

1997 Piston Guide



**For
Residential
Split-Systems**



®



®

**This information is the
latest from
Bryant / Day & Night.
The correct Piston
is printed on
every Split-System rating
plate produced since
January 1989.**

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INTRODUCTION TO PISTON TYPE REFRIGERANT METERING DEVICE

The piston refrigerant metering device is a fixed orifice, easily removable with a 3/8" male flare liquid line feed connection.

Proper application of the piston provides metering flow control to the evaporator or indoor coil which is superior to a comparable capillary tube fed coil. Pistons are easily serviced and can be field changed to allow optimum performance.

The heat pump requires that the piston incorporate bypass or reverse flow characteristics. The piston eliminates the check valves in the heat pump circuitry and it allows easy piston change. It is no longer necessary to change the complete device. Figure 1 shows a typical piston in a metering and bypass position.

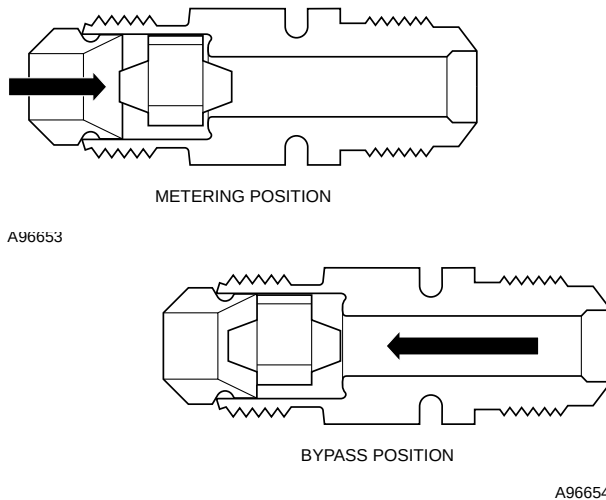


Fig. 1 — Piston Positions

Note that pistons are included in liquid service valves or liquid distributor inside unit on all heat pumps. Pistons can be used on cooling only as well as heat pump coils and for this reason, most coils and fan coils have a piston.

TABLE 1
ORDERING NUMBERS FOR
BRYANT/DAY & NIGHT CHECK-FLO-RATER® PISTON

The following is a guide to Check-Flo-Rater® piston I.D. numbers, orifice diameters, and service parts ordering numbers:

Piston I.D. Number	Orifice Diameter	Service Parts 10-Pack Number
35	.0350	EA52PH035
38	.0380	EA52PH038
40	.0400	EA52PH040
42	.0420	EA52PH042
46	.0469	EA52PH046
49	.0492	EA52PH049
52	.0520	EA52PH052
55	.0550	EA52PH055
57	.0571	EA52PH057
59	.0595	EA52PH059
61	.0610	EA52PH061
63	.0635	EA52PH063
65	.0650	EA52PH065
67	.0670	EA52PH067
70	.0700	EA52PH070
73	.0730	EA52PH073
76	.0760	EA52PH076
78	.0781	EA52PH078
80	.0807	EA52PH080
82	.0820	EA52PH082
84	.0846	EA52PH084
86	.0860	EA52PH086
88	.0886	EA52PH088
90	.0905	EA52PH090
93	.0938	EA52PH093
96	.0960	EA52PH096
98	.0980	EA52PH098
101	.1015	EA52PH101
104	.1040	EA52PH104
109	.1090	EA52PH109

Also available from your Bryant/Day & Night distributor service parts center are the Check-Flo-Rater® retainer and 'O' Ring under part no. 99CC409892.

COOLING CHARGING PROCEDURE

For charging units with non-TXV metering devices, superheat is the guide. For units with a TXV, subcooling is the guide. Both procedures are used in the cooling mode. Superheat and subcooling training materials are available from your distributor. These training materials also include information pertaining to cooling airflow range which can be used for an estimation in cooling airflow.

SUPERHEAT CHARGING METHOD

To check and adjust charge during cooling season, use Tables 2 and 3 and the following procedure:

1. Operate unit a minimum of fifteen (15) minutes before checking charge.
2. Measure vapor pressure by attaching a gage to vapor valve service port.
3. Measure vapor line temperature by attaching an accurate thermistor type or electronic thermometer to unit vapor line near vapor valve. Heat pumps require that the temperature to be measured between the accumulator and compressor. Insulate thermometer for accurate readings.
4. Measure outdoor coil inlet air dry-bulb temperature with a second thermometer.
5. Measure indoor coil inlet air wet-bulb temperature with a sling psychrometer.
6. Refer to Table 2. Find air temperature entering outdoor coil and wet-bulb temperature entering indoor coil. At this intersection, note the superheat.
7. Refer to Table 3. Find superheat temperature and vapor pressure, and note vapor line temperature.
8. If unit has higher vapor line temperature than charted temperature, add refrigerant until charted temperature is reached.
9. If unit has lower vapor line temperature than charted temperature, bleed refrigerant until charted temperature is reached.
10. If air temperature entering outdoor coil or pressure at vapor valve changes, charge to new vapor line temperature indicated on chart.

TABLE 2 — SUPERHEAT CHARGING TABLE (°F)

Outdoor Temp (°F)	Indoor Coil Entering Air (°F) WB															
	50	52	54	56	58	60	62	64	66	68	70	72	74	76		
55	9	12	14	17	20	23	26	29	32	35	37	40	42	45		
60	7	10	12	15	18	21	24	27	30	33	35	38	40	43		
65	—	6	10	13	16	19	21	24	27	30	33	36	38	41		
70	—	—	7	10	13	16	19	21	24	27	30	33	36	39		
75	—	—	—	6	9	12	15	18	21	24	28	31	34	37		
80	—	—	—	—	5	8	12	15	18	21	25	28	31	35		
85	—	—	—	—	—	—	8	11	15	19	22	26	30	33		
90	—	—	—	—	—	—	5	9	13	16	20	24	27	31		
95	—	—	—	—	—	—	—	6	10	14	18	22	25	29		
100	—	—	—	—	—	—	—	—	8	12	15	20	23	27		
105	—	—	—	—	—	—	—	—	5	9	13	17	22	26		
110	—	—	—	—	—	—	—	—	—	6	11	15	20	25		
115	—	—	—	—	—	—	—	—	—	—	8	14	18	23		

— Do not attempt to charge system under these conditions or refrigerant slugging may occur. Charge must be weighed in under these conditions.

TABLE 3 — REQUIRED VAPOR TEMPERATURE (°F)

Superheat Temp (°F)	Vapor Pressure at Service Port (psig)								
	61.5	64.2	67.1	70.0	73.0	76.0	79.2	82.4	85.7
0	35	37	39	41	43	45	47	49	51
2	37	39	41	43	45	47	49	51	53
4	39	41	43	45	47	49	51	53	55
6	41	43	45	47	49	51	53	55	57
8	43	45	47	49	51	53	55	57	59
10	45	47	49	51	53	55	57	59	61
12	47	49	51	53	55	57	59	61	63
14	49	51	53	55	57	59	61	63	65
16	51	53	55	57	59	61	63	65	67
18	53	55	57	59	61	63	65	67	69
20	55	57	59	61	63	65	67	69	71
22	57	59	61	63	65	67	69	71	73
24	59	61	63	65	67	69	71	73	75
26	61	63	65	67	69	71	73	75	77
28	63	65	67	69	71	73	75	77	79
30	65	67	69	71	73	75	77	79	81
32	67	69	71	73	75	77	79	81	83
34	69	71	73	75	77	79	81	83	85
36	71	73	75	77	79	81	83	85	87
38	73	75	77	79	81	83	85	87	89
40	75	77	79	81	83	85	87	89	91

SUBCOOLING CHARGING METHOD

1. Operate unit a minimum of fifteen (15) minutes before checking the charge (cooling mode).
2. Measure liquid service valve pressure by attaching an accurate gage to the liquid service port.
3. Measure the liquid line temperature by attaching an accurate thermistor type or electronic thermometer to the liquid line near the outdoor coil.
4. Refer to unit rating plate or service manual to find required subcooling temperature using Table 4. Find the point the required subcooling temperature intersects the measured liquid service valve pressure.
5. To obtain the required subcooling temperature at a specific liquid line pressure, add refrigerant if liquid line temperature is higher than indicated or remove refrigerant if temperature is lower. Allow a tolerance of $\pm 3^{\circ}\text{F}$.

**TABLE 4 — REQUIRED LIQUID LINE
TEMPERATURE ($^{\circ}\text{F}$)**

Pressure (PSIG) at Service Fitting	Required Subcooling Temperature ($^{\circ}\text{F}$)					
	0	5	10	15	20	25
134	76	71	66	61	56	51
141	79	74	69	64	59	54
148	82	77	72	67	62	57
156	85	80	75	70	65	60
163	88	83	78	73	68	63
171	91	86	81	76	71	66
179	94	89	84	79	74	69
187	97	92	87	82	77	72
196	100	95	90	85	80	75
205	103	98	93	88	83	78
214	106	101	96	91	86	81
223	109	104	99	94	89	84
233	112	107	102	97	92	87
243	115	110	105	100	95	90
253	118	113	108	103	98	93
264	121	116	111	106	101	96
274	124	119	114	109	104	99
285	127	122	117	112	107	102
297	130	125	120	115	110	105
309	133	128	123	118	113	108
321	136	131	126	121	116	111
331	139	134	129	124	119	114
346	142	137	132	127	122	117
359	145	140	135	130	125	120

HEATING CHARGING PROCEDURE

In order to accurately charge a heat pump in the heating mode, the charge must be weighed in as indicated on unit rating plate. Remove any refrigerant remaining in system before recharging. If the system has lost complete charge, evacuate and recharge by weight. The Heating Check Charts in the unit Installation Instructions are for reference only.

SPLIT-SYSTEM INTRODUCTION

The most important fact to remember is the correct indoor (cooling) piston is shipped with the outdoor unit. The shipped piston is correct for any approved coil combination. Consult pre-sale literature for approved coil combinations. The required outdoor (heating) piston is always factory installed in the liquid valve or liquid distributor and no change is required. Always check outdoor piston for proper sizing.

For interconnecting tubing lengths greater than fifty (50) ft, consult your distributor for long-line information. The following tables show the correct piston(s) for any current split-system product.

The following listing also includes metering devices required when a piston is not used, such as “EXV” and “TXV” assemblies.

SPLIT-SYSTEM AIR CONDITIONERS

Model Number	Indoor Piston
550A024-A	61
550A030-A	63
550A036-A	70
550A042-A	73
550A048-A	78
550A060-A	90
550A060-B	90
561A018-A	52
561A018-B	52
561A018-C	52
561A018-E	49
561A024-A	59
561A024-B	59
561A024-C	57
561A024-D	59
561A024-E	57
561A030-A	67
561A030-B	67
561A030-C	65
561A030-D	63
561A036-A	70
561A036-B	70
561A036-C	73
561A036-D	73
561A036-E	70
561A042-A	78
561A042-C	80
561A042-D	76
561A042-E	82
561A048-B	84
561A048-D	84
561A048-E	88
561A048-F	82
561A048-G	84
561A060-B	90
561A060-D	90
561A060-E	93
561A060-F	93
561A060-G	90
561A060-H	93
561A060-J	90
561C018-B	52
561C018-C	52
561C024-A	57
561C024-B	57
561C024-C	57
561C030-A	67
561C030-B	65
561C030-C	65
561C036-A	73
561C036-B	70
561C036-C	70
561C036-D	73
561C042-A	76

SPLIT-SYSTEM AIR CONDITIONERS continued

Model Number	Indoor Piston
561C042-B	82
561C048-A	82
561C048-B	84
561C060-A	93
561C060-B	90
561C060-C	93
561C060-D	90
561M024-C	57
561M024-D	59
561M024-E	57
561M030-A	67
561M030-C	65
561M030-D	63
561M036-D	73
561M036-E	70
561M042-D	76
561M042-E	82
561M048-F	82
561M048-G	84
561N024-A	57
561N024-B	57
561N024-C	57
561N030-A	67
561N030-B	65
561N030-C	65
561N036-A	73
561N036-B	70
561N036-C	70
561N036-D	73
561N042-A	76
561N042-B	82
561N048-A	82
561N048-B	84
561W018-A	52
561W024-A	57
561W030-A	67
561W036-A	70
561W042-A	82
561W042-B	76
561W048-A	82
561W060-A	93
562A018-A	57
562A024-A	61
562A030-A	70
562A036-A	76
562A036-B	76
562A042-A	80
562A042-B	80
562A048-A	88
562A048-B	88
562A060-A	101
562A060-B	98

SPLIT-SYSTEM AIR CONDITIONERS continued

Model Number		Indoor Piston
	562C018-A	57
	562C024-A	61
	562C030-A	70
	562C036-A	76
	562C036-B	76
	562C042-A	80
	562C042-B	80
	562C048-A	88
	562C048-B	88
	562C060-A	98
	562C060-B	101
	563A024-A	61
	563A030-A	70
	563A036-A	76
	563A036-B	73
	563A042-A	82
	563A042-B	84
	563A048-A	90
	563A048-B	90
	563A048-C	90
	563A060-A	104
	563A060-B	104
	563A060-C	104
	563C024-A	61
	563C024-B	61
	563C030-A	70
	563C030-B	70
	563C036-A	73
	563C036-B	76
	563C036-C	73
	563C042-A	84
	563C042-B	82
	563C042-C	82
	563C048-A	90
	563C048-B	90
50 H E R T Z	563C048-C	90
	563C060-A	104
	563C060-B	104
	563C060-C	104
	590A020-A	49
	590A025-A	63
	590A030-A	63
	590A035-A	70
	590A040-B	80
	590A050-A	80
	590A060-B	93
	593C018-A	55
	593C018-B	55
	593C024-A	57
	593C024-B	57
	593C030-A	67
	593C030-B	67
	593C036-B	73

SPLIT-SYSTEM AIR CONDITIONERS continued

Model Number	Indoor Piston
593C036-C	73
593C042-A	78
593C042-B	78
593C048-A	82
593C048-B	82
593C048-C	82
593C060-A	98
593C060-B	96
593C060-C	96
594D018-A	55
594D018-B	55
594D024-A	59
594D024-B	59
594D030-A	63
594D030-B	67
594D036-A	73
594D036-B	73
594D042-A	78
594D042-B	78
594D048-A	84
594D048-B	93
594D060-A	93
594D060-B	93
597C018-A	55
597C018-B	55
597C024-B	61
597C024-C	61
597C030-B	67
597C030-C	67
597C036-B	76
597C036-C	76
597C036-D	76
597C042-B	84
597C042-C	84
597C042-D	82
597C048-B	90
597C048-C	90
597C048-D	90
597C060-B	101
597C060-C	104
597C060-D	101
598A036-C	EA36EC362
598A048-C	EA36EC362
598A060-C	EA36EC362
598W036-A	EA36EC362

SPLIT-SYSTEM HEAT PUMPS

Model Number	Indoor Piston	Outdoor Piston
661B018-D	52	40
661B018-E	55	40
661B024-A	57	46
661B024-D	65	46
661B024-E	61	46
661B024-F	63	49
661B024-G	63	49
661B030-A	70	52
661B030-D	73	52
661B030-E	73	52
661B030-F	70	52
661B030-G	67	55
661B030-H	70	55
661B036-A	78	59
661B036-D	80	59
661B036-E	78	59
661B036-F	78	59
661B036-G	76	61
661B036-H	73	59
661B042-A	84	63
661B042-C	84	67
661B042-D	84	65
661B048-A	88	67
661B048-C	88	73
661B048-D	88	73
661B060-A	101	70
661B060-C	96	76
661B060-D	96	76
661C018-A	52	40
661C018-B	55	40
661C024-A	63	49
661C024-B	63	49
661C030-A	70	55
661C030-B	67	55
661C036-A	76	61
661C036-B	73	59
661C042-A	84	67
661C042-B	84	65
661C048-A	88	73
661C048-B	88	73
661C060-A	96	76
661C060-B	96	76
661N024-D	65	46
661N024-E	61	46
661N024-F	63	49
661N024-G	63	49
661N030-D	73	52
661N030-E	73	52
661N030-F	70	52
661N030-G	67	55
661N030-H	70	55
661N036-D	80	59
661N036-E	78	59

SPLIT-SYSTEM HEAT PUMPS continued

Model Number	Indoor Piston	Outdoor Piston
661N036-G	76	61
661N036-H	73	59
661N042-A	84	63
661N042-C	84	67
661N042-D	84	65
661N048-A	88	67
661N048-C	88	73
661N048-D	88	73
661P024-A	63	49
661P024-B	63	49
661P030-A	70	55
661P030-B	67	55
661P036-A	76	61
661P036-B	73	59
661P042-A	84	67
661P042-B	84	65
661P048-A	88	73
661P048-B	88	73
661W018-A	55	40
661W024-A	63	49
661W030-A	70	55
661W036-A	76	61
661W042-A	84	67
661W048-A	88	73
661W060-A	96	76
662A018-A	57	43
662A024-A	61	52
662A030-A	67	55
662A036-A	76	63
662A042-A	82	65
662A048-A	90	73
662A060-A	EA36EC355	78
662C018-A	57	43
662C024-A	61	52
662C030-A	67	55
662C036-A	76	63
662C042-A	82	65
662C048-B	90	73
662C060-B	101	78
663A018-A	EA36EC350	43
663A024-A	EA36EC351	52
663A030-A	EA36EC352	55
663A036-A	EA36EC353	63
663A042-A	EA36EC353	65
663A048-A	EA36EC354	73
663A060-A	EA36EC355	78
663C018-A	EA36EC350	43
663C024-A	EA36EC351	52
663C030-A	EA36EC352	55
663C036-A	EA36EC353	63
663C042-A	EA36EC353	65
663C048-A	EA36EC354	73
663C060-B	EA36EC355	78

SPLIT-SYSTEM HEAT PUMPS continued

	Model Number	Indoor Piston	Outdoor Piston
50 THERM-Z	690A030-B	67	55
	690A035-B	70	59
	690A040-C	76	63
	690A050-B	82	73
	690A060-C	93	76
	693C018-C	55	42
	693C024-B	61	49
	693C030-B	70	59
	693C036-B	78	61
	693C042-B	82	63
	693C048-B	88	70
	693C060-B	98	78
	693D018-A	55	42
	693D024-A	65	46
	693D030-A	70	52
	693D036-A	76	61
	693D042-A	80	63
	693D048-A	88	70
	693D060-A	98	78
	694C018-C	EA36EC350	42
	694C024-C	EA36EC351	49
	694C030-C	EA36EC352	52
	694C036-C	EA36EC353	59
	694C042-B	EA36EC353	63
	694C048-B	EA36EC354	70
	697B018-B	EA36EC350	42
	697B024-B	EA36EC351	49
	697B030-B	EA36EC352	52
	697B036-B	EA36EC353	59
	697B042-B	EA36EC353	63
	697B048-B	EA36EC354	70
	697B060-B	EA36EC355	73
	697C018-B	EA36EC350	42
	697C024-A	EA36EC351	49
	697C030-A	EA36EC352	52
	697C030-B	EA36EC352	52
	697C036-A	EA36EC353	59
	697C036-B	EA36EC353	59
	697C042-A	EA36EC353	63
	697C042-B	EA36EC353	63
	697C048-A	EA36EC354	70
	697C060-A	EA36EC355	73
	697H024-A	EA36EC351	EA36EC381
	697H030-A	EA36EC352	EA36EC381
	697H036-A	EA36EC353	EA36EC383
	697H042-A	EA36EC353	EA36EC384
	697H048-A	EA36EC354	EA36EC384
	698A036-B	EA36EC361	55
	698A048-B	EA36EC361	70
	698A060-B	EA36EC361	67

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