TOPAIRE

WATER COOLED PACKAGED CHILLERS WITH SCROLL COMPRESSORS

12 to 62 Tons

TWCS SERIES R22/R407c

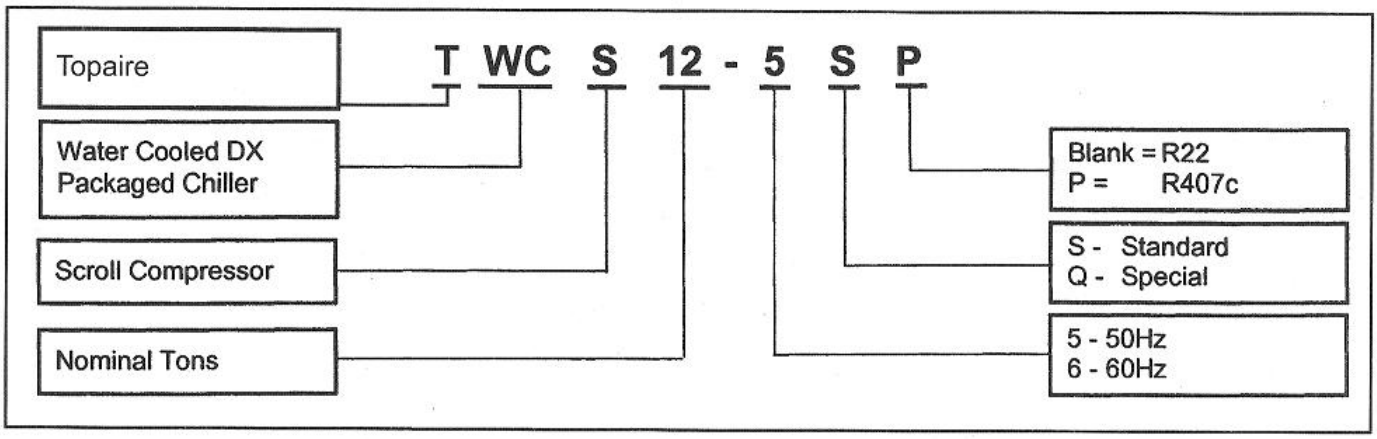
50/60 Hz

TOPAIRE
air conditioner

Form No : TWCS - 10 - 05 - 01

TABLE OF CONTENTS

NOMENCLATURE



STANDARD FEATURES

Size Range

- ☆ 32 models from 12 to 62 tons.
- ☆ Standard version available.
- ☆ Rated with R22 and R407c. Consult factory for use of other HFC refrigerants.

Compressor

- ☆ Scroll hermetic type operating at 2950 RPM (50Hz); 3550 RPM (60Hz).
- ☆ High EER, low sound power level and high reliability.
- ☆ Controlled orbit with floating seals and advanced scroll geometry.
- ☆ No-contact scroll design and 100% motor cooled by suction gas.
- ☆ Thermostat fitted to prevent thermal overload.
- ☆ Capability of 50% tandem unloading.

Evaporator

- ☆ Vessels constructed in accordance to ASME CODES Sections VIII Division I for unfired pressure vessels.
- ☆ Topaire high efficiency inner-fin tubes design for compactness and weight reduction.
- ☆ 250 psig on refrigerant side design pressure.
- ☆ 150 psig on water side design pressure.
- ☆ Approval Stamp available from JKKP (Malaysia), UDT (Poland), BPA, China State Bureau of Quality and Technical Supervision of the People's Republic of China and ASME.
- ☆ 1" thick PE foam closed cell insulation.

Condenser

- ☆ Vessels constructed in accordance to ASME CODES Sections VIII Division I for unfired pressure vessels.
- ☆ Removable heads and interchangeable end-for-end for job flexibility.
- ☆ 3/4" OD seamless, extended surface copper tubes.
- ☆ 300 psig on refrigerant side design pressure
- ☆ 150 psig on water side design pressure
- ☆ Approval Stamp available from JKKP (Malaysia), UDT (Poland), BPA, China State Bureau of Quality and Technical Supervision of the People's Republic of China and ASME.

Electrical/Control

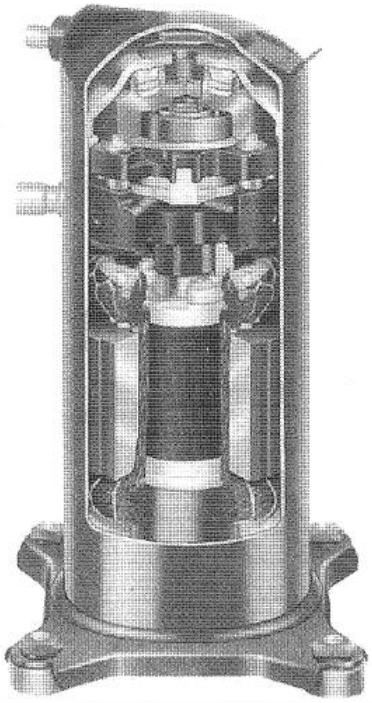
- ☆ Reliable microprocessor based controller with electromechanical system is standard for all models.
- ☆ Chilled water pump control.

OPERATING BENEFITS: SCROLL COMPRESSOR

FIGURE 1 : SCROLL COMPRESSOR

1. **DELIVERING THE HIGHEST EFFICIENCY**
   Scroll compressor gives efficiencies 10% higher than any competitive compressor on the market today – at the right conditions.

2. **DELIVERING THE QUIETEST OPERATION**
   Scroll technology gives you compressor operation that is many times quieter than other technologies.

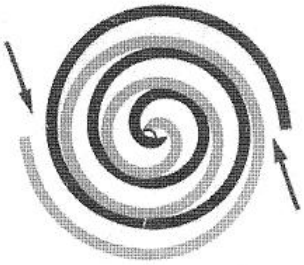


3. **DELIVERING THE INDUSTRY'S BEST VALUE**
   Scroll compressor clearly delivers more system value because of its high efficiency, fewer required components, increased reliability and quieter operation.

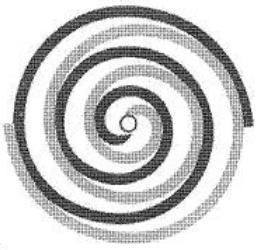
4. **DELIVERING FOR THE FUTURE**
   Scroll compressor is by far the most advanced products in the industry today for air conditioning, refrigeration and heat pump applications.

FIGURE 2 : PRINCIPLE OF SCROLL COMPRESSION

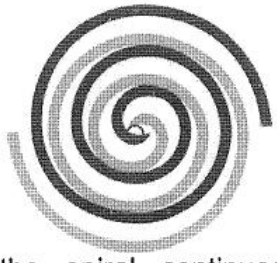
The scroll is a simple compression concept first patented in 1905. A scroll is an involute spiral which, when matched with a mating scroll form as shown above, generates a series of crescent-shaped gas pockets between the two members. During compression, one scroll remains stationary (fixed-scroll) while the other form (orbiting scroll) is allowed to orbit (but not rotate) around the first form. As this motion occurs, the pockets between the two forms are slowly pushed to the center of the two scrolls while simultaneously being reduced in volume. When the pocket reaches the center of the scroll form, the gas, which is now at a high pressure, is discharged out of a port located at the center. During compression, several pockets are being compressed simultaneously, resulting in a very smooth process. Both the suction process (outer portion of the scroll members) and the discharge process (inner portion) are continuous.



Compression in the scroll is created by the interaction of an orbiting spiral and a stationary spiral. Gas enters the outer openings as one of the spirals orbits.

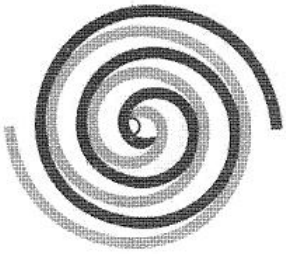


The open passages are sealed off as gas is drawn into the spiral.

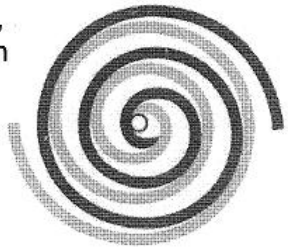


As the spiral continues to orbit, the gas is compressed into two increasingly smaller pockets.

By the time the gas arrives at the center port, discharge pressure has been reached.



Actually, during operation, all six gas passages are in various stages of compression at all times, resulting in nearly continuous suction and discharge.



CAPACITY CONTROL

The standard system capacity control operates as follows:

- ☆ As the chiller load initially drops, the suction of the compressor(s) starts dropping proportionately, thus balancing minor load variations.
- ☆ Variation of unit capacity in response to system load requirements is controlled by an operating thermostat, which monitors the return water temperature.
- ☆ On multiple compressor units, capacity is controlled by compressor staging.

ELECTRICAL CONTROLS

MCCB/ MCB - Main Circuit Breaker

This is an automatic, calibrated, ambient compensated, magnetic trip circuit breaker, which provides both direct line-break compressor branch circuit. short circuit locked rotor and overload protection. It has a manually operable handle for compressor circuit disconnect.

M - Contactor

The Contactor, operated by the control circuit, provides power individually to the compressors. Contactors are used in single across-the-line start. This device is amp rated to handle both rated load amp and locked rotor amps.

CR - Relays (Miscellaneous Control)

These relays provide the necessary circuit logic for lock-in, lock -out and control functions.

HTR - Crankcase Heater

Energized continuously as long as control circuit power disconnect switch (not supplied with the unit) is closed and compressor is off. This heater maintains crankcase temperature above the system temperature during the compressor off cycle, preventing refrigerant migration into the crankcase and consequent cause compressor damage.

SOL - Liquid Line Solenoid Valve

Closes when the compressor(s) is off to prevent any liquid refrigerant from accumulating in the chiller during the off cycle.

OL - Motor Overload (Manual Reset)

The compressors are protected by thermal overload relays. The overload relays are manually reset.

PCR or UVR - Phase Control Relay (Optional)

Protects the unit from the following electric supply malfunctions: Under voltage, phase reversal, phase loss and phase imbalance. If the PCR or UVR trips, a control relay will de-energize and open the control circuit. A red LED trip light, located on the PCR or UVR, will indicate a supply malfunction. Tile PCR or UVR is a Auto reset control device.

50 Hz								60 Hz							
Model TWCS	Leaving Chilled Water Temp.	Condenser Water Entering Temp. °F						Model TWCS	Leaving Chilled Water Temp.	Condenser Water Entering Temp. °F					
		75		85		95				75		85		95	
	°F	Tons	kWI	Tons	kWI	Tons	kWI		°F	Tons	kWI	Tons	kWI	Tons	kWI
12-5	42	12.1	8.5	11.4	9.4	10.9	10.6	15-6	42	14.3	10.2	13.5	11.3	12.8	12.7
	44	12.6	8.5	12.0	9.4	11.3	10.6		44	14.9	10.2	14.1	11.3	13.3	12.7
	46	13.1	8.5	12.4	9.4	11.8	10.6		46	15.5	10.2	14.6	11.3	13.9	12.7
	48	13.7	8.5	12.9	9.4	12.2	10.5		48	16.1	10.2	15.2	11.3	14.5	12.7
	50	14.2	8.5	13.4	9.4	12.7	10.5		50	16.8	10.2	15.9	11.3	15.0	12.7
17-5	42	17.2	11.4	16.4	12.9	15.5	14.5	20-6	42	20.3	13.7	19.3	15.5	18.3	17.4
	44	17.9	11.4	17.1	12.9	16.2	14.5		44	21.1	13.7	20.1	15.4	19.1	17.4
	46	18.6	11.4	17.7	12.9	16.8	14.5		46	22.0	13.7	20.9	15.4	19.9	17.4
	48	19.4	11.4	18.5	12.9	17.5	14.5		48	22.9	13.7	21.8	15.4	20.7	17.3
	50	20.1	11.5	19.2	12.9	18.2	14.4		50	23.8	13.7	22.6	15.4	21.5	17.3
20-5	42	21.0	14.5	20.1	16.1	19.1	17.9	25-6	42	24.8	17.5	23.7	19.3	22.5	21.5
	44	21.9	14.6	20.9	16.1	19.9	17.9		44	25.8	17.5	24.7	19.4	23.4	21.5
	46	22.7	14.6	21.7	16.1	20.7	17.9		46	26.8	17.5	25.6	19.4	24.4	21.5
	48	23.7	14.7	22.6	16.2	21.5	17.9		48	27.9	17.7	26.7	19.4	25.3	21.5
	50	24.6	14.7	23.5	16.2	22.3	17.9		50	29.0	17.7	27.7	19.4	26.3	21.5
25-5	42	25.8	17.9	24.6	20.0	23.3	22.5	30-6	42	30.2	21.5	29.0	24.0	27.5	27.0
	44	26.8	17.9	25.6	20.0	24.2	22.4		44	31.7	21.5	30.2	24.0	28.6	26.9
	46	27.9	17.9	26.6	20.0	25.2	22.4		46	32.9	21.5	31.4	24.0	29.8	26.9
	48	29.0	17.9	27.7	20.0	26.2	22.4		48	34.2	21.5	32.6	24.0	30.9	26.9
	50	30.1	17.9	28.7	20.0	27.3	22.4		50	35.6	21.5	33.9	24.0	32.2	26.8
30-5	42	30.1	20.4	28.7	22.9	27.2	25.7	35-6	42	35.5	24.5	33.9	27.5	32.1	30.9
	44	31.3	20.4	30.4	22.9	28.3	25.7		44	37.0	24.5	35.2	27.4	33.4	30.8
	46	32.6	20.4	31.1	22.9	29.4	25.7		46	38.4	24.5	36.6	27.4	34.7	30.8
	48	33.9	20.4	32.3	22.8	30.6	25.6		48	40.0	24.5	38.1	27.4	36.1	30.8
	50	35.2	20.4	33.6	22.8	31.8	25.6		50	41.5	24.5	39.6	27.4	37.6	30.7
35-5	42	34.4	22.9	32.8	25.8	31.1	29.0	40-6	42	40.6	27.5	38.7	30.9	36.7	34.8
	44	35.8	22.9	35.2	25.7	32.3	28.9		44	42.3	27.5	40.3	30.9	38.2	34.7
	46	37.3	22.9	35.5	25.7	33.7	28.9		46	44.0	27.5	41.9	30.9	39.7	34.7
	48	38.7	22.9	36.9	25.7	35.0	28.9		48	45.7	27.5	43.6	30.8	41.3	34.7
	50	40.3	22.9	38.4	25.7	36.4	28.9		50	47.5	27.5	45.3	30.8	42.9	34.7
40-5	42	42.0	29.1	40.1	32.2	38.2	35.8	50-6	42	49.5	34.9	47.4	38.6	45.0	43.0
	44	43.7	29.1	41.8	32.2	39.7	35.9		44	51.6	35.0	50.2	38.7	46.9	43.0
	46	45.5	29.2	43.5	32.3	41.3	35.9		46	53.7	35.1	51.3	38.7	48.7	43.0
	48	47.3	29.3	45.2	32.3	43.0	35.9		48	55.8	35.2	53.3	38.8	50.7	43.0
	50	49.2	29.4	47.0	32.3	44.7	35.9		50	58.0	35.3	55.4	38.8	52.7	43.1
50-5	42	51.6	35.8	49.2	40.1	46.6	44.9	60-6	42	60.9	43.0	58.1	48.1	55.0	53.9
	44	53.7	35.8	51.2	40.0	48.5	44.9		44	63.4	43.0	60.4	48.0	57.2	53.9
	46	55.8	35.8	53.2	40.0	50.4	44.8		46	65.9	43.0	62.8	48.0	59.5	53.8
	48	58.0	35.8	55.3	39.9	52.4	44.8		48	68.5	43.0	65.3	47.9	61.9	53.7
	50	60.3	35.9	57.5	39.9	54.5	44.7		50	71.1	43.0	67.8	47.9	64.3	53.7

50 Hz								60 Hz							
Model TWCS	Leaving Chilled Water Temp.	Condenser Water Entering Temp. °F						Model TWCS	Leaving Chilled Water Temp.	Condenser Water Entering Temp. °F					
		75		85		95				75		85		95	
	°F	Tons	kWI	Tons	Kwi	Tons	kWI		°F	Tons	kWI	Tons	kWI	Tons	kWI
12-5SP	42	12.5	8.8	11.7	10.0	10.8	11.3	15-6SP	42	14.7	10.6	14.2	12.3	12.8	13.5
	44	13.0	8.8	12.2	10.0	11.3	11.2		44	15.3	10.6	15.0	12.3	13.3	13.5
	46	13.6	8.8	12.7	9.9	11.8	11.2		46	16.0	10.6	15.6	12.3	13.9	13.5
	48	14.2	8.8	13.3	9.9	12.3	11.2		48	16.7	10.6	16.1	12.3	14.5	13.5
	50	14.8	8.8	13.8	9.9	12.9	11.2		50	17.4	10.6	16.7	12.3	15.2	13.5
17-5SP	42	17.8	12.4	16.6	14.5	15.5	15.9	20-6SP	42	21.0	14.8	19.6	16.8	18.2	19.1
	44	18.6	12.4	17.9	14.5	16.2	15.9		44	21.9	14.8	20.5	16.8	19.1	19.0
	46	19.4	12.3	18.3	14.5	16.9	15.9		46	22.9	14.8	21.4	16.8	19.9	19.0
	48	20.2	12.3	18.9	14.5	17.6	15.8		48	23.9	14.8	22.3	16.7	20.8	19.0
	50	21.1	12.3	19.8	14.4	18.4	15.8		50	24.9	14.8	23.3	16.7	21.7	19.0
20-5SP	42	22.0	15.5	20.6	17.3	19.1	19.5	25-6SP	42	26.0	18.5	24.3	20.8	22.6	23.4
	44	23.0	15.5	21.5	17.4	20.0	19.6		44	27.1	18.6	25.3	20.8	23.6	23.5
	46	24.0	15.6	22.5	17.4	20.9	19.6		46	28.3	18.7	26.5	20.9	24.6	23.5
	48	25.1	15.7	23.4	17.5	21.8	19.6		48	29.6	18.8	27.7	20.9	25.7	23.5
	50	26.1	15.7	24.5	17.5	22.7	19.7		50	30.8	18.9	28.9	21.0	26.8	23.6
25-5SP	42	27.0	19.0	25.3	21.4	23.6	24.2	30-6SP	42	31.8	22.8	29.8	25.7	27.8	29.0
	44	28.1	19.0	26.4	21.4	24.6	24.1		44	33.2	22.8	31.2	25.6	29.1	28.9
	46	29.3	19.0	27.6	21.3	25.7	24.1		46	34.6	22.7	32.5	25.6	30.4	28.9
	48	30.6	18.9	28.7	21.3	26.9	24.0		48	36.1	22.7	33.9	25.5	31.7	28.8
	50	31.9	18.9	30.0	21.2	28.0	24.0		50	37.6	22.7	35.4	25.5	33.1	28.8
30-5SP	42	31.3	21.9	29.3	25.2	27.3	28.0	35-6SP	42	36.9	26.3	34.6	29.7	32.2	33.6
	44	32.7	21.8	31.1	25.2	28.5	27.9		44	38.5	26.2	36.1	29.6	33.6	33.5
	46	34.1	21.8	32.1	25.1	29.7	27.9		46	40.2	26.2	37.7	29.6	35.1	33.5
	48	35.5	21.8	33.3	25.1	31.1	27.8		48	41.9	26.1	39.3	29.5	36.6	33.4
	50	37.0	21.7	34.7	25.0	32.4	27.8		50	43.7	26.1	41.0	29.5	38.2	33.3
35-5SP	42	35.6	24.7	33.3	29.0	30.9	31.8	40-6SP	42	42.0	29.7	39.3	33.7	36.5	38.1
	44	37.2	24.7	35.8	29.0	32.3	31.7		44	43.9	29.6	41.0	33.6	38.1	38.1
	46	38.8	24.7	36.6	29.0	33.8	31.7		46	45.8	29.6	42.8	33.5	39.8	38.0
	48	40.5	24.6	37.9	28.9	35.2	31.6		48	47.7	29.5	44.7	33.5	41.6	38.0
	50	42.2	24.6	39.5	28.8	36.8	31.6		50	49.8	29.5	46.6	33.4	43.4	37.9
40-5SP	42	44.1	30.9	41.2	34.7	38.3	39.0	50-6SP	42	52.0	37.1	48.6	41.6	45.2	46.8
	44	46.0	31.0	43.0	34.7	40.0	39.1		44	54.3	37.2	50.8	41.7	47.2	46.9
	46	48.0	31.2	44.9	34.8	41.7	39.2		46	56.7	37.4	53.0	41.8	49.3	47.0
	48	50.1	31.3	46.9	34.9	43.6	39.2		48	59.1	37.5	55.3	41.9	51.4	47.1
	50	52.3	31.4	48.9	35.0	45.5	39.3		50	61.7	37.7	57.7	42.0	53.7	47.2
50-5SP	42	53.9	38.0	50.6	42.8	47.2	48.3	60-6SP	42	63.6	45.7	59.7	51.4	55.7	58.0
	44	56.3	38.0	52.8	42.7	49.3	48.2		44	66.4	45.6	62.3	51.3	58.2	57.8
	46	58.7	37.9	55.1	42.6	51.5	48.1		46	69.2	45.5	65.0	51.2	60.7	57.7
	48	61.2	37.9	57.5	42.6	53.7	48.0		48	72.2	45.4	67.8	51.1	63.4	57.6
	50	63.8	37.8	59.9	42.5	56.0	47.9		50	75.2	45.4	70.7	51.0	66.1	57.5

PHYSICAL SPECIFICATIONS R22

50Hz

Unit Model		12-5	17-5	20-5	25-5	30-5	35-5	40-5	50-5
Nominal Capacity	Ton	12	17	21	25	30	35	42	51
Compressors Type (Qty)		Single (2)	Single (2)	Single (2)	Single (2)	Single (1) Tandem (1)	Tandem (2)	Tandem (2)	Tandem (2)
% Step Capacity Reduction		0, 50, 100	0, 50, 100	0, 50, 100	0, 50, 100	0, 25, 50, 75, 100	0, 25, 50, 75, 100	0, 25, 50, 75, 100	0, 25, 50, 75, 100
EVAPORATOR									
Model		CHD006481A	CHD06601B	CHD007481A	CHD007601B	CHD008601A	CHD008601A	CHD010601A	CHD011601B
Water Volume, Gallons		3.7	3.9	4.5	5.5	8.1	8.1	10.7	12.9
Minimum Flow Rate	GPM	19.4	29.1	37.2	37.3	55.9	55.9	62.1	85.4
Maximum Flow Rate	GPM	62.7	94.7	101.7	116.2	168.3	168.3	206.0	304.7
Pressure Drop	Psi	5.0	4.4	4.4	7.7	4.1	5.4	5.8	3.9
Water Conn. Size	inch	3 MPT	3 MPT	3 MPT	3 MPT	3 MPT	3 MPT	4 MPT	4 MPT
CONDENSER									
Model		CDS06D080 ART	CDS06D080 ART	CDS06D080 BRT	CDS08D080 ART	CDS08D080 BRT	CDS08D080 CRT	CDS10D080 ART	CDS10D080 BRT
Water Volume, Gallons		2.5	2.8	3.3	4.6	4.9	5.6	7.7	8.9
Minimum Flow Rate	GPM	19.0	19.0	23.0	29.3	33.3	38.0	48.4	58.7
Maximum Flow Rate	GPM	76.1	76.1	91.9	117.3	133.2	152.2	193.4	234.6
Pressure Drop	Psi	1.6	3.3	3.2	3.3	3.5	4.1	2.7	2.8
Water Conn. Size	inch	2 MPT	2 MPT	2 MPT	2.5 MPT	2.5 MPT	2.5 MPT	4 MPT	4 MPT
ELECTRICAL									
Compressor (Each):	RLA	10.5	13.5	16.0	18.5	12.0	13.5	16.0	18.5
	LRA	100	128	128	189	124	128	128	189
Unit Data :	RLA	21	27	32	37	48	54	64	74
	MCA	24	30	36	42	51	57	68	79
	MFS	40	50	50	60	60	70	80	100
GENERAL									
Unit Length	inch	92	94	92	94	95 1/4	95 1/4	96 3/4	96 3/4
Unit Width	inch	24	24	24	24	34	34	35	35
Unit Height	inch	60 3/4	60 3/4	62	64	53 3/4	53 3/4	57 1/8	60 1/8
Refrigerant Charge, R22	lbs	26	38	46	56	64	76	96	112
Unit Shipping Weight	lbs	1345	1373	1449	1678	2126	2415	2898	3218
Unit Operating Weight	lbs	1407	1433	1521	1772	2237	2533	3056	3405

60Hz

UNIT MODEL		15-6	20-6	25-6	30-6	35-6	40-6	50-6	60-6
Nominal Capacity	Ton	14	20	25	30	35	40	50	60
Compressors Type (Qty)		Single (2)	Single (2)	Single (2)	Single (2)	Single (1) Tandem (1)	Tandem (2)	Tandem (2)	Tandem (2)
% Step Capacity Reduction		0, 50, 100	0, 50, 100	0, 50, 100	0, 50, 100	0, 25, 50, 75, 100	0, 25, 50, 75, 100	0, 25, 50, 75, 100	0, 25, 50, 75, 100
EVAPORATOR									
Model		CHD006481A	CHD007481A	CHD007601B	CHD008601A	CHD008601A	CHD010601A	CHD011601B	CHD012601B
Water Volume, Gallons		3.9	4.5	5.5	8.1	8.1	10.7	12.9	15.4
Minimum Flow Rate	GPM	19.4	29.1	37.3	49.7	55.9	62.1	68.3	93.4
Maximum Flow Rate	GPM	62.7	94.7	116.2	164.3	168.3	206.0	206.4	367.8
Pressure Drop	Psi	7.4	4.1	3.2	4.3	5.7	5.1	7.6	3.8
Water Conn. Size	inch	3 MPT	3 MPT	3 MPT	3 MPT	3 MPT	4 MPT	4 MPT	4 MPT
CONDENSER									
Model		CDS06D080 ART	CDS06D080 BRT	CDS08D080 ART	CDS08D080 BRT	CDS08D080 CRT	CDS10D080 ART	CDS10D080 BRT	CDS10D080 CRT
Water Volume, Gallons		2.8	3.3	4.1	4.9	5.6	7.7	8.9	9.9
Minimum Flow Rate	GPM	19.0	23.0	29.3	33.3	38.0	48.4	58.7	68.2
Maximum Flow Rate	GPM	76.1	91.9	117.3	133.2	152.2	193.4	234.6	272.6
Pressure Drop	Psi	2.3	3.5	3.2	3.9	4.2	2.4	2.7	3.1
Water Conn. Size	inch	2 MPT	2 MPT	2.5 MPT	2.5 MPT	2.5 MPT	4 MPT	4 MPT	4 MPT
ELECTRICAL									
Compressor (Each):	RLA	10.5	13.5	16.0	18.5	12.0	13.5	16.0	18.5
	LRA	100	128	168	189	124	128	128	189
Unit Data :	RLA	21	27	32	37	48	54	64	74
	MCA	24	30	36	42	51	57	68	79
	MFS	40	50	50	60	60	70	80	100
GENERAL									
Unit Length	inch	92	92	94	94	95 1/4	96 3/4	96 3/4	96 3/4
Unit Width	inch	24	24	24	24	34	35	35	35
Unit Height	inch	60 3/4	62	64	65 1/8	53 3/4	56 7/8	58 1/4	61 1/8
Refrigerant Charge, R22	lbs	32	44	55	66	76	88	110	132
Unit Shipping Weight	lbs	1351	1402	1636	1757	2159	2861	3102	3316
Unit Operating Weight	lbs	1413	1474	1729	1868	2276	3019	3289	3533

NOT APPLICABLE

50Hz

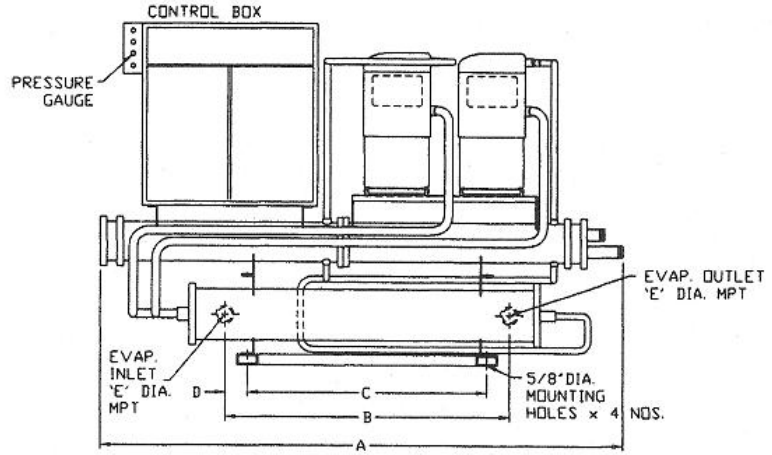
UNIT MODEL		12-5SP	17-5SP	20-5SP	25-5SP	30-5SP	35-5SP	40-5SP	50-5SP
Nominal Capacity	Ton	12	18	22	26	31	36	43	53
Compressors Type (Qty)		Single (2)	Single (2)	Single (2)	Single (2)	Single (1) Tandem (1)	Tandem (2)	Tandem (2)	Tandem (2)
% Step Capacity Reduction		0, 50, 100	0, 50, 100	0, 50, 100	0, 50, 100	0, 25, 50, 75, 100	0, 25, 50, 75, 100	0, 25, 50, 75, 100	0, 25, 50, 75, 100
EVAPORATOR									
Model		CHD006481A	CHD06601B	CHD007481A	CHD007601B	CHD008601A	CHD008601A	CHD010601A	CHD011601B
Water Volume, Gallons		3.7	3.9	4.5	5.5	8.1	8.1	10.7	12.9
Minimum Flow Rate	GPM	19.4	29.1	37.2	37.3	55.9	55.9	62.1	85.4
Maximum Flow Rate	GPM	62.7	94.7	101.7	116.2	168.3	168.3	206.0	304.7
Pressure Drop	Psi	5.1	4.6	4.6	3.6	4.3	5.7	5.8	4.2
Water Conn. Size	inch	3 MPT	3 MPT	3 MPT	3 MPT	3 MPT	3 MPT	4 MPT	4 MPT
CONDENSER									
Model		CDS06D080 ART	CDS06D080 ART	CDS06D080 BRT	CDS08D080 ART	CDS08D080 BRT	CDS08D080 CRT	CDS10D080 ART	CDS10D080 BRT
Water Volume, Gallons		2.5	2.8	3.3	4.6	4.9	5.6	7.7	8.9
Minimum Flow Rate	GPM	19.0	19.0	23.0	29.3	33.3	38.0	48.4	58.7
Maximum Flow Rate	GPM	76.1	76.1	91.9	117.3	133.2	152.2	193.4	234.6
Pressure Drop	Psi	1.7	3.6	3.3	3.5	4.0	4.6	2.7	3.0
Water Conn. Size	inch	2 MPT	2 MPT	2 MPT	2.5 MPT	2.5 MPT	2.5 MPT	4 MPT	4 MPT
ELECTRICAL									
Compressor (Each):	RLA	10.5	14	15.5	19	12	14	15.5	19
	LRA	100	128	168	189	124	128	158	189
Unit Data :	RLA	11	28	31	38	48	56	62	76
	MCA	24	32	35	43	51	60	66	81
	MFS	40	50	50	60	70	80	80	100
GENERAL									
Unit Length	inch	92	94	92	94	95 1/4	95 1/4	96 3/4	96 3/4
Unit Width	inch	24	24	24	24	34	34	35	35
Unit Height	inch	60 3/4	60 3/4	62	64	53 3/4	53 3/4	57 1/8	60 1/8
Refrigerant Charge, R407c	lbs	26	37	45	55	63	75	94	110
Unit Shipping Weight	lbs	1345	1372	1448	1677	2125	2414	2896	3216
Unit Operating Weight	lbs	1407	1432	1520	1771	2236	2532	3054	3403

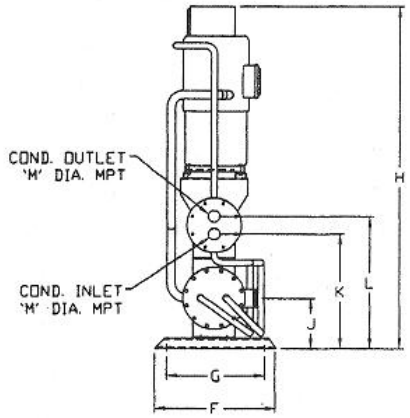
60Hz

UNIT MODEL		15-6SP	20-6SP	25-6SP	30-6SP	35-6SP	40-6SP	50-6SP	60-6SP
Nominal Capacity	Ton	15	20	25	31	35	41	51	62
Compressors Type (Qty)		Single (2)	Single (2)	Single (2)	Single (2)	Single (1) Tandem (1)	Tandem (2)	Tandem (2)	Tandem (2)
% Step Capacity Reduction		0, 50, 100	0, 50, 100	0, 50, 100	0, 50, 100	0, 25, 50, 75, 100	0, 25, 50, 75, 100	0, 25, 50, 75, 100	0, 25, 50, 75, 100
EVAPORATOR									
Model		CHD006481A	CHD007481A	CHD007601B	CHD008601A	CHD008601A	CHD010601A	CHD011601B	CHD012601B
Water Volume, Gallons		3.7	4.5	5.5	8.1	8.1	10.7	12.9	15.4
Minimum Flow Rate	GPM	19.4	29.1	37.3	49.7	55.9	62.1	68.3	93.4
Maximum Flow Rate	GPM	62.7	94.7	116.2	164	168.3	206.0	206.4	367.8
Pressure Drop	Psi	6.9	4.3	3.3	4.7	5.9	5.3	3.9	4.0
Water Conn. Size	inch	3 MPT	3 MPT	3 MPT	3 MPT	3 MPT	4 MPT	4 MPT	4 MPT
CONDENSER									
Model		CDS06D080 ART	CDS06D080 BRT	CDS08D080 ART	CDS08D080 BRT	CDS08D080 CRT	CDS10D080 ART	CDS10D080 BRT	CDS10D080 CRT
Water Volume, Gallons		2.3	2.8	3.6	4.1	4.7	5.9	7.2	8.3
Minimum Flow Rate	GPM	19.0	23.0	29.3	33.3	38.0	48.4	58.7	68.2
Maximum Flow Rate	GPM	76.1	91.9	117.3	133.2	152.2	193.4	234.6	272.6
Pressure Drop	Psi	2.6	3.7	3.2	4.1	4.5	2.5	2.8	3.3
Water Conn. Size	inch	2 MPT	2 MPT	2.5 MPT	2.5 MPT	2.5 MPT	4 MPT	4 MPT	4 MPT
ELECTRICAL									
Compressor (Each):	RLA	10.5	14	15.5	19	12	14	15.5	19
	LRA	100	128	168	189	124	128	158	189
Unit Data :	RLA	11	28	31	38	48	56	62	76
	MCA	24	32	35	43	51	60	66	81
	MFS	40	50	50	60	70	80	80	100
GENERAL									
Unit Length	inch	92	92	94	94	95 1/4	96 3/4	96 3/4	96 3/4
Unit Width	inch	24	24	24	24	34	35	35	35
Unit Height	inch	60 3/4	62	64	65 1/8	53 3/4	56 7/8	58 1/4	61 1/8
Refrigerant Charge, R407c	lbs	31	43	54	65	75	86	108	129
Unit Shipping Weight	lbs	1350	1401	1635	1756	2158	2859	3100	3313
Unit Operating Weight	lbs	1412	1473	1728	1867	2275	3017	3287	3530

DIMENSIONAL DATA

2 SINGLE COMPRESSOR

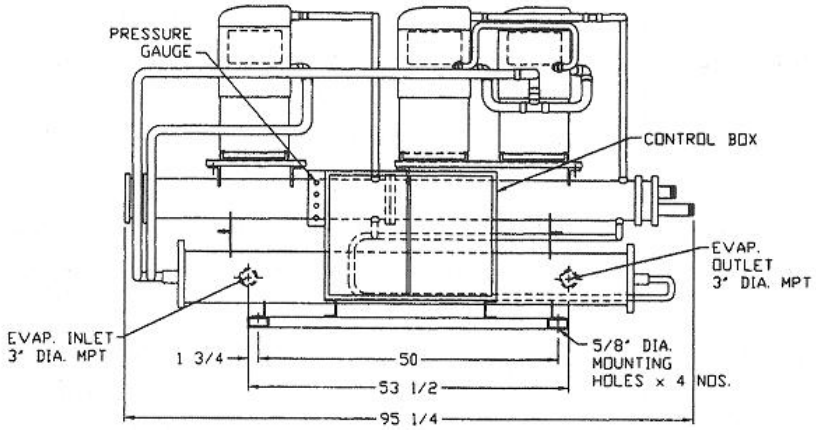


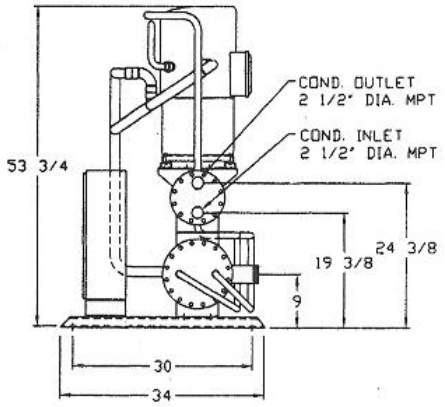


50 HZ												
MODEL	A	B	C	D	E	F	G	H	J	K	L	M
TWCS 12-5	92	44	40	2	3	24	20	51 3/4	7 7/8	16	19	2
TWCS 17-5	94	56	40	8	3	24	20	51 3/4	7 7/8	16	19	2
TWCS 20-5	92	44	40	2	3	24	20	53	8 3/8	17 1/8	20 1/8	2
TWCS 25-5	94	56	40	8	3	24	20	55	8 3/8	17 1/4	22 1/4	2 1/2

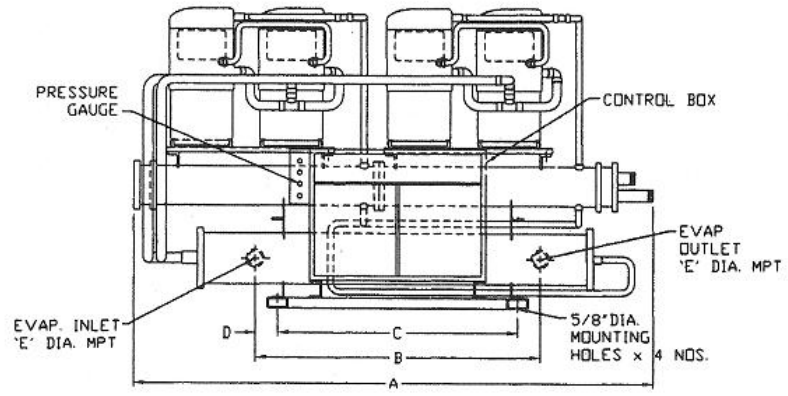
60 HZ												
MODEL	A	B	C	D	E	F	G	H	J	K	L	M
TWCS 15-6	92	44	40	2	3	24	20	51 3/4	7 7/8	16	19	2
TWCS 20-6	92	44	40	2	3	24	20	53	8 3/8	17 1/8	20 1/8	2
TWCS 25-6	94	56	40	8	3	24	20	51	8 3/8	17 1/4	22 1/4	2 1/2
TWCS 30-6	94	56	40	8	3	24	20	54 1/8	9	19 3/8	24 3/8	2 1/2

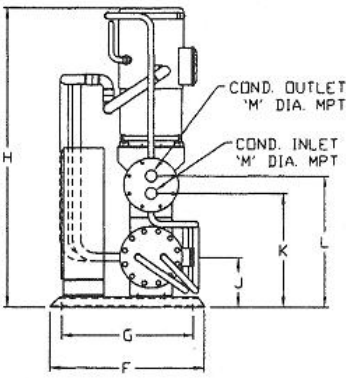
1 SINGLE & 1 TANDEM COMPRESSOR





2 TANDEM COMPRESSOR





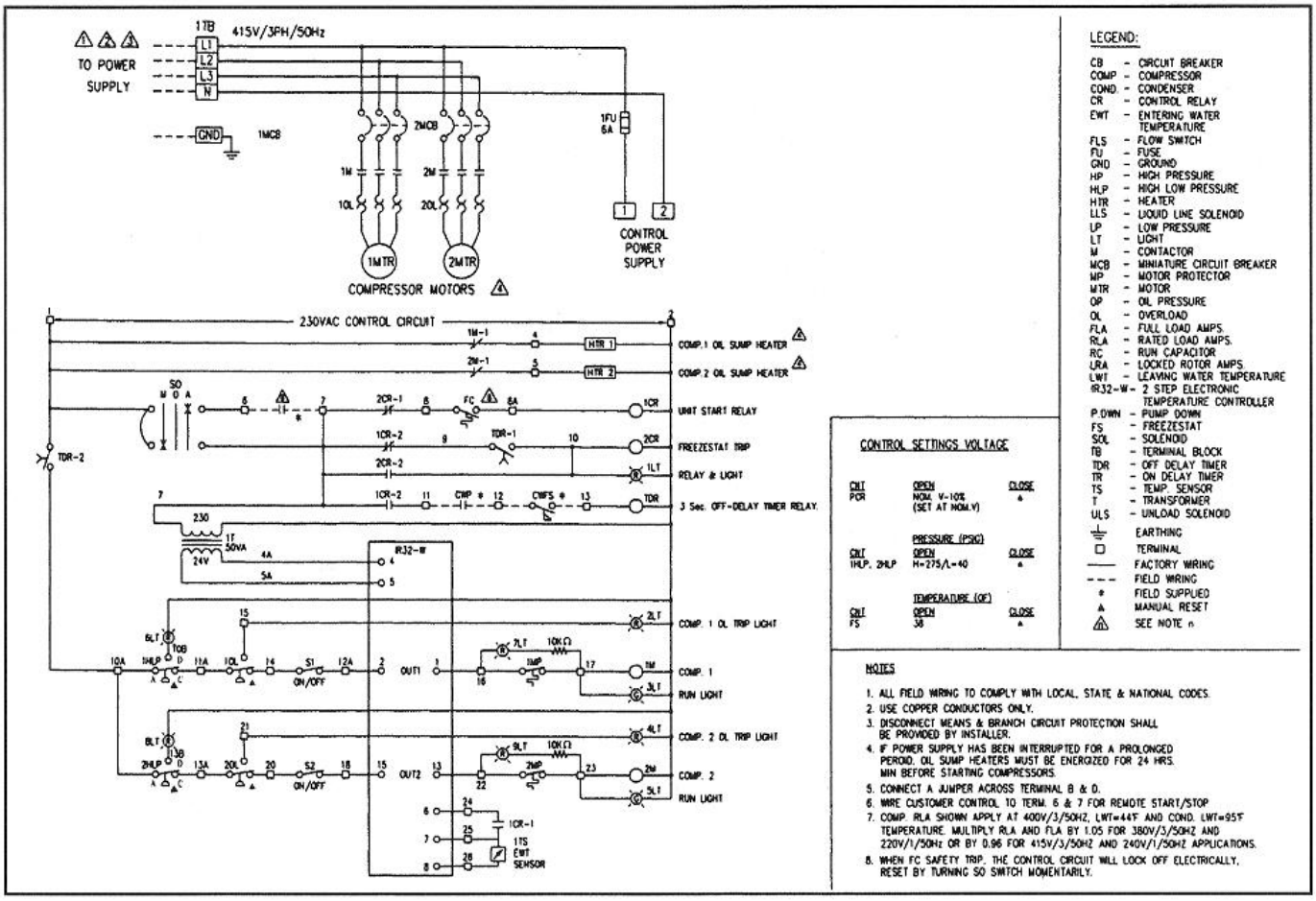
50 HZ												
MODEL	A	B	C	D	E	F	G	H	J	K	L	M
TWCS 35-5	95 1/4	53 1/2	50	1 3/4	3	34	30	53 3/4	9	19 3/8	24 3/8	2 1/2
TWCS 40-5	96 3/4	53 1/2	50	1 3/4	4	35	31	57 1/8	9 5/8	21 1/2	26 1/2	4
TWCS 50-5	96 3/4	53 1/2	50	1 3/4	4	35	31	60 1/8	10 1/8	22 5/8	27 5/8	4

60 HZ												
MODEL	A	B	C	D	E	F	G	H	J	K	L	M
TWCS 40-6	96 3/4	53 1/2	50	1 3/4	4	35	31	56 7/8	9 5/8	21 1/2	26 1/2	4
TWCS 50-6	96 3/4	53 1/2	50	1 3/4	4	35	31	58 1/4	10 1/8	22 5/8	27 5/8	4
TWCS 60-6	96 3/4	53 1/2	50	1 3/4	4	35	31	61 1/8	10 5/8	23 3/4	28 3/4	4

NOTES:
1.) WATER PIPING TO BE SUPPORTED TO MINIMIZE LOAD ON UNIT.
2.) SUFFICIENT ROOM MUST BE ALLOWED FOR EVAPORATOR AND CONDENSER WATER CONNECTION.
3.) 36" OF FLEXIBLE CONDUIT SHALL BE USED.
4.) SPRING ISOLATORS ARE OPTIONAL. IF SPRING ISOLATOR ARE INSTALLED, FLEXIBLE CONNECTION SHALL BE USED TO PROVIDE ISOLATION IN CONDENSER WATER AND CHILLED WATER PIPES.
5.) DIMENSION DO NOT INCLUDE COOLER INSULATION.
6.) ALL DIMENSIONS ARE IN INCHES.

TYPICAL WIRING DIAGRAM

2 SINGLE COMPRESSOR — 50Hz



LEGEND:

CB	CIRCUIT BREAKER
COMP	COMPRESSOR
COND.	CONDENSER
CR	CONTROL RELAY
EWT	ENTERING WATER TEMPERATURE
FLS	FLOW SWITCH
FU	FUSE
GND	GROUND
HP	HIGH PRESSURE
HLP	HIGH LOW PRESSURE
HTR	HEATER
LLS	LIQUID LINE SOLENOID
LP	LOW PRESSURE
LT	LIGHT
M	CONTACTOR
MCB	MINIATURE CIRCUIT BREAKER
MP	MOTOR PROTECTOR
MTR	MOTOR
OP	OIL PRESSURE
OL	OVERLOAD
FLA	FULL LOAD AMPS.
RLA	RATED LOAD AMPS.
RC	RUN CAPACITOR
LRA	LOCKED ROTOR AMPS.
LWT	LEAVING WATER TEMPERATURE
IR32-W-	2 STEP ELECTRONIC TEMPERATURE CONTROLLER
P.DWN	PUMP DOWN
FS	FREEZESTAT
SOL	SOLENOID
TB	TERMINAL BLOCK
TDR	OFF DELAY TIMER
TR	ON DELAY TIMER
TS	TEMP. SENSOR
T	TRANSFORMER
ULS	UNLOAD SOLENOID
⏚	EARTHING
□	TERMINAL
———	FACTORY WIRING
- - -	FIELD WIRING
*	FIELD SUPPLIED
▲	MANUAL RESET
⚠	SEE NOTE n

CONTROL SETTINGS VOLTAGE

	OPEN	CLOSE
CNT PCR	NOM. V-10% (SET AT NOM.V)	▲

PRESSURE (PSIG)

	OPEN	CLOSE
CNT 1HLP, 2HLP	H=275/L=40	▲

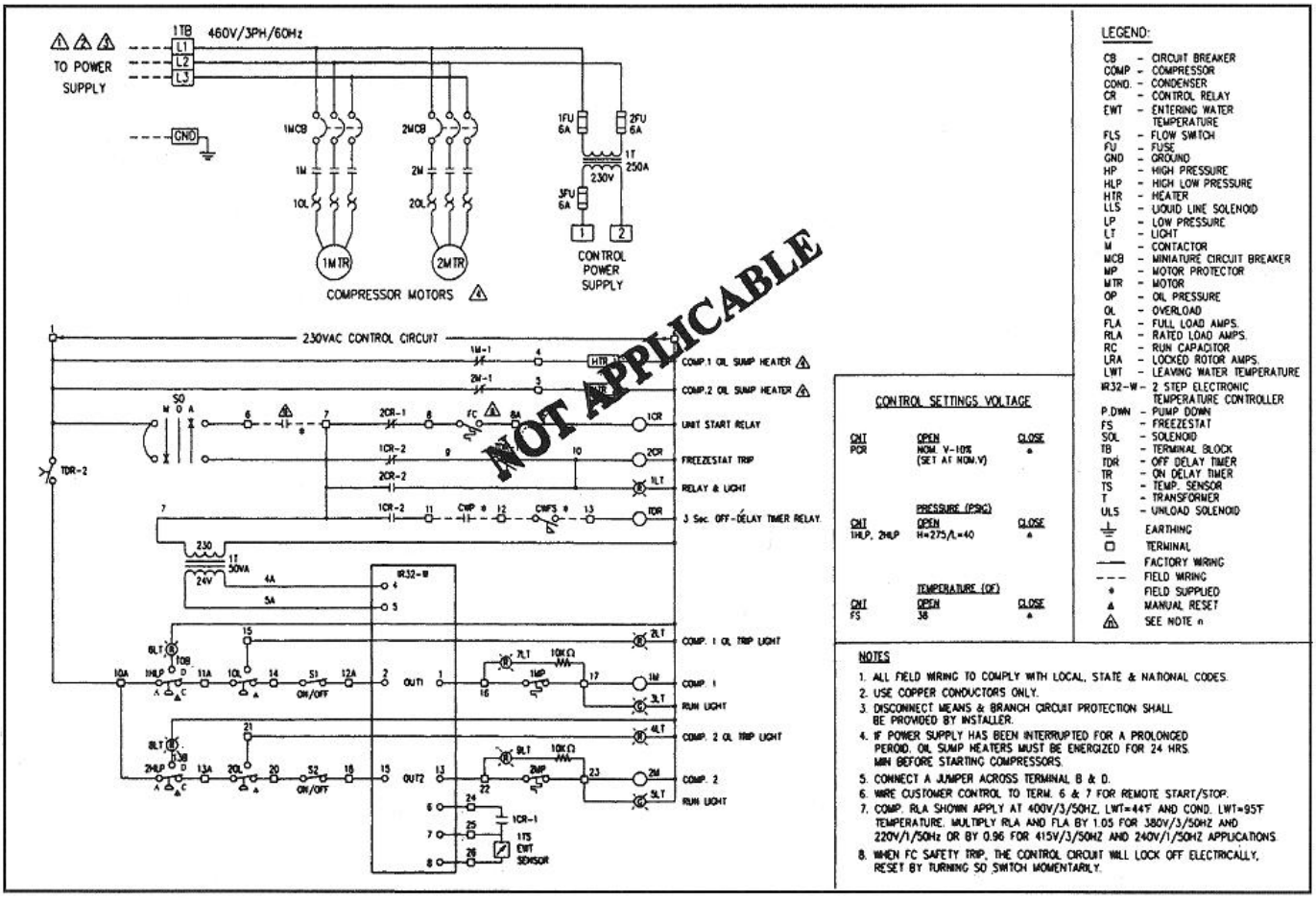
TEMPERATURE (OF)

	OPEN	CLOSE
CNT FS	38	▲

NOTES

1. ALL FIELD WIRING TO COMPLY WITH LOCAL, STATE & NATIONAL CODES.
2. USE COPPER CONDUCTORS ONLY.
3. DISCONNECT MEANS & BRANCH CIRCUIT PROTECTION SHALL BE PROVIDED BY INSTALLER.
4. IF POWER SUPPLY HAS BEEN INTERRUPTED FOR A PROLONGED PERIOD, OIL SUMP HEATERS MUST BE ENERGIZED FOR 24 HRS. MIN BEFORE STARTING COMPRESSORS.
5. CONNECT A JUMPER ACROSS TERMINAL B & D.
6. WIRE CUSTOMER CONTROL TO TERM. 6 & 7 FOR REMOTE START/STOP.
7. COMP. RLA SHOWN APPLY AT 400V/3/50HZ, LWT=44°F AND COND. LWT=95°F TEMPERATURE. MULTIPLY RLA AND FLA BY 1.05 FOR 380V/3/50HZ AND 220V/1/50Hz OR BY 0.96 FOR 415V/3/50HZ AND 240V/1/50HZ APPLICATIONS.
8. WHEN FC SAFETY TRIP, THE CONTROL CIRCUIT WILL LOCK OFF ELECTRICALLY, RESET BY TURNING SO SWITCH MOMENTARILY.

2 SINGLE COMPRESSOR — 60Hz



LEGEND:

CB	CIRCUIT BREAKER
COMP	COMPRESSOR
COND.	CONDENSER
CR	CONTROL RELAY
EWT	ENTERING WATER TEMPERATURE
FLS	FLOW SWITCH
FU	FUSE
GND	GROUND
HP	HIGH PRESSURE
HLP	HIGH LOW PRESSURE
HTR	HEATER
LLS	LIQUID LINE SOLENOID
LP	LOW PRESSURE
LT	LIGHT
M	CONTACTOR
MCB	MINIATURE CIRCUIT BREAKER
MP	MOTOR PROTECTOR
MTR	MOTOR
OP	OIL PRESSURE
OL	OVERLOAD
FLA	FULL LOAD AMPS.
RLA	RATED LOAD AMPS.
RC	RUN CAPACITOR
LRA	LOCKED ROTOR AMPS.
LWT	LEAVING WATER TEMPERATURE
IR32-W-	2 STEP ELECTRONIC TEMPERATURE CONTROLLER
P.DWN	PUMP DOWN
FS	FREEZESTAT
SOL	SOLENOID
TB	TERMINAL BLOCK
TDR	OFF DELAY TIMER
TR	ON DELAY TIMER
TS	TEMP. SENSOR
T	TRANSFORMER
ULS	UNLOAD SOLENOID
⏚	EARTHING
□	TERMINAL
———	FACTORY WIRING
- - -	FIELD WIRING
*	FIELD SUPPLIED
▲	MANUAL RESET
⚠	SEE NOTE n

CONTROL SETTINGS VOLTAGE

	OPEN	CLOSE
CNT PCR	NOM. V-10% (SET AT NOM.V)	▲

PRESSURE (PSIG)

	OPEN	CLOSE
CNT 1HLP, 2HLP	H=275/L=40	▲

TEMPERATURE (OF)

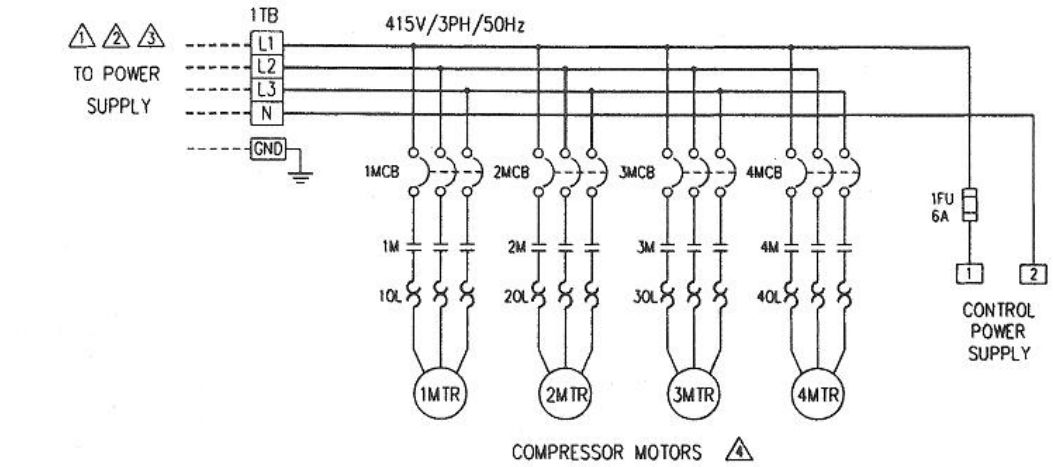
	OPEN	CLOSE
CNT FS	38	▲

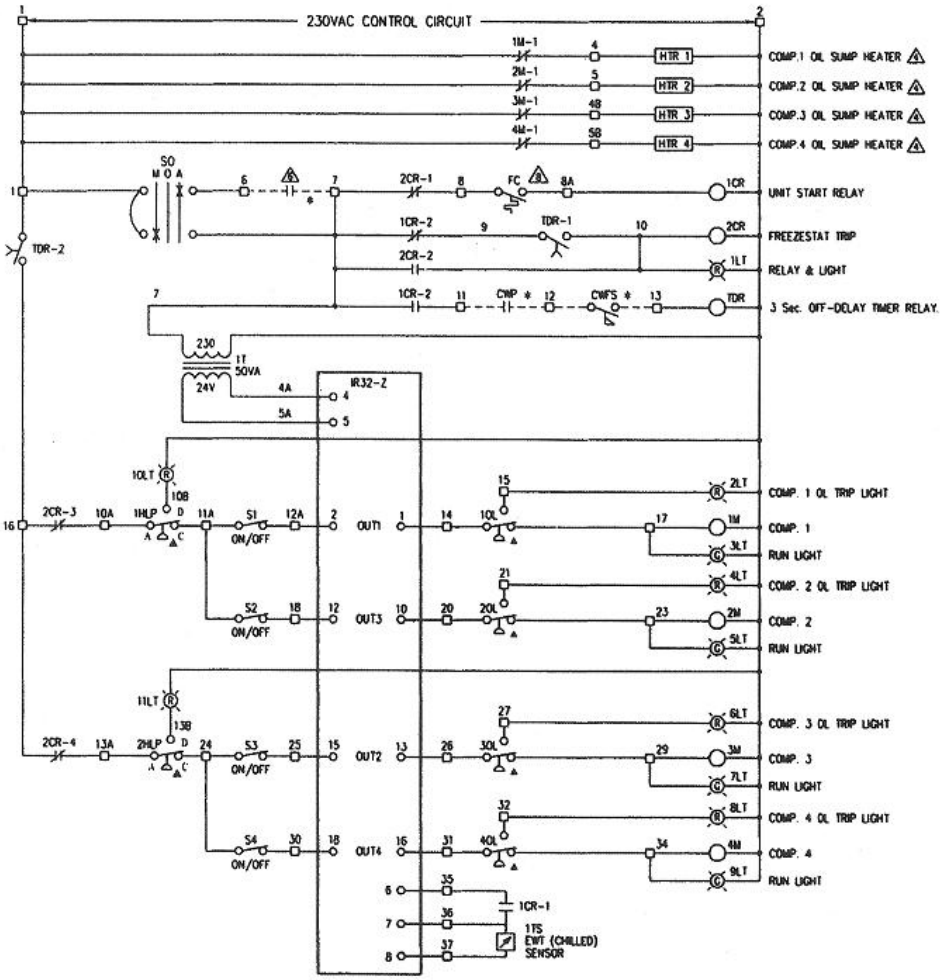
NOTES

1. ALL FIELD WIRING TO COMPLY WITH LOCAL, STATE & NATIONAL CODES.
2. USE COPPER CONDUCTORS ONLY.
3. DISCONNECT MEANS & BRANCH CIRCUIT PROTECTION SHALL BE PROVIDED BY INSTALLER.
4. IF POWER SUPPLY HAS BEEN INTERRUPTED FOR A PROLONGED PERIOD, OIL SUMP HEATERS MUST BE ENERGIZED FOR 24 HRS. MIN BEFORE STARTING COMPRESSORS.
5. CONNECT A JUMPER ACROSS TERMINAL B & D.
6. WIRE CUSTOMER CONTROL TO TERM. 6 & 7 FOR REMOTE START/STOP.
7. COMP. RLA SHOWN APPLY AT 400V/3/50HZ, LWT=44°F AND COND. LWT=95°F TEMPERATURE. MULTIPLY RLA AND FLA BY 1.05 FOR 380V/3/50HZ AND 220V/1/50Hz OR BY 0.96 FOR 415V/3/50HZ AND 240V/1/50HZ APPLICATIONS.
8. WHEN FC SAFETY TRIP, THE CONTROL CIRCUIT WILL LOCK OFF ELECTRICALLY, RESET BY TURNING SO SWITCH MOMENTARILY.

TYPICAL WIRING DIAGRAM

2 TANDEM COMPRESSOR 50Hz





LEGEND:

CB	–	CIRCUIT BREAKER
COMP	–	COMPRESSOR
COND.	–	CONDENSER
CR	–	CONTROL RELAY
EWT	–	ENTERING WATER TEMPERATURE
FLS	–	FLOW SWITCH
FU	–	FUSE
GND	–	GROUND
GFR	–	GROUND FAULT RELAY
GFS	–	GROUND FAULT SENSOR
HP	–	HIGH PRESSURE
HLP	–	HIGH LOW PRESSURE
HTR	–	HEATER
LLS	–	LIQUID LINE SOLENOID
LP	–	LOW PRESSURE
LT	–	LIGHT
M	–	CONTACTOR
MCB	–	MINIATURE CIRCUIT BREAKER
MP	–	MOTOR PROTECTOR
MTR	–	MOTOR
OP	–	OIL PRESSURE
OL	–	OVERLOAD
FLA	–	FULL LOAD AMPS.
RLA	–	RATED LOAD AMPS.
RC	–	RUN CAPACITOR
LRA	–	LOCKED ROTOR AMPS.
LWT	–	LEAVING WATER TEMPERATURE
IR32-W	–	2 STEP ELECTRONIC TEMPERATURE CONTROLLER
P.DWN	–	PUMP DOWN
FS	–	FREEZESTAT
SOL	–	SOLENOID
TB	–	TERMINAL BLOCK
TDR	–	OFF DELAY TIMER
TR	–	ON DELAY TIMER
TS	–	TEMP. SENSOR
T	–	TRANSFORMER
ULS	–	UNLOAD SOLENOID
⏚		EARTHING
□		TERMINAL
———		FACTORY WIRING
- - - -		FIELD WIRING
*		FIELD SUPPLIED
▲		MANUAL RESET
△n		SEE NOTE n

CONTROL SETTINGS VOLTAGE

CNT	OPEN	CLOSE
PCR	NOM. V-10% (SET AT NOM.V)	▲

PRESSURE (PSIG)

CNT	OPEN	CLOSE
1HLP, 2HLP	H=164/L=28	▲

TEMPERATURE (OF)

CNT	OPEN	CLOSE
FS	38	▲

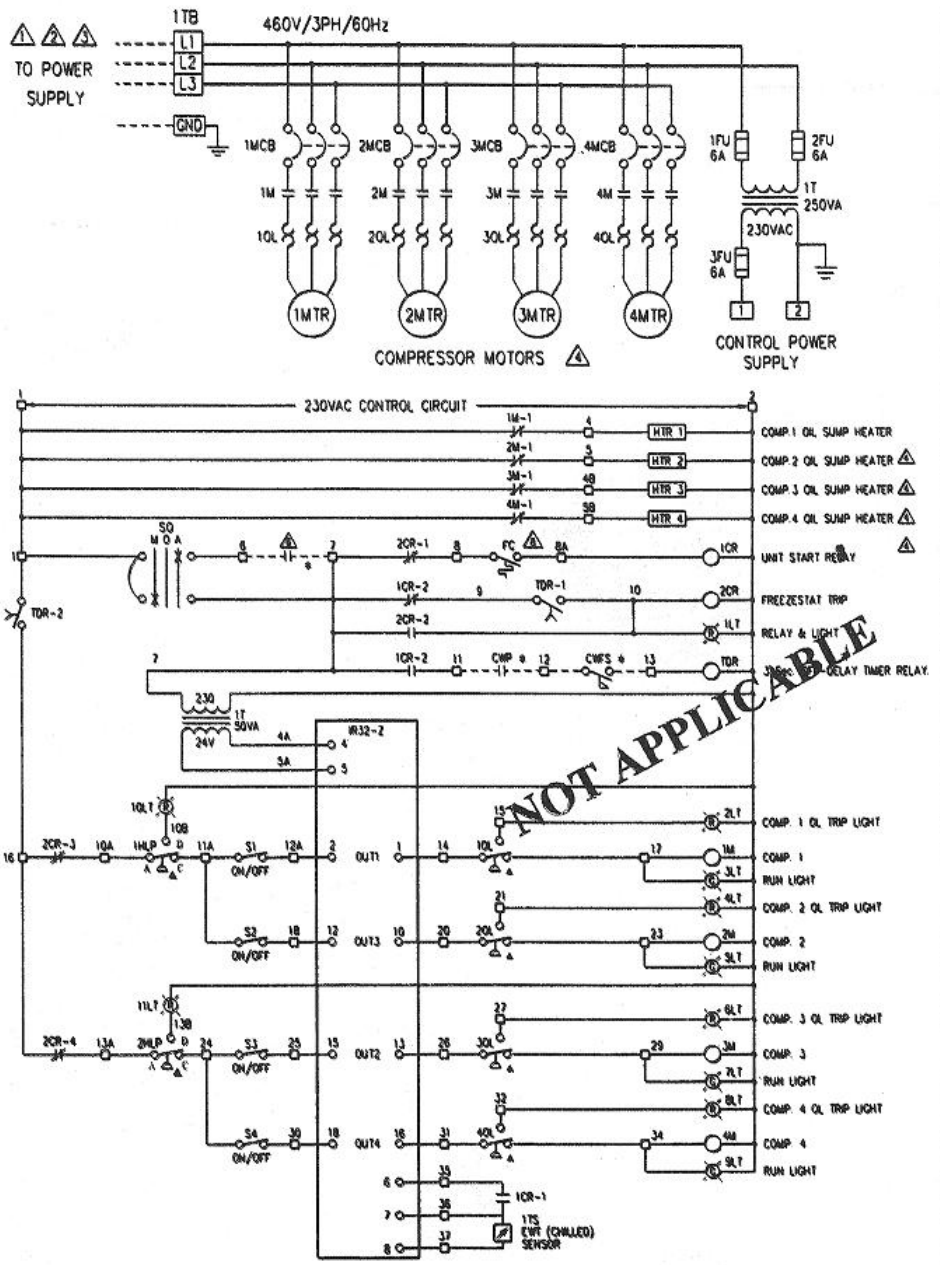
NOTES

1. ALL FIELD WIRING TO COMPLY WITH LOCAL, STATE & NATIONAL CODES.
2. USE COPPER CONDUCTORS ONLY.
3. DISCONNECT MEANS & BRANCH CIRCUIT PROTECTION SHALL BE PROVIDED BY INSTALLER.
4. IF POWER SUPPLY HAS BEEN INTERRUPTED FOR A PROLONGED PERIOD. OIL SUMP HEATERS MUST BE ENERGIZED FOR 24 HOURS. MIN BEFORE STARTING COMPRESSORS.
5. CONNECT A JUMPER ACROSS TERMINAL B & D.
6. WIRE CUSTOMER CONTROL TO TERM. 6 & 7 FOR REMOTE START/STOP.
7. COMP. RLA SHOWN APPLY AT 460V/3/50Hz, LWT=44°F AND COND. LWT=95°F TEMPERATURE.
8. WHEN FC SAFETY TRIP, THE CONTROL CIRCUIT WILL LOCK OFF ELECTRICALLY, RESET BY TURNING SO SWITCH MOMENTARILY.
9. UTILISE SHIELDED TWISTED PAIR AWG20 OR AWG22, THE SUPERVISORY INSTRUMENT MUST HAVE A TERMINATION RESISTOR OF 120Ω BETWEEN D+ AND D–.

TYPICAL WIRING DIAGRAM

2 TANDEM COMPRESSOR

60Hz



LEGEND:

CB	-	CIRCUIT BREAKER
COMP	-	COMPRESSOR
COND.	-	CONDENSER
CR	-	CONTROL RELAY
EWT	-	ENTERING WATER TEMPERATURE
FLS	-	FLOW SWITCH
FU	-	FUSE
GND	-	GROUND
GFR	-	GROUND FAULT RELAY
GFS	-	GROUND FAULT SENSOR
HP	-	HIGH PRESSURE
HLP	-	HIGH LOW PRESSURE
HTR	-	HEATER
LLS	-	LIQUID LINE SOLENOID
LP	-	LOW PRESSURE
LT	-	LIGHT
M	-	CONTACTOR
MCB	-	MINIATURE CIRCUIT BREAKER
MP	-	MOTOR PROTECTOR
MTR	-	MOTOR
OP	-	OIL PRESSURE
OL	-	OVERLOAD
FLA	-	FULL LOAD AMPS.
RLA	-	RATED LOAD AMPS.
RC	-	RUN CAPACITOR
LRA	-	LOCKED ROTOR AMPS.
LWT	-	LEAVING WATER TEMPERATURE
IR32-W	-	2 STEP ELECTRONIC TEMPERATURE CONTROLLER
P.DWN	-	PUMP DOWN
FS	-	FREEZESTAT
SOL	-	SOLENOID
TB	-	TERMINAL BLOCK
TDR	-	OFF DELAY TIMER
TR	-	ON DELAY TIMER
TS	-	TEMP. SENSOR
T	-	TRANSFORMER
ULS	-	UNLOAD SOLENOID
⏚		EARTHING
□		TERMINAL
———		FACTORY WIRING
- - - -		FIELD WIRING
*		FIELD SUPPLIED
▲		MANUAL RESET
⚠n		SEE NOTE n

CONTROL SETTINGS VOLTAGE

CNT	OPEN	CLOSE
PCR	NOM. V-10% (SET AT NOM.V)	▲

PRESSURE (PSIG)

CNT	OPEN	CLOSE
1HLP, 2HLP	H=164/L=28	▲

TEMPERATURE (OF)

CNT	OPEN	CLOSE
FS	38	▲

NOTES

1. ALL FIELD WIRING TO COMPLY WITH LOCAL, STATE & NATIONAL CODES.
2. USE COPPER CONDUCTORS ONLY.
3. DISCONNECT MEANS & BRANCH CIRCUIT PROTECTION SHALL BE PROVIDED BY INSTALLER.
4. IF POWER SUPPLY HAS BEEN INTERRUPTED FOR A PROLONGED PEROID, OIL SUMP HEATERS MUST BE ENERGIZED FOR 24 HOURS. MIN BEFORE STARTING COMPRESSORS.
5. CONNECT A JUMPER ACROSS TERMINAL B & D.
6. WIRE CUSTOMER CONTROL TO TERM. 6 & 7 FOR REMOTE START/STOP.
7. COMP. RLA SHOWN APPLY AT 460V/3/50Hz, LWT=44°F AND COND. LWT=95°F TEMPERATURE.
8. WHEN FC SAFETY TRIP, THE CONTROL CIRCUIT WILL LOCK OFF ELECTRICALLY, RESET BY TURNING SO SWITCH MOMENTARILY.
9. UTILISE SHIELDED TWISTED PAIR AWG20 OR AWG22, THE SUPERVISORY INSTRUMENT MUST HAVE A TERMINATION RESISTOR OF 120Ω BETWEEN D+ AND D−.

MANUFACTURER RESERVES THE RIGHT TO CHANGE SPECIFICATION OR DESIGN AT ANY TIME WITHOUT PRIOR NOTICE.

TOPAIRE
air conditioner

MADE IN MALAYSIA