

Owner:	Date:
	Mueller® Dealer:
Phone:	Phone:
Email:	Email:

Milk Cooler Information

Size:	Model:	Milk Cooler Piping:	☐ Single Unit	☐ Dual Unit
Serial No.			☐ Triple Unit	☐ Quad Unit

Fre-Heater® Heat Recovery Device

Brand:	Size in Gallons:
Model:	Distance from Units (meters):
Refrigeration Inlet Line Size (cm OD):	Refrigeration Outlet Line Size (cm OD):

Condensing Unit(s) Information

Note: Viewed left (L) and right (R) from the rear of the cooler.

Horsepower (Bottom)	L:	R:	Horsepower (Sides)	L:	R:
Model (Bottom)	L:	R:	Model (Sides)	L:	R:
Serial No. (Bottom)	L:	R:	Serial No. (Sides)	L:	R:
Electrical Char. (Volt/Phase/Hertz)	L:	R:	Electrical Char. (Volt/Phase/Hertz)	L:	R:
Wire Size and Length (meters)	L:	R:	Wire Size and Length (meters)	L:	R:
Breaker Size (Ampere)	L:	R:	Breaker Size (Ampere)	L:	R:
Suction Line (Diameter–Length)	L:	R:	Suction Line (Diameter–Length)	L:	R:
Liquid Line (Diameter–Length)	L:	R:	Liquid Line (Diameter–Length)	L:	R:

Note: Attach a simple sketch of refrigerant piping showing number of fittings, riser lengths, and location of valves and filter-driers.

Condensing Unit(s) Location

Size of Vent (cm):	☐ Inside	☐ Outside
Type of Screen: ☐ Louvered ☐ Screened	Side of Building:	☐ North ☐ South ☐ East ☐ West
Exhaust Fan Size (cm):	Condenser Air Flow Direction:	☐ North ☐ South ☐ East ☐ West
Exhaust Fan CFM:		

Note: Attach a simple sketch of unit location.

Milking Information

Survey Taken On:	☐ First Milking ☐ Second Milking	Amount of Milk in Cooler (kg):
	☐ Third Milking ☐ Fourth Milking	Amount of Milk Added This Milking (kg):

Milk Cooler Thermometer Reading

Beginning of Survey (°C):	Time Milking Started:	☐ a.m. ☐ p.m.
End of Survey (°C):	Time Agitator Starts:	☐ a.m. ☐ p.m.
Peak Blend Temperature While Milk is Being Added (°C):	Time Compressor Starts:	☐ a.m. ☐ p.m.
Compressor Stops (°C):	Time Milking Stops:	☐ a.m. ☐ p.m.
Amount of Refrigerant Charge (kg):	Time Compressor Stops:	☐ a.m. ☐ p.m.
R-22 Checked by Weigh-In/Weigh-Out Method:		

☐ Yes ☐ No

R-22 Pressure Temperature Chart

psig	°C	psig	°C	psig	°C	psig	°C	psig	°C	psig	°C
0	-40.81	71	5.36	142	26.27	213	40.94	284	52.56	355	62.28
1	-39.39	72	5.73	143	26.51	214	41.11	285	52.72	356	62.39
2	-38.05	73	6.10	144	26.74	215	41.33	286	52.83	357	62.50
3	-36.77	74	6.47	145	26.98	216	41.50	287	53.00	358	62.61
4	-35.54	75	6.83	146	27.21	217	41.67	288	53.17	359	62.78
5	-34.36	76	7.19	147	27.44	218	41.83	289	53.28	360	62.89
6	-33.23	77	7.55	148	27.68	219	42.00	290	53.44	361	63.00
7	-32.14	78	7.90	149	27.91	220	42.22	291	53.56	362	63.11
8	-31.09	79	8.25	150	28.14	221	42.39	292	53.72	363	63.28
9	-30.07	80	8.60	151	28.37	222	42.56	293	53.89	364	63.39
10	-29.09	81	8.94	152	28.60	223	42.72	294	54.00	365	63.50
11	-28.14	82	9.29	153	28.83	224	42.89	295	54.17	366	63.61
12	-27.22	83	9.63	154	29.06	225	43.06	296	54.28	367	63.78
13	-26.32	84	9.97	155	29.28	226	43.28	297	54.44	368	63.89
14	-25.44	85	10.31	156	29.51	227	43.44	298	54.61	369	64.00
15	-24.59	86	10.64	157	29.73	228	43.61	299	54.72	370	64.11
16	-23.77	87	10.97	158	29.95	229	43.78	300	54.89	371	64.28
17	-22.96	88	11.29	159	30.17	230	43.94	301	55.00	372	64.39
18	-22.17	89	11.62	160	30.39	231	44.11	302	55.17	373	64.50
19	-21.41	90	11.94	161	30.61	232	44.28	303	55.28	374	64.61
20	-20.65	91	12.27	162	30.83	233	44.44	304	55.44	375	64.72
21	-19.92	92	12.58	163	31.05	234	44.61	305	55.61	376	64.89
22	-19.20	93	12.90	164	31.27	235	44.78	306	55.72	377	65.00
23	-18.49	94	13.21	165	31.48	236	44.94	307	55.89	378	65.11
24	-17.80	95	13.53	166	31.69	237	45.11	308	56.00	379	65.22
25	-17.13	96	13.83	167	31.91	238	45.28	309	56.17	380	65.33
26	-16.46	97	14.14	168	32.12	239	45.44	310	56.28	381	65.44
27	-15.81	98	14.45	169	32.34	240	45.61	311	56.44	382	65.61
28	-15.17	99	14.76	170	32.55	241	45.78	312	56.56	383	65.72
29	-14.54	100	15.06	171	32.76	242	45.94	313	56.72	384	65.83
30	-13.93	101	15.36	172	32.97	243	46.11	314	56.83	385	65.94
31	-13.32	102	15.66	173	33.18	244	46.28	315	57.00	386	66.06
32	-12.72	103	15.95	174	33.39	245	46.44	316	57.11	387	66.17
33	-12.13	104	16.24	175	33.59	246	46.61	317	57.28	388	66.28
34	-11.56	105	16.53	176	33.80	247	46.78	318	57.39	389	66.44
35	-10.99	106	16.83	177	34.01	248	46.94	319	57.56	390	66.56
36	-10.43	107	17.12	178	34.21	249	47.11	320	57.67	391	66.67
37	-9.87	108	17.40	179	34.42	250	47.28	321	57.78	392	66.78
38	-9.33	109	17.69	180	34.62	251	47.44	322	57.94	393	66.89
39	-8.79	110	17.97	181	34.82	252	47.61	323	58.06	394	67.00
40	-8.27	111	18.26	182	35.03	253	47.78	324	58.22	395	67.11
41	-7.74	112	18.53	183	35.23	254	47.94	325	58.33	396	67.22
42	-7.23	113	18.81	184	35.43	255	48.11	326	58.5	397	67.33
43	-6.72	114	19.09	185	35.63	256	48.22	327	58.61	398	67.50
44	-6.22	115	19.37	186	35.83	257	48.39	328	58.72	399	67.61
45	-5.73	116	19.64	187	36.03	258	48.56	329	58.89	400	67.72
46	-5.24	117	19.91	188	36.22	259	48.72	330	59.00	401	67.83
47	-4.76	118	20.18	189	36.42	260	48.89	331	59.17	402	67.94
48	-4.28	119	20.45	190	36.62	261	49.06	332	59.28	403	68.06
49	-3.81	120	20.72	191	36.81	262	49.22	333	59.39	404	68.17
50	-3.34	121	20.98	192	37.01	263	49.33	334	59.56	405	68.28
51	-2.88	122	21.25	193	37.20	264	49.50	335	59.67	406	68.39
52	-2.43	123	21.51	194	37.39	265	49.67	336	59.83	407	68.50
53	-1.98	124	21.77	195	37.59	266	49.83	337	59.94	408	68.61
54	-1.54	125	22.03	196	37.78	267	50.00	338	60.06	409	68.72
55	-1.10	126	22.29	197	37.94	268	50.11	339	60.22	410	68.83
56	-0.66	127	22.55	198	38.17	269	50.28	340	60.33	411	69.00
57	-0.23	128	22.81	199	38.33	270	50.44	341	60.44	412	69.11
58	0.19	129	23.06	200	38.56	271	50.61	342	60.61	413	69.22
59	0.61	130	23.32	201	38.72	272	50.72	343	60.72	414	69.33
60	1.03	131	23.57	202	38.94	273	50.89	344	60.83	415	69.44
61	1.44	132	23.82	203	39.11	274	51.06	345	61.00	416	69.56
62	1.85	133	24.07	204	39.28	275	51.22	346	61.11	417	69.67
63	2.26	134	24.32	205	39.50	276	51.33	347	61.22	418	69.78
64	2.66	135	24.57	206	39.67	277	51.50	348	61.39	419	69.89
65	3.06	136	24.81	207	39.83	278	51.67	349	61.5	420	70.00
66	3.44	137	25.06	208	40.06	279	51.78	350	61.61	421	70.11
67	3.83	138	25.30	209	40.22	280	51.94	351	61.78	422	70.22
68	4.22	139	25.54	210	40.39	281	52.11	352	61.89	423	70.33
69	4.61	140	25.79	211	40.61	282	52.28	353	62.00	424	70.44
70	4.98	141	26.03	212	40.78	283	52.39	354	62.11	425	70.56

REFRIGERANT CHARGE (R-22)			
Unit HP	Tri-Plate / Fre-Heater®	HPF Air-Cooled Units¹	E-Star® OHSE¹
3 HP	10.0 lbs/4.53 kg	11.5 lbs/5.22 kg	–
3 HP²	–	9.5 lbs/4.31 kg	–
3.5 OHSE	–	–	13.5 lbs/6.12 kg
4 HPF	12.0 lbs/5.44 kg	16.0 lbs/7.26 kg	–
5 HPF(S)	14.0 lbs/6.35 kg	19.0 lbs/8.62 kg	–
5 OHSE	–	–	15.0 lbs/6.80 kg
7.5 OHSE	–	–	30.0 lbs/13.6 kg
10 OHSE	–	–	34.0 lbs/15.8 kg

¹Refrigerant charge is the same with or without Model “D” Fre-Heater.

²Three horsepower units with small condenser (86.36 cm x 50.8 cm).

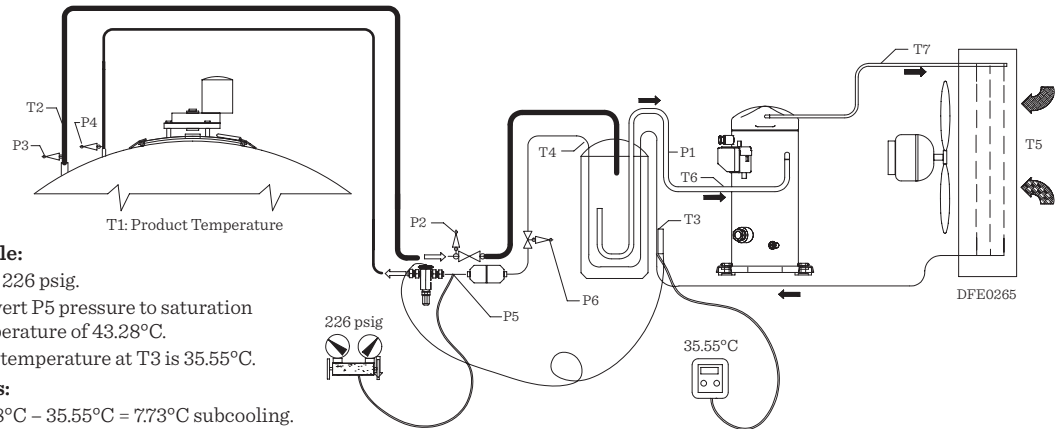
SUBCOOLING VALVE SELECTION (R-22)		
Unit HP	Part No.	Subcooling Valve No.
3 HPF	8822369	BS94541-OA
3.5 OHSE	8822369	BS94541-OA
4 HPF	8822369	BS94541-OA
5 HPF(S)	8822106	BS94555-OA
5 OHSE	8822106	BS94555-OA
7.5 OHSE	8823805	BS99067-**-78
10 OHSE	8824398	BS99067-**-67.8

(S) Denotes scroll compressor models.

MODEL OE REFRIGERANT VALVE CHART (R-22)		
Unit HP	Part No.	Expansion Valve No.
3 OE	8824490	AAE-3HC/FBVE-3-**
3.5 OESE	8824490	AAE-4HC/FBVE-3-**
4 OE	8824491	AAE-4HC/FBVE-4-**
5 OESE	8824492	AAE-5HC/FBVE-5-**
7.5 OESE	N/A	573-SVE-5-**

(S) Denotes scroll compressor models.

HiPerForm® Subcooling Measurement



Example:

- P5 is 226 psig.
- Convert P5 pressure to saturation temperature of 43.28°C.
- Line temperature at T3 is 35.55°C.

Results:

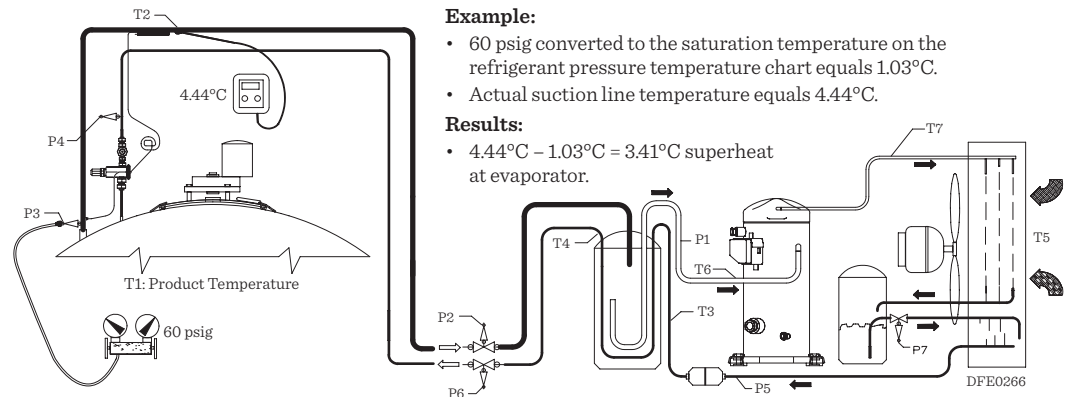
- 43.28°C – 35.55°C = 7.73°C subcooling.

Instructions:

1. Determine the high-side pressure at P5 with an accurate gauge.
2. From the refrigerant pressure temperature chart, determine the saturation temperature of the high-side pressure.
3. Measure the temperature of the high-side liquid at the subcooling valve remote bulb location T3.
4. Subtract the temperature measured in step 3 from the saturation temperature read from the chart in step 2. The difference is the amount of subcooled refrigerant.

Note: The above readings must be taken with the evaporator completely covered with milk or water at a product temperature below 7°C, and a condensing temperature of at least 35°C.

Model OESE Superheat Measurement



Example:

- 60 psig converted to the saturation temperature on the refrigerant pressure temperature chart equals 1.03°C.
- Actual suction line temperature equals 4.44°C.

Results:

- 4.44°C – 1.03°C = 3.41°C superheat at evaporator.

Instructions:

1. Determine the suction pressure with an accurate gauge at the evaporator outlet P3.
2. From the refrigerant pressure temperature chart, determine the saturation temperature at the observed suction pressure.
3. Measure the temperature of the suction gas at the expansion valve remote bulb location T2.
4. Subtract the saturation temperature read from the chart in step 2 from the temperature measured in step 3. The difference is the superheat of suction gas.

Note: The above readings must be taken with the evaporator completely covered with milk or water at a product temperature below 7°C, and a condensing temperature of at least 35°C.

TEMPERATURE READINGS

- T1: Milk temperature
T2: Suction line temperature at evaporator outlet
T3: Line temperature at accumulator inlet/subcooling valve bulb
T4: Line temperature at accumulator outlet
T5: Ambient temperature entering condenser
T6: Suction line temperature entering compressor
T7: Compressor discharge temperature

PRESSURE READINGS

- P1: Suction pressure at compressor inlet
P2: Suction pressure at accumulator inlet
P3: Suction pressure at evaporator outlet
P4: Pressure at evaporator inlet or TXV inlet
P5: Pressure at subcooling valve inlet (HiPerForm® units)
P5: Pressure at filter-drier inlet (OESE® units)
P6: Pressure at liquid line service valve
P7: Pressure at receiver outlet (OESE units only)

- SH: Superheat is the suction pressure @ P3 converted to a temperature and subtracted from T2
SC: Subcooling is the pressure @ P5 converted to a temperature minus the temperature @ T3
E-T: Evaporator temperature
C-T: Condensing temperature

Survey Data to be Recorded by Technician

[illegible]

¹Take a setup reading before starting the test.

²Take a reading at five-minute intervals.

³Take voltage readings at the start, in the middle, and at the end of test.