TRANE® AIR CONDITIONING

FILE INFORMATION:
DIVISION TAB-TRANE REFRIGERATION PRODUCTS
PRODUCT TAB-RECIPROCATING COMPRESSORS
LITERATURE ITEM-GENERAL SERVICE BULLETIN

LITERATURE FILE NO.
HCOM-SB-14

GENERAL SERVICE BULLETIN

11/29/76
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SUBJECT: OVERLOAD RELAY (FURNAS) SETTINGS FOR RECIPROCATING COMPRESSORS

INTRODUCTION

In past years, there has been considerable dialogue on the subject of compressor overload settings. This bulletin will explain overload operating criteria and instructions for calibrating replacement overloads. Also included in this bulletin are tables showing actual overload calibration setpoints by unit type and model.

DISCUSSION

I Overload Selection and Setting For U.S. Products

One of the basic requirements on the compressor overload is that it must permit a unit to operate on an extremely hot day and undervoltage. This is when air conditioning is most needed and the customer obviously expects the equipment to run.

Maximum ARI load condition described in the various equipment standards is the best consensus of what the maximum application conditions are in the field and should be the design criteria for unit operating capability.

As an example, the ARI maximum load condition for a rooftop unit is 95 F dry and 71 F wet bulb to the evaporators and 115 F outdoor air to the condenser at ± 10% voltage, whichever represents the worst situation. Units are required to operate for a minimum of two hours at this condition.

This maximum condition and undervoltage imposes a design operating capability on the compressor which requires a certain maximum motor strength.

With the system balance points commonly used in system design, the compressor will be exposed to a saturated evaporator temperature of approximately 50 F and a saturated condensing temperature of 150 F, so the hermetic motor must be capable of operating at this condition without stalling or overheating. All Trane compressors exceed this criteria.

Knowing these facts, it becomes a simple task to select an overload setting for a specific unit. One way would be to run a unit in the laboratory at the maximum ARI condition and measure the compressor current. The overload setting should be equal to this current. In actual fact, time prevents carrying out such a test for all unit sizes and voltages, so a combination of tests and calculated values are used. This method has proved to be quite reliable.

The compressor current selected is that value which is representative of the vendor's motor that draws the highest current. This selection process

is required because there is usually a small difference in motor current draw between various motor manufacturers.

There is a 12% manufacturing tolerance on the actual trip current of the Furnas Class 948 ambient compensated overload. Two current values must therefore be defined. The lower value is the "Must Hold Current" and the upper value (12% higher) is the "Must Trip Current".

Because the various units we build require literally hundreds of different settings, the relays are purchased to nominal ratings where the must hold point can be adjusted within ±20% of the nominal rating. The relays used are shown in Table 1.

TABLE 1

Nominal Rating Amps	Range	Furnas Catalog No.	Trane Part No.
20	16-24	948AA31B*	RLY-532
30	24-36	948BA13B*	RLY-531
45	36-54	948CA31B*	RLY-450
65	52-78	948DA31B*	RLY-453
95	76-114	948EA31B*	RLY-467
140	112-160	948FA31B*	RLY-526

*For 60 Cycle Use Only

THE NOMINAL RATING OF THE RELAY IS THE MUST HOLD CURRENT TO WHICH IT WAS CALIBRATED AT THE MANUFACTURER'S PLANT. Adjustment within the ±20% range is done by a special calibrated knob shown in Figure 1.

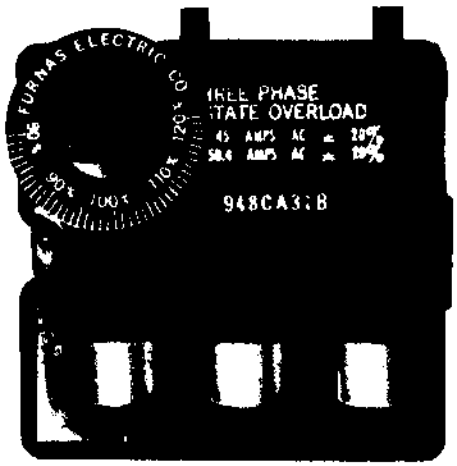

FIGURE 1

As an example, a 140 amp relay set at 100% has a must hold current of 140 amps and the must trip rating will be 112% of this value. After setting the overload in our plant for specific unit model, the overload is sealed and a label affixed which shows the actual must hold and must trip value.

II Setting Of Replacement Overloads

Knowing the must hold value of the overload relay from the must hold value of the defective relay, or from the attached tables, a replacement overload can be set through the use of the calibration knob included in the kit

when you order a replacement overload. (Action is being taken in La Crosse to have an adjustment knob included with a replacement overload). Offices have been supplied with several such knobs on a one time basis. Additional knobs can be ordered directly from Furnas Electric Company, 1007 McKee Street, Batavia, Illinois 60510. The knob is calibrated in percent of the nominal must hold value and is inserted in a hole under the pressure sensitive label on the face of the relay.

As an example, let us consider this case:

Label on defective relay

Must Hold Current = 125 Amps
Must Trip Current = 140 Amps
Closest Nominal Relay Rating Selected From Table 1 - 140 Amps

$$\text{\% Setting of Adjustment Knob on Replacement Relay} = \frac{100\% \times 125 \text{ Amps Desired Must Hold}}{140 \text{ Amps (O.L. Must Hold Rating Obtained from Table 1)}} = 89.2\% = 89\%$$

If there are doubts about the correctness of the must hold current on a specific unit overload, please check with La Crosse Service Department.

IMPORTANT! Please note that the nameplate Rated Load Current for the compressors does not enter into the overload setting in any way. There used to be a fixed relationship between the overload setting and the Rated Load Current of our products. This is no longer the case. Now that our products are being U.L. listed, there is no fixed relationship.

R-12 CONDENSER UNITS

UNIT TYPE	VOLTAGE	TYPE START	OVERLOAD AMPS	
			MUST HOLD	MUST TRIP
RWUA-10	200	PW	22.5	25.5
RWUA-10	230	PW	20	22
RWUA-10	460	X-L	20	22
RWUA-10	460	PW	10	11
RWUA-10	575	X-L	16	18
RWUA-10	575	PW	8	9
RWUA-13	200	PW	28	31.5
RWUA-13	230	PW	24.5	27.5
RWUA-13	460	X-L	25	28
RWUA-13	460	PW	12.5	14
RWUA-13	575	X-L	20	21
RWUA-13	575	PW	10	10.5
RWUA-17	200	PW	36	40.5
RWUA-17	230	PW	31	35
RWUA-17	460	X-L	31	34
RWUA-17	460	PW	15.5	17
RWUA-17	575	X-L	26	29
RWUA-17	575	PW	13	14.5
RWUA-19	200	PW	43	48
RWUA-19	230	PW	37.5	42
RWUA-19	460	X-L	38	43
RWUA-19	460	PW	19	21.5
RWUA-19	575	X-L	30	34
RWUA-19	575	PW	15	17

R-22 CONDENSER UNITS

UNIT TYPE	VOLTAGE	TYPE START	OVERLOAD AMPS	
			MUST HOLD	MUST TRIP
RWUA-15	200	PW	35	39
RWUA-15	230	PW	30.5	34
RWUA-15	460	X-L	30	34
RWUA-15	460	PW	15	17
RWUA-15	575	X-L	25	27
RWUA-15	575	PW	12.5	13.5
RWUA-20	200	PW	46.5	51.5
RWUA-20	230	PW	39.5	44.5
RWUA-20	460	X-L	40	46
RWUA-20	460	PW	20	23
RWUA-20	575	X-L	32	36
RWUA-20	575	PW	16	18
RWUA-25	200	PW	53.5	60
RWUA-25	230	PW	46.5	52
RWUA-25	460	X-L	46	52
RWUA-25	460	PW	23	26
RWUA-25	575	X-L	37	41
RWUA-25	575	PW	18.5	20.5
RWUA-30	200	PW	65	73
RWUA-30	230	PW	56.5	63.5
RWUA-30	460	X-L	56	64
RWUA-30	460	PW	28	32
RWUA-30	575	X-L	45	51
RWUA-30	575	PW	22.5	25.5

R-12 COMPRESSOR UNITS

UNIT TYPE	VOLTAGE	TYPE START	OVERLOAD AMPS	
			MUST HOLD	MUST TRIP
HCUA-10	200	PW	27	30.5
HCUA-10	230	PW	23	26
HCUA-10	460	X-L	24	27
HCUA-10	460	PW	12	13.5
HCUA-10	575	X-L	19	21
HCUA-10	575	PW	9.5	10.5
HCUA-13	200	PW	33	37
HCUA-13	230	PW	28.5	32.5
HCUA-13	460	X-L	28	33
HCUA-13	460	PW	14	16.5
HCUA-13	575	X-L	24	27
HCUA-13	575	PW	12	13.5
HCUA-17	200	PW	43	48.5
HCUA-17	230	PW	37	42.5
HCUA-17	460	X-L	37	42
HCUA-17	460	PW	18.5	21
HCUA-17	575	X-L	30	34
HCUA-17	575	PW	15	17
HCUA-19	200	PW	50	56
HCUA-19	230	PW	43	48.5
HCUA-19	460	X-L	44	49
HCUA-19	460	PW	22	24.5
HCUA-19	575	X-L	35	39
HCUA-19	575	PW	17.5	19.5

R-22 COMPRESSOR UNITS

UNIT TYPE	VOLTAGE	TYPE START	OVERLOAD AMPS	
			MUST HOLD	MUST TRIP
HCUA-15	200	PW	41	46.5
HCUA-15	230	PW	35.5	40.5
HCUA-15	460	X-L	36	40
HCUA-15	460	PW	18	20
HCUA-15	575	X-L	29	34
HCUA-15	575	PW	14.5	17
HCUA-20	200	PW	54	61
HCUA-20	230	PW	47	53
HCUA-20	460	X-L	47	53
HCUA-20	460	PW	23.5	26.5
HCUA-20	575	X-L	37	42
HCUA-20	575	PW	18.5	21
HCUA-25	200	PW	66.5	75.5
HCUA-25	230	PW	58.5	66
HCUA-25	460	X-L	58	66
HCUA-25	460	PW	29	33
HCUA-25	575	X-L	47	53
HCUA-25	575	PW	23.5	26.5
HCUA-30	200	PW	76	86
HCUA-30	230	PW	66.5	74.5
HCUA-30	460	X-L	66	75
HCUA-30	460	PW	33	37.5
HCUA-30	575	X-L	54	61
HCUA-30	575	PW	27	30.5

AIR COOLED COLD GENERATORS

UNIT TYPE	VOLTAGE	TYPE START	OVERLOAD AMPS		% SETTING
			MUST HOLD	MUST TRIP	
CGAA-20	200	PW	53	60	82
CGAA-20	230	PW	45	51	100
CGAA-20	460	X-L	45	51	100
CGAA-20	460	PW	22	25	110
CGAA-20	575	X-L	36	40	80
CGAA-20	575	PW	18	20	90
CGAA-25	200	PW	68	75	105
CGAA-25	230	PW	58	65	89
CGAA-25	460	X-L	58	65	89
CGAA-25	460	PW	29	32	97
CGAA-25	575	X-L	47	53	104
CGAA-25	575	PW	23	26	115
CGAA-30	200	PW	80	90	84
CGAA-30	230	PW	70	78	108
CGAA-30	460	X-L	70	78	108
CGAA-30	460	PW	35	39	117
CGAA-30	575	X-L	57	64	88
CGAA-30	575	PW	28	32	93

NOTE: The values for each compressor are the same for 40, 50 and 60 ton duplex units.

WATER COOLED COLD GENERATORS

UNIT TYPE	VOLTAGE	TYPE START	OVERLOAD AMPS	
			MUST HOLD	MUST TRIP
CGWA-10	200	PW	23	26
CGWA-10	230	PW	20	22.5
CGWA-10	460	X-L	20	22.5
CGWA-10	460	PW	10	11.3
CGWA-10	575	X-L	16	18
CGWA-10	575	PW	8	9
CGWA-15	200	PW	34	38
CGWA-15	230	PW	29.5	33
CGWA-15	460	X-L	30	34
CGWA-15	460	PW	15	17
CGWA-15	575	X-L	24	27
CGWA-15	575	PW	12	13.5
CGWA-20	200	PW	45	50.5
CGWA-20	230	PW	39	44
CGWA-20	460	X-L	39	44
CGWA-20	460	PW	19.5	22
CGWA-20	575	X-L	32	36
CGWA-20	575	PW	16	18
CGWA-25	200	PW	53.5	60
CGWA-25	230	PW	46.5	52
CGWA-25	460	X-L	47	53
CGWA-25	460	PW	23.5	26.5
CGWA-25	575	X-L	39	43
CGWA-25	575	PW	19.5	21.5
CGWA-30	200	PW	61.5	69
CGWA-30	230	PW	53.5	60
CGWA-30	460	X-L	54	60
CGWA-30	460	PW	27	30
CGWA-30	575	X-L	43	48
CGWA-30	575	PW	21.5	24

COMPRESSOR CHILLERS

UNIT TYPE	VOLTAGE	TYPE START	OVERLOAD AMPS	
			MUST HOLD	MUST TRIP
CCUA-10	200	PW	27	31
CCUA-10	230	PW	24	27
CCUA-10	460	X-L	24	28
CCUA-10	460	PW	12	14
CCUA-10	575	X-L	19	22
CCUA-10	575	PW	9.5	11
CCUA-15	200	PW	40	45
CCUA-15	230	PW	35	39.5
CCUA-15	460	X-L	35	39
CCUA-15	460	PW	17.5	19.5
CCUA-15	575	X-L	28	32
CCUA-15	575	PW	14	16
CCUA-20	200	PW	51.5	57.5
CCUA-20	230	PW	45	50.5
CCUA-20	460	X-L	45	51
CCUA-20	460	PW	22.5	25.5
CCUA-20	575	X-L	37	41
CCUA-20	575	PW	18.5	20.5
CCUA-25	200	PW	66	74
CCUA-25	230	PW	57.5	64.5
CCUA-25	460	X-L	58	65
CCUA-25	460	PW	29	32.5
CCUA-25	575	X-L	46	52
CCUA-25	575	PW	23	26
CCUA-30	200	PW	71	86.5
CCUA-30	230	PW	67	75
CCUA-30	460	X-L	67	75
CCUA-30	460	PW	33.5	37.5
CCUA-30	575	X-L	54	60
CCUA-30	575	PW	27	30

AIR COOLED SELF CONTAINED (STANDARD UNITS)

UNIT TYPE	VOLTAGE	TYPE START	OVERLOAD AMPS		% SETTING
			MUST HOLD	MUST TRIP	
SRUA-20	200	PW	55.9	62.9	86
SRUA-20	230	PW	48.6	54.6	108
SRUA-20	460	X-L	48.6	54.6	108
SRUA-20	460	PW	24.2	27.2	81
SRUA-20	575	X-L	38.6	43.4	86
SRUA-20	575	PW	19.3	21.7	96
SRUA-25	200	PW	70.3	79	108
SRUA-25	230	PW	61	68.5	94
SRUA-25	460	X-L	61	68.5	94
SRUA-25	460	PW	30.5	34.3	101
SRUA-25	575	X-L	48	55.1	109
SRUA-25	575	PW	24.6	27.6	82
SRUA-30	200	PW	82.5	92.8	87
SRUA-30	230	PW	71.6	80.5	110
SRUA-30	460	X-L	71.6	80.5	110
SRUA-30	460	PW	36	40.5	80
SRUA-30	575	X-L	57.3	64.4	88
SRUA-30	575	PW	28.6	32.2	95
SRUA-40	200	PW	103	106	108
SRUA-40	230	PW	90.8	102	95
SRUA-40	460	X-L	90.8	102	95
SRUA-40	460	PW	45.3	50.9	100
SRUA-40	575	X-L	73.5	82.5	113
SRUA-40	575	PW	36.7	41.3	81
SRUA-50	200	PW	122	137	87
SRUA-50	230	PW	106	119	111
SRUA-50	460	X-L	106	119	112
SRUA-50	460	PW	53.4	60	82
SRUA-50	575	X-L	84.7	95.2	89
SRUA-50	575	PW	42.3	47.5	94
SRUA-60	200	PW	146	164	104
SRUA-60	230	PW	127	143	91
SRUA-60	460	X-L	127	143	91
SRUA-60	460	PW	64.2	72.1	99
SRUA-60	575	X-L	102	114	107
SRUA-60	575	PW	51	57.3	113

WATER COOLED SELF CONTAINED (STANDARD UNITS)

UNIT TYPE	VOLTAGE	TYPE START	OVERLOAD AMPS		% SETTING
			MUST HOLD	MUST TRIP	
SWUA-20	200	PW	45	50.6	100
SWUA-20	230	PW	39.2	44	87
SWUA-20	460	X-L	39.2	44	87
SWUA-20	460	PW	19.6	22	98
SWUA-20	575	X-L	31.3	35.2	104
SWUA-20	575	PW	15.7	17.6	80
SWUA-25	200	PW	54.9	61.7	84
SWUA-25	230	PW	47.9	53.7	106
SWUA-25	460	X-L	47.9	53.7	106
SWUA-25	460	PW	23.9	26.9	119
SWUA-25	575	X-L	38.3	43	85
SWUA-25	575	PW	19.2	21.6	96
SWUA-30	200	PW	65.8	74	101
SWUA-30	230	PW	57.3	64.4	88
SWUA-30	460	X-L	57.3	64.4	88
SWUA-30	460	PW	28.6	32.2	95
SWUA-30	575	X-L	45.9	51.5	102
SWUA-30	575	PW	23	25.8	115
SWUA-40	200	PW	81.5	91.5	86
SWUA-40	230	PW	70.9	79.6	109
SWUA-40	460	X-L	70.9	79.6	109
SWUA-40	460	PW	35.4	39.8	118
SWUA-40	575	X-L	56.7	63.7	87
SWUA-40	575	PW	28.4	31.9	95
SWUA-50	200	PW	94	105.8	99
SWUA-50	230	PW	99.5	111.9	105
SWUA-50	460	X-L	81.7	91.9	86
SWUA-50	460	PW	49.7	55.9	110
SWUA-50	575	X-L	65.4	73.5	101
SWUA-50	575	PW	32.7	36.7	109
SWUA-60	200	PW	114.3	128.5	82
SWUA-60	230	PW	99.5	111.9	105
SWUA-60	460	X-L	99.5	111.9	105
SWUA-60	460	PW	49.7	55.9	110
SWUA-60	575	X-L	79.6	89.5	84
SWUA-60	575	PW	39.8	44.7	89

AIR COOLED SELF CONTAINED (CSA)

UNIT TYPE	VOLTAGE	TYPE START	OVERLOAD AMPS		% SETTING
			MUST HOLD	MUST TRIP	
SRUA-20	200	PW	50	56.2	111
SRUA-20	230	PW	43.4	48.7	96
SRUA-20	460	X-L	43.4	48.7	96
SRUA-20	460	PW	21.6	24.3	108
SRUA-20	575	X-L	34.4	38.7	114
SRUA-20	575	PW	17.2	19.3	86
SRUA-25	200	PW	62.7	70.5	96
SRUA-25	230	PW	55	61.8	84
SRUA-25	460	X-L	54.5	61.2	84
SRUA-25	460	PW	27.2	30.6	90
SRUA-25	575	X-L	44.5	50	99
SRUA-25	575	PW	22.2	25	111
SRUA-30	200	PW	73.9	83	113
SRUA-30	230	PW	64	71.9	98
SRUA-30	460	X-L	64.5	72.5	99
SRUA-30	460	PW	32.2	36.2	107
SRUA-30	575	X-L	51.1	57.5	113
SRUA-30	575	PW	25.6	28.7	85
SRUA-40	200	PW	92.5	104	97
SRUA-40	230	PW	81.2	91.2	85
SRUA-40	460	X-L	81.2	91.3	85
SRUA-40	460	PW	40.6	45.6	90
SRUA-40	575	X-L	65.6	73.7	101
SRUA-40	575	PW	32.8	36.8	109
SRUA-50	200	PW	109	122	115
SRUA-50	230	PW	94.4	106	99
SRUA-50	460	X-L	95.3	107	100
SRUA-50	460	PW	47.8	53.7	106
SRUA-50	575	X-L	75.6	85	116
SRUA-50	575	PW	37.8	42.5	84
SRUA-60	200	PW	130	146	93
SRUA-60	230	PW	114	128	120
SRUA-60	460	X-L	114	128	120
SRUA-60	460	PW	57.3	64.4	88
SRUA-60	575	X-L	90.9	102	95
SRUA-60	575	PW	45.5	51.2	101

WATER COOLED SELF CONTAINED (CSA)

UNIT TYPE	VOLTAGE	TYPE START	OVERLOAD AMPS		% SETTING
			MUST HOLD	MUST TRIP	
SWUA-20	200	PW	46	57.1	102
SWUA-20	230	PW	40	45	89
SWUA-20	460	X-L	40	45	89
SWUA-20	460	PW	20	22.5	100
SWUA-20	575	X-L	32	36	107
SWUA-20	575	PW	16	18	80
SWUA-25	200	PW	54.6	61.4	84
SWUA-25	230	PW	47.5	53.4	106
SWUA-25	460	X-L	47.5	53.4	106
SWUA-25	460	PW	23.8	26.7	119
SWUA-25	575	X-L	38	42.7	85
SWUA-25	575	PW	19	21.3	95
SWUA-30	200	PW	64.6	72.6	99
SWUA-30	230	PW	56.2	63.1	87
SWUA-30	460	X-L	56.2	63.1	87
SWUA-30	460	PW	28	31.5	93
SWUA-30	575	X-L	45	50.5	100
SWUA-30	575	PW	22.4	25.2	112
SWUA-40	200	PW	86	96.7	91
SWUA-40	230	PW	75	84.2	115
SWUA-40	460	X-L	75	84.2	115
SWUA-40	460	PW	37.4	42	83
SWUA-40	575	X-L	60	67.4	92
SWUA-40	575	PW	30	33.7	100
SWUA-50	200	PW	93.3	104.9	98
SWUA-50	230	PW	81.2	91.3	86
SWUA-50	460	X-L	81.2	91.3	86
SWUA-50	460	PW	40.6	45.6	90
SWUA-50	575	X-L	65	73	100
SWUA-50	575	PW	32.5	36.5	108
SWUA-60	200	PW	112.2	126.1	80
SWUA-60	230	PW	97.6	109.8	103
SWUA-60	460	X-L	97.6	109.8	103
SWUA-60	460	PW	48.9	54.9	109
SWUA-60	575	X-L	78.1	87.9	82
SWUA-60	575	PW	39.1	43.9	87

AIR COOLED SELF CONTAINED (50 CYCLE)

UNIT TYPE	VOLTAGE	OVERLOAD AMPS		% SETTING
		MUST HOLD	MUST TRIP	
SRUA-20	380	24	25	78
SRUA-20	400	23	25	112
SRUA-20	415	22	24	106
SRUA-25	380	32	34	103
SRUA-25	400	31	33	100
SRUA-25	415	30	32	97
SRUA-30	280	37	39	80
SRUA-30	400	35	37	76
SRUA-30	415	33	36	107
SRUA-40	380	45	48	97
SRUA-40	400	43	45	93
SRUA-40	415	41	44	88
SRUA-50	380	51	54	110
SRUA-50	400	48	51	104
SRUA-50	415	47	50	101
SRUA-60	380	62	66	93
SRUA-60	400	59	63	88
SRUA-60	415	57	60	85

WATER COOLED SELF CONTAINED (50 CYCLE)

UNIT TYPE	VOLTAGE	OVERLOAD AMPS		% SETTING
		MUST HOLD	MUST TRIP	
SWUA-20	380	20	21	97
SWUA-20	400	19	20	92
SWUA-20	415	18	19	87
SWUA-25	380	26	28	84
SWUA-25	400	25	26	81
SWUA-25	415	25	26	81
SWUA-30	380	30	32	97
SWUA-30	400	29	30	94
SWUA-30	415	28	29	91
SWUA-40	380	38	41	82
SWUA-40	400	36	39	78
SWUA-40	415	35	37	113
SWUA-50	380	48	51	104
SWUA-50	400	45	48	97
SWUA-50	415	44	46	95
SWUA-60	380	57	60	85
SWUA-60	400	54	57	81
SWUA-60	415	52	55	78

SPLIT SYSTEM CONDENSING UNITS (STANDARD)

UNIT TYPE	VOLTAGE	TYPE START	OVERLOAD AMPS		% SETTING
			MUST HOLD	MUST TRIP	
RAUA-20	200	PW	55	61.5	84
RAUA-20	230	PW	47.5	53	104
RAUA-20	460	X-L	47.5	53	104
RAUA-20	460	PW	23.5	26.5	117
RAUA-20	575	X-L	37.5	42	83
RAUA-20	575	PW	18.5	21	92
RAUA-25	200	PW	71	79.5	109
RAUA-25	230	PW	61.5	69	94
RAUA-25	460	X-L	62.5	70	96
RAUA-25	460	PW	31	35	103
RAUA-25	575	X-L	50	56	111
RAUA-25	575	PW	25	28	83
RAUA-30	200	PW	83	93	87
RAUA-30	230	PW	70.5	79	108
RAUA-30	460	X-L	71	79.5	109
RAUA-30	460	PW	35.5	40	118
RAUA-30	575	X-L	57.5	64	88
RAUA-30	575	PW	28.5	32	95

SPLIT SYSTEM CONDENSING UNITS (STANDARD - E AND F COMPRESSOR)

UNIT TYPE	VOLTAGE	TYPE START	OVERLOAD AMPS		% SETTING
			MUST HOLD	MUST TRIP	
RAUA-40	200	PW	90	100.5	94
RAUA-40	230	PW	81	91	85
RAUA-40	460	X-L	81	91	85
RAUA-40	460	PW	4015	45.5	90
RAUA-40	575	X-L	68.5	77	105
RAUA-40	575	PW	34	38.5	114
RAUA-50	200	PW	106.5	119.5	111
RAUA-50	230	PW	96.5	108.5	101
RAUA-50	460	X-L	97.5	109	102
RAUA-50	460	PW	48.5	54.5	108
RAUA-50	575	X-L	81	91	85
RAUA-50	575	PW	40.5	45.5	90
RAUA-60	200	PW	131.5	147.5	94
RAUA-60	230	PW	119	133.5	85
RAUA-60	460	X-L	120	134	85
RAUA-60	460	PW	60	67	92
RAUA-60	575	X-L	100	112	105
RAUA-60	575	PW	50	56	111
RAUA-80	200	PW	165	184.5	118
RAUA-80	230	PW	155	173.5	110.5
RAUA-80	460	X-L	155	173.5	110.5
RAUA-80	460	PW	77.5	86.5	82.5
RAUA-80	575	X-L	126	141	90
RAUA-80	575	PW	63.5	71	98
RAUA-100	200	PW	214	239	92.5
RAUA-100	230	PW	194	217	84
RAUA-100	460	X-L	194	217	84
RAUA-100	460	PW	97.5	109	102.5
RAUA-100	575	X-L	164	183.5	117
RAUA-100	575	PW	82.5	92.5	87

SPLIT SYSTEM CONDENSING UNITS (STANDARD - M AND R COMPRESSOR)

UNIT TYPE	VOLTAGE	TYPE START	OVERLOAD AMPS		% SETTING
			MUST HOLD	MUST TRIP	
RAUA-40	200	PW	55	61.5	84
RAUA-40	230	PW	47.5	53	104
RAUA-40	460	X-L	47.5	53	104
RAUA-40	460	PW	23.5	26.5	117
RAUA-40	575	X-L	37.5	42	83
RAUA-40	575	PW	18.5	21	92
RAUA-50	200	PW	71	79.5	109
RAUA-50	230	PW	61.5	69	94
RAUA-50	460	X-L	62.5	70	96
RAUA-50	460	PW	31	35	103
RAUA-50	575	X-L	50	56	111
RAUA-50	575	PW	25	28	83
RAUA-60	200	PW	83	93	87
RAUA-60	230	PW	70.5	79	108
RAUA-60	460	X-L	71	79.5	109
RAUA-60	460	PW	35.5	40	118
RAUA-60	575	X-L	57.5	64	88
RAUA-60	575	PW	28.5	32	95
RAUA-80	200	PW	108.5	121.5	114
RAUA-80	230	PW	95	106	100
RAUA-80	460	X-L	95	106	100
RAUA-80	460	PW	47.5	53	105
RAUA-80	575	X-L	76	85	117
RAUA-80	575	PW	38	42.5	84
RAUA-100	200	PW	122.5	137	87
RAUA-100	230	PW	106.5	119.5	112
RAUA-100	460	X-L	107.5	120	113
RAUA-100	460	PW	53.5	60	82
RAUA-100	575	X-L	86	96.5	90
RAUA-100	575	PW	43	48	95
RAUA-120	200	PW	150	168	107
RAUA-120	230	PW	131.5	147.5	94
RAUA-120	460	X-L	131	147	93
RAUA-120	460	PW	65.5	73.5	100
RAUA-120	575	X-L	105	117.5	110
RAUA-120	575	PW	52.5	58.5	116

SPLIT SYSTEM CONDENSING UNITS (CSA)

UNIT TYPE	VOLTAGE	TYPE START	OVERLOAD AMPS		% SETTING
			MUST HOLD	MUST TRIP	
RAUA-20	200	PW	49	55	108
RAUA-20	230	PW	42.5	47.5	94
RAUA-20	460	X-L	42.5	47.5	94
RAUA-20	460	PW	21	23.5	105
RAUA-20	575	X-L	33.5	37.5	111
RAUA-20	575	PW	16.5	18.5	82
RAUA-25	200	PW	63.5	71	97
RAUA-25	230	PW	55	61.5	84
RAUA-25	460	X-L	56	62.5	86
RAUA-25	460	PW	28	31	93
RAUA-25	575	X-L	44.5	50	98
RAUA-25	575	PW	22.5	25	112
RAUA-30	200	PW	74	83	113
RAUA-30	230	PW	63	70.5	96
RAUA-30	460	X-L	63.5	71	97
RAUA-30	460	PW	31.5	35.5	105
RAUA-30	575	X-L	51.5	57.5	114
RAUA-30	575	PW	25.5	28.5	85

SPLIT SYSTEM CONDENSING UNITS (CSA-E AND F COMPRESSOR)

UNIT TYPE	VOLTAGE	TYPE START	OVERLOAD AMPS		% SETTING
			MUST HOLD	MUST TRIP	
RAUA-40	200	PW	80.5	90	84
RAUA-40	230	PW	72.5	81	111
RAUA-40	460	X-L	72.5	81	111
RAUA-40	460	PW	36	40.5	80
RAUA-40	575	X-L	61.5	68.5	94
RAUA-40	575	PW	30.5	34	101
RAUA-50	200	PW	95	106.5	100
RAUA-50	230	PW	86.5	96.5	91
RAUA-50	460	X-L	87	97.5	91
RAUA-50	460	PW	43.5	48.5	96
RAUA-50	575	X-L	72.5	81	111
RAUA-50	575	PW	36	40.5	80
RAUA-60	200	PW	117.5	131.5	83
RAUA-60	230	PW	106.5	119	112
RAUA-60	460	X-L	107	120	112
RAUA-60	460	PW	53.5	60	82
RAUA-60	575	X-L	89	100	93
RAUA-60	575	PW	44.5	50	98

SPLIT SYSTEM CONDENSING UNITS (CSA - M AND R COMPRESSOR)

UNIT TYPE	VOLTAGE	TYPE START	OVERLOAD AMPS		% SETTING
			MUST HOLD	MUST TRIP	
RAUA-40	200	PW	49	55	108
RAUA-40	230	PW	42.5	47.5	94
RAUA-40	460	X-L	42.5	47.5	94
RAUA-40	460	PW	21	23.5	105
RAUA-40	575	X-L	33.5	37.5	111
RAUA-40	575	PW	16.5	18.5	82
RAUA-50	200	PW	63.5	71	97
RAUA-50	230	PW	55	61.5	84
RAUA-50	460	X-L	56	62.5	86
RAUA-50	460	PW	28	31	93
RAUA-50	575	X-L	44.5	50	98
RAUA-50	575	PW	22.5	25	112
RAUA-60	200	PW	74	83	113
RAUA-60	230	PW	63	70.5	96
RAUA-60	460	X-L	63.5	71	97
RAUA-60	460	PW	31.5	35.5	105
RAUA-60	575	X-L	51.5	57.5	114
RAUA-60	575	PW	25.5	28.5	85
RAUA-80	200	PW	96.5	108.5	101
RAUA-80	230	PW	84.5	95	89
RAUA-80	460	X-L	84.5	95	89
RAUA-80	460	PW	42	47.5	93
RAUA-80	575	X-L	67.5	76	104
RAUA-80	575	PW	34	38	113
RAUA-100	200	PW	109	122.5	114
RAUA-100	230	PW	95	106.5	100
RAUA-100	460	X-L	95.5	107.5	100
RAUA-100	460	PW	47.5	53.5	106
RAUA-100	575	X-L	76.5	86	118
RAUA-100	575	PW	38	43	85
RAUA-120	200	PW	133.5	150	95
RAUA-120	230	PW	117	131.5	83
RAUA-120	460	X-L	116.5	131	83
RAUA-120	460	PW	58	65.5	89
RAUA-120	575	X-L	93	104.5	98
RAUA-120	575	PW	46.5	52.5	103

SPLIT SYSTEM CONDENSING UNITS (50 CYCLE)

UNIT TYPE	VOLTAGE	OVERLOAD AMPS		% SETTING
		MUST HOLD	MUST TRIP	
RAUA-20	200	47	53	104
RAUA-20	230	42.5	48	94
RAUA-20	400	24.5	27.5	81
RAUA-25	200	61	69	95
RAUA-25	230	55.5	62.5	85
RAUA-25	400	32	36	106
RAUA-30	200	70.5	79.5	108
RAUA-30	230	64	72	98
RAUA-30	400	36.5	41.5	81

SPLIT SYSTEM CONDENSING UNITS (50 CYCLE - E AND F COMPRESSOR)

UNIT TYPE	VOLTAGE	OVERLOAD AMPS		% SETTING
		MUST HOLD	MUST TRIP	
RAUA-40	200	89	99.5	93
RAUA-40	230	75	84	115
RAUA-40	400	37	42	82
RAUA-50	200	95	106.5	100
RAUA-50	230	86.5	96.5	90
RAUA-50	400	38	43.5	85
RAUA-60	200	119.5	134.5	85
RAUA-60	230	109	122	115
RAUA-60	400	57.5	64.5	88

SPLIT SYSTEM CONDENSING UNITS (50 CYCLE - M AND R COMPRESSOR)

UNIT TYPE	VOLTAGE	OVERLOAD AMPS		% SETTING
		MUST HOLD	MUST TRIP	
RAUA-40	200	47	53	104
RAUA-40	230	42.5	48	94
RAUA-40	400	24.5	27.5	81
RAUA-50	200	61	69	95
RAUA-50	230	55.5	62.5	85
RAUA-50	400	32	36	106
RAUA-60	200	70.5	79.5	108
RAUA-60	230	64	72	98
RAUA-60	400	36.5	41.5	81
RAUA-80	200	95	106	100
RAUA-80	230	82	92	86
RAUA-80	400	47.5	53	105
RAUA-100	200	106.5	119.5	112
RAUA-100	230	93	104	98
RAUA-100	400	53.5	60	82
RAUA-120	200	131.5	147.5	94
RAUA-120	230	113.5	127	81
RAUA-120	400	65.5	73.5	100

ROOFTOP MULTIZONE (STANDARD UNITS)

UNIT TYPE	VOLTAGE	TYPE START	OVERLOAD AMPS		% SETTING
			MUST HOLD	MUST TRIP	
17 TON	200	PW	49	55	109
17 TON	230	PW	42	47	94
17 TON	460	X-L	42	47	94
17 TON	460	PW	21	24	106
17 TON	575	X-L	34	38	113
17 TON	575	PW	17	19	85
20 TON	2-0	PW	56	63	86
20 TON	230	PW	50	56	111
20 TON	460	X-L	50	56	111
20 TON	460	PW	25	28	83
20 TON	575	X-L	41	46	90
20 TON	575	PW	20	23	101
25 TON	200	PW	70	78	107
25 TON	230	PW	62	70	96
25 TON	460	X-L	62	70	96
25 TON	460	PW	31	35	104
25 TON	575	X-L	50	56	111
25 TON	575	PW	25	28	83
30 TON	200	PW	86	96	90
30 TON	230	PW	75	84	115
30 TON	460	X-L	75	84	115
30 TON	460	PW	37	42	83
30 TON	575	X-L	59	66	91
30 TON	575	PW	29	33	99
34 TON	200	PW	86	96	90
34 TON	230	PW	75	84	115
34 TON	460	X-L	75	84	115
34 TON	460	PW	37	42	83
34 TON	575	X-L	59	66	91
34 TON	575	PW	29	33	99
40 TON	200	PW	99	111	104
40 TON	230	PW	87	98	92
40 TON	460	X-L	87	98	92
40 TON	460	PW	44	49	97
40 TON	575	X-L	70	78	107
40 TON	575	PW	35	39	116

ROOFTOP MULTIZONE (CSA)

UNIT TYPE	VOLTAGE	TYPE START	OVERLOAD AMPS		% SETTING
			MUST HOLD	MUST TRIP	
17 TON	200	PW	48	54	107
17 TON	230	PW	42	47	94
17 TON	460	X-L	42	47	94
17 TON	460	PW	21	23	106
17 TON	575	X-L	34	38	113
17 TON	575	PW	17	19	86
20 TON	200	PW	55	61	84
20 TON	230	PW	48	53	106
20 TON	460	X-L	48	53	106
20 TON	460	PW	24	26	119
20 TON	575	X-L	39	43	86
20 TON	575	PW	19	21	97
25 TON	200	PW	66	74	102
25 TON	230	PW	58	65	89
25 TON	460	X-L	58	65	89
25 TON	460	PW	29	32	96
25 TON	575	X-L	47	52	104
25 TON	575	PW	23	26	117
30 TON	200	PW	78	87	82
30 TON	230	PW	67	75	103
30 TON	460	X-L	67	75	103
30 TON	460	PW	33	37	111
30 TON	575	X-L	55	62	85
30 TON	575	PW	28	31	93
34 TON	200	PW	78	87	82
34 TON	230	PW	67	75	103
34 TON	460	X-L	67	75	103
34 TON	460	PW	33	37	111
34 TON	575	X-L	55	62	85
34 TON	575	PW	28	31	93
40 TON	200	PW	93	104	98
40 TON	230	PW	81	90	85
40 TON	460	X-L	81	90	85
40 TON	460	PW	41	45	90
40 TON	575	X-L	66	73	101
40 TON	575	PW	33	36	109

ROOFTOP MULTIZONE (50 CYCLE)

UNIT TYPE	VOLTAGE	OVERLOAD AMPS		% SETTING
		MUST HOLD	MUST TRIP	
17 TON	380	21	24	107
17 TON	415	20	22	99
20 TON	380	24	27	80
20 TON	415	22	25	111
25 TON	380	32	36	108
25 TON	415	30	33	99
30 TON	380	37	42	83
30 TON	15	34	38	113
34 TON	380	37	42	83
34 TON	415	34	38	113
40 TON	380	46	51	102
40 TON	415	43	48	95

ROOFTOP SINGLE ZONE (STANDARD UNITS)

UNIT TYPE	VOLTAGE	TYPE START	OVERLOAD AMPS		% SETTING
			MUST HOLD	MUST TRIP	
20 TON	200	PW	56	63	86
20 TON	230	PW	50	56	111
20 TON	460	X-L	50	56	111
20 TON	460	PW	25	28	83
20 TON	575	X-L	41	46	90
20 TON	575	PW	20	23	101
25 TON	200	PW	70	78	107
25 TON	230	PW	62	70	96
25 TON	460	X-L	62	70	96
25 TON	460	PW	31	35	104
25 TON	575	X-L	50	56	111
25 TON	575	PW	25	28	83
30 TON	200	PW	86	96	90
30 TON	230	PW	75	84	115
30 TON	460	X-L	75	84	115
30 TON	460	PW	37	42	83
30 TON	575	X-L	59	66	91
30 TON	575	PW	29	33	99
40 TON	200	PW	89	100	94
40 TON	230	PW	89	100	94
40 TON	460	X-L	89	100	94
40 TON	575	X-L	68	76	105
50 TON	200	PW	106	119	112
50 TON	230	PW	106	119	112
50 TON	460	X-L	106	119	112
50 TON	575	X-L	81	90	85
60 TON	200	PW	86	96	90
60 TON	230	PW	75	84	115
60 TON	460	X-L	75	84	115
60 TON	460	PW	37	42	83
60 TON	575	X-L	59	66	91
60 TON	575	PW	29	33	99
75 TON	200	PW	99	111	104
75 TON	230	PW	87	98	92
75 TON	460	X-L	87	98	92
75 TON	460	PW	44	49	97
75 TON	575	X-L	70	78	107
75 TON	575	PW	35	39	116

ROOFTOP SINGLE ZONE (CSA)

UNIT TYPE	VOLTAGE	TYPE START	OVERLOAD AMPS		% SETTING
			MUST HOLD	MUST TRIP	
20 TON	200	PW	55	61	84
20 TON	230	PW	48	53	106
20 TON	460	X-L	48	53	106
20 TON	460	PW	24	26	119
20 TON	575	X-L	39	43	86
20 TON	575	PW	19	21	97
25 TON	200	PW	66	74	102
25 TON	230	PW	58	65	89
25 TON	460	X-L	58	65	89
25 TON	460	PW	29	32	96
25 TON	575	X-L	47	52	104
25 TON	575	PW	23	26	117
30 TON	200	PW	78	87	82
30 TON	230	PW	67	75	103
30 TON	460	X-L	67	75	103
30 TON	460	PW	33	37	111
30 TON	575	X-L	55	62	85
30 TON	575	PW	28	31	93
40 TON	200	PW	80	89	84
40 TON	230	PW	80	89	84
40 TON	460	X-L	80	89	84
40 TON	460	PW	40	44	89
40 TON	575	X-L	61	68	94
40 TON	575	PW	31	34	102
50 TON	200	PW	95	106	100
50 TON	230	PW	95	106	100
50 TON	460	X-L	95	106	100
50 TON	460	PW	48	53	106
50 TON	575	X-L	72	81	111
50 TON	575	PW	36	40	120
60 TON	200	PW	78	87	82
60 TON	230	PW	67	75	103
60 TON	460	X-L	67	75	103
60 TON	460	PW	33	37	111
60 TON	575	X-L	55	62	85
60 TON	575	PW	28	31	93
75 TON	200	PW	93	104	98
75 TON	230	PW	81	90	85
75 TON	460	X-L	81	90	85
75 TON	460	PW	41	45	90
75 TON	575	X-L	66	73	101
75 TON	575	PW	33	36	109

ROOFTOP SINGLE ZONE (50 CYCLE)

UNIT TYPE	VOLTAGE	OVERLOAD AMPS		% SETTING
		MUST HOLD	MUST TRIP	
20 TON	380	24	27	80
20 TON	415	22	25	111
25 TON	380	32	36	108
25 TON	415	30	33	99
30 TON	380	37	42	83
30 TON	415	34	38	113
40 TON	380	38	43	85
40 TON	415	35	39	117
50 TON	380	46	52	103
50 TON	415	42	47	94
60 TON	380	37	42	83
60 TON	415	34	38	113
75 TON	380	46	51	102
75 TON	415	43	48	95

FILE INFORMATION
COMPRESSOR, RECIPROCATING