



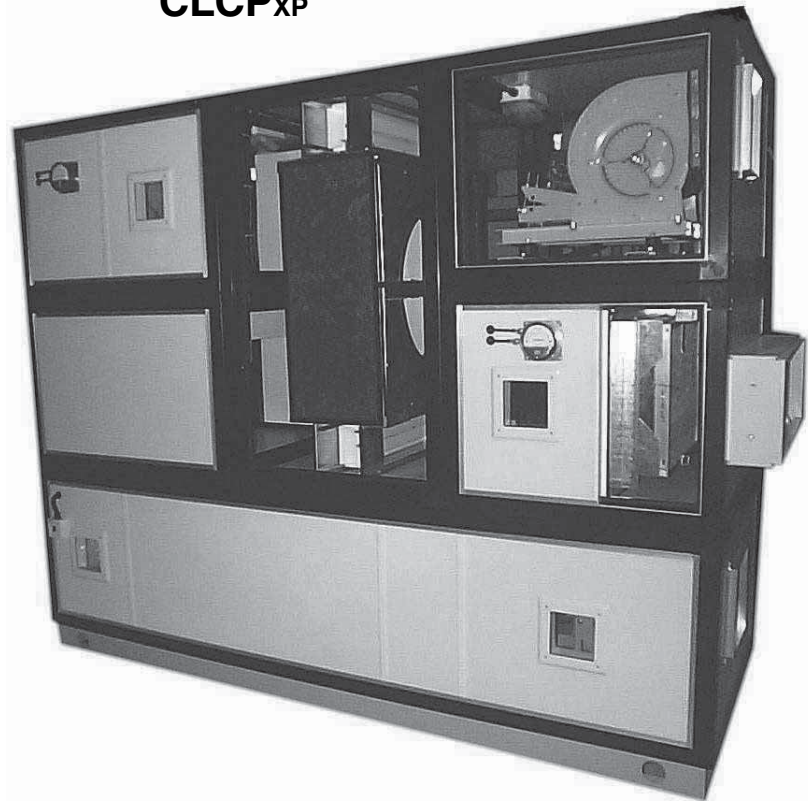
# Installation Operation Maintenance

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## TRANE Quantum™ Air Handler

Model: CLCP<sub>Euro</sub>

CLCP<sub>XP</sub>



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IND-SVN01A-E4  
(Jan 2010)



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## Notice

World environmental scientists have concluded, based on the best currently available evidence, that ozone in our upper atmosphere is being reduced due to the release of CFC fully halogenated compounds.

The Trane Company urges that all HVAC servicers working on Trane equipment, or any manufacturer's products, make very effort to eliminate, if possible, or vigorously reduce the emission of CFC, HCFC and HFC refrigerants to the atmosphere resulting from installation, operation, routine maintenance, or major service on this equipment. Always act in a responsible manner to conserve refrigerants for continued use even when acceptable alternatives are available.

*Refrigerant used in any type of air-conditioning or refrigerating equipment should be recovered for reuse, recovered and / or recycled for reuse, reprocessed (reclaimed), or properly destroyed, whenever it is removed from equipment. Never release to the atmosphere!*

## Safety Considerations

The equipment covered by this manual is designed for safe and reliable operation when installed and operated within its design specification limits. To avoid personal injury or damage to equipment or property while installing or operating this equipment, it is essential that qualified, experienced personnel perform these functions using good judgement and safe practices. *See the following cautionary statement.*

## Warning and Cautions

Notice that WARNING and CAUTION appear at appropriate intervals throughout this manual.



WARNING indicates a potentially hazardous situation that could result in personal injury or death.



CAUTIONs are designed to alert you to conditions that could result in minor personal injury or equipment damage.

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# General Information

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## • Foreword

These installations, operation and maintenance instructions are given as a guide to good practice in the installation, commission into service, operation and periodic maintenance by the user, of TRANE Quantum™ Air Handler. They do not contain full service procedures necessary for the continued successful operation of this equipment; the services of a qualified technician should be employed through the medium of a maintenance contract with a reputable service company.

## • Warranty

Trane's standard warranty covers the equipment. It does not cover damage due to misuse, lack of maintenance, or failure to comply with the manufacturer's instructions or recommendations.

## • Unit Description

TRANE Quantum™ Air Handler are Central Station Air Handlers designed for a variety of controlled air application. The basic unit consists of a fan, heating and/or cooling coils, filters and air dampers. See product catalogue for list of available modules and options.

The TRANE Quantum™ Air Handler are designed for cooling load conditions of 1000-65000 nominal CFM. Fans are double width, double inlet, centrifugal types with forward curved, backward curved, and airfoil blade designs.

To insure fan motor assembly stability the unit ships with shipping brackets

located between the fan support frame. These spacers must be removed prior to fan operation, to assure proper vibration isolation.

Units ship as complete units, sections or subassemblies. Each section is provided with a nameplate (label) which includes type of section, unit serial number, customer tag number and unit model number.



# CLCP<sub>XP</sub> Model Nomenclature

EG.: CLCPxp--1203218CM`FDA0200F`1A1D`A020A11Z  
22802`AAA`WLO4144X`WLO4144X`WLO4144X`A

DIGIT	Description
1, 2, 3	CLC = Climate Changer
4	P = Development sequence
5, 6	xp = X'tra Performance.
7, 8	- - = For future use
9,10,11	Casing Sizes : 003 / 004 / 006 / 008 / 010 / 012 / 014 / 016 / 020 / 025 / 030 / 035 / 040 / 045 060 / 065 / 070 / 080 / 085 / 090 / 095 / 100 / 110 / 120
12,13,14,15	Casing parametric dimension 0404 (003) 1004 (008) 1206 (014) 1210 (025) 1612 (040) 2014 (060) 2614 (080) 3214 (095) 3218 (120) 0604 (004) 0806 (010) 1008 (016) 1212 (030) 1812 (045) 2214 (065) 2814 (085) 3216 (100) 0804 (006) 1006 (012) 1208 (020) 1412 (035) 2012 (050) 2414 (070) 3014 (090) 3217 (110)
16	Insulation: C = 50mm PU Insulation
17	Country of Origin: M = Malaysia C = China
18,19,20	Fan Models : FDA ADA BDB BNA ANA SSS = Special XXX = None
21,22,23,24	Fan size 0200 0280 0400 0560 0800 1120 XXXX=None 0225 0315 0450 0630 0900 1250 0250 0355 0500 0710 1000 1400
25	Fan / Bearing Type A=S C=S2 E=SM G=TM I=TX K=S2M M=T2M X=None B=C D=C2 F=CM H=XM J=XX L=C2M N=XZM
26	Fan Arrangement 1=ARR 1 3=ARR 3 5=ARR 5 7=ARR 7 9=ARR 9 B=ARR 11 X=None 2=ARR 2 4=ARR 4 6=ARR 6 8=ARR 8 A=ARR 10 C=ARR 12 S=Special
27,28	Motor Frame , kW & Pole A1=#63, 0.18kW, 4P, eff2 I1=#112M, 3.7kW, 4P, eff2 Q1=#200L, 30.0kW, 4P, eff2 A2=#63, 0.18kW, 2P, eff2 I2=#112M, 3.7kW, 2P, eff2 B1=#71, 0.37kW, 4P, eff2 J1=#112M, 4.0kW, 4P, eff2 R1=#225S, 37.0kW, 4P, eff2 B2=#71, 0.37kW, 2P, eff2 J2=#112M, 4.0kW, 2P, eff2 C1=#80, 0.55kW, 4P, eff2 K1=#132S, 5.5kW, 4P, eff2 T1=#225M, 45.0kW, 4P, eff2 C2=#71, 0.55kW, 2P, eff2 K2=#132S, 5.5kW, 2P, eff2 D1=#80, 0.75kW, 4P, eff2 L1=#132M, 7.5kW, 4P, eff2 U1=#250S, 55.0kW, 4P, eff2 D2=#80, 0.75kW, 2P, eff2 L2=#132S, 7.5kW, 2P, eff2 E1=#90S, 1.1kW, 4P, eff2 M1=#160M, 11.0kW, 4P, eff2 V1=#250M, 75.0kW, 4P, eff2 E2=#80, 1.1kW, 2P, eff2 M2=#160M, 11.0kW, 2P, eff2 F1=#90L, 1.5kW, 4P, eff2 N1=#160L, 15.0kW, 4P, eff2 W1=#280SC, 90.0kW, 4P, eff2 F2=#90S, 1.5kW, 2P, eff2 N2=#160M, 15.0kW, 2P, eff2 G1=#100L, 2.2kW, 4P, eff2 O1=#180M, 18.5kW, 4P, eff2 Y1=#280MC, 110.0kW, 4P, eff2 G2=#90L, 2.2kW, 2P, eff2 O2=#160L, 18.5kW, 2P, eff2 H1=#100L, 3.0kW, 4P, eff2 P1=#180L, 22.0kW, 4P, eff2 Z1=#315SC, 132.0kW, 4P, eff2 H2=#100L, 3.0kW, 2P, eff2 P2=#180M, 22.0kW, 2P, eff2  A3=#63, 0.18kW, 4P, eff1 I3=#112M, 3.7kW, 4P, eff1 Q3=#200L, 30.0kW, 4P, eff1 A4=#63, 0.18kW, 2P, eff1 I4=#112M, 3.7kW, 2P, eff1 B3=#71, 0.37kW, 4P, eff1 J3=#112M, 4.0kW, 4P, eff1 R3=#225SC, 37.0kW, 4P, eff1 B4=#71, 0.37kW, 2P, eff1 J4=#112M, 4.0kW, 2P, eff1 C3=#80, 0.55kW, 4P, eff1 K3=#132S, 5.5kW, 4P, eff1 T3=#225M, 45.0kW, 4P, eff1 C4=#71, 0.55kW, 2P, eff1 K4=#132S, 5.5kW, 2P, eff1 D3=#80, 0.75kW, 4P, eff1 L3=#132M, 7.5kW, 4P, eff1 U3=#250S, 55.0kW, 4P, eff1 D4=#80, 0.75kW, 2P, eff1 L4=#132S, 7.5kW, 2P, eff1 E3=#90S, 1.1kW, 4P, eff1 M3=#160M, 11.0kW, 4P, eff1 V3=#250M, 75.0kW, 4P, eff1 E4=#80, 1.1kW, 2P, eff1 M4=#160M, 11.0kW, 2P, eff1 F3=#90L, 1.5kW, 4P, eff1 N3=#160L, 15.0kW, 4P, eff1 W3=#280SC, 90.0kW, 4P, eff1 F4=#90S, 1.5kW, 2P, eff1 N4=#160M, 15.0kW, 2P, eff1 G3=#100L, 2.2kW, 4P, eff1 O3=#180M, 18.5kW, 4P, eff1 Y3=#280MC, 110.0kW, 4P, eff1 G4=#90L, 2.2kW, 2P, eff1 O4=#160L, 18.5kW, 2P, eff1 H3=#100L, 3.0kW, 4P, eff1 P3=#180L, 22.0kW, 4P, eff1 Z3=#315SC, 132.0kW, 4P, eff1 H4=#100L, 3.0kW, 2P, eff1 P4=#180M, 22.0kW, 2P, eff1 XX=None SS = Special
29	Electrical rating of motor : Volt/Phase/Hz. D=380 - 415 V / 3 Ph / 50 Hz E=200V / 3 Ph / 50 Hz F=230V / 3 Ph / 60 Hz G=380V / 3 Ph / 60 Hz H=440V / 3 Ph / 60 Hz J=460V / 3 Ph / 60 Hz K=480V / 3 Ph / 60 Hz L= 200V / 3Ph / 60Hz X=None
30	Fan Pulley Size
31,32,33	Fan shaft diameter
34	Motor Pulley Size
35,36	Motor shaft diameter
37	Belt type A=SPA B=SPB C=SPC Z=SPZ X=None
38,39,40,41	Belt length, - - - mm
42	Pulley Grooves 1=1Groove 2=2Groove 3=3Groove 4=4Groove 5=5Groove X=None
43	Pre-Filter Media A=2"Pleated 30% B=2"Washable 20% C=2" Aluminum D=4"Pleated 30% S=SPECIAL X=None
44, 45	Filter Media # 1 , Filter Media # 2 A=2"Pleated 30% F=Hepa 99.99% K=4"Cartridge 85% P=12"Cartridge 65% U=Biocell B=2"Washable 20% G=15" Bag 60-65% L=4"Cartridge 95% Q=12"Cartridge 85% V=PTFE C=2" Aluminum H=15" Bag 85% M=21" Bag 60-65% R=12"Cartridge 95% X=None D=4"Pleated 30% I=15" Bag 95% N=21" Bag 85% S=Carbon E=Hepa 99.97% J=4"Cartridge 65% O=21"Bag 95% T=Special Media
46	Coil Section # 1 , Type : W = WL (1/2"Tube) ; L = LL(1/2"Tube) ; D = DL(1/2"Tube) ; F =FD(1/2"Tube) ; A = A(1/2"Tube) ; B = AA(1/2"Tube) , S = Special , X = Without Coil P = WL (5/8"Tube) ; Q = LL(5/8"Tube) ; R = DL(5/8"Tube) ; T =FD(5/8"Tube) ; U = A(5/8"Tube) ; V = AA(5/8"Tube)
47	Coil Connection : L = LH Side R = RH Side B = Both Sides X = None
48,49	Coil Rows : 01=1row 02= 2row 04= 4row 06= 6row 08= 8row 10= 10row 12= 12row XX = without coil
50,51,52	Coil Fin Series(FPF) : 100 - 168 Fins per Foot XXX = without coil SSS= Special
53	Coil Turbulator : X = No Y = Yes
54	Coil Section # 2 , Type : W = WL (1/2"Tube) ; L = LL(1/2"Tube) ; D = DL(1/2"Tube) ; F =FD(1/2"Tube) ; A = A(1/2"Tube) ; B = AA(1/2"Tube) , S = Special , X = Without Coil P = WL (5/8"Tube) ; Q = LL(5/8"Tube) ; R = DL(5/8"Tube) ; T =FD(5/8"Tube) ; U = A(5/8"Tube) ; V = AA(5/8"Tube)
55	Coil Connection : L = LH Side R = RH Side B = Both Sides X = None
56, 57	Coil Rows : 01=1row 02= 2row 04= 4row 06= 6row 08= 8row 10= 10row 12= 12row XX = without coil
58, 59, 60	Coil Fin Series(FPF) : 100 - 168 Fins per Foot XXX = without coil SSS= Special
61	Coil Turbulator : X = No Y = Yes
62	Coil Section # 3 , Type : W = WL (1/2"Tube) ; L = LL(1/2"Tube) ; D = DL(1/2"Tube) ; F =FD(1/2"Tube) ; A = A(1/2"Tube) ; B = AA(1/2"Tube) , S = Special , X = Without Coil P = WL (5/8"Tube) ; Q = LL(5/8"Tube) ; R = DL(5/8"Tube) ; T =FD(5/8"Tube) ; U = A(5/8"Tube) ; V = AA(5/8"Tube)
63	Coil Connection : L = LH Side R = RH Side B = Both Sides X = None
64, 65	Coil Rows : 01=1row 02= 2row 04= 4row 06= 6row 08= 8row 10= 10row 12= 12row XX = without coil
66, 67, 68	Coil Fin Series(FPF) : 100 - 168 Fins per Foot XXX = without coil SSS= Special
69	Coil Turbulator : X = No Y = Yes
70	Service digit A = present Model Nomenclature Revision, First Issue Nov, 09



# CLCP<sub>EURO</sub> Model Nomenclature

eg.: CLCPeuro 0030404DM`FDA0200F`1A1D`A020A11Z  
22802`AAA`WLO4144X`WLO4144X`WLO4144X`C

DIGIT	Description
1, 2, 3	CLC = Climate Changer
4	P = Development sequence
5, 6, 7, 8	euro = Eurovent Certified
9, 10, 11	Casing Sizes : 003 / 004 / 006 / 008 / 010 / 012 / 014 / 016 / 020 / 025 / 030 / 035 / 040 / 045 / 050 060 / 065 / 070 / 080 / 085 / 090 / 095
12, 13, 14, 15	Casing parametric dimension: 0404 (003) 1004 (008) 1206 (014) 1210 (025) 1612 (040) 2014 (060) 2614 (080) 3214 (095) 0604 (004) 0806 (010) 1008 (016) 1212 (030) 1812 (045) 2214 (065) 2814 (085) 0804 (006) 1006 (012) 1208 (020) 1412 (035) 2012 (050) 2414 (070) 3014 (090)
16	Insulation: A = 25mm PU Insulation C = 50mm PU Insulation+Stealth Insulator S = Special B = 25mm PU Insulation+Stealth Insulator D = 50 mm Thermal Break (Eurovent)
17	Country of Origin: M = Malaysia C = China
18, 19, 20	Fan Models : FDA ADA BDB BNA ANA SSS = Special XXX = None
21, 22, 23, 24	Fan sizes: 0200 0280 0400 0560 0800 1120 XXXX=None 0225 0315 0450 0630 0900 1250 0250 0355 0500 0710 1000 1400
25	Fan / Bearing Type A=S C=S2 E=SM G=TM I=TX K=S2M M=T2M X=None B=C D=C2 F=CM H=XM J=XX L=C2M N=X2M
26	Fan Arrangement 1=ARR 1 3=ARR 3 5=ARR 5 7=ARR 7 9=ARR 9 B=ARR 11 X=None 2=ARR 2 4=ARR 4 6=ARR 6 8=ARR 8 A=ARR 10 C=ARR 12 5=Special
27, 28	Motor Frame , kW & Pole A1=#63, 0.18kW, 4P, eff2 I1=#112M, 3.7kW, 4P, eff2 Q1=#200L, 30.0kW, 4P, eff2 A2=#63, 0.18kW, 2P, eff2 I2=#112M, 3.7kW, 2P, eff2 B1=#71, 0.37kW, 4P, eff2 J1=#112M, 4.0kW, 4P, eff2 R1=#225S, 37.0kW, 4P, eff2 B2=#71, 0.37kW, 2P, eff2 J2=#112M, 4.0kW, 2P, eff2 C1=#80, 0.55kW, 4P, eff2 K1=#132S, 5.5kW, 4P, eff2 T1=#225M, 45.0kW, 4P, eff2 C2=#71, 0.55kW, 2P, eff2 K2=#132S, 5.5kW, 2P, eff2 D1=#80, 0.75kW, 4P, eff2 L1=#132M, 7.5kW, 4P, eff2 U1=#250S, 55.0kW, 4P, eff2 D2=#80, 0.75kW, 2P, eff2 L2=#132S, 7.5kW, 2P, eff2 E1=#90S, 1.1kW, 4P, eff2 M1=#160M, 11.0kW, 4P, eff2 V1=#250M, 75.0kW, 4P, eff2 E2=#80, 1.1kW, 2P, eff2 M2=#160M, 11.0kW, 2P, eff2 F1=#90L, 1.5kW, 4P, eff2 N1=#160L, 15.0kW, 4P, eff2 W1=#280SC, 90.0kW, 4P, eff2 F2=#90S, 1.5kW, 2P, eff2 N2=#160M, 15.0kW, 2P, eff2 G1=#100L, 2.2kW, 4P, eff2 O1=#180M, 18.5kW, 4P, eff2 Y1=#280MC, 110.0kW, 4P, eff2 G2=#90L, 2.2kW, 2P, eff2 O2=#160L, 18.5kW, 2P, eff2 H1=#100L, 3.0kW, 4P, eff2 P1=#180L, 22.0kW, 4P, eff2 Z1=#315SC, 132.0kW, 4P, eff2 H2=#100L, 3.0kW, 2P, eff2 P2=#180M, 22.0kW, 2P, eff2 A3=#63, 0.18kW, 4P, eff1 I3=#112M, 3.7kW, 4P, eff1 Q3=#200L, 30.0kW, 4P, eff1 A4=#63, 0.18kW, 2P, eff1 I4=#112M, 3.7kW, 2P, eff1 B3=#71, 0.37kW, 4P, eff1 J3=#112M, 4.0kW, 4P, eff1 R3=#225SC, 37.0kW, 4P, eff1 B4=#71, 0.37kW, 2P, eff1 J4=#112M, 4.0kW, 2P, eff1 C3=#80, 0.55kW, 4P, eff1 K3=#132S, 5.5kW, 4P, eff1 T3=#225M, 45.0kW, 4P, eff1 C4=#71, 0.55kW, 2P, eff1 K4=#132S, 5.5kW, 2P, eff1 D3=#80, 0.75kW, 4P, eff1 L3=#132M, 7.5kW, 4P, eff1 U3=#250S, 55.0kW, 4P, eff1 D4=#80, 0.75kW, 2P, eff1 L4=#132S, 7.5kW, 2P, eff1 E3=#90S, 1.1kW, 4P, eff1 M3=#160M, 11.0kW, 4P, eff1 V3=#250M, 75.0kW, 4P, eff1 E4=#80, 1.1kW, 2P, eff1 M4=#160M, 11.0kW, 2P, eff1 F3=#90L, 1.5kW, 4P, eff1 N3=#160L, 15.0kW, 4P, eff1 W3=#280SC, 90.0kW, 4P, eff1 F4=#90S, 1.5kW, 2P, eff1 N4=#160M, 15.0kW, 2P, eff1 G3=#100L, 2.2kW, 4P, eff1 O3=#180M, 18.5kW, 4P, eff1 Y3=#280MC, 110.0kW, 4P, eff1 G4=#90L, 2.2kW, 2P, eff1 O4=#160L, 18.5kW, 2P, eff1 H3=#100L, 3.0kW, 4P, eff1 P3=#180L, 22.0kW, 4P, eff1 Z3=#315SC, 132.0kW, 4P, eff1 H4=#100L, 3.0kW, 2P, eff1 P4=#180M, 22.0kW, 2P, eff1 XX=None SS = Special
29	Electrical rating of motor : Volt/Phase/Hz. D=380 - 415 V / 3 Ph / 50 Hz E=200V / 3 Ph / 50 Hz F=230V / 3 Ph / 60 Hz G=380V / 3 Ph / 60 Hz H=440V / 3 Ph / 60 Hz J=460V / 3 Ph / 60 Hz K=480V / 3 Ph / 60 Hz L= 200V / 3Ph / 60Hz X=None
30	Fan Pulley Size
31, 32, 33	Fan shaft diameter
34	Motor Pulley Size
35, 36	Motor shaft diameter
37	Belt type A=SPA B=SPB C=SPC Z=SPZ X=None
38, 39, 40, 41	Belt length, - - - mm
42	Pulley Grooves 1=1Groove 2=2Groove 3=3Groove 4=4Groove 5=5Groove X=None
43	Pre-Filter Media A=2"Pleated 30% B=2"Washable 20% C=2" Aluminum D=4"Pleated 30% S=SPECIAL X=None
44, 45	Filter Media # 1 , Filter Media # 2 A=2"Pleated 30% F=Hepa 99.99% K=4"Cartridge 85% P=12"Cartridge 65% U=Biocell B=2"Washable 20% G=15" Bag 60-65% L=4"Cartridge 95% Q=12"Cartridge 85% V=PTFE C=2" Aluminum H=15" Bag 85% M=21" Bag 60-65% R=12"Cartridge 95% X=None D=4"Pleated 30% I=15" Bag 95% N=21" Bag 85% S=Carbon E=Hepa 99.97% J=4"Cartridge 65% O=21"Bag 95% T=Special Media
46	Coil Section # 1 , Type : W = WL (1/2"Tube) ; L = LL(1/2"Tube) ; D = DL(1/2"Tube) ; F =FD(1/2"Tube) ; A = A(1/2"Tube) ; B = AA(1/2"Tube) , S = Special , X = Without Coil
47	Coil Connection : L = LH Side R = RH Side B = Both Sides X = None
48, 49	Coil Rows : 01=1row 02= 2row 04= 4row 06= 6row 08= 8row 10= 10row 12= 12row XX = without coil
50, 51, 52	Coil Fin Series(FPF) : 100 - 168 Fins per Foot XXX = without coil SSS= Special
53	Coil Turbulator : X = No Y = Yes
54	Coil Section # 2 , Type W = WL (1/2"Tube) ; L = LL(1/2"Tube) ; D = DL(1/2"Tube) ; F =FD(1/2"Tube) ; A = A(1/2"Tube) ; B = AA(1/2"Tube) , S = Special , X = Without Coil
55	Coil Connection : L = LH Side R = RH Side B = Both Sides X = None
56, 57	Coil Rows : 01=1row 02= 2row 04= 4row 06= 6row 08= 8row 10= 10row 12= 12row XX = without coil
58, 59, 60	Coil Fin Series(FPF) : 100 - 168 Fins per Foot XXX = without coil SSS= Special
61	Coil Turbulator : X = No Y = Yes
62	Coil Section # 3 , Type W = WL (1/2"Tube) ; L = LL(1/2"Tube) ; D = DL(1/2"Tube) ; F =FD(1/2"Tube) ; A = A(1/2"Tube) ; B = AA(1/2"Tube) , S = Special , X = Without Coil
63	Coil Connection : L = LH Side R = RH Side B = Both Sides X = None
64, 65	Coil Rows : 01=1row 02= 2row 04= 4row 06= 6row 08= 8row 10= 10row 12= 12row XX = without coil
66, 67, 68	Coil Fin Series(FPF) : 100 - 168 Fins per Foot XXX = without coil SSS= Special
69	Coil Turbulator : X = No Y = Yes
70	Service digit, C = present

# Receiving

## • Nameplate

All of TRANE Quantum™ Air Handler are identified by a multiple-character model number. Its use enables owner/operator, installing contractors, and service technicians to define the operation, components and options for a particular unit. Be sure to refer to the information printed on the unit nameplate (figure1) when ordering replacement or requesting service.

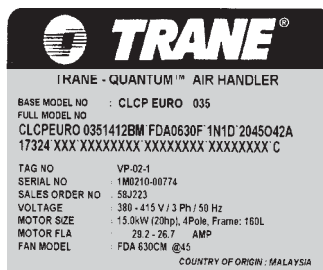


Figure 1

## • Delivery Check

All unit sections are securely fasten to skids for shipping and handling purpose.

Upon receipt of the unit(s), inspect for damage that may have occurred during shipment and any items, which were ordered but did not arrive with the unit. Complete the following checks:

1. Visually inspect the exterior unit casing and all accessories for any dents, punctures or shipping and handling damage.
2. Cut all banding (if applicable) loose from skid, but do not remove the skids.
3. Check all access doors to confirm that they are secured with latches.
4. Manually rotate the fan wheel to ensure free movement of the shaft and bearings  
Inspect the fan housing for any foreign objects.
5. Inspect the coil(s) for fin damage.

## • Resolving Shipping damage

If damage is found or items are missing:

1. Report all claims of shipping damage to the delivering carrier (transporter) immediately, and schedule an inspection.
2. Make specific notations concerning the damage on the freight bill.
3. Keep damaged material in the same location as received. It is the receiver's responsibility to provide reasonable evidence that damage was not incurred after delivery.
4. Photograph damage if possible.
5. Do not move or discard damaged freight packaging materials.
6. Notify the Trane sales representative of the damage and arrange for repair. Do not attempt and arrange for repair. Do not attempt to repair the unit without consulting the sales representative. **TRANE IS NOT RESPONSIBLE FOR SHIPPING DAMAGE.**

## • Storage Considerations

When storing a TRANE Quantum™ Air Handler, for a period of time before installation, it must be protected. **The warranty will not cover damages to the unit do to negligence during storage.** Indoor storage is ideal and requires only a few special precautions.

To protect the unit from damage due to the elements and prevent it from possibly becoming a contaminant source for indoor air quality (IAQ)

problems, the unit should be stored indoors.

When outdoor storage is necessary, several things must be done to prevent damage.

## • Outdoor Storage

1. Select a well-drained area, preferably a concrete pad or blacktop surface.
2. Place the unit(s) on a dry surface or raised off the ground to assure adequate air circulation beneath unit and to assure that no portion of the unit contacts standing water at any time.
3. Allow proper clearance around the unit to perform periodic inspection and maintenance of the equipment while in storage.
4. Keep the equipment in the original shipping container for protection and ease of handling.
5. Cover the unit securely with a **CANVAS** tarp.
6. Ensure that the canvas tarp is secure.
7. Do not stack units.
8. Do not pile other material on the units.
9. Loosen belt tension on drive belts.





# Rigging and Handling

## Rigging and Handling

Confirm that factory installed (if any) attachment brackets are in place and screws tight, before rigging. The unit will ship either assembled or as sections. Before preparing the unit for lifting, estimate the approximate center of gravity for lifting safety. Because of placement of internal components, the unit weight may be unevenly distributed, with more weight in the coil and fan area. Approximate unit weights are given in Appendix A & B.

Always apply good rigging procedures when lifting a unit. Before hoisting the unit into position, be sure that a proper method of rigging is used, with straps or slings and spreader bars for protection and safety during lifting. Always test-lift the unit to determine exact unit balance and stability before hoisting it to the installation location.


 <b>WARNING</b>
<p>NEVER ASSEMBLE OR BOLT SECTIONS OR SUBASSEMBLIES TOGETHER BEFORE RIGGING. ALWAYS RIG SECTIONS OR SUBASSEMBLIES AS RECEIVED FROM THE FACTORY.</p>

 <b>WARNING</b>
<p>DO NOT LIFT THE UNIT WITHOUT TEST-LIFT FOR BALANCE AND RIGGING. DO NOT LIFT THE UNIT ABOVE PERSONNEL. FAILURE TO OBSERVE THESE WARNINGS MAY RESULT IN PERSONAL INJURY, DEATH OR EQUIPMENT DAMAGE. (See Appendix A &amp; B for components weight).</p>

## Off Loading


A specific lifting method for offloading the units is recommended as follows (See Figure 2):

1. 75mm-diameter lifting holes, or certified lifting lugs, are provided on the unit base frame.
2. ALL LIFTING POINTS in one axis of the unit must be used when offloading and moving the unit.
3. Slings and spreader bars are to be provided by the rigger and attached to ALL LIFTING POINTS.
4. The minimum rated lifting capacity (vertical) of each sling and spreader bar should be no less than the shipping weight.
5. The unit must be lifted with care, avoiding shock load by lifting the unit slowly and evenly.

 <b>WARNING</b>
<p>ENSURE SLINGS DO NOT FOUL ON UNIT PROTRUSIONS.</p> <p>THE CENTRE OF GRAVITY WILL VARY PER UNIT... POSITION THE SLING AND SPREADER BARS CAREFULLY TO COMPENSATE FOR THIS.</p>

## Moving To Position On Site

TRANE Quantum™ Air Handler are supplied in sections modules, flat packed, or as a complete unit, in accordance with the relevant assembly drawings. Any necessary use of force during unloading or movement of the units must only be applied via the unit base frame or shipping pallet.

 <b>WARNING</b>
<p>NEVER LIFT THE UNITS BY COIL CONNECTIONS OR BY ANY OTHER PROTRUSIONS.</p> <p>THE ROOF IS NOT DESIGNED TO BE WALKED ON, BUT IF THIS IS UNAVOIDABLE, ENSURE A MORE EVEN WEIGHT DISTRIBUTION BY THE USE OF BOARDS.</p> <p>FAILURE TO DO SO MAY RESULT IN SEVERE PERSONAL INJURY OR DEATH.</p>

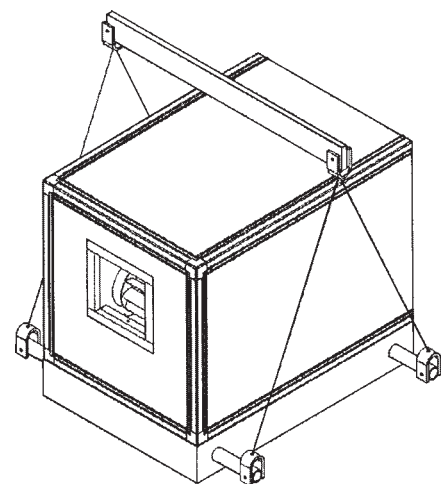


Figure 2

# Rigging and Handling

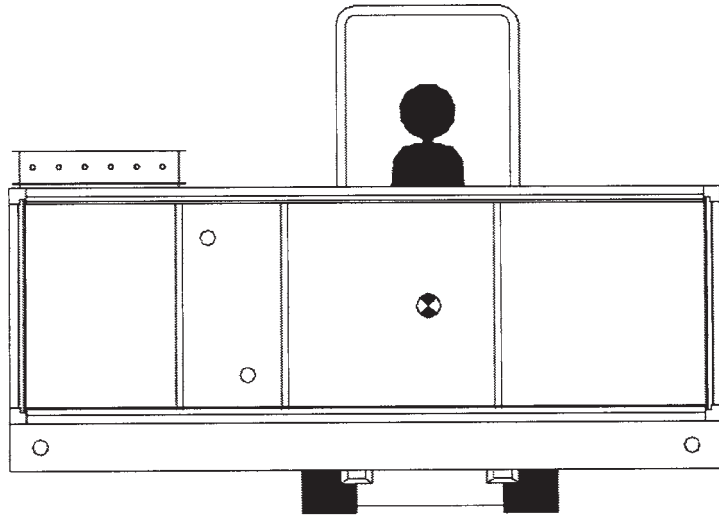
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## Forklift Trucks

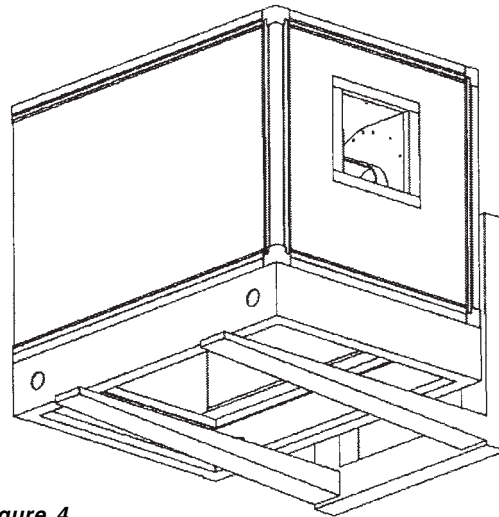
The forks must only be applied under the unit base frame and not against the unit base frame. The lift point should be as near as possible to the centre of gravity (see Figures 3 and 4). In the case of larger units the use of several forklift trucks may be required.

## Roller Movement

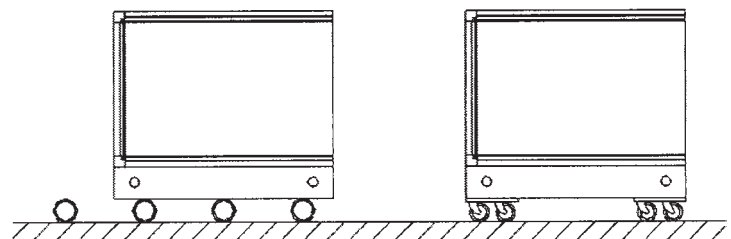
Units fitted with base frames may be moved on roller trolley or tubular rollers (see Figure 5).



*Figure 3*



*Figure 4*



*Figure 5*

# Installation

## Foundation

When selecting and preparing the unit site, follow these guidelines:

1. Ensure that the site can support the total weight of the unit. Unit weight figures only provide total gross weights and do not include the additional weight for water in any coils.
2. Confirm that the foundation of the mounting platform is large enough to include the unit dimensions plus service plus service access.
3. The floor or foundation must be level for correct coil drainage and condensate flow.
4. Provide adequate lighting for maintenance personnel to perform maintenance duties.
5. When the unit is positioned on site, there must be sufficient space around the unit to ensure that correct operation and effective maintenance can be carried out. Figure 6 gives recommended space allowances.
  - On the designated access side of the unit, working areas must have minimum 1 mtr, space (P).
  - Allowance for coil connections, dimension "C" must be dimension 200mm + unit width.
  - A clear unobstructed area before and after an air intake or discharge is required to ensure correct air movement. The width of the area must be  $\geq$  the width of the unit, and the depth (dimension "L") must be  $\geq 0.5 \times$  the overall unit height.

Complete reinforced concrete foundations are suitable or strip foundations may also be used (see Figure 7).

In the case of strip foundations, concrete or steel supports are premissible, but support is required under breakpoints and every 2 m along the unit base.

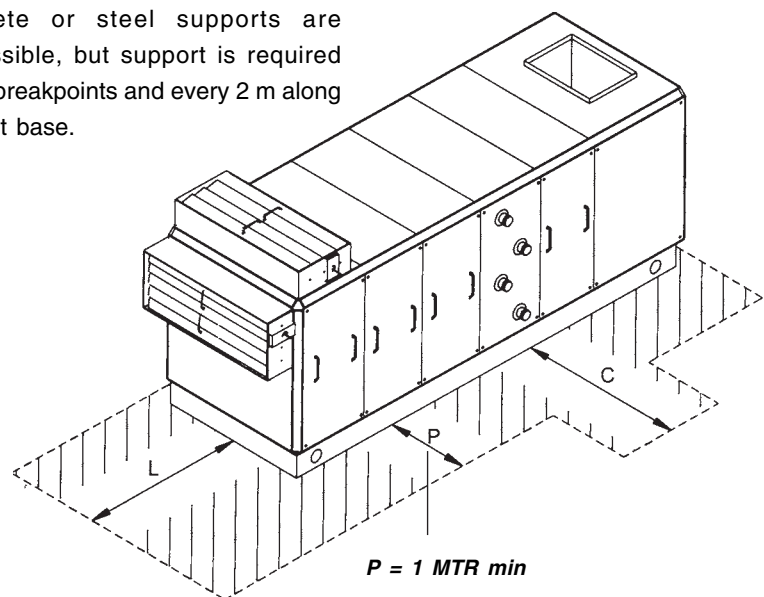


Figure 6

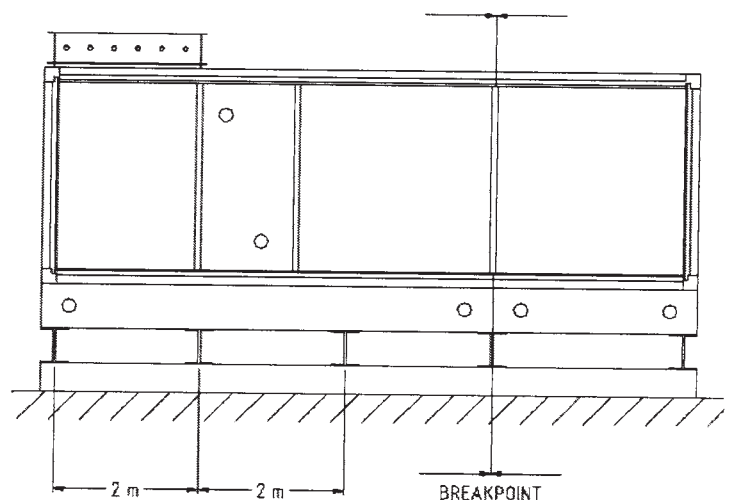


Figure 7 - Air Handling Unit Steels Foundation

# Installation

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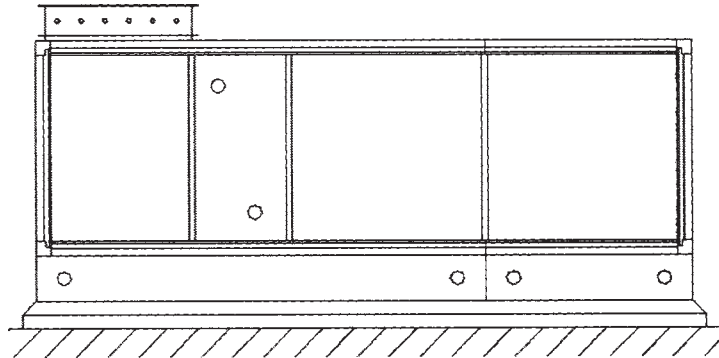


## IMPORTANT

FAILURE TO PROVIDE A LEVEL  
PLINTH OR SUPPORT WILL  
RESULT IN DOORS JAMMING  
AND AIR LEAKS FROM THE  
CASING.

### Erection

To minimize noise transmission, insulation material such as cork slabbing (TICO pads) or rubber pad may be placed between the unit base and the foundation (see Figure 8).



*Figure 8 - Air Handling Unit Plinth Foundation*

# Assembly & Installation

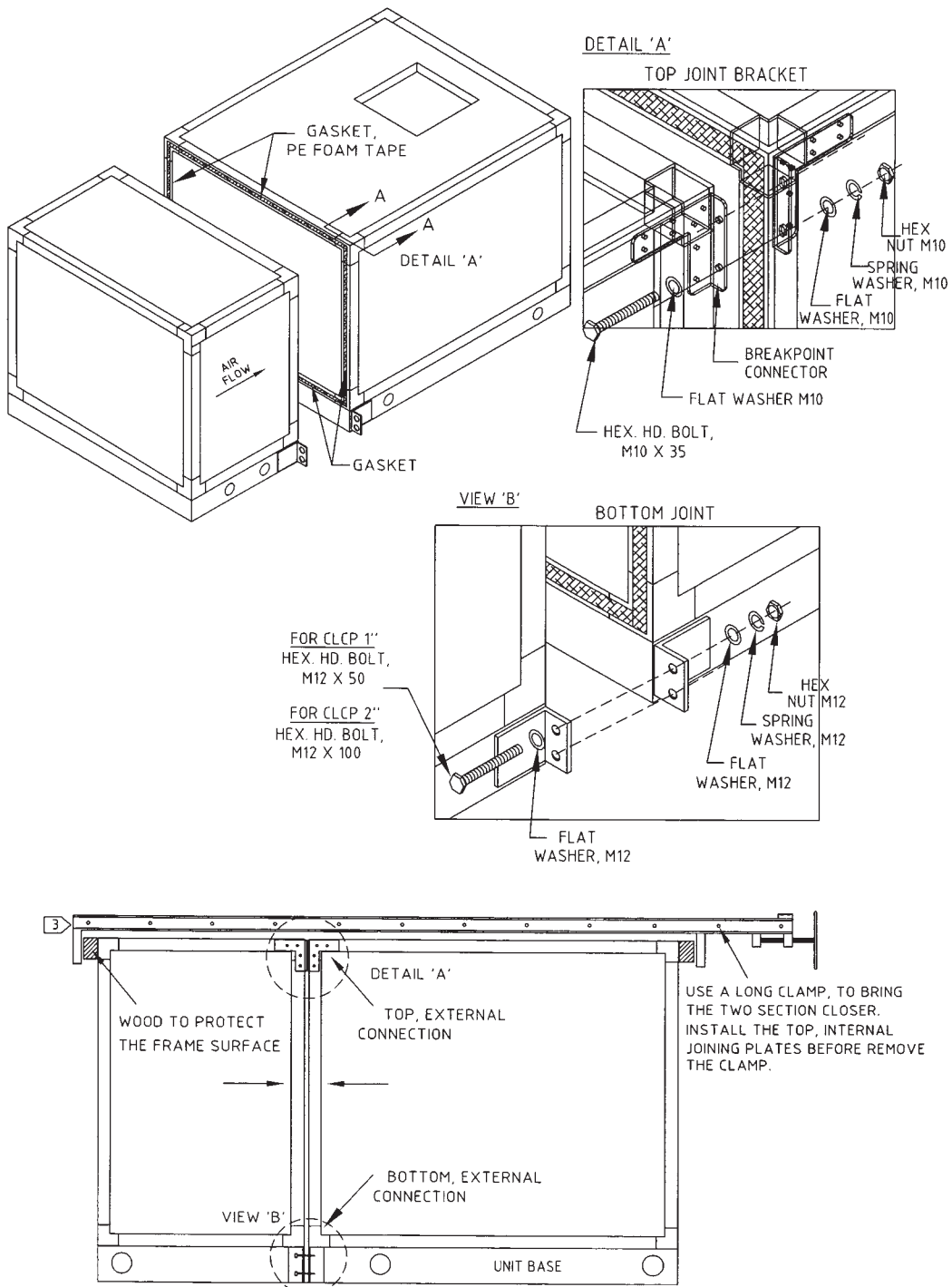
## CLCP<sub>Euro</sub> & CLCP<sub>XP</sub>

(External connection)

**BREAK POINT JOINING METHOD.**

MODULE TO MODULE BREAK  
POINT EXTERNAL JOINING.  
(TO BE DONE AT JOB SITE)

● ENSURE GASKET IS IN-PLACE  
& GOOD CONDITION AT FRAME.

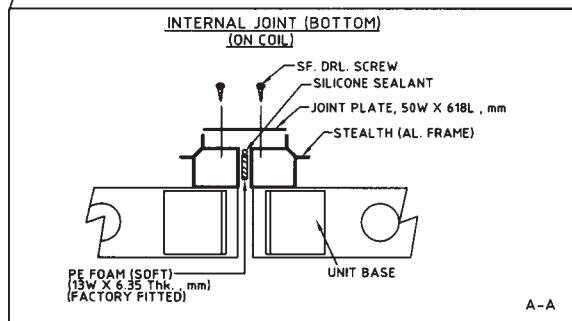
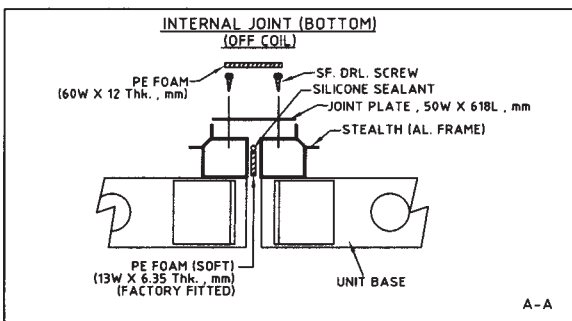
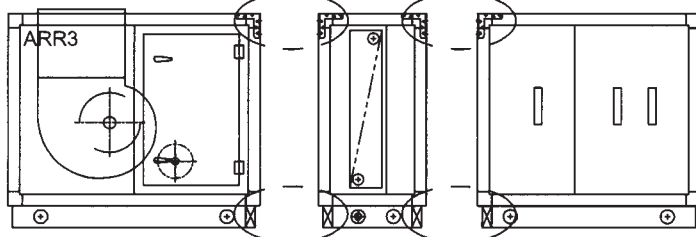
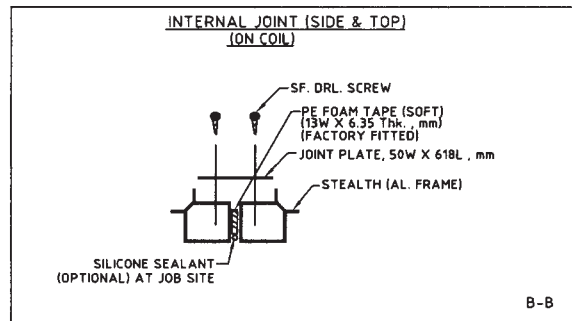
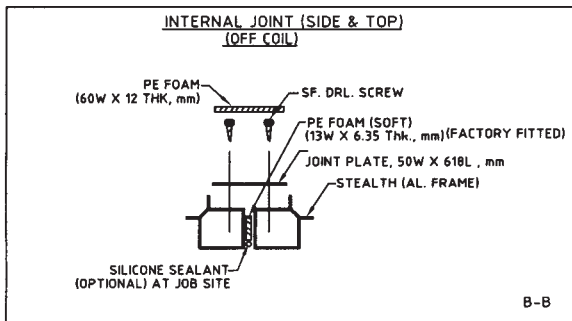
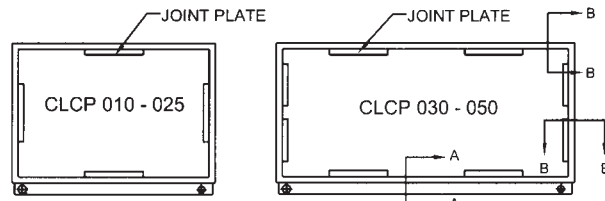


# Assembly & Installation

## CLCP<sub>Euro</sub> Break Point (25mm) - Frame to Frame

### CLCP<sub>Euro</sub>, 1" (25mm) - Break Point Frame to Frame Joining.

MODEL	1 Break Point SHIP WITH UNIT ITEMS				
	① JOINT PLATE (618MM)	② PE FOAM,		③ SF. DRL. SCREW	④ SEALANT TUBE
		MM. LG	5 Meter/Roll		
CLCP 003	-	2480	1	-	1
CLCP 004	-	3100	1	-	1
CLCP 006	-	3720	1	-	1
CLCP 008	-	4340	1	-	1
CLCP 010	4 Pcs	4340	1	24 Pcs	1
CLCP 012		4960	1		1
CLCP 014		5580	2		1
CLCP 016		5580	2		1
CLCP 020		6200	2		1
CLCP 025		6820	2		1
CLCP 030	8 Pcs	7440	2	48 Pcs	1
CLCP 035		8060	2		1
CLCP 040		8680	2		1
CLCP 045		9300	2		1
CLCP 050		9920	2		1

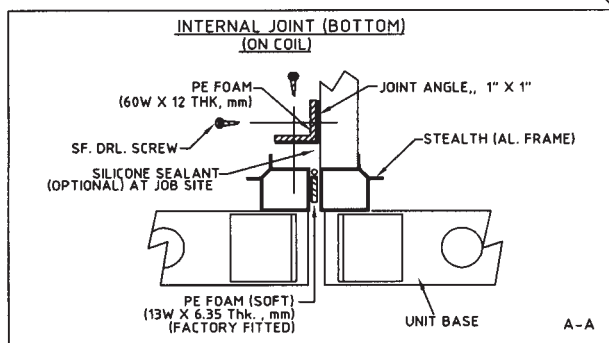
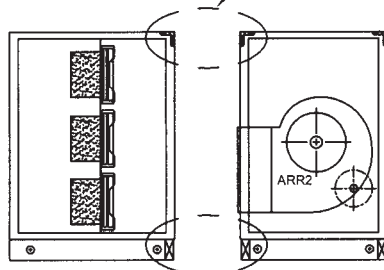
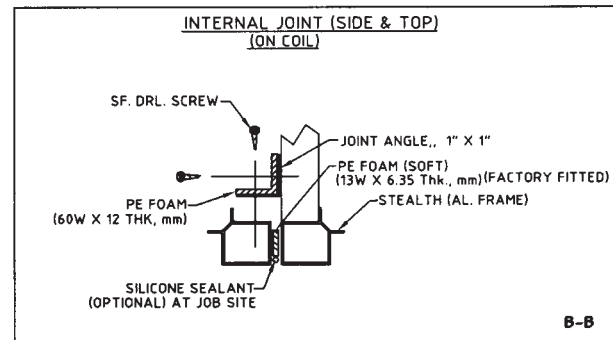
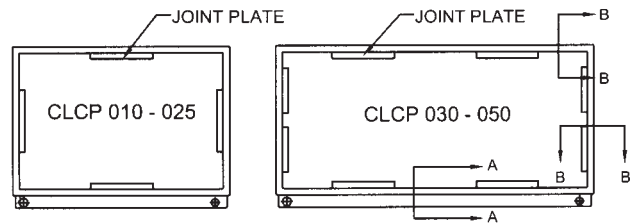


# Assembly & Installation

## CLCP<sub>Euro</sub> Break Point (25mm) - Panel to Frame

CLCP<sub>EURO</sub>, 1" (25mm) - Break Point Panel to Frame Joining.

MODEL	1 Break Point SHIP WITH UNIT ITEMS				
	JOINT PLATE (618MM)	PE FOAM,		SF. DRL. SCREW	SEALANT TUBE
		MM, LG	5 Meter/Roll		
CLCP 003	-	2480	1	-	1
CLCP 004	-	3100	1	-	1
CLCP 006	-	3720	1	-	1
CLCP 008	-	4340	1	-	1
CLCP 010	4 Pcs	4340	1	24 Pcs	1
CLCP 012		4960	1		1
CLCP 014		5580	2		1
CLCP 016		5580	2		1
CLCP 020		6200	2		1
CLCP 025		6820	2		1
CLCP 030	8 Pcs	7440	2	48 Pcs	1
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CLCP 040		8680	2		1
CLCP 045		9300	2		1
CLCP 050		9920	2		1

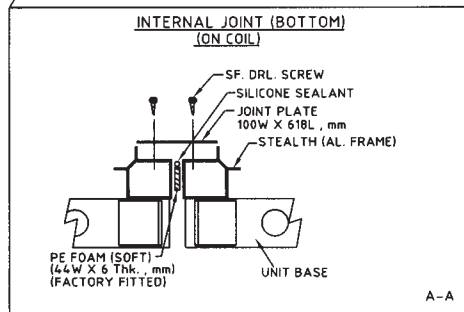
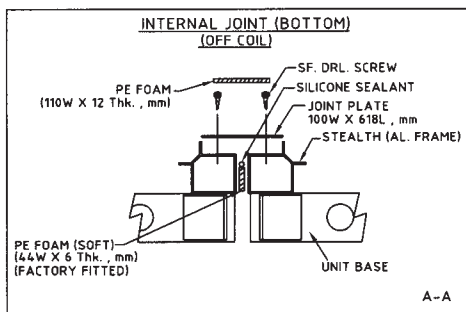
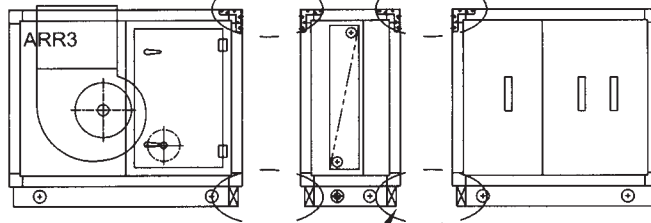
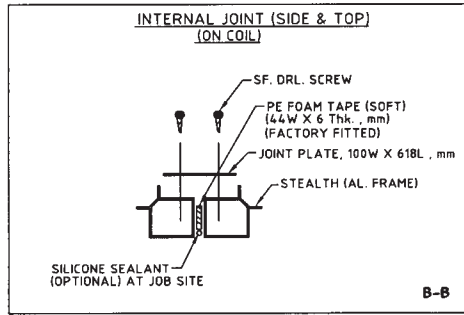
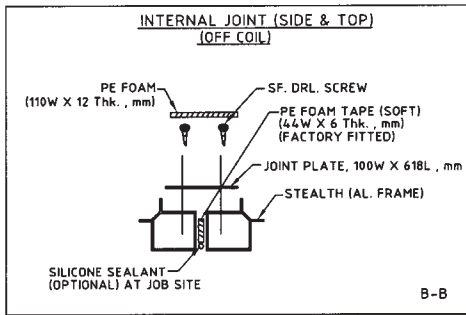
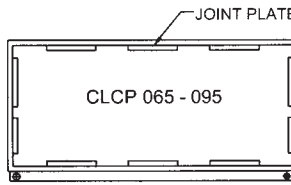
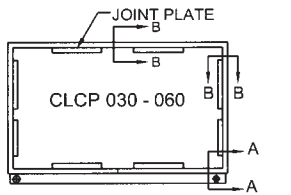
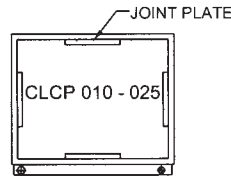


# Assembly & Installation

## CLCP<sub>Euro</sub> Break Point 2" (50mm)- Frame to Frame

### CLCP<sub>Euro</sub>, 2" (50mm) - Break Point Frame to Frame Joining.

MODEL	PER 1 Break Point SHIP WITH UNIT ITEMS				
	① JOINT PLATE (618MM)	② PE FOAM		③ SF. DRL. SCREW	④ SEALANT TUBE
		MM, LG	5 Meter/Roll		
CLCP 003	-	2480	1	-	1
CLCP 004	-	3100	1	-	1
CLCP 006	-	3720	1	-	1
CLCP 008	-	4340	1	-	1
CLCP 010	4 Pcs	4340	1	24 Pcs	1
CLCP 012		4960	1		1
CLCP 014		5580	2		1
CLCP 016		5580	2		1
CLCP 020		6200	2		1
CLCP 025		6820	2		1
CLCP 030	8 Pcs	7440	2	48 Pcs	1
CLCP 035		8060	2		1
CLCP 040		8680	2		1
CLCP 045		9300	2		1
CLCP 050		9920	2		1
CLCP 060		10540	3		1
CLCP 065	10 Pcs	11160	3	60 Pcs	2
CLCP 070		11780	3		2
CLCP 080		12400	3		2
CLCP 085		13020	3		2
CLCP 090		13640	3		2
CLCP 095		14260	3		2



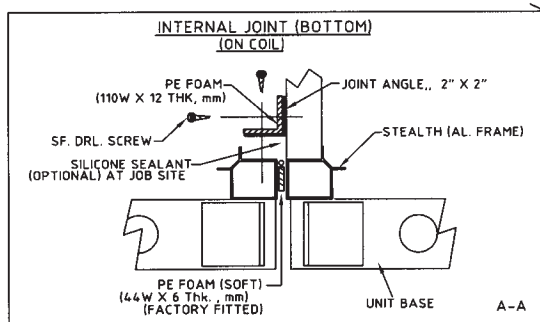
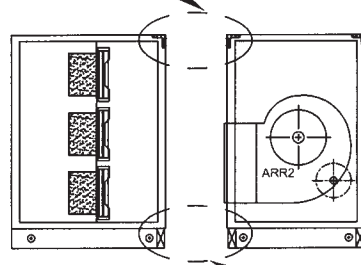
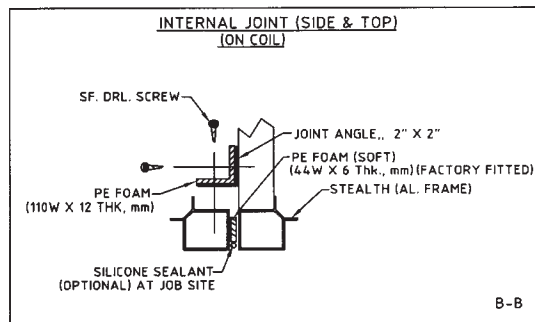
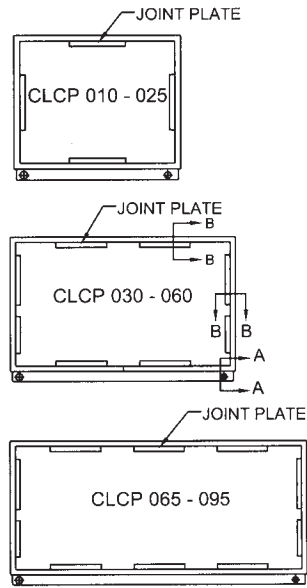


# Assembly & Installation

## CLCP<sub>Euro</sub> Break Point 2" (50mm)- Panel to Frame

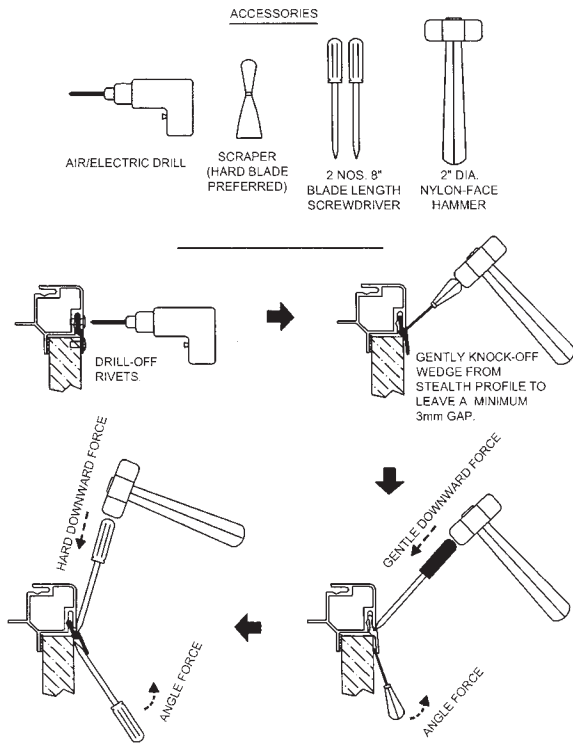
### CLCP<sub>Euro</sub>, 2" (50mm) - Break Point Panel to Frame Joining.

MODEL	PER 1 Break Point SHIP WITH UNIT ITEMS				
	①	②		③	④
	JOINT PLATE (618MM)	PE FOAM		SF. DRL. SCREW	SEALANT TUBE
	MM, LG	5 Meter/Roll			
CLCP 003	-	2480	1	-	1
CLCP 004	-	3100	1	-	1
CLCP 006	-	3720	1	-	1
CLCP 008	-	4340	1	-	1
CLCP 010	4 Pcs	4340	1	24 Pcs	1
CLCP 012		4960	1		1
CLCP 014		5580	2		1
CLCP 016		5580	2		1
CLCP 020		6200	2		1
CLCP 025		6820	2		1
CLCP 030	8 Pcs	7440	2	48 Pcs	1
CLCP 035		8060	2		1
CLCP 040		8680	2		1
CLCP 045		9300	2		1
CLCP 050		9920	2		1
CLCP 060		10540	3		1
CLCP 065	10 Pcs	11160	3	60 Pcs	2
CLCP 070		11780	3		2
CLCP 080		12400	3		2
CLCP 085		13020	3		2
CLCP 090		13640	3		2
CLCP 095		14260	3		2



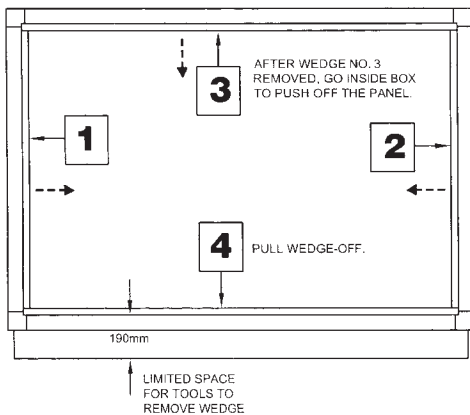
# Assembly & Installation CLCP<sub>Euro</sub> Paneling

## REMOVING WEDGE METHODOLOGY

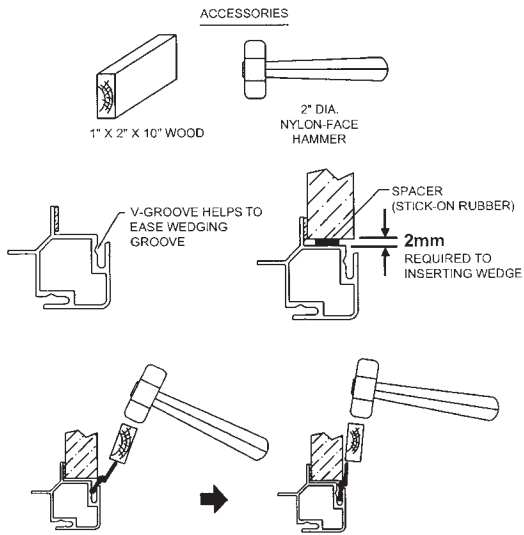


## REMOVING WEDGE METHODOLOGY

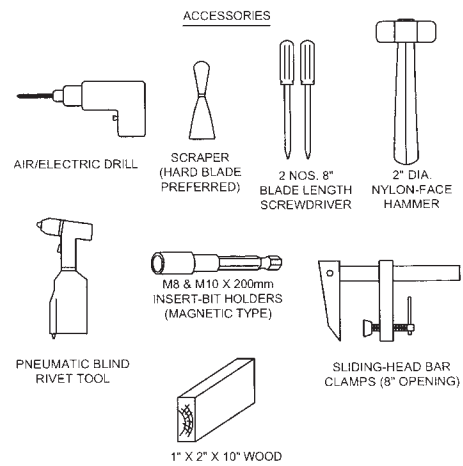
### SEQUENCE TO REMOVE WEDGES



## INSERTING WEDGE METHODOLOGY



## ACCESSORIES TO DISMANTLE & ASSEMBLE CLCP



## PERSONAL PROTECTION EQUIPMENTS



# Assembly & Installation

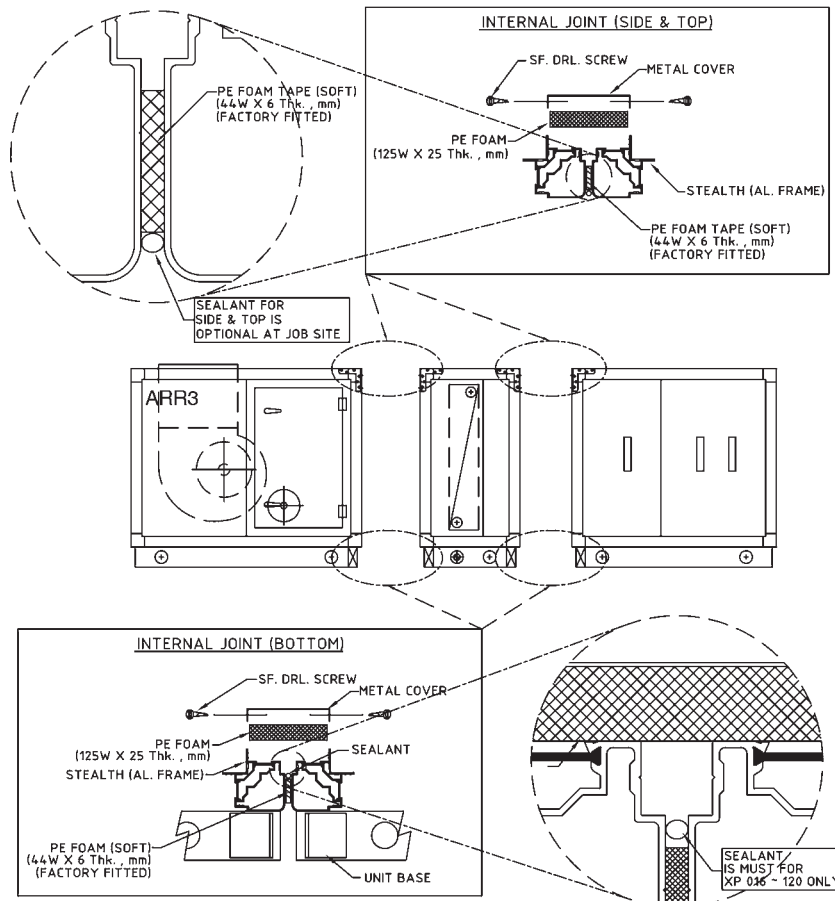
## CLCP-XP - Break Point

### Frame to Frame Joining

MODEL CLCP	PER 1 Break Point SHIP WITH UNIT ITEMS			
	①		②	③
	PE FOAM, 125W		SF. DRL. SCREW	SEALANT TUBE
	MM, LG	1 Meter/Strip		
XP 003(0404)	2480	3	24	-
XP 004(0604)	3100	4	24	-
XP 006(0804)	3720	4	24	-
XP 008(1004)	4340	5	24	-
XP 010(0806)	4340	5	28	-
XP 012(1006)	4960	5	28	-
XP 014(1206)	5580	6	32	-
XP 016(1008)	5580	6	32	1
XP 020(1208)	6200	7	32	1
XP 025(1210)	6820	7	36	2
XP 030(1212)	7440	8	40	2
XP 035(1412)	8060	9	40	2
XP 040(1612)	8680	9	40	2
XP 045(1812)	9300	10	48	2
XP 050(2012)	9920	10	48	2
XP 060(2014)	10540	11	48	2
XP 065(2214)	11160	12	52	3
XP 070(2414)	11780	12	52	3
XP 080(2614)	12400	13	56	3
XP 085(2814)	13020	14	56	3
XP 090(3014)	13640	14	56	3
XP 095(3214)	14260	15	60	3
XP 100(3216)	14880	15	68	3
XP 110(3217)	15200	16	68	3
XP 120(3218)	15520	16	68	3

XP 003 ~ 014, NO SEALANT  
REQ'D AT JOINING

SEALANT IS MUST  
FOR XP 016 ~ 120  
AT BOTTOM



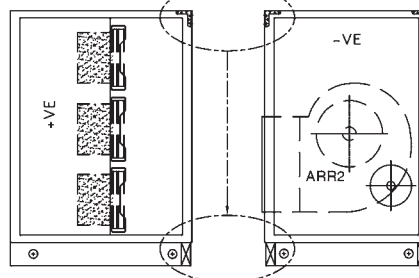
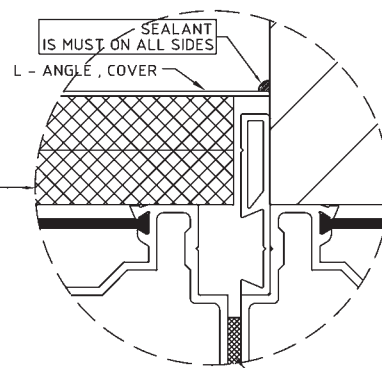
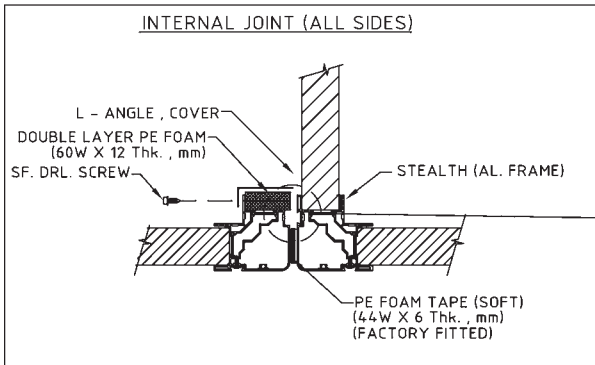
# Assembly & Installation CLCP-XP - Break Point

## Panel to Frame Joining.

MODEL CLCP	PER 1 Break Point SHIP WITH UNIT ITEMS			
	①		②	③
	PE FOAM, 60W		SF. DRL SCREW	SEALANT TUBE
	MM, LG	5 Meter/Roll		
XP 003(0404)	4960	1	12	-
XP 004(0604)	6200	2	12	-
XP 006(0804)	7440	2	12	-
XP 008(1004)	8680	2	12	-
XP 010(0806)	8680	2	14	-
XP 012(1006)	9920	2	14	-
XP 014(1206)	11160	3	16	-
XP 016(1008)	11160	3	16	1
XP 020(1208)	12400	3	16	1
XP 025(1210)	13640	3	18	2
XP 030(1212)	14880	3	20	2
XP 035(1412)	16120	4	20	2
XP 040(1612)	17360	4	20	2
XP 045(1812)	18600	4	24	2
XP 050(2012)	19840	4	24	2
XP 060(2014)	21080	5	24	2
XP 065(2214)	22320	5	26	3
XP 070(2414)	23560	5	26	3
XP 080(2614)	24800	5	28	3
XP 085(2814)	26040	6	28	3
XP 090(3014)	27280	6	28	3
XP 095(3214)	28520	6	30	3
XP 100(3216)	29760	6	34	3
XP 110(3217)	30400	7	34	3
XP 120(3218)	31040	7	34	3

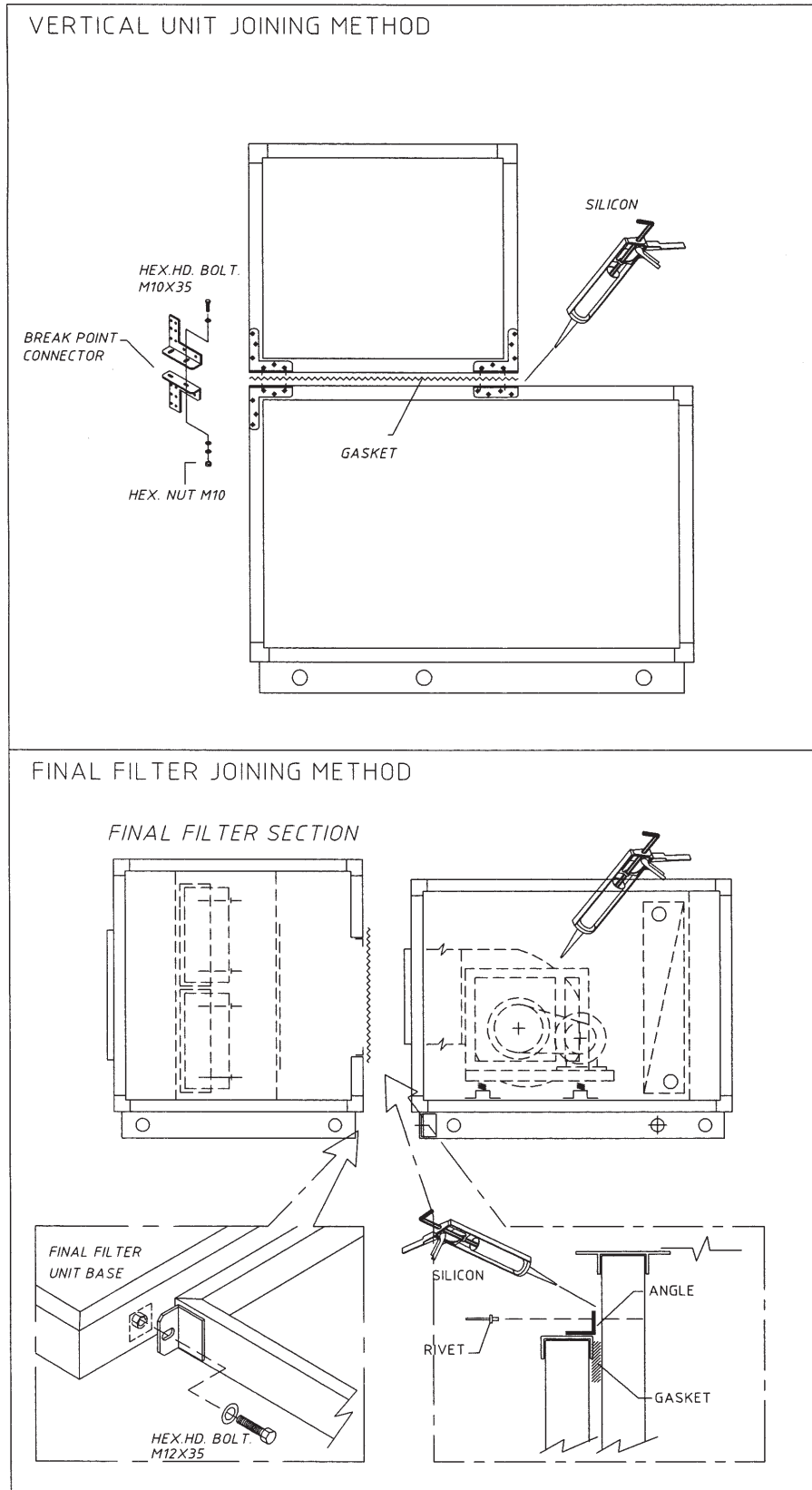
XP 003 ~ 014, NO SEALANT  
REQ'D AT JOINING

SEALANT IS MUST  
FOR XP 016 ~ 120  
AT ALL SIDES



# Assembly & Installation

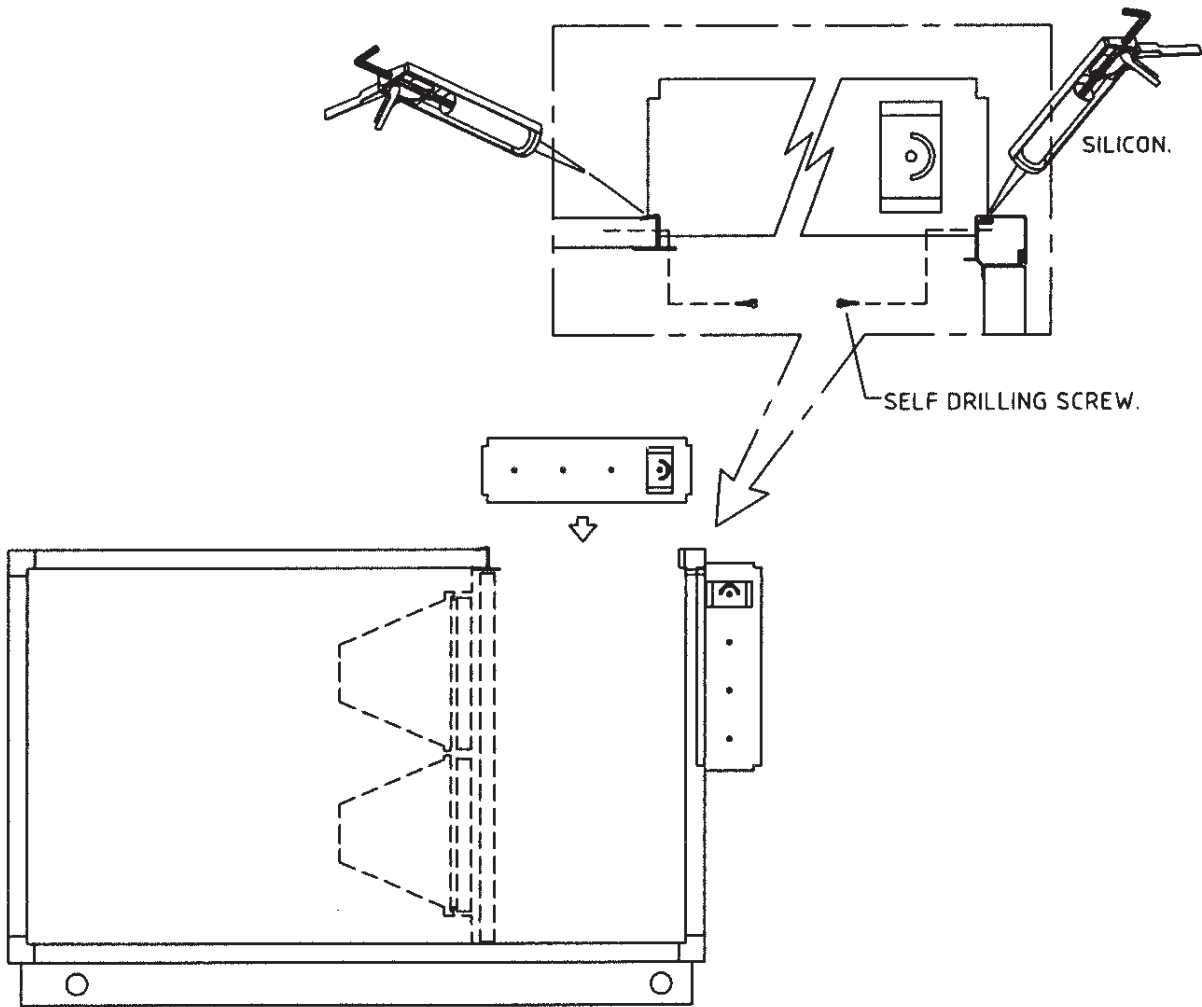
## CLCP



# Assembly & Installation CLCP

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## DAMPER INSTALLATION.




# Assembly & Installation

## Piping - Condensate Drain Pan Connections

On cooling section(s) the drain pan should always be connected directly to a trap to ensure proper drainage of condensate.

	<b>CAUTION</b>
Failure to provide adequate condensate piping may result in water damage to the equipment or building.	

	<b>IMPORTANT</b>
The applicable "rule of thumb" for amount of condensate may as high as 6 lbs/hr/ton for units serving areas with high latent heat.	

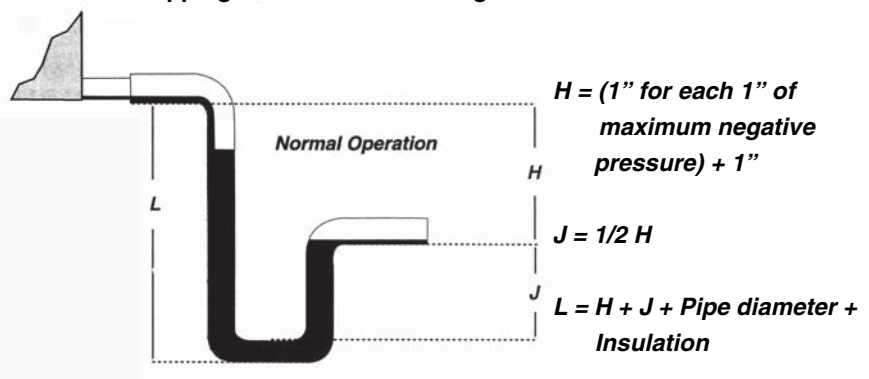
Male-threaded, 1-1/2" BSPT condensate drain connection is provided on one side of the coil section. The main drain lines and trap must be the same size as the drain connection. Pitch the connection line horizontal or downward toward an open drain and install a plugged tee to facilitate cleaning. Condensate lines should not be connected to a closed drain. This is to avoid the possibility of drawing sewer gasses into the unit. **Drain traps must be primed. If they are not, the trap is essentially non-existent and the drain pan will likely overflow.**

## Units With More Than One Drain Pan

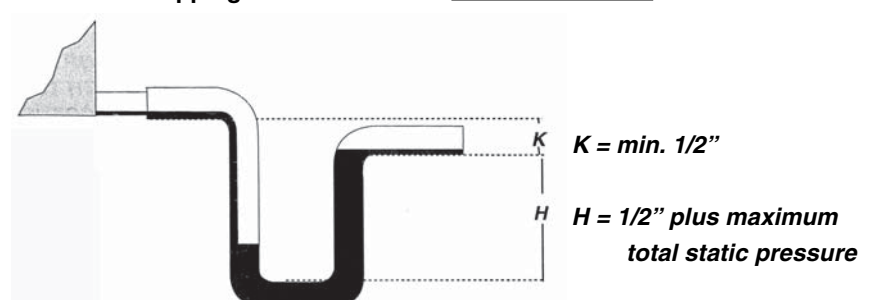
With the Trane Quantum™ Air Handler, each module can be ordered with or without a drain pan. When more than one module has a drain pan, you must trap each module individually. Connecting all drains to a common line with only one trap will result in condensate retention, and possible water damage to the air handler or adjoining space.

If a module has a drain pan for cleaning purposes only, it does not need a trap; however a cap or shut off valve should be installed on the drain connection. Only modules handling condensate, such as a cooling coil module or eliminator module, require a trap. *Figure 9 through Figure 10* are examples of typical installations.

**Figure 9**  
Drain Pan Trapping for module under Negative Pressure



**Figure 10**  
Drain Pan Trapping for module under Positive Pressure



# Assembly & Installation

## Chilled Water Piping - Coil Connection

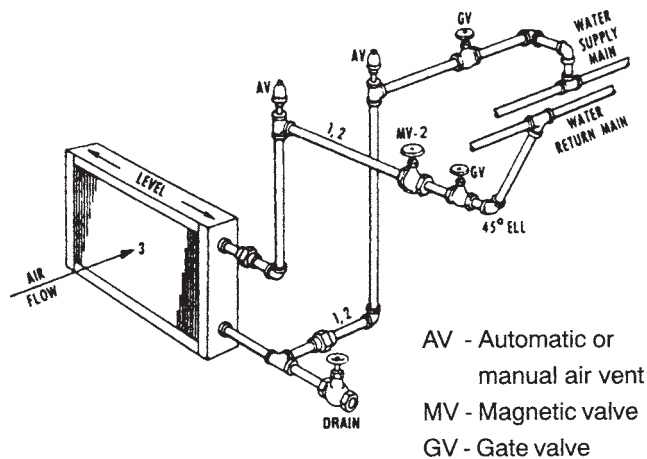
### General Coil Piping Recommendation

Refer to Figure 11 for typical cooling / heating and steam coil piping.

Proper installation, piping and trapping is necessary to assure satisfactory coil operation and to prevent operational damage. Water inlet and outlet connections protrude through the coil section side panel. Follow standard piping practices when piping to the coil. Note the following:

- 1 Support all piping independently of the coils.
- 2 Provide swing joints or flexible fittings in all connections that are adjacent heating coils in order to absorb thermal expansion and contraction strains.
- 3 When attaching piping to the coil header, make the connection only tight enough to prevent leaks, the maximum recommended torque is 200ft-lbs.
- 4 Teflon tape or teflon piping compound should not be used because of its high lubricity, teflon makes it easier to tighten the pipe to the header joint past the point where an effective seal is created, thus damage to the coil could result.
- 5 "White Zinc" compound / pipe sealer on all threaded connection is recommended, instead.

**Figure 11**  
Typical Piping for Water Coil



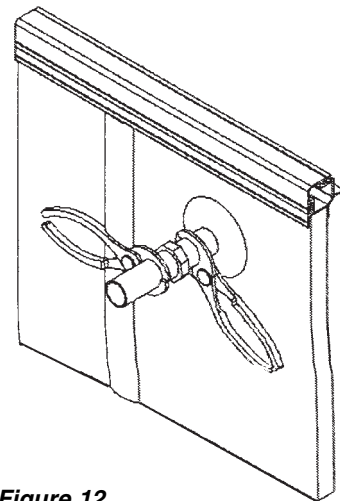
AV - Automatic or manual air vent  
MV - Magnetic valve  
GV - Gate valve

**NOTE: DRAIN AND VENT CONNECTIONS ARE PROVIDED AS STANDARD ON COIL HEADERS.**

**IF EXTENDED DRAINS AND VENTS ARE REQUIRED, THEY MUST BE FIELD PROVIDED.**

**! IMPORTANT**

**To avoid damaging the coil connections it is essential to grip the pipe connection whilst applying counter pressure to tighten the joint (see Figure 12). Use "Back-up wrench" when attaching piping to coils, on threaded connections.**



**Figure 12**  
Completely stress-free connections are essential. The pipework of the coils should be arranged to facilitate easy removal of the coil for any required maintenance purposes.



# Assembly & Installation

## Steam Coil Piping Type A, AA Steam Coils

These are for central system, industrial and process application with one row, opposite-end connections. Maximum standard operating limits:  
Copper tubes: 100 psig and 400°F  
Type AA coils feeds alternate tubes. Refer to Figure 13 for typical steam coil piping.

**CAUTION**

Condensate must flow freely from coil at all times to prevent physical coil damage from water hammer, unequal thermal stresses, freeze-up and/or corrosion. Complete the following recommendations to prevent coil damage.

1. Install a 1/2 inch, 15 degree swing check vacuum breaker in the unused condensate return tapping as close as possible to the coil.
  2. Vent the vacuum breaker line to the atmosphere or connect it to the return main at the discharge side of the steam trap.
- Note: Vacuum breaker relief is mandatory when the coil is controlled by a modulating steam supply or a two-position (ON-OFF) automatic steam supply valve.

3. Run the return pipe at the full size of the steam trap connection except for the short nipple screwed directly into the coil condensate connection. Do not bush or reduce the coil return tapping size.

4. Proper steam trap selection and installation is necessary for satisfactory coil performance and service life. For installation, use the

following steps:

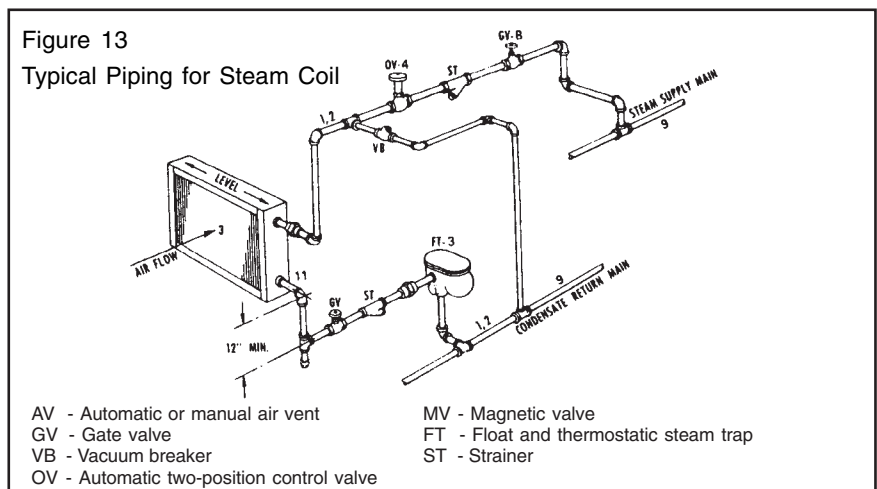
- Select trap based on maximum possible condensate rate.
- Locate the steam trap discharge at least 12 inches below the condensate return tapping, this provides sufficient hydrostatic head pressure to overcome trap losses and assure complete condensate removal.
- Float and thermostatic traps are recommended because of gravity drain and continuous discharge operation.
- Use float and thermostatic traps are recommended because of gravity drain and continuous discharge operation.
- Use float and thermostatic traps with atmospheric pressure gravity condensate return, with automatic control or where the possibility of low-pressure supply steam exists.
- Use bucket traps ONLY when the supply steams in unmodulated and 25 psig or higher.
- Always install strainers as close as possible to the inlet side of the trap. Do not modulate Type A, AA coils. Use two position (ON-OFF) steam supply controls.

5. Use a V-port modulating valve to obtain gradual modulating action.

**CAUTION**

Caution: Always open the steam supply control valve slowly to prevent possible coil damage.

6. Do not modulate systems with overhead or pressurized returns unless the condensate is drained by gravity to a receiver (vented to the atmosphere) and returned to the main by a condensate pump.
7. At start-up on units with fresh air dampers, slowly turn the steam on full at least 10 minutes before opening the fresh air.
8. Pitch all supply and return steam piping down minimum of 1-inch per 10 feet in the direction of flow.
9. Do not drain the steam mains or take-off through the coils. Drain the mains ahead of the coils through a steam trap to the return line.
10. Overhead return require 1 psig of pressure at the steam trap discharge for each 2 - feet elevation to assure continuous condensate removal.





# Assembly & Installation

## Refrigerant Coil Piping

**TYPE FD COILS HAVE BEEN DEHYDRATED AND CHARGED WITH A HOLDING CHARGE OF DRY NITROGEN. 10-20 PSIG TO PREVENT LEAKS AND SYSTEM CONTAMINATION, DO NOT BREAK THE SEALS UNTIL THE COIL IS INSTALLED.**

1. Follow accepted refrigeration piping practices and safety precautions for typical refrigerant coil piping and components. Specific recommendations are provided with the condensing units, including instructions for pressure-testing, evacuation, and system charging. General recommendations for component selection and line sizing follow.
2. Leak-test the entire refrigeration system after all piping is complete.
3. Charge the unit according to approximate weight requirements, operating pressures and superheat / subcooling measurements.
4. Adjust the thermal expansion valve setting if necessary.

## General Refrigerant Piping Recommendations

**IMPORTANT: REFER TO THE NOTE ON THE INSIDE FRONT COVER OF THIS MANUAL REGARDING HANDLING OF REFRIGERANTS.**

### Liquid Line Components

Trane recommends the use of a properly sized liquid line filter-drier installed upstream from the expansion valve and as close to the evaporator

coil as possible. Base filter-drier selection on a minimum pressure drop of 2 psi at the design condition.

1. Install moisture indicator/sight glass between the expansion valve and filter-drier. The moisture indicator/ sight glass must be sized to match the size of the liquid line at the thermal expansion valve.
2. Size liquid line shutoff valve with an access port using the selected liquid line OD, and install it close to the condenser.
3. Minimize use of other valves, tube bends and reducers since these items tend to increase pressure drop and to reduce subcooling at the expansion valve.
4. The Thermal Expansion Valve (TEV) must be selected for proper size and capacity. The size of the TEV should cover the full range of loadings. Check that the valve will successfully operate at the lightest load condition. Select expansion valves with external equalizer connections, and those designed to operate against a back pressure of 20 pounds per square inch higher than actual evaporator pressure.
5. Install the TEV directly in the coil liquid connection (distributor) provided. The liquid distributor must be in a true vertical position.

### Suction Line Components

Install suction line pressure tap on the leaving side of the evaporator coil near the TEV sensing bulb location. Accurate superheat measurement and thermal expansion valve adjustment demands that suction pressure be

measured near the evaporator coil.

### Liquid Line Sizing

All compressors have a Refrigerant Charge Limit (RCL) that must not be exceeded. Since the RCL and pressure drop are in direct conflict with each other, Trane recommends that the liquid line be sized as small as possible, while maintaining a low enough pressure drop to ensure 5°F(3°C) of subcooling at the expansion valve.

### Suction Line Sizing

Suction line tubes must be sized to maintain refrigerant vapor velocities that are high enough to ensure oil entrainment under all operating conditions.

It is not necessary to pitch horizontal suction lines toward the compressor when refrigerant coils is used with Trane condensing units that are designed with a gas trap in the suction line just prior to the compressor.

# Assembly & Installation

**CAUTION**

To avoid equipment malfunction, use care when brazing or soldering so that distributor tubing is not restricted or blocked. To braze Thermostatic Expansion Valves (TXV) avoid direct flame (figure 15) to the valve body and avoid excessive heat on diaphragm. As an extra precaution, a wet cloth may be around the body and element during brazing operation.

Figure 14  
Typical Piping for Refrigerant Coil

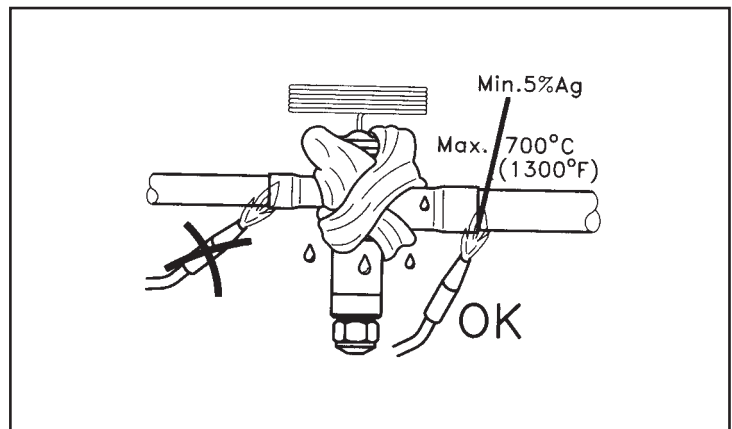
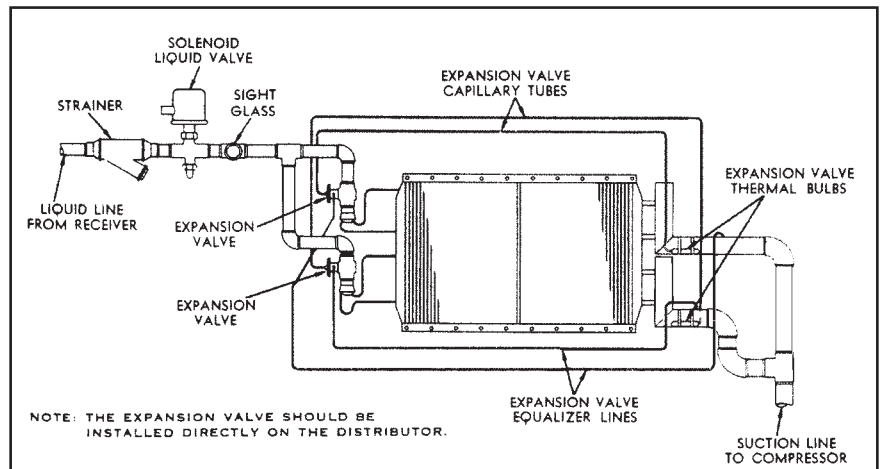
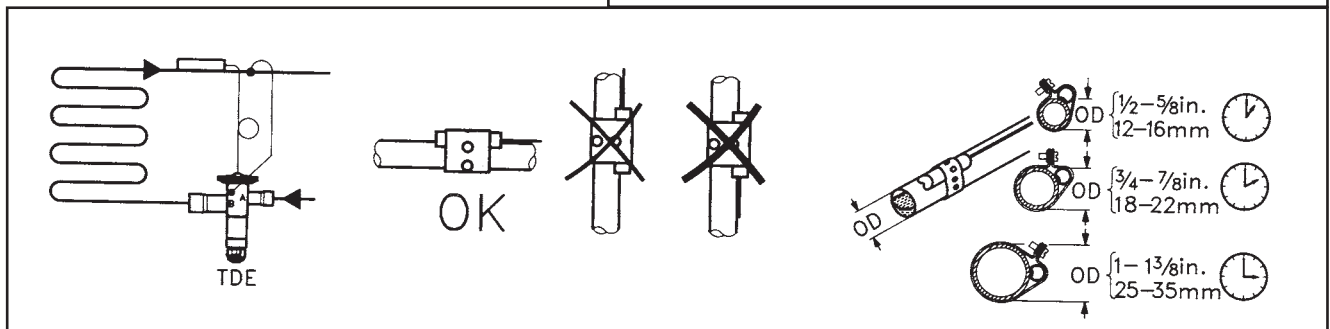


Figure 15  
Solder Technique



Note: Flame should heat away from TXV element

# Start - Up

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Perform the following steps prior to starting the unit.

1. Inspect electrical connections. They should be clean and secure. Compare actual wiring with specific diagrams provided on the unit.
2. Check piping and valves for leaks. Open or close the valves to check for proper operation. Drain lines should be open.

drain pan and check drain opening and condensate line for obstructions.

7. Prime the DRAIN TRAP.

## Start-up Procedures

After completing all start-up checks and procedures, the unit may be started. The following checks and adjustments should be made during initial start-up:

If the unit was stored for an extended period of time, the following items should be checked before starting the unit.

1. Inspect motor bearings for moisture and rust. Replace bearings if necessary and repack with new grease.
2. **Check motor winding. An acceptable winding resistance reading is from 6 meg-ohms to infinity. If reading is less than 5 meg-ohms, winding should be dried out in an oven or by a blower.**
3. Inspect the entire motor for rust and corrosion.
4. Lubricate the motor as instructed in the section titled "Periodic Maintenance," or as indicated by the maintenance tag on the motor.
5. Bump-start unit and observe the fan wheel for proper rotation, as indicated by rotation arrow located on fan housing.
6. Measure the motor voltage and ampage on all phases to ensure proper operation. The readings should fall within the range given on the motor nameplate.

Maximum allowable voltage imbalance is two percent. Voltage imbalance is defined as 100 times the sum of the deviation of the three voltage from the average, divided by twice the average voltage. For example, if the three measured voltages are 221, 230 and 227, the average would be 226 volts.



### CAUTION

**The use of untreated or improperly treated water in unit coils may cause scaling, erosion, corrosion, algae, smile or other equipment damage. Consult a qualified water treatment specialist to determine if water treatment is required. The Trane Company assumes no respon-sibility for equipment damage caused by untreated or improperly treated water.**

3. If equipped with a refrigerant coil, charge and leak-test the unit and get it ready for operation according to instructions provided with the condenser equipment.
4. Check that all air filters are in place and positioned properly. Under Periodic Maintenance, see section titled "Air Filters."
5. Close and secure all unit access doors. Check that the latch set screws are tight.
6. Remove all foreign material from the



### WARNING

**Disconnect electrical power prior to access into a fan or ductwork. Even when locked out electrically, fans may cause injury or damage if the impeller is subject to "wind-milling." The impeller should be secured to physically restrict rotational movement. Failure to secure impeller can cause severe personal injury r death. Disconnect electrical power source when connecting or disconnecting electrical wires for test procedures. Do not open service access doors while the unit is operating. Failure to exercise caution or while inspecting. unit operation may result in injury or death from electrical shock, air movement or rotating parts.**

# Start - Up

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The percent of voltage imbalance is then calculated:

$$\frac{100 \times \{[226-221] + [230-226] + [227-226]\}}{2 \times 226}$$

= 2.2% (*Unacceptable*)

In this example, 2.2 percent imbalance is not acceptable and the power company should be notified to correct it.

7. Check unit vibration if the fan speed is changed more than 5% from the original designed rpm, or if parts such as shafts, fan wheels, bearings, or other drive components are replaced. Do not exceed max. fan rpm.
8. Pay particular attention to any vibration, noise or overheating of the motor and fan bearings.  
(Bearings may run warm during break in.)

## Excessive Vibration

***EXCESSIVE VIBRATION MUST BE CORRECTED TO PREVENT BEARING AND SHAFT DAMAGE. SEE THE SECTION TITLED "TROUBLE-SHOOTING" FOR DETAILS ON THE COMMON CAUSES FOR VIBRATION.***

## Determine Fan RPM

Fan rpm can be determined by using a strobe-type tachometer, or revolution counter.

## Sheave Alignment

Align the fan and motor sheaves by using a straightedge. The straightedge must be long enough to span the distance between the outside edges of the sheaves. For more details refer to maintenance section.

# Maintenance

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## Periodic Maintenance Checklist

The following checklist describes the suggested maintenance schedule to maintain proper operation of the unit. Detailed procedures for owner-operator maintenance checks are given after this checklist.



### WARNING

Disconnect electrical power and allow rotating parts to stop before servicing the unit. Exercise caution if unit must be on for test or maintenance procedures. Failure to do so may result in injury or death from electrical shock or moving parts.



### WARNING

Disconnect electrical power prior to access into fan or ductwork. Even when locked out electrically, fans may cause injury or damage if the impeller is subject to "windmilling". The impeller should be secured to physically restrict rotational movement can cause severe personal injury or death.

#### After 48 Hours Operation

- Belts have acquired their permanent stretch. Readjust but do not overtighten.

#### Weekly

- Observe unit weekly for any change in running condition and any unusual noise.

#### Every Month or weekly

- Check air filters. Clean or replace if

clogged or dirty. Change bag filters when pressure drop is 1-inch W.G.

#### Every Three to Six Months

- Check greasing on fan and motor.
- Align fan and motor sheaves (pulley). Tighten sheaves setscrews to the proper torque.

- Check and adjust fan belt tension.

- Tighten electrical connection.

- Inspect coils for dirt build-up or coil freeze up

#### Every Year

- Inspect the unit casing for corrosion. If damage is found, clean and repaint the surface with a rust-resistant primer and vinyl chlorinated lacquer.

- Clean the fan wheels and fan shaft. Remove rust with emery cloth and apply a coat of LPS#3 or an equivalent.

- Inspect the condensate drain pan and drain line, remove sludge or foreign materials that might obstruct proper drainage. Remove obstacles.

- Check damper linkages, set-screws and blade adjustment for proper damper operation.

- Inspect the control and power box wiring for secure connections and insulation.

- Rotate the fan wheel and check for obstruction in the fan housing. The wheel should not rub on the fan housing. Adjust the center if necessary and tighten wheel setscrews to the

proper torque.

- Check condition of gasketing and insulation around unit, door and damper.

- Examine flex connections for cracks or leaks. Repair or replace damage material.



### IMPORTANT

**Small & Medium size fans are furnished shielded bearings. The bearings are lubricated for life and maintenance free. If re-lubrication is necessary, on larger fans it is recommended to use a lithium base grease suitable for all temperatures within the operational limits.**

# Maintenance

## Maintenance Plan

The following table (see Table 1) gives recommended maintenance intervals for the CLCP unit. Intervals are based upon normal running conditions, in a moderate climate, and assuming 24 hour running.

Units operating outside these guidelines may require shorter or longer maintenance intervals.

**Table 1 - Recommended Maintenance Intervals**

Component	Check the following	Weekly	Monthly	3 - 6 Monthly	Annual
Fan / Motor	Fan In General	Yes			
	For Corrosion		Yes		
	Flexible Connection		Yes		
	Anti-Vibration Mounts			Yes	
	Drainage		Yes		
	Fan Bearing			Yes	
	Motors In General		Yes		
	Motor Bearing			Yes	
	Belt Drive In General		Yes		
	Panel Or Bag Filters	Yes			
Filter	Roll Filters			Yes	
	Fin Block / Fin Bundle				Yes
Coils	Frost Protection			Yes	
	Drainage	Yes			Yes
	Drop Eliminator			Yes	
	Steam Coils		Yes		
Humidifiers	Scaling		Yes		
	Condensate Drain		Yes		
Dampers	Dampers			Yes	
	Scilencers				Yes
Inlet / Outlet	Hoods And Louvers		Yes		
	Plate Heat Exchangers				Yes
Energy Recovery Components	Thermal Wheel			Yes	
	Control Box And Wiring				Yes

# Maintenance

The maintenance interval periods are stated, guidelines only. Any large deviations in the pattern of usage may necessitate further maintenance attention.

## IMPORTANT

**During maintenance operation the unit must be completely isolated and precautions taken to prevent any premature restart.**

### 1. Fan

If the fan / motor assembly is going to be stored for two weeks before use, the fan should be rotated by hand at weekly intervals to avoid bearing damage.

If storage will be over one month it is recommended that the belts be slackened as well.

Check for soiling, damage, corrosion, and any tendency to bind. Clean as necessary.

Check that the flexible connection are securely fixed.

Check the function of all antivibration mounts.

Check for any obstructions or blockages of the air intakes and discharges.

Check the traps for leaks or blockages and prime as necessary.

### 2. Bearing Test

Check that the fan bearing is tightened and is not unduly noisy, by sounding it using a metal bar as a conductor.

Where a belt guard has been supplied, check that it is fitted correctly.

If there is any irregular noise or

knocking, renew both bearings. Fan bearing are greased for life, but larger units with standard bearings require annual lubrication. These have grease nipple. In the case of extreme running conditions, lubricate in accordance with the following recommendations:

Recommended lubricants;

- ALVANIA
- GREASE 3 (SHELL)
- MOBILUX 3 (MOBIL)
- BEACON 3 (ESSO)
- SKF 28 (BALL BEARING GREASE)

## IMPORTANT

**Do not overlubricate bearings. Excessive pressure caused by overlubrication can displace bearing grease seals or cause grease to overheat the bearing, resulting in premature bearing failure.**

### 3. Fan Motors

Inspect periodically for excessive vibration or temperature. Operating conditions will vary the frequency of inspection and lubrication. Contact the motor manufacturer or Trane for lubrication instruction. Most smaller frame motors comes without grease nipple where the bearings are permanently sealed.

The motors with double shielded bearings are lubricated for life and cannot be relubricated.

W.E motors up to 132 frame and TECO and Brook Hansen motors up to 180 frame comes with sealed for life bearings, while motors above this

range, have open bearings with "flush through" re-greasing facilities.



**WARNING: DISCONNECT POWER SOURCE FOR MOTOR LUBRICATION. FAILURE TO DO SO MAY RESULT IN INJURY OR DEATH FROM ELECTRICAL SHOCK OR MOVING PARTS.**

To re-lubricate the motor, complete the following:

1. Turn the motor off. Make sure it cannot accidentally restart.
2. Remove the relief plug and clean out any hardened grease.
3. Add fresh grease through the fitting with low pressure grease gun.
4. Run the motor for few minutes to expel any excess grease through the relief vent.
5. Stop the motor and replace the relief plug.

Table2  
Motor Greasing Intervals

Rated Output kW	Poles	Relubrication Period	
		Standard condition	Severe condition
0 - 30	4 upwards	7 years	3 years
37 - 75	4 upwards	210 days	70 days
90 - 110	4 upwards	90 days	30 days

Standard condition: 8 hour operation per day with rated or light loading in a clean and low vibration environment. Severe condition: 24 hour operation per day with rated/light loading or in a dirty/dusty environment or where the motor is subject to vibration/light shock loading.

Grease Type:

- TECO/Brook Hansen motor - Use Esso Unirex Lithium N3 grease.
- W.E motor - Use Shell Alvania R3.



# Maintenance

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## 4. Air Filters

Appendix D provides filter size, type and quantity. To replace throwaway filters, install new filters with the directional arrows pointing in direction of airflow. To clean permanent filters wash under a stream of water to remove dirt and lint. Remove oil filter (aluminum or grease filter) with a wash of mild alkali solution. Rinse in clean, hot water and allow to dry. Coat both sides of the filter by immersing or spraying it with Air Maze Filter Lote W or equivalent. Allow to drain and dry for about 12 hours.

## 5. Drain Pans

### Inspecting Cleaning

The condensate drain pan and drain line must be checked to assure that the condensate drains as designed. This inspection should occur a minimum of every six months or more often as dictated by operating experience.

For units with sloped drain pans: If evidence of standing water or condensate overflow exists, steps should be taken to identify and remedy the cause immediately. Refer to the troubleshooting section of this manual for possible causes and solutions. If microbial growth in the drain pan is observed, it should be cleaned and removed immediately. Drain pans should be cleaned using the following procedure:

1. Disconnect all electrical power to the unit.
2. Don the appropriate personal protective equipment (PPE).
3. Remove all standing water.
4. Use a scraper or other tools to remove any solid matter. Remove solid

matter with a vacuum device that utilizes high efficiency particulate arrestance (HEPA) filters with a minimum efficiency of 99.97% at 0.3 micron particle size.

5. Thoroughly clean the contaminated area(s) with a mild bleach and water solution or an EPA-approved sanitizer specifically designed for HVAC use. Carefully follow the sanitizer manufacturer's instructions regarding the use of the product.

6. Immediately rinse the drain pan thoroughly with fresh water to prevent potential corrosion from the cleaning solution of the drain pan and drain line components.

7. Allow the unit to dry thoroughly before putting the system back into service.

8. Determine and correct the cause of the microbial contamination.

9. Be careful that the contaminated material does not contact other areas of the unit or building. Properly dispose of all contaminated materials and cleaning solution.

## 6. Coil Cleaning

Steam, hot water and chilled water coils should be kept clean to maintain maximum performance. If fins become dirty, clean with steam and detergent, hot water spray and detergent, or one of the commercially available chemical coil cleaners. Rinse coils thoroughly after cleaning.

In the event of coils being out of commission for some time, it is advisable to completely drain down the coil. On each occasion when refilling is undertaken, check that the coil is effectively vented.

Periodic cleaning of the coils is required.

Dirty coils have increased airside pressure drops and reduced heat transfer, thus unbalancing the cooling or heating system.

### Cleaning

In the event that fin edges have been bent, they can be straightened with the aid of a coil comb.

The cleaning is carried out with the unit intact using a powerful vacuum cleaner on the dust-contaminated side. If the unit is very dirty it will need to be removed and wet cleaned.


If required, soft cleaning brushes may be used ensuring that the heat exchanger fin are not damaged.

### Frost protection

Check that frost protection is working before the commencement of each winter period. Ensure that the frost sensor is correctly installed and fitted and is working within the correct temperature range.

### Drop eliminator

Check the cleanliness of the droplet separator section and the blades annually. If the blades are dirty, remove and clean them. Contamination can result in damage through water droplets in the system's performance. Ensure that the blades are correctly repositioned and that they are not distorted.


 <b>WARNING</b>
Follow all directions provided with chemical cleaners to avoid personal injury and/or coil damage. Commercially available chemical cleaners may contain caustic or hazardous agents.

# Maintenance

## Direct expansion coils


Never use hot water or steam to clean these coils. During normal operation, the fin block must not ice up. If this occurs, check the refrigeration system.

Refrigerant coils should be kept clean to maintain maximum performance. If fins become dirty, clean with cold water and detergent or one of the commercially available chemicals coil cleaners. Rinse coils thoroughly after cleaning.

 <b>WARNING</b>
<p>Never use steam or hot water to clean a refrigerant coil. Dangerous pressures may be built up by improper application of heat resulting in equipment damage or personal injury.</p>

## 7. Coil Winterization

Provisions must be made to drain those coils that are not in use when subjected to freezing temperature.

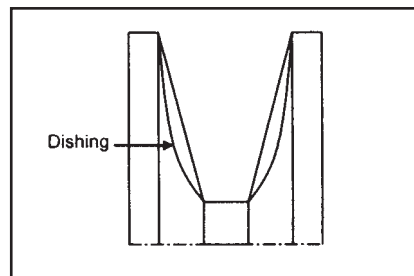
 <b>CAUTIONS</b>
<p>Failure to properly drain and vent coils when not in use during freezing temperatures may result in coil freeze-up damage. Drain and vent hardware provided by installing contractor.</p>

To drain these coils, blow out the coils with compressed air, fill and drain the tubes with full-strength ethylene glycol several times, and then drain the coil as completely as possible.

## 8. Pulley and Belt

Proper installation techniques will assure that you get full service life and minimum down time from your belt drives.

1. Turn machine OFF and lock out power source.
2. Remove belt guard, loosen motor mounts and shorten center distance between pulleys. Remove old belts.
3. Inspect. Repair or replace drives components.
  - Clean oil, grease and debris from pulleys, remove rust with wire brush.
  - Inspect and replace damaged pulleys. Get your money's worth from a new set of belts by checking and replacing worn or damaged pulleys. In the long run,



replacement pulley cost will more than be recovered in increased belt life, reduced downtime, and lower maintenance expenses.

Check following:

- a) Worn groove sidewalls, "Dishing" should not exceed 1/32" (0.8mm) for individual belts. With a banded belt, dishing should not exceed 1/64" (0.4mm). When a banded belt rides too low in worn pulley grooves the tie band can be cut by the flanges between the grooves.
- b) Shiny pulley groove bottoms. This is a sure sign that the belt has bottomed out. The resulting

slippage shortens belt life.

- c) Wobbling and/or damaged pulleys. Generally caused by improper pulley or bushing installation, wobbling and/or damaged pulleys can unbalance a drive, wear out belt rapidly, and damage bearings and bend shafts.

Check and repair worn bearings and bent shafts.

4. Select replacement belts.

Replace all belts on a drive with a new matched set.

- a) Do not mix old and new belts on a drive. A new belt will ride higher in the pulley groove and operate at a higher tension than an old belt. Running them together will damage the new belt as it cannot carry its share of the load.
- b) Do not mix belt from different make, because dimensions and constructions will vary running such "Mis-Matched" belts will not give full service life.
- c) Replace with correct type and cross section belt. Matched SPA section belt with SPA section pulleys. Do not put a SPA belt section on a SPB section pulley. Also dimensionally similar belts can have very different horsepower rating.

5. Install new belts

- Loosen the drive take up and place the new belts on the pulley. Press the belts with your hand to position the slack of each belt on the same side of the drive. If the slack is on different sides, start up loads can break belt tensile cords.
- Do not pry or force belts onto the pulleys. This can break the load carrying tensile cords of the belt

# Maintenance

and the belts will break or turn over shortly after installation.

- Take up sleek until belts fit snugly.

## 6. Check pulley alignment.

- Place a straight edge across pulleys faces to correct alignment.
- Check parallel position of shafts and correct alignment or grooves.
- Note: Mount pulleys as close to bearing as possible.

**Note:** Store belts in a cool, dry place out of direct sunlight.

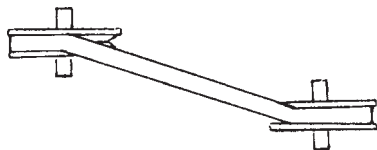
Types of sheave and shaft misalignment



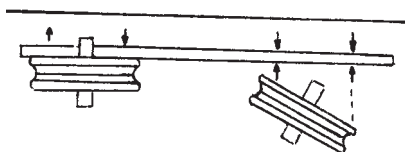
Horizontal Angular



Vertical Angular

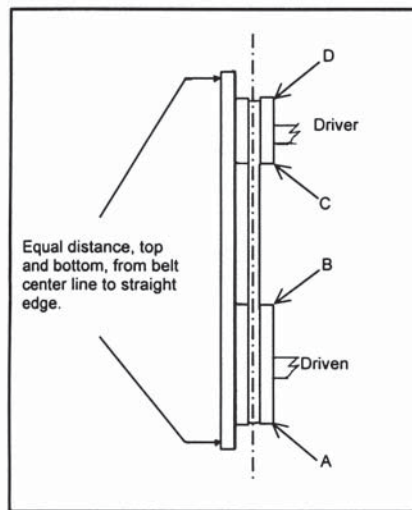


Parrallel



Align with straightedge along sheave faces

Figure 16  
Sheave Alignment



## Fan Belt Tension

Note: Fan belt tension should be checked at least twice during the first day of operation, since there is a rapid decrease in tension until belts are run in.

Proper belt tensioning is required to ensure maximum bearing and drive component life and is based on fan brake horsepower requirement.

## Belt Tension Measurement

Check the belt tension as follows:

Measure the span length mm of the drive. With a belt tensioner at the center of the span, apply a force K (perpendicular to the span) large enough to deflect the belt 15mm per 1 meter of span. Refer to figure 17.

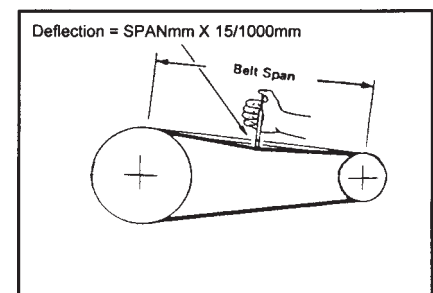
$$\text{DEFLECTION} = \text{SPAN mm} \times 15 / 1000 \text{mm}$$

The deflection force for the belt should be within the minimum and maximum force shown in the Table 3. When the tension drops to the minimum value,

readjust to the maximum value.

To measure belt tension, use a belt tensioner as shown in Figure 18. Determine actual deflection by depressing one belt with the belt tensioner and measuring the deflection relative to the other belts or to belt line. Adjust the belt tension to the correct force (Newton) and tighten all setscrews to the proper torques.

Figure 17  
Belt Tension Measurement



# Maintenance

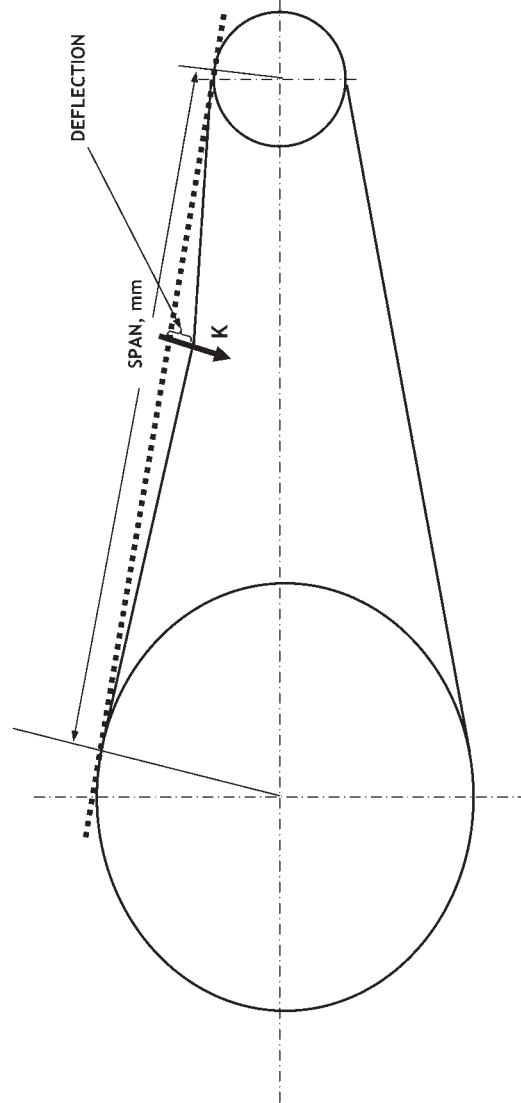
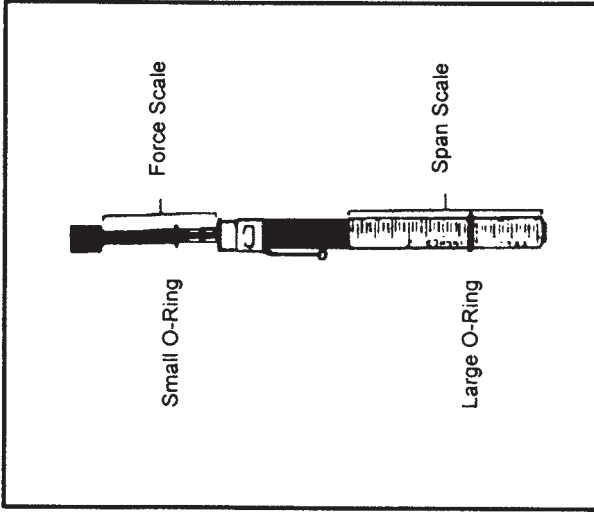
Table 3. Deflection Force, K

Cross Section Dia. of smaller pulley	Force Unit	DEFLECTION FORCE, K							
		SPZ		SPA		SPB		SPC	
		min.	max.	min.	max.	min.	max.	min.	max.
63 - 80, mm	kgF	1.2	1.9	1.5	2.3	-	-	-	-
	N	12	19	14	23				
81 - 112, mm	kgF	1.6	2.4	1.9	3.0	2.5	3.7	-	-
	N	16	24	19	29	24	36		
113 - 160, mm	kgF	1.9	2.9	2.7	4.1	3.4	5.1	4.5	6.9
	N	19	28	26	40	33	50	45	68
161 - 224, mm	kgF	1.9	3.0	3.1	4.7	4.4	6.5	5.9	8.9
	N	19	29	30	46	43	64	58	87
225 - 355, mm	kgF	-	-	3.3	4.9	5.2	7.9	8.1	12.1
	N			32	48	51	77	79	119
356 - 630, mm	kgF	-	-	-	-	5.6	8.4	10.5	15.7
	N					55	82	103	154

N = Newton

kgF = kilogram Force = 9,80665 N

Figure 18  
Belt Tension Measurement



# Trouble Analysis

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## General

Use the tables in this section to assist in identifying the cause or causes of a malfunction in Air Handler operation. The column header RECOMMENDED ACTION will suggest repair procedures.

Note: These tables are intended as a diagnostic aid only. For detailed repair procedures, contact your local Trane Service Company.

Symptom	Probable Cause	Recommended Action
Bearing noise	Poor alignment	Loosen bearing setscrews and realign
	Inadequate lubrication	Grease bearing(s) (Plummer block)
Bearing is excessively hot	Overtensioned belts No lubricant (plummer block type) Overlubrication Misaligned bearing	Retension belts Apply grease Clean surface of grease and purge Correct alignment and check that shaft is level
Motor stalls	Low line voltage  Short circuit, phase to earth (open Phase) Overloaded motor	Check across AC line. Correct voltage if possible  Check line phases and terminal block connection. Reduce system load, fan driven speed or increase motor capacity
Motor overheats	Motor fan is clogged with dirt preventing proper ventilation Overloaded motor Motor fan damaged	Remove fan cover, clean fan and replace cover Reduce load or replace with larger motor Replace motor fan / clean
Excessive vibration	Poor pulley alignment Transport brackets not removed Overtensioned belts Fan / unit vibration isolator collapsed	Check pulley alignment Remove items used for transport only Retension belts Replace vibration isolator
Excessive vibrator	Misalign drive	Align drive
Excessive motor noise	Motor mounting bolts loose Worn motor bearings Fan rubbing on fan cover	Tighten motor mounting bolts Replace bearings and seals Remove interference in motor fan housing
Excessive fan noise	Fan rubbing on inlet cone or guard Worm fan bearings Loose impeller	Remove item and repair Replace bearings and seals Retighten hub
Premature belt wear	Incorrect tension or alignment Dirt or grease on belts Belts rubbing Odd belts being fitted	Re-tension and align Clean belts and pulleys; check for grease leaks Remove obstruction Replace with full set
Filter collapsing	Blocked with dirt Air velocity too high Filter wrong size	Change at advised dirty condition Check unit running conditions Replace with filter sizes as supplied from Trane

# Trouble Analysis

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Symptom	Probable Cause	Recommended Action
Damper seizing	Blade bent Spindle or mechanism loose Actuator loose	Repair or replace blade Tightening lever fixings Refit actuator correctly
Low coil capacity (Chilled Water)	Air is by passing coil Coil tubes are blocked Incorrect airflow (CFM) Incorrect water flow rate (GPM) Incorrect water temperature	Prevent bypass with block-off Clean and unblock tubes Check water pumps, valves and lines for obstructions Provide proper water temperature
Low coil capacity (Refrigerant)	Air is by passing coil Coil tubes are blocked Incorrect airflow Expansion valve not operating Poor refrigerant distribution	Prevent bypassing with block-off Clean and unblock tubes Check fan-operating conditions Check sensing bulb location and TXV operation Check for blockage in distributor and tube
Leaking Coil	Header / exposed pipe damage Cracks in joints due to strain of pipework on headers Swelling of joints due to frost (Water-hammer Steam Coils)	Repair damaged part Check support and alignment of pipework and rectify Check frost protection method and correct, improve Trapping of steaam supply
Drain pan overflow	Incorrect hydraulic trapping Blockage in trap Plugged Drain Line Unit not level	Resize / fit trap and check air break arrangement Clean trap and refit Clean drain line Level unit
Standing water in drain pan	Improper trap design	Design trap per unit installation instructions
Wet interior insulation	Coil face velocity too high Improper trap design Drain pan leaks / overflows Condensation on surfaces	Reduce fan speed Design trap per unit installation instructions Repair leaks Insulate surfaces
Excess dirt in unit	Missing filters Filter bypass	Replace filters Reduce filters bypass
Microbial growth (mold) inside air handler	Standing water in drain pan Moisture problems	See "Standing water" symptom See "Wet interior insulation" section
Loose fan belt	Motor is poorly positioned Worn or damaged belt Worn Sheaves	Adjust tension Replace belt or belt set. Check sheave alignment Replace sheaves
Short belt life	Worn Sheaves Misalign belt Grease or oil on belts Belt slipping Belts rubbing	Replace sheaves Realign drive with MVP sheave set at mean pitch diameter Check for leaky bearings. Clean belts and sheaves Adjust tension Remove obstruction or realign drive for clearance
Rapid motor bearing wear	Excessive overhung load due to overtensioned drive	Check belt tension and overhung load
	Excessive overhung load due to a small	Replace sheave with larger one

# Trouble Analysis

## Pulley and Belt

SYMPTOMS	Causes																								
	Belt pries on or misplaced slack	Belts rubbing guard	Pulleys misalign	Won or damaged pulleys	Pulleys too far from pulleys	Poor bearing or shaft conditions	Insufficient tension	Excessive tension	Improper pulley installation	Belt worn (Normal service life)	Wrong belt cross section or type	Mismatched or mixed belts	Machine induced impulse or shock	Improper or prolonged storage	Excessive heat	Excessive oil or grease	Use of belt dressing	Abrasive environment	Foreign objects in grooves	Excessive moisture	Overloaded drive-underbelting	Drive seriously overbelted	Pulley too small	Insufficient wrap on small pulley	Backside Idler
Rapid side wall wear		@	@	✓			@				@			@	@	@	@	@		@					
Worn cover on back		✓																							@
Belt turns over or jump off pulley	@						@			@		✓							@						
Belt soft, swollen																✓	@								
Belt slips, squeals (Spin Burn)				✓			✓			@						@				@	@			@	
Belt cover split	@																		@						
Underside cracked				@									@	✓					@				✓		@
Tie-band damaged		@	@	✓															✓						
Repeated breakage	@						@					@							@		✓				
Belts ride too high				✓					@	@	✓						@					✓			
Belts bottoming				✓																		✓			
Repeated take up necessary				@			@			@													@		
Belt vibrate excessively or appear mismatched			@	@			@	@			@	✓										@	@		
Bearing are hot				@	@	@		✓														@	@		
Shafts whip or bend				@	@	@		✓																	
Cracked bushings				@				✓	✓																
Pulley wobble				@		@		✓																	

✓ Indicates Most Common Causes  
 @ Indicates Other Possible Causes



# Appendix A

## HDT - Unit Weight (CLCP<sub>EURO</sub>)

### HDT Unit Weight (kg) – Fan and Coil Sections (without motor weight)

#### 50mm Casing

Model Size	Fan Section Weight		Coil Section Weight						
	Fan Arrangement		Coil Row						
	Front-Top and Front-Bottom	Top-Front and Top-Back	1	2	4	6	8	10	12
003	68	68	52	55	69	83	101	112	123
004	82	82	67	71	91	112	136	153	171
006	111	111	82	87	116	140	171	193	217
008	128	128	97	103	134	170	208	236	263
010	140	140	109	117	152	192	235	269	304
012	178	190	131	141	183	234	288	332	377
014	196	209	150	162	212	273	337	390	444
016	238	251	165	178	234	300	371	429	488
020	282	297	187	203	268	348	431	502	573
025	364	379	217	237	315	410	510	596	684
030	406	407	268	292	384	500	622	729	840
035	466	483	302	330	436	571	712	838	965
040	567	585	335	368	487	644	803	949	1093
045	592	611	376	413	549	726	907	1074	1238
050	740	782	409	451	601	798	999	1181	1369
060	765	809	465	515	694	926	1163	1379	1603
065	930	923	539	594	790	1051	1317	1560	1808
070	930	954	577	637	852	1134	1424	1689	1958
080	1067	1092	620	685	912	1219	1530	1817	2107
085	1099	1125	676	747	994	1328	1668	1984	2300
090	1137	1164	716	791	1056	1414	1775	2111	2447
095	1168	1196	754	835	1116	1497	1882	2239	2595

#### 25mm Casing

Model Size	Fan Section Weight		Coil Section Weight						
	Fan Arrangement		Coil Row						
	Front-Top and Front-Bottom	Top-Front and Top-Back	1	2	4	6	8	10	12
003	51	51	50	52	66	80	97	108	119
004	62	62	62	65	83	104	126	142	160
006	81	81	75	80	102	130	159	181	204
008	96	96	90	96	124	159	194	222	249
010	105	105	102	110	141	181	221	255	290
012	135	144	123	133	171	222	272	316	361
014	149	159	141	153	199	260	319	372	426
016	179	188	156	169	221	287	353	412	471
020	212	222	177	193	254	333	411	482	554
025	277	288	206	227	299	394	489	575	663
030	319	319	256	281	367	483	599	707	817
035	354	360	289	318	418	553	688	814	940
040	439	452	321	355	468	624	777	922	1067
045	458	472	361	399	528	705	880	1046	1210
050	582	613	394	436	579	776	970	1151	1339

1. Coil weight is the operating weight.



# Appendix A

## HDT - Unit Weight (CLCP<sub>EURO</sub>)

### Fan + Coil + Filter Sections (without motor weight)

#### 50mm Casing

Model Size	Fan Section Weight		Coil Section Weight							Filter Section Length, L3			
	Fan Arrangement		Coil Row							2"Flat Filter	2"Hi-Capacity Filter	2"Flat Filter + 15"Bag Filter	2"Flat Filter + 4"Cartridge Filter
	Front-Top and Front-Bottom	Top-Front and Top-Back	1	2	4	6	8	10	12				
003	68	68	52	55	69	83	101	112	123	21	47	36	41
004	82	82	67	71	91	112	136	153	171	25	57	38	48
006	111	111	82	87	116	140	171	193	217	32	67	44	58
008	128	128	97	103	134	170	208	236	263	38	81	50	67
010	140	140	109	117	152	192	235	269	304	35	84	54	71
012	178	190	131	141	183	234	288	332	377	41	102	62	81
014	196	209	150	162	212	273	337	390	444	48	111	70	94
016	238	251	165	178	234	300	371	429	488	44	117	67	100
020	282	297	187	203	268	348	431	502	573	50	128	74	112
025	364	379	217	237	315	410	510	596	684	54	149	83	129
030	406	407	268	292	384	500	622	729	840	56	165	96	142
035	466	483	302	330	436	571	712	838	965	68	193	106	161
040	567	585	335	368	487	644	803	949	1093	75	205	116	175
045	592	611	376	413	549	726	907	1074	1238	82	232	125	194
050	740	782	409	451	601	798	999	1181	1369	75	230	142	219
060	765	809	465	515	694	926	1163	1379	1603	82	251	157	249
065	930	923	539	594	790	1051	1317	1560	1808	88	279	169	269
070	930	954	577	637	852	1134	1424	1689	1958	95	290	180	288
080	1067	1092	620	685	912	1219	1530	1817	2107	101	319	187	315
085	1099	1125	676	747	994	1328	1668	1984	2300	108	330	198	328
090	1137	1164	716	791	1056	1414	1775	2111	2447	114	359	209	349
095	1168	1196	754	835	1116	1497	1882	2239	2595	119	365	220	362

#### 25mm Casing

Model Size	Fan Section Weight		Coil Section Weight							Filter Section Length, L3			
	Fan Arrangement		Coil Row							2"Flat Filter	2"Hi-Capacity Filter	2"Flat Filter + 15"Bag Filter	2"Flat Filter + 4"Cartridge Filter
	Front-Top and Front-Bottom	Top-Front and Top-Back	1	2	4	6	8	10	12				
003	51	51	50	52	66	80	97	108	119	19	42	31	36
004	62	62	62	65	83	104	126	142	160	23	48	29	39
006	81	81	75	80	102	130	159	181	204	31	58	34	48
008	96	96	90	96	124	159	194	222	249	37	70	39	56
010	105	105	102	110	141	181	221	255	290	33	72	43	59
012	135	144	123	133	171	222	272	316	361	39	88	49	68
014	149	159	141	153	199	260	319	372	426	46	97	55	80
016	179	188	156	169	221	287	353	412	471	42	103	52	85
020	212	222	177	193	254	333	411	482	554	48	112	58	96
025	277	288	206	227	299	394	489	575	663	51	131	66	112
030	319	319	256	281	367	483	599	707	817	53	146	77	123
035	354	360	289	318	418	553	688	814	940	65	172	85	140
040	439	452	321	355	468	624	777	922	1067	72	183	94	153
045	458	472	361	399	528	705	880	1046	1210	80	209	102	171
050	582	613	394	436	579	776	970	1151	1339	73	206	118	195

1. Coil weight is the operating weight.
2. Filter weight include filter media.



# Appendix A

## HDT - Unit Weight (CLCP<sub>Euro</sub>)

### Fan + Coil + Filter and Mixing Sections (without motor weight)

#### 50mm Casing

Model Size	Fan Section Weight (kg)		Coil Section Weight (kg)							Filter Section Weight (kg)				Mixing Box/Rear or Top Inlet Section Weight
	Fan Arrangement		Coil Row							2"Flat Filter	2"Hi-Capacity Filter	2"Flat Filter + 15"Bag Filter	2"Flat Filter + 4"Cartridge Filter	
	Front-Top & Front-Bottom	Top-Front & Top-Back	1	2	4	6	8	10	12					
003	51	51	50	52	66	80	97	108	119	0	47	36	29	38
004	62	62	62	65	83	104	126	143	160	0	57	38	34	45
006	81	81	75	80	102	130	159	181	205	0	68	44	43	54
008	96	96	90	96	124	159	194	222	249	0	81	50	50	64
010	105	105	102	110	141	181	221	255	290	0	84	55	54	66
012	135	144	123	133	171	222	273	316	361	0	101	62	63	78
014	149	159	141	153	199	260	320	372	426	0	111	70	74	81
016	179	188	156	169	221	287	353	412	471	0	117	71	80	104
020	212	222	177	193	254	333	411	482	554	0	128	74	90	111
025	277	288	206	227	299	394	483	575	663	0	149	83	105	115
030	319	319	256	281	367	483	600	707	817	0	165	96	116	134
035	354	360	289	318	418	553	688	814	940	0	193	106	134	148
040	439	452	321	355	468	624	777	922	1067	0	205	115	146	161
045	458	472	361	399	528	705	880	1046	1210	0	232	142	163	211
050	582	613	394	436	579	776	970	1151	1339	0	230	157	187	215
060	765	809	465	515	694	926	1163	1379	1603	0	251	157	214	241
065	900	923	539	594	790	1051	1317	1560	1808	0	279	169	233	279
070	930	954	577	637	852	1134	1424	1689	1958	0	290	180	251	324
080	1068	1092	619	685	912	1219	1530	1817	2107	0	319	187	276	332
085	1099	112	676	747	994	1328	1668	1984	2300	0	330	198	287	379
090	1137	1164	715	791	1056	1414	1775	2111	2447	0	359	209	307	388
095	1168	1196	754	834	1116	1497	1882	2239	2595	0	365	220	317	397

#### 25mm Casing

Model Size	Fan Section Weight (kg)		Coil Section Weight (kg)							Filter Section Weight (kg)				Mixing Box/Rear or Top Inlet Section Weight
	Fan Arrangement		Coil Row							2"Flat Filter	2"Hi-Capacity Filter	2"Flat Filter + 15"Bag Filter	2"Flat Filter + 4"Cartridge Filter	
	Front-Top & Front-Bottom	Top-Front & Top-Back	1	2	4	6	8	10	12					
003	51	51	50	52	66	80	97	108	119	0	42	31	26	35
004	62	62	62	65	83	104	126	143	160	0	48	31	31	42
006	81	81	75	80	102	130	159	181	205	0	58	34	39	51
008	96	96	90	96	124	159	194	222	249	0	70	39	46	60
010	105	105	102	110	141	181	221	255	290	0	72	43	49	58
012	135	144	123	133	171	222	273	316	361	0	88	49	57	68
014	149	159	141	153	199	260	320	372	426	0	97	55	66	71
016	179	188	156	169	221	287	353	412	471	0	103	55	74	89
020	212	222	177	193	254	333	411	482	554	0	112	58	83	95
025	277	288	206	227	299	394	483	575	663	0	131	66	96	98
030	319	319	256	281	367	483	600	707	817	0	146	77	108	114
035	354	360	289	318	418	553	688	814	940	0	172	85	125	127
040	439	452	321	355	468	624	777	922	1067	0	183	94	137	140
045	458	472	361	399	528	705	880	1046	1210	0	209	102	154	181
050	582	613	394	436	579	776	970	1151	1339	0	209	118	177	181

Note:

1. Coil weight is the operating weight.
2. Filter weight includes filter media.

# Appendix A

## VDT - Unit Weight (CLCP<sub>Euro</sub>)

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### Fan and Coil Sections (without motor weight)

#### 50mm Casing

Model Size	Fan Section Weight (kg)		Coil Section Weight (kg)						
	Fan Arrangement		Coil Row						
	Front-Top, Front-Bottom, Back-Top & Back-Bottom	Top-Front & Top-Back	1	2	4	6	8	10	12
003	107	107	76	78	87	100	113	123	134
004	121	121	94	98	111	132	150	167	184
006	175	175	112	117	135	162	186	209	232
008	205	205	139	146	168	204	233	262	288
010	228	228	151	159	186	226	261	295	330
012	254	267	187	197	230	281	326	370	414
014	272	286	211	223	263	324	378	431	484
016	355	370	246	260	306	372	432	490	550
020	471	486	264	281	335	414	486	557	629
025	582	599	336	357	423	518	606	692	780
030	609	627	396	420	500	616	725	833	942
035	773	792	438	468	560	695	822	948	1074

#### 25mm Casing

Model Size	Fan Section Weight (kg)		Coil Section Weight (kg)						
	Fan Arrangement		Coil Row						
	Front-Top, Front-Bottom, Back-Top & Back-Bottom	Top-Front & Top-Back	1	2	4	6	8	10	12
003	88	88	70	72	81	95	107	118	129
004	99	99	79	82	96	116	134	151	168
006	146	146	94	99	116	144	168	190	213
008	169	167	115	121	144	179	209	237	264
010	189	189	127	135	162	201	237	270	305
012	211	220	156	166	199	249	295	338	383
014	224	235	177	189	228	290	344	396	450
016	296	307	203	217	262	328	389	447	507
020	400	412	221	238	292	371	443	514	586
025	491	504	274	295	361	456	544	630	717
030	520	534	328	353	432	548	657	765	875
035	657	671	366	395	487	622	749	875	1001

Note:

1. Coil weight is the operating weight.



# Appendix A

## VDT - Unit Weight (CLCP<sub>Euro</sub>)

### Fan + Coil + Filter Sections (without motor weight)

#### 50mm Casing

Model Size	Fan Section Weight (kg)		Coil Section Weight (kg)							Filter Section Weight (kg)			
	Fan Arrangement		Coil Row							2"Flat Filter	2" Hi-Capacity Filter	2"Flat Filter + 15"Bag Filter	2"Flat Filter + 4"Cartridge Filter
	Front-Top, Front-Bottom, Back Top & Back-Bottom	Top-Front & Top-Back	1	2	4	6	8	10	12				
003	107	107	76	78	87	100	113	123	134	0	47	36	29
004	121	121	94	98	111	132	150	167	184	0	57	38	34
006	175	175	112	117	135	162	186	209	232	0	68	44	43
008	205	205	139	146	168	204	233	262	288	0	81	50	50
010	228	228	151	159	186	226	261	295	330	0	84	55	54
012	254	267	187	197	230	281	326	370	414	0	101	62	63
014	272	286	211	223	263	324	378	431	484	0	111	70	74
016	355	370	246	260	306	372	432	490	550	0	117	71	80
020	471	486	264	281	335	414	486	557	629	0	128	74	90
025	582	599	336	357	423	518	606	692	780	0	149	83	105
030	609	627	396	420	500	616	725	833	942	0	165	96	116
035	773	792	438	468	560	695	822	948	1074	0	193	106	134

#### 25mm Casing

Model Size	Fan Section Weight (kg)		Coil Section Weight (kg)							Filter Section Weight (kg)			
	Fan Arrangement		Coil Row							2"Flat Filter	2" Hi-Capacity Filter	2"Flat Filter + 15"Bag Filter	2"Flat Filter + 4"Cartridge Filter
	Front-Top, Front-Bottom, Back Top & Back-Bottom	Top-Front & Top-Back	1	2	4	6	8	10	12				
003	88	88	70	72	81	95	107	118	129	0	42	31	26
004	99	99	79	82	96	116	134	151	168	0	48	31	31
006	146	146	94	99	116	144	168	190	213	0	58	34	39
008	169	167	115	121	144	179	209	237	264	0	70	39	46
010	189	189	127	135	162	201	237	270	305	0	72	43	49
012	211	220	156	166	199	249	295	338	383	0	88	49	57
014	224	235	177	189	228	290	344	396	450	0	97	55	68
016	296	307	203	217	262	328	389	447	507	0	103	55	74
020	400	412	221	238	292	371	443	514	586	0	112	58	83
025	491	504	274	295	361	456	544	630	717	0	131	66	98
030	520	534	328	353	432	548	657	765	875	0	146	77	108
035	657	671	366	395	487	622	749	875	1001	0	172	85	125

Note:

1. Coil weight is the operating weight.
2. Filter weight includes filter media.

# Appendix B

## HDT - Unit Weight (CLCP<sub>XP</sub>)

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### Fan and Coil sections (without motor weight)

Model Size	Fan Section Weight		Coil Section Weight						
	Fan Arrangement		Coil Row						
	Front-Top and Front-Bottom	Top-Front and Top-Back	1	2	4	6	8	10	12
003	88	88	126	130	138	146	170	178	186
004	107	107	156	163	175	187	222	234	247
006	132	144	186	194	211	227	272	289	305
008	154	166	215	226	246	267	322	343	364
010	193	206	217	234	263	293	350	380	411
012	246	261	245	267	306	347	418	459	500
014	264	280	268	296	345	396	480	531	582
016	301	317	302	330	386	437	530	581	633
020	322	356	339	373	440	502	610	673	735
025	447	467	375	418	502	582	709	789	868
030	467	489	428	482	592	694	848	950	1052
035	556	580	472	534	663	783	961	1081	1201
040	632	656	517	590	735	873	1077	1215	1353
045	654	679	569	653	817	976	1208	1366	1525
050	759	788	615	709	892	1069	1326	1503	1680
060	785	815	678	789	1012	1225	1524	1738	1951
065	952	986	746	873	1125	1368	1705	1948	2192
070	978	1014	795	933	1207	1472	1838	2103	2369
080	1113	1148	842	992	1287	1574	1970	2257	3545
085	1139	1175	905	1070	1392	1708	2140	2456	2771
090	1165	1202	953	1128	1471	1809	2271	2608	2945
095	1191	1540	1000	1186	1552	1910	2401	2761	3118
100	1650	1745	1213	1450	1915	2370	2981	3437	3893
110	2054	2151	1250	1507	2014	2511	3162	2659	4155
120	2092	2193	1293	1571	2111	2642	3328	3859	4389

1: Coil weight is the operating weight



# Appendix B

## HDT - Unit Weight (CLCP<sub>XP</sub>)

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### Fan + Coil + Filter Sections (without motor weight)

Model Size	Fan Section Weight		Coil Section Weight							Filter Section Length .L3		
	Fan Arrangement		Coil Row							2" Flat Filter	2" Flat Filter + 15" Bag Filter	2" Flat Filter + 4" Cartridge Filter
	Front-Top and Front-Bottom	Top-Front and Top-Back	1	2	4	6	8	10	12			
003	88	88	126	130	138	146	170	178	186	9	38	21
004	107	107	156	163	175	187	222	234	247	10	42	23
006	132	144	186	194	211	227	272	289	305	12	50	29
008	154	166	215	226	246	267	322	343	364	14	54	32
010	193	206	217	234	263	293	350	380	411	15	57	36
012	246	261	245	267	306	347	418	459	500	16	62	38
014	264	280	268	296	345	396	480	531	582	18	70	46
016	301	317	302	330	386	437	530	581	633	19	72	50
020	322	356	339	373	440	502	610	673	735	21	79	56
025	447	467	375	418	502	582	709	789	868	24	88	65
030	467	489	428	482	592	694	848	950	1052	27	97	73
035	556	580	472	534	663	783	961	1081	1201	29	106	82
040	632	656	517	590	735	873	1077	1215	1353	32	114	90
045	654	679	569	653	817	976	1208	1366	1525	35	123	99
050	759	788	615	709	892	1069	1326	1503	1680	37	132	107
060	785	815	678	789	1012	1225	1524	1738	1951	41	144	120
065	952	986	746	873	1125	1368	1705	1948	2192	44	152	128
070	978	1014	795	933	1207	1472	1838	2103	2369	47	162	139
080	1113	1148	842	992	1287	1574	1970	2257	3545	50	171	147
085	1139	1175	905	1070	1392	1708	2140	2456	2771	53	181	158
090	1165	1202	953	1128	1471	1809	2271	2608	2945	56	190	166
095	1191	1540	1000	1186	1552	1910	2401	2761	3118	59	200	177
100	1650	1745	1213	1450	1915	2370	2981	3437	3893	63	213	194
110	2054	2151	1250	1507	2014	2511	3162	2659	4155	64	215	195
120	2092	2193	1293	1571	2111	2642	3328	3859	4389	69	231	214

1: Coil weight is the operating weight  
 : Filter section weight includes filter media

# Appendix B

## HDT - Unit Weight (CLCP<sub>XP</sub>)

### Fan + Coil + Filter and Mixing Sections (without motor weight)

Model Size	Fan Section Weight		Coil Section Weight							Filter Section (kg)			Mixing Box / Rear or Top Inlet Section Weight (kg)
	Fan Arrangement		Coil Row							2" Flat Filter	2" Flat Filter + 15" Bag Filter	2" Flat Filter + 4" Cartridge Filter	
	Front-Top and Front-Bottom	Top-Front and Top-Back	1	2	4	6	8	10	12				
003	88	88	126	130	138	146	170	178	186	9	38	21	55
004	107	107	156	163	175	187	222	234	247	10	42	23	65
006	132	144	186	194	211	227	272	289	305	12	50	29	75
008	154	166	215	226	246	267	322	343	364	14	54	32	85
010	193	206	217	234	263	293	350	380	411	15	57	36	81
012	246	261	245	267	306	347	418	459	500	16	62	38	91
014	264	280	268	296	345	396	480	531	582	18	70	46	103
016	301	317	302	330	386	437	530	581	633	19	72	50	97
020	322	356	339	373	440	502	610	673	735	21	79	56	109
025	447	467	375	418	502	582	709	789	868	24	88	65	123
030	467	489	428	482	592	694	848	950	1052	27	97	73	129
035	556	580	472	534	663	783	961	1081	1201	29	106	82	146
040	632	656	517	590	735	873	1077	1215	1353	32	114	90	174
045	654	679	569	653	817	976	1208	1366	1525	35	123	99	188
050	759	788	615	709	892	1069	1326	1503	1680	37	132	107	193
060	785	815	678	789	1012	1225	1524	1738	1951	41	144	120	213
065	952	986	746	873	1125	1368	1705	1948	2192	44	152	128	219
070	978	1014	795	933	1207	1472	1838	2103	2369	47	162	139	264
080	1113	1148	842	992	1287	1574	1970	2257	3545	50	171	147	271
085	1139	1175	905	1070	1392	1708	2140	2456	2771	53	181	158	320
090	1165	1202	953	1128	1471	1809	2271	2608	2945	56	190	166	328
095	1191	1540	1000	1186	1552	1910	2401	2791	3118	59	200	177	336
100	1650	1745	1213	1450	1915	2370	2981	3437	3893	63	213	194	340
110	2054	2151	1250	1507	2014	2511	3162	2659	4155	64	215	195	345
120	2092	2193	1293	1571	2111	2642	3328	3859	4389	69	231	214	353

- 1: Coil weight is the operating weight
- 2: Filter section weight includes filter medic



## Appendix B

### VDT - Unit Weight (CLCP<sub>XP</sub>)

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#### Fan and Coil sections (without motor weight)

Model Size	Fan Section Weight		Coil Section Weight						
	Fan Arrangement		Coil Row						
	Front-Top and Front-Bottom	Top-Front and Top-Back	1	2	4	6	8	10	12
003	103	103	153	158	165	173	189	197	205
004	132	132	190	197	209	221	246	258	271
006	162	174	227	236	252	268	302	319	335
008	190	202	262	273	293	314	357	378	399
010	229	242	289	306	335	365	410	440	471
012	288	302	327	349	388	429	486	527	568
014	313	329	361	389	438	489	558	609	660
016	350	366	424	452	508	559	637	688	740
020	378	412	442	476	543	605	698	761	823
025	510	531	541	584	668	748	858	938	1017
030	540	561	610	664	774	876	1012	1114	1216
035	638	662	669	733	860	980	1139	1259	1379
040	722	746	731	804	949	1087	1270	1408	1546
045	755	780	800	884	1048	1207	1417	1575	1734



# Appendix B

## VDT - Unit Weight (CLCP<sub>XP</sub>)

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### Fan + Coil + Filter Sections (without motor weight)

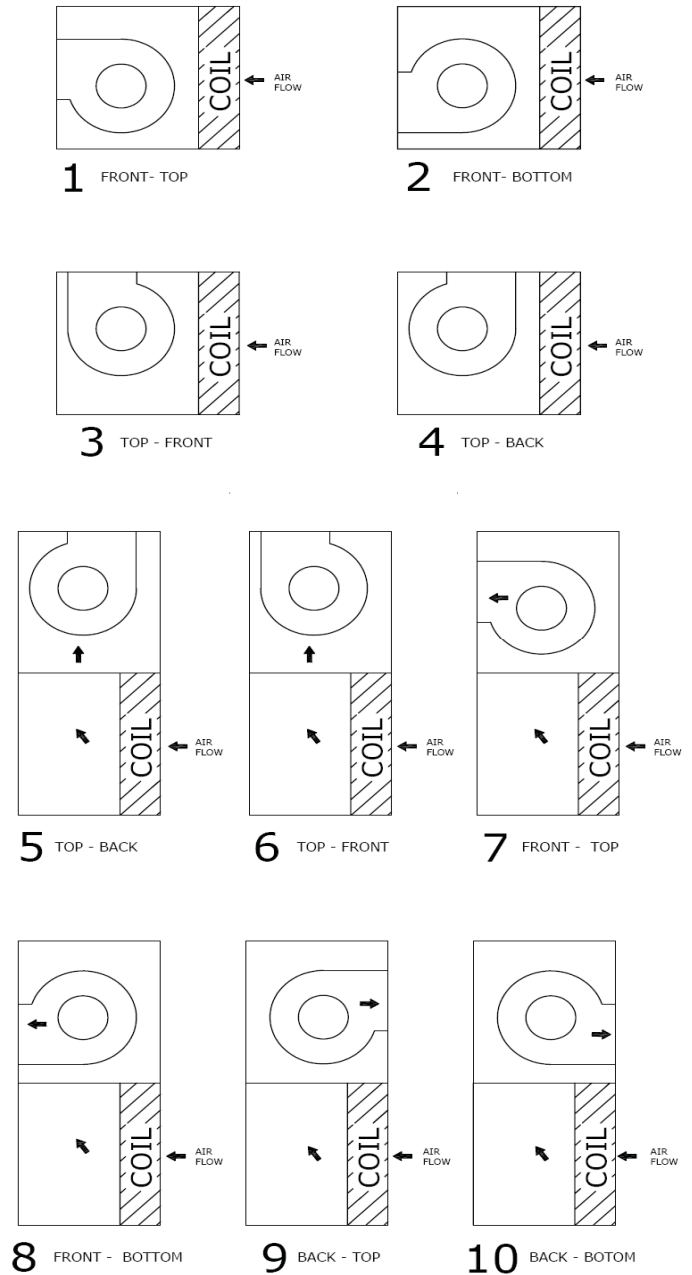
Model Size	Fan Section Weight		Coil Section Weight							Coil Length .L3		
	Fan Arrangement		Coil Row							2" Flat Filter	2" Flat Filter + 15" Bag Filter	2" Flat Filter + 4" Cartridge Filter
	Front-Top and Front-Bottom	Top-Front and Top-Back	1	2	4	6	8	10	12			
003	103	103	153	158	165	173	189	197	205	9	38	21
004	132	132	190	197	209	221	246	258	271	10	42	23
006	162	174	227	236	252	268	302	319	335	12	50	29
008	190	202	262	273	293	314	357	378	399	14	54	32
010	229	242	289	306	335	365	410	440	471	15	57	36
012	288	302	327	349	388	429	486	527	568	16	62	38
014	313	329	361	389	438	489	558	609	660	18	70	46
016	350	366	424	452	508	559	637	688	740	19	72	50
020	378	412	442	476	543	605	698	761	823	21	79	56
025	510	531	541	584	668	748	858	938	1017	24	88	65
030	540	561	610	664	774	876	1012	1114	1216	27	97	73
035	638	662	669	733	860	980	1139	1259	1379	29	106	82
040	722	746	731	804	949	1087	1270	1408	1546	32	114	90
045	755	780	800	884	1048	1207	1417	1575	1734	35	123	99

# Appendix C- Fans and Arrangement

## Fan Size and Diameter

Model Size	Fan size	Fan size Diameter (mm)
003	FC 200	200
	BC 200	
004	FC 225	225
	BC 225	
006	FC 250	250
	BC 250	
008	FC 280	280
	BC 280	
010	FC 315	315
	BC 315	
012	FC 400	400
	BC 400	
014	FC 400	400
	BC 400	
016	FC 450	450
	BC 450	
020	FC 500	500
	BC 500	
025	FC 560	560
	BC 560	
030	FC 560	560
	BC 560	
035	FC 630	630
	BC 630	
040	FC 710	710
	BC 710	
045	FC 710	710
	BC 710	
050	FC 800	800
	BC 800	
060	FC 800	800
	BC 800	
065	FC 900	900
	BC 900	
070	FC 900	900
	BC 900	
080	FC 1000	1000
	BC 1000	
085	FC 1000	1000
	BC 1000	
090	FC 1000	1000
	BC 1000	
095	FC 1000	1000
	BC 1000	
100	FC 1120	1120
	BC 1120	
110	BC 1250	1250
120	BC 1250	1250














## Fan Discharge Arrangements

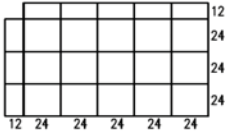
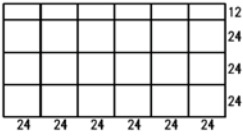
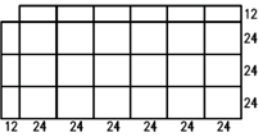
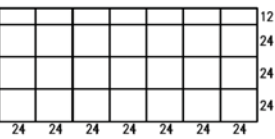
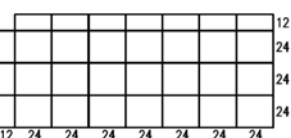
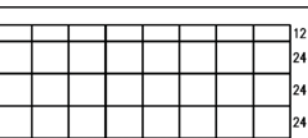
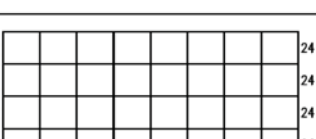
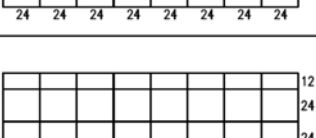


# Appendix D- Filter and Quantity

## Filter Dimension (Nominal) and Arrangement

Flat Filter, Bag Filter & Cartridge Filter




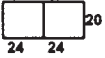



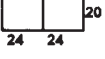
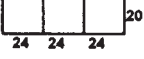
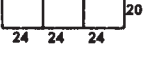

MODEL	ARRANGEMENT	(Nominal Sizes in inches)
003 004		24 20
006 008		24 24 20
010 012		24 24 12 20
014		24 24 24 12 20
016		24 24 24 12 24
020		24 24 24 24
025		24 24 24 12 24
030		24 24 24 24
035		24 24 24 12 24
040		24 24 24 24
045		24 24 24 12 24
050		24 24 24 24
060		24 24 24 12 24

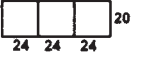
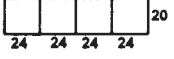
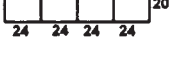
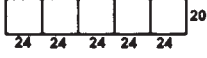
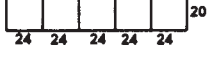
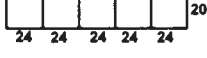

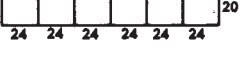
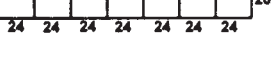
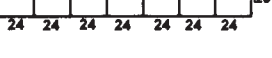
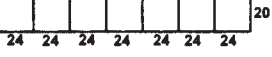
MODEL	ARRANGEMENT	(Nominal Sizes in inches)
065		12 24 24 24 24 24 24 12 24
070		12 24 24 24 24 24 24 24
080		12 24 24 24 24 24 24 24
085		12 24 24 24 24 24 24 24
090		12 24 24 24 24 24 24 24
095		12 24 24 24 24 24 24 24
100 110		24 24 24 24 24 24 24 24
120		12 24 24 24 24 24 24 24

# Appendix D- Filter and Quantity

## Filter Dimension and Arrangement

### High Capacity Filter - CLCP Euro only


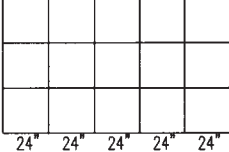

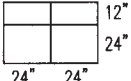
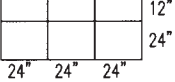
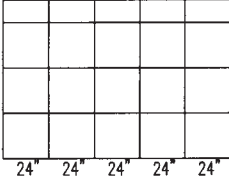
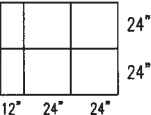
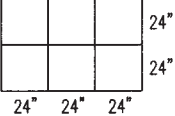
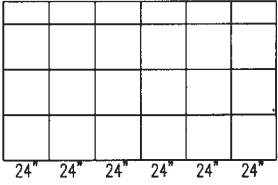
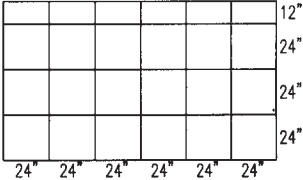
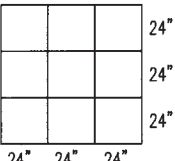
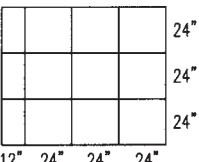
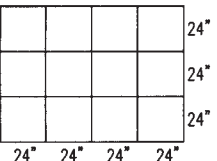
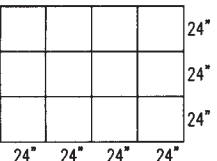
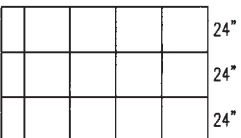
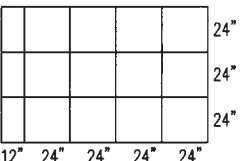
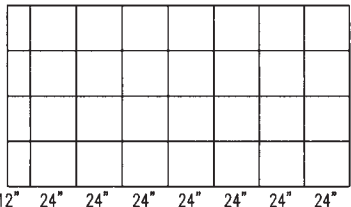
FILTER PLAN		
Model	Dimension	Filter Arrangement
003	2 ROWS – 24" X 20"	
004	2 ROWS – 24" X 20"	
006	2 ROWS – 48" X 20"	
008	2 ROWS – 48" X 20"	
010	4 ROWS – 48" X 20"	
012	4 ROWS – 48" X 20"	
014	4 ROWS – 72" X 20"	
016	5 ROWS – 48" X 20"	
020	5 ROWS – 72" X 20"	
025	7 ROWS – 72" X 20"	
030	8 ROWS – 72" X 20"	

FILTER PLAN		
Model	Dimension	Filter Arrangement
035	8 ROWS – 72" X 20"	
040	8 ROWS – 96" X 20"	
045	2 ROWS – 96" X 20"	
050	8 ROWS – 120" X 20"	
060	9 ROWS – 120" X 20"	
065	9 ROWS – 120" X 20"	
070	9 ROWS – 144" X 20"	
080	9 ROWS – 144" X 20"	
085	9 ROWS – 168" X 20"	
090	9 ROWS – 168" X 20"	
095	9 ROWS – 168" X 20"	

# Appendix D- Filter and Quantity

## Filter Dimension and Arrangement

### Final Filter (HEPA)

FILTER PLAN					
MODEL	ARRANGEMENT	(NOMINAL SIZES IN INCHES)	MODEL	ARRANGEMENT	(NOMINAL SIZES IN INCHES)
003 & 004		24" 24"	050		24" 24" 24" 24" 24"
006 & 008		24" 24"			
010 & 012		12" 24" 24"			
014		12" 24" 24"	060 & 065		12" 24" 24" 24" 24"
016		24" 24" 12" 24"			
020		24" 24" 24" 24"	070 & 080		12" 24" 24" 24" 24"
025		12" 24" 24" 24"			
030		24" 24" 24" 24" 24"	085 & 090		12" 24" 24" 24" 24"
035		12" 24" 24" 24"			
040		24" 24" 24" 24" 24"	095		12" 24" 24" 24" 24"
045		12" 24" 24" 24" 24"			
			100, 110 & 120		24" 24" 24" 24" 24"



# Appendix E- TECO MOTOR Performance Data 380 / 415V - 50Hz, 2/4/6/8 Poles

**Motor types AEEB and AEVB, Class F insulation, 380 / 415V - 50HZ, Eff 2.**

Output		Full Load Speed (RPM)	Frame Size	% Efficiency			% Power Factor			Current (A) 380 Volts		Current (A) 415 Volts		Torque				Rotor GD <sup>2</sup> Kg-m <sup>2</sup>	Approx Weight AEEB Kg	Approx Weight AEVB Kg
HP	KW			Full Load	3/4 Load	1/2 Load	Full Load	3/4 Load	1/2 Load	Full Load	Locked Rotor	Full Load	Locked Rotor	Full Load	Locked Rotor	Pull Up	Pull Out			
20	15	2925	160M	90.5	91	90	91	90	85.5	27.5	209	25.2	191	4.963	215	180	270	0.183	128	120
		1465	160L	90.5	90.5	89	86	80.5	71	29.2	213	26.7	195	9.909	240	195	285	0.381	151	148
		970	180L	90	90.5	90	85	82.5	76	29.6	208	27.1	190	14.966	200	155	230	1.233	206	205
		730	200L	89.5	89	87.5	77	70.5	59.5	32.9	208	30.1	190	19.887	200	180	240	1.610	293	280
25	18.5	2930	160L	91.5	91.5	91	92	90	85.5	33.6	251	30.8	230	6.193	250	190	290	0.237	151	148
		1450	180M	91	91	90.5	86	83.5	76.5	36.3	246	33.2	225	12.515	200	170	230	0.571	183	175
		970	200L	91	91	91	83.5	82	76	37.2	246	34.1	225	18.708	205	170	215	1.610	293	280
		730	225S	90	90	89	78	72	62	40.4	246	37	225	24.858	185	150	200	2.093	346	330
30	22	2930	180M	92	92.5	91.5	90	88.5	83.5	41.1	295	37.6	270	7.432	220	190	270	0.283	190	190
		1460	180L	91.5	91.5	90.5	86.5	82.5	74.5	42.9	295	39.3	270	14.915	215	180	260	0.744	206	205
		975	200L	92.5	92.5	92	83.5	79.5	71.5	44	295	40.3	270	22.334	220	200	250	1.919	293	280
		730	225M	91	90.5	89	77	70.5	59	48.5	295	44.4	270	29.830	200	175	220	2.442	370	360
40	30	2960	200L	92	91.5	89	84.5	79	71	58.3	404	53.4	370	9.809	190	170	280	0.521	289	285
		1470	200L	92.5	93	92.5	86.5	83.5	76.5	56.7	410	51.9	375	19.751	240	195	285	1.264	293	280
		980	225M	91.5	91.5	88.5	81.5	75	65	60.8	394	55.7	361	29.627	220	190	240	2.326	370	360
		730	250S	90.5	90	88.5	78.5	70.5	60	63.8	393	58.4	360	39.773	200	170	230	3.475	498	450
50	37	2950	200L	92.5	92.5	91.5	88.5	87	81	69.2	494	63.4	452	12.303	180	145	260	0.633	289	285
		1470	225S	92.5	92	91	85	81.5	74.5	72.1	494	66	452	24.689	200	175	230	1.649	346	330
		980	250S	92.5	92.5	91.5	85.5	81	73	71.6	486	65.6	445	37.034	210	190	240	3.373	498	450
		730	250M	91	91	89.5	79.5	73	62	78.6	481	71.7	440	49.716	200	170	230	4.572	562	520
60	45	2950	225M	93	92.5	91	91.5	90	86	79.9	557	73.2	510	14.763	145	130	260	1.074	353	370
		1470	225M	92.5	93	92	85.5	83	76.5	85.9	557	78.7	510	29.627	190	160	215	1.731	370	360
		980	250M	92.5	92.5	91.5	84.5	79	69.5	87	573	79.7	525	44.440	230	210	270	3.829	562	520
		725	280SC	92	91	90.2	80	74	66	92.8	552	85	505	60.5	140	110	210	8.4	650	710
75	55	2960	250S	93.5	93.5	87.5	9.05	88	85.5	100	721	92	660	18.392	165	140	315	1.410	466	470
		1480	250S	93.5	93.5	92	89	87	81	102	683	93.5	625	36.783	200	165	265	3.643	498	450
		970	280SC	93	92.8	91.6	83	79	73	108	683	99	625	55.2	145	115	220	7	600	670
		730	280MC	92.4	92	91	80	74	66	112	677	103	620	73.4	135	105	210	10	680	740
100	75	2950	250M	94	94	93	90	89.5	86	134	934	123	855	24.605	150	120	285	1.678	517	545
		1480	250M	94.5	94.5	93.5	88.5	87	83	135	934	124	855	49.044	240	200	280	4.490	562	520
		975	280MC	93.6	93.5	91.6	84.5	80.5	73	144	928	132	850	74.9	140	110	210	10	690	790
		730	315SC	93	92.4	91	80	75.5	68	153	928	140	850	100	135	105	210	19.1	840	920
125	90	2950	280SA	94	93.9	91	88.5	86.5	84.5	164	1119	150	1025	29.7	130	105	220	2.7	620	660
		1475	280SC	94	93.9	91	86.5	83	79	168	1119	154	1025	59.4	145	115	220	7	630	720
		975	315SC	93.9	93.8	91.6	84.5	80.5	73	171	1114	157	1020	89.9	140	110	210	15.7	870	950
		730	315MC	93	93	91.7	80	75.5	68	183	1114	168	1020	120	125	100	210	23.9	1020	1120
150	110	2955	280MA	94	94	91	88.5	86.5	84.5	201	1365	184	1250	36.3	120	95	210	3.6	690	760
		1480	280MC	94.5	94.5	91	86.5	84.5	79	204	1365	187	1250	72.4	125	100	210	8.7	710	780
		975	315MC	94.1	94	92	84.5	80.5	73	211	1365	193	1250	110	120	95	210	17	970	1100
175	132	2955	315SA	94.6	94.5	90.8	89.2	87.5	84.5	237	1562	217	1430	43.5	110	90	210	6.3	840	930
		1480	315SC	94.8	94.8	91.2	87.5	84.5	80.5	242	1562	222	1430	86.9	125	100	210	11.3	890	1020
		975	315MC	94.3	94.2	92.4	84.5	80.5	73	252	1562	231	1430	132	120	95	210	18.9	1100	1210
200	150	2960	315MA	94.8	94.6	92	89.2	87.5	84.5	270	1775	247	1625	49.4	105	85	210	7.2	910	1000
		1480	315MC	94.9	94.9	91.3	87.5	84.5	80.5	274	1775	251	1625	98.7	110	90	210	14.3	970	1070
250	185	2960	315MA	94.9	94.8	92	89.2	87.5	84.5	333	2190	305	2005	60.9	105	85	210	7.3	1000	1100
		1480	315MB	95	94.9	92	87.5	84.5	80.5	339	2190	310	2005	122	110	90	210	14.3	1070	1180

Note : 1. For ampere values of other voltage motors, multiply the 415 volt values by the following factors:

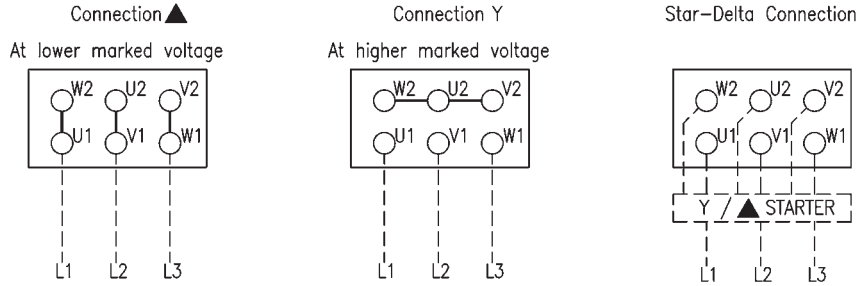
Voltage	200	220	346	365	400	420	440	500	550
Factor	2.08	1.89	1.2	1.13	1.04	0.99	0.94	0.83	0.75

2. FLT = full-load torque

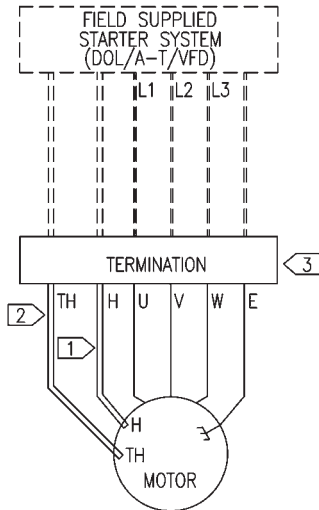
3. Data are subject to revisions without notice.

# Typical - unit wiring diagram

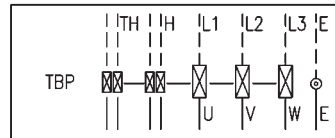
## CONNECTION DRAWING FOR BARE MOTOR



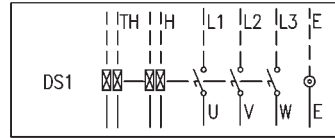
## CONNECTION DRAWING FOR TERMINATION - 3 POLE



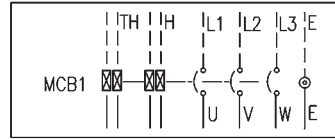
TERMINATION TYPE :- 1  TERMINATION BLOCK



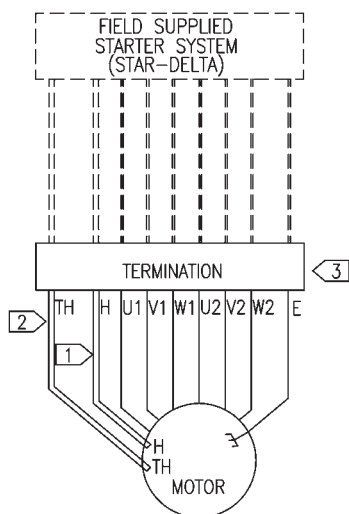
2  ISOLATOR SWITCH / DISCONNECT SWITCH



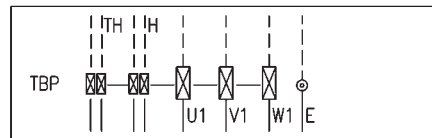
3  MCB / MCCB



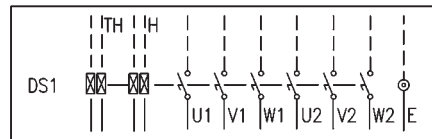
## CONNECTION DRAWING FOR TERMINATION - 6 POLE



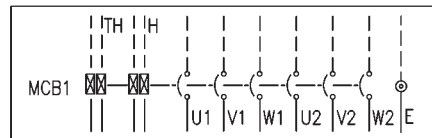
TERMINATION TYPE :- 1  TERMINATION BLOCK



2  ISOLATOR SWITCH / DISCONNECT SWITCH



3  MCB / MCCB



LEGENDS	
DS	DISCONNECT SWITCH / ISOLATOR SWITCH
H	ANTI-CONDENSATION HEATERS
MCB	CIRCUIT BREAKER
TH	THERMISTOR PROTECTION
TBP	TERMINAL BLOCK, POWER
TB	TERMINAL BLOCK

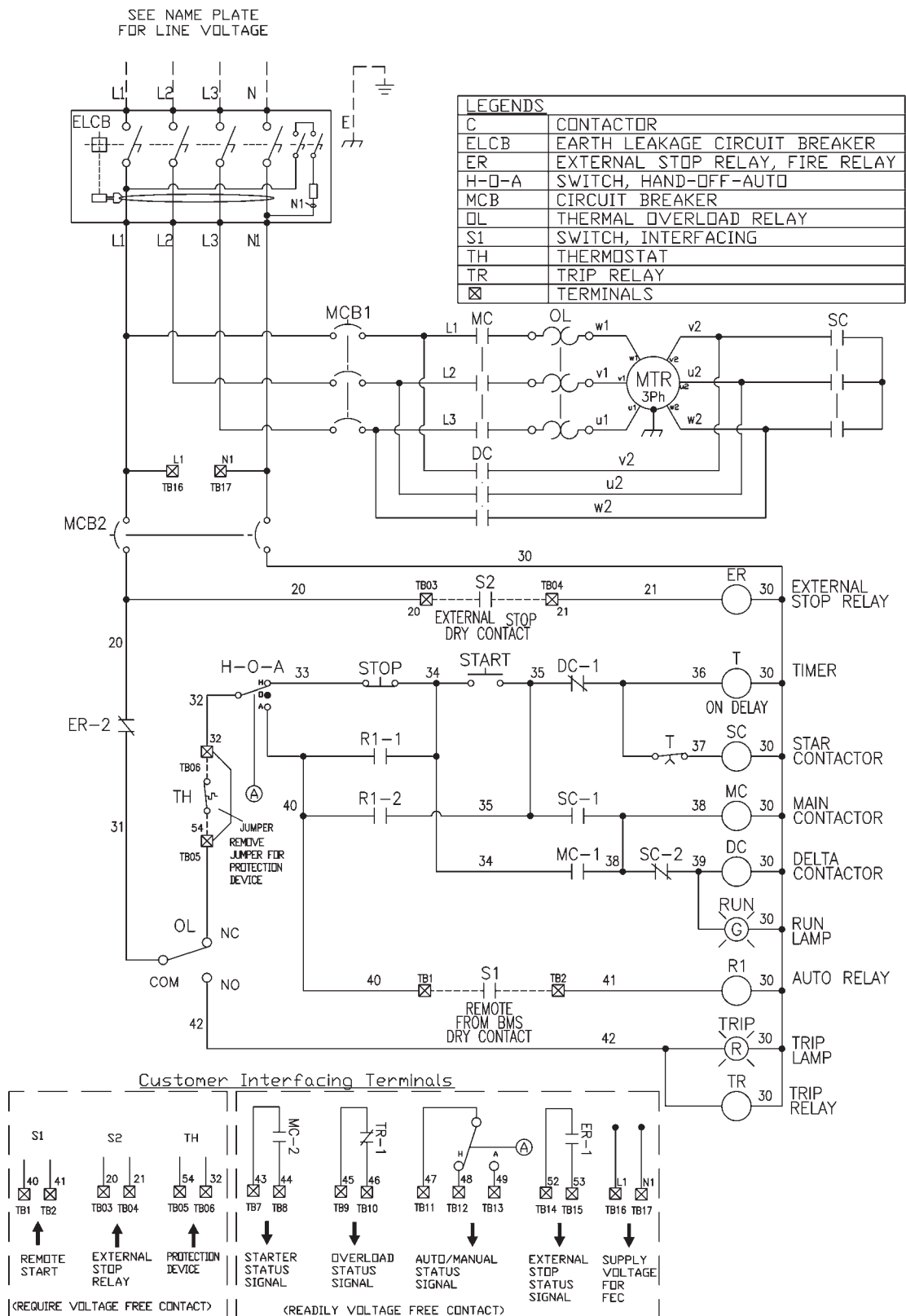
- NOTES :-
- 1 ONLY AVAILABLE WHEN HEATER OPTION AT MOTOR IS SELECTED.
  - 2 ONLY AVAILABLE WHEN THERMISTOR OPTION AT MOTOR IS SELECTED.
  - 3 REFER TO TERMINATION TYPE.



# Typical - Wiring Diagram

## Starter, Star-Delta

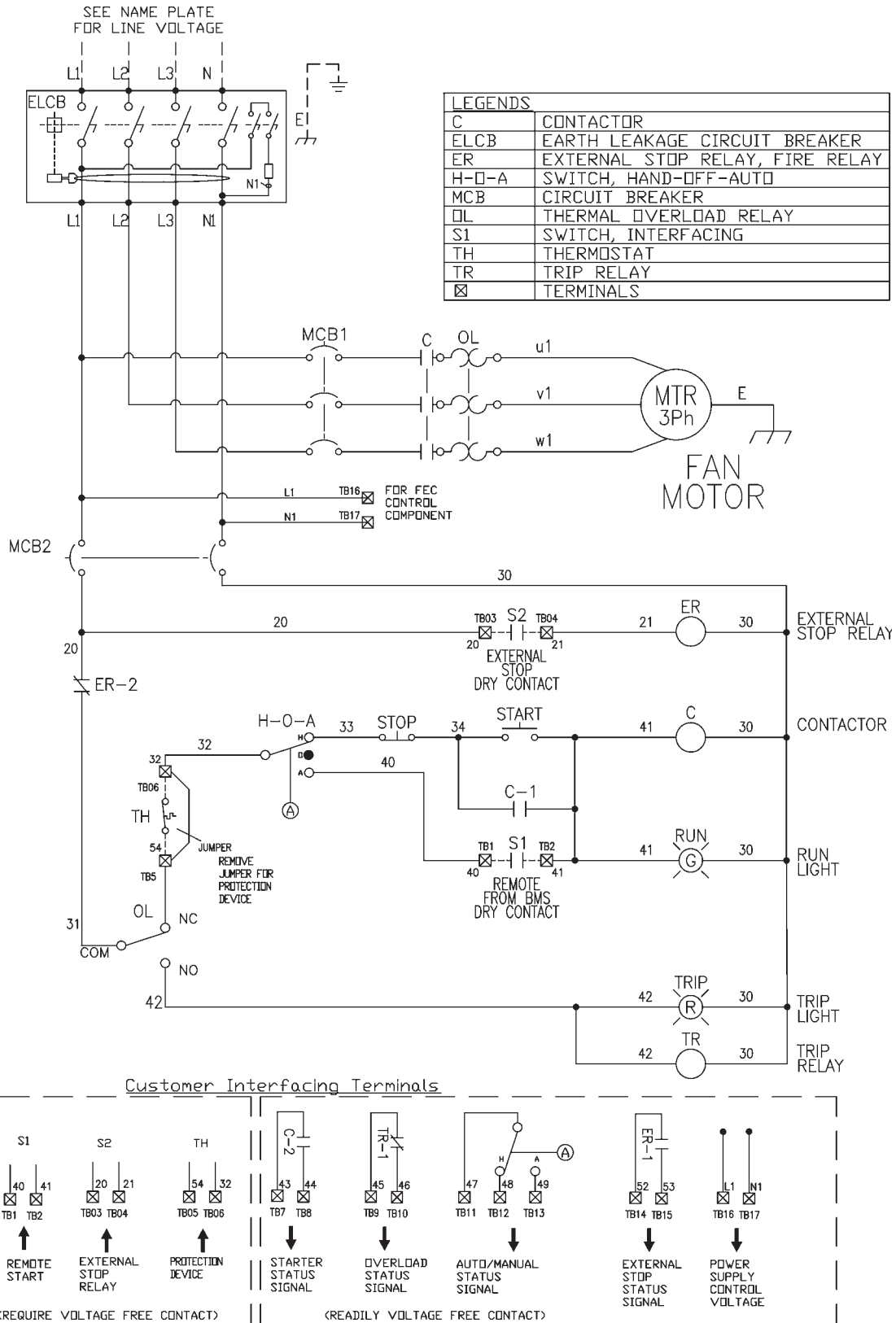
### 380 - 420V, 3Phase, 4Wires, + ELCB Standard



# Typical - Wiring Diagram

## Starter, Dol

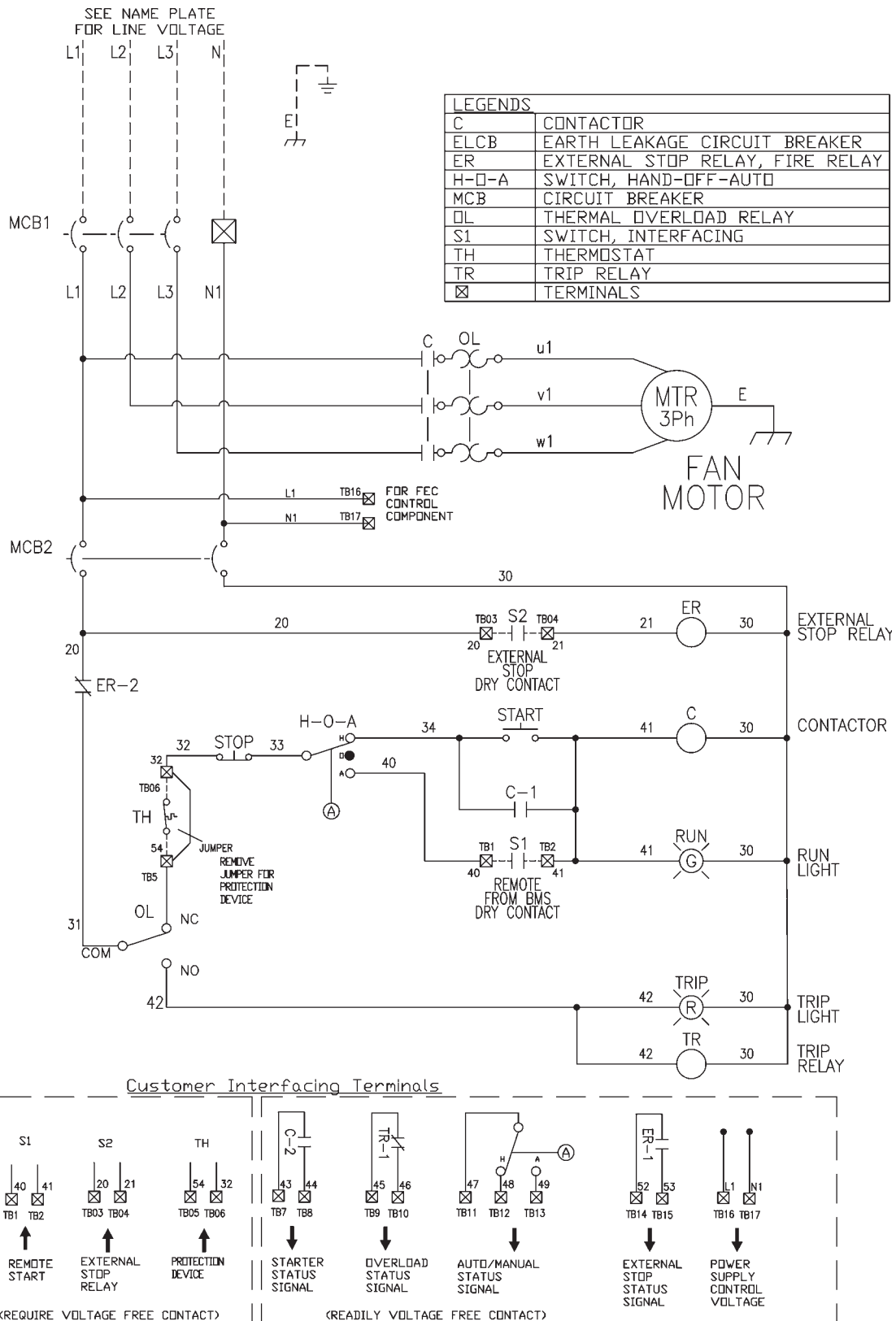
### 380 - 420V, 3Phase, 4Wires, + ELCB Standard



# Typical - Wiring Diagram

## Starter, Dol

### 380 - 420V, 3Phase, 4Wires, Standard



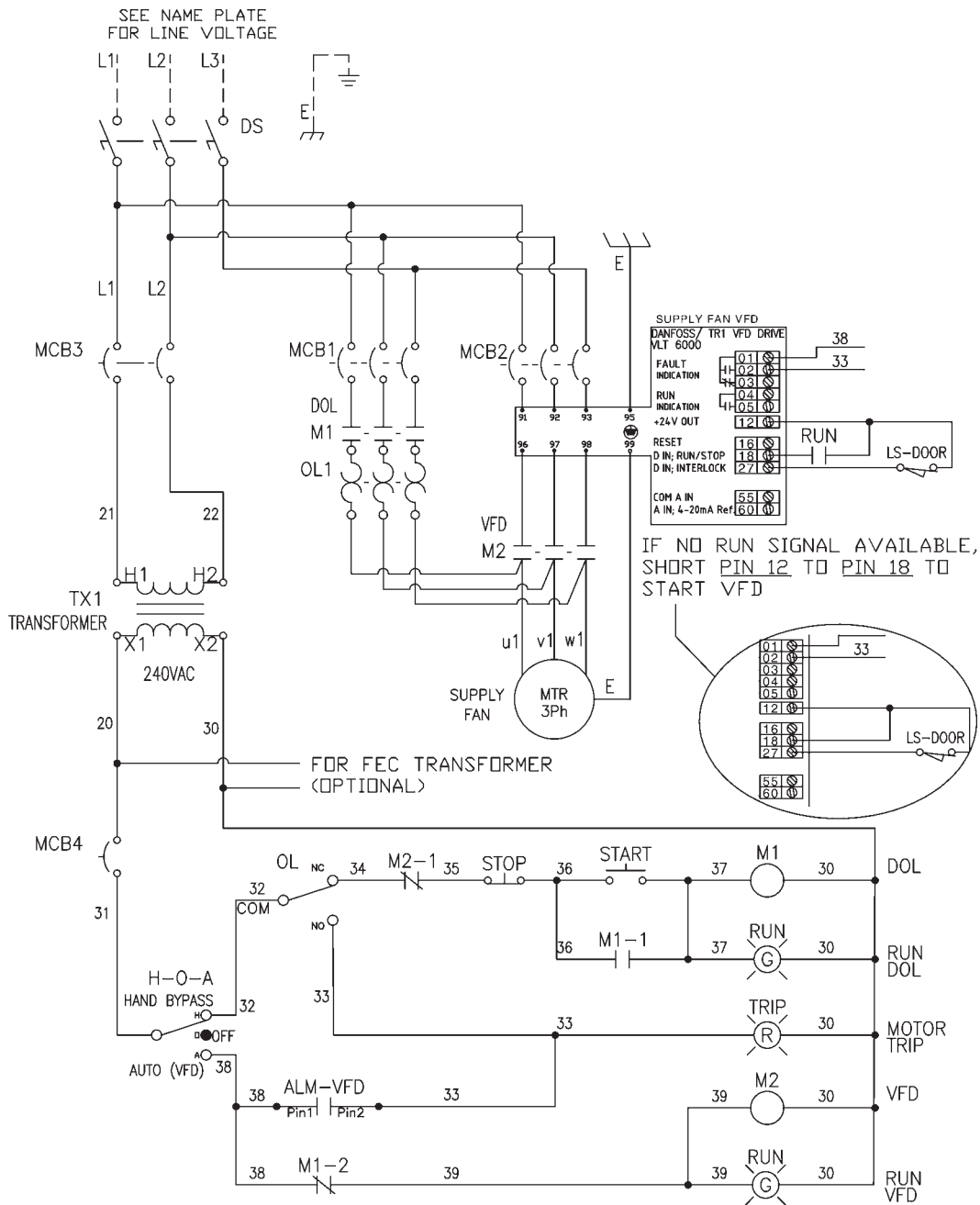


# Typical - Wiring Diagram

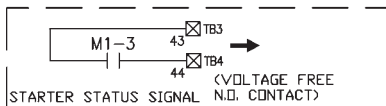
## VFD Starter + DoI

### Bypass Starter C/W Door Switch

#### 380/415/440/460V, 3Phase, 3Wires




#### Customer Interfacing Terminals



#### LEGENDS

DS	DISCONNECT SWITCH
H-O-A	SWITCH, HAND-OFF-AUTO
M1, M2	CONTACTOR
MCB	CIRCUIT BREAKER
OL	THERMAL OVERLOAD RELAY
S1	SWITCH, INTERFACING
TX	TRANSFORMER
⊠	TERMINALS

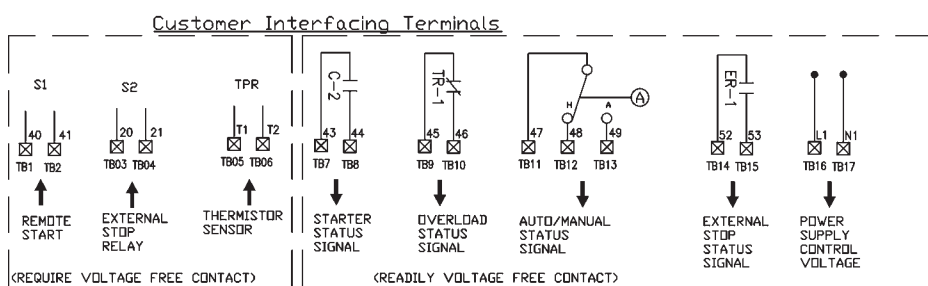
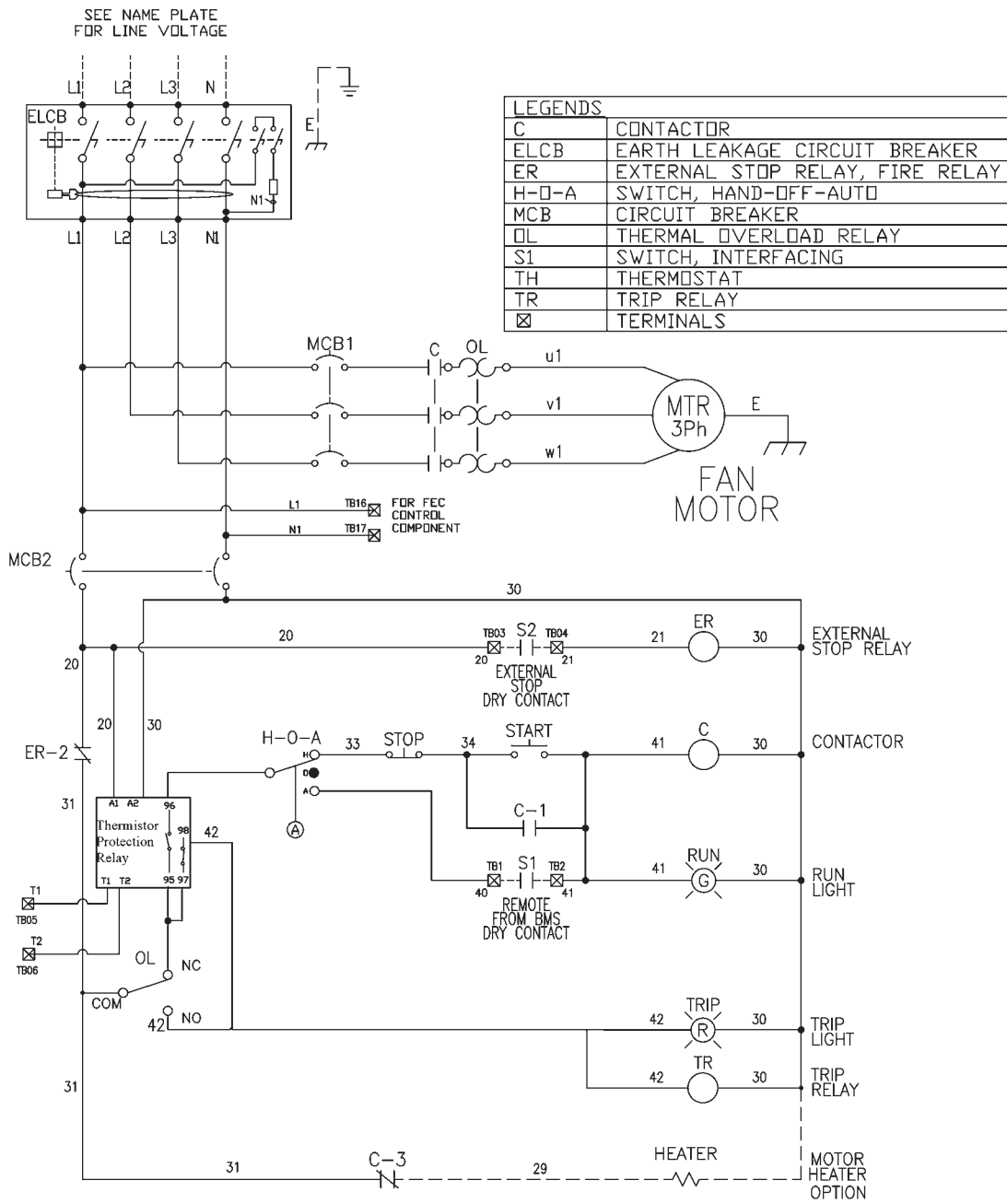
# Typical - Wiring Diagram



## Starter, Dol

### 380 - 420V, 3Phase, 4Wires + ELCB

### Enhance with Thermistor Relay

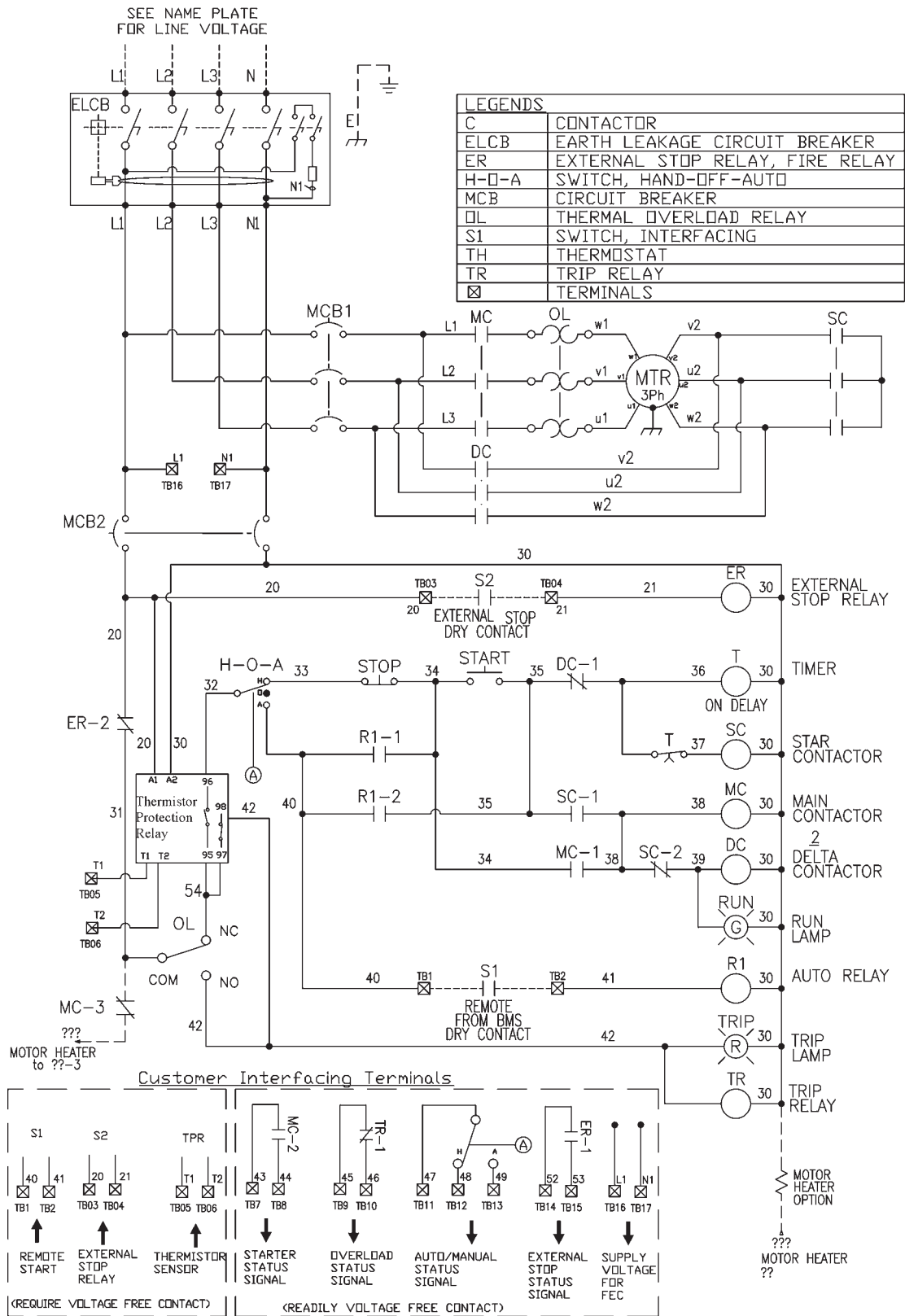




# Typical - Wiring Diagram

## Starter, Dol

### 380 - 420V, 3Phase, 4Wires, Standard

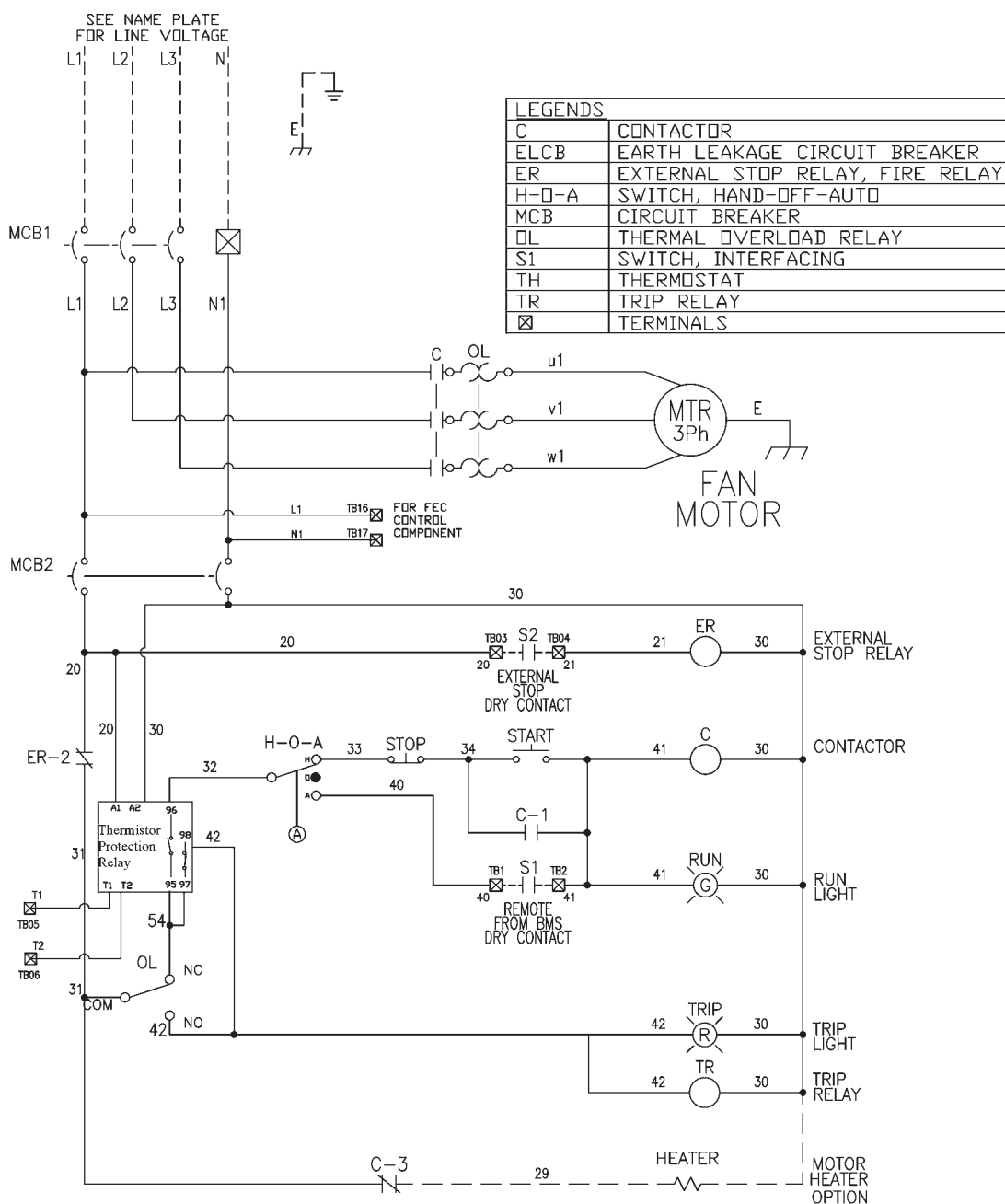


# Typical - Wiring Diagram

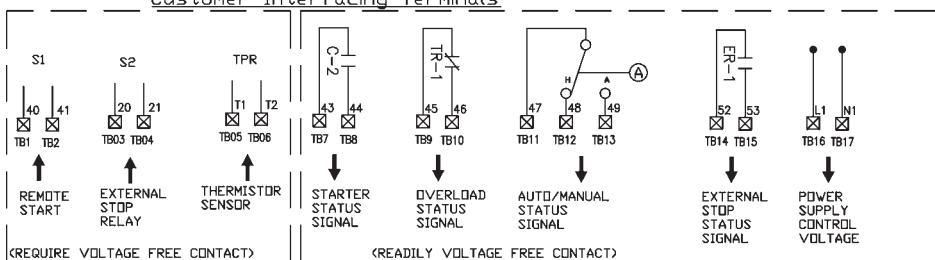
## Starter, Dol

### 380 - 420V, 3Phase, 4Wires,

### Enhance with Thermistor Relay

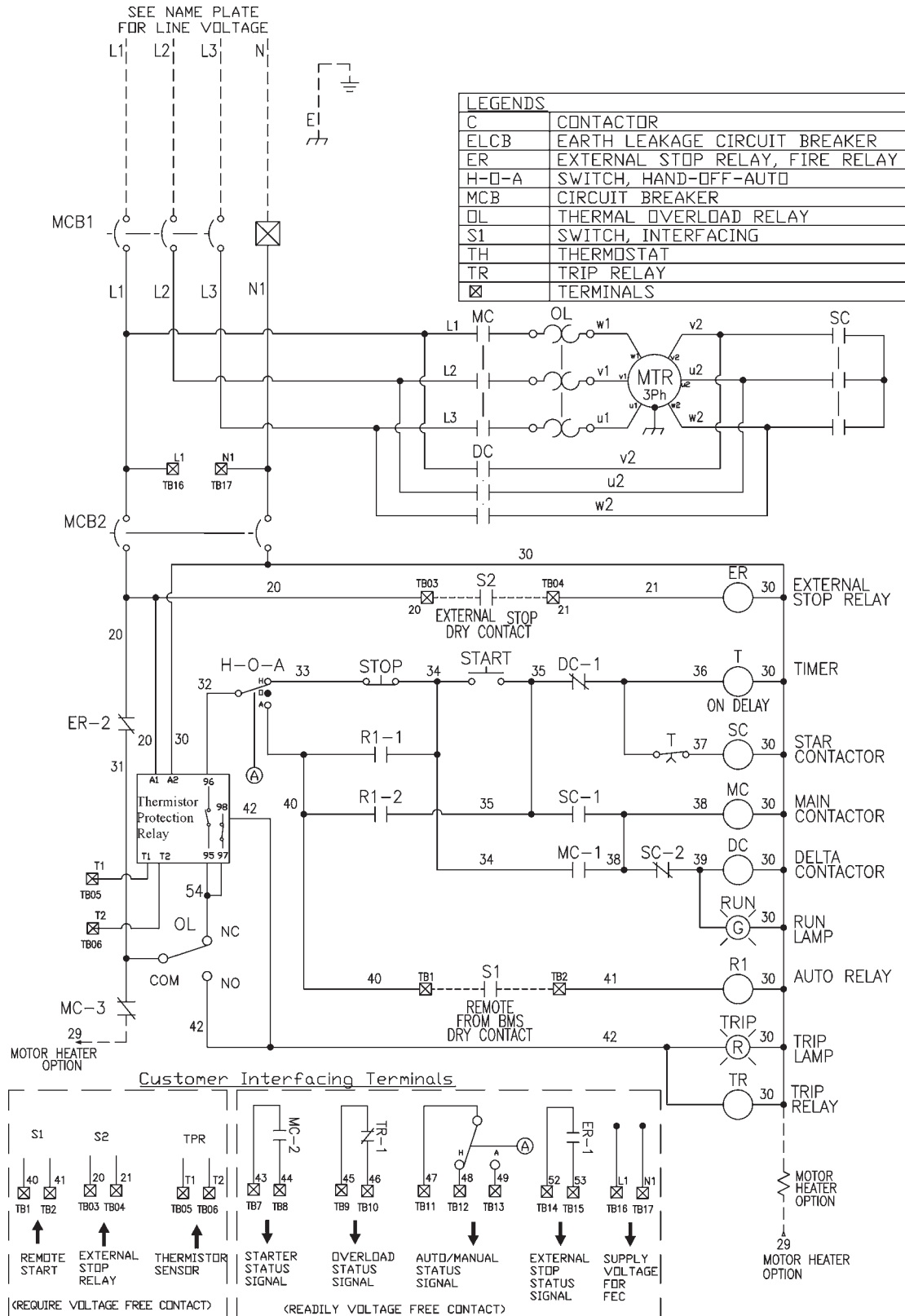


#### Customer Interfacing Terminals





# Typical - Wiring Diagram Starter, Star-Delta 380 - 420V, 3Phase, 4Wires, Enhance with Thermistor Relay

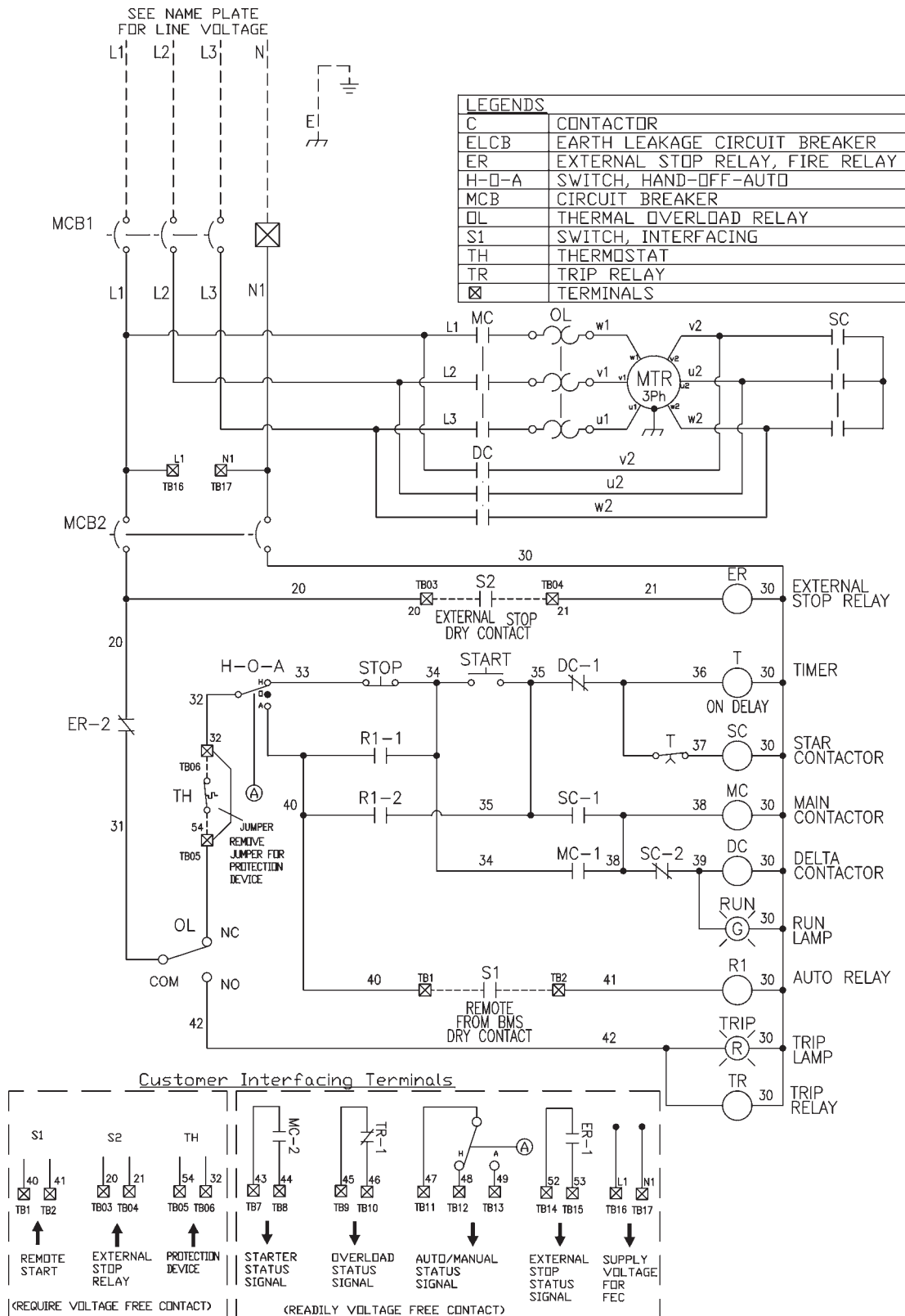




# Typical - Wiring Diagram

## Starter, Star-Delta

### 380 - 420V, 3Phase, 4Wires, Standard





## Safety Recommendations

To avoid accidents and damage, the following recommendations should be observed during maintenance and service visits:

1. Disconnect the main supply before any servicing on the unit.
2. Service work on the refrigeration system and the electrical system should be carried out only by qualified and experienced personnel.

## Maintenance Contract

It is strongly recommended that you sign a maintenance contract with your local Service Agency. This contract provides regular maintenance of your installation by a specialist in our equipment. Regular maintenance ensures that any malfunction is detected and corrected in good time and minimizes the possibility that serious damage will occur. Finally, regular maintenance ensures the maximum operating life of your equipment. We would remind you that failure to respect these installation and maintenance instructions may result in immediate cancellation of the warranty.

*The manufacturer has a policy of continuous product improvement, and reserves the right to alter any details of the products at any time without notice.*

*This publication is a general guide to install, use and properly maintain our products. The information given may be different from the specification for a particular country or for a specific order. In this event. Please refer to your nearest office.*

*In no event shall Trane be liable for any incidental or consequential damages resulting from the use, misuse or inability to use the product.*

## Training

The equipment described in this manual is the result of many years of research and continuous development. To assist you in obtaining the best use of it and maintaining it in perfect operating condition over a long period of time, the manufacturer has at your disposal a refrigeration and air conditioning service school. The principal aim of this is to give operators and technicians a better knowledge of the equipment they are using, or that is under their charge. Emphasis is particularly given to the importance of periodic checks on the unit operating parameters as well as on preventive maintenance, which reduces the cost of owning the unit by avoiding serious and costly breakdown.



For additional information, contact:  
Distributor / Installer stamp



# Pre-Start Up Checklist

## TRANE AHU Pre-start up Checklist

### General Information

Date \_\_\_\_\_

Project Name: \_\_\_\_\_

Trane Sales Order # \_\_\_\_\_

Trane AHU Model \_\_\_\_\_

Unit Serial No.: \_\_\_\_\_

Unit TAG # \_\_\_\_\_

Design Capacity (CFM) @ Design ESP \_\_\_\_\_

AHU Location \_\_\_\_\_

Area Served \_\_\_\_\_

Start-Up Contractor \_\_\_\_\_

T & C Technician / Engineer \_\_\_\_\_

### Casing Installation Check

Exterior casing in good condition  \_\_\_\_\_

Interior casing in good condition  \_\_\_\_\_

Is the unit installation level?  \_\_\_\_\_

Are the unit clearances adequate for service and operation?  \_\_\_\_\_

Do all access doors open freely and are the handles operational?  \_\_\_\_\_

### Fan-Motor Installation Checks

	Supply Fan	Return / Exhaust Fan
Have all shipping braces / brackets been removed?	<input type="checkbox"/> _____	<input type="checkbox"/> _____
Fan and Motor Alignment correct	<input type="checkbox"/> _____	<input type="checkbox"/> _____
Belt tension & condition good	<input type="checkbox"/> _____	<input type="checkbox"/> _____
Belt guard in place and secure.	<input type="checkbox"/> _____	<input type="checkbox"/> _____
Do the fan rotates freely?	<input type="checkbox"/> _____	<input type="checkbox"/> _____

### Electrical Installation Checks

Electrical Cable entry at unit wall & motor terminal box is sealed.	<input type="checkbox"/> _____	<input type="checkbox"/> _____
Have all electrical connections been tested for tightness?	<input type="checkbox"/> _____	<input type="checkbox"/> _____
Insulation test done on motor winding.	<input type="checkbox"/> _____ ohm	<input type="checkbox"/> _____ ohm
Has overcurrent protection been installed to match unit nameplate requirement?	<input type="checkbox"/> _____	<input type="checkbox"/> _____
Does the electrical supply correspond to the unit nameplate?	<input type="checkbox"/> _____	<input type="checkbox"/> _____
External Power Disconnects in place and labeled.	<input type="checkbox"/> _____	<input type="checkbox"/> _____
Proper grounding Installed for motor and unit.	<input type="checkbox"/> _____	<input type="checkbox"/> _____

Motor Nameplate FLA	_____ Amp	_____ Amp
Installed Motor kW	_____ kW	_____ kW
Electrical Power Supply	_____ Vac/Ph/Hz	_____ Vac/Ph/Hz
Voltage Imbalance	_____ %	_____ %



# Pre-Start Up Checklist

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## Coil & Piping Installation Checks

- Coils water In/OUT piping connected correctly.  \_\_\_\_\_
- Condensate drain and P-trap been installed correctly / primed  \_\_\_\_\_
- External pipe fittings complete and pipes properly supported  \_\_\_\_\_
- Coil Headers of specified material  \_\_\_\_\_
- Valves installed in correct direction  \_\_\_\_\_

## Filter Instalation Checks

- Are the air filters installed with proper orientation?  \_\_\_\_\_
- Filter Diffrential Pressure Switch operation?  \_\_\_\_\_

## Mixing Box / Economizer Dampers

- Outdoor Air Damper Operation check  \_\_\_\_\_
- Return Air Damper Operation check  \_\_\_\_\_
- Exhaust Air Damper Operation check  \_\_\_\_\_
- Have the air dampers been inspected?  \_\_\_\_\_

## Supply Duct Installation Checks

- 3D requirement**
- Duct visibly sound, clean, sealed & in good condition  \_\_\_\_\_
  - Ducts have no apprarent flow restriction.  \_\_\_\_\_
  - Ducts have turning vanes in square elbows  \_\_\_\_\_

### Notes:

- Put a check or an "X" in the box if the indicated item is "OK"
- Put "NA" in the box if the item does not apply.
- Put "BO" in the box if the work is was performed by Others  
(include appropriate explanation)







**Trane**

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*For more information, contact your local district office*

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