	1087	1075	1044	1010	965	615	840	750
				Med	823	854	840	816	780	738	678	607
				Low	740	730	720	680	665	620	573	500
G1D91BT075D12B	1/3	10 x 8	45-75	High	1390	1337	1270	1207	1138	1063	949	858
				Med/Hi	1230	1176	1137	1082	1012	931	838	718
				Med	1008	984	956	912	872	806	722	587
				Low	872	847	834	800	758	690	600	495
G1D91BT075D16C	3/4	12 x 10	35-65	High	1921	1888	1831	1759	1668	1624	1549	1445
				Med/Hi	1750	1720	1682	1661	1625	1494	1397	1327
				Med	1515	1491	1462	1421	1397	1330	1258	1185
				Med/Low	1315	1300	1255	1213	1188	1159	1103	1017
				Low	1033	982	962	952	906	851	804	721
G1D91BT100D16C	3/4	12 x 10	45-75	High	1976	1924	1866	1806	1745	1667	1582	1494
				Med/Hi	1707	1666	1620	1584	1536	1476	1399	1301
				Med	1481	1455	1423	1395	1347	1302	1240	1182
				Med/Low	1260	1239	1217	1184	1139	1098	1047	973
				Low	969	943	911	892	858	791	743	674
G1D91BT100D20C	0.9	12 x 10	45-75	High	2134	2080	1944	1943	1856	1779	1682	1619
				Med/Hi	1973	1932	1902	1832	1763	1672	1571	1520
				Med	1877	1843	1795	1726	1687	1586	1577	1334
				Med/Low	1732	1742	1715	1653	1582	1520	1410	1339
				Low	1633	1586	1555	1504	1462	1385	1308	1250
G1D91BT125D20C	0.9	12 x 10	45-75	High	2134	2080	1944	1943	1856	1779	1682	1619
				Med/Hi	1973	1932	1902	1832	1763	1672	1571	1520
				Med	1877	1843	1795	1726	1687	1586	1577	1334
				Med/Low	1732	1742	1715	1653	1582	1520	1410	1339
				Low	1633	1586	1555	1504	1462	1385	1308	1250

* .50 in. W.C. maximum approved external static pressure

Filter Requirements

Airflow Descriptor	Disposal Filters			Permanent Filters		
	Min. Area (sq. in)	Size (in.)	Quantity	Min. Area (sq. in)	Size (in.)	Quantity
12	576	16 x 20	2	288	16 x 20	1
14	672	20 x 20	2	336	20 x 20	1
16	768	20 x 20	2	384	20 x 20	1
20, 22	960	20 x 25	2	480	20 x 25	1

Note: The airflow descriptor is the two digit number following the "D" in the model number, e.g., "20" is the airflow descriptor for model G1D91BT100D20C. Areas and dimensions shown for permanent filters are based on filters rated at 600 feet per minute face velocity. Typical filter sizes are shown; however, any combination of filters whose area equals or exceeds the minimum area shown is satisfactory.

Clearances (in.) *Upflow*

Model	Top	Right Side	Left Side	Front	Back	Vent
G1D91BT050D12B	1	0	0	2	0	0
G1D91BT075D12B	1	0	0	2	0	0
G1D91BT075D16C	1	0	0	2	0	0
G1D91BT100D16C	1	0	0	2	0	0
G1D91BT100D20C	1	0	0	2	0	0
G1D91BT125D20C	1	0	0	2	0	0

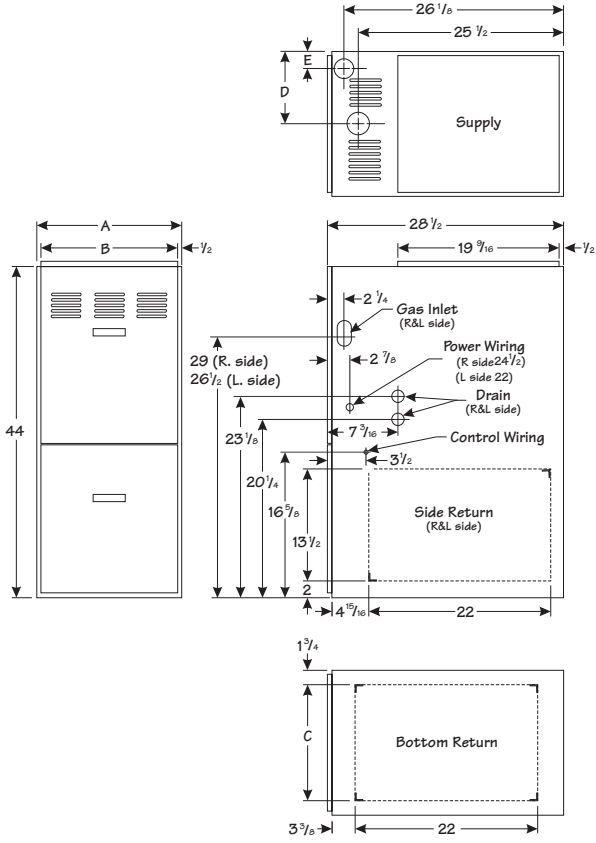
Clearances (in.) *Horizontal*

Model	Top	Right Side	Left Side	Front	Back	Vent
G1D91BT050D12B	1	0	0	2	18	0
G1D91BT075D12B	1	0	0	2	18	0
G1D91BT075D16C	1	0	0	2	18	0
G1D91BT100D16C	1	0	0	2	18	0
G1D91BT100D20C	1	0	0	2	18	0
G1D91BT125D20C	1	0	0	2	18	0

G1D91BT

Dimensions (in.)

Model	A	B	C	D	E
G1D91BT050D12B	17-1/2	16-1/2	14	10-1/8	2
G1D91BT075D12B	17-1/2	16-1/2	14	11-3/4	2
G1D91BT075D16C	21	20	17-1/2	13-3/8	3-5/8
G1D91BT100D16C	21	20	17-1/2	15	2
G1D91BT100D20C					
G1D91BT125D20C	21	20	17-1/2	16-1/2	1-5/8



G1D93AU

Upflow
93% AFUE
Input Range: 45,000 – 112,000 BTUH
Direct Drive Circulating Blower
Motor HP: 1/3, 3/4, 0.9

Physical

Model	Input (Btuh)	Output (Btuh)	AFUE	Nom. Cooling Cap.	Gas Inlet (in.)	Appr. Weight (lbs.)*
G1D93AU045D12B	45,000	42,000	92.5	1.5 - 3.0	1/2	160
G1D93AU067D12B	67,500	63,000	92.5	1.5 - 3.0	1/2	185
G1D93AU067D16C	67,500	63,000	92.5	2.5 - 4.0	1/2	195
G1D93AU090D16C	90,000	84,000	92.5	2.5 - 4.0	1/2	195
G1D93AU090D20C	90,000	84,000	92.5	3.0 - 5.0	1/2	205
G1D93AU112D20D	112,000	104,000	92.5	3.0 - 5.0	1/2	220

* Unit weights based on approximate shipping weight

Electrical

Model	Volts/ Hz/ Ph	Minimum Time Delay Breaker or Fuse	Nominal FLA	Transformer (VA)
G1D93AU045D12B	120/60/1	15	6.1	40
G1D93AU067D12B	120/60/1	15	6.1	40
G1D93AU067D16C	120/60/1	15	7.4	40
G1D93AU090D16C	120/60/1	15	7.2	40
G1D93AU090D20C	120/60/1	15	10.4	40
G1D93AU112D20D	120/60/1	15	9.6	40

Blower Performance

Model	Motor HP	Blower Size	Temp. Rise	Blower Speed	CFM @ ext. Static Pressure - in. W.C. w/Filter(s)*							
					.20	.30	.40	.50	.60	.70	.80	.90
G1D93AU045D12B	1/3	10 x 8	35-65	High	1518	1446	1366	1297	1219	1122	1003	834
				Med/Hi	1340	1298	1234	1182	1101	1018	903	752
				Med	1099	1084	1060	1019	952	883	783	709
				Low	942	935	896	868	829	760	651	553
G1D93AU067D12B	1/3	10 x 8	45-75	High	1390	1337	1270	1207	1138	1063	949	858
				Med/Hi	1230	1176	1137	1082	1012	931	838	718
				Med	1008	984	956	912	872	806	722	587
				Low	872	847	834	800	758	690	600	495
G1D93AU067D16C	3/4	12 x 10	35-65	High	1921	1888	1831	1759	1668	1624	1549	1445
				Med/Hi	1750	1720	1682	1661	1625	1494	1397	1327
				Med	1515	1491	1462	1421	1397	1330	1258	1185
				Med/Low	1315	1300	1255	1213	1188	1159	1103	1017
				Low	1033	982	962	652	906	851	804	721
G1D93AU090D16C	3/4	12 x 10	45-75	High	1976	1924	1866	1806	1745	1667	1582	1494
				Med/Hi	1707	1666	1620	1584	1536	1476	1399	1301
				Med	1481	1455	1423	1395	1347	1302	1240	1182
				Med/Low	1260	1239	1217	1184	1139	1098	1047	973
				Low	969	943	911	892	858	791	743	674
G1D93AU090D20C	0.9	12 x 10	40-70	High	2134	2080	1944	1943	1856	1779	1682	1619
				Med/Hi	1973	1932	1902	1832	1763	1672	1571	1520
				Med	1877	1843	1795	1726	1687	1586	1577	1334
				Med/Low	1732	1742	1715	1653	1582	1520	1410	1339
				Low	1633	1586	1555	1504	1462	1385	1308	1250
G1D93AU112D20D	0.9	12 x 10	40-70	High	2184	2121	2046	1980	1890	1743	1685	1623
				Med/Hi	2035	1961	1897	1845	1783	1706	1611	1548
				Med	1871	1841	1802	1738	1657	1614	1535	1419
				Med/Low	1725	1685	1642	1613	1567	1486	1385	1342
				Low	1591	1549	1532	1475	1447	1363	1279	1206

* .50 in. W.C. maximum approved external static pressure

Filter Requirements

Airflow Descriptor	Disposal Filters			Permanent Filters		
	Min. Area (sq. in)	Size (in.)	Quantity	Min. Area (sq. in)	Size (in.)	Quantity
12	576	16 x 20	2	288	16 x 20	1
14	672	20 x 20	2	336	20 x 20	1
16	768	20 x 20	2	384	20 x 20	1
20	960	20 x 25	2	480	20 x 25	1

Note: The airflow descriptor is the two digit number following the "D" in the model number, e.g., "20" is the airflow descriptor for model G1D93AU090D20C. Areas and dimensions shown for permanent filters are based on filters rated at 600 feet per minute face velocity. Typical filter sizes are shown; however, any combination of filters whose area equals or exceeds the minimum area shown is satisfactory.

Vent Length Specifications – Maximum

Model	Pipe Size (in.)		
	2	2.5	3
G1D93AU045	60 ft.	90 ft.	90 ft.
G1D93AU067	60 ft.	90 ft.	90 ft.
G1D93AU090	60 ft.	90 ft.	90 ft.
G1D93AU112	NR	50 ft.	60 ft.

Allowance for vent and air intake terminals included in lengths shown. One 90° elbow equals 5' of pipe. Min. length 5' and one elbow not including the vent and air intake terminals.

NR = Not Recommended

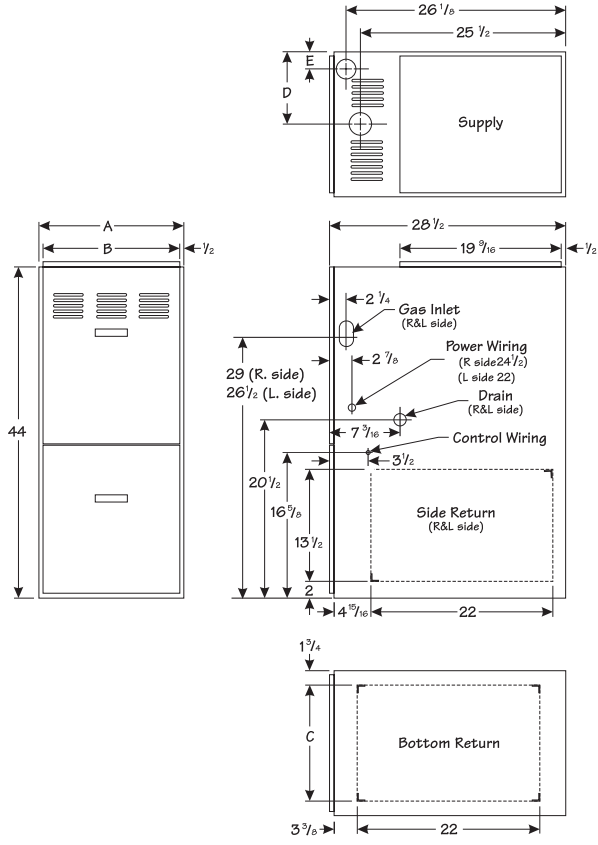
Clearances (in.)

Model	Top	Right Side	Left Side	Front	Back	Vent
G1D93AU045D12B	1	0	0	2	0	0
G1D93AU067D12B						
G1D93AU067D16C						
G1D93AU090D16C						
G1D93AU090D20C						
G1D93AU112D20D						

Dimensions (in.)

G1D93AU

Model	A	B	C	D	E
G1D93AU045D12B	17-1/2	16-1/2	14	10-1/8	2
G1D93AU067D12B	17-1/2	16-1/2	14	11-5/8	2
G1D93AU067D16C	21	20	17-1/2	13-3/8	3-5/8
G1D93AU090D16C	21	20	17-1/2	14-5/8	2
G1D93AU090D20C					
G1D93AU112D20D	24-1/2	23-1/2	21	18	2



G1D93BU

Upflow
93% AFUE
Input Range: 45,000 – 112,000 BTUH
Direct Drive Circulating Blower
Motor HP: 1/3, 3/4, 0.9

Physical

Model	Input (Btuh)	Output (Btuh)	AFUE	Nom. Cooling Cap.	Gas Inlet (in.)	Appr. Weight (lbs.)*
G1D93BU045D12B	45,000	42,000	92.5	1.5 - 3.0	1/2	160
G1D93BU067D12B	67,500	63,000	92.5	1.5 - 3.0	1/2	185
G1D93BU067D16C	67,500	63,000	92.5	2.5 - 4.0	1/2	195
G1D93BU090D16C	90,000	84,000	92.5	2.5 - 4.0	1/2	195
G1D93BU090D20C	90,000	84,000	92.5	3.0 - 5.0	1/2	205
G1D93BU112D20D	112,000	104,000	92.5	3.0 - 5.0	1/2	220

* Unit weights based on approximate shipping weight

Electrical

Model	Volts/ Hz/ Ph	Minimum Time Delay Breaker or Fuse	Nominal FLA	Transformer (VA)
G1D93BU045D12B	120/60/1	15	5.4	40
G1D93BU067D12B	120/60/1	15	6.1	40
G1D93BU067D16C	120/60/1	15	7.4	40
G1D93BU090D16C	120/60/1	15	7.2	40
G1D93BU090D20C	120/60/1	15	10.4	40
G1D93BU112D20D	120/60/1	15	9.6	40

Blower Performance

Model	Motor HP	Blower Size	Temp. Rise	Blower Speed	CFM @ ext. Static Pressure - in. W.C. w/Filter(s)*							
					.20	.30	.40	.50	.60	.70	.80	.90
G1D93BU045D12B	1/3	10 x 8	35-65	High	1354	1307	1253	1200	1120	1060	980	880
				Med/Hi	1087	1075	1044	1010	965	615	840	750
				Med	823	854	840	816	780	738	678	607
				Low	740	730	720	680	665	620	573	500
G1D93BU067D12B	1/3	10 x 8	45-75	High	1390	1337	1270	1207	1138	1063	949	858
				Med/Hi	1230	1176	1137	1082	1012	931	838	718
				Med	1008	984	956	912	872	806	722	587
				Low	872	847	834	800	758	690	600	495
G1D93BU067D16C	3/4	12 x 10	35-65	High	1921	1888	1831	1759	1668	1624	1549	1445
				Med/Hi	1750	1720	1682	1661	1625	1494	1397	1327
				Med	1515	1491	1462	1421	1397	1330	1258	1185
				Med/Low	1315	1300	1255	1213	1188	1159	1103	1017
				Low	1033	982	962	952	906	851	804	721
G1D93BU090D16C	3/4	12 x 10	45-75	High	1976	1924	1866	1806	1745	1667	1582	1494
				Med/Hi	1707	1666	1620	1584	1536	1476	1399	1301
				Med	1481	1455	1423	1395	1347	1302	1240	1182
				Med/Low	1260	1239	1217	1184	1139	1098	1047	973
				Low	969	943	911	892	858	791	743	674
G1D93BU090D20C	0.9	12 x 10	40-70	High	2134	2080	1944	1943	1856	1779	1682	1619
				Med/Hi	1973	1932	1902	1832	1763	1672	1571	1520
				Med	1877	1843	1795	1726	1687	1586	1577	1334
				Med/Low	1732	1742	1715	1653	1582	1520	1410	1339
				Low	1633	1586	1555	1504	1462	1385	1308	1250
G1D93BU112D20D	0.9	12 x 10	40-70	High	2184	2121	2046	1980	1890	1743	1685	1623
				Med/Hi	2035	1961	1897	1845	1783	1706	1611	1548
				Med	1871	1841	1802	1738	1657	1614	1535	1419
				Med/Low	1725	1685	1642	1613	1567	1486	1385	1342
				Low	1591	1549	1532	1475	1447	1363	1279	1206

* .50 in. W.C. maximum approved external static pressure

Filter Requirements

Airflow Descriptor	Disposal Filters			Permanent Filters		
	Min. Area (sq. in)	Size (in.)	Quantity	Min. Area (sq. in)	Size (in.)	Quantity
12	576	16 x 20	2	288	16 x 20	1
14	672	20 x 20	2	336	20 x 20	1
16	768	20 x 20	2	384	20 x 20	1
20	960	20 x 25	2	480	20 x 25	1

Note: The airflow descriptor is the two digit number following the "D" in the model number, e.g., "20" is the airflow descriptor for model G1D93BU090D20C. Areas and dimensions shown for permanent filters are based on filters rated at 600 feet per minute face velocity. Typical filter sizes are shown; however, any combination of filters whose area equals or exceeds the minimum area shown is satisfactory.

Vent Length Specifications – Maximum

Model	Pipe Size (in.)		
	2	2.5	3
G1D93BU045	60 ft.	90 ft.	90 ft.
G1D93BU067	60 ft.	90 ft.	90 ft.
G1D93BU090	20 ft.	50 ft.	60 ft.
G1D93BU112	NR	50 ft.	60 ft.

Allowance for vent and air intake terminals included in lengths shown. One 90° elbow equals 5' of pipe. Min. length 5' and one elbow not including the vent and air intake terminals.

NR = Not Recommended

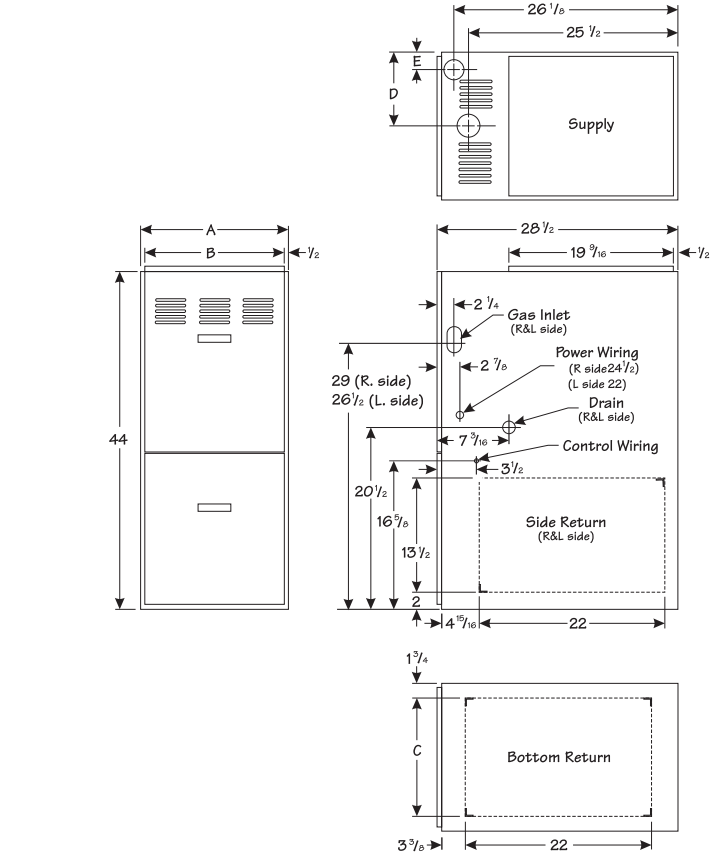
Clearances (in.)

Model	Top	Right Side	Left Side	Front	Back	Vent
G1D93BU045D12B	1	0	0	2	0	0
G1D93BU067D12B						
G1D93BU067D16C						
G1D93BU090D16C						
G1D93BU090D20C						
G1D93BU112D20D						

Dimensions (in.)

G1D93BU

Model	A	B	C	D	E
G1D93BU045D12B	17-1/2	16-1/2	14	10-1/8	2
G1D93BU067D12B	17-1/2	16-1/2	14	11-5/8	2
G1D93BU067D16C	21	20	17-1/2	13-3/8	3-5/8
G1D93BU090D16C	21	20	17-1/2	14-5/8	2
G1D93BU090D20C					
G1D93BU112D20D	24-1/2	23-1/2	21	18	2



G1D93AC

Counterflow
93% AFUE
Input Range: 45,000 – 112,000 BTUH
Direct Drive Circulating Blower
Motor HP: 1/3, 3/4, 0.9

Physical

Model	Input (Btuh)	Output (Btuh)	AFUE	Nom. Cooling Cap.	Gas Inlet (in.)	Appr. Weight (lbs.)*
G1D93AC045D12B	45,000	42,000	92.5	1.5 - 3.0	1/2	150
G1D93AC067D12B	67,500	63,000	92.5	1.5 - 3.0	1/2	180
G1D93AC067D16C	67,500	63,000	92.5	2.5 - 4.0	1/2	180
G1D93AC090D16C	90,000	84,000	92.5	2.5 - 4.0	1/2	190
G1D93AC090D20C	90,000	84,000	92.5	3.0 - 5.0	1/2	190
G1D93AC112D20D	112,000	104,000	92.5	3.0 - 5.0	1/2	215

* Unit weights based on approximate shipping weight

Electrical

Model	Volts/ Hz/ Ph	Minimum Time Delay Breaker or Fuse	Nominal FLA	Transformer (VA)
G1D93AC045D12B	120/60/1	15	5.9	40
G1D93AC067D12B	120/60/1	15	5.9	40
G1D93AC067D16C	120/60/1	15	6.9	40
G1D93AC090D16C	120/60/1	15	6.9	40
G1D93AC090D20C	120/60/1	15	8.8	40
G1D93AC112D20D	120/60/1	15	8.8	40

Blower Performance

Model	Motor HP	Blower Size	Temp. Rise	Blower Speed	CFM @ ext. Static Pressure - in. W.C. w/Filter(s)*							
					.20	.30	.40	.50	.60	.70	.80	.90
G1D93AC045D12B	1/3	10 x 8	35-65	High	1342	1285	1236	1170	1098	1027	927	819
				Med/Hi	1084	1053	1031	982	929	868	805	710
				Med	866	845	816	798	754	711	645	548
				Low	736	709	685	653	624	571	506	410
G1D93AC067D12B	1/3	10 x 8	45-75	High	1358	1303	1229	1164	1082	1004	946	849
				Med/Hi	1268	1212	1153	1087	1019	956	901	824
				Med	1063	1029	990	943	890	842	771	678
				Low	896	873	846	816	793	740	689	599
G1D93AC067D16C	3/4	12 x 10	35-65	High	1901	1815	1751	1599	1558	1531	1462	1352
				Med/Hi	1713	1696	1620	1585	1496	1459	1387	1303
				Med	1598	1569	1484	1473	1435	1365	1282	1218
				Med/Low	1358	1319	1287	1256	1211	1162	1108	1026
				Low	1059	1035	1015	974	934	864	801	739
G1D93AC090D16C	3/4	12 x 10	35-65	High	2038	1964	1895	1815	1735	1652	1539	1450
				Med/Hi	1799	1752	1700	1625	1554	1477	1394	1303
				Med	1603	1569	1534	1459	1401	1355	1287	1204
				Med/Low	1337	1312	1271	1221	1180	1141	1093	1023
				Low	1045	1020	987	956	912	871	806	735
G1D93AC090D20C	0.9	12 x 10	40-70	High	2116	2014	1908	1821	1719	1628	1532	1391
				Med/Hi	2002	1929	1861	1811	1726	1625	1546	1426
				Med	1908	1846	1790	1707	1645	1540	1466	1232
				Med/Low	1704	1650	1559	1509	1400	1302	1230	1150
				Low	1491	1422	1322	1304	1241	1175	1074	983
G1D93AC112D20D	0.9	12 x 10	40-70	High	2116	2014	1908	1821	1719	1628	1532	1391
				Med/Hi	2002	1929	1861	1811	1726	1625	1546	1426
				Med	1908	1846	1790	1707	1645	1540	1466	1232
				Med/Low	1704	1650	1559	1509	1400	1302	1230	1150
				Low	1491	1422	1322	1304	1241	1175	1074	983

* .50 in. W.C. maximum approved external static pressure

Filter Requirements

Airflow Descriptor	Disposal Filters			Permanent Filters		
	Min. Area (sq. in)	Size (in.)	Quantity	Min. Area (sq. in)	Size (in.)	Quantity
12	576	16 x 20	2	288	16 x 20	1
14	672	20 x 20	2	336	20 x 20	1
16	768	20 x 20	2	384	20 x 20	1
20	960	20 x 25	2	480	20 x 25	1

Note: The airflow descriptor is the two digit number following the "D" in the model number, e.g., "20" is the airflow descriptor for model G1D93AC090D20C. Areas and dimensions shown for permanent filters are based on filters rated at 600 feet per minute face velocity. Typical filter sizes are shown; however, any combination of filters whose area equals or exceeds the minimum area shown is satisfactory.

Vent Length Specifications – Maximum

Model	Pipe Size (in.)		
	2	2.5	3
G1D93AC045	60 ft.	90 ft.	90 ft.
G1D93AC067	60 ft.	90 ft.	90 ft.
G1D93AC090	60 ft.	90 ft.	90 ft.
G1D93AC112	NR	50 ft.	60 ft.

Allowance for vent and air intake terminals included in lengths shown. One 90° elbow equals 5' of pipe. Min. length 5' and one elbow not including the vent and air intake terminals.

NR = Not Recommended

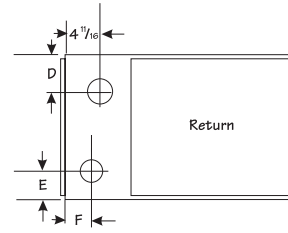
Clearances (in.)

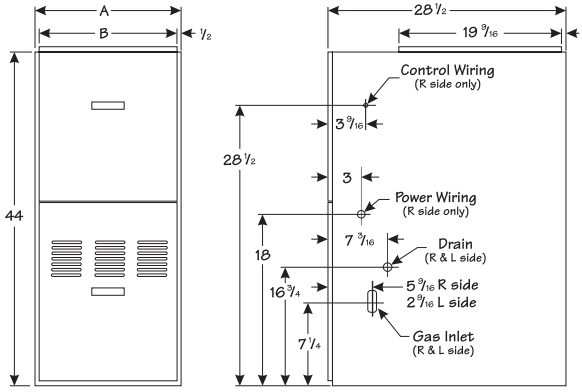
Model	Top	Right Side	Left Side	Front	Back	Vent
G1D93AC045D12B	1	0	0	2	0	0
G1D93AC067D12B						
G1D93AC067D16C						
G1D93AC090D16C						
G1D93AC090D20C						
G1D93AC112D20D						

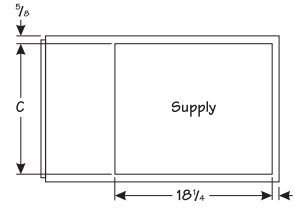
Dimensions (in.)

G1D93AC

Model	A	B	C	D	E	F
G1D93AC045D12B	17-1/2	16-1/2	16-1/4	3-11/16	4-1/2	3
G1D93AC067D12B						
G1D93AC067D16C	21	20	19-3/4	5-11/16	6-1/4	3
G1D93AC090D16C						
G1D93AC090D20C						
G1D93AC112D20D	24-1/2	23-1/2	23-1/4	4-11/16	6-3/8	3-5/16







G1D93BC

Counterflow
93% AFUE
Input Range: 45,000 – 112,000 BTUH
Direct Drive Circulating Blower
Motor HP: 1/3, 3/4, 0.9

Physical

Model	Input (Btuh)	Output (Btuh)	AFUE	Nom. Cooling Cap.	Gas Inlet (in.)	Appr. Weight (lbs.)*
G1D93BC045D12B	45,000	42,000	92.5	1.5 - 3.0	1/2	150
G1D93BC067D12B	67,500	63,000	92.5	1.5 - 3.0	1/2	180
G1D93BC067D16C	67,500	63,000	92.5	2.5 - 4.0	1/2	180
G1D93BC090D16C	90,000	84,000	92.5	2.5 - 4.0	1/2	190
G1D93BC090D20C	90,000	84,000	92.5	3.0 - 5.0	1/2	190
G1D93BC112D20D	112,000	104,000	92.5	3.0 - 5.0	1/2	215

* Unit weights based on approximate shipping weight

Electrical

Model	Volts/ Hz/ Ph	Minimum Time Delay Breaker or Fuse	Nominal FLA	Transformer (VA)
G1D93BC045D12B	120/60/1	15	5.9	40
G1D93BC067D12B	120/60/1	15	5.9	40
G1D93BC067D16C	120/60/1	15	6.9	40
G1D93BC090D16C	120/60/1	15	6.9	40
G1D93BC090D20C	120/60/1	15	8.8	40
G1D93BC112D20D	120/60/1	15	8.8	40

Blower Performance

Model	Motor HP	Blower Size	Temp. Rise	Blower Speed	CFM @ ext. Static Pressure - in. W.C. w/Filter(s)*							
					.20	.30	.40	.50	.60	.70	.80	.90
G1D93BC045D12B	1/3	10 x 8	35-65	High	1342	1285	1236	1170	1098	1027	927	819
				Med/Hi	1084	1053	1031	982	929	868	805	710
				Med	866	845	816	798	754	711	645	548
				Low	736	709	685	653	624	571	506	410
G1D93BC067D12B	1/3	10 x 8	45-75	High	1358	1303	1229	1164	1082	1004	946	849
				Med/Hi	1268	1212	1153	1087	1019	956	901	824
				Med	1063	1029	990	943	890	842	771	678
				Low	896	873	846	816	793	740	689	599
G1D93BC067D16C	3/4	12 x 10	35-65	High	1901	1815	1751	1599	1558	1531	1462	1352
				Med/Hi	1713	1696	1620	1585	1496	1459	1387	1303
				Med	1598	1569	1484	1473	1435	1365	1282	1218
				Med/Low	1358	1319	1287	1256	1211	1162	1108	1026
				Low	1059	1035	1015	974	934	864	801	739
G1D93BC090D16C	3/4	12 x 10	35-65	High	2038	1964	1895	1815	1735	1652	1539	1450
				Med/Hi	1799	1752	1700	1625	1554	1477	1394	1303
				Med	1603	1569	1534	1459	1401	1355	1287	1204
				Med/Low	1337	1312	1271	1221	1180	1141	1093	1023
				Low	1045	1020	987	956	912	871	806	735
G1D93BC090D20C	0.9	12 x 10	40-70	High	2116	2014	1908	1821	1719	1628	1532	1391
				Med/Hi	2002	1929	1861	1811	1726	1625	1546	1426
				Med	1908	1846	1790	1707	1645	1540	1466	1232
				Med/Low	1704	1650	1559	1509	1400	1302	1230	1150
				Low	1491	1422	1322	1304	1241	1175	1074	983
G1D93BC112D20D	0.9	12 x 10	40-70	High	2116	2014	1908	1821	1719	1628	1532	1391
				Med/Hi	2002	1929	1861	1811	1726	1625	1546	1426
				Med	1908	1846	1790	1707	1645	1540	1466	1232
				Med/Low	1704	1650	1559	1509	1400	1302	1230	1150
				Low	1491	1422	1322	1304	1241	1175	1074	983

* .50 in. W.C. maximum approved external static pressure

Filter Requirements

Airflow Descriptor	Disposal Filters			Permanent Filters		
	Min. Area (sq. in)	Size (in.)	Quantity	Min. Area (sq. in)	Size (in.)	Quantity
12	576	16 x 20	2	288	16 x 20	1
14	672	20 x 20	2	336	20 x 20	1
16	768	20 x 20	2	384	20 x 20	1
20	960	20 x 25	2	480	20 x 25	1

Note: The airflow descriptor is the two digit number following the "D" in the model number, e.g., "20" is the airflow descriptor for model G1D93BC090D20C. Areas and dimensions shown for permanent filters are based on filters rated at 600 feet per minute face velocity. Typical filter sizes are shown; however, any combination of filters whose area equals or exceeds the minimum area shown is satisfactory.

Vent Length Specifications – Maximum

Model	Pipe Size (in.)		
	2	2.5	3
G1D93BC045	60 ft.	90 ft.	90 ft.
G1D93BC067	60 ft.	90 ft.	90 ft.
G1D93BC090	20 ft.	50 ft.	60 ft.
G1D93BC112	NR	50 ft.	60 ft.

Allowance for vent and air intake terminals included in lengths shown. One 90° elbow equals 5' of pipe. Min. length 5' and one elbow not including the vent and air intake terminals.

NR = Not Recommended

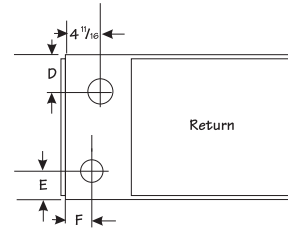
Clearances (in.)

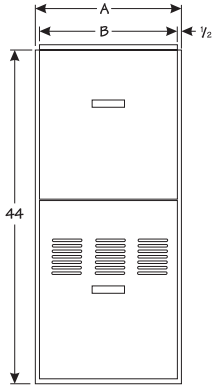
Model	Top	Right Side	Left Side	Front	Back	Vent
G1D93BC045D12B	1	0	0	2	0	0
G1D93BC067D12B						
G1D93BC067D16C						
G1D93BC090D16C						
G1D93BC090D20C						
G1D93BC112D20D						

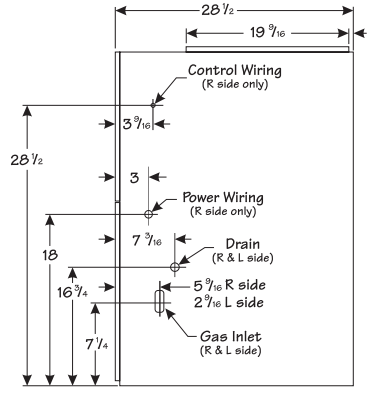
Dimensions (in.)

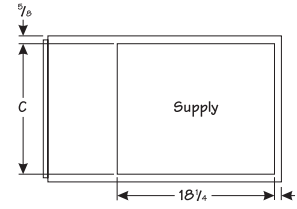
G1D93BC

Model	A	B	C	D	E	F
G1D93BC045D12B	17-1/2	16-1/2	16-1/4	3-11/16	4-1/2	3
G1D93BC067D12B						
G1D93BC067D16C	21	20	19-3/4	5-11/16	6-1/4	3
G1D93BC090D16C						
G1D93BC090D20C						
G1D93BC112D20D	24-1/2	23-1/2	23-1/4	4-11/16	6-3/8	3-5/16









Section 2 – Sequence of Operation

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G1D91/93A (U,C) Units: HSI Ignition System w/Honeywell Smart Valve II "Blue Sentry"

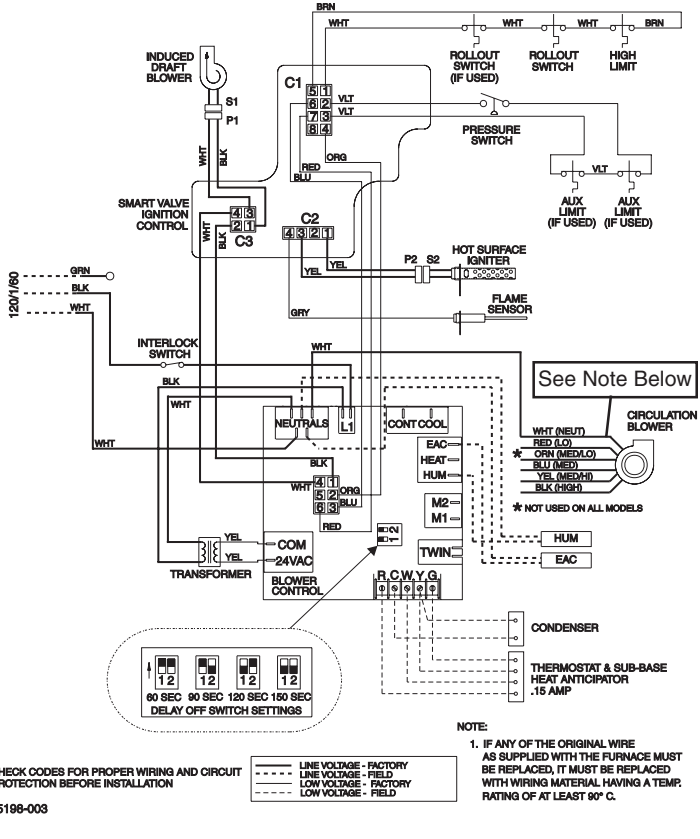


Figure 2-1 Connection Diagram 45198-003

Note: Blower speeds are adjustable and must be set for proper heat rise and cooling CFM. Adjust speeds by connecting correct motor lead to HEAT or COOL terminals. To run same speed in heat and cool modes, install jumper between HEAT and COOL terminals. Only connect one motor lead to HEAT terminal and none to COOL terminal when jumper wire is used.

Simplified Sequence – A Series Units (Refer to Figure 2-1)

HEAT CALL

1. The thermostat sends a 24-volt signal to blower control board terminal W, which is then sent to the gas valve.
2. The valve will start the induced draft blower, causing the negative pressure switch to close.
3. The 24-volt pressure switch signal is sent to the gas valve, initiating the 15-second pre-purge period.
4. The gas valve energizes the igniter with 120 volts. When the igniter reaches its working temperature in approximately 7 seconds, the valve opens, allowing gas to flow to the burners.
5. After ignition, the flame is sensed. A 12-volt signal is sent to the blower control board, starting the circulating blower 30-second “on” delay.
6. Operation continues until the call for heat is satisfied, at which time the gas valve closes.
7. Several seconds later, the induced draft blower shuts down (post-purge).
8. The circulating air blower turns off after the blower “off” delay (adjustable).

COOLING CALL

1. The thermostat sends a 24-volt signal to the Y terminal on the blower control board, energizing the circulating blower 7-second “on” delay.
2. The circulating air blower starts and continues to run until the thermostat is satisfied.
3. When the cooling call is satisfied, the blower is de-energized after a 60-second “off” delay.

FAN ONLY CALL

1. The thermostat sends a 24-volt signal to the blower control board, causing the circulating air blower to start in heat speed.
2. The fan operates until the thermostat fan switch is moved to the OFF or AUTO position. This causes the circulating air blower to be de-energized.

Note: If the unit is set up for continuous fan operation, there is a brief interruption in blower operation when the thermostat calls for heating or cooling.

Detailed Sequence – A Series Units (Refer to Figure 2-1 on page 2-2)

POWER – STANDBY MODE (NO THERMOSTAT CALLS)

Line Voltage

1. Line voltage from the furnace junction box is sent to the door interlock switch.
2. With the blower compartment door in place, the switch closes, sending power to the L1 terminals on the blower control board.
3. Line voltage is supplied to the primary side of the transformer from the L1 terminal on the blower control board.
4. Neutral for the primary side of the transformer is connected to the NEUTRAL terminal of the blower control board.
5. Neutral from the junction box is attached to the neutral terminal on the blower control board.
6. Line voltage is present at pin 1 on the 6-pin molex connector on the blower control board.
7. From pin 1 on the board, line voltage is sent to pin 2 of the C3 connector on the gas valve.
8. Line voltage is also present at the CONT terminal on the blower control board.

Low Voltage

1. 24VAC from the secondary side of the transformer is routed to the blower control board terminals marked 24VAC and COM.
2. Blower control board: 24VAC at R terminal and pin 6 of the 6-pin molex connector. 12VAC is present at pin 2 of the molex connector.
3. Gas valve: 24VAC is sent to plug C1 pins 7 and 3. 12VAC is present at pins 1, 2, and 5. C1 pin 7 is 24VAC standby power. C1 pin 6 is 24VAC common standby.
4. 24VAC is available at terminals R and C of the blower control board. R is power to the thermostat. C is common for an outdoor condenser or power stealing thermostat.

SMART VALVE II "BLUE SENTRY" GAS VALVE

In standby mode, the gas valve LED flashes at a steady rate (bright-dim). This indicates normal operation – no faults detected. If a fault occurs, the LED will flash a code to indicate the type of fault detected. Refer to the fault codes found in Table 2-1 on page 2-9.

If the gas valve is switched off during a call for heat, the LED

will flash to indicate a failed pressure switch circuit.

The Smart Valve II "Blue Sentry" gas valve and 120V hot surface igniter are polarity sensitive. If the gas valve senses reversed polarity, a fault code will be displayed by the LED. The burners may ignite but will shut off as soon as the igniter de-energizes.

BLOWER CONTROL BOARD

The Ultra V series of furnaces are equipped with either a four- or five-speed circulating air blower. On four-speed models, the board has enough terminals to hold the extra blower motor leads. On units equipped with five-speed motors, there is one extra motor lead that does not have a location on the board. This lead is left in the wire bundle coming from the blower motor. This is normal; the lead does not need to be connected to the board.

SAFETY CIRCUIT STANDBY MODE

The safety circuit is always energized when there is power to the unit. The safety circuit remains energized at all times.

24VAC from pin 6 of the blower control board molex connector is supplied to pin 7 of plug C1 on the gas valve. 12VAC is sent from pin 5 of C1 connector to the high limit and rollout switch(es). 12VAC is sent from pin 1 of plug C1 to the limit and rollout switch(es). This completes the limit safety circuit, which operates as a shunt circuit.

If at any time the high limit or rollout switch(es) open, the 12VAC shunt circuit between pins 1 and 5 of plug C1 is interrupted and the gas valve will immediately shut down. The circulating air blower and induced draft blower will continue to operate whether or not there is a call from the thermostat.

The diagnostic LED on the gas valve will flash a code indicating a failure in the safety circuit. Refer to Table 2-1 on page 2-9 to determine the failure indicated.

When the safety circuit is restored, and if W is still energized at the blower control board, the valve will again make a trial for ignition. The gas valve LED will return to the steady flash (bright-dim). The unit operation will return to normal. If W is not energized after the safety circuit is restored, the induced draft blower will shut down after the normal 5-second post-purge period. The circulating air blower will time off as if at the end of a normal heat call.

AUXILIARY LIMIT

An auxiliary limit is used on all counterflow and horizontal furnaces. It is located in the blower compartment, mounted to the blower housing. This limit is circuited in series with the pressure switch. Auxiliary limit switches are Normally Closed auto reset switches.

The auxiliary limits are connected to a shunt circuit between pins 2 and 3 of plug C1. When a call for heat is energized, 12VAC is sent from pins 2 and 3 to the auxiliary limits and pressure switch.

If the switch opens due to high blower compartment temperature, the gas valve will not energize until the switch resets. The gas valve LED will flash a fault code indicating the auxiliary limit is stuck open. The auxiliary limit does not affect cooling operation and it will not energize the blowers unless there is a call from the thermostat (see the fault code table on page 2-9).

HEAT CALL

A call for heat closes the circuit from R to W in the thermostat. A 24-volt signal is sent to the blower control board, energizing the W terminal. 12 volts is sent to pin 2 of the 6-pin molex connector on the blower control board. The 12-volt signal then goes to pin 4 of plug C1 on the gas valve.

The gas valve closes an internal relay, sending 120 volts from pin 2 of plug C3 to pin 1 of plug C3. This starts the induced draft blower. 12VAC is then supplied to one side of the Normally Open pressure switch from pin 3 of plug C1 and to the other side of the pressure switch from pin 2 of plug C1. When the induced draft blower has created enough negative pressure, the pressure switch closes. This completes the 12VAC shunt circuit between pins 2 and 3 of plug C1.

After a 15-second pre-purge, the valve energizes pin 1 of plug C2. This sends 120 volts to the igniter. After approximately 7 seconds of igniter warm-up, the gas valve opens, allowing gas to flow to the main burners. Once the main burners have ignited, a flame sensing micro-amp signal (approximately 1.0 – 3.0 micro-amps) is sent to pin 4 of plug C2. Ground to the chassis of the furnace is essential for proper flame sensing (see Note 1 for further details).

Once flame sense is established, a 12-volt signal is sent from the gas valve to the blower control board from pin 4 of plug C1 to pin 2 of the 6-pin molex connector on the blower control board (see Note 2). This closes the heat speed blower relay after a 30-second blower “on” delay (see Note 3).

The furnace will continue to operate until the call for heat is satisfied and the R – W circuit is opened. This interrupts the 24-volt signal to the W terminal on the blower control board and the 12-volt signal from pin 2 of the 6-pin molex connector. The gas valve closes immediately and, after a 5-second post-purge, the induced draft blower stops. After the blower “off” delay (see Note 4), the blower control board shuts down the circulation air blower by de-energizing the HEAT speed blower relay.

Notes

1. If the flame sense signal is lost due to the loss of sustained

flame at any time during the heating cycle, the gas valve will immediately shut down. The induced draft blower will go through its normal post-purge, after which the gas valve will initiate another ignition sequence. The gas valve will make four trials for ignition then go into a soft-lockout. The gas valve will make another trial for ignition approximately 60 minutes later.

2. *This system sends 12-volt signals to and from the board and gas valve through the orange wire during a call for heat.*

3. *When the heat speed blower relay energizes, 120 volts is sent to the HUM humidifier terminal and EAC electronic air cleaner terminal. These terminals are located on either side of the HEAT terminal.*

4. *Blower "off" delay can be adjusted (60, 90, 120, or 150 seconds) on the blower control board by changing the DIP switch settings on the fan timer.*

COOLING CALL

A call for cooling closes the circuit from R to Y in the thermostat, sending a 24-volt signal to the Y terminal on the blower control board.

The blower control board energizes the COOL speed relay after a 7-second blower "on" delay. This energizes the circulation air blower motor causing it to run the cool speed*.

The furnace will continue to operate in the cool mode until the call for cooling is satisfied and the thermostat opens the R – Y circuit. This de-energizes the Y terminal on the board, causing the COOL speed blower relay to de-energize after a 60-second (non-adjustable) "off" delay.

* *At the same time the cooling speed terminal energizes, the EAC terminal also energizes. The EAC terminal is energized any time there is a heating call or cooling call from the thermostat.*

FAN ON

When the switch on the thermostat is moved to the "FAN ON" position, the circuit between R and G is completed. This sends a 24-volt signal to the G terminal on the blower control board.

When the G terminal energizes, the board immediately closes the HEAT speed relay, energizing the circulating air blower motor. The blower continues to operate as long as the G terminal is energized*.

When the fan switch is moved to the "AUTO" position, the circuit between R and G opens. The G terminal on the blower control board de-energizes, causing the HEAT speed relay to open immediately, shutting down the circulating air blower.

* *When the G terminal energizes, line voltage is sent to the HEAT speed terminal and the EAC*

terminal. Both terminals remain energized as long as there is a call from the thermostat to G terminal.

CONTINUOUS FAN

The blower control board has a terminal next to the COOL speed terminal that is marked CONT. This terminal is always energized with line voltage when there is no call from the thermostat. If continuous fan operation is desired, the LOW SPEED lead of the circulating air blower motor can be connected to this terminal. On a call for heat, cooling, or fan from the thermostat, the blower control board will de-energize the continuous fan terminal and switch to energize the fan speed that is required for the thermostat call.

⚠ CAUTION

The constant air terminal is intended for low speed only. Higher speeds have greater electrical loads which may overload the CONT terminal causing a blower control board failure.

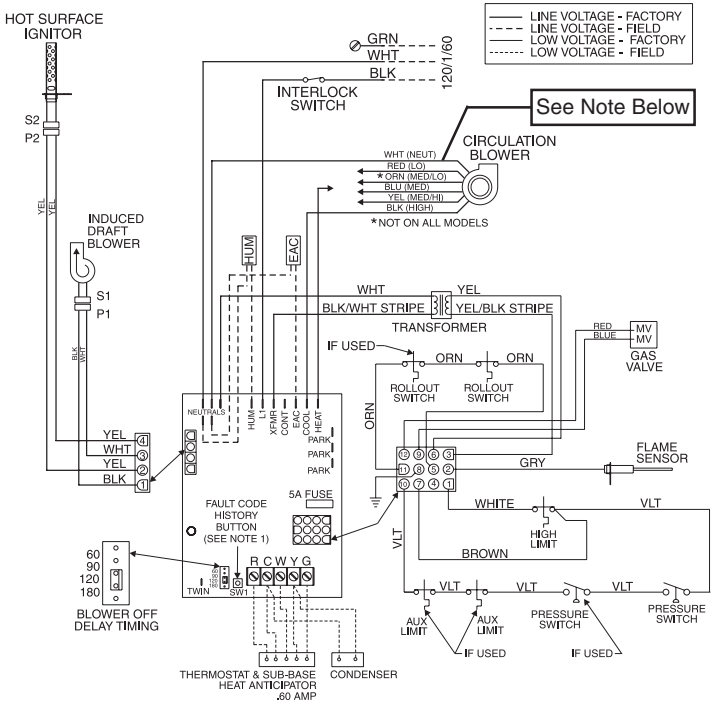
Table 2-1 Smart Valve II Diagnostics

LED Status	Fault Description
Off	No Power to the System Control
Steady Flash (11 or more flashes with no pause)	Normal Operation (Standby or call for heat)
2 Flashes	Pressure Switch Closed When It Should Be Open
3 Flashes	Pressure Switch Stuck Open 30 Seconds or Longer After Call for Heat (System in 5-minute delay mode before next call for heat). On/off switch in "off" position during a call for heat will generate this code.
4 Flashes	Open Limit Switch or Limit Switch Circuit
5 Flashes	Flame Sense Signal Sensed Out of Proper Sequence
6 Flashes - pause - **1** Flash (see Note 1)	Soft Lockout Type 1 (Failure to light within 4 trials for ignition)
6 Flashes - pause - **2** Flashes (see Notes 1 & 2)	Soft Lockout Type 2 (Flame sense lost during run)
6 Flashes - pause - **3** Flashes (see Notes 1 & 2)	Soft Lockout Type 3 (Pressure switch opened during run)
6 Flashes - pause - **4** Flashes (see Notes 1 & 2)	Soft Lockout Type 4 (Limit or limit circuit opened during run)
6 Flashes - pause - **5** Flashes (see Note 1)	Soft Lockout Type 5 (Flame has gone away after Error Code 5)
6 Flashes - pause - **7** Flashes (see Note 1)	Soft Lockout Type 7 (Self-check failure)
10 Flashes (SV9520H8034 only)	Line Input Voltage Polarity Reversed

Note 1: The 6 + X designation indicates a combination of flash codes. Six flashes shows the control is in soft lockout, followed by X flashes to indicate the reason the control went into soft lockout. When the 6 + X code is flashed, the control will attempt a new ignition sequence after 1 hour (if the call for heat is still present). Reset of the thermostat will initiate a new ignition sequence immediately.

Note 2: Any combination of five “abnormal events” during a single call for heat will result in a soft lockout. An abnormal event is an occurrence of any of the following: flame sense failure during run, airflow proving circuit open during run, or limit circuit open during run. The flash code will indicate which was the last abnormal event that put the system into the soft lockout state (see above).

G1D91/93B (U,C,T) Units: HSI Ignition System w/Honeywell VR8205 Gas Valve



1. PRESS AND RELEASE FAULT CODE HISTORY BUTTON TO DISPLAY FAULT CODES. TO ERASE CODES, PRESS AND HOLD BUTTON IN FOR MORE THAN 5 SECONDS.
2. IF ANY OF THE ORIGINAL WIRE AS SUPPLIED WITH THE FURNACE MUST BE REPLACED, IT MUST BE REPLACED WITH WIRING MATERIAL HAVING A TEMP. RATING OF AT LEAST 90°C.

CHECK CODES FOR PROPER WIRING AND CIRCUIT PROTECTION BEFORE INSTALLATION.

Figure 2-2 Connection Diagram 45198-006

Note: Blower speeds are adjustable and must be set for proper heat rise and cooling CFM. Adjust speeds by connecting correct motor lead to HEAT or COOL terminals. To run same speed in heat and cool modes, install jumper between HEAT and COOL terminals. Only connect one motor lead to HEAT terminal and none to COOL terminal when jumper wire is used.

Simplified Sequence – B Series Units (Refer to Figure 2-1)

HEAT CALL

1. During a call for heat the thermostat closes the R-W circuit of the control board.

2. The control board verifies the limit switches are closed and the pressure switch is open. Then it closes the induced draft blower relay causing the induced draft blower to run.

3. As vent pressure is developed by the induced draft blower, the pressure switch closes.

4. Once the pressure switch closes the control initiates the hot surface igniter.

5. After the 7-second warm-up time the control energizes the main gas valve causing the main burners to ignite.

6. The hot surface igniter is de-energized 3 seconds after the main valve opens. If flame is sensed during this time the main valve remains energized and the control starts the heat blower “on” delay of 30 seconds.

7. As the heating demand is met the thermostat de-energizes the R-W circuit.

8. The control de-energizes the main valve causing the burners to shut off.

9. The post-purge delay begins allowing the inducer draft blower to operate for 15 seconds then de-energizes.

10. The circulating air blower will continue to operate until the field selectable heat blower “off” delay expires.

11. The control returns to standby mode once the heat blower “off” delay expires.

COOLING CALL

During a call for cooling the thermostat energizes the (“R-Y”) circuit of the control board. After a 1 second cooling "on" delay time the control energizes the cooling fan speed terminal.

FAN ONLY CALL

During a fan on call the thermostat energizes the R-G circuit of the control board immediately causing the fan to energize the cooling fan speed terminal. The fan remains energized as long as the thermostat calls for fan on operation.

Detailed Sequence – B Series Units (Refer to Figure 2-2 on page 2-10)

POWER – STANDBY MODE (NO THERMOSTAT CALLS)

All controls are off and the control is waiting for a thermostat demand. The thermostat inputs, rollout switch circuit, and flame sense are continually monitored. The control initiates action when a thermostat call is received, rollout switch opens, or flame sense is present with gas valve closed.

Line Voltage

1. Line voltage from the furnace junction box is sent to the door interlock switch.

2. With the blower compartment door in place, the switch closes, sending power to the L1 terminal on the Integrated Hot Service Ignition control (IHSI).

3. Line voltage is supplied to the primary side of the transformer from the XFMR terminal on the IHSI control board.

4. Neutral for the primary side of the transformer is connected to one of the neutral terminals located on the IHSI control board.

5. Neutral from the junction box is attached to one of the neutral terminals located on the IHSI control board.

6. Line voltage is also present at the CONT tap on the IHSI control board.

7. A ground screw is located in the furnace junction box and must be connected to a good ground source. The ground should lead back to the main electrical panel ground.

Low Voltage

1. 24VAC from the secondary side of the transformer is routed to the IHSI control board through pins 3 and 6 of the P1 12-pin molex connector.

2. 24VAC is routed from pin 11 of the 12-pin connector through the rollout switch safety circuit and back to pin 5 of the 12-pin connector.

AUXILIARY LIMIT

An auxiliary limit is used on all counterflow and horizontal furnaces. It is located in the blower compartment, mounted to the blower housing. This limit is circuited in series with the pressure switch. Auxiliary limit switches are Normally Closed auto reset switches.

HEAT CALL

24VAC is supplied to the thermostat from the R terminal. During the call for heat, 24VAC is sent from the R terminal to the W terminal.

The control verifies the high limit is closed by a presence of 24VAC at pin 7 of the P1 12-pin molex connector. At the same time it verifies the pressure switch is open by an absence of 24-vac at pin 10 of the 12-pin connector. Pin 1 of the 12-pin connector supplies 24VAC for the limit safety circuit. L1 120VAC power is sent to pin 1 of the P2 4-pin high voltage molex connector. L1 neutral is supplied by pin 3 of the 4-pin connector, starting the inducer motor.

Pressure Switch Circuit Characteristics

If the pressure switch is closed before or simultaneously with a W thermostat call to the board the LED on the control will flash "2" and wait indefinitely for the pressure switch to open. If the pressure switch does not close within 5 seconds, the LED on the control will flash "3" as long as the pressure switch remains open with the inducer energized. If the W signal is removed before the pressure switch is proven, the control goes back to standby mode.

As the induced draft blower starts, the pressure switch closes, sending 24VAC to pin 10 of the P1 12-pin connector. The control runs the inducer for a 15-second pre-purge time period.

Once the pre-purge time has elapsed, the control energizes 120VAC to pin 2 and 120VAC to pin 4 of the P2 4-pin high voltage molex connector. The control maintains voltage at these terminals to warm up the igniter for 7 seconds.

Circuit Characteristics

If the W signal is removed during igniter warm-up time, the control de-energizes the inducer and igniter and goes back to standby.

After the 7-second warm-up time, the control energizes 24VAC to pin 12 of the P1 12-pin molex connector. 24VAC neutral is supplied by pin 9 of the 12-pin connector energizing the main gas valve.

Three seconds after pin 12 and 9 of the 12-pin connector energize the main gas valve, the control de-energizes pin 2 of the P2 4-pin high voltage molex connector shutting down the hot surface igniter. Pins 12 and 9 of the 12-pin connector (feeding the gas valve) remain energized for another 4 seconds giving the system a total of 7 seconds for trial for ignition.

Trial for Ignition Circuit Characteristics

If flame is not sensed after the ignition trial time, the control de-energizes the gas valve and counts the failed ignition. If there are less than five failed ignition attempts, the control begins another ignition sequence with pre-purge. If there are five or more failed ignition attempts, the control locks out (see Lockout on page 2-15). Inducer will complete a post-purge after the fifth failed trial. The LED on the control will flash "7" if the lockout is due to failed ignition. If W is removed

during flame proving time, the control de-energizes the gas valve and igniter, energizes the blower on heat speed, and initiates inducer post-purge and heat blower "off" delay. If the pressure switch opens, the control will count the open pressure switch cycle. De-energized gas valve and igniter go back to pressure switch proving.

Pin 2 of the P1 12-pin molex connector supplies 120VAC when measured to ground during open flame circuit (no flame is present). A maximum of 0.5 microamperes DC is required for flame sense.

Once flame is sensed though ground, the control initiates the heat speed blower "on" delay. Once 30 seconds have elapsed from the time the gas valve was energized, the control then energizes 120VAC at the HEAT terminal supplying 120VAC to the circulation air blower.

Blower "On" Delay Circuit Characteristics

If W is removed, the gas valve de-energizes and starts inducer post-purge and heat blower "off" delay. If the pressure switch opens, it will count the switch cycle, de-energize the gas valve, energize the blower heat speed, and go back to pressure switch proving for re-ignition attempt.

The control will continue to operate in the heat mode until 24VAC is interrupted at the W terminal. The control immediately de-energizes 24VAC at pin 2 of the P1 12-pin molex connector. When 24VAC is interrupted at the W terminal, the control initiates the field-selectable heat blower "off" delay.

Once the call for heat "W" is completed, 24VAC is removed from the W terminal. The control de-energizes terminals 1 and 3 of the P2 4-pin high voltage molex connector after a 15-second post-purge from the time the "W" signal is removed.

Heat terminal remains energized with 120VAC for the selected blower "off" time delay as selected by the movable shunt provided. The system returns to standby.

Blower "Off" Delay Circuit Characteristics

If the heat *"W" call returns before the blower "off" delay is completed, the control begins an ignition sequence with pre-purge while the blower "off" delay continues.*

HEATING SAFETY CIRCUIT CHARACTERISTICS

High Limit

If the high limit switch opens, the control initiates a call for heat speed blower operation and induced draft blower operation. It de-energizes the main gas valve and hot surface igniter.

When the high limit switch closes again, the control begins the heat blower "off" delay and induced draft blower post-purge delay.

If a call for heat is present during a high limit open occurrence, the

control immediately de-energizes the main gas valve and hot surface igniter. The control will run the heat speed blower and induced draft blower until the switch closes again or the heat call is de-energized. If the heat call is still present when the switch closes again, the heat speed blower continues to run and the control initiates an ignition sequence.

Rollout Switch

An open rollout switch removes power from the thermostat so the control cannot respond to a thermostat call or open high limit while the rollout switch is open.

When the rollout switch opens, the current operating mode is interrupted. Gas valve and igniter are de-energized. Cool blower "off" delay begins if in cooling mode. The inducer is energized and runs for a post-purge delay time and is then de-energized. The indoor blower runs continuously on high speed. The LED on the control flashes "5". The control remains locked out flashing "5" until power is removed from the control.

Pressure Switch Proving

During a call for heat, the control monitors the pressure switch operation. If the pressure switch opens five times for more than 2 seconds each time during the heat call, the control will lock out for 60 minutes. See **Lockout** (this page) and ***Pressure Switch Circuit Characteristics*** (page 2-13) for more information.

Flame Sensing

If the flame is not sensed after the ignition trial, the control de-energizes the main gas valve and counts the failed ignition. If there are less than five failed ignitions, the control begins another ignition with induced draft blower pre-purge. If there are five or more failed ignitions, the control initiates a 60-minute lockout. During lockout, the main gas valve is de-energized while heat speed blower "off" delay and induced draft blower post-purge are energized.

Lockout

The gas valve remains de-energized and the control will not initiate an ignition sequence while in lockout. A call for cooling or call for fan operates as normal. The control will still respond to an open limit, open rollout, and undesired flame.

Lockout shall automatically reset after 1 hour. Lockout may be manually reset by removing power from the control for more than 1 second or removing the thermostat call for heat for more than 3 seconds.

Incorrect Polarity

If correct voltage is not sensed by the L1 terminal in respect to ground, the control will not respond to a heat call and the LED on the control will flash "9". All cooling and fan on functions will operate normally. The control returns to normal operation once correct voltage is sensed at L1.

Fault Code History Function

The control has fault sensing capabilities that are displayed by an LED signal. The LED fault codes are listed in Table 2-2 as well as on the furnace access panel and in the furnace installation instructions.

The control stores the last five fault codes in memory. To access the memory, depress the SW1 switch for less than 5 seconds. The LED will display the last five fault codes from the most recent to oldest in order.

Reset the fault code history of the control by depressing the SW1 switch for longer than 5 seconds.

Runaway Flame Safety Circuit Function

If flame is sensed for longer than 4 seconds while the gas valve is de-energized, the control will energize the inducer and indoor blower motor on high speed. When the flame is no longer sensed, the induced draft blower will run until the post-purge period ends and the indoor blower motor will run through the selected heat blower "off" delay. The control LED will flash "1" while the undesired flame is present.

Table 2-2 United Technologies Ignition Control Fault Codes

LED Status	Fault Description
LED Off	No power to control or control hardware fault detected
LED On	Normal operation
1 Flash	Flame present with gas valve off
2 Flashes	Pressure switch closed with inducer off
3 Flashes	Pressure switch open with inducer on
4 Flashes	High limit switch open
5 Flashes	Rollout switch open
6 Flashes	Pressure switch cycle lockout
7 Flashes	Lockout due to no ignition
8 Flashes	Lockout due to too many flame dropouts
9 Flashes	Incorrect line voltage phasing

COOLING CALL

24VAC is supplied to the thermostat from the R terminal. During a call for cooling, 24VAC is sent from the R terminal to the Y and G terminals of the IHSI control.

The control will delay for 1 second before energizing the COOL terminal with 120VAC to start the circulating air blower. 24VAC is also routed to start the outdoor condensing unit.

When "Y" signal is removed, the control will start a 60-second "off" delay, then de-energize the COOL terminal, shutting down the circulating air blower.

"Y" Call Circuit Characteristics

If the fan is already energized when the call for cool occurs, the fan remains running and does not de-energize for the 1-second cooling "on" fan delay.

A call for cooling has priority over continuous fan and delays the blower energizing if a call for fan occurs during the cooling blower "on" delay period.

If a call for heat exists with a call for cooling, the call for heat shall proceed as normal except the fan remains energized on cool speed. If the call for cool goes away while a call for heat exists, the cooling "off" delay is canceled and the blower operation reverts to the heat cycle.

The cooling fan operation is not affected by ignition lockout.

FAN ON

24VAC is supplied to the G terminal of the control. The control supplies 120VAC to the COOL terminal energizing the circulating air blower. When 24VAC to "G" is removed, the COOL terminal is immediately de-energized.

Fan On Circuit Characteristics

If a call for heat is energized during a fan on (G) call, the control de-energizes the COOL terminal immediately and begins the heat call/ignition sequence.

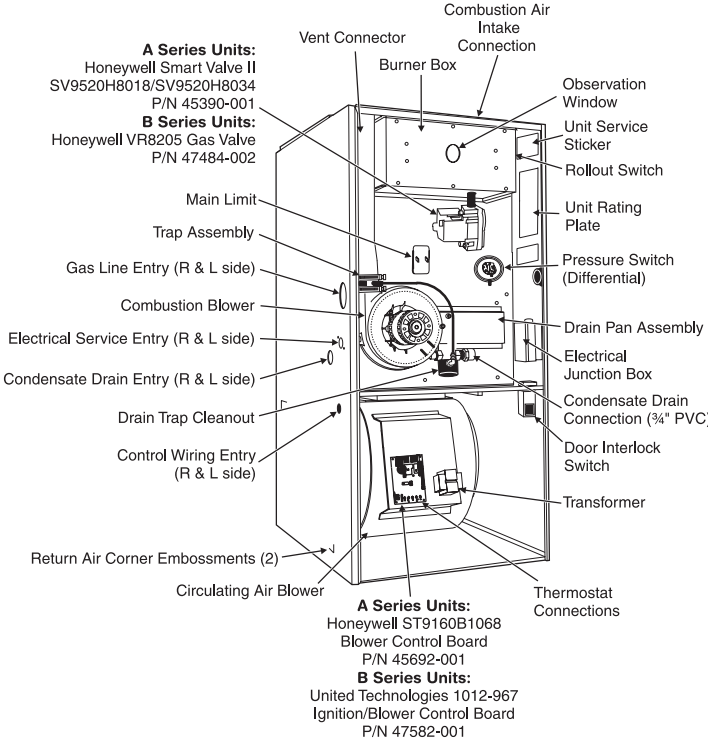
If a call for cooling (Y) is energized simultaneously with the call for fan (G), the call for cool overrides the call for fan and the blower remains off for the cooling "on" delay period.

⚠ CAUTION

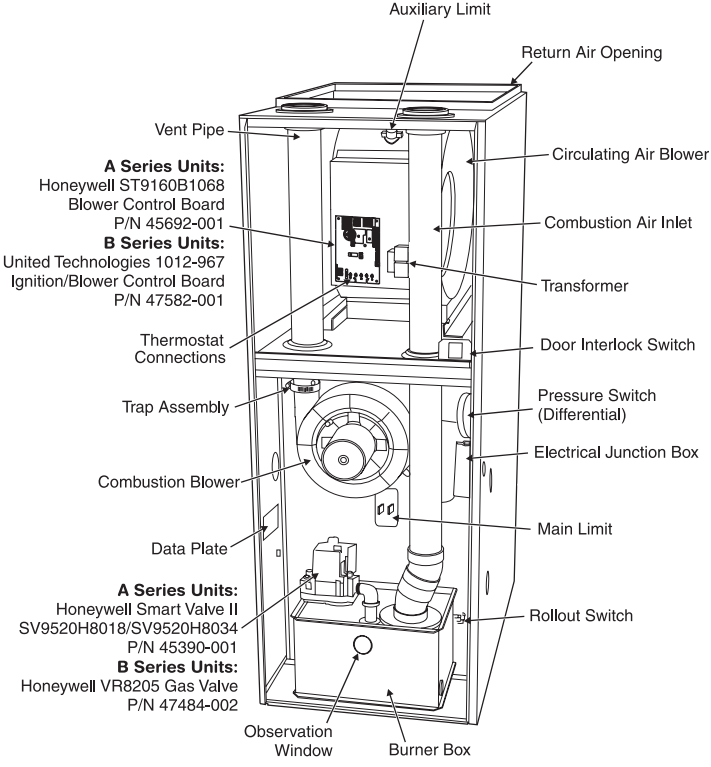
The constant air terminal is intended for low speed only. Higher speeds have greater electrical loads which may overload the CONT terminal causing a blower control board failure.

Section 3 – Component Locations

G1D91AU, G1D91BU, G1D91BT, G1D93AU, & G1D93BU



G1D93AC & G1D93BC



Section 4 – Furnace Components

Transformer 4-2

Gas Valve 4-3
- Honeywell SV9520 Smart Valve II 4-3
- Honeywell VR8205 4-4

Hot Surface Igniter (HSI) 4-5

Blower Control 4-6
- Honeywell ST9160B 4-6

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Circulating Air Blower 4-8

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Pressure Switch 4-11
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Door Interlock Switch 4-18

Main (High) Limit Switch 4-18

Flame Rollout Switch 4-19

Auxiliary Limit Switch 4-20

Burners 4-21

Condensate Collar 4-23

Header Box 4-23

Condensate Drain System 4-24

Note: See the **Accessories** section for Field Repair Parts Kits.

Furnace Components

This section provides brief descriptions of the most important components within G1D91/93 furnace units. The information presented here is not intended to take the place of the instructions and printed literature packed with each component by the original manufacturer.

Transformer

The transformer supplies 24VAC from its secondary windings to operate the blower control board, gas valve, and ignition control depending on the particular furnace model. It is typically rated at 40 VA, 50/60 Hz.

Transformer Specifications

G1D91AU, G1D93AU, G1D93AC Units
Manufacturers: Basler Electric and Products Unlimited
Models: BE152640-GDD (Basler Electric)/4000Y01V18K31 (Products Unlimited)
P/N 38491B001
Primary/Secondary: 120VAC/24VAC

G1D91BU, G1D91BT, G1D93BU, G1D93BC Units
Manufacturers: Basler Electric and Products Unlimited
Models: BE152640-GEK (Basler Electric)/4000-01E07AE31 (Products Unlimited)
P/N 43211-001
Primary/Secondary: 120VAC/24VAC

Note: "A" series unit transformer shown. "B" series units use leadless transformers. Connections on B unit tranformers are 1/4" male spade connectors.

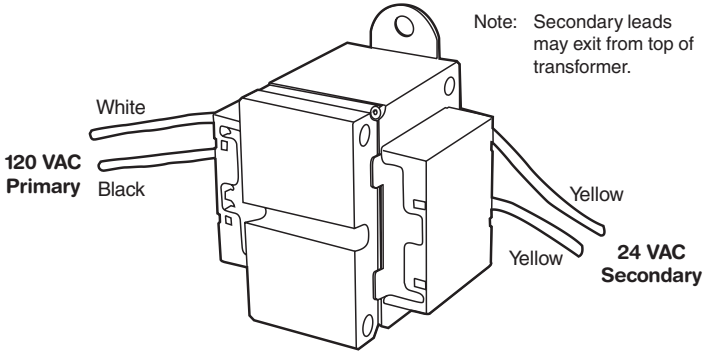


Figure 4-1 24-Volt Transformer

Gas Valve

⚠WARNING

Suffix letter “H” (in the Honeywell part number) indicates a slow-opening pressure regulator. DO NOT replace an “H” model valve with any other kind. Improper replacement of this valve could cause actions resulting in property damage, personal injury, or death.

G1D91AU, G1D93AU, G1D93AC Units:

Honeywell SV9520 Smart Valve II Series – Used with Hot Surface Ignition (HSI) System

Gas Valve Specifications

Manufacturer: Honeywell
Models: SV9520H8018 &
SV9520H8034 (Natural Gas)
P/N 45390-001
Regulator Setting: 3.5" (+/– .3") W.C.
Electrical: 24VAC/60Hz
24V Hot: 1.25A
24V Thermostat: 0.25A
1" Drop Capacity: 150,000 Btuh
Max. Regulator Capacity: 200,000 Btuh
Temperature Rating: 0°F - 175°F
Pipe Connections: 0.5" x 0.5" NPT

Pre-purge Time (factory set): 15 seconds
Trial for Ignition: 7 seconds
Post-purge Time: 5 seconds
Auto Restart: 60 minutes
Pressure Switch Verification: 30 seconds
Heat Call Re-Try Delay: 5 minutes

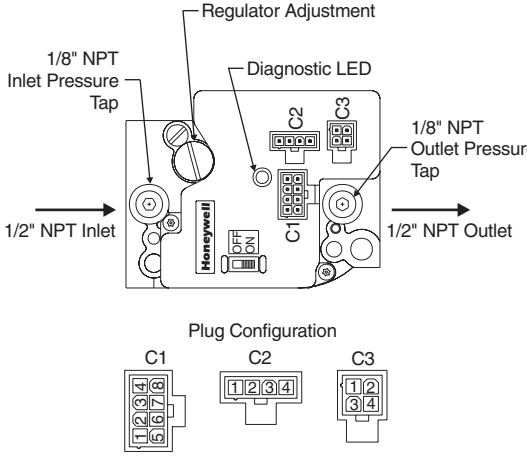


Figure 4-2 Honeywell SV9520 Smart Valve II Gas Valve

G1D91BU, G1D91BT, G1D93BU, G1D93BC Units: Honeywell VR8205 Series – Used with Hot Surface Ignition (HSI) System

Gas Valve Specifications

Manufacturer: Honeywell
Models: VR8205S2338 (Natural Gas)
P/N 47484-001
Regulator Setting: 3.5" (+/– .3") W.C.
1" Drop Capacity: 150,000 Btuh
Max. Regulator Capacity: 200,000 Btuh
Pipe Connections: 0.5" x 0.5" NPT

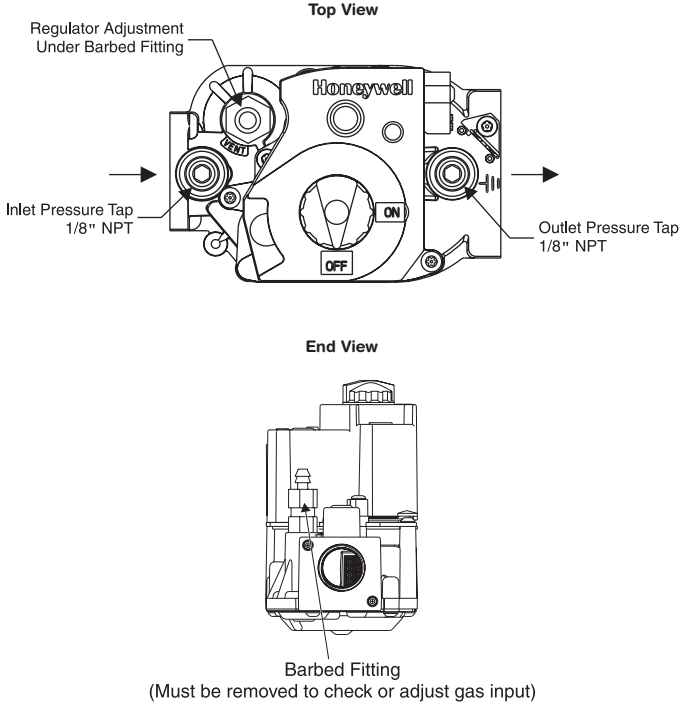


Figure 4-3 Honeywell VR8205 Series Gas Valve

Hot Surface Igniter (HSI)

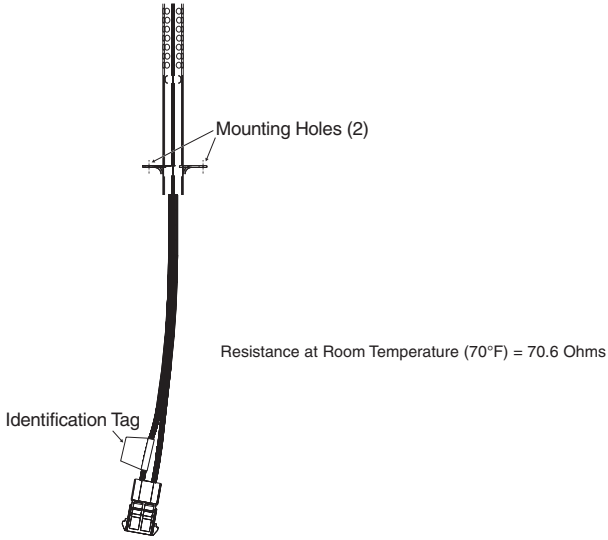


Figure 4-4 Hot Surface Igniter P/N 44744-002

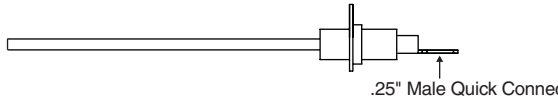


Figure 4-5 Flame Sensor P/N 44745-001

Blower Control Board (G1D91AU, G1D93AU, G1D93AC Units)

Honeywell ST9160B

Blower Control Board Specifications

Manufacturer: Honeywell
Model: ST9160B0168
P/N 45692-001
Environmental: Temperature – 40°F to 175°F (– 40°C to 79°C)
Humidity: 95% non-condensing

Timing:
Heat Blower On Delay – 30 seconds (non-adjustable)
Heat Blower Off Delay – 60 to 150 seconds (adjustable; factory set at 120 seconds)
Cool Blower Off Delay – 60 seconds (non-adjustable)

Contact Ratings:
Heat/Cool Relays 15 FLA/30 LRA @ 115VAC
Inducer Relays 7.5 FLA/15 LRA @ 230VAC

Circulation Blower Control:
115/230VAC +15% –10%

Call for Heat (W)	Heat Speed
Call for Cool (Y + G)	Cool Speed
Call for Fan (G)	Heat Speed
Unused Lead Park	2 terminals – M1/M2

Combustion Blower Control: 115/230VAC +15% –10%

Contact Ratings: 1.5 FLA/10LRA @ 115VAC
.75 FLA/5LRA @ 230VAC

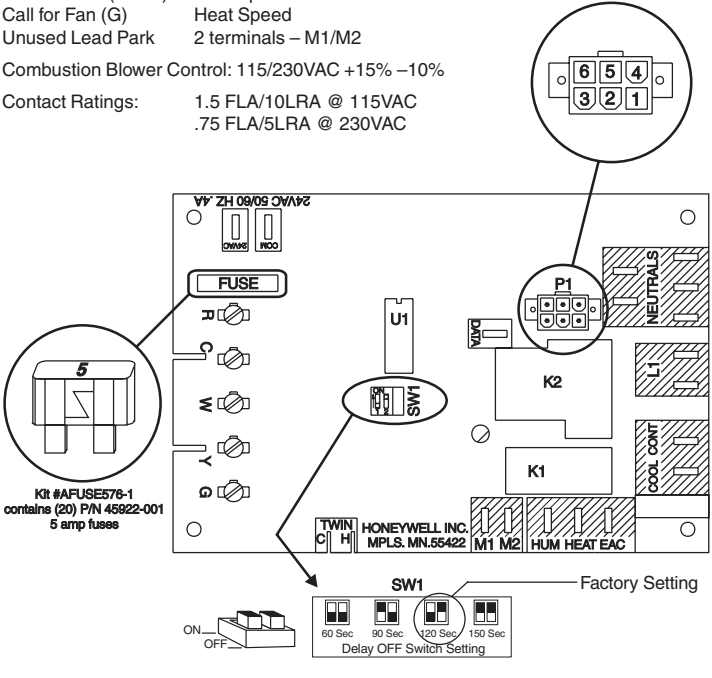


Figure 4-6 Honeywell ST9160B Blower Control Board

Integrated Ignition/Blower Control Board (G1D91BU, G1D91BT, G1D93BU, G1D93BC Units)

UTEC 1012-967

Intergrated Control Board Specifications

Manufacturer: United Technologies
Model: 1012-967
P/N 47582-001
Environmental:
Temperature – 22°F to 158°F
(– 30°C to 70°C)
Humidity: 95% non-condensing

Timing:
Heat Blower On Delay – 30 seconds
(non-adjustable)
Heat Blower Off Delay – 60 to 180 seconds
(adjustable; factory set at 120 seconds)
Cool Blower Off Delay – 60 seconds
(non-adjustable)

Contact Ratings:
Heat/Cool Relays 15 FLA/30 LRA @ 115VAC
Inducer Relays 7.5 FLA/15 LRA @ 230VAC

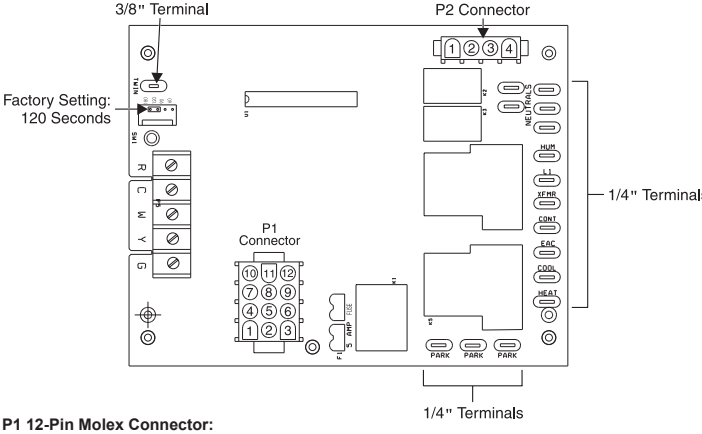
Circulation Blower Control:
115/230VAC +15% –10%

Call for Heat (W)	Heat Speed
Call for Cool (Y + G)	Cool Speed
Call for Fan (G)	Heat Speed
Unused Lead Park	3 terminals

Combustion Blower Control:
115/230VAC +15% –10%
Contact Ratings
1.5 FLA/10LRA @ 115VAC
.75 FLA/5LRA @ 230VAC

P2 4-Pin Molex Connector:

Pin 1 Inducer 120VAC Line
Pin 2 HSI 120VAC Line
Pin 3 Inducer 120VAC Neutral
Pin 4 HSI 120VAC Neutral



P1 12-Pin Molex Connector:

Pin 1 Limit Switch Out (HLO), Common with "W"
Pin 2 Flame Sense Electrode (FP)
Pin 3 Continuous 24VAC from Transformer (TH)
Pin 4 Unused
Pin 5 Rollout Switch Output (RO1)
Pin 6 24VAC Return for Transformer Secondary (TR)
Pin 7 Limit Switch Input (HLI)
(externally connected to pressure switch)
Pin 8 Earth/Chassis Ground
(Common with "C")
Pin 9 Main Gas Valve Return/Common
(MV)
Pin 10 Pressure Switch Input (PS)
Pin 11 Rollout Switch Input (RO2)
(Common with "R")
Pin 12 Main Gas Valve Output (MV)

Figure 4-7 United Technologies 1012-967 Integrated Control Board

Circulating Air Blower

Each furnace has a particular blower motor and blower wheel assembly. These assemblies are specifically matched to each furnace to achieve the rated airflow. It is recommended that only the matching blower motors and wheel assemblies be used for replacements. This is to ensure that the rated airflow is achieved. Refer to the **Parts List** section beginning on page 7-1 for the correct part numbers.

Table 4-1 Blower Information – All Models

Motor P/N	FLA V/Hz/Ph	RPM	# of Speeds	HP	Capacitor	Motor Depth
44626-001	4.9 115/60/1	1075	4	1/3	7.5 MFD 370VAC	4.12"
44627-001	6.4 115/60/1	1075	4	1/3	7.5 MFD 370VAC	4.36"
44627-002	6.4 115/60/1	1075	4	1/3	7.5 MFD 370VAC	4.12"
45614-001	6.5 120/60/1	1100	4	1/2	7.5 MFD 370VAC	4.86"
44628-001	8.9 115/60/1	1075	5	3/4	12.5 MFD 370VAC	5.11"
45480-001	11.0 120/60/1	1000	5	0.9	20.0 MFD 370VAC	5.36"
47462-001	4.9 115/60/1	1075	4	1/3	7.5 MFD 370VAC	4.56"
47463-001	9.0 115/60/1	1075	3	1/2	7.5 MFD 370VAC	5.06"
47464-001	6.4 115/60/1	1075	4	1/3	7.5 MFD 370VAC	4.56"
47466-001	12.4 115/60/1	1060	4	3/4	12.5 MFD 370VAC	5.81"
47467-001	8.9 115/60/1	1075	5	3/4	12.5 MFD 370VAC	5.31"
47468-011	11.0 115/60/1	1000	5	0.9	20.0 MFD 370VAC	5.81"

Notes: Additional data: Motor diameter, 5.625"; shaft size, .50"; rotation, CCW lead end. FLA and capacitor ratings may vary. Always check FLA and capacitor ratings on motor data plate.

Induced Draft Blower

The induced draft blower is also referred to as a “combustion” blower, since its purpose is to establish flow of combustion air through the heat exchanger. Mounted at the outlet of the secondary heat exchanger, the blower establishes a negative pressure within the heat exchanger and exhausts the flue products outside the structure through the vent pipe.

The induced draft blower motor on the G1D91/93 furnace operates at a fixed speed. A restrictor orifice is placed at the inlet, depending on the input rating.

A Field Repair Parts Kit is available. See the **Accessories** section beginning on page 6-1.

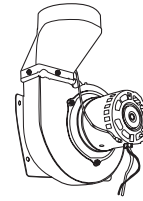


Figure 4-8 Induced Draft Blower

Orifice for Induced Draft Blower

To establish the proper combustion airflow for a specific furnace model, a restrictor orifice is installed on the inlet face of the combustion blower. When replacing a combustion blower, it is essential that the correct orifice be re-installed when the blower is mounted to the furnace.

The molded plastic piece installs in the circular groove on the inlet face of the induced draft blower housing. Since the same blower is used for several models, the orifice provides a convenient way to set the diameter of the blower inlet. The furnace parts list can provide the correct part number for a particular furnace model (see the **Parts Lists** section beginning on page 7-1).

⚠IMPORTANT

It is critical that the correct orifice is installed for a particular furnace unit. The furnace will not operate correctly without the correct orifice.

Table 4-2 Induced Draft Blower Orifices

P/N	Number Stamped on Part	Actual Hole Diameter	Color
40086B001	.81	.813"	Gray
40086B002	1.05	1.047"	Orange
40086B003	1.10	1.094"	Black
40086B004	1.20	1.203"	Blue
40086B006	1.00	1.002"	Yellow
40086B007	.72	.718"	Green
40086B009	.88	.880"	White

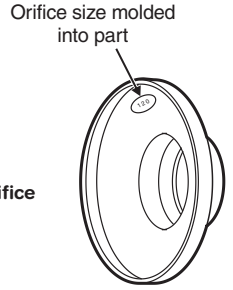


Figure 4-9 Induced Draft Blower Orifice

Pressure Switches

These are Normally Open switches that react to a difference in pressure on an internal diaphragm. It will not allow ignition to start if the induced draft blower cannot produce sufficient negative pressure relative to atmospheric pressure or pressure in a sealed burner box.

During a call for heat, the gas valve will start the induced draft blower. The pressure switch will remain open until the induced draft blower builds enough pressure to cause the switch to close. If the pressure switch does not close with 30 seconds of the induced draft blower starting, the gas valve will de-energize the draft blower for 5 minutes. After 5 minutes, the gas valve will restart the draft blower and wait 30 seconds for the pressure switch to close. This sequence will be repeated until either the switch closes or power is interrupted.

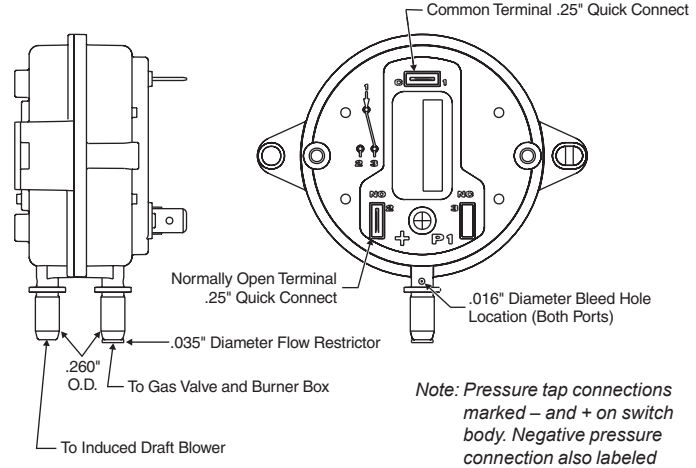
The part number is stamped on the body of the switch. A label on the switch carries the manufacturer's model number. Always verify the proper switch number from the parts list.

Table 4-3 Dual Port (Differential) Pressure Switches

P/N	Vendor/Model Number	Switch Open	Color Code	Switch Closed
45695-001	IS20102-3134	-.30" +/- -.05" W.C.	Yellow	-.45" W.C.
45695-002	IS20102-3135	-.45" +/- -.05" W.C.	Blue	-.60" W.C.
45695-003	IS20102-3136	-.60" +/- -.05" W.C.	Brown	-.75" W.C.
45695-004	IS20102-3137	-.70" +/- -.05" W.C.	Green	-.87" W.C.
45695-005	IS20102-3138	-.50" +/- -.05" W.C.	Purple	-.65" W.C.
45696-001	IS20103-3138	-.60" +/- -.05" W.C.	Gray	-.75" W.C.
45696-002	IS20103-3139	-.70" +/- -.05" W.C.	Orange	-.87" W.C.

Pressure Switch Specifications

Electrical Rating: 3 FLA, 18 LRA at 24VAC
Electrical Switch: Single Pole, Normally Open, Snap Acting
Maximum Pressure: 3.0" W.C.
Operating Temperature Range: – 40° to 190°F
Recommended Operating Position: Diaphragm Vertical
Normally Open - Close on Pressure Rise,
Open on Pressure Fall



Note: Pressure tap connections marked – and + on switch body. Negative pressure connection also labeled "Blower".

Figure 4-10 Dual Port Pressure Switches

Checking Pressure Switch Operation

It is easy to check a pressure switch as it operates within the overall system. These test procedures make it possible to pinpoint the opening and closing actions of the pressure switch.

⚠WARNING

DO NOT try to repair a pressure switch. Use an identical replacement. The use of an improperly repaired or malfunctioning pressure switch could result in property damage, personal injury, or death.

⚠WARNING

Never try to adjust a pressure switch or jumper the switch to allow the furnace to operate. Doing so could allow the furnace to operate under hazardous conditions, potentially causing property damage, personal injury, or death.

What Is Needed for the Tests

- A good general-purpose incline manometer with a range of 0 - 3" W.C. (Dwyer 1227 or equivalent).
- Use the parts list to verify that the proper pressure switch is installed in the unit. Look for the part number stamped on the metal housing. A label on the housing shows the manufacturer's model number.
- Find the Switch Closed and Switch Open values for the pressure switch in Table 4-3 on page 4-11.
- Assorted lengths of plastic tubing and tees to make the connections to the manometer including the following: 1/8" I.D. high temperature silicone tubing, 1/4" I.D. vinyl tubing, 1/8" tee and 1/4" tee.

Terminology

Terms related to pressure switch operation and incline manometer testing are in Figure 4-11.

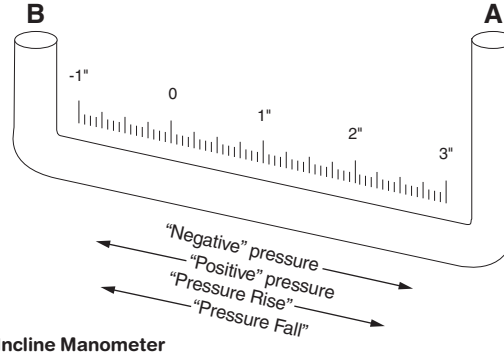


Figure 4-11 Incline Manometer

A Word About the "Switch Closed" Value

Switch Closed is the pressure at which the contacts close as the induced draft blower comes up to speed. It is calculated by adding – 0.1" W.C. to the sum of the switch's Open value and its upper tolerance.

For example, for P/N 45695-001 switch:

– 0.1" + (– .30" + – .05") = – 0.45" W.C.

On a system operating correctly, it is likely that the manometer reading will go to a value that is more than enough to close the switch.

A Word About the "Switch Open" Value

Switch Open is the pressure at which the contacts open as the negative pressure decreases (pressure fall).

Procedure for Checking Pressure Switch

1. Position the manometer so it can be watched easily during testing. Balance and zero the manometer according to the manufacturer's instructions.
2. Insert a test line with tee between the pressure switch and the induced draft blower. Connect the test line to the manometer at the high end of the scale (A in Figure 4-12).
3. Insert a second test line with tee between the burner box and the other side of the pressure switch. Connect this test line to the manometer at the low end of the scale (B in Figure 4-12). The manometer will read the same differential that the pressure switch reacts to during the heat cycle.
4. Using Table 4-3 found on page 4-11, verify the Switch Closed value for the switch being worked with.
5. Start the furnace to call for heat. Observe the manometer reading increase (increasing pressure rise) as the induced draft blower comes up to speed. The ignition should start at a reading that is approximately the Switch Closed value that has been determined for the specific switch.
6. With the furnace running in the full heat cycle, observe the pressure reading. Note this reading and compare it to the Switch Open value shown for that switch in Table 4-3 on page 4-11.

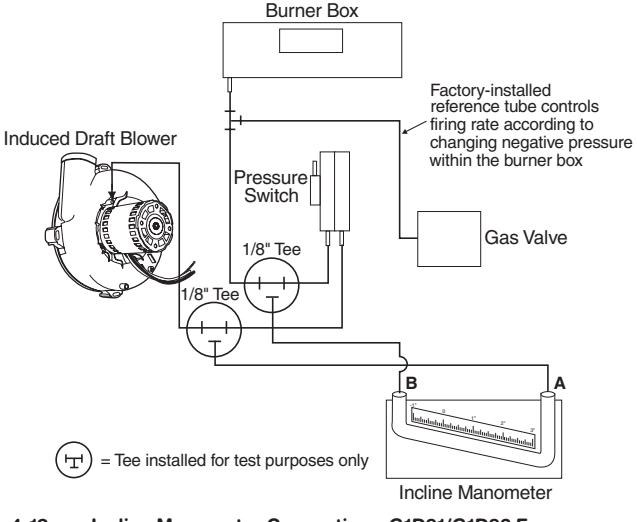


Figure 4-12 Incline Manometer Connection – G1D91/G1D93 Furnace

Table 4-4 Pressure Range Table[1]

Model Number	Approximate Minimum Pressure[2] W.C. +/- 5%	Approximate Maximum Pressure[3] W.C. +/- 5%
G1D91A/BU050	-1.30" W.C.	-1.50" W.C.
G1D91A/BU075	-1.10" W.C.	-1.40" W.C.
G1D91A/BU100	-1.00" W.C.	-1.60" W.C.
G1D91A/BU125	-1.65" W.C.	-1.85" W.C.
G1D93A/BU045	-1.45" W.C.	-1.55" W.C.
G1D93A/BU067	-1.25" W.C.	-1.50" W.C.
G1D93A/BU090	-1.20" W.C.	-1.60" W.C.
G1D93A/BU112	-1.70" W.C.	-1.80" W.C.
G1D93A/BC045	-1.35" W.C.	-1.60" W.C.
G1D93A/BC067	-1.25" W.C.	-1.60" W.C.
G1D93A/BC090	-1.05" W.C.	-1.50" W.C.
G1D93A/BC112	-1.60" W.C.	-1.90" W.C.

1 All pressures based on direct vent installation. Non-direct vent pressures may be slightly higher.
2 Minimum pressure listing is based on maximum vent length and 115 volts.
3 Maximum pressure listing is based on minimum vent length and 115 volts.

Pressure Switch Problems

The negative pressure developed in the combustion chamber is directly related to airflow. During furnace operation, the switch will react to conditions that reduce airflow, such as: blocked or restricted intake (combustion air piping), blockage of vent (flue) piping, blockage of the condensate drain piping, plugged pressure tap ports, leaking hose, or a failure of the induced draft blower motor.

If the pressure switch has already been replaced and problems are still being experienced, follow the procedure **Checking Pressure Switch Operation** (found on page 4-12).

If the measured static pressure reading does not meet the switch specifications, check these items:

- Pressure switch hose/tubing for cracks or loose connections
- Induced draft blower wheel for corrosion or loose blades

- Induced draft blower for tight bearings or loose inducer wheel
- Vent system design (oversized, undersized, long runs)

The measured static pressure reading should be compared to the pressure switch specifications. If the measured static pressure meets or exceeds the specifications and switch contacts will not transfer, check the following items:

- Switch out of calibration
- Defective pressure switch
- Moisture in pressure switch tubing
- Incorrect switch installed

⚠WARNING

DO NOT try to repair a pressure switch. Use an identical replacement. The use of an improperly repaired or malfunctioning pressure switch could result in property damage, personal injury, or death.

⚠WARNING

Never try to adjust a pressure switch or jumper the switch to allow the furnace to operate. Doing so could allow the furnace to operate under hazardous conditions, potentially causing property damage, personal injury, or death.

Blocked Intake

Blocked intake is any condition that blocks or restricts the flow of intake (combustion) air to a point where the pressure fall reaches the calibrated open setting of the pressure switch.

Potential causes:

- Rodents
- Spiders
- Nest building in the intake pipe
- Debris or trash that has been pulled into the intake pipe
- Improperly sized or excessive intake pipe lengths

Symptoms:

- Excessive negative pressure in the burner box area. The furnace cycles on and off quite frequently, typically within 60 seconds or so.
- Inability of unit to stay on for a complete call for heat.

For a blocked intake or blocked flue, connect the incline manometer as shown in Figure 4-12 on page 4-14 and follow the procedure as directed.

Blocked Drain

Excessive buildup of condensate within the drain line of the furnace is typically caused by an improperly vented or sized drain line; a frozen drain line; or one that is plugged with dirt, insects, PVC shavings, etc. (See the **Installation** section beginning on page 5-1 for more information.)

The symptoms of a blocked drain are the induced draft blower becoming flooded with condensate or failing to reach full RPM (preventing the pressure switch from closing).

Blocked Flue

Blocked flue is any condition that blocks or restricts the flue (vent) pipe to a point where the pressure fall reaches the calibrated open setting of the pressure switch.

Potential causes:

- Rodents
- Spiders
- Nest building in the flue pipe
- Outlet screens with excessive restriction
- Improperly sized or excessive length of flue pipe
- High wind conditions exceeding 40 mph

Symptoms:

- Low negative pressure on the induced draft blower. The unit cycles on and off quite frequently, typically coming back on within 60 seconds.
- Inability of unit to stay on for a complete call for heat.

Units cycling on pressure switch re-ignite sooner than a main limit switch can reset.

Tip: With all wiring connected and unit running, use a volt meter across the pressure switch terminals.

No voltage reading = switch closed
Voltage present (approx. 10VAC) = switch open

Door Interlock Switch

When the blower door is removed, the interlock switch breaks the power supply to the burner controls and blower motor. Switch operation should be checked during routine service and maintenance. The standard switch is rated for 21A @ 120VAC, 3/4 HP.

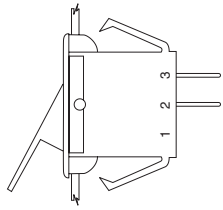


Figure 4-13 Door Interlock Switch P/N 45610-001

⚠WARNING

Except for during servicing of the furnace by a qualified technician, do not bypass the door interlock switch to run the furnace with the door in or out of position.

Main (High) Limit Switch

The main (high) limit switch is a Normally Closed control that opens if abnormally high circulating air temperatures occur. The temperature at which the switch opens is marked on the switch. It is an automatic reset control.

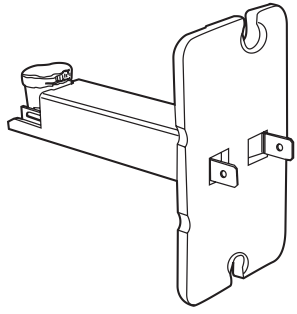


Figure 4-14 Main (High) Limit Switch

Flame Rollout Switch

A Normally Closed manual reset switch that opens when abnormal temperatures occur in the burner area. These temperatures occur when a restricted heat exchanger causes the main burner flame to “rollout” into the vestibule area.

To reset the switch, push the button on top. The color of the button is different than the color of the body of the switch.

Flame Rollout Switch Specifications
Cutout Temperature: Marked on body of switch
Nominal Switch Contact Rating: 15A @ 120VAC

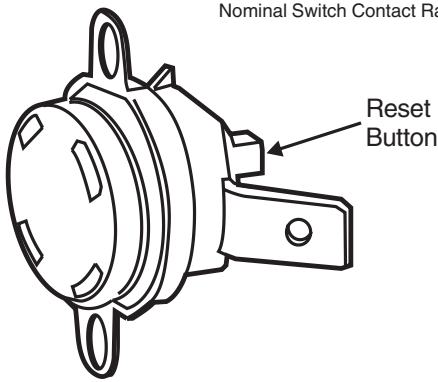


Figure 4-15 Flame Rollout Switch

Auxiliary Limit Switch

All G1D91BT, G1D93AC, and G1D93BC furnaces are equipped with auxiliary limit switches to prevent overheating of the components in the blower section of the furnace. The switches are Normally Closed, auto reset switches. Typically, auxiliary limit switches open due to incorrect blower “off” delay timer settings, improper heat rise adjustment, and/or incorrectly sized or restricted ducts. See the **Installation** section beginning on page 5-1 for more information.

Only switches having identical ratings should be used as a replacement. Refer to the parts list for correct auxiliary limit switch part numbers.

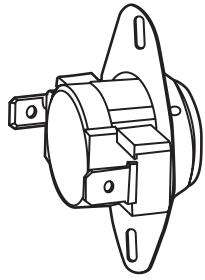


Figure 4-16 Auxiliary Limit Switch

Burners

G1D91 and G1D93 furnaces use the “inshot” type burner design. No adjustment is provided for primary or secondary air. For best operation, keep the burners clean. Use the correct orifice size and adjust the manifold pressure for the fuel being used and operating altitude.

Orifices

Table 4-5 Manifold Orifices

P/N	Hole Diameter (Drill Size)	Hole Diameter (Inches)
39030B009	44	.0860
39030B011	55	.0520
39030B019	42	.0935



Figure 4-17 Orifice Hole

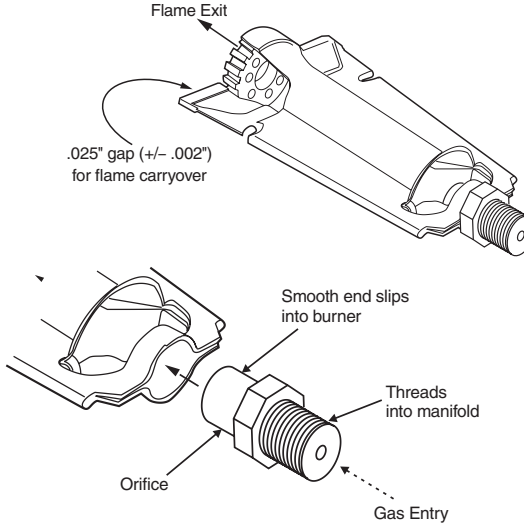


Figure 4-18 Inshot Burners

Flame Carryover Problems

During ignition, the flame must travel uninterrupted from one burner to the rest of the burners. If ignition is interrupted between burners, it will result in delayed ignition.

Causes:

- Carryover “wing” on burner is plugged with insects or debris
- Improper gap setting on wings
- Incorrect gas pressure

The burner wing has a specified gap (typically 0.025" +/– .002") which must carry gas and a small flame to allow flame carryover from one burner to the next. Check the gap settings on all burners.

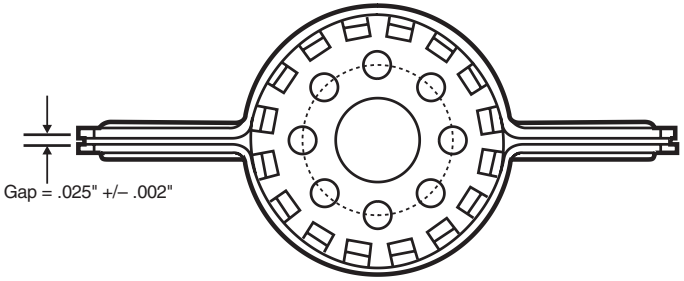


Figure 4-19 Burner Wing Gap

Erratic Burner Operation – Direct Vented G1D91/G1D93 Models Only

Symptom: Burners fade out momentarily, then re-ignite with a slight delayed ignition.

Cause: Recirculated flue gas is entering the intake air vent because an incorrect vent termination was used. The use of two 45° termination pieces increases the chance of recirculation of the gases which can cause this to happen.

Action: Rework the installation to conform to the guidelines provided in the Installation Instructions provided with the furnace.

Condensate Collar

G1D91/G1D93 models use a condensate collar which serves two purposes. It is a connection point between the outlet of the induced draft blower and the external flue piping. In addition, the condensate collar also collects condensate from the blower exhaust air, draining it through a vinyl tube to the header box. This is an important safety feature, as the water seal prevents flue gases from entering the living space.

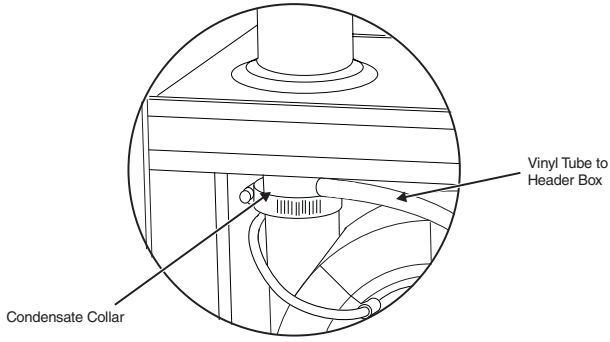


Figure 4-20 Condensate Collar P/N 45217-001

Header Box

Air drawn through the heat exchanger passes through the header box before entering the induced draft blower. Therefore, the entire header box is under negative pressure. The header box serves as a mounting for the induced draft blower, and as a collection point for condensate built up in the flue pipe.

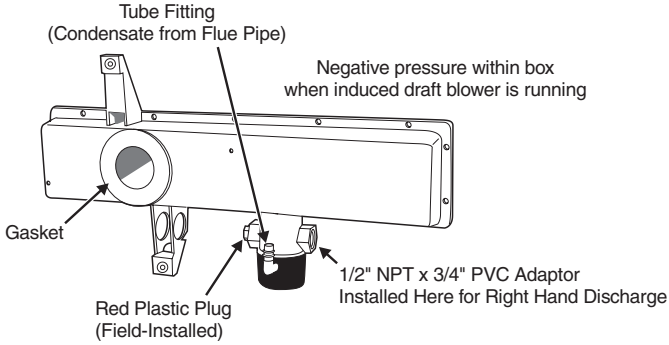


Figure 4-21 Header Box

Condensate Drain System

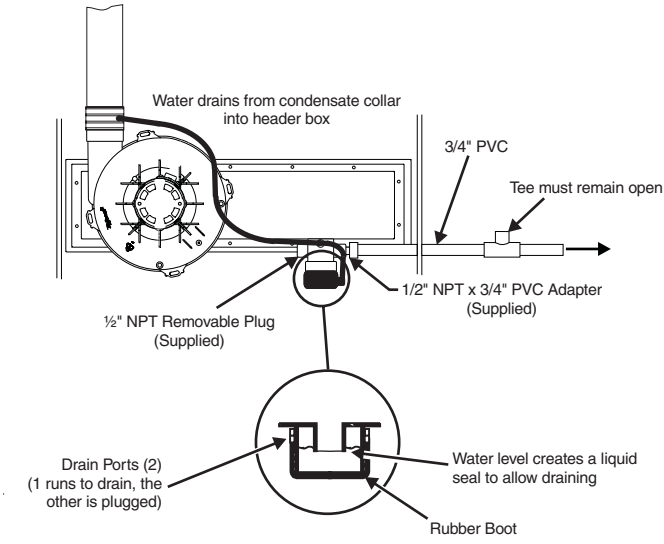


Figure 4-22 Condensate Drain System – Upflow/Counterflow Installation

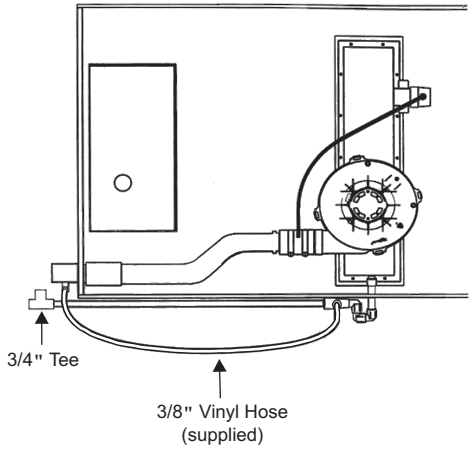


Figure 4-23 Condensate Drain System Horizontal Installation – Right to Left Airflow (G1D91BT Models Only)

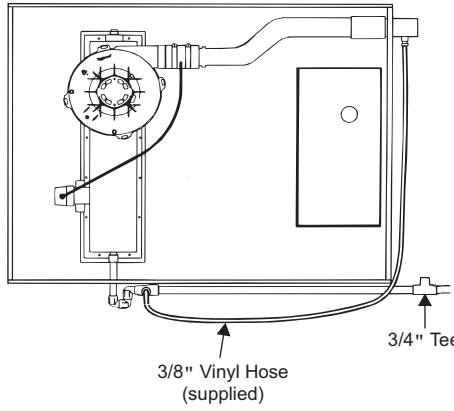


Figure 4-24 Condensate Drain System Horizontal Installation – Left to Right Airflow (G1D91BT Models Only)

Section 5 – Installation

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Installation

Information in this section is provided for the service technician to use during service and troubleshooting of G1D91/93 furnaces. It does not take the place of the complete Installation Instructions shipped with every unit. For a copy of the most recent edition of the Installation Instructions, consult the table below and contact the factory.

Table 5-1 Installation Instructions

P/N	Date	Description
45466K003	1-04	High Efficiency 90+ Gas Furnaces
47860F004	6-04	High Efficiency Multi-Position Furnaces

The furnace design is certified by CSA International in compliance with the latest edition of American National Standard Z21.47/CSA Standard 2.3 for Gas-Fired Central Furnaces, for operation with natural gas or propane. Consult the rating plate on the furnace for gas type before installing.

The maximum hourly heat loss of space shall be calculated in accordance with the procedure described in the current manuals of Air Conditioning Contractors of America, or by any other recognized method which is suitable for local conditions, provided the results obtained are in substantial agreement with, and not less than, those obtained using the procedure described in the manuals.

G1D91AU, G1D91BU, G1D93AU, and G1D93BU models shall be installed only as **upflow** furnaces. G1D93AC and G1D93BC models shall be installed only as **counterflow** (downflow) furnaces. G1D91BT models may be installed as **upflow** or **horizontal** furnaces. When installed horizontally, the installer must install a sheet metal screw to retain the upper door as shown in Figure 5-1.

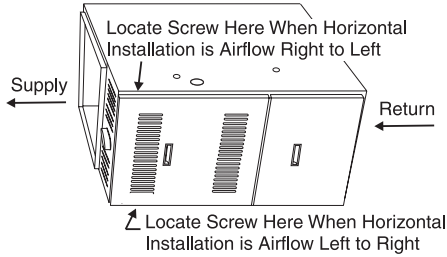


Figure 5-1 Horizontal Installations

Inspection of Shipment

This furnace is shipped in one package, completely assembled and wired. The thermostat is shipped in a separate carton when ordered.

Upon receipt of equipment, carefully inspect it for possible shipping damage. If damage is found, it should be noted on the carrier's freight bill. Damage claims should be filed with the carrier immediately. Claims of shortages should be filed with the seller within 5 days.

Location

To provide proper operation and satisfactory performance, care must be taken in choosing the location for this furnace. The atmosphere in which the furnace operates must be free of contaminants such as chlorides and sulfates.

The furnace must be installed so that electrical components are protected from water. **Unit must be level for proper condensate drainage.**

⚠ CAUTION

The condensate drain on this furnace is incorporated within the furnace and must be primed before start-up. **The condensate system must not be exposed to temperatures under 32°F.** Use of heat tape is permissible provided the rate temperature of the tape does not exceed 155°F.

All models are suitable for closet or utility room installation.

The furnace is suitable for installation in buildings constructed on-site. The furnace should be centralized in respect to the heat distribution system as much as practicable. When installed in a utility room, the door should be wide enough to allow the largest part of the furnace to enter, or permit the replacement of another appliance, such as a water heater.

⚠ CAUTION

Do not use the furnace as a heater in a building under construction. The furnace can be severely damaged due to the abnormal environment caused by construction. Chlorides from sources such as paint, stain, or varnish; tile and counter cements; adhesives; and foam insulation are abundant in a structure under construction and can be highly corrosive. Low return air temperature can cause condensation in the furnace and other damage that can shorten the life of the unit.

A gas-fired furnace for installation in a residential garage must be installed so the burner(s) and the ignition source are located not less than 18" above the floor. The furnace is to be located or protected to avoid physical damage by vehicles.

If the furnace is to be installed in an attic or other insulated space, it must be kept free and clear of insulating materials.

Clearances

All servicing and cleaning of the furnace can be performed from the front. If installed in a closet or utility room, provide 18" clearance in front for service if the door to the room is not in line with the front of the furnace.

Refer to Table 5-2 for the minimum clearances to combustibles required for construction and proper unit operation.

Where servicing clearances are greater than clearances to combustibles, servicing clearances take precedence.

Upflow models (G1D91AU, G1D91BU, G1D93AU, and G1D93BU) and multi-position models (G1D91BT) may be installed on wood flooring but shall not be installed directly on carpeting, tile, or any other combustible material.

Counterflow models (G1D93AC and G1D93BC) are certified for installation on combustible flooring provided a special base assembly is used. (Refer to the ***Duct Connection – Counterflow Models*** section beginning on page 5-45 for more information on using the special base assembly.)

When a counterflow unit is installed on a combustible floor, 1" clearance must be provided between the supply duct and the floor.

Table 5-2 Minimum Clearances to Combustibles

	Upflow/Counterflow	Horizontal
Sides	0"	0"
Rear	0"	0"
Front	2"	0"
Flue Pipe	0"	18"
Plenum Top	1"	1"
Supply Duct	1"	1"

Combustion Air

Adequate provisions for combustion air and ventilation of furnace must be made. Refer to Section 5.3, “Air for Combustion and Ventilation,” of the National Fuel Gas Code, ANSI Z223.1/NFPA54 (latest edition), Sections 7.2, 7.3, or 7.4 of CSA B149.1 Natural Gas and Propane Installation Codes (latest edition), or applicable provisions of the local building codes.

⚠WARNING

Insufficient combustion air can cause headaches, nausea, dizziness, or asphyxiation. When considering combustion air requirements, enough air must also be provided to meet the needs of all fuel-burning appliances and exhaust fans.

⚠WARNING

Air openings in the front of the furnace must be kept free of obstructions. Any obstruction may cause improper operation that can result in a fire hazard or carbon monoxide injury.

Unconfined Space

An unconfined space is defined as “a space whose volume is more than 50 cubic feet per 1000 BTU per hour of the combined input rating of all appliances installed in that space.” When a furnace is installed in an unconfined space in a building, it can be assumed that the infiltration will be sufficient to supply the required air. If the furnace is installed in a ventilated attic or crawl space, it is assumed that the infiltration is sufficient to supply the required air. However, in a building of unusually tight construction, additional outdoor air should be provided.

Confined Space

A confined space is defined as “a space whose volume is less than 50 cubic feet per 1000 BTU per hour of the combined input rating of all appliances installed in that space.”

If the furnace is installed in a confined space within the building and combustion air is taken from a heated space, the combustion air and ventilating air must enter and leave the space through two permanent openings of equal area. One opening shall be located within 12" of the ceiling and the other within 12" of the floor, each having a free area of 1 square inch per 1000 BTU/HR of total input rating of all appliances within the space and not less than 100 square inches each.

If the furnace is installed in a space within a building of tight construction, makeup air must be supplied from outdoors. In this case, one opening

shall be within 12" of the ceiling and one opening within 12" of the floor. If combustion ducts are vertical, each opening shall have a free area of 1 square inch per 4000 BTU/HR of the total input rating of all appliances within the enclosure. If horizontal combustion ducts are run, 1 square inch per 2000 BTU/HR is required.

Contaminated Combustion Air

Excessive exposure to contaminated combustion air will result in safety and performance related problems. The recommended source of combustion air is outdoor air. However, the use of indoor air in most applications is acceptable if the following guidelines are followed:

1. If the furnace is installed in a confined space, it is recommended that the necessary combustion air come from the outdoors by way of an attic, crawl space, air duct, or direct opening.

2. If indoor combustion air is used, there must be no exposure to the substances listed in Item 5.

3. All provisions for indoor combustion air must meet the requirements for combustion air indicated in the National Fuel Gas Code, ANSI Z223.1/NFPA54 (latest edition), and/or any applicable local codes. In Canada, see CSA B149.1, Natural Gas and Propane Installation Codes (latest edition).

4. The following types of installation may require **outdoor air** for combustion, due to chemical exposures:

    - Commercial buildings
    - Buildings with indoor pools
    - Furnaces installed in laundry rooms
    - Furnaces installed in hobby or craft rooms
    - Furnaces installed near chemical storage areas

5. Exposure to the following substances in the combustion air supply may also require **outdoor air** for combustion:

    - Permanent wave solutions
    - Chlorinated waxes and cleaners
    - Chlorine-based swimming pool chemicals
    - Water softening chemicals
    - Deicing salts or chemicals
    - Carbon tetrachloride
    - Halogen-type refrigerants
    - Cleaning solvents (such as perchloroethylene)
    - Printing inks, paint removers, varnishes, etc.
    - Cements and glues
    - Antistatic fabric softeners for clothes dryers

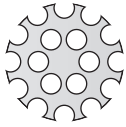
- Masonry acid washing materials
- Chlorinated laundry products
- Hydrochloric acid

Venting

The high efficiency of this furnace is accomplished by the removal of both sensible and latent heat from the flue gases. The removal of latent heat results in the condensation of moisture in the flue gases. This condensation occurs in the secondary heat exchanger and in the vent system. Therefore, this furnace requires special venting considerations and the instructions must be followed to insure proper operation. All venting must be in accordance with the codes having jurisdiction in the area and these instructions.

These furnaces can be installed as either direct vent or non-direct vent units. A direct vent (two pipe) installation requires that all the air necessary for combustion be supplied from outside the dwelling through an air intake pipe. A non-direct vent (one pipe) installation uses air from inside the dwelling for combustion.

The furnace is shipped with the air inlet pipe terminated to the top panel for either inside or outside combustion air. An inlet air restrictor plate (see Figure 5-2) is supplied with this furnace and can be found in the plastic bag containing the Installation Instructions and the User's Information Manual. The inlet restrictor plate must be used in all installations using inside air for combustion (non-direct vent).



Inlet Air Restrictor Plate

The inlet air restrictor plate **must** be installed in all installations using inside air for combustion (non-direct vent).

Flue Pipe Screen

The flue pipe screen should be installed at the termination of the flue pipe in all installations.

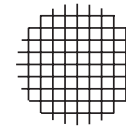


Figure 5-2 Inlet Air Restrictor Plate and Flue Pipe Screen

To install the inlet restrictor plate:

1. Install the restrictor plate in the inlet plate collar in the top panel of the furnace.
2. Insert a 3" section of PVC pipe (field supplied) into the collar. Use high temperature RTV sealant to attach PVC pipe to collar.

3. Attach a 90° elbow (field supplied) to the PVC pipe. Use high temperature RTV sealant to attach elbow to PVC pipe.

Two different sized inlet restrictor plates are supplied with the furnace (2" and 3"). The 3" restrictor plate should be used with non-direct venting 125K models only; all other non-direct vented models use the 2" restrictor plate.

Also included in the plastic bag containing the inlet air restriction plate is a flue pipe screen (see Figure 5-2 on page 5-7). In all installations, this screen should be installed at the termination of the flue pipe and is designed to keep objects out of the flue pipe.

⚠WARNING

If at any time in the future the installation of this furnace is changed to require outside fresh air for combustion, the inlet air restrictor plate must be removed. Failure to do so could cause improper operation that can result in a fire hazard or carbon monoxide injury.

For either type of installation (direct or non-direct vent), special venting considerations must be followed. Refer to the proper section in pages 5-18 to 5-36 for the type of furnace and venting being installed.

The venting system must be supported with mounting straps to prevent any weight load from being applied to the vent blower. Horizontal vent pipe must be supported every 5' and vertical pipe should be supported every 10' to prevent sagging and provide rigid support.

When a furnace is installed as direct vent, provisions for ventilation air should follow the same requirements as if installed as non-direct vent. Proper ventilation air is necessary to maintain furnace component temperatures within acceptable limits.

All vents passing through floors, ceilings, and walls must be installed in accordance with National Fuel Gas Code, ANSI Z223.1/NFPA 54 (latest edition).

In all applications where the flue pipe is run through an unconditioned space, 1/2" Armaflex or equivalent must be used over the pipe. In extreme cold climates, 3/4" Armaflex is recommended.

Materials

All pipe, fittings, primer, and solvent cement must conform with American National Standard Institute and American Society for Testing and Materials (ANSI/ASTM) standards. The solvent shall be free flowing and contain no lumps, undissolved particles, or any foreign matter that adversely affects

the joint strength or chemical resistance of the cement. The cement shall show no gelation, stratification, or separation that cannot be removed by stirring.

Refer to Table 5-3 for approved piping and fitting materials.

Table 5-3 Piping and Fitting Specifications

Piping and Fitting Material	ASTM Specification
Schedule 40 PVC (Pipe)	D1785
Schedule 40 PVC (Cellular Core Pipe)	F891
Schedule 40 PVC (Fittings)	D2466
SDR-26 (Pipe)	D2241
Schedule 40 ABS (Pipe)	D1527
Schedule 40 ABS (Fittings)	D2468
Schedule 40 & 80 CPVC (Pipe)	F441
ABS-DWV Drain Waste & Vent (Pipe & Fittings)	D2661
PVC-DWV Drain Waste & Vent (Pipe & Fittings)	D2665

The primers and solvents used must also meet ASTM specifications. PVC primer is specified in ASTM F656. Use PVC solvent as specified as specified in ASTM D2564 and ABS solvent cement as specified in ASTM D2235. Low temperature cement is recommended. Metal or plastic strapping may be used for vent pipe hangers.

When making ABS joints, pieces can be prepared with a cleaner. When joining ABS to PVC materials, use PVC solvent cement as specified in ASTM D3138.

Preferred fittings are DWV style or long sweep. Seal all joints gas tight with appropriate cement. In areas where vent and air intake pipes are exposed to abnormal stress or are subject to damage, schedule 80 pipe should be used.

Category IV Furnace Limitations

G1D91/93 furnaces are Category IV furnaces. Any furnace in this class shall **not** be connected to any Type B, BW, or L vent or vent connector

and shall **not** be connected to any portion of a factory-built or masonry chimney. **This furnace is not to be common vented with any other appliance. The vent pipe must not be connected to a chimney flue serving a separate appliance designed to burn solid fuel.**

Concentric Vent Kit

A concentric vent kit (model #ACVK2) is available for use when installing G1D91/93 units as direct vent furnaces and the air intake and vent pipe are to be run through the same hole, whether horizontally through the wall or vertically through the roof. See the **Accessories** section page 6-25 for more information on the concentric vent kit.

Vent Pipe Size and Length

The vent pipe and air intake pipe (if applicable) should be sized in accordance with the information found in Tables 5-4 through 5-6 on pages 5-11 and 5-12. One 90° elbow is equivalent to 5' of pipe. Two 45° elbows are equivalent to one 90° elbow. The minimum length certified for use with this furnace is 5' and one elbow, not including the vent and air intake terminals.

In the event that the pipe length is in between the lengths listed in the table, use the next larger length listed. For example, if a length of pipe needed to install the furnace is 27', use the diameter values for the 30' row in the tables. For direct vent installations, if the vent and air intake pipe are not equal in length and number of elbows, then determine the minimum pipe diameter for both the vent and air intake. If the results indicate different diameters, use the larger of the two for both the vent and air intake. **Under no circumstances should the vent and air intake pipe size be different in diameter.**

For installation details, refer to the appropriate section in pages 5-18 to 5-36 for the unit model and type of installation.

Table 5-4 Minimum Pipe Diameter (in.) 40,000 – 80,000 BTU/HR Models

Vent Pipe Length (ft.)	Number of 90° Elbows									
	0	1	2	3	4	5	6	7	8	9
5	1.5	1.5	2	2	2	2	2	2	2	2
10	1.5	2	2	2	2	2	2	2	2	2
20	2	2	2	2	2	2	2	2	2	2.5
30	2	2	2	2	2	2	2	2.5	2.5	2.5
40	2	2	2	2	2	2.5	2.5	2.5	2.5	2.5
50	2	2	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3
60	2	2.5	2.5	2.5	2.5	2.5	2.5	3	3	3
70	2.5	2.5	2.5	2.5	2.5	3	3	3	3	NR
80	2.5	2.5	2.5	3	3	3	3	3	NR	NR
90	2.5	2.5	3	3	3	3	3	NR	NR	NR

NR = Not Recommended

Table 5-5 Minimum Pipe Diameter (in.) 90,000 – 100,000 BTU/HR Models

Vent Pipe Length (ft.)	Number of 90° Elbows									
	0	1	2	3	4	5	6	7	8	9
5	NR	2	2	2	2	2	2	2.5	2.5	2.5
10	2	2	2	2	2	2	2.5	2.5	2.5	2.5
20	2	2	2	2	2	2.5	2.5	2.5	2.5	3
30	2	2	2	2.5	2.5	2.5	2.5	3	3	3
40	2	2	2.5	2.5	2.5	3	3	3	3	3
50	2.5	2.5	2.5	3	3	3	3	3	3	NR
60	2.5	3	3	3	3	3	3	NR	NR	NR
70	3	3	3	3	3	NR	NR	NR	NR	NR
80	3	3	3	NR	NR	NR	NR	NR	NR	NR
90	3	3	NR	NR	NR	NR	NR	NR	NR	NR

NR = Not Recommended

Table 5-6 Minimum Pipe Diameter (in.) 112,000 - 125,000 BTU/HR Models

Vent Pipe Length (ft.)	Number of 90° Elbows									
	0	1	2	3	4	5	6	7	8	9
5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
10	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3
20	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3	3	NR
30	2.5	2.5	2.5	2.5	2.5	3	3	NR	NR	NR
40	2.5	2.5	2.5	2.5	3	NR	NR	NR	NR	NR
50	2.5	3	3	NR	NR	NR	NR	NR	NR	NR
60	3	3	NR	NR	NR	NR	NR	NR	NR	NR

NR = Not Recommended

Special Note: G1D93AC & G1D93BC 45,000/67,000 BTU/HR Units Only

The 45,000 and 67,000 BTU/HR G1D93AC and G1D93BC models contain an inlet air assembly that uses two 22.5° elbows that attach separately from the straight inlet pipe (see Figure 5-2). This allows the inlet pipe assembly to be removed if needed for service. **Do not cement these elbows.**

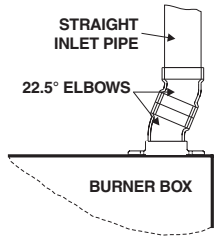
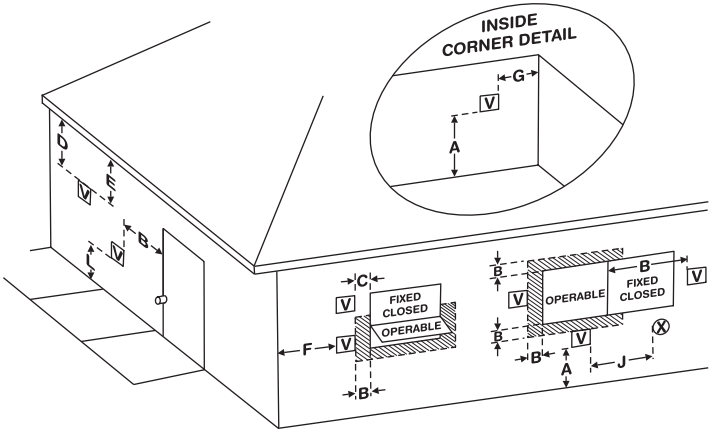


Figure 5-3 G1D93AC/G1D93BC 45,000 & 67,000 BTU/HR Units

Horizontal Venting

The vent for this appliance shall not terminate over public walkways; or near soffit vents or crawl space vents or other areas where condensate or vapor could create a nuisance or hazard or cause property damage; or where condensate vapor could cause damage or could be detrimental to the operation of regulators, relief valves, or other equipment.

See Figure 5-4 (pages 5-14 and 5-15) and Figure 5-5 (pages 5-16 and 5-17) for additional information on where the horizontal vent terminal can and cannot terminate.



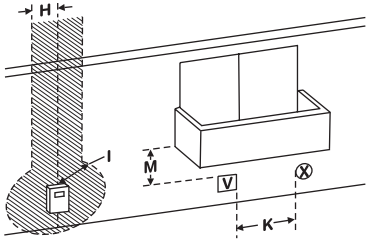
		Canadian Installations[1]	US Installations[2]
A	Clearance above grade, veranda, porch, deck, or balcony	12 in. (30cm)	12 in. (30cm)
B	Clearance to window or door that may be opened	6 in. (15 cm) for appliances less than or equal to 10,000 Btuh (3 kW), 12 in. (30 cm) for appliances greater than 10,000 Btuh (3 kW) and less than or equal to 100,000 Btuh (30 kW), 36 in. (91 cm) for appliances greater than 100,000 Btuh (30 kW)	6 in. (15 cm) for appliances less than or equal to 10,000 Btuh (3 kW), 9 in. (23 cm) for appliances greater than 10,000 Btuh (3 kW) and less than or equal to 50,000 Btuh (15 kW), 12 in. (30 cm) for appliances greater than 50,000 Btuh (15 kW)
C	Clearance to permanently closed window	*	*
D	Vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 2 ft (61 cm) from the center line of the terminal	*	*
E	Clearance to unventilated soffit	*	*
F	Clearance to outside corner	*	*
G	Clearance to inside corner	*	*

Figure 5-4 Sidewall Vent Terminal Clearances – Direct Vented Furnaces

V **Vent Terminal**

X **Air Supply Inlet**

Area Where Terminal Is Not Permitted



		Canadian Installations[1]	US Installations[2]
H	Clearance to each side of center line extended above meter/regulator assembly	3 ft (91 cm) within a height 15 ft (4.5m) above the meter/regulator assembly	*
I	Clearance to service regulator vent outlet	3 ft (91 cm)	*
J	Clearance to nonmechanical air supply inlet to building or the combustion air inlet to any other appliance	6 in. (15 cm) for appliances less than or equal to 10,000 Btuh (3 kW), 12 in. (30 cm) for appliances greater than 10,000 Btuh (3 kW) and less than or equal to 100,000 Btuh (30 kW), 36 in. (91 cm) for appliances greater than 100,000 Btuh (30 kW)	6 in. (15 cm) for appliances less than or equal to 10,000 Btuh (3 kW), 9 in. (23 cm) for appliances greater than 10,000 Btuh (3 kW) and less than or equal to 50,000 Btuh (15 kW), 12 in. (30 cm) for appliances greater than 50,000 Btuh (15 kW)
K	Clearance to a mechanical air supply inlet	6 ft (1.83 m)	3 ft (91 cm) above if within 10 ft (3 m) horizontally
L	Clearance above paved sidewalk or paved driveway located on public property	7 ft (2.13 m)†	*
M	Clearance under veranda, porch, deck, or balcony	12 in. (30 cm)‡	*

[1] In accordance with the current *CSA B149.1, Natural Gas and Propane Installation Code*

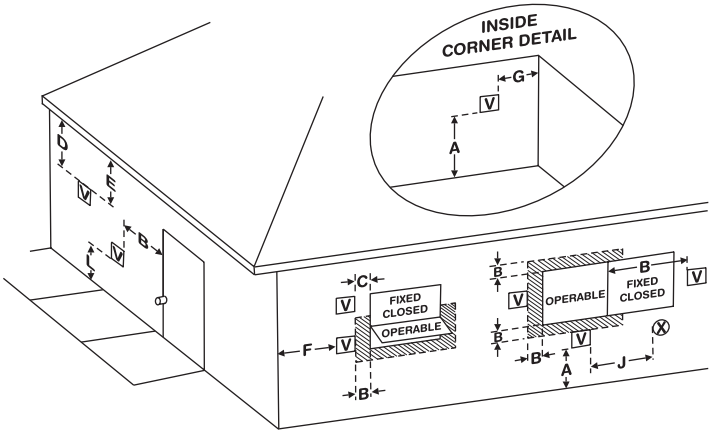
[2] In accordance with the current *ANSI Z2223.1/ NFPA 54, National Fuel Gas Code*

† A vent shall not terminate directly above a sidewalk or paved driveway that is located between two single family dwellings and serves both dwellings.

‡ Permitted only if veranda, porch, deck, or balcony is fully open on a minimum of two sides beneath the floor.

* For clearances not specified in *ANSI Z2223.1/ NFPA 54* or *CSA B149.1*, the following statement shall be included:

"Clearance in accordance with local installation codes and the requirements of the gas supplier and the manufacturer's installation instructions."



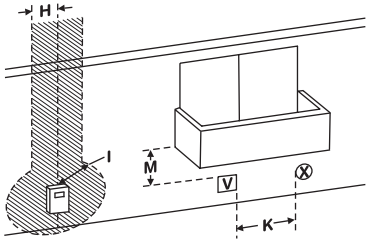
		Canadian Installations[1]	US Installations[2]
A	Clearance above grade, veranda, porch, deck, or balcony	12 in. (30cm)	12 in. (30cm)
B	Clearance to window or door that may be opened	6 in. (15 cm) for appliances less than or equal to 10,000 Btuh (3 kW), 12 in. (30 cm) for appliances greater than 10,000 Btuh (3 kW) and less than or equal to 100,000 Btuh (30 kW), 36 in. (91 cm) for appliances greater than 100,000 Btuh (30 kW)	4 ft (1.2 m) below or to side of opening; 1 ft (30 cm) above opening
C	Clearance to permanently closed window	*	*
D	Vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 2 ft (61 cm) from the center line of the terminal	*	*
E	Clearance to unventilated soffit	*	*
F	Clearance to outside corner	*	*
G	Clearance to inside corner	*	*

Figure 5-5 Sidewall Vent Terminal Clearances – Non-Direct Vented Furnaces

V **Vent Terminal**

X **Air Supply Inlet**

Area Where Terminal Is Not Permitted



		Canadian Installations[1]	US Installations[2]
H	Clearance to each side of center line extended above meter/regulator assembly	3 ft (91 cm) within a height 15 ft (4.5m) above the meter/regulator assembly	*
I	Clearance to service regulator vent outlet	3 ft (91 cm)	*
J	Clearance to nonmechanical air supply inlet to building or the combustion air inlet to any other appliance	6 in. (15 cm) for appliances less than or equal to 10,000 Btuh (3 kW), 12 in. (30 cm) for appliances greater than 10,000 Btuh (3 kW) and less than or equal to 100,000 Btuh (30 kW), 36 in. (91 cm) for appliances greater than 100,000 Btuh (30 kW)	4 ft (1.2 m) below or to side of opening; 1 ft (30 cm) above opening
K	Clearance to a mechanical air supply inlet	6 ft (1.83 m)	3 ft (91 cm) above if within 10 ft (3 m) horizontally
L	Clearance above paved sidewalk or paved driveway located on public property	7 ft (2.13 m)†	7 ft (2.13 m)
M	Clearance under veranda, porch, deck, or balcony	12 in. (30 cm)‡	*

[1] In accordance with the current *CSA B149.1, Natural Gas and Propane Installation Code*

[2] In accordance with the current *ANSI Z2223.1/ NFPA 54, National Fuel Gas Code*

† A vent shall not terminate directly above a sidewalk or paved driveway that is located between two single family dwellings and serves both dwellings.

‡ Permitted only if veranda, porch, deck, or balcony is fully open on a minimum of two sides beneath the floor.

* For clearances not specified in *ANSI Z2223.1/ NFPA 54* or *CSA B149.1*, the following statement shall be included:

"Clearance in accordance with local installation codes and the requirements of the gas supplier and the manufacturer's installation instructions."

Upflow Models G1D91AU, G1D91BU, G1D91BT, G1D93AU, & G1D93BU Direct Vent Installation – Horizontal

An inlet air restrictor plate (see Figure 5-2 on page 5-7) is supplied with the G1D91/93 furnace and can be found in the plastic bag containing the Installation Instructions and User's Information Manual. **The restrictor plate is to be used only in non-direct vent applications.** See the non-direct venting sections on pages 5-22 and 5-23 for more information on installing the restrictor plate in G1D91/93 upflow non-direct vent applications.

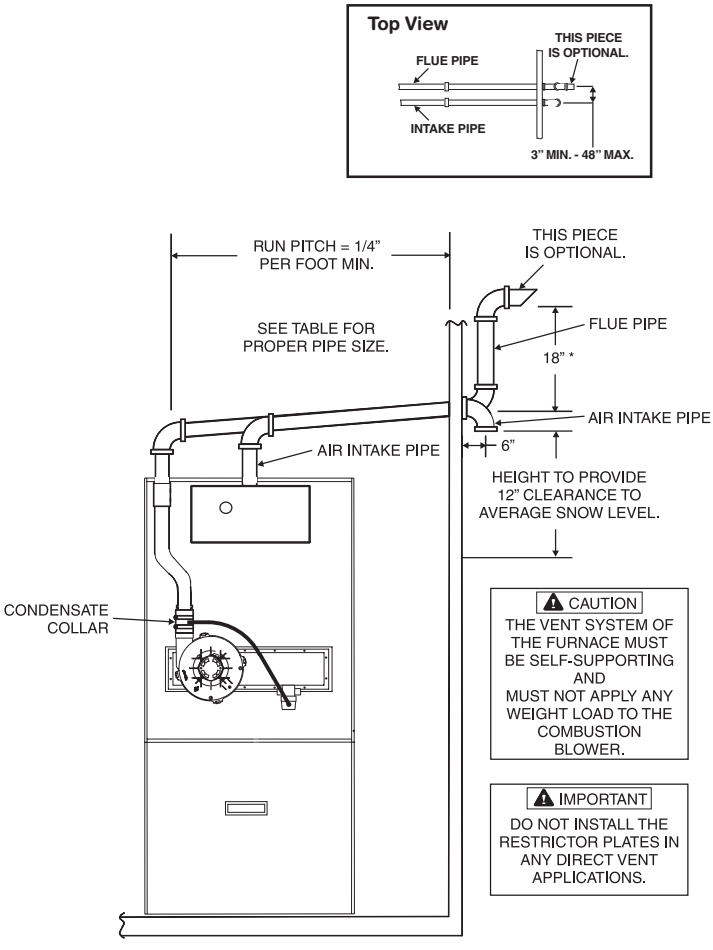
The flue pipe screen (see Figure 5-2 on page 5-7) should be installed at the termination of the flue pipe and is designed to keep objects out of the flue pipe. An additional screen should **not** be placed in the intake termination. If a screen is installed, the air intake may freeze shut.

The vent pipe on horizontal runs must slope upward, away from the furnace, at a pitch of 1/4" per foot of run minimum.

Do not cement the air intake into the connector on the burner box. Use high temperature RTV silicone sealant so that the intake pipe can be removed if service is required.

For proper operation, the vent and air intake pipe must be installed in the same pressure zone. Therefore, in horizontal venting applications they must be on the same side of the house within the parameters shown in Figure 5-6.

On initial start-up of the unit, condensate may run down into the combustion blower and cause noise.



* The 18" dimension is the minimum recommended height for extremely cold areas. In these areas, moisture in the flue gases may condense and freeze on the air intake if this height is reduced. In milder climates, this may be reduced to a minimum of 6". Height may be increased as needed provided total length is not exceeded.

Figure 5-6 Direct Vent Horizontal Installation Upflow Models G1D91AU, G1D91BU, G1D91BT, G1D93AU, & G1D93BU

Upflow Models G1D91AU, G1D91BU, G1D91BT, G1D93AU, & G1D93BU Direct Vent Installation – Vertical

An inlet air restrictor plate (see Figure 5-2 on page 5-7) is supplied with the G1D91/93 furnace and can be found in the plastic bag containing the Installation Instructions and User's Information Manual. **The restrictor plate is to be used only in non-direct vent applications.** See the non-direct venting sections on pages 5-22 and 5-23 for more information on installing the restrictor plate in G1D91/93 upflow non-direct vent applications.

The flue pipe screen (see Figure 5-2 on page 5-7) should be installed at the termination of the flue pipe and is designed to keep objects out of the flue pipe. An additional screen should **not** be placed in the intake termination. If a screen is installed, the air intake may freeze shut.

Do not cement the air intake into the connector on the burner box. Use high temperature RTV silicone sealant so that the intake pipe can be removed if service is required.

For proper operation, the vent and air intake pipe must be installed in the same pressure zone.

On initial start-up of the unit, condensate may run down into the combustion blower and cause noise.

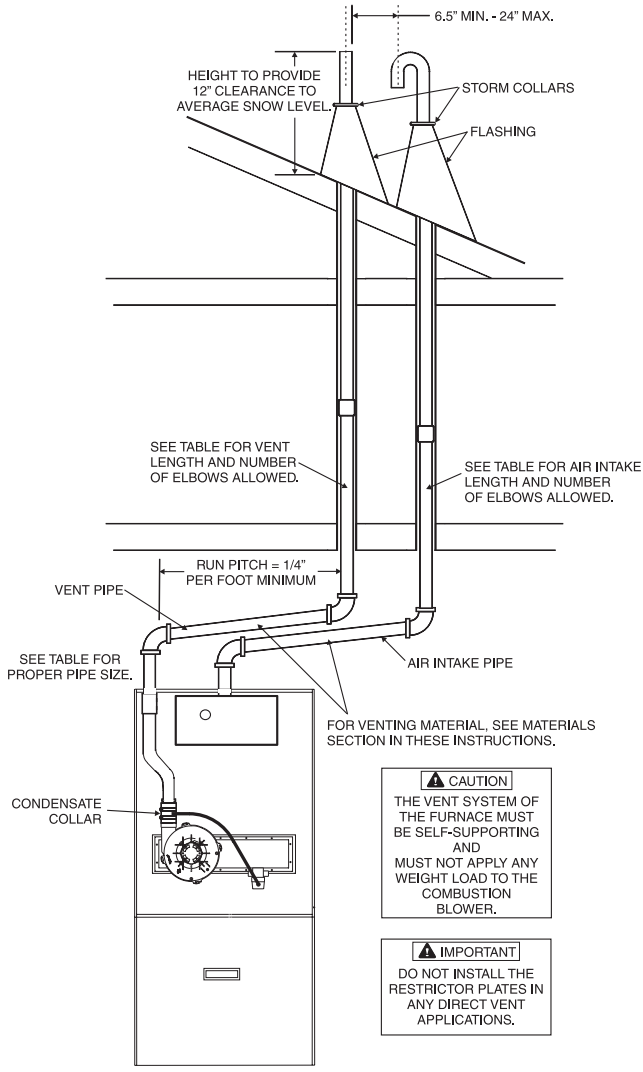


Figure 5-7 Direct Vent Vertical Installation Upflow Models G1D91AU, G1D91BU, G1D91BT, G1D93AU, & G1D93BU

Upflow Models G1D91AU, G1D91BU, G1D91BT, G1D93AU, & G1D93BU Non-Direct Vent Installations

An inlet air restrictor plate (see Figure 5-2 on page 5-7) is supplied with the G1D91/93 furnace and can be found in the plastic bag containing the Installation Instructions and User's Information Manual. The restrictor plate is to be used only in non-direct vent applications. Place the restrictor plate into the inlet collar, insert 3" section of PVC pipe (field supplied), then attach a 90° elbow (field supplied) to the PVC pipe in all non-direct vent installations (see Figures 5-8 and 5-9).

Two different sized inlet restrictor plates are supplied with the furnace (2" and 3"). The 3" restrictor plate should be used with non-direct venting 125K models only; all other non-direct vented models use the 2" restrictor plate.

The flue pipe screen (see Figure 5-2 on page 5-7) should be installed at the termination of the flue pipe and is designed to keep objects out of the flue pipe.

The vent pipe on horizontal runs must slope upward, away from the furnace, at a pitch of 1/4" per foot of run minimum.

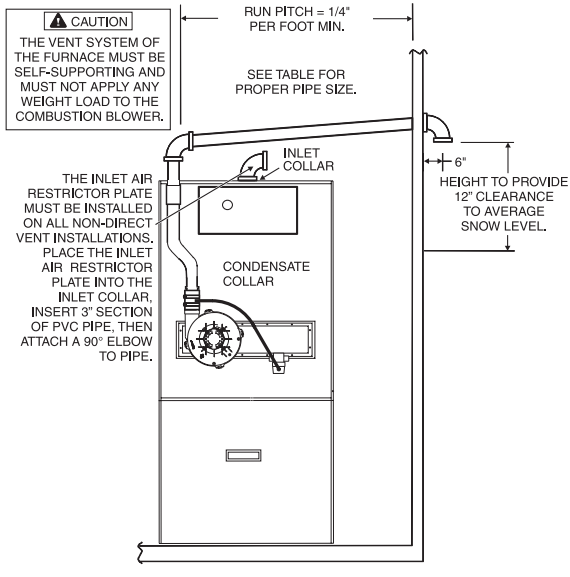


Figure 5-8 **Non-Direct Vent Horizontal Installation Upflow Models G1D91AU, G1D91BU, G1D91BT, G1D93AU, G1D93BU**

On initial start-up of the unit, condensate may run down into the combustion blower and cause noise.

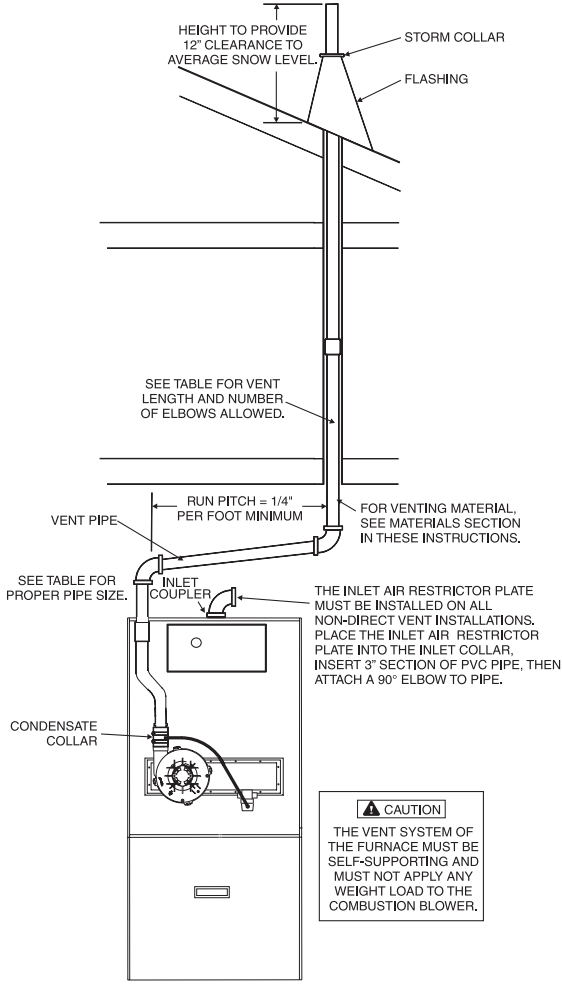


Figure 5-9 Non-Direct Vent Vertical Installation Upflow Models G1D91AU, G1D91BU, G1D91BT G1D93AU, G1D93BU

Counterflow Model G1D93AC & G1D93BC Direct Vent Installation – Horizontal

An inlet air restrictor plate (see Figure 5-2 on page 5-7) is supplied with the G1D93 furnace and can be found in the plastic bag containing the Installation Instructions and User's Information Manual. **The restrictor plate is to be used only in non-direct vent applications.** See the non-direct venting sections on pages 5-28 and 5-29 for more information on installing the restrictor plate in G1D93 counterflow non-direct vent applications.

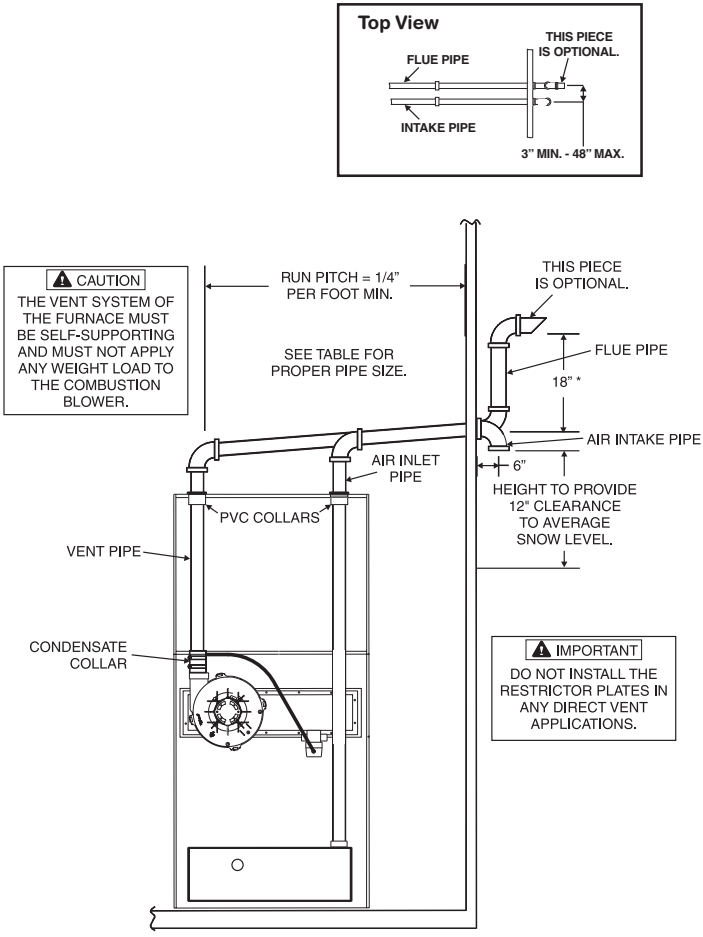
The flue pipe screen (see Figure 5-2 on page 5-7) should be installed at the termination of the flue pipe and is designed to keep objects out of the flue pipe. An additional screen should **not** be placed in the intake termination. If a screen is installed, the air intake may freeze shut.

The vent pipe on horizontal runs must slope upward, away from the furnace, at a pitch of 1/4" per foot of run minimum.

Do not cement the air intake into the connector on the burner box. Use high temperature RTV silicone sealant so that the intake pipe can be removed if service is required.

For proper operation, the vent and air intake pipe must be installed in the same pressure zone. Therefore, in horizontal venting applications they must be on the same side of the house within the parameters shown in Figure 5-10.

On initial start-up of the unit, condensate may run down into the combustion blower and cause noise.



* The 18" dimension is the minimum recommended height for extremely cold areas. In these areas, moisture in the flue gases may condense and freeze on the air intake if this height is reduced. In milder climates, this may be reduced to a minimum of 6". Height may be increased as needed provided total length is not exceeded.

Figure 5-10 Direct Vent Horizontal Installation Counterflow Models G1D93AC & G1D93BC

Counterflow Model G1D93AC & G1D93BC Direct Vent Installation – Vertical

An inlet air restrictor plate (see Figure 5-2 on page 5-7) is supplied with the G1D93 furnace and can be found in the plastic bag containing the Installation Instructions and User's Information Manual. **The restrictor plate is to be used only in non-direct vent applications.** See the non-direct venting sections on pages 5-28 and 5-29 for more information on installing the restrictor plate in G1D93 counterflow non-direct vent applications.

The flue pipe screen (see Figure 5-2 on page 5-7) should be installed at the termination of the flue pipe and is designed to keep objects out of the flue pipe. An additional screen should **not** be placed in the intake termination. If a screen is installed, the air intake may freeze shut.

Do not cement the air intake into the connector on the burner box. Use high temperature RTV silicone sealant so that the intake pipe can be removed if service is required.

For proper operation, the vent and air intake pipe must be installed in the same pressure zone.

On initial start-up of the unit, condensate may run down into the combustion blower and cause noise.

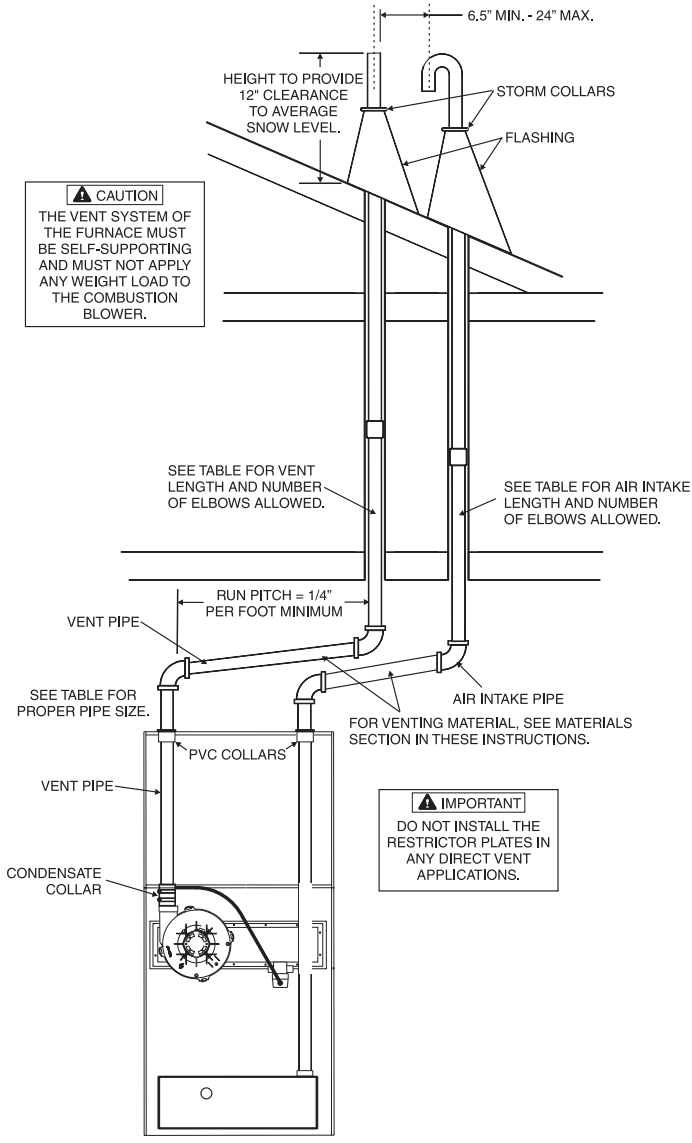


Figure 5-11 Direct Vent Vertical Installation Counterflow Models G1D93AC & G1D93BC

Counterflow Model G1D93AC & G1D93BC Non-Direct Vent Installations

An inlet air restrictor plate (see Figure 5-2 on page 5-7) is supplied with the G1D93 furnace and can be found in the plastic bag containing the Installation Instructions and User's Information Manual. The restrictor plate is to be used only in non-direct vent applications. Place the restrictor plate into the inlet collar, insert 3" section of PVC pipe (field supplied), then attach a 90° elbow (field supplied) to the PVC pipe in all non-direct vent installations (see Figures 5-12 and 5-13).

Two different sized inlet restrictor plates are supplied with the furnace (2" and 3"). The 3" restrictor plate should be used with non-direct venting 125K models only; all other non-direct vented models use the 2" restrictor plate.

The flue pipe screen (see Figure 5-2 on page 5-7) should be installed at the termination of the flue pipe and is designed to keep objects out of the flue pipe.

The vent pipe on horizontal runs must slope upward, away from the furnace, at a pitch of 1/4" per foot of run minimum.

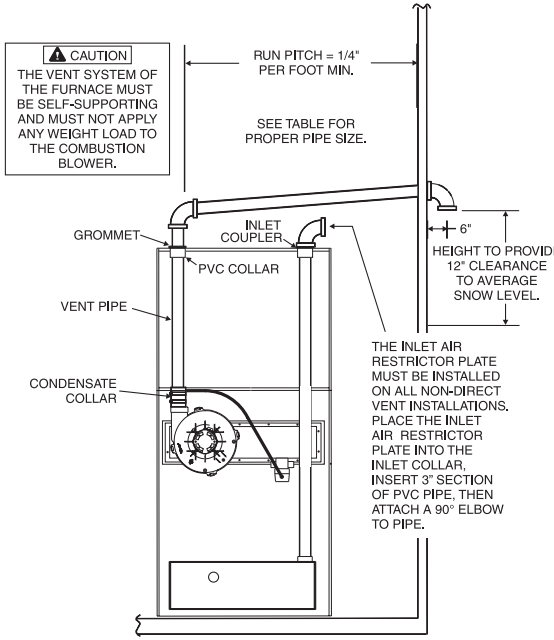


Figure 5-12 Non-Direct Vent Horizontal Installation Counterflow Models G1D93AC & G1D93BC

On initial start-up of the unit, condensate may run down into the combustion blower and cause noise.

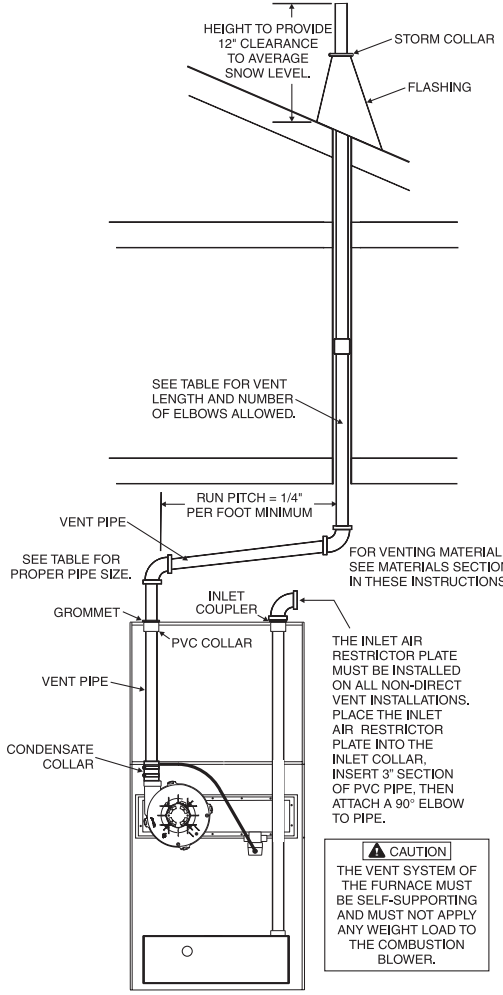


Figure 5-13 Non-Direct Vent Vertical Installation Counterflow Models G1D93AC & G1D93BC

Multi-Position G1D91BT Model Direct Vent Installation: Horizontal Installation – Horizontal Venting

An inlet air restrictor plate (see Figure 5-2 on page 5-7) is supplied with the G1D91BT furnace and can be found in the plastic bag containing the Installation Instructions and User's Information Manual. **The restrictor plate is to be used only in non-direct vent applications.** See the non-direct venting sections on pages 5-22 and 5-23 for more information on installing the restrictor plate in G1D91BT horizontal non-direct vent applications.

The flue pipe screen (see Figure 5-2 on page 5-7) should be installed at the termination of the flue pipe and is designed to keep objects out of the flue pipe. An additional screen should **not** be placed in the intake termination. If a screen is installed, the air intake may freeze shut.

The 18" dimension shown in Figure 5-14 is the recommended height for extremely cold areas. In these areas, moisture in the flue gases may condense and freeze on the air intake if this height is reduced. In milder climates, this may be reduced to a minimum of 6". Height may be increased as needed provided the total length of pipe to furnace is not exceeded.

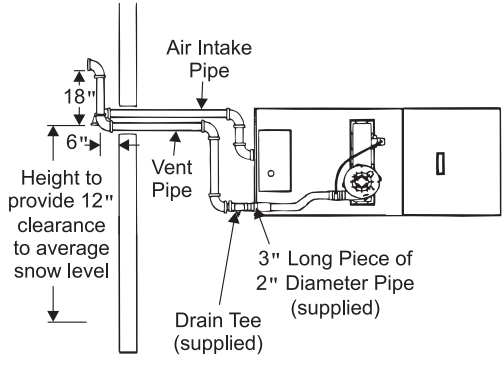
The vent pipe on horizontal runs must slope upward, away from the furnace, at a pitch of 1/4" per foot of run minimum.

Do not cement the air intake into the connector on the burner box. Use high temperature RTV silicone sealant so that the intake pipe can be removed if service is required.

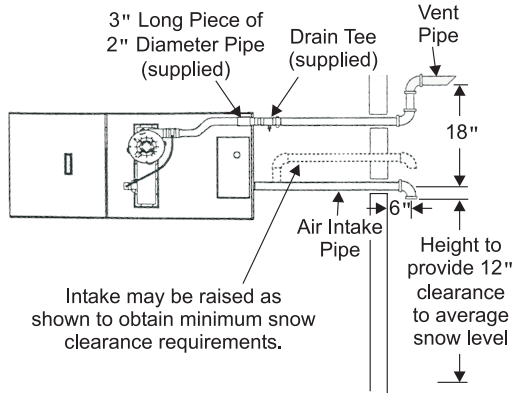
For proper operation, the vent and air intake pipe must be installed in the same pressure zone. Therefore, in horizontal venting applications they must be on the same side of the house within the parameters shown in Figure 5-14.

On initial start-up of the unit, condensate may run down into the combustion blower and cause noise.

Airflow Right to Left



Airflow Left to Right



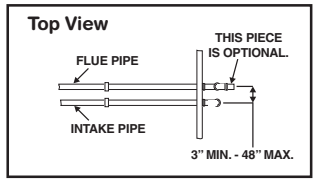


Figure 5-14 Direct Vent Horizontal Installation – Horizontal Venting Multi-Position G1D91BT Models

Multi-Position G1D91BT Model Direct Vent Installation: Horizontal Installation – Vertical Venting

An inlet air restrictor plate (see Figure 5-2 on page 5-7) is supplied with the G1D91BT furnace and can be found in the plastic bag containing the Installation Instructions and User's Information Manual. **The restrictor plate is to be used only in non-direct vent applications.** See the non-direct venting sections on pages 5-22 and 5-23 for more information on installing the restrictor plate in G1D91BT horizontal non-direct vent applications.

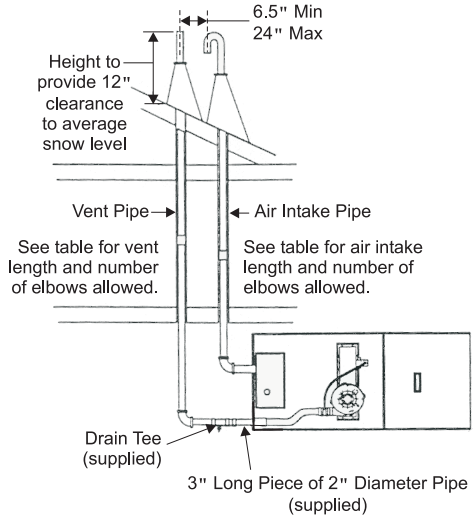
The flue pipe screen (see Figure 5-2 on page 5-7) should be installed at the termination of the flue pipe and is designed to keep objects out of the flue pipe. An additional screen should **not** be placed in the intake termination. If a screen is installed, the air intake may freeze shut.

The vent pipe on horizontal runs must slope upward, away from the furnace, at a pitch of 1/4" per foot of run minimum.

Do not cement the air intake into the connector on the burner box. Use high temperature RTV silicone sealant so that the intake pipe can be removed if service is required.

On initial start-up of the unit, condensate may run down into the combustion blower and cause noise.

Airflow Right to Left



Airflow Left to Right

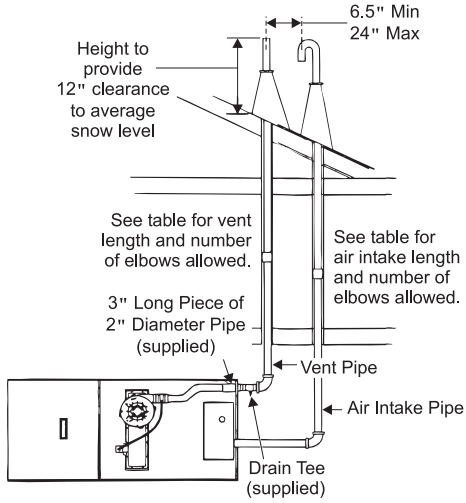


Figure 5-15 **Direct Vent Horizontal Installation – Vertical Venting Multi-Position G1D91BT Models**

Multi-Position G1D91BT Model Non-Direct Vent Installation: Horizontal Installation

An inlet air restrictor plate (see Figure 5-2 on page 5-7) is supplied with the G1D91BT furnace and can be found in the plastic bag containing the Installation Instructions and User's Information Manual. The restrictor plate is to be used only in non-direct vent applications. Place the restrictor plate into the inlet collar, insert 3" section of PVC pipe (field supplied), then attach a 90° elbow (field supplied) to the PVC pipe in all non-direct vent installations (see Figures 5-16 and 5-17).

Two different sized inlet restrictor plates are supplied with the furnace (2" and 3"). The 3" restrictor plate should be used with non-direct venting 125K models only; all other non-direct vented models use the 2" restrictor plate.

The flue pipe screen (see Figure 5-2 on page 5-7) should be installed at the termination of the flue pipe and is designed to keep objects out of the flue pipe.

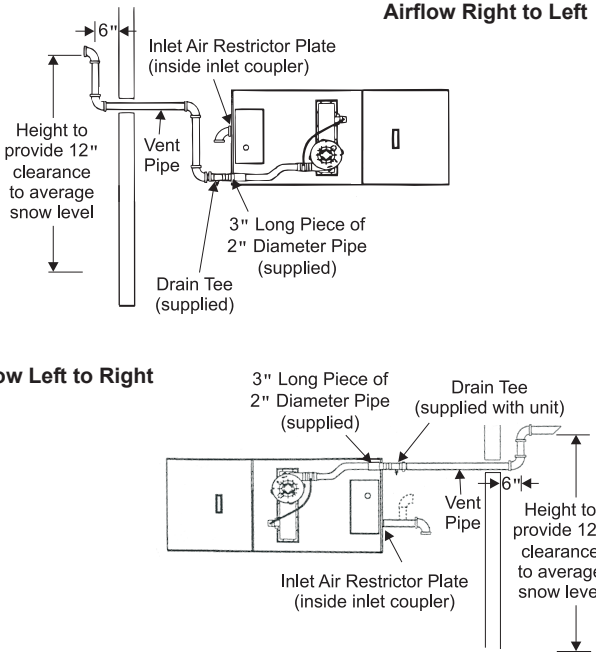


Figure 5-16 **Non-Direct Vent Horizontal Installation – Horizontal Venting Multi-Position G1D91BT Models**

The vent pipe on horizontal runs must slope upward, away from the furnace, at a pitch of 1/4" per foot of run minimum.

On initial start-up of the unit, condensate may run down into the combustion blower and cause noise.

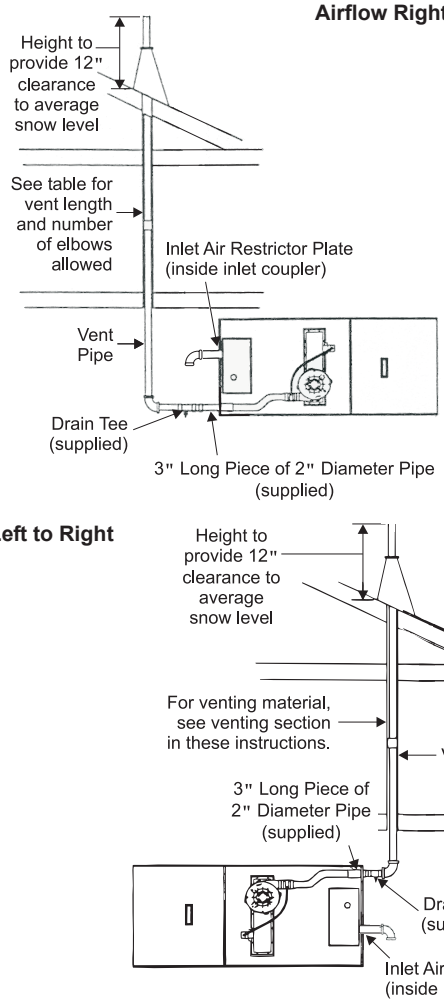


Figure 5-17 Non-Direct Vent Horizontal Installation – Vertical Venting Multi-Position G1D91BT Models

Multi-Position G1D91BT Model Horizontal Installation: Low Clearance Installations

Vent pipe on horizontal runs must slope upward, away from the furnace, at a minimum pitch of 1/4" per foot of run, to prevent accumulation of condensate. In certain horizontal, left-to-right airflow applications, the furnace's close proximity to the floor joists above the unit may make it difficult to obtain the required pitch/slope. Figure 5-18 shows the accepted vent practice used to obtain proper pitch/slope back to the furnace for proper drainage.

In all applications, minimum clearances to combustibles must be observed (as shown in Table 5-2 on page 5-4) as well as all other required clearances shown in Figure 5-14 (page 5-31) or Figure 5-16 (page 5-34).

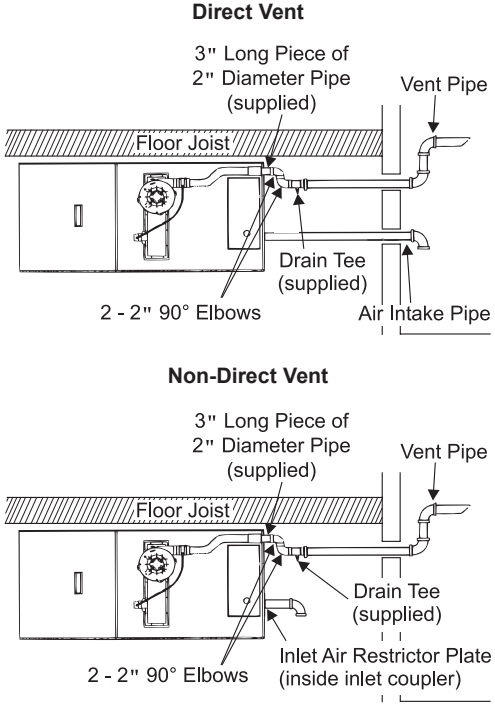


Figure 5-18 Low Clearance Horizontal Installation Multi-Position G1D91BT Models

Existing Vent Systems

When an existing furnace is removed from a common venting system serving other appliances, the venting system is likely to be too large to properly vent the remaining attached appliances. An improperly sized venting system can result in spillage of flue products into the living space, the formation of condensate, leakage, etc.

The following test should be conducted with each appliance while the other appliances connected to the common venting system are not in operation.

1. Seal any unused openings in the common venting system.
2. Visually inspect the venting system for proper size and horizontal pitch and determine there is no blockage or restriction, leakage, corrosion, or other deficiencies which could cause an unsafe condition.
3. Insofar as is practical, close all building doors and windows between the space in which the appliances remaining connected to the common venting system are located and other spaces in the building. Turn on clothes dryers and any appliance not connected to the common venting system. Turn on exhaust fans, such as range hoods and bathroom exhausts, so they will operate at maximum speed. Do not operate a summer exhaust fan. Close fireplace dampers.
4. Following the lighting instructions, place the unit being inspected in operation. Adjust the thermostat so the appliance will operate continuously.
5. Test for spillage at the draft hood relief opening after 5 minutes of main burner operation. Use the flame of a match or candle.
6. After it has been determined that each appliance remaining connected to the common venting system properly vents when tested as outlined above, return doors, windows, exhaust fans, fireplace dampers, and any other fuel burning appliance to their previous condition of use.
7. If improper venting is observed during any of the above tests, the common venting system must be corrected. **See National Fuel Gas Code, ANSI Z223.1 (latest edition) or CAN/CGA B149.1 & .2 Installation Codes to correct improper operation of common venting system.**

Condensate Disposal

The condensate drain should be routed directly to a locally acceptable disposal area. The condensate drain line should not be run directly to the outdoors especially in colder climates where temperatures may cause the condensate to freeze in the drain line.

In horizontal installations where clearances beneath the unit is limited (G1D91BT models only), an alternate method for condensate disposal trap installation may be used (see page 5-42).

Upflow Installation

Install the condensate drain line to the unit as follows. The condensate can be drained from either the right or left side of the furnace. Install the 1/2" NPT x 3/4" PVC adapter (supplied) in the drain on the side that the draining will occur. Install the plastic pipe plug opposite of the drain. Using 3/4" PVC pipe, make a connection from the adapter just installed to extend just outside the unit. Install a 3/4" PVC tee as shown in Figure 5-19. From the tee, install the drain to the disposal area. The top of the tee must be left open for proper condensate drainage.

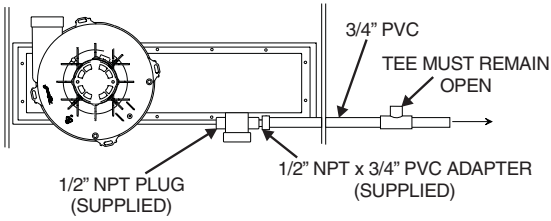


Figure 5-19 Condensate Disposal – Upflow/Counterflow Installation

Horizontal Installation – Right to Left Airflow

Furnace must be mounted such that the side through which the condensate will drain is elevated a minimum of 9" above a surface such as a floor.

Install unit at a slight pitch forward (see Figure 5-20).

1. Relocate the 1/2" NPT plug installed on the flue pan to one side of the internal trap assembly (as shown in Figure 5-21).
2. Connect the 1/2" NPT plug (supplied) to the opposite side of the internal trap assembly from the plug installed in Step 1.
3. Insert trap assembly (supplied) into flue pan (see Figure 5-22).
4. Connect a length of 3/4" PVC pipe (3' minimum) to the trap assembly (see Figure 5-23 on 5-40).

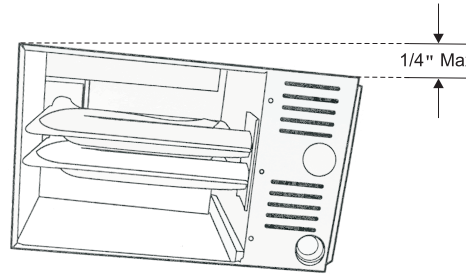


Figure 5-20 Horizontal Installation – Right to Left Airflow: Tilt Unit Forward

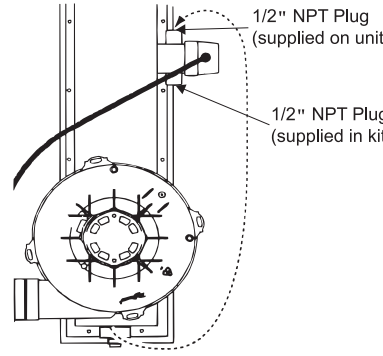


Figure 5-21 Horizontal Installation – Right to Left Airflow: Insert Plugs

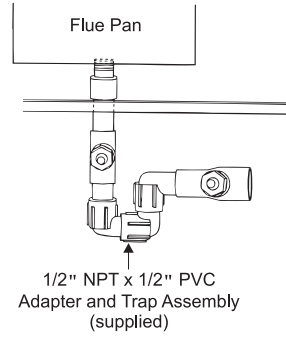
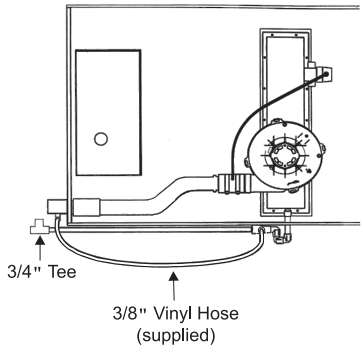


Figure 5-22 Horizontal Installation – Right to Left Airflow: Install Trap Assembly

5. Install 3/4" tee (supplied) as shown in Figure 5-23.



Be sure to avoid double-trapping the vinyl hose. Hose must be installed as shown.

Figure 5-23 Horizontal Installation – Right to Left Airflow: Completing Condensate Drain Installation

6. From the tee, connect the drain to disposal area. The top of the tee must be left open for proper condensate drainage. The open end of the tee must be oriented so that condensate does not run out of the opening.
7. Remove 72" vinyl hose supplied with unit and cut in half. Connect one end of the vinyl hose to the 3/8" barbed fitting of the 2" x 2" x 1/2" tee in vent and the other end to the 3/8" barbed fitting on the drain trap assembly.

Horizontal Installation – Left to Right Airflow

Furnace must be mounted such that the side through which the condensate will drain is elevated a minimum of 9" above a surface such as a floor.

Install unit at a slight pitch forward (see Figure 5-24).

1. Relocate 1/2" NPT plug installed on flue pan to one side of the internal trap assembly (as shown in Figure 5-25).
2. Connect the 1/2" NPT plug (supplied) to the opposite side of the internal trap assembly from the plug installed in Step 1.
3. Insert trap assembly (supplied) into flue pan (see Figure 5-26).
4. Connect a length of 3/4" PVC pipe (3' minimum) to the trap assembly (see Figure 5-27 on page 5-42).
5. Install 3/4" tee (supplied) as shown in Figure 5-27.

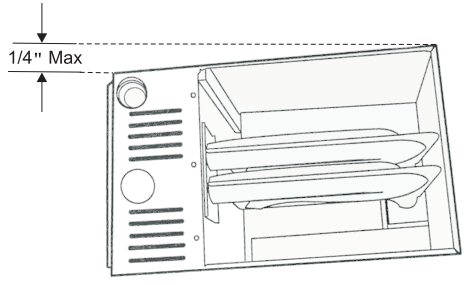


Figure 5-24 Horizontal Installation – Left to Right Airflow: Tilt Unit Forward

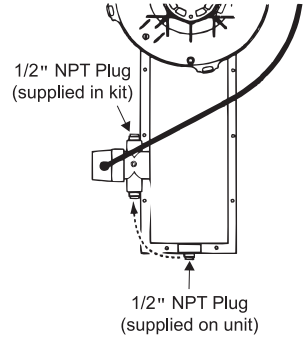


Figure 5-25 Horizontal Installation – Left to Right Airflow: Insert Plugs

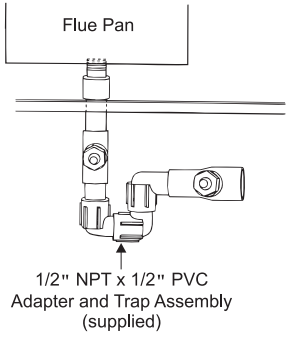
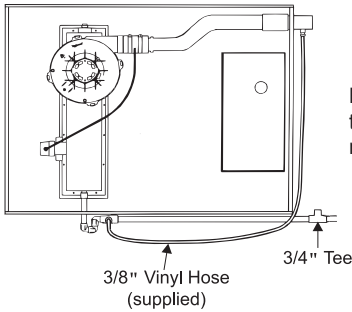


Figure 5-26 Horizontal Installation – Left to Right Airflow: Install Trap Assembly



Be sure to avoid double-trapping the vinyl hose. Hose must be installed as shown.

Figure 5-27 Horizontal Installation – Left to Right Airflow: Completing Condensate Drain Installation

6. From the tee, connect the drain to disposal area. The top of the tee must be left open for proper condensate drainage. The open end of the tee must be oriented so that condensate does not run out of the opening.
7. Connect one end of 72" vinyl hose (supplied) to 3/8" barbed fitting of the 2" x 2" x 1/2" tee in vent and the other end to 3/8" barbed fitting on drain trap assembly.

Horizontal Installation – Tight Clearance Below Unit

In certain horizontal installations, clearance between unit and drain pan beneath unit may be limited. In these applications, an alternate method may be used to install the condensate drain trap assembly. Using two 90° elbows (field supplied), bring condensate trap out to side of unit beyond drain pan (see Figure 5-28). After trap assembly has been attached using this method, follow proper instructions on the previous pages for completing condensate drain installation.

⚠ CAUTION

To avoid property damage caused by condensate drain blockage, install a field-fabricated auxiliary drain pan with a separate drain line to the outside under the entire furnace and drain system, including open vent tees.

Pressure Switch Connection (G1D91BT Models Only)

Upflow Installation

The unit is shipped from the manufacturer with a black hose connected to the pressure switch. The other end of the hose must be connected to the

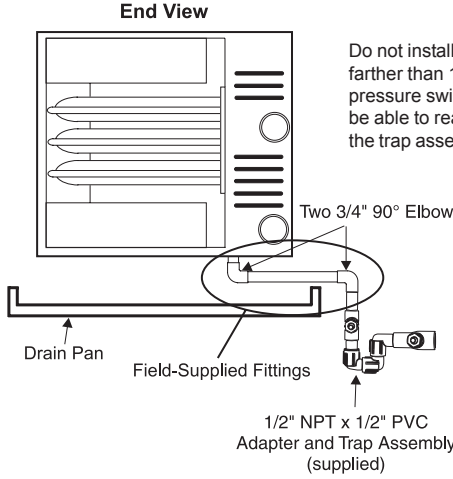


Figure 5-28 Condensate Drain Trap Installation – Tight Clearance Below Unit

flue pan (see Figure 5-29). Remove and discard the plastic cap plug from 1/4" port on the flue pan and connect the hose to the port.

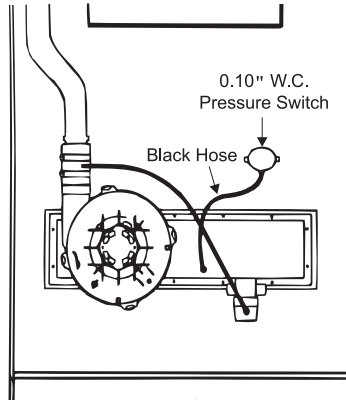


Figure 5-29 Pressure Switch Connection: G1D91BT Models – Upflow Installations

Horizontal Installation

The unit is shipped from the manufacturer with a black hose connected to the pressure switch. The other end of the hose must be connected to the external drain trap.

Route hose through gas line access hole in cabinet (see Figure 5-30). Then connect to 1/4" barbed fitting on drain trap assembly.

Be sure that the pressure switch hose does not form a trap to hold condensation that could form from the flue gas. Hose may be cut shorter to avoid forming a trap, if required.

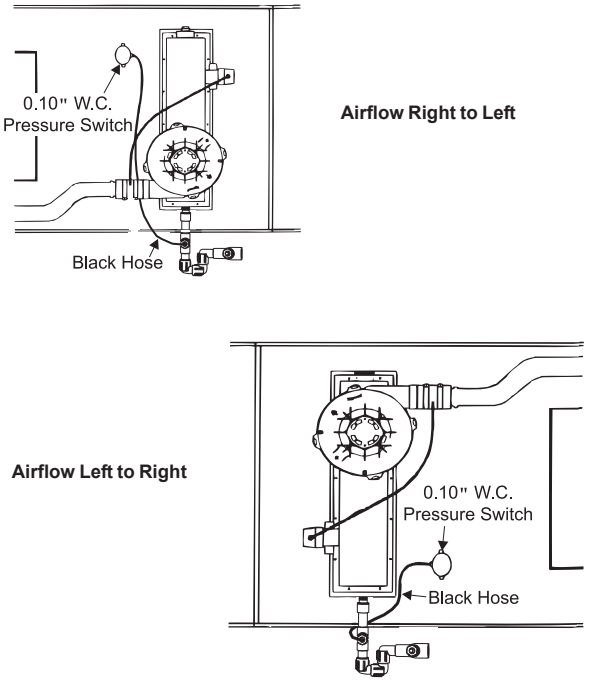


Figure 5-30 Pressure Switch Connection: G1D91BT Models – Horizontal Installation

Circulating Air Supply

When the furnace is installed so that the supply ducts carry air circulated by the furnace to areas outside the space containing the furnace, the return air shall be handled by a duct or ducts sealed to the furnace casing and terminated outside the space containing the furnace.

A return air duct system is recommended. If the unit is installed in a confined space or closet, a return connection must be run, full size, to a location outside the closet. The air duct in the closet must be tight to prevent any entrance of air from the closet into the circulating air.

If there is no complete return air duct system, the return air connection must be sealed to the furnace casing and run, full size, to a location outside the utility room or space housing the furnace to prevent a negative pressure on the venting system.

⚠ CAUTION

When an air conditioning unit is used in conjunction with the furnace, the evaporator coil must be installed in the discharge (supply) air. Do not install an evaporator coil in the return air; excessive condensation will occur within the furnace.

Outlet Duct

For installations not equipped with a cooling coil, a removable access panel must be provided in the discharge (supply) duct. The opening should be accessible when the furnace is placed in service. Smoke or reflected light may be observed inside the casing to indicate the presence of leaks in the heat exchanger. The cover for the opening shall be attached in such a manner as to prevent leaks. The recommended opening size is 6" x 14" for all sizes.

Duct Connection – Counterflow Models G1D93AC & G1D93BC

If a unit is installed on a noncombustible floor, it may be installed directly over the supply duct or plenum.

For installations on combustible flooring, a special base must be ordered and used. (See the **Accessories** section on page 6-27 for more information.) To install using the special base assembly, see Figure 5-31 on page 5-46 and the following instructions:

1. Cut a hole in the floor, sized to provide 1" clearance between all four sides of the duct and the edge of the flooring. The four angles on the base assembly should recess into the floor joists and the base should rest on all four outside flanges.

2. Construct duct connections with right angle flanges.
3. Drop the duct connections through the top of the base assembly with the right angle flanges in good contact with the glass tape on top of the base assembly.
4. Carefully position the furnace over the right angle duct flanges.

A return air duct system is recommended. If the unit is installed in a confined space or closet, a return connection must be run, full size, to a location outside the closet. The air duct in the closet must be tight to prevent any entrance of air from the closet into the circulating air.

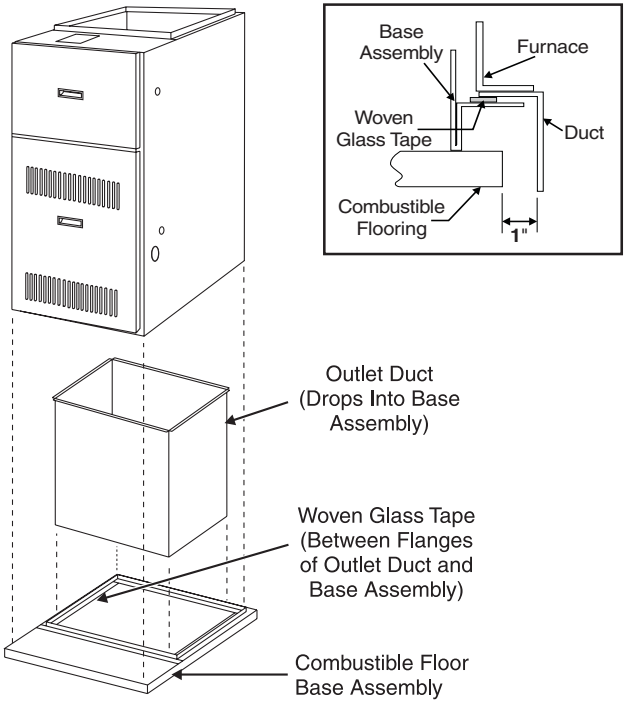


Figure 5-31 Combustible Floor Installation (G1D93AC & G1D93BC Models Only)

Electrical Wiring

⚠ WARNING

Risk of electrical shock. Disconnect electrical power at the circuit breaker or service panel before making electrical connections. Failure to disconnect power supplies can result in property damage, personal injury or death.

The furnace must be grounded and wired in accordance with local codes or, in the absence of local codes, with the National Electrical Code ANSI/ NFPA No. 70 (latest edition) and/or CSA C22.1 Electrical Code (latest edition) if an external electrical source is utilized.

In all instances, other than wiring for the thermostat, the wiring to be done and any replacement of wire shall conform with the temperature limitation for Type T wire – 63°F (35°C) rise.

Connect a sufficiently sized wire with ground to the furnace's line voltage connections and ground lug. Refer to the furnace rating plate for electrical characteristics to be used in sizing field supply wiring and over-current protection.

The line voltage supply should be routed through a readily accessible disconnect located within sight of the furnace. A junction box on the furnace side panel is provided for line voltage connections. Refer to the furnace wiring diagram for specific connection information.

Proper polarity of the supply connections ("HOT" and "NEUTRAL") must be observed to ensure that safety controls provide the protection intended.

A connection to the ground lug and actual earth ground (typically a ground stake or buried steel pipe) must be maintained for proper operation.

Thermostat

Install a room thermostat according to the instructions furnished with it. Select a location on an inside wall that is not subject to drafts, direct sunshine, or other heat sources. The initial heat anticipator setting should be equal to the total current draw of the control circuit.

Low voltage thermostat connections are to be made to the integrated ignition/blower control board as indicated on the wiring diagram.

Twinning

The integrated ignition/blower control board is designed to permit "twinning" of furnaces (two furnaces connected to a common supply and return air system, and controlled by one thermostat). An accessory kit

must be ordered from the manufacturer (see the **Accessories** section for more information on twinning kits). Specific wiring and operating instructions are included with the kit.

Each furnace must have its own dedicated venting system.

Continuous Low Speed Blower

If continuous blower operation on low speed is desired, connect the lowest speed motor tap to the “CONT” terminal on the integrated ignition/blower control board (refer to furnace wiring diagram). The blower will operate on low speed whenever main power is connected to the furnace, except when it operates on heating or cooling speed during thermostat call for heating or cooling. **This constant air terminal is intended for low speed only.** If a motor is wired for a higher speed, the increased amp draw could cause the board control to fail and void the warranty.

Humidifier

Terminals are provided on the integrated ignition/blower control board for connection to a 120-volt humidifier. The “HUM” terminal is energized whenever the thermostat is calling for heat. Refer to the furnace wiring diagram for specific connection information.

Electronic Air Cleaner

Terminals are provided on the integrated ignition/blower control board for connection of a 120-volt electronic air cleaner. The “EAC” terminal is energized whenever the thermostat is calling for heat, cooling, or continuous blower. Refer to the furnace wiring diagram for specific connection information.

Gas Supply and Piping

Refer to the furnace rating plate to make sure the furnace is equipped to burn the gas supplied (natural or propane).

⚠WARNING

Any conversion of a natural gas unit to propane gas must be done by qualified personnel using a conversion kit available from the manufacturer, following the instructions in the conversion kit. If done improperly, overfiring of the burners and improper burner operation can result. This can create carbon monoxide which could cause asphyxiation.

Gas supply piping should be installed in accordance with local codes and the regulations of the utility. Piping must be of adequate size to prevent

undue pressure drop. Consult the local utility or gas supplier for complete details on special requirements for sizing gas piping.

If local codes allow the use of a flexible gas appliance connector, always use a new listed connector. Do not use a connector which has previously serviced another gas appliance.

Pipe connections must be tight, and a non-hardening pipe compound resistant to liquefied petroleum gases should be used.

Connect the gas pipe to the furnace controls providing a ground joint union as close to the gas controls as is possible to facilitate removal of controls and manifold. Provide a drip leg on the outside of the furnace. A manual shutoff valve shall be installed in the gas line, outside the unit, 5' above the floor, or in accordance with any local codes. A test gauge connection must be installed with a 1/8" NPT plugged tapping immediately upstream of the shutoff valve (see Figure 5-32 on page 5-50).

The furnace must be isolated from the gas supply piping system by closing the individual manual shutoff valve during any pressure testing of the gas supply piping system at test pressure equal to or less than 1/2 psig (3.5 kPa) or 14" W.C. If the piping system is to be tested at pressures in excess of 1/2 psig (3.5 kPa), the furnace and its appliance main gas valve must be disconnected from the gas supply piping system.

⚠WARNING

The gas valve supplied with this furnace is rated at 1/2 psig maximum. Any higher pressure may rupture the pressure regulator diaphragm and may cause overfiring of the burners and improper burner operation. The overfiring may result in the creation of carbon monoxide which could cause asphyxiation.

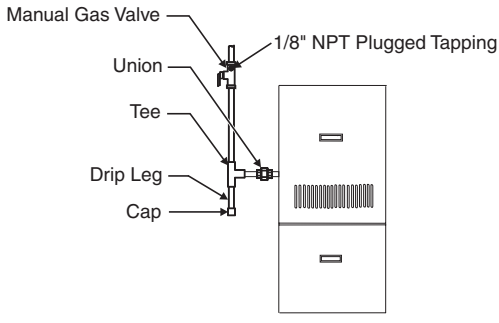
After gas piping is complete, carefully check all piping connections (factory and field) for gas leaks. Use a leak detecting solution or other preferred means. Some soaps used for leak detection are corrosive to certain metals. Carefully rinse piping thoroughly after leak detection has been completed.

⚠WARNING

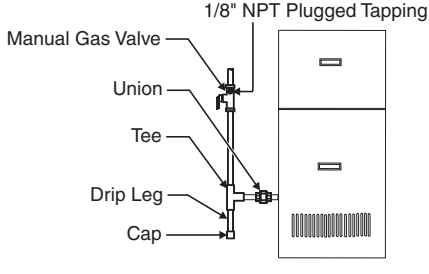
FIRE OR EXPLOSION HAZARD

Failure to follow the safety warnings exactly could result in serious injury, death, or property damage.

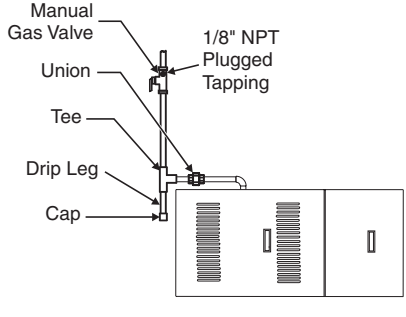
Never test for gas leaks with an open flame. Use a commercially available soap solution made specifically for the detection of leaks to check all connections. A fire or explosion may result causing property damage, personal injury, or loss of life.



Upflow



Counterflow



Horizontal

Figure 5-32 Gas Piping Connection

Filters

Upflow Models G1D91AU, G1D91BU, G1D91BT, G1D93AU, & G1D93BU

A filter rack and permanent 16" x 25" x 1/2" filter are supplied with the furnace. (Models designed for more than 1600 CFM nominal air delivery include two of each.) The filter rack is to be installed between the return air duct and the side of the furnace. Refer to Figure 5-33 and the following instructions to install the filter rack:

1. Using the corner embossments as a guide, mark and cut a full-size opening in the side panel(s).
2. Using the filter rack as a template, mark and drill four 7/64" diameter screw holes in the side panel(s).
3. With the filter access opening toward the front of the furnace, use sheet metal screws to fasten the rack(s) to the side panel(s).

The filter slides in the rack from the front of the unit. Install the filter(s) with the mesh side towards furnace.

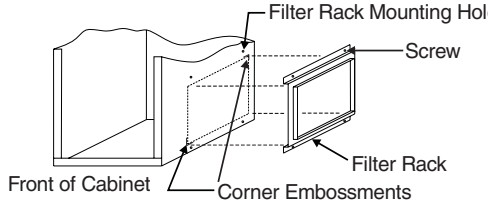


Figure 5-33 Filter Rack Installation

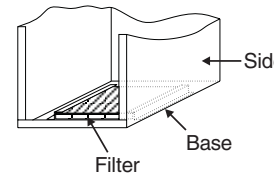


Figure 5-34 Bottom Filter Location – Upflow Models

Model #AMB20A side filter frame kit accessory is available for single side return air connection in installations requiring more than 1600 CFM nominal air delivery. A bottom return filter kit (model #AFILT529) is also available from the manufacturer (see Accessories section page 6-2).

Counterflow Models G1D93AC & G1D93BC

Filters are not supplied with these furnaces. However, filters must be used. It is the installer's responsibility to install properly sized filters in accordance with Table 5-7.

Table 5-7 Minimum Filter Requirements

Airflow Descriptor	Disposable Filters			Cleanable Filters		
	Min. Area (sq. in.)	Size (in.)	Qty.	Min. Area (sq. in.)	Size (in.)	Qty.
09	480	20 x 25	1	240	16 x 20	1
10	480	20 x 25	1	240	16 x 20	1
12	576	16 x 20	2	288	16 x 20	1
14	672	20 x 20	2	336	20 x 20	1
16	768	20 x 20	2	384	20 x 20	1
20	960	20 x 25	2	480	20 x 25	1

1. The Airflow Descriptor is the two digits following the "D" in the model number.
2. Areas and dimensions shown for permanent filters are based on filters rated at 600 feet per minute face velocity.
3. Typical filter sizes are shown; however, any combination of filters whose area equals or exceeds the minimum area shown is satisfactory.

Other filter accessories are also available from the manufacturer including a full line of indoor air quality products. For information on these products, contact the local distributor.

Checking and Adjusting Gas Input Rate

Gas input must never exceed the value shown on the furnace rating plate.

Only small variations in gas input may be made by adjusting the regulator. In no case should the final manifold pressure vary more than 0.3" W.C. from the specified pressure.

To adjust the regulator, turn the adjusting screw on the regulator clockwise to increase pressure and input or counterclockwise to decrease pressure and input.

Calculating Furnace Input Rate

Make sure all other gas appliances are turned off. Observe the gas meter (when available). The test hand on the meter should be timed for at least one revolution. Note the number of seconds for one revolution.

$$\frac{\text{Cubic feet per revolution} \times 3600 \times \text{Heating Value}}{\text{Number of seconds per revolution}}$$

Note: Heating value can be obtained from the local utility or gas supplier.

Supply Pressure

The minimum permissible pressure for the purpose of input adjustment is 5.0" W.C. for natural gas and 11.0" W.C. for propane.

Ideal line pressure for natural gas is 7.0" W.C.
Ideal line pressure for propane is 12.0" W.C.

Gas Valve Manifold Pressure

To measure the manifold pressure, remove the pipe plug in the downstream manifold side of the gas valve and connect a water manometer or gauge (on B series units, disconnect hose and remove barbed fitting before connecting water manometer or gauge).

Note: See the **Furnace Components** *section, pages 4-3 and 4-4, for tap location and size.*

Table 5-8 Line and Manifold Pressures

Gas	Line Pressure	Manifold Pressure
Natural	7.0" W.C.	3.5" W.C.
Propane (L.P.)	12.0" W.C.	10.0" W.C.

Check the furnace rating according to the procedure described above in **Calculating Furnace Input Rate**.

Direct Vent Manifold Pressure Check

The burner box static pressure varies with the different inlet vent pipe lengths and ambient air conditions. Therefore, the gas valve regulator must be able to reference the box pressure to maintain a constant manifold setting. The reference tube vent port on the gas valve has a barbed fitting. Connect this port, using a tee fitting, to the burner box and pressure switch, as seen in Figure 5-35.

When setting or checking the gas valve outlet manifold pressure, the manometer must be connected to the gas valve outlet pressure tap and the burner box pressure hose, as seen in Figure 5-35.

The actual manifold pressure will be higher than the reading indicated if the burner box hose is not connected. The difference will be equal to the burner box static pressure.

Example:

3.50" W.C.	Gas valve outlet pressure tap reading
– (–.15" W.C.)	Burner box inlet pressure (hose not connected)
3.65" W.C.	Actual manifold pressure instead of the desired 3.5" W.C.

The burner box pressure hose does not have to be connected in order to set the outlet manifold pressure if the burner box front inspection window is removed, or if the gas valve reference tube is left off while checking manifold pressure.

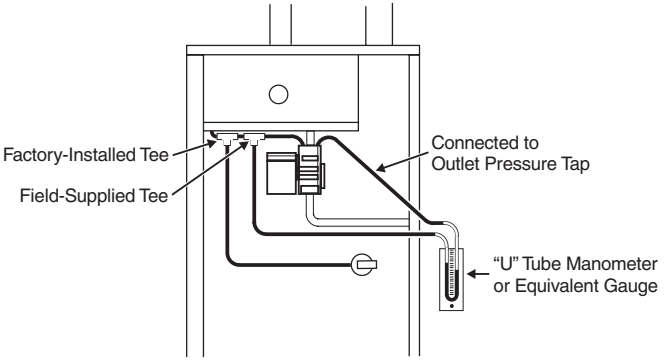


Figure 5-35 Checking Direct Vent Manifold Pressure with Burner Box Reference

Determining Furnace Input – Natural Gas Only

Note: Front door of furnace must be in place when checking gas input.

1. Turn off all other gas appliances served by the same gas meter.
2. With furnace operating in full heat cycle, note how many seconds it takes for one full revolution of the smallest dial on the meter. Typically, this will be a 1/2- or 1-cubic foot test dial.
3. Using the number of seconds for one revolution and the size of the meter dial, determine the hourly cubic ft/hr gas flow by using the formula provided below or Table 5-9.

$$\text{Cubic Ft/Hr} = \frac{\text{Number of Dial Revolutions} \times \text{Cubic Foot/Revolution} \times 3600}{\text{Time (in seconds) Required for Number of Timed Revolutions}}$$

4. Calculate the furnace input using the following formula:

$$\text{BTUH} = \text{Cubic Ft/Hr} \times \text{BTU/Cubic Foot}$$

   The local gas supplier should be able to provide the heating value of the gas, in BTU/cubic foot. If a specific value is not available, use 1000 BTU/cubic foot. This value is based on the heating value of natural gas at sea level pressure.

Note: Input should never exceed 100% of rated input. Adjust manifold pressure or change main orifice size if required.

Table 5-9 Gas Rate (Cubic Feet per Hour)

Seconds for One Revolution	Test Dial			Seconds for One Revolution	Test Dial		
	1/2 Cubic Feet	1 Cubic Feet	2 Cubic Feet		1/2 Cubic Feet	1 Cubic Feet	2 Cubic Feet
10	160	360	720	36	50	100	200
12	150	300	600	38	47	95	190
14	129	257	514	40	45	90	180
16	113	225	450	42	43	86	172
18	100	200	400	44	41	82	164
20	90	180	360	46	39	78	156
22	82	164	325	48	37	75	150
24	75	150	300	50	36	72	144
26	69	138	276	52	35	69	138
28	64	129	258	54	34	67	134
30	60	120	240	56	32	64	128
32	56	113	226	58	31	62	124
34	53	106	212	60	30	60	120

High Altitude Installation

G1D91/93 furnaces are approved in the USA and Canada for operation at altitudes from 0 to 4500 feet above sea level without modification. Operation above 4500 feet requires the manifold pressure to be adjusted according to Table 5-10. To adjust the manifold pressure, refer to the section entitled **Checking and Adjusting Gas Input Rate** on page 5-53.

Table 5-10 Manifold Pressure vs. Altitude – 90% Category IV Venting

Altitude (ft.)	Natural Gas		Propane (LP)		Input Factor
	Heating Value* (BTU/ft^3)	Manifold Pressure (in. W.C.)	Heating Value* (BTU/ft^3)	Manifold Pressure (in. W.C.)	
2000	948	3.50	2278	10.00	0.9666
3000	914	3.50	2196	10.00	0.9499
4000	881	3.50	2116	10.00	0.9332
4500	865	3.50	2077	10.00	0.9249
5000	849	3.29	2039	9.41	0.8900
5500	833	3.27	2000	9.35	0.8790
6000	818	3.25	1964	9.29	0.8680
6500	802	3.23	1927	9.24	0.8570
7000	787	3.21	1891	9.18	0.8460
7500	771	3.19	1853	9.12	0.8350

* Consult local utility for actual heating value.

Furnace Input = Input Factor x Nameplate Input

Above 7500 feet, consult Technical Services at 1-800-448-5872.

For Category IV installations at altitudes 5000 feet and above, a 3" vent pipe is recommended.

Temperature Rise

The temperature rise is the difference between the temperature of the return air and the heated air from the furnace. **Temperature rise must be measured during installation and must be within the range on the furnace rating plate.** After about 20 minutes of heating operation, determine the furnace temperature rise. Take air temperature readings in both the return air ducts and the heated air ducts (about 6 feet from the furnace where they will not be affected by radiant heat). Figure 5-36 shows where to take the readings.

If more than one run of return or heated air ducts are used, air temperature measurements should be taken in each duct. These measurements can be converted to an average to obtain the temperature rise of the whole system.

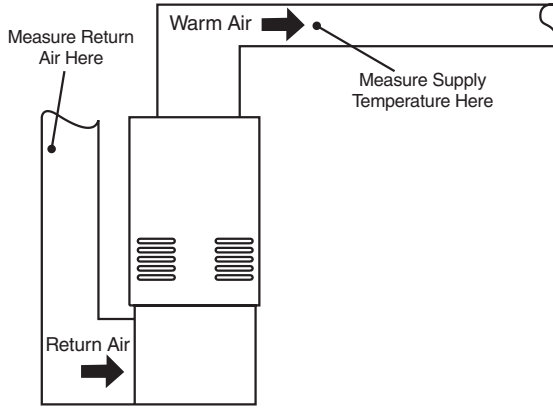


Figure 5-36 Measuring Temperature Rise

Calculating CFM by the Temperature Rise Method

After the temperature rise has been determined, use the following formula to calculate the CFM. Increase the blower speed to decrease the temperature rise; decrease the blower speed to increase the temperature rise.

$$CFM = \frac{BTUH\ (Output)}{\triangle T \times 1.08}$$

$\triangle T$ = Difference in Temperature

- BTUH (out) = BTUH (in) x $\frac{Efficiency}{100}$
- Minimum steady state efficiency: 80%
- Use actual AFUE if over 80%
- $\triangle T$ = Temperature of heated air minus temperature of return air

Example:

BTUH (input)	=	80,000
AFUE	=	90%
$\triangle T$	=	45°

$$1481\ CFM = \frac{80{,}000 \times .9}{45 \times 1.08}$$

Selecting Blower Speeds

Although each furnace leaves the factory set to blower speeds for heating and cooling, in reality the range of installations makes it impossible to set speeds that are right for every installation. The simple idea of “High for cooling, Low for heating” may work for some installations, but the installer or service technician must know how to select the proper blower speeds for a particular installation.

For Heating:

- Calculate the CFM as shown above.
- Verify the external static pressure of the system.
- Verify the furnace model and/or blower data.
- Consult the Blower Performance tables found in the **Specifications** section to obtain the correct speed.

For Cooling:

- Use a nominal value of 400 CFM per ton of cooling.
- Verify the external static pressure of the system.
- Verify the furnace model and/or blower data.
- Consult the Blower Performance tables found in the **Specifications** section to obtain the correct speed.

Heat Anticipator Settings

Heat anticipators are built into most thermostats to prevent wide swings in room temperature during furnace operation. The heat output from these small resistance heaters must be the same regardless of the current flowing through, so most thermostats have an adjustment to compensate for current variation in the thermostat circuit.

Electronic thermostats do not use a resistance type anticipator. Instead, they contain a factory-installed program to determine a cycle rate. The cycle rate is normally field-adjustable, but the method of adjusting the cycle rate depends on the brand of thermostat. Check with the thermostat manufacturer to find out the proper adjustment method.

For resistance type anticipators, measure the actual current draw in the control circuit (terminal R to W), using a low-range ammeter (0 – 2.0 amps). Once the current draw has been determined, set the heat anticipator to match that value.

If a low-range ammeter is not available, use a clamp-on type:

1. Wrap *exactly* 10 turns of wire around the jaws of the ammeter (see Figure 5-37).
2. Connect one end of the wire to the W terminal of the thermostat sub-base, and the other to the R terminal.
3. Turn power on, and wait approximately 1 minute. Read the meter. Furnace should be in full operation.
4. Divide the meter reading by 10. This is the correct anticipator setting.

Table 5-11 Heat Anticipator Setting

Ignition System	Heat Anticipator Setting
Smart Valve II SV9520H8018/SV9520H8034 & ST9160B1068	.15 Amp
United Technologies 1012-967	.60 Amp

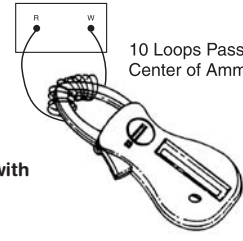


Figure 5-37 Measuring Current with Clamp-On Ammeter

Checking Micro-Amp Ratings

Measure an ignition device's micro-amp rating by connecting a micro-amp meter in series with the flame sensing device (see Figure 5-38).

Table 5-12 Micro-Amp Rating of Ignition Devices

Ignition System	Micro-Amps
HSI - Smart Valve II SV9520H8018/SV9520H8034 & ST9160B1068	1.0 - 3.0 Minimum
HSI - United Technologies 1012-967	0.5 Maximum

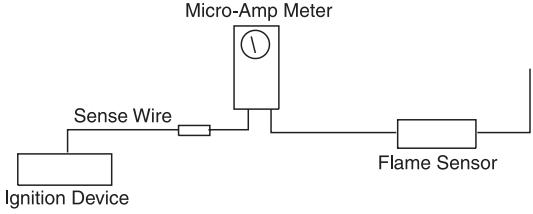


Figure 5-38 Typical Connection of Micro-Amp Meter in Flame Sense Circuit

Checking Ignition Sensor Output

Sensor output voltage of an ignition device may also be checked (see Figure 5-39).

Table 5-13 Sensor Output Voltage

Ignition System	AC Volts to Ground
HSI - Smart Valve II SV9520H8018/SV9520H8034 & ST9160B1068	100
HSI - United Technologies 1012-967	120

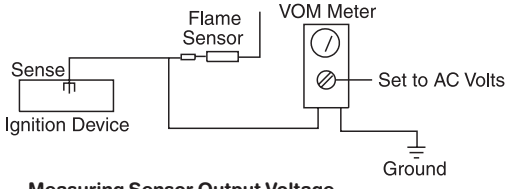


Figure 5-39 Measuring Sensor Output Voltage

Field Service Form (Gas-Fired Furnace)

The following form has been prepared to help the Technical Service Department help you fix service problems in the field. Please complete all applicable sections before calling for assistance. A full-size (8.5" x 11") version is available and can be obtained by calling the Technical Services Department; please ask for form #JS/GF-1.

Owner Date _____

Name: _____

Street: _____

City: _____ Zip: _____

State/Providence: _____

Phone: _____

Servicing Contractor

Name: _____

Street: _____

City: _____ Zip: _____

State/Providence: _____

Phone: _____

Distributor

Name: _____

City & State: _____

Equipment Information:

Gas Type: Natural _____ Propane (L.P.) _____

Furnace: Model # _____

Serial # _____

Date Installed: _____

Evaporator: Model # _____

Serial # _____

Date Installed: _____

Description of Problem: _____

_____

_____

_____

_____

Actions Taken to Correct Problem: _____

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Notes: _____

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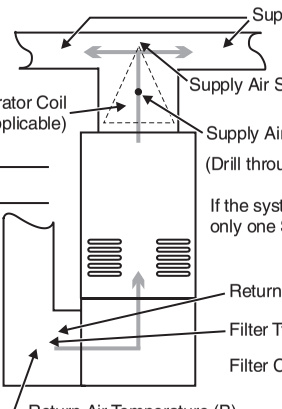
_____

Vent Items for Gas Furnaces

Exhaust		**Inlet (if applicable)**	
Type	_____	Type	_____
Rise, Pitch	_____	Rise, Pitch	_____
Diameter	_____	Diameter	_____
Length	_____	Length	_____
# of 90's	_____	# of 90's	_____
# of 45's	_____	# of 45's	_____

Upflow

IMPORTANT: *Run furnace at least 10 minutes before taking measurements, except for the Standby Line and Low Voltage measurements, which should be taken before the furnace is turned on.*



Supply Air Temperature (A) _____ °F

Supply Air Static Pressure - Downstream of Coil + _____ " W.C.

Evaporator Coil (if applicable)

Supply Air Static Pressure - Upstream of Coil + _____ " W.C.

(Drill through A-plate of coil to get this static measurement)

Blower Motor Speed Tap (Heating) _____

(Cooling) _____

If the system does not include an evaporator coil, only one Supply Air Static Pressure measurement is needed.

Actual Voltage (Measured)

(Standby) Line Voltage* _____

(Running) Line Voltage _____

(Standby) Low Voltage* _____

(Running) Low Voltage _____

Unit Ground (Yes/No)? _____

Return Air Static Pressure – _____ " W.C.

Filter Type/Size _____

Filter Condition _____

Return Air Temperature (B) _____ °F

Plenum Size:

Return _____

Supply _____

* Measure before the furnace is put into operation.

(A) – (B) = _____ °F Temperature Rise

Total Static Pressure _____ " W.C.

Number of Runs _____

Counterflow

IMPORTANT: *Run furnace at least 10 minutes before taking measurements, except for the Standby Line and Low Voltage measurements, which should be taken before the furnace is turned on.*

Actual Voltage (Measured)

(Standby) Line Voltage* _____

(Running) Line Voltage _____

(Standby) Low Voltage* _____

(Running) Low Voltage _____

Unit Ground (Yes/No)? _____

* Measure before the furnace is put into operation.

Plenum Size:

Return _____

Supply _____

Number of Runs _____

Blower Motor Speed Tap (Heating) _____

(Cooling) _____



Filter Type/Size _____

Filter Condition _____

Return Air Temperature (B) _____ °F

Return Air Static Pressure – _____ " W.C.

Supply Air Static Pressure - Upstream of Coil + _____ " W.C.

Supply Air Static Pressure - Downstream of Coil + _____ " W.C.
(Drill through A-plate of coil to get this static measurement)

If the system does not include an evaporator coil, only one Supply Air Static Pressure measurement is needed.

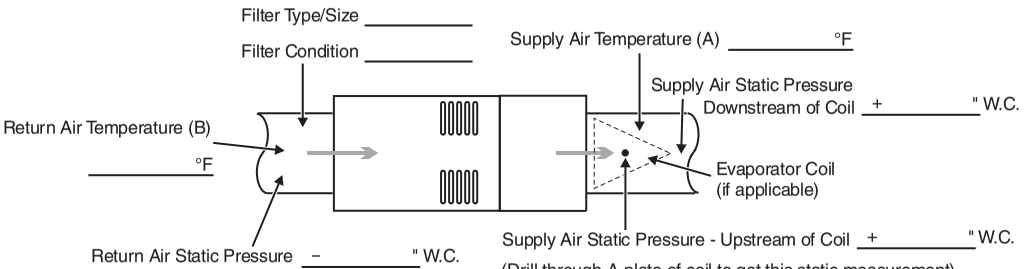
Supply Air Temperature (A) _____ °F

(A) – (B) = _____ °F Temperature Rise

Total Static Pressure _____ " W.C.

Horizontal – Left to Right Airflow

IMPORTANT: *Run furnace at least 10 minutes before taking measurements, except for the Standby Line and Low Voltage measurements, which should be taken before the furnace is turned on.*



If the system does not include an evaporator coil, only one Supply Air Static Pressure measurement is needed.

Actual Voltage (Measured)

(Standby) Line Voltage* _____

(Running) Line Voltage _____

(Standby) Low Voltage* _____

(Running) Low Voltage _____

Unit Ground (Yes/No)? _____

Plenum Size:

Return _____

Supply _____

Number of Runs _____

Blower Motor Speed Tap (Heating) _____

(Cooling) _____

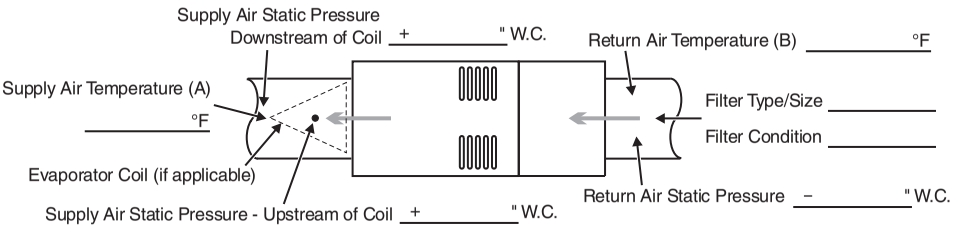
* Measure before the furnace is put into operation.

(A) – (B) = _____ °F Temperature Rise

Total Static Pressure _____ " W.C.

Horizontal – Right to Left Airflow

IMPORTANT: *Run furnace at least 10 minutes before taking measurements, except for the Standby Line and Low Voltage measurements, which should be taken before the furnace is turned on.*



(Drill through A-plate of coil to get this static measurement)

If the system does not include an evaporator coil, only one Supply Air Static Pressure measurement is needed.

Actual Voltage (Measured)

(Standby) Line Voltage* _____

(Running) Line Voltage _____

(Standby) Low Voltage* _____

(Running) Low Voltage _____

Unit Ground (Yes/No)? _____

* Measure before the furnace is put into operation.

Plenum Size:

Return _____

Supply _____

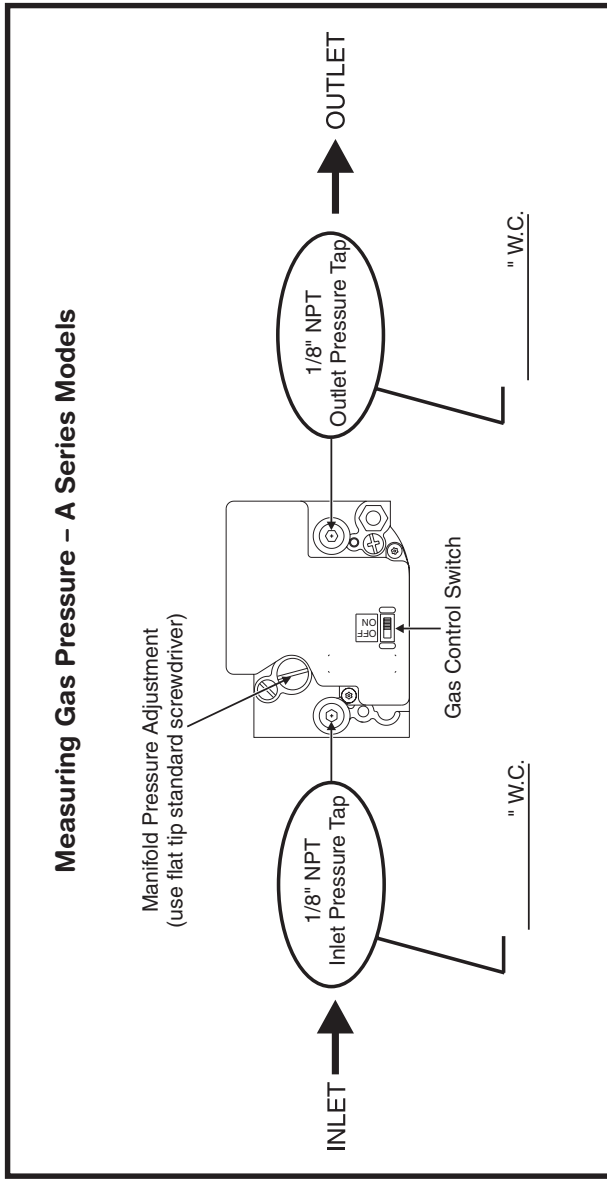
Number of Runs _____

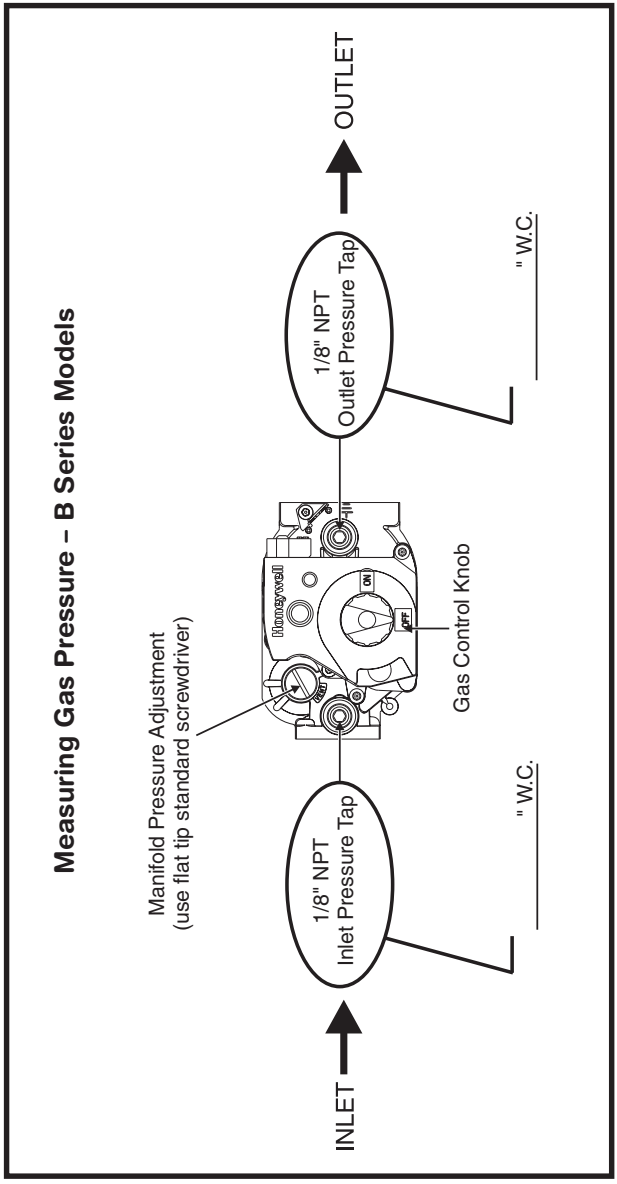
Blower Motor Speed Tap (Heating) _____

(Cooling) _____

(A) – (B) = _____ °F Temperature Rise

Total Static Pressure _____ " W.C.


Measuring Gas Pressure – A Series Models
INLET
1/8" NPT
Inlet Pressure Tap
" W.C.
Manifold Pressure Adjustment
(use flat tip standard screwdriver)
OFF
ON
Gas Control Switch
1/8" NPT
Outlet Pressure Tap
" W.C.
OUTLET


Measuring Gas Pressure – B Series Models
INLET
1/8" NPT
Inlet Pressure Tap
" W.C.
Manifold Pressure Adjustment
(use flat tip standard screwdriver)
Honeywell
ON
OFF
Gas Control Knob
1/8" NPT
Outlet Pressure Tap
" W.C.
OUTLET

Section 6 – Accessories

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Accessories

Several accessories or kits are offered to increase the performance or versatility of G1D91/93 furnaces and are available from the local distributor. This section provides a general description of each of these accessories or kits.

Note: Complete instructions are packaged with each kit or its components and accessories. These instructions should be read carefully prior to installation. The instructions are intended as a general guide only, for use by qualified personnel, and do not supercede any national or local codes in any way.

Table 6-1 Accessories and Kits Available for G1D91/93 Furnaces

P/N	Description
AMB20A	Single Side Double Filter Frame Kit
AFILT525	Counterflow Return Filter Kit (G1D93AC/G1D93BC only)
AFILT529	Bottom Return Filter Kit (G1D91AU/G1D91BU/G1D93AU/G1D93BU only)
ALPKT572-2	Natural Gas to Propane Conversion Kit (G1D91AU only)
ALPKT572-3	Natural Gas to Propane Conversion Kit (G1D91BU/G1D91BT only)
ALPKT574-2	Natural Gas to Propane Conversion Kit (G1D93AU/G1D93AC only)
ALPKT574-3	Natural Gas to Propane Conversion Kit (G1D93BU/G1D93BC only)
ANGKT555	Propane to Natural Gas Conversion Kit (G1D91AU/G1D91BU/G1D91BT only)
ANGKT556	Propane to Natural Gas Conversion Kit (G1D93AU/G1D93BU/G1D93AC/G1D93BC only)
AFOSL443	Fossil Fuel Kit
ATWIN578	Twinning Kit (A series only)
ATWIN579	Twinning Kit (B series only)
ACVK2	Concentric Vent Kit
ABASE512	Counterflow Combustible Floor Base (17.5" cabinets)
ABASE568	Counterflow Combustible Floor Base (21.0" cabinets)
ABASE569	Counterflow Combustible Floor Base (24.5" cabinets)
A531-3	Field Repair Parts Kit (G1D91AU/G1D93AU/G1D93AC)
AFUSE576	Fuse Replacement Kit (all models)

Natural Gas to Propane Conversion Kits

Conversion kits ALPKT572-2 and ALPKT572-3 are used to convert G1D91 furnaces from natural gas to propane. Conversion kit ALPKT572-2 (page 6-4) is for converting G1D91AU furnaces. Conversion kit ALPKT572-3 (page 6-5) is for converting G1D91BU or G1D91BT furnaces.

Conversion kits ALPKT574-2 and ALPKT574-3 are used to convert G1D93 furnaces from natural gas to propane. Conversion kit ALPKT574-2 (page 6-6) is for converting G1D93AU or G1D93AC furnaces. Conversion kit ALPKT574-3 (page 6-7) is for converting G1D93BU or G1D93BC furnaces.

Note: These kits are to be used for conversion at the same altitude (no change in altitude).

Line Pressure = 11.0" W.C. minimum, 14.0" W.C. maximum

Manifold Pressure = 10.0" W.C.

Gas Supply Pressure - L.P.

Minimum pressure to the furnace = 11.0" W.C. (for the purpose of input adjustment)

Maximum pressure to the gas valve = 14.0" W.C.

Checking the Input Rate

Measure the input rate of the furnace and compare it to the rating plate. The formula for the input rate is:

$$\frac{\text{Cubic feet per revolution} \times 3600 \times \text{Heating Value}}{\text{Number of seconds per revolution}}$$

Natural Gas to Propane Conversion Kit ALPKT572-2

Conversion Kit ALPKT572-2 is to be used to convert G1D91AU furnaces from natural gas to propane. To convert G1D91BU or G1D91BT furnaces, see ***Natural Gas to Propane Conversion Kit ALPKT572-3*** on page 6-5.

Table 6-2 ALPKT572-2 Parts List

Quantity	Description
4	Self-tapping Screws
6	#54 Orifices (P/N 39030B005)
1	Adapter Kit for Honeywell Gas Valve
1	Installation Instructions
1	Gas Valve Conversion Label
1	Conversion Plate
1	Conversion Gas Installation Label
2	3" x 6" Steel LP Adapter Plates
2	3" x 9" Steel LP Adapter Plates

Natural Gas to Propane Conversion Kit ALPKT572-3

Conversion Kit ALPKT572-3 is to be used to convert G1D91BU or G1D91BT furnaces from natural gas to propane. To convert G1D91AU furnaces, see ***Natural Gas to Propane Conversion Kit ALPKT572-2*** on page 6-4.

Table 6-3 ALPKT572-3 Parts List

Quantity	Description
2	Self-tapping Screws
6	#54 Orifices (P/N 39030B005)
1	Conversion Kit for Gas Control Valve
1	Installation Instructions
1	Gas Control Valve Conversion Label
1	Conversion Plate Label
1	Gas Conversion Manifold Label
1	Furnace Conversion Information Label
2	3" x 6" Steel LP Adapter Plates
2	3" x 9" Steel LP Adapter Plates

Natural Gas to Propane Conversion Kit ALPKT574-2

Conversion Kit ALPKT574-2 is to be used to convert G1D93AU or G1D93AC furnaces from natural gas to propane. To convert G1D93BU or G1D93BC furnaces, see ***Natural Gas to Propane Conversion Kit ALPKT574-3*** on page 6-7.

Table 6-4 ALPKT574-2 Parts List

Quantity	Description
2	Self-tapping Screws
5	#55 Orifices (P/N 39030B011)
1	Conversion Kit for Gas Control Valve
1	Installation Instructions
1	Gas Control Valve Conversion Label
1	Conversion Plate Label
1	Gas Conversion Manifold Label
1	Furnace Conversion Information Label
2	3" x 6" Steel LP Adapter Plates
2	3" x 9" Steel LP Adapter Plates

Natural Gas to Propane Conversion Kit ALPKT574-3

Conversion Kit ALPKT574-3 is to be used to convert G1D93BU or G1D93BC furnaces from natural gas to propane. To convert G1D93AU or G1D93AC furnaces, see ***Natural Gas to Propane Conversion Kit ALPKT574-2*** on page 6-6.

Table 6-5 ALPKT574-3 Parts List

Quantity	Description
2	Self-tapping Screws
5	#55 Orifices (P/N 39030B011)
1	Conversion Kit for Gas Control Valve
1	Installation Instructions
1	Gas Control Valve Conversion Label
1	Conversion Plate Label
1	Gas Conversion Manifold Label
1	Furnace Conversion Information Label
2	3" x 6" Steel LP Adapter Plates
2	3" x 9" Steel LP Adapter Plates

Propane to Natural Gas Conversion Kits

Conversion kits ANGKT555 and ANGKT556 are used to convert G1D91 and G1D93 furnaces from propane to natural gas. Conversion kit ANGKT555 (page 6-9) is to be used to convert G1D91AU, G1D91BU, or G1D91BT furnaces from propane to natural gas. Conversion kit ANGKT556 (page 6-10) is for converting G1D93AU, G1D93BU, G1D93AC, or G1D93BC furnaces from propane to natural gas.

Note: These kits are to be used for conversion at the same altitude (no change in altitude).

Line Pressure = 5.0" W.C. minimum, 9.0" W.C. maximum

Manifold Pressure = 3.5" W.C.

Gas Supply Pressure - Natural Gas

Minimum pressure to the furnace = 5.0" W.C. (for the purpose of input adjustment)

Maximum pressure to the gas valve = 9.0" W.C.

Checking the Input Rate

Measure the input rate of the furnace and compare it to the rating plate. The formula for the input rate is:

$$\frac{\text{Cubic feet per revolution} \times 3600 \times \text{Heating Value}}{\text{Number of seconds per revolution}}$$

Propane to Natural Gas Conversion Kit ANGKT555

Conversion kit ANGKT555 is to be used to convert G1D91AU, G1D91BU, or G1D91BT furnaces from propane to natural gas. To convert G1D93AU, G1D93BU, G1D93AC, or G1D93BC furnaces, see ***Propane to Natural Gas Conversion Kit ANGKT556*** on page 6-10.

Table 6-6 ANGKT555 Parts List

Quantity	Description
6	#42 Orifices (P/N 39030B019)
1	Adapter Kit for Honeywell Gas Valve
1	Installation Instructions
1	Gas Valve Conversion Label
1	Conversion Plate
1	Conversion Gas Installation Label

Propane to Natural Gas Conversion Kit ANGKT556

Conversion kit ANGKT556 is to be used to convert G1D93AU, G1D93BU, G1D93A, or G1D93BC furnaces from propane to natural gas. To convert G1D91AU, G1D91BU, or G1D91BT furnaces, see ***Propane to Natural Gas Conversion Kit ANGKT555*** on page 6-9.

Table 6-7 ANGKT556 Parts List

Quantity	Description
5	#44 Orifices (P/N 39030B009)
1	Adapter Kit for Honeywell Gas Valve (P/N 33192A011)
1	Installation Instructions
1	Gas Valve Conversion Label
1	Conversion Plate
1	Conversion Gas Installation Label

Fossil Fuel Kit AFOSL443

Fossil Fuel Kit AFOSL443 is a control package designed to coordinate the actions of a heat pump as the primary heating source, and a gas- or oil-fired furnace as an auxiliary heat source. The controller cycles the furnace during the second stage heat call and defrost.

The kit can be used to switch from heat pump to furnace operation using a compatible thermostat. The kit can also be used to switch operating modes according to a predetermined economic “balance” point.

An outdoor thermostat **is not included** with the AFOSL443 Fossil Fuel Kit. ASTAT444 Outdoor Thermostat must be ordered separately.

Note: A lower outdoor thermostat setting operates the heat pump at colder outdoor temperatures.

Location

The control can be located on the exterior surface of the furnace with the mounting screws that are provided. Do not locate the accessory where excessive temperatures (above 150°F) in furnace operation may occur. This accessory can also be mounted in close proximity to the furnace if a suitable location on the furnace is not available.

Furnace and AFOSL443/ASTAT444 Function

1. Outdoor temperature above outdoor thermostat setpoint (see Figure 6-1 on page 6-12 for outdoor thermostat function)
   - Call for 1st Stage = heat pump only
   - Call for 2nd Stage = heat pump off and furnace on
   - Furnace blower runs through pump off/furnace on cycle (no blower delay)
   - Call for 2nd Stage releases – no change; furnace stays on latch circuit in fossil fuel kit
   - Call for 1st Stage releases – furnace cycles off with blower “off” delay
2. Outdoor temperature below outdoor thermostat setpoint
   - Call for 1st Stage = furnace on (no blower delay)
   - Call for 2nd Stage = no response
   - Call for 2nd Stage releases = no response
   - Call for 1st Stage releases = furnace off with blower “off” delay

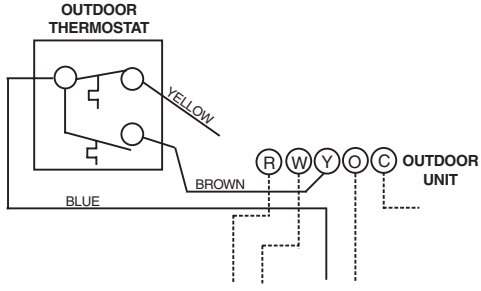


Figure 6-1 Outdoor Thermostat for Fossil Fuel Kit

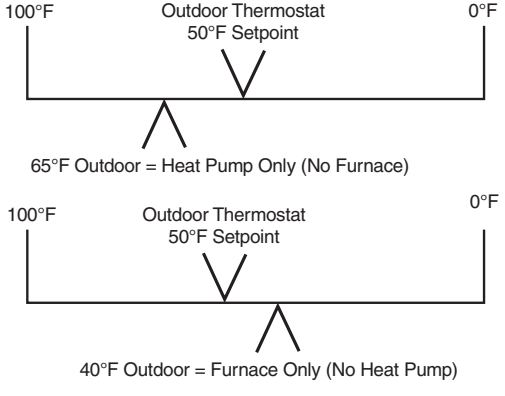


Figure 6-2 Outdoor Thermostat Operation with Fossil Fuel Kit

Furnace and AFOSL Function (No Outdoor Thermostat)

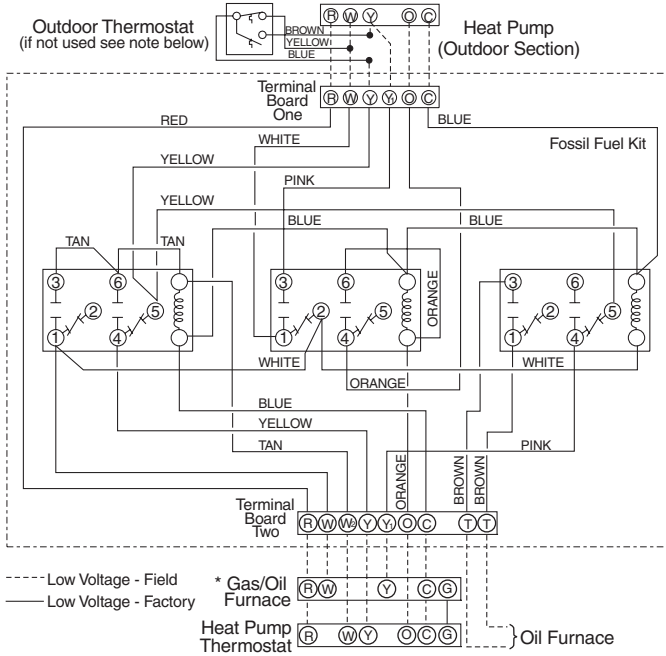
- Call for 1st Stage = heat pump and blower
- Call for 2nd Stage = heat pump off and furnace on
- Furnace blower runs through pump off/furnace on cycle (no blower delay)
- Call for 2nd Stage releases – no change; furnace stays on latch circuit in fossil fuel kit
- Call for 1st Stage releases – furnace cycles off with blower “off” delay

Defrost Function

- Heat pump in heat mode
- Defrost initiated by heat pump defrost board
- Reversing valve shifts; 24VAC sent to startfurnace for defrost cycle
- Furnace runs until defrost is complete, or until room thermostat is satisfied

Furnace and Fossil Fuel Kit – Emergency Heat

- Thermostat operates 2nd Stage as primary heat call
- Furnace cycles on until room thermostat is satisfied



* Oil furnaces with one transformer for heating and cooling (a Protectorelay with five thermostat terminals) should be wired as the gas/oil furnace shown above.

Note: If outdoor thermostat is not used, install wire directly from "Y" terminal on outdoor heat pump to "Y" terminal on Terminal Board One.

Figure 6-3 Schematic – Fossil Fuel Kit

Twinning Kits

"Twinning" means installing two furnaces to operate as one furnace, or as separate first and second stages. The two furnaces are installed close together to work off common ductwork.

⚠IMPORTANT

Do not try to twin more than two furnaces. The kit is designed to operate a maximum of two gas-fired furnaces. Only twin same brand control boards, such as Honeywell to Honeywell, Heatcraft to Heatcraft, and United Technologies to United Technologies.

Description of Twinning Operation

Both circulating air blowers start and stop at the same time.

When there is a call for heat, the induced draft blower of furnace #1 energizes. The pressure switch closes, the pilot ignites, the gas valve opens, and the burners come on. Thirty seconds later, both circulating air blowers start. If the furnaces are being staged, heating for furnace #2 energizes when the thermostat calls for second stage heating. Otherwise, heating for furnace #2 comes on at the same time as furnace #1. When the heat demand is satisfied, the heating relays de-energize, closing the gas valves. Both circulating air blowers continue to run until the fan "off" settings have been reached.

When there is a call for cooling, both circulating air blowers energize to the selected cooling speed tap.

Note: Apply power to both units at the same time. If power is interrupted to one unit, the relays will chatter.

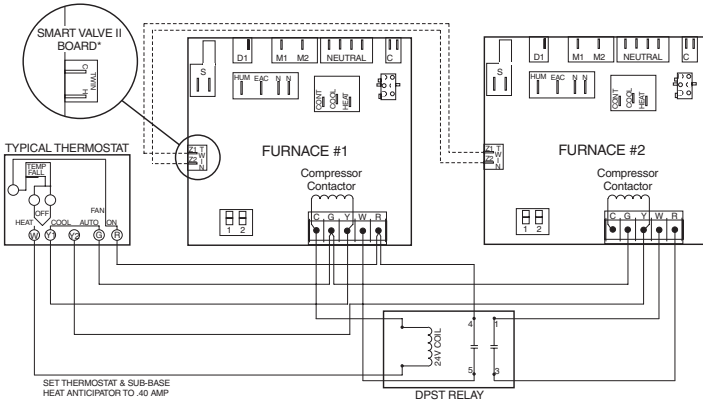
To twin two G1D91AU, G1D93AU, or G1D93AC furnaces (A series units), see Twinning Kit ATWIN578 section beginning on page 6-15. To twin two G1D91BU, G1D91BT, G1D93BU, or G1D93BC furnaces (B series units), see Twinning Kit ATWIN579 section beginning on page 6-20.

Twinning Kit ATWIN578

Twinning Kit ATWIN578 is to be used to twin two G1D91/93 A series furnaces (G1D91AU, G1D93AU, or G1D93AC). For information on twinning two G1D91/93 B series furnaces, see ***Twinning Kit ATWIN579*** on page 6-20.

Table 6-8 ATWIN578 Parts List

Quantity	Description
1	DPST Relay
2	Twinning Wires
2	Self-Tapping Screws
1	Installation Instructions



* Smart Valve II boards use the letters C and H instead of Z_1 and Z_2

Figure 6-4 ATWIN578 Twinning Kit Wiring

Twinning Sequences

One thermostat can be used to control both units. The furnaces can be installed to run in one of four possible modes:

Single-stage heat/single-stage cool (page 6-16)
Two-stage heat/two-stage cool (page 6-17)
Two-stage heat/single-stage cool (page 6-18)
Single-stage heat/two-stage cool (page 6-19)

Single-Stage Heat/Single-Stage Cool (Figure 6-5)

Call for Heat
1. Call for heat is initiated.
2. Both furnaces ignite.
3. After blower "on" time delay, both circulating air blowers start simultaneously. If one unit ignites 5 – 10 seconds later, the blowers still energize simultaneously.
4. Heat call ends.
5. Both furnaces turn off.
6. Both circulating air blowers delay time off.

Call for Cooling
1. Call for cooling is initiated.
2. Both condensers start simultaneously.
3. Both circulating air blowers start simultaneously.
4. Cooling call ends.
5. Both circulating air blowers delay time off.

Call for Fan On
1. Call for Fan On is initiated.
2. Both circulating air blowers start simultaneously (at HEAT terminal speed).
3. Fan On call ends.
4. Both circulating air blowers turn off.

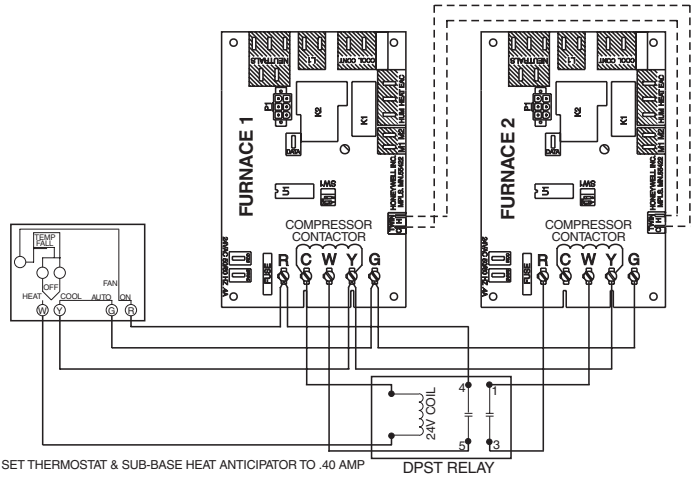


Figure 6-5 Single-Stage Heat/Single-Stage Cool

Two-Stage Heat/Two-Stage Cool (Figure 6-6)

Call for Heat

1. 1st stage call for heat is initiated, furnace #1 ignites.
2. Blower “on” delay, then both circulating air blowers energize simultaneously.
3. 2nd stage call for heat, furnace #2 ignites.
4. 2nd stage heat call ends, furnace #2 shuts off.
5. 1st stage heat call ends, furnace #1 shuts off.
6. Both circulating air blowers delay time off.

Call for Cooling

1. 1st stage call for cooling is initiated, condenser #1 cycles on.
2. Both circulating air blowers start simultaneously.
3. 2nd stage call for cooling, condenser #2 cycles on.
4. 2nd stage cooling call ends, condenser #2 shuts off.
5. 1st stage cooling call ends, condenser #1 shuts off.
6. Both circulating air blowers delay time off.

Call for Fan On

1. Call for Fan On is initiated.
2. Both circulating air blowers start simultaneously (at HEAT terminal speed).
3. Fan On call ends.
4. Both circulating air blowers turn off.

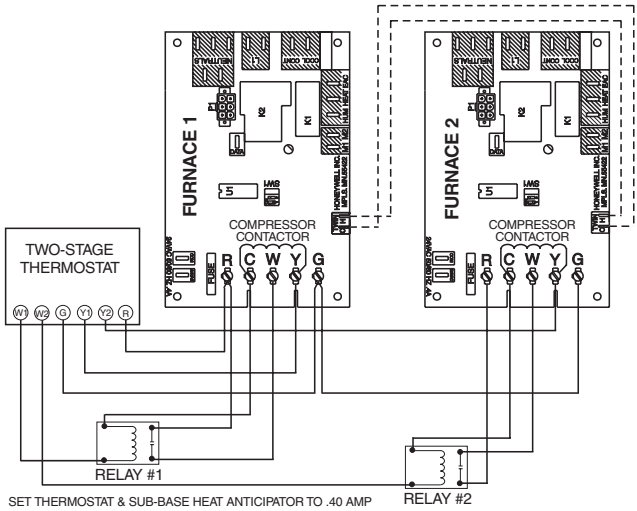


Figure 6-6 Two-Stage Heat/Two-Stage Cool

Two-Stage Heat/Single-Stage Cool (Figure 6-7)

Call for Heat

1. 1st stage call for heat is initiated, furnace #1 ignites.
2. Blower "on" delay, then both circulating air blowers energize simultaneously.
3. 2nd stage call for heat, furnace #2 ignites.
4. 2nd stage heat call ends, furnace #2 shuts off.
5. 1st stage heat call ends, furnace #1 shuts off.
6. Both circulating air blowers delay time off.

Call for Cooling

1. Call for cooling is initiated.
2. Both condensers start simultaneously.
3. Both circulating air blowers start simultaneously.
4. Cooling call ends.
5. Both circulating air blowers delay time off.

Call for Fan On

1. Call for Fan On is initiated.
2. Both circulating air blowers start simultaneously (at HEAT terminal speed).
3. Fan On call ends.
4. Both circulating air blowers turn off.

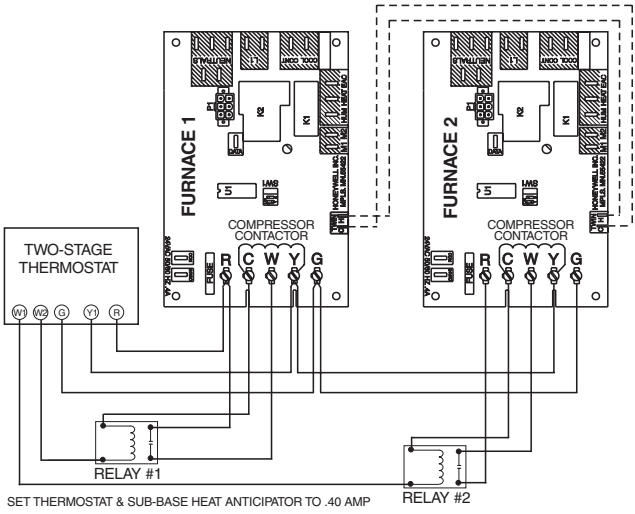


Figure 6-7 Two-Stage Heat/Single-Stage Cool

Single-Stage Heat/Two-Stage Cool (Figure 6-8)

Call for Heat
1. Call for heat is initiated.
2. Both furnaces ignite.
3. After blower “on” time delay, both circulating air blowers start simultaneously. If one unit ignites 5 - 10 seconds later, the blowers still energize simultaneously.
4. Heat call ends.
5. Both furnaces turn off.
6. Both circulating air blowers delay time off.

Call for Cooling
1. 1st stage call for cooling is initiated, condenser #1 cycles on.
2. Both circulating air blowers start simultaneously.
3. 2nd stage call for cooling, condenser #2 cycles on.
4. 2nd stage cooling call ends, condenser #2 shuts off.
5. 1st stage cooling call ends, condenser #1 shuts off.
6. Both circulating air blowers delay time off.

Call for Fan On
1. Call for Fan On is initiated.
2. Both circulating air blowers start simultaneously (at HEAT terminal speed).
3. Fan On call ends.
4. Both circulating air blowers turn off.

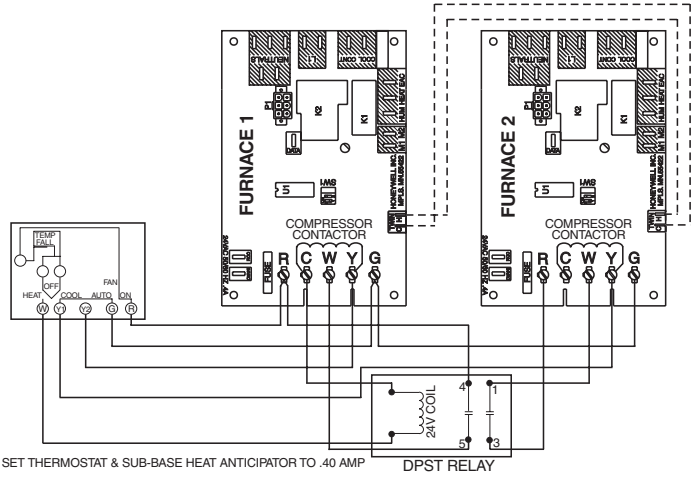


Figure 6-8 Single-Stage Heat/Two-Stage Cool

Twinning Kit ATWIN579

Twinning Kit ATWIN579 is to be used to twin two G1D91/93 B series furnaces (G1D91BU, G1D91BT, G1D93BU, or G1D93BC). For information on twinning two G1D91/93 A series furnaces, see ***Twinning Kit ATWIN578*** on page 6-15.

Table 6-9 ATWIN579 Parts List

Quantity	Description
1	DPST Relay
1	Transformer
4	Self-Tapping Screws
4	3/16" Terminals
4	Wire Nuts
1	Installation Instructions

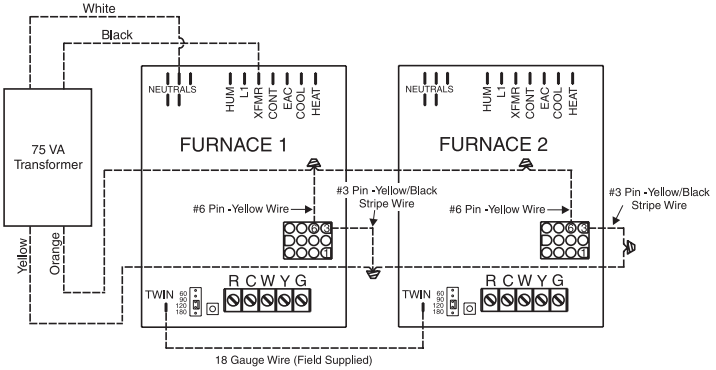


Figure 6-9 ATWIN579 Twinning Kit Wiring

Twinning Sequences

One thermostat can be used to control both units. The furnaces can be installed to run in one of four possible modes:

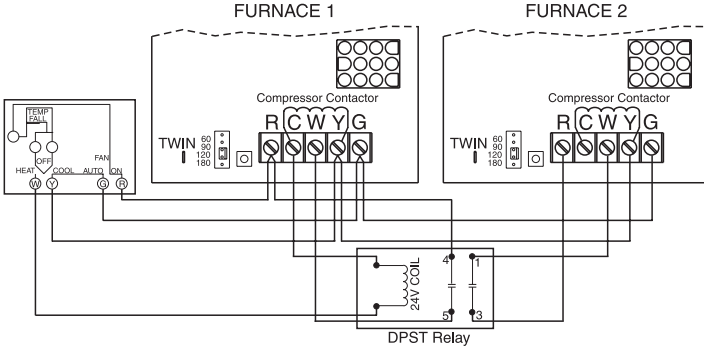
Single-stage heat/single-stage cool (page 6-21)
Two-stage heat/two-stage cool (page 6-22)
Two-stage heat/single-stage cool (page 6-23)
Single-stage heat/two-stage cool (page 6-24)

Single-Stage Heat/Single-Stage Cool (Figure 6-10)

Call for Heat
1. Call for heat is initiated.
2. Both furnaces ignite.
3. After blower “on” time delay, both circulating air blowers start simultaneously. If one unit ignites 5 – 10 seconds later, the blowers still energize simultaneously.
4. Heat call ends.
5. Both furnaces turn off.
6. Both circulating air blowers delay time off.

Call for Cooling
1. Call for cooling is initiated.
2. Both condensers start simultaneously.
3. Both circulating air blowers start simultaneously.
4. Cooling call ends.
5. Both circulating air blowers delay time off.

Call for Fan On
1. Call for Fan On is initiated.
2. Both circulating air blowers start simultaneously (at HEAT terminal speed).
3. Fan On call ends.
4. Both circulating air blowers turn off.



Set thermostat and sub-base heat anticipator to .60 Amp.

Figure 6-10 Single-Stage Heat/Single-Stage Cool

Two-Stage Heat/Two-Stage Cool (Figure 6-11)

Call for Heat

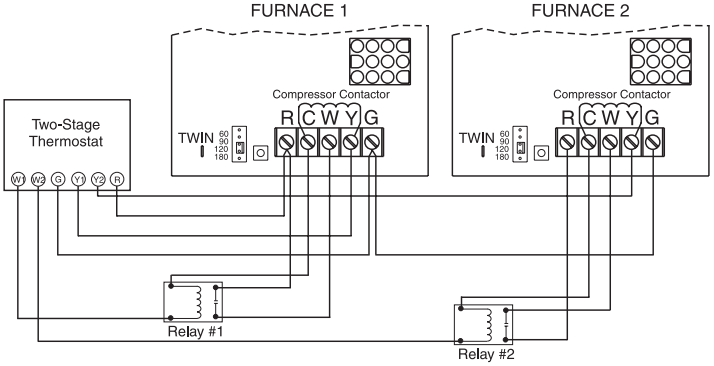
1. 1st stage call for heat is initiated, furnace #1 ignites.
2. Blower “on” delay, then both circulating air blowers energize simultaneously.
3. 2nd stage call for heat, furnace #2 ignites.
4. 2nd stage heat call ends, furnace #2 shuts off.
5. 1st stage heat call ends, furnace #1 shuts off.
6. Both circulating air blowers delay time off.

Call for Cooling

1. 1st stage call for cooling is initiated, condenser #1 cycles on.
2. Both circulating air blowers start simultaneously.
3. 2nd stage call for cooling, condenser #2 cycles on.
4. 2nd stage cooling call ends, condenser #2 shuts off.
5. 1st stage cooling call ends, condenser #1 shuts off.
6. Both circulating air blowers delay time off.

Call for Fan On

1. Call for Fan On is initiated.
2. Both circulating air blowers start simultaneously (at HEAT terminal speed).
3. Fan On call ends.
4. Both circulating air blowers turn off.



Set thermostat and sub-base heat anticipator to .60 Amp.

Figure 6-11 Two-Stage Heat/Two-Stage Cool

Two-Stage Heat/Single-Stage Cool (Figure 6-12)

Call for Heat

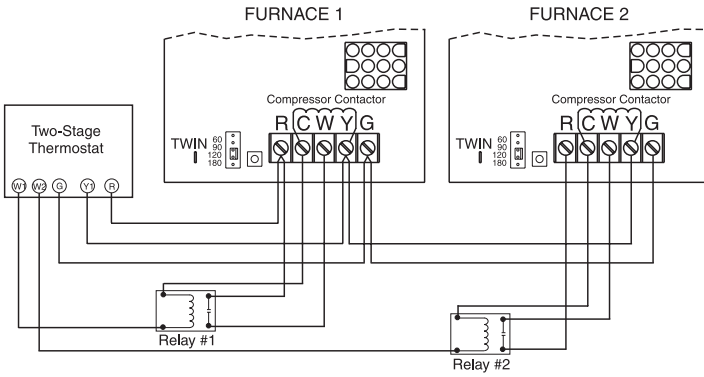
1. 1st stage call for heat is initiated, furnace #1 ignites.
2. Blower “on” delay, then both circulating air blowers energize simultaneously.
3. 2nd stage call for heat, furnace #2 ignites.
4. 2nd stage heat call ends, furnace #2 shuts off.
5. 1st stage heat call ends, furnace #1 shuts off.
6. Both circulating air blowers delay time off.

Call for Cooling

1. Call for cooling is initiated.
2. Both condensers start simultaneously.
3. Both circulating air blowers start simultaneously.
4. Cooling call ends.
5. Both circulating air blowers delay time off.

Call for Fan On

1. Call for Fan On is initiated.
2. Both circulating air blowers start simultaneously (at HEAT terminal speed).
3. Fan On call ends.
4. Both circulating air blowers turn off.



Set thermostat and sub-base heat anticipator to .60 Amp.

Figure 6-12 Two-Stage Heat/Single-Stage Cool

Single-Stage Heat/Two-Stage Cool (Figure 6-13)

Call for Heat

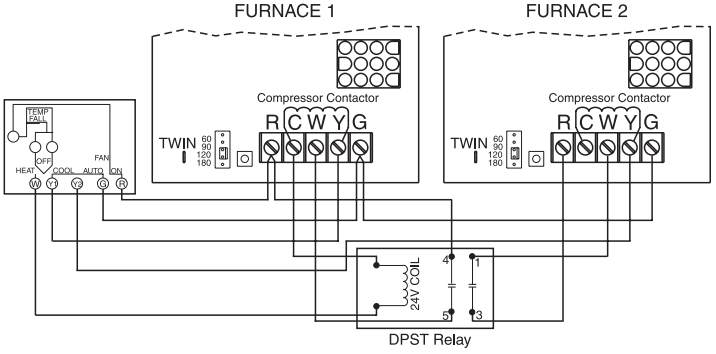
1. Call for heat is initiated.
2. Both furnaces ignite.
3. After blower “on” time delay, both circulating air blowers start simultaneously. If one unit ignites 5 - 10 seconds later, the blowers still energize simultaneously.
4. Heat call ends.
5. Both furnaces turn off.
6. Both circulating air blowers delay time off.

Call for Cooling

1. 1st stage call for cooling is initiated, condenser #1 cycles on.
2. Both circulating air blowers start simultaneously.
3. 2nd stage call for cooling, condenser #2 cycles on.
4. 2nd stage cooling call ends, condenser #2 shuts off.
5. 1st stage cooling call ends, condenser #1 shuts off.
6. Both circulating air blowers delay time off.

Call for Fan On

1. Call for Fan On is initiated.
2. Both circulating air blowers start simultaneously (at HEAT terminal speed).
3. Fan On call ends.
4. Both circulating air blowers turn off.



Set thermostat and sub-base heat anticipator to .60 Amp.

Figure 6-13 Single-Stage Heat/Two-Stage Cool

Concentric Vent Kit ACVK2

Concentric Vent Kit ACVK2 is used when installing G1D91/93 furnaces as direct vent appliances. This kit allows the air intake and vent pipe to be run through the same hole, whether horizontally through the wall or vertically through the roof (see Figures 6-14 through 6-16).

All vent and air intake pipe lengths and materials must conform to those outlined in the installation instructions included with the furnace. The location of the structure penetration must follow the guidelines as listed in the installation instructions, except where noted.

Note: When the furnace requires a 3" vent (exhaust pipe), use a 2" x 3" reducer (field-supplied) at the concentric vent termination.

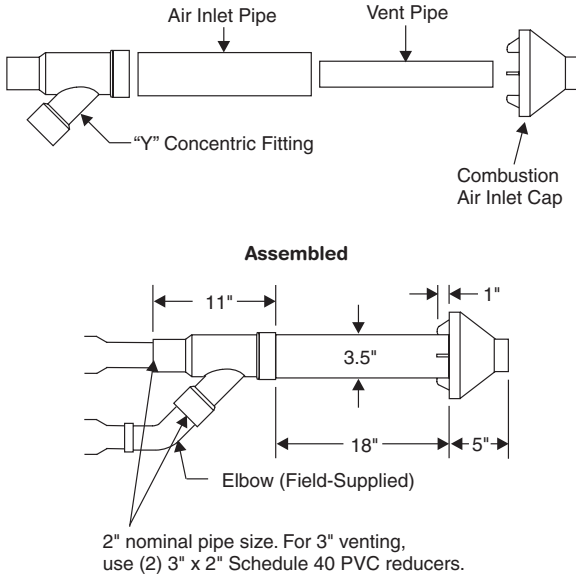
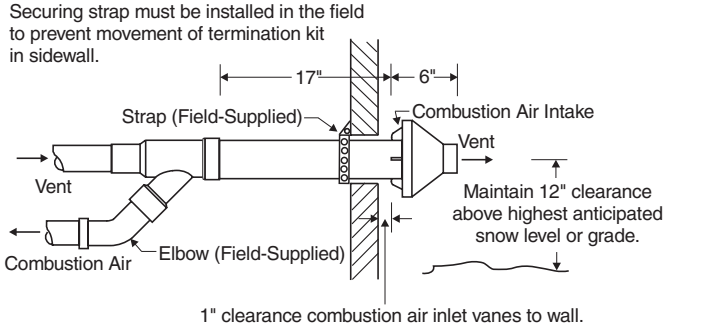


Figure 6-14 Concentric Vent Kit ACVK2-1



* The elbow size must be increased to 3" for some vent applications. Refer to the unit installation instructions and vent tables. 3" x 2" reducer is field-supplied.

Note: The termination should be installed so that the air intake is at least 12" above the average depth of snow accumulation.

Figure 6-15 Concentric Vent – Horizontal Installation (Wall Penetration)

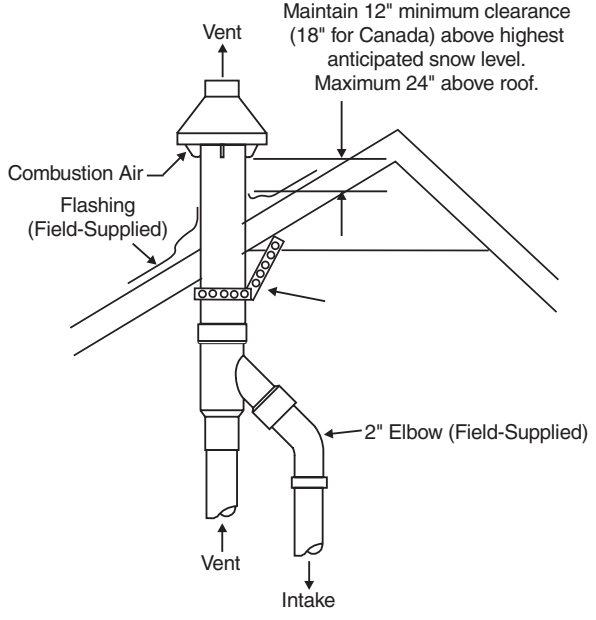


Figure 6-16 Concentric Vent – Vertical Installation (Roof Penetration)

Counterflow Combustible Floor Base Kits – G1D93AC and G1D93BC Units

If a G1D93AC or G1D93BC furnace is installed on a noncombustible floor, it may be installed directly over the supply duct or plenum. For installations on combustible flooring, a special base must be used (refer to Table 6-1 on page 6-2 to determine which base kit to use).

To install using the special base assembly, see Figure 6-17 and the following instructions:

1. Cut a hole in the floor, sized to provide 1" clearance between all four sides of the duct and the edge of the flooring. The four angles on the base assembly should recess into the floor joists and the base should rest on all four outside flanges.
2. Construct duct connections with right angle flanges.
3. Drop the duct connections through the top of the base assembly with the right angle flanges in good contact with the glass tape on top of the base assembly.
4. Carefully position the furnace over the right angle duct flanges.

A return air duct system is recommended. If the unit is installed in a confined space or closet, a return connection must be run, full size, to a location outside the closet. The air duct in the closet must be tight to prevent any entrance of air from the closet into the circulating air.

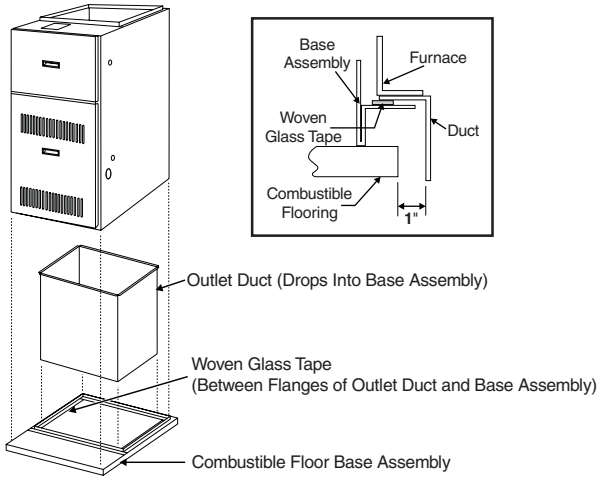


Figure 6-17 Combustible Floor Installation – G1D93AC/G1D93BC Units

Field Repair Parts Kit A531-3

The A531-3 Field Repair Parts Kit includes the G1D91AU, G1D93AU, and G1D93AC parts most commonly replaced by field technicians.

Table 6-10 Field Repair Parts Kit A531-3 Parts List

Quantity	Description
1	Induced Draft Blower Gasket (P/N 36733B004)
1	Transformer (P/N 38491B001)
1	Hot Surface Igniter (P/N 44744-002)
1	Flame Sensor (P/N 44745-001)
1	Induced Draft Blower (P/N 45037-001)
1	Gas Valve (P/N 45390-001)
1	Blower Control Board (P/N 45692-001)

Section 7 – Parts Lists

G1D91AU-1 7-2
Exploded View Drawing 7-2
G1D91AU-1 7-3

G1D91BU-1 7-6
Exploded View Drawing 7-6
G1D91BU-1 7-7

G1D91BT-1 7-12
Exploded View Drawing 7-12
G1D91BT-1 7-13

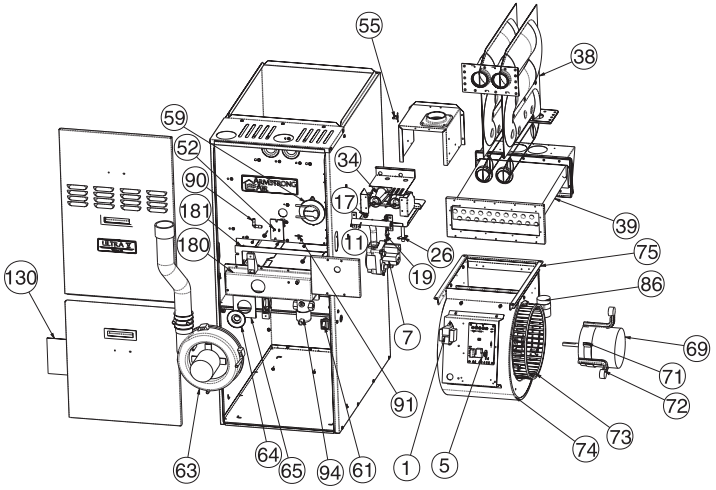
G1D93A/BU-1 7-18
Exploded View Drawing 7-18
G1D93AU-1 7-19
G1D93BU-1 7-21

G1D93A/BC-1 7-24
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G1D93AC-1 7-25
G1D93BC-1 7-27

Note: See the **Accessories** section for Field Repair Parts Kits.

G1D91AU-1

Exploded View



The numbers in the drawing refer to reference numbers provided in the following parts lists.

G1D91AU-1

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7-11-00

TO SELECT PART #

Last letter of the Model # is the Service Level.

G1D91AU125D20D-1**A**

First find Model #.---------->

G1D91AU125D20D-1**(*)**

Then match Service Level for desired part.------->

REF	PART #	PART DESCRIPTION	REC STOCKING PART	SERVICE LEVEL = *	G1D91AU050D12B-1(*)	G1D91AU075D12B-1(*)	G1D91AU075D16C-1(*)	G1D91AU100D16C-1(*)	G1D91AU100D20C-1(*)	G1D91AU125D20D-1(*)
1	38491B001	TRANSFORMER	+	A	1	1	1	1	1	1
5	45692-001	BLOWER CONTROL	+	A	1	1	1	1	1	1
5	45922-001	5 AMP FUSE-BLOWER CONTROL	+	A	1	1	1	1	1	1
7	45390-001	VALVE-GAS	+	A	1	1	1	1	1	1
11	45486-001	MANIFOLD		A	1					
11	45486-002	MANIFOLD		A		1	1			
11	45486-003	MANIFOLD		A				1	1	
11	45486-004	MANIFOLD		A						1
17	39030B019	ORIFICE #42 NATURAL GAS		A	2	3	3	4	4	5
19	44745-001	SENSOR-FLAME	+	A	1	1	1	1	1	1
26	44744-002	IGNITER-HOT SURFACE	+	A	1	1	1	1	1	1
34	39271B001	BURNER-ENDSHOT		A	2	3	3	4	4	5
38	40654-001	HEAT EXCHANGER-PRIMARY		A	1					
38	40654-002	HEAT EXCHANGER-PRIMARY		A		1	1			
38	40654-003	HEAT EXCHANGER-PRIMARY		A				1	1	
38	40654-004	HEAT EXCHANGER-PRIMARY		A						1
39	40091B001	HEAT EXCHANGER-SECONDARY		A	1					
39	40092B001	HEAT EXCHANGER-SECONDARY		A		1	1			
39	40093B001	HEAT EXCHANGER-SECONDARY		A				1	1	
39	40094B001	HEAT EXCHANGER-SECONDARY		A						1
52	40154B001	SWITCH-LIMIT 150°F/120°F	+	A	1	1	1			
52	40154B004	SWITCH-LIMIT 170°F/140°F	+	A				1		
52	40154B006	SWITCH-LIMIT 180°F/150°F	+	A					1	
52	40154B016	SWITCH-LIMIT 215°F/185°F	+	A						1
55	37520B014	SWITCH-FLAME ROLLOUT	+	A	1	1	1	1	1	1
59	45695-003	SWITCH-PRESSURE -.60"		A	1			1	1	
59	45695-004	SWITCH-PRESSURE -.70"		A		1	1			1
61	45610-001	SWITCH-INTERLOCK	+	A	1	1	1	1	1	1
63	45037-001	BLOWER-INDUCED DRAFT	+	A	1	1	1	1	1	1
64	40086B001	ORIFICE-I.D. BLOWER GRAY		A	1					
64	40086B002	ORIFICE-I.D. BLOWER ORANGE		A				1	1	
64	40086B004	ORIFICE-I.D. BLOWER BLUE		A						1
64	40086B009	ORIFICE-I.D. BLOWER WHITE		A		1	1			

G1D91AU-1 (cont)

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7-11-00

TO SELECT PART #

Last letter of the Model # is the Service Level.

G1D91AU125D20D-1**A**

First find Model #.---------->

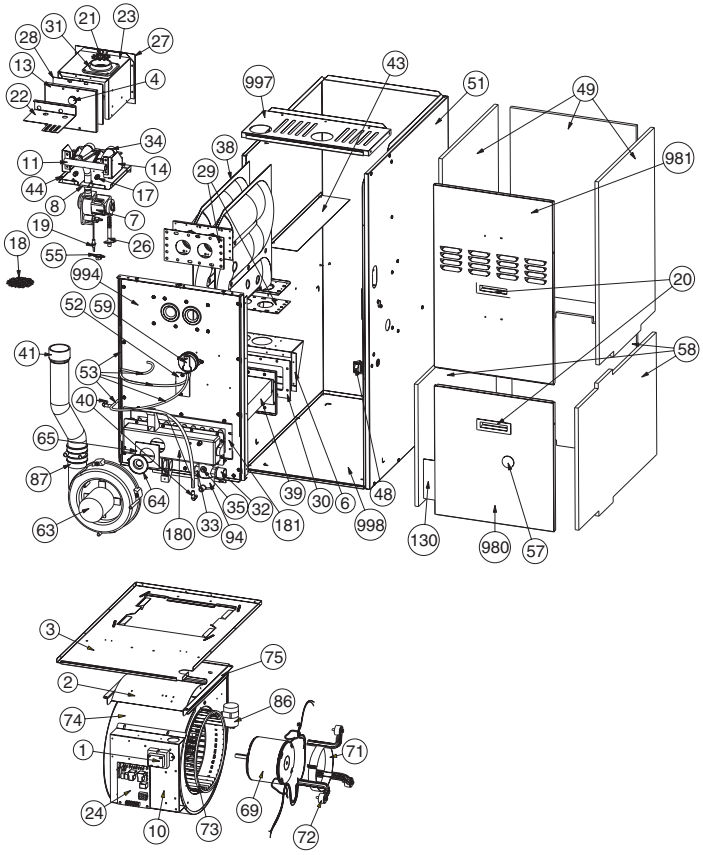
G1D91AU125D20D-1**(*)**

Then match Service Level for desired part.------->

REF	PART #	PART DESCRIPTION	REC STOCKING PART	SERVICE LEVEL = *	G1D91AU050D12B-1(*)	G1D91AU075D12B-1(*)	G1D91AU075D16C-1(*)	G1D91AU100D16C-1(*)	G1D91AU100D20C-1(*)	G1D91AU125D20D-1(*)
65	36733B004	GASKET-I.D. BLOWER	+	A	1	1	1	1	1	1
69	44627-002	MOTOR 1/3 HP	+	A	1	1				
69	44628-001	MOTOR 3/4 HP	+	A			1	1		
69	45480-001	MOTOR .90 HP	+	A					1	1
71	07407B000	BAND-MOTOR MOUNTING		A	1	1				
71	38180C001	BAND-MOTOR MOUNTING		A			1	1	1	1
72	07408B003	ARM-MOTOR MOUNTING		A	3	3				
72	07408B008	ARM-MOTOR MOUNTING		A			4	4	4	4
73	02592A003	WHEEL-BLOWER 10 x 8		A	1	1				
73	02592A024	WHEEL-BLOWER 12 x 10		A			1	1	1	1
74	45557-002	HOUSING-BLOWER		A	1	1				
74	45557-003	HOUSING-BLOWER		A			1	1	1	1
75	40170B003	RAIL-RIGHT BLOWER		A	1	1	1	1	1	1
76	40170B003	RAIL-LEFT BLOWER		A	1	1	1	1	1	1
86	39232D008	CAPACITOR 12.5 MFD@370V	+	A			1	1		
86	39232D028	CAPACITOR 20 MFD@370V	+	A					1	1
86	S39232D004	CAPACITOR 7.5 MFD@370V	+	A	1	1				
90	45140-001	ELBOW-PLASTIC	+	A	1	1	1	1	1	1
91	39358B001	TEE-PLASTIC	+	A	1	1	1	1	1	1
94	45035-001	TRAP-BOOT W/PORT	+	A	1	1	1	1	1	1
130	45198-003	LABEL-WIRING DIAGRAM		A	1	1	1	1	1	1
180	40095B001	BOX-HEADER		A	1	1	1			
180	40096B001	BOX-HEADER		A						1
180	45665-001	BOX-HEADER		A				1	1	
181	42381-002	GASKET-HEADER BOX	+	A						1
181	42381-003	GASKET-HEADER BOX	+	A	1	1	1			
181	42381-004	GASKET-HEADER BOX	+	A				1	1	

G1D91BU-1

Exploded View



The numbers in the drawing refer to reference numbers provided in the following parts lists.

G1D91BU-1

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9-04

TO SELECT PART #

Last letter of the Model # is the Service Level.

G1D91BU125D20D-1**A**

First find Model #.---------->

G1D91BU125D20D-1**(*)**

Then match Service Level for desired part.------>

REF	PART #	PART DESCRIPTION	G1D91BU050D12B-1(*)	G1D91BU075D12B-1(*)	G1D91BU075D16C-1(*)	G1D91BU100D16C-1(*)	G1D91BU100D20C-1(*)	G1D91BU100D22D-1(*)	G1D91BU125D20D-1(*)
1	R43211-001	TRANSFORMER	1	1	1	1	1	1	1
2	R01240B003	CUTOFF BLOWER	1	1					
2	R01240B023	CUTOFF BLOWER			1	1	1	1	1
3	R46374-002	PANEL-BLOWER DECK	1	1					
3	R46374-005	PANEL-BLOWER DECK			1	1	1		
3	R46374-004	PANEL-BLOWER DECK						1	1
4	R43331-002	PLUG-WINDOW	1	1	1	1	1	1	1
6	R45226-001	TRANSITION BOX - 50K	1						
6	R45226-002	TRANSITION BOX - 75K		1	1				
6	R45226-003	TRANSITION BOX - 100K				1	1	1	
6	R45226-004	TRANSITION BOX - 125K							1
7	R47484-002	VALVE-GAS SINGLE STAGE	1	1	1	1	1	1	1
8	R45635-001	GROMMET-GAS MANIFOLD	1	1	1	1	1	1	1
10	R40281-008	CONTROL BRACKET PANEL	1	1	1	1	1	1	
11	R45486-001	MANIFOLD	1						
11	R45486-002	MANIFOLD		1	1				
11	R45486-003	MANIFOLD				1	1	1	
11	R45486-004	MANIFOLD							1
13	R45171-005	FRONT-BURNER BOX	1						
13	R45171-001	FRONT-BURNER BOX		1	1				
13	R45171-002	FRONT-BURNER BOX				1	1	1	
13	R45171-003	FRONT-BURNER BOX							1
14	R45484-001	RACK-BURNER 50K	1						
14	R45484-003	RACK-BURNER 75K		1	1				
14	R45484-004	RACK-BURNER 100K				1	1	1	
14	R45484-005	RACK-BURNER 125K							1
17	R39030B019	ORIFICE #42	2	3	3	4	4	4	5
18	R37648B002	SCREEN 3.50" ROUND	1	1	1	1	1	1	1
19	R44745-001	SENSOR-FLAME	1	1	1	1	1	1	1
20	R45174-001	HANDLE-BEIGE	2	2	2	2	2	2	2
21	R45660-001	PLATE-RESTRICTOR 2"	1	1	1	1	1	1	
21	R45661-001	PLATE-RESTRICTOR 3"							1
22	R45192-006	BAFFLE-BURNER BOX	1						
22	R45192-002	BAFFLE-BURNER BOX		1	1				
22	R45192-003	BAFFLE-BURNER BOX				1	1	1	

G1D91BU-1 (cont)

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9-04

TO SELECT PART #

Last letter of the Model # is the Service Level.

G1D91BU125D20D-1**A**

First find Model #.---------->

G1D91BU125D20D-1**(*)**

Then match Service Level for desired part.------>

REF	PART #	PART DESCRIPTION	G1D91BU050D12B-1(*)	G1D91BU075D12B-1(*)	G1D91BU075D16C-1(*)	G1D91BU100D16C-1(*)	G1D91BU100D20C-1(*)	G1D91BU100D22D-1(*)	G1D91BU125D20D-1(*)
22	R45192-004	BAFFLE-BURNER BOX							1
23	R45170-028	WRAP-BURNER BOX	1						
23	R45170-029	WRAP-BURNER BOX		1	1				
23	R45170-030	WRAP-BURNER BOX				1	1	1	
23	R45170-031	WRAP-BURNER BOX							1
24	R47582-001	INTEGRATED IGNITION/BLOWER CONTROL	1	1	1	1	1	1	1
26	R44744-002	IGNITER-HOT SURFACE	1	1	1	1	1	1	1
27	R45179-005	GASKET-BURNER BOX WRAP	1						
27	R45179-001	GASKET-BURNER BOX WRAP		1	1				
27	R45179-002	GASKET-BURNER BOX WRAP				1	1	1	
27	R45179-003	GASKET-BURNER BOX WRAP							1
28	R45180-005	GASKET-BURNER BOX COVER	1						
28	R45180-001	GASKET-BURNER BOX COVER		1	1				
28	R45180-002	GASKET-BURNER BOX COVER				1	1	1	
28	R45180-003	GASKET-BURNER BOX COVER							1
29	R40400-001	GASKET-ATTACH 50'S	2						
29	R40400-002	GASKET-ATTACH 75'S		2	2				
29	R40400-003	GASKET-ATTACH 100'S				2	2	2	
29	R40400-004	GASKET-ATTACH 125'S							2
30	R40695-001	GASKET-COIL 50'S	1	1	1				
30	R40695-004	GASKET-COIL 100'S				1	1	1	
30	R40695-002	GASKET-COIL 125'S							1
31	R45562-001	COLLAR-PVC	1	1	1	1	1	1	
31	R45563-001	COLLAR-BLACK CPVC 3"							1
32	R37649B002	ADAPTER-1/2M-PVC STRAIGHT	1	1	1	1	1	1	1
33	R32844A002	RED PLUG	1	1	1	1	1	1	1
34	R39271B001	BURNER	2	3	3	4	4	4	5
35	R32844A004	PLUG	1	1	1	1	1	1	1
38	RHTEX301	90% HEAT EXCHANGER 50K	1						
38	RHTEX302	90% HEAT EXCHANGER 75K		1	1				
38	RHTEX303	90% HEAT EXCHANGER 100K				1	1	1	
38	RHTEX304	90% HEAT EXCHANGER 125K							1
39	R40091B001	COIL-SECONDARY HEAT EXCHANGER	1						
39	R45181-001	COIL-SECONDARY HEAT EXCHANGER		1	1				

G1D91BU-1 (cont)

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9-04

TO SELECT PART #

Last letter of the Model # is the Service Level.

G1D91BU125D20D-1**A**

First find Model #.---------->

G1D91BU125D20D-1(*)

Then match Service Level for desired part.------>

REF	PART #	PART DESCRIPTION	G1D91BU050D12B-1(*)	G1D91BU075D12B-1(*)	G1D91BU075D16C-1(*)	G1D91BU100D16C-1(*)	G1D91BU100D20C-1(*)	G1D91BU100D22D-1(*)	G1D91BU125D20D-1(*)
39	R48485-001	COIL-SECONDARY HEAT EXCHANGER				1	1	1	
39	R40093B001	COIL-SECONDARY HEAT EXCHANGER							1
40	R45140-001	PLASTIC ELBOW	2	2	2	2	2	2	2
41	R45666-002	VENT PIPE	1	1	1	1	1	1	1
43	R40087B002	AIR BAFFLE	2						
43	R40087B001	AIR BAFFLE		2		2	2	2	2
43	R40087B004	AIR BAFFLE			2				
44	R45172-009	BASE-BURNER BOX	1						
44	R45172-010	BASE-BURNER BOX		1	1				
44	R45172-011	BASE-BURNER BOX				1	1	1	
44	R45172-012	BASE-BURNER BOX							1
48	R45610-001	SWITCH BRACKET ASSEMBLY	1	1	1	1	1	1	1
49	R48016-001	FOIL FACE INSULATION KIT	1	1	1	1	1	1	1
51	R47871-001	PANEL-WRAPPER	1	1					
51	R47871-002	PANEL-WRAPPER			1	1	1		
51	R47871-003	PANEL-WRAPPER						1	1
52	R46105-004	LIMIT CONTROL	1			1			
52	R46105-001	LIMIT CONTROL		1	1				
52	R46105-006	LIMIT CONTROL-RED					1		
52	R46105-012	LIMIT CONTROL-YELLOW/WHITE						1	
52	R46105-016	LIMIT CONTROL-PINK/WHITE							1
53	R48018-001	90% HOSE KIT	1	1	1	1	1	1	1
55	R37520B018	SWITCH-ROLLOUT	1	1	1	1	1	1	1
57	R100008-01	SIGHT GLASS	1	1	1	1	1	1	1
58	R48017-001	TUFFSKIN INSULATION KIT	1	1	1	1	1	1	1
59	R45695-003	SWITCH-PRESS BROWN .60	1			1	1	1	
59	R45695-004	SWITCH-PRESS GREEN .70		1	1				1
63	R45037-001	BLOWER-INDUCED DRAFT	1	1	1	1	1	1	1
64	R40086B001	ORIFICE (GRAY) .81	1						
64	R40086B009	ORIFICE (WHITE) .88		1	1				
64	R40086B002	ORIFICE (ORANGE) 1.05				1	1	1	
64	R40086B004	ORIFICE (BLUE) 1.20							1
65	R36733B004	GASKET-I.D. BLOWER	1	1	1	1	1	1	1
69	R47462-001	MOTOR-1/3 HP EMERSON	1	1					

G1D91BU-1 (cont)

REVISED
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TO SELECT PART #

Last letter of the Model # is the Service Level.

G1D91BU125D20D-1**A**

First find Model #.---------->

G1D91BU125D20D-1**(*)**

Then match Service Level for desired part.------>

REF	PART #	PART DESCRIPTION	G1D91BU050D12B-1(*)	G1D91BU075D12B-1(*)	G1D91BU075D16C-1(*)	G1D91BU100D16C-1(*)	G1D91BU100D20C-1(*)	G1D91BU100D22D-1(*)	G1D91BU125D20D-1(*)
69	R47467-001	MOTOR-3/4 HP EMERSON			1	1			
69	R47468-001	MOTOR-0.9 HP EMERSON				1	1		
71	R07407B000	BAND-MOTOR MOUNTING	1	1					
71	R38180C001	BAND-MOTOR MOUNTING			1	1	1	1	1
72	R07408B003	ARM-MOTOR MOUNTING	3	3					
72	R07408B008	ARM-MOTOR MOUNTING			4	4	4	4	4
73	R02592A003	WHEEL-BLOWER	1	1					
73	R02592A024	WHEEL-BLOWER			1	1	1	1	1
74	R45557-002	BLOWER HOUSING ASSEMBLY	1	1					
74	R45557-003	BLOWER HOUSING ASSEMBLY			1	1	1	1	1
75	R40170B003	RAIL-BLOWER (1) NARROW	2	2	2	2	2	2	2
86	R39232D004	CAPACITOR 7.5 MFD@370V	1	1					
86	R39232D008	CAPACITOR RUN 12.5			1	1			
86	R39232D028	CAPACITOR RUN 20 MFD					1	1	1
94	R45035-001	BOOT-FOR TRAP W/PORT	1	1	1	1	1	1	1
130	R45198-006	LABEL-WIRING DIAGRAM	1	1	1	1	1	1	1
180	R40095B001	HEADER BOX-PLASTIC	1	1	1				
180	R45665-001	HEADER BOX-PLASTIC				1	1	1	
180	R40096B001	HEADER BOX-PLASTIC							1
181	R42381-003	HEADER BOX GASKET	1	1	1				
181	R42381-004	HEADER BOX GASKET				1	1	1	
181	R42381-002	HEADER BOX GASKET							1
980	R45360-007	BLOWER COMPARTMENT DOOR 17.5	1	1					
980	R45360-008	BLOWER COMPARTMENT DOOR 21.0			1	1	1		
980	R5360-009	BLOWER COMPARTMENT DOOR 24.5						1	1
981	R45361-001	UPFLOW 90 BURNER DOOR	1	1					
981	R45361-002	UPFLOW 90 BURNER DOOR			1	1	1		
981	R45361-003	UPFLOW 90 BURNER DOOR						1	1
994	R45317-001	VEST PANEL	1						
994	R45317-002	VEST PANEL		1					
994	R45317-003	VEST PANEL			1				
994	R45317-004	VEST PANEL				1	1		
994	R45317-005	VEST PANEL						1	
994	R45317-006	VEST PANEL							1

G1D91BU-1 (cont)

REVISED
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TO SELECT PART #

Last letter of the Model # is the Service Level.

G1D91BU125D20D-1**A**

First find Model #.---------->

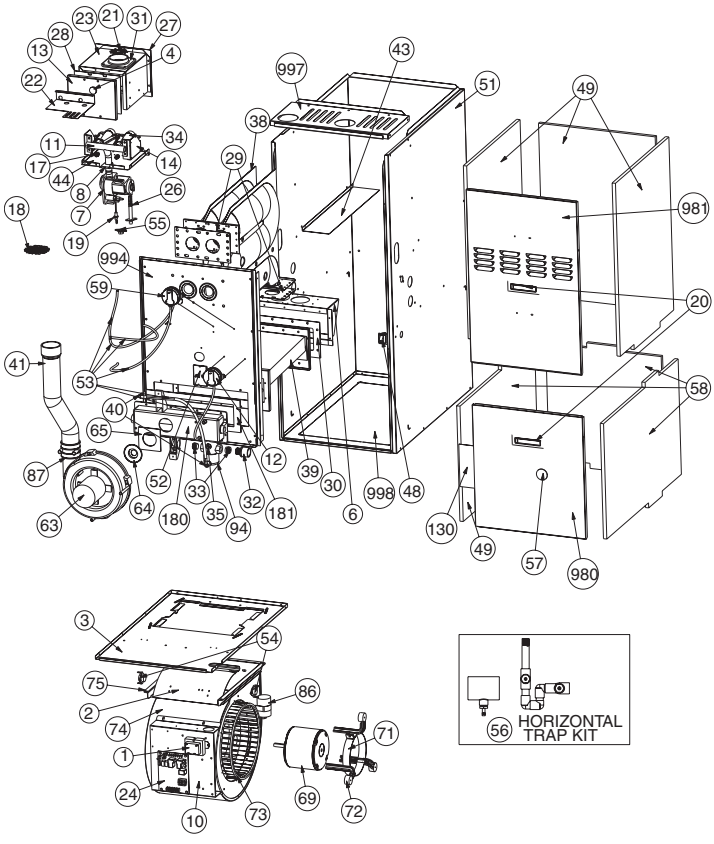
G1D91BU125D20D-1**(*)**

Then match Service Level for desired part.------>

REF	PART #	PART DESCRIPTION	G1D91BU050D12B-1(*)	G1D91BU075D12B-1(*)	G1D91BU075D16C-1(*)	G1D91BU100D16C-1(*)	G1D91BU100D20C-1(*)	G1D91BU100D22D-1(*)	G1D91BU125D20D-1(*)
997	R45195-001	TOP FILLER PANEL	1						
997	R45195-002	TOP FILLER PANEL		1					
997	R45195-003	TOP FILLER PANEL			1				
997	R45195-004	TOP FILLER PANEL				1	1		
997	R45195-005	TOP FILLER PANEL						1	
997	R45195-006	TOP FILLER PANEL							1
998	R44937-002	SOLID BASE PANEL	1	1					
998	R44937-003	SOLID BASE PANEL			1	1	1		
998	R44937-004	SOLID BASE PANEL						1	1

G1D91BT-1

Exploded View



The numbers in the drawing refer to reference numbers provided in the following parts lists.

G1D91BT-1

REVISED
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TO SELECT PART #

Last letter of the Model # is the Service Level.

G1D91BT125D20C-1**A**

First find Model #.---------->

G1D91BT125D20C-1**(*)**

Then match Service Level for desired part.------->

REF	PART #	PART DESCRIPTION	G1D91BT050D12B-1(*)	G1D91BT075D12B-1(*)	G1D91BT075D16C-1(*)	G1D91BT100D16C-1(*)	G1D91BT100D20C-1(*)	G1D91BT125D20C-1(*)
1	R43211-001	TRANSFORMER	1	1	1	1	1	1
2	R01240B003	CUTOFF BLOWER	1	1				
2	R01240B023	CUTOFF BLOWER			1	1	1	1
3	R46374-002	PANEL-BLOWER DECK	1	1				
3	R46374-005	PANEL-BLOWER DECK			1	1	1	1
4	R43331-002	PLUG-WINDOW	1	1	1	1	1	1
6	R45226-001	TRANSITION BOX - 50K	1					
6	R45226-002	TRANSITION BOX - 75K		1	1			
6	R45226-003	TRANSITION BOX - 100K				1	1	
6	R45226-004	TRANSITION BOX - 125K						1
7	R47484-002	SINGLE STAGE VALVE GAS	1	1	1	1	1	1
8	R45635-001	GROMMET-GAS MANIFOLD	1	1	1	1	1	1
10	R40281-008	CONTROL BRACKET PANEL	1	1	1	1	1	1
11	R45486-001	MANIFOLD	1					
11	R45486-002	MANIFOLD		1	1			
11	R45486-003	MANIFOLD				1	1	
11	R45486-004	MANIFOLD						1
12	R47865-001	PRESSURE SWITCH - .10	1	1	1	1	1	1
13	R45171-005	FRONT-BURNER BOX	1					
13	R45171-001	FRONT-BURNER BOX		1	1			
13	R45171-002	FRONT-BURNER BOX				1	1	
13	R45171-003	FRONT-BURNER BOX						1
14	R45484-001	RACK-BURNER 50K	1					
14	R45484-003	RACK-BURNER 75K		1	1			
14	R45484-004	RACK-BURNER 100K				1	1	
14	R45484-005	RACK-BURNER 125K						1
17	R39030B019	ORIFICE #42	2	3	3	4	4	5
18	R37648B002	SCREEN 3.50" ROUND	1	1	1	1	1	1
19	R44745-001	FLAME SENSOR	1	1	1	1	1	1
20	R45174-001	HANDLE	2	2	2	2	2	2
21	R45660-001	PLATE-RESTRICTOR 2"	1	1	1	1	1	
21	R45661-001	PLATE-RESTRICTOR 3"						1
22	R45192-006	BAFFLE-BURNER BOX	1					
22	R45192-002	BAFFLE-BURNER BOX		1	1			

G1D91BT-1 (cont)

REVISED
9-04

TO SELECT PART #

Last letter of the Model # is the Service Level.

G1D91BT125D20C-1**A**

First find Model #.---------->

G1D91BT125D20C-1**(*)**

Then match Service Level for desired part.------->

REF	PART #	PART DESCRIPTION	G1D91BT050D12B-1(*)	G1D91BT075D12B-1(*)	G1D91BT075D16C-1(*)	G1D91BT100D16C-1(*)	G1D91BT100D20C-1(*)	G1D91BT125D20C-1(*)
22	R45192-003	BAFFLE-BURNER BOX				1	1	
22	R45192-004	BAFFLE-BURNER BOX						1
23	R45170-028	WRAP-BURNER BOX	1					
23	R45170-029	WRAP-BURNER BOX		1	1			
23	R45170-030	WRAP-BURNER BOX				1	1	
23	R45170-031	WRAP-BURNER BOX						1
24	R47582-001	INTEGRATED IGNITION/BLOWER CONTROL	1	1	1	1	1	1
26	R44744-002	HOT SURFACE IGNITER	1	1	1	1	1	1
27	R45179-005	GASKET-BURNER BOX WRAP	1					
27	R45179-001	GASKET-BURNER BOX WRAP		1	1			
27	R45179-002	GASKET-BURNER BOX WRAP				1	1	
27	R45179-003	GASKET-BURNER BOX WRAP						1
28	R45180-005	GASKET-BURNER BOX COVER	1					
28	R45180-001	GASKET-BURNER BOX COVER		1	1			
28	R45180-002	GASKET-BURNER BOX COVER				1	1	
28	R45180-003	GASKET-BURNER BOX COVER						1
29	R40400-001	GASKET-ATTACH 50'S	2					
29	R40400-002	GASKET-ATTACH 75'S		2	2			
29	R40400-003	GASKET-ATTACH 100'S				2	2	
29	R40400-004	GASKET-ATTACH 125'S						2
30	R40695-001	GASKET-COIL 50'S	1	1	1			
30	R40695-004	GASKET-COIL 100'S				1	1	
30	R40695-002	GASKET-COIL 125'S						1
31	R45562-001	COLLAR-PVC	1	1	1	1	1	
31	R45563-001	COLLAR-BLACK CPVC 3"						1
32	R37649B002	ADAPTER-1/2M-PVC STRAIGHT	1	1	1	1	1	1
33	R32844A002	RED PLUG	1	1	1	1	1	1
34	R39271B001	BURNER	2	3	3	4	4	5
35	R32844A004	PLUG	1	1	1	1	1	1
38	R99817-001	90% HEAT EXCHANGER 50K	1					
38	R99817-002	90% HEAT EXCHANGER 75K		1	1			
38	R99817-003	90% HEAT EXCHANGER 100K				1	1	
38	R99817-004	90% HEAT EXCHANGER 125K						1

G1D91BT-1 (cont)

REVISED
9-04

TO SELECT PART #

Last letter of the Model # is the Service Level.

G1D91BT125D20C-1**A**

First find Model #.---------->

G1D91BT125D20C-1**(*)**

Then match Service Level for desired part.------->

REF	PART #	PART DESCRIPTION	G1D91BT050D12B-1(*)	G1D91BT075D12B-1(*)	G1D91BT075D16C-1(*)	G1D91BT100D16C-1(*)	G1D91BT100D20C-1(*)	G1D91BT125D20C-1(*)
39	R40091B001	COIL-SECONDARY HEAT EXCHANGER	1					
39	R45181-001	COIL-SECONDARY HEAT EXCHANGER		1	1			
39	R48485-001	COIL-SECONDARY HEAT EXCHANGER				1	1	
39	R40093B001	COIL-SECONDARY HEAT EXCHANGER						1
40	R45140-001	PLASTIC ELBOW	2	2	2	2	2	2
41	R45666-002	VENT PIPE	1	1	1	1	1	1
43	R40087B002	AIR BAFFLE	2					
43	R40087B001	AIR BAFFLE		2		2	2	
43	R40087B004	AIR BAFFLE			2			
44	R45172-009	BASE-BURNER BOX	1					
44	R45172-010	BASE-BURNER BOX		1	1			
44	R45172-011	BASE-BURNER BOX				1	1	
44	R45172-012	BASE-BURNER BOX						1
48	R45610-001	SWITCH BRACKET ASSEMBLY	1	1	1	1	1	1
49	R48016-001	FOIL FACE INSULATION KIT	1	1	1	1	1	1
51	R47871-001	PANEL-WRAPPER	1	1				
51	R47871-002	PANEL-WRAPPER			1	1	1	1
52	R46105-004	LIMIT CONTROL	1			1		
52	R46105-001	LIMIT CONTROL		1	1			
52	R46105-006	LIMIT CONTROL-RED					1	
52	R46105-016	LIMIT CONTROL-PINK/WHITE						1
53	R48018-001	90% HOSE KIT	1	1	1	1	1	1
54	R01851A007	LIMIT SWITCH-BLUE	2	2	2	2	2	2
55	R37520B018	ROLLOUT SWITCH	1	1	1	1	1	1
56	R47873-001	HORIZONTAL TRAP KIT	1	1	1	1	1	1
57	R100008-01	SIGHT GLASS	1	1	1	1	1	1
58	R48017-001	TUFFSKIN INSULATION KIT	1	1	1	1	1	1
59	R45695-003	PRESSURE SWITCH BROWN .60	1					
59	R45695-004	PRESSURE SWITCH GREEN .70		1	1			
59	R45695-010	PRESSURE SWITCH GRAY .85				1	1	1
63	R45037-001	INDUCED DRAFT BLOWER	1	1	1	1	1	1
64	R40086B001	ORIFICE (GRAY) .81	1					
64	R40086B009	ORIFICE (WHITE) .88		1	1			

G1D91BT-1 (cont)

REVISED
9-04

TO SELECT PART #

Last letter of the Model # is the Service Level.

G1D91BT125D20C-1**A**

First find Model #.---------->

G1D91BT125D20C-1**(*)**

Then match Service Level for desired part.------->

REF	PART #	PART DESCRIPTION	G1D91BT050D12B-1(*)	G1D91BT075D12B-1(*)	G1D91BT075D16C-1(*)	G1D91BT100D16C-1(*)	G1D91BT100D20C-1(*)	G1D91BT125D20C-1(*)
64	R40086B002	ORIFICE (ORANGE) 1.05				1	1	
64	R40086B004	ORIFICE (BLUE) 1.20						1
65	R36733B004	GASKET-INDUCED DRAFT BLOWER	1	1	1	1	1	1
69	R47462-001	MOTOR-1/3 HP EMERSON	1					
69	R47464-001	MOTOR-1/3 HP EMERSON		1				
69	R47467-001	MOTOR-3/4 HP EMERSON			1	1		
69	R47468-001	MOTOR-0.9 HP EMERSON					1	1
71	R07407B000	BAND-MOTOR MOUNTING	1	1				
71	R38180C001	BAND-MOTOR MOUNTING			1	1	1	1
72	R07408B003	ARM-MOTOR MOUNTING	3	3				
72	R07408B008	ARM-MOTOR MOUNTING			4	4	4	4
73	R02592A003	BLOWER WHEEL	1	1				
73	R02592A024	BLOWER WHEEL			1	1	1	1
74	R45557-005	BLOWER HOUSING ASSEMBLY	1	1				
74	R45557-006	BLOWER HOUSING ASSEMBLY			1	1	1	1
75	R40170B003	BLOWER RAIL	2	2	2	2	2	2
86	R39232D004	CAPACITOR 7.5 MFD@370V	1	1				
86	R39232D008	CAPACITOR 12.5 MFD@370V			1	1		
86	R39232D028	CAPACITOR 20 MFD@370V					1	1
94	R45035-001	BOOT-FOR TRAP W/PORT	1	1	1	1	1	1
130	R45198-006	LABEL-WIRING DIAGRAM	1	1	1	1	1	1
180	R47800-001	HEADER BOX-PLASTIC	1	1	1			
180	R47800-002	HEADER BOX-PLASTIC				1	1	
180	R47800-003	HEADER BOX-PLASTIC						1
181	R42381-003	HEADER BOX GASKET	1	1	1			
181	R42381-004	HEADER BOX GASKET				1	1	
181	R42381-002	HEADER BOX GASKET						1
980	R45360-007	BLOWER COMPARTMENT DOOR 17.5	1	1				
980	R45360-008	BLOWER COMPARTMENT DOOR 21.0			1	1	1	1
981	R45361-001	UPFLOW 90 BURNER DOOR	1	1				
981	R45361-002	UPFLOW 90 BURNER DOOR			1	1	1	1
994	R45317-001	VEST PANEL	1					
994	R45317-002	VEST PANEL		1				
994	R45317-003	VEST PANEL			1			

G1D91BT-1 (cont)

REVISED
9-04

TO SELECT PART #

Last letter of the Model # is the Service Level.

G1D91BT125D20C-1**A**

First find Model #.---------->

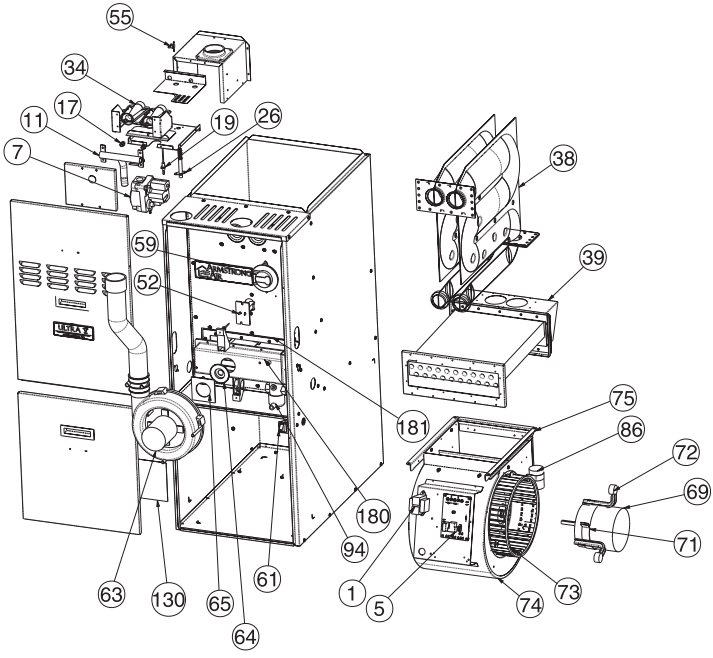
G1D91BT125D20C-1**(*)**

Then match Service Level for desired part.------->

REF	PART #	PART DESCRIPTION	G1D91BT050D12B-1(*)	G1D91BT075D12B-1(*)	G1D91BT075D16C-1(*)	G1D91BT100D16C-1(*)	G1D91BT100D20C-1(*)	G1D91BT125D20C-1(*)
994	R45317-004	VEST PANEL				1	1	
994	R45317-017	VEST PANEL						1
997	R45195-001	TOP FILLER PANEL	1					
997	R45195-002	TOP FILLER PANEL		1				
997	R45195-003	TOP FILLER PANEL			1			
997	R45195-004	TOP FILLER PANEL				1	1	
997	R45195-012	TOP FILLER PANEL						1
998	R44937-002	SOLID BASE PANEL	1	1				
998	R44937-003	SOLID BASE PANEL			1	1	1	1

G1D93A/BU-1

Exploded View



The numbers in the drawing refer to reference numbers provided in the following parts lists.

G1D93AU-1

REVISED
7-11-00

TO SELECT PART #

Last letter of the Model # is the Service Level.

G1D93AU112D20D-1**A**

First find Model #.---------->

G1D93AU112D20D-1**(*)**

Then match Service Level for desired part.------->

REF	PART #	PART DESCRIPTION	REC STOCKING PART	SERVICE LEVEL = *	G1D93AU045D12B-1(*)	G1D93AU067D12B-1(*)	G1D93AU067D16C-1(*)	G1D93AU090D16C-1(*)	G1D93AU090D20C-1(*)	G1D93AU112D20D-1(*)
1	38491B001	TRANSFORMER	+	A	1	1	1	1	1	1
5	45692-001	BLOWER CONTROL	+	A	1	1	1	1	1	1
5	45922-001	5 AMP FUSE-BLOWER CONTROL	+	A	1	1	1	1	1	1
7	45390-001	VALVE-GAS	+	A	1	1	1	1	1	1
11	45486-001	MANIFOLD		A	1					
11	45486-002	MANIFOLD		A		1	1			
11	45486-003	MANIFOLD		A				1	1	
11	45486-004	MANIFOLD		A						1
17	39030B009	ORIFICE #44 NATURAL GAS		A	2	3	3	4	4	5
17	39030B011	ORIFICE #55 LP		A	2	3	3	4	4	5
19	44745-001	SENSOR-FLAME	+	A	1	1	1	1	1	1
26	44744-002	IGNITER-HOT SURFACE	+	A	1	1	1	1	1	1
34	39271B001	BURNER-ENDSHOT		A	2	3	3	4	4	5
38	40654-001	HEAT EXCHANGER-PRIMARY		A	1					
38	40654-002	HEAT EXCHANGER-PRIMARY		A		1	1			
38	40654-003	HEAT EXCHANGER-PRIMARY		A				1	1	
38	40654-004	HEAT EXCHANGER-PRIMARY		A						1
39	40091B001	HEAT EXCHANGER-SECONDARY		A	1					
39	40092B001	HEAT EXCHANGER-SECONDARY		A		1	1			
39	40093B001	HEAT EXCHANGER-SECONDARY		A				1	1	
39	40094B001	HEAT EXCHANGER-SECONDARY		A						1
52	40154B001	SWITCH-LIMIT 150°F/120°F	+	A	1	1	1			
52	40154B004	SWITCH-LIMIT 170°F/140°F	+	A				1		
52	40154B006	SWITCH-LIMIT 180°F/150°F	+	A					1	
52	40154B016	SWITCH-LIMIT 215°F/185°F	+	A						1
55	37520B014	SWITCH-FLAME ROLLOUT	+	A	1	1	1	1	1	1
59	45695-003	SWITCH-PRESSURE -.60"		A	1			1	1	
59	45695-004	SWITCH-PRESSURE -.70"		A		1	1			1
61	45610-001	SWITCH-INTERLOCK	+	A	1	1	1	1	1	1
63	45037-001	BLOWER-INDUCED DRAFT	+	A	1	1	1	1	1	1

G1D93AU-1 (cont)

REVISED
7-11-00

TO SELECT PART #

Last letter of the Model # is the Service Level.

G1D93AU112D20D-1**A**

First find Model #.---------->

G1D93AU112D20D-1(*)

Then match Service Level for desired part.------->

REF	PART #	PART DESCRIPTION	REC STOCKING PART	SERVICE LEVEL = *	G1D93AU045D12B-1(*)	G1D93AU067D12B-1(*)	G1D93AU067D16C-1(*)	G1D93AU090D16C-1(*)	G1D93AU090D20C-1(*)	G1D93AU112D20D-1(*)
64	40086B001	ORIFICE-I.D. BLOWER GRAY		A		1	1			
64	40086B003	ORIFICE-I.D. BLOWER BLACK		A						1
64	40086B006	ORIFICE-I.D. BLOWER YELLOW		A				1	1	
64	40086B007	ORIFICE-I.D. BLOWER GREEN		A	1					
65	36733B004	GASKET-I.D. BLOWER	+	A	1	1	1	1	1	1
69	44627-002	MOTOR 1/3 HP	+	A	1	1				
69	44628-001	MOTOR 3/4 HP	+	A			1	1		
69	45480-001	MOTOR .90 HP	+	A					1	1
71	07407B000	BAND-MOTOR MOUNTING		A	1	1				
71	38180C001	BAND-MOTOR MOUNTING		A			1	1	1	1
72	07408B003	ARM-MOTOR MOUNTING		A	3	3				
72	07408B008	ARM-MOTOR MOUNTING		A			4	4	4	4
73	02592A003	WHEEL-BLOWER 10 x 8		A	1	1				
73	02592A024	WHEEL-BLOWER 12 x 10		A			1	1	1	1
74	S45557-002	HOUSING-BLOWER		A	1	1				
74	S45557-003	HOUSING-BLOWER		A			1	1	1	1
75	40170B003	RAIL-RIGHT BLOWER		A	1	1	1	1	1	1
76	40170B003	RAIL-LEFT BLOWER		A	1	1	1	1	1	1
86	39232D008	CAPACITOR 12.5 MFD@370V	+	A			1	1		
86	39232D028	CAPACITOR 20 MFD@370V	+	A					1	1
86	S39232D004	CAPACITOR 7.5 MFD@370V	+	A	1	1				
90	45140-001	ELBOW-PLASTIC	+	A	1	1	1	1	1	1
91	39358B001	TEE-PLASTIC	+	A	1	1	1	1	1	1
94	45035-001	TRAP-BOOT W/PORT	+	A	1	1	1	1	1	1
130	45198-003	LABEL-WIRING DIAGRAM		A	1	1	1	1	1	1
180	40095B001	BOX-HEADER		A	1	1	1			
180	40096B001	BOX-HEADER		A						1
180	45665-001	BOX-HEADER		A				1	1	
181	42381-002	GASKET-HEADER BOX	+	A						1
181	42381-003	GASKET-HEADER BOX	+	A	1	1	1			
181	42381-004	GASKET-HEADER BOX	+	A				1	1	

G1D93BU-1

REVISED
11-04-03

TO SELECT PART #

Last letter of the Model # is the Service Level.

G1D93BU112D20D-1**A**

First find Model #.---------->

G1D93BU112D20D-1**(*)**

Then match Service Level for desired part.------->

REF	PART #	PART DESCRIPTION	REC STOCKING PART	SERVICE LEVEL = *	G1D93BU045D12B-1(*)	G1D93BU067D12B-1(*)	G1D93BU067D16C-1(*)	G1D93BU090D16C-1(*)	G1D93BU090D20C-1(*)	G1D93BU112D20D-1(*)
1	43211-001	TRANSFORMER	+	A	1	1	1	1	1	1
5	47582-001	CONTROL-IGNITION	+	A	1	1	1	1	1	1
7	47484-002	VALVE-GAS SINGLE STAGE	+	A	1	1	1	1	1	1
11	45486-001	MANIFOLD-50K/45K		A	1					
11	45486-002	MANIFOLD-75K/67K		A		1	1			
11	45486-003	MANIFOLD100K/9OK		A				1	1	
11	45486-004	MANIFOLD125K/112K		A						1
17	39030B009	ORIFICE #44	+	A	2	3	3	4	4	5
19	44745-001	SENSOR-FLAME	+	A	1	1	1	1	1	1
26	44744-002	IGNITER-HOT SURFACE	+	A	1	1	1	1	1	1
34	39271B001	BURNER		A	2	3	3	4	4	5
38	HTEX301	ARM-90% HT EXCHANGER 50K		A	1					
38	HTEX302	ARM-90% HT EXCHANGER 75K		A		1	1			
38	HTEX303	ARM-90% HT EXCHANGER 100K		A				1	1	
38	HTEX304	ARM-90% HT EXCHANGER 125K		A						1
39	40091B001	COIL-SECONDARY HT EXCH		A	1					
39	40093B001	COIL-SECONDARY HT EXCH		A						1
39	45181-001	COIL-SECONDARY HT EXCH		A		1	1			
39	45485-001	COIL-SECONDARY HT EXCH		A				1	1	
52	46105-001	CONTROL-LIMIT VIOLET	+	A		1	1			
52	46105-004	CONTROL-LIMIT GREEN	+	A	1			1		
52	46105-006	CONTROL-LIMIT RED	+	A					1	
52	46105-016	CONTROL-LIMIT PINK/WHITE	+	A						1
55	37520B013	SWITCH-ROLLOUT PINK 250	+	A	1	1	1	1	1	1
59	45695-003	SWITCH-PRESS BROWN .60	+	A	1			1	1	
59	45695-004	SWITCH-PRESS GREEN .70	+	A		1	1			1
61	45610-001	ASSY-SWITCH BRACKET		A	1	1	1	1	1	1
63	45037-001	BLOWER-INDUCED DRAFT	+	A	1	1	1	1	1	1
64	40086B001	ORIFICE (GRAY) .81	+	A		1	1			
64	40086B001	ORIFICE (BLACK) 1.10	+	A						1
64	40086B001	ORIFICE (YELLOW) 1.00	+	A				1	1	
64	40086B001	ORIFICE (GREEN) .72	+	A	1					
65	36733B004	GASKET-I.D. BLOWER	+	A	1	1	1	1	1	1

G1D93BU-1 (cont)

REVISED
11-04-03

TO SELECT PART #

Last letter of the Model # is the Service Level.

G1D93BU112D20D-1**A**

First find Model #.---------->

G1D93BU112D20D-1**(*)**

Then match Service Level for desired part.------>

REF	PART #	PART DESCRIPTION	REC STOCKING PART	SERVICE LEVEL = *	G1D93BU045D12B-1(*)	G1D93BU067D12B-1(*)	G1D93BU067D16C-1(*)	G1D93BU090D16C-1(*)	G1D93BU090D20C-1(*)	G1D93BU112D20D-1(*)
69	44626-001	MOTOR 1/3 HP, 1 PHASE	+	A	1	1				
69	44628-001	MOTOR 3/4 HP, 1 PHASE	+	A			1	1		
69	45480-001	MOTOR 0.9 HP, 1 PHASE	+	A					1	1
71	07407B000	BAND-MOTOR MOUNTING		A	1	1				
71	38180C001	BAND-MOTOR MOUNTING		A			1	1	1	1
72	07408B003	ARM-MOTOR MOUNTING		A	3	3				
72	07408B008	ARM-MOTOR MOUNTING		A			4	4	4	4
73	02592A003	WHEEL-BLOWER		A	1	1				
73	02592A024	WHEEL-BLOWER		A			1	1	1	1
74	45557-002	ASSY-BLOWER HOUSING		A	1	1				
74	45557-003	ASSY-BLOWER HOUSING		A			1	1	1	1
75	40170B003	RAIL-BLOWER (1) NARROW		A	2	2	2	2	2	2
86	39232D004	CAPACITOR 7.5 MFD@370V	+	A	1	1				
86	39232D008	CAPACITOR-RUN 12.5	+	A			1	1		
86	39232D028	CAPACITOR-RUN 20 MFD	+	A					1	1
90	45140-001	ELBOW-PLASTIC		A	2	2	2	2	2	2
94	45035-001	BOOT-FOR TRAP W/PORT		A	1	1	1	1	1	1
127	06131B022	FILTER 24.63 X 15.63 X .50	+	A	1	1	1	1	1	1
130	45198-005	LABEL-WIRING DIAGRAM		A	1	1	1	1	1	1
180	40095B001	BOX-HEADER PLASTIC		A	1	1	1			
180	40096B001	BOX-HEADER PLASTIC		A						1
180	45665-001	BOX-HEADER PLASTIC		A				1	1	
181	42381-002	HDRBX GSKT - 3/4 BRNR		A						1
181	42381-003	GASKET-HEADER BOX		A	1	1	1			
181	42381-004	HDRBOX GSKT		A				1	1	
980	45360-007	DOOR-ARM BLO COM 17.5		A	1	1				
980	45360-008	DOOR-ARM BLO COM 21.0		A			1	1	1	
980	45360-009	DOOR-ARM BLO COM 24.5		A						1
981	45361-001	DOOR-ARM U/F 90 BURNER		A	1	1				
981	45361-002	DOOR-ARM U/F 90 BURNER		A			1	1	1	
981	45361-003	DOOR-ARM U/F 90 BURNER		A						1

G1D93BU-1 (cont)

REVISED
11-04-03

TO SELECT PART #

Last letter of the Model # is the Service Level.

G1D93BU112D20D-1**A**

First find Model #.---------->

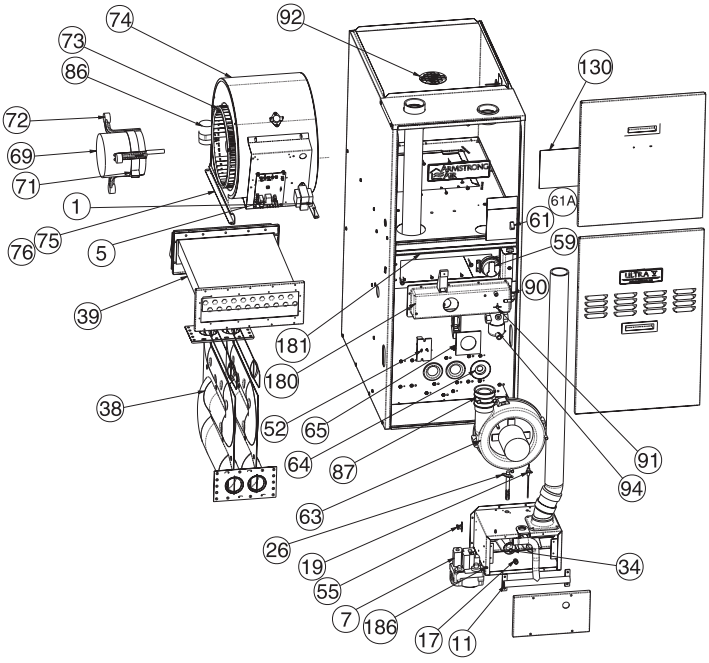
G1D93BU112D20D-1**(*)**

Then match Service Level for desired part.------>

REF	PART #	PART DESCRIPTION	REC STOCKING PART	SERVICE LEVEL = *	G1D93BU045D12B-1(*)	G1D93BU067D12B-1(*)	G1D93BU067D16C-1(*)	G1D93BU090D16C-1(*)	G1D93BU090D20C-1(*)	G1D93BU112D20D-1(*)
984	45556-007	ASSY-BLOWER		A		1				
984	45556-008	ASSY-BLOWER		A			1	1		
984	45556-009	ASSY-BLOWER		A					1	1
984	45556-024	ASSY-BLOWER		A	1					

G1D93A/BC-1

Exploded View



The numbers in the drawing refer to reference numbers provided in the following parts lists.

G1D93AC-1

REVISED
7-11-00

TO SELECT PART #

Last letter of the Model # is the Service Level.

G1D93AC112D20D-1**A**

First find Model #.---------->

G1D93AC112D20D-1**(*)**

Then match Service Level for desired part.------>

REF	PART #	PART DESCRIPTION	REC STOCKING PART	SERVICE LEVEL = *	G1D93AC045D12B-1(*)	G1D93AC067D12B-1(*)	G1D93AC067D16C-1(*)	G1D93AC090D16C-1(*)	G1D93AC090D20C-1(*)	G1D93AC112D20D-1(*)
1	38491B001	TRANSFORMER	+	A	1	1	1	1	1	1
5	45692-001	BLOWER CONTROL	+	A	1	1	1	1	1	1
5	45922-001	5 AMP FUSE-BLOWER CONTROL	+	A	1	1	1	1	1	1
7	45390-001	VALVE-GAS	+	A	1	1	1	1	1	1
11	45173-002	MANIFOLD		A	1					
11	45173-004	MANIFOLD		A				1	1	
11	45173-005	MANIFOLD		A						1
11	45486-002	MANIFOLD		A		1	1			
17	39030B009	ORIFICE #44 NATURAL GAS		A	2	3	3	3	4	4
19	44745-001	SENSOR-FLAME	+	A	1	1	1	1	1	1
26	44744-002	IGNITER-HOT SURFACE	+	A	1	1	1	1	1	1
34	39271B001	BURNER-ENDSHOT		A	2	3	3	3	4	4
38	40654-001	HEAT EXCHANGER-PRIMARY		A	1					
38	40654-002	HEAT EXCHANGER-PRIMARY		A		1	1	1		
38	40654-003	HEAT EXCHANGER-PRIMARY		A					1	1
39	40091B001	HEAT EXCHANGER-SECONDARY		A	1					
39	40092B001	HEAT EXCHANGER-SECONDARY		A		1	1	1		
39	40093B001	HEAT EXCHANGER-SECONDARY		A					1	1
52	40154B001	SWITCH-LIMIT 150°F/120°F	+	A	1	1				
52	40154B002	SWITCH-LIMIT 160°F/130°F	+	A			1			
52	40154B004	SWITCH-LIMIT 170°F/140°F	+	A				1		
52	40154B006	SWITCH-LIMIT 180°F/150°F	+	A					1	
52	40154B007	SWITCH-LIMIT 190°F/160°F	+	A						1
55	37520B014	SWITCH-FLAME ROLLOUT	+	A	1	1	1	1	1	1
59	45696-001	SWITCH-PRESSURE -.60"		A	1			1	1	
59	45696-002	SWITCH-PRESSURE -.70"		A		1	1			1
61	45610-001	SWITCH-INTERLOCK	+	A	1	1	1	1	1	1
61A	43602-001	SWITCH-INTERLOCK	+	A	1	1	1	1	1	1
63	45037-001	BLOWER-INDUCED DRAFT	+	A	1	1	1	1	1	1
64	40086B001	ORIFICE-I.D. BLOWER GRAY		A		1	1			
64	40086B003	ORIFICE-I.D. BLOWER BLACK		A						1
64	40086B006	ORIFICE-I.D. BLOWER YELLOW		A				1	1	
64	40086B007	ORIFICE-I.D. BLOWER GREEN		A	1					

G1D93AC-1 (cont)

REVISED
7-11-00

TO SELECT PART #

Last letter of the Model # is the Service Level.

G1D93AC112D20D-1**A**

First find Model #.---------->

G1D93AC112D20D-1**(*)**

Then match Service Level for desired part.------>

REF	PART #	PART DESCRIPTION	REC STOCKING PART	SERVICE LEVEL = *	G1D93AC045D12B-1(*)	G1D93AC067D12B-1(*)	G1D93AC067D16C-1(*)	G1D93AC090D16C-1(*)	G1D93AC090D20C-1(*)	G1D93AC112D20D-1(*)
65	36733B004	GASKET-I.D. BLOWER	+	A	1	1	1	1	1	1
69	44627-002	MOTOR 1/3 HP	+	A	1	1				
69	44628-001	MOTOR 3/4 HP	+	A			1	1		
69	45480-001	MOTOR .90 HP	+	A					1	1
71	07407B000	BAND-MOTOR MOUNTING		A	1	1				
71	38180C001	BAND-MOTOR MOUNTING		A			1	1	1	1
72	07408B003	ARM-MOTOR MOUNTING		A	3	3				
72	07408B008	ARM-MOTOR MOUNTING		A			4	4	4	4
73	02592A003	WHEEL-BLOWER 10 x 8		A	1	1				
73	02592A024	WHEEL-BLOWER 12 x 10		A			1	1	1	1
74	45557-007	HOUSING-BLOWER		A	1	1				
74	45557-008	HOUSING-BLOWER		A			1	1	1	1
75	40170B003	RAIL-RIGHT BLOWER		A	1	1	1	1	1	1
76	40170B003	RAIL-LEFT BLOWER		A	1	1	1	1	1	1
86	39232D004	CAPACITOR 7.5 MFD@370V	+	A	1	1				
86	39232D008	CAPACITOR 12.5 MFD@370V	+	A			1	1		
86	39232D028	CAPACITOR 20 MFD@370V	+	A					1	1
87	45217-001	ADAPTER-CONDENSATE COLLAR	+	A	1	1	1	1	1	1
90	45140-001	ELBOW-PLASTIC	+	A	1	1	1	1	1	1
91	39358B001	TEE-PLASTIC	+	A	1	1	1	1	1	1
92	37648B002	SCREEN 3"		A	1	1	1	1	1	1
94	45035-001	TRAP-BOOT W/PORT	+	A	1	1	1	1	1	1
130	45198-003	LABEL-WIRING DIAGRAM		A	1	1	1	1	1	1
180	40095B001	BOX-HEADER		A	1	1	1			
180	40096B001	BOX-HEADER		A						1
180	45665-001	BOX-HEADER		A				1	1	
181	42381-002	GASKET-HEADER BOX	+	A						1
181	42381-003	GASKET-HEADER BOX	+	A	1	1	1			
181	42381-004	GASKET-HEADER BOX	+	A				1	1	
186	39363B001	FITTING-BRASS BARBED VENT	+	A	1	1	1	1	1	1

G1D93BC-1

REVISED
11-04-03

TO SELECT PART #

Last letter of the Model # is the Service Level.

G1D93BC112D20D-1**A**

First find Model #.---------->

G1D93BC112D20D-1**(*)**

Then match Service Level for desired part.------>

REF	PART #	PART DESCRIPTION	REC STOCKING PART	SERVICE LEVEL = *	G1D93BC045D12B-1(*)	G1D93BC067D12B-1(*)	G1D93BC067D16C-1(*)	G1D93BC090D16C-1(*)	G1D93BC090D20C-1(*)	G1D93BC112D20D-1(*)
1	43211-001	TRANSFORMER	+	A	1	1	1	1	1	1
5	47582-001	CONTROL-IGNITION	+	A	1	1	1	1	1	1
7	47484-002	VALVE-GAS	+	A	1	1	1	1	1	1
11	45173-002	MANIFOLD-45K/50K		A	1					
11	45173-003	MANIFOLD-67K/75K		A			1			
11	45173-004	MANIFOLD-90K/100K		A				1	1	
11	45173-005	MANIFOLD-112K/125K		A						1
11	45486-005	MANIFOLD-75K/67K		A		1				
17	39030B009	ORIFICE #44	+	A	2	3	3	4	4	5
19	44745-001	SENSOR-FLAME	+	A	1	1	1	1	1	1
26	44744-002	IGNITER-HOT SURFACE	+	A	1	1	1	1	1	1
34	39271B001	BURNER		A	2	3	3	4	4	5
38	HTEX301	ARM-90% HT EXCHANGER 50K		A	1					
38	HTEX302	ARM-90% HT EXCHANGER 75K		A		1	1			
38	HTEX303	ARM-90% HT EXCHANGER 100K		A				1	1	
38	HTEX304	ARM-90% HT EXCHANGER 125K		A						1
39	40091B001	COIL-SECONDARY HT EXCH		A	1					
39	40093B001	COIL-SECONDARY HT EXCH		A						1
39	45181-001	COIL-SECONDARY HT EXCH		A		1	1			
39	45485-0011	COIL-SECONDARY HT EXCH		A				1	1	
52	46105-001	CONTROL-LIMIT VIOLET	+	A	1	1				
52	46105-002	CONTROL-LIMIT ORANGE	+	A			1	1		
52	46105-006	CONTROL-LIMIT RED	+	A					1	
52	46105-007	CONTROL-LIMIT PINK	+	A						1
55	37520B013	SWITCH-ROLLOUT PINK 250	+	A	1	1	1	1	1	1
59	45696-001	SWITCH-PRESS GRAY .60	+	A	1			1	1	
59	45696-002	SWITCH-PRESS ORANGE .70	+	A		1	1			1
61	45610-001	ASSY-SWITCH BRACKET		A	1	1	1	1	1	1
63	45037-001	BLOWER-INDUCED DRAFT	+	A	1	1	1	1	1	1
64	40086B001	ORIFICE (GRAY) .81	+	A		1	1			
64	40086B003	ORIFICE (BLACK) 1.10	+	A						1
64	40086B006	ORIFICE (YELLOW) 1.00	+	A				1	1	
64	40086B007	ORIFICE (GREEN) .72	+	A	1					

G1D93BC-1 (cont)

REVISED
11-04-03

TO SELECT PART #

Last letter of the Model # is the Service Level.

G1D93BC112D20D-1**A**

First find Model #.---------->

G1D93BC112D20D-1**(*)**

Then match Service Level for desired part.------>

REF	PART #	PART DESCRIPTION	REC STOCKING PART	SERVICE LEVEL = *	G1D93BC045D12B-1(*)	G1D93BC067D12B-1(*)	G1D93BC067D16C-1(*)	G1D93BC090D16C-1(*)	G1D93BC090D20C-1(*)	G1D93BC112D20D-1(*)
65	36733B004	GASKET-I.D. BLOWER	+	A	1	1	1	1	1	1
69	44627-001	MOTOR-1/3 HP, 1 PHASE	+	A	1	1				
69	44628-001	MOTOR-3/4 HP, 1 PHASE	+	A			1	1		
69	45480-001	MOTOR-0.9 HP, 1 PHASE	+	A					1	1
71	07407B000	BAND-MOTOR MOUNTING		A	1	1				
71	38180C001	BAND-MOTOR MOUNTING		A			1	1	1	1
72	07408B003	ARM-MOTOR MOUNTING		A	3	3				
72	07408B008	ARM-MOTOR MOUNTING		A			4	4	4	4
73	02592A003	WHEEL-BLOWER		A	1	1				
73	02592A024	WHEEL-BLOWER		A			1	1	1	1
74	45557-007	ASSY-BLOWER HOUSING		A	1	1				
74	45557-008	ASSY-BLOWER HOUSING		A			1	1	1	1
75	40170B003	RAIL-BLOWER (1) NARROW		A	2	2	2	2	2	2
86	39232D004	CAPACITOR 7.5 MFD@370V	+	A	1	1				
86	39232D008	CAPACITOR 12.5 MFD@370V	+	A			1	1		
86	39232D028	CAPACITOR 20 MFD@370V	+	A					1	1
90	45140-001	ELBOW-PLASTIC		A	2	2	2	2	2	2
94	45035-001	BOOT-FOR TRAP W/PORT		A	1	1	1	1	1	1
130	45198-005	LABEL-WIRING DIAGRAM		A	1	1	1	1	1	1
180	40095B001	BOX-HEADER PLASTIC		A	1	1	1			
180	40096B001	BOX-HEADER PLASTIC		A						1
180	45665-001	BOX-HEADER PLASTIC		A				1	1	
181	42381-002	GASKET-HEADER BOX		A						1
181	42381-003	GASKET-HEADER BOX		A	1	1	1			
181	42381-004	GASKET-HEADER BOX		A				1	1	
981	45361-004	DOOR-ARM C/F 90 BURNER		A	1	1				
981	45361-005	DOOR-ARM C/F 90 BURNER		A			1	1		
981	45361-006	DOOR-ARM C/F 90 BURNER		A					1	1
984	45556-010	ASSY-BLOWER		A	1	1				
984	45556-011	ASSY-BLOWER		A			1	1		
984	45556-012	ASSY-BLOWER		A					1	1

A.A.C.
421 Monroe Street • Bellevue, OH 44811