



CODE SHEET

VISTA Projects Limited			
VENDOR DRAWING/DOCUMENT SQUAD CHECK			
A	Reviewed without exception. Proceed with fabrication. Issue final drawings/ documents.		
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SDR CODE	EQUIPMENT TAG	REVIEWED BY	DATE
DE02	B-1100	P. VALLA	AUG. 23, 2012

PROJECT NAME: Murphy Cadotte / 1780-024

VENDOR NAME: ABB Ber-Mac

DOCUMENT
NUMBER: BM000117-0001

VENDOR
REVISION: 1

DOCUMENT
DESCRIPTION: MCC/Instrument Air Building Lighting and Instrument Layout

VENDOR
TRANSMITTAL
NUMBER: 2012-08-21 BM000117 As-Built Transmittal



CODE SHEET

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SDR CODE	EQUIPMENT TAG	REVIEWED BY	DATE
DE02	B-1100	P. VALLA	AUG. 23, 2012

PROJECT NAME: Murphy Cadotte / 1780-024

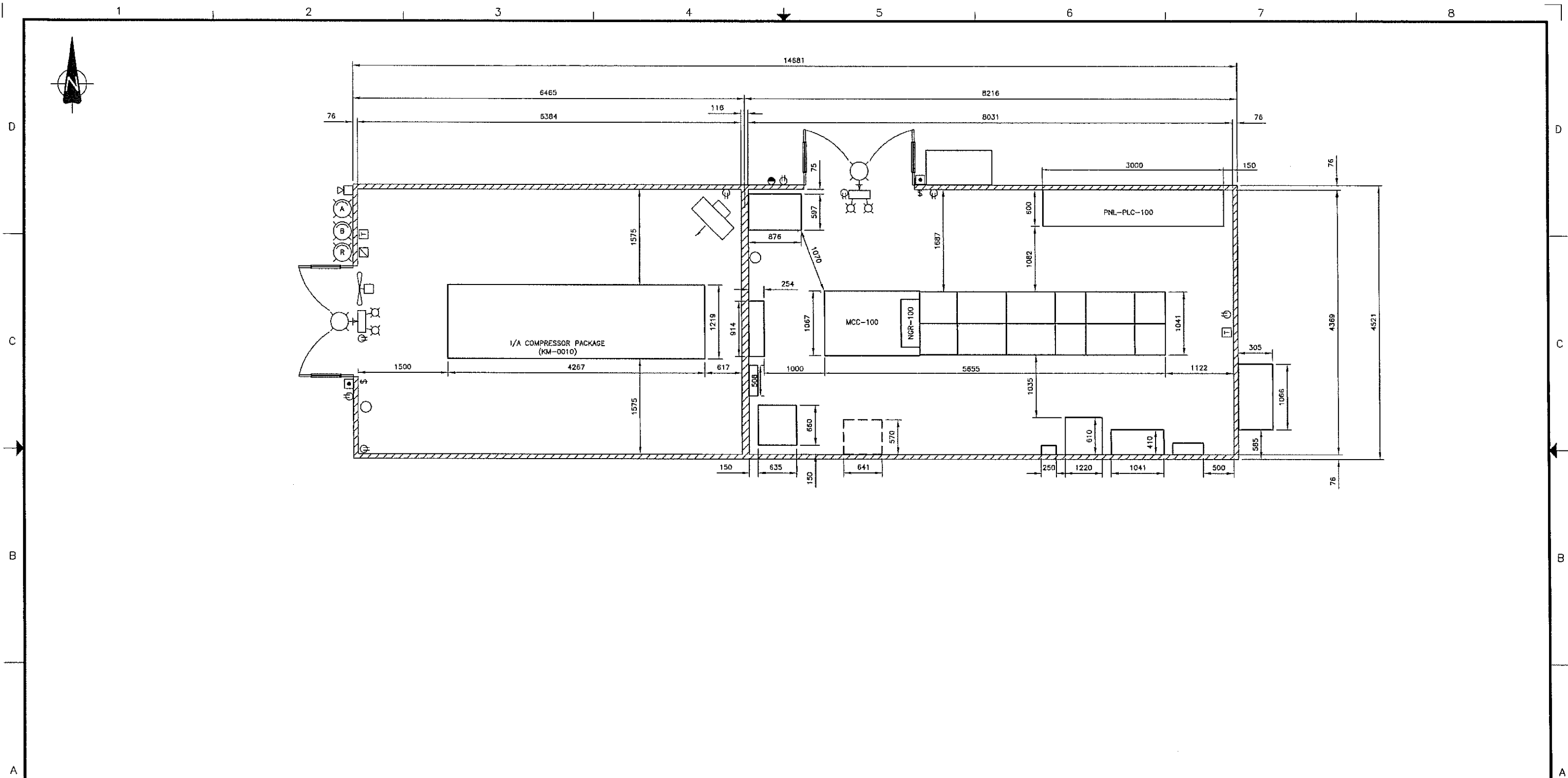
VENDOR NAME: ABB Ber-Mac

DOCUMENT
NUMBER: BM000117-0002

VENDOR
REVISION: 1 /

DOCUMENT
DESCRIPTION: MCC/Instrument Air Building Equipment Layout

VENDOR
TRANSMITTAL
NUMBER: 2012-08-21 BM000117 As-Built Transmittal



MCC BUILDING B-1100
(PLAN VIEW)

								DRAWN BY: KSB		DATE 12.03.28	<div>ABB BER-MAC</div> <div>MURPHY OIL CO. LTD. 13-09-085-17 W5M MCC/INSTRUMENT AIR BUILDING B-1100 EQUIPMENT LAYOUT</div>			
								DESIGNED BY: KSB		DATE 12.03.28				
								CHECKED BY: JG		DATE 12.04.04				
								APPROVED BY: DAH		DATE 12.07.25				
								CLIENT BY:		DATE	SCALE 1:30	JOB NO. BM000117	DRAWING NO. BM000117-0002	REV. 1
		1	AS BUILT	FRN	12-08-20	TAF								
		0	ISSUED FOR CONSTRUCTION	FRN	12-07-24	TAF	DAH							
		C	RE-ISSUED FOR APPROVAL	CVM	12-07-06	JG								
		B	RE-ISSUED FOR APPROVAL	CVM	12-06-21	JG								
		A	ISSUED FOR APPROVAL	KSB	12-04-04	JG								
	REFERENCE DRAWINGS	REV.	DESCRIPTION		BY	DATE	CHK	APP.	CLIENT					



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SDR CODE	EQUIPMENT TAG	REVIEWED BY	DATE
DE02	B-1100	P. VALLA	Aug. 23, 2012

PROJECT NAME: Murphy Cadotte / 1780-024

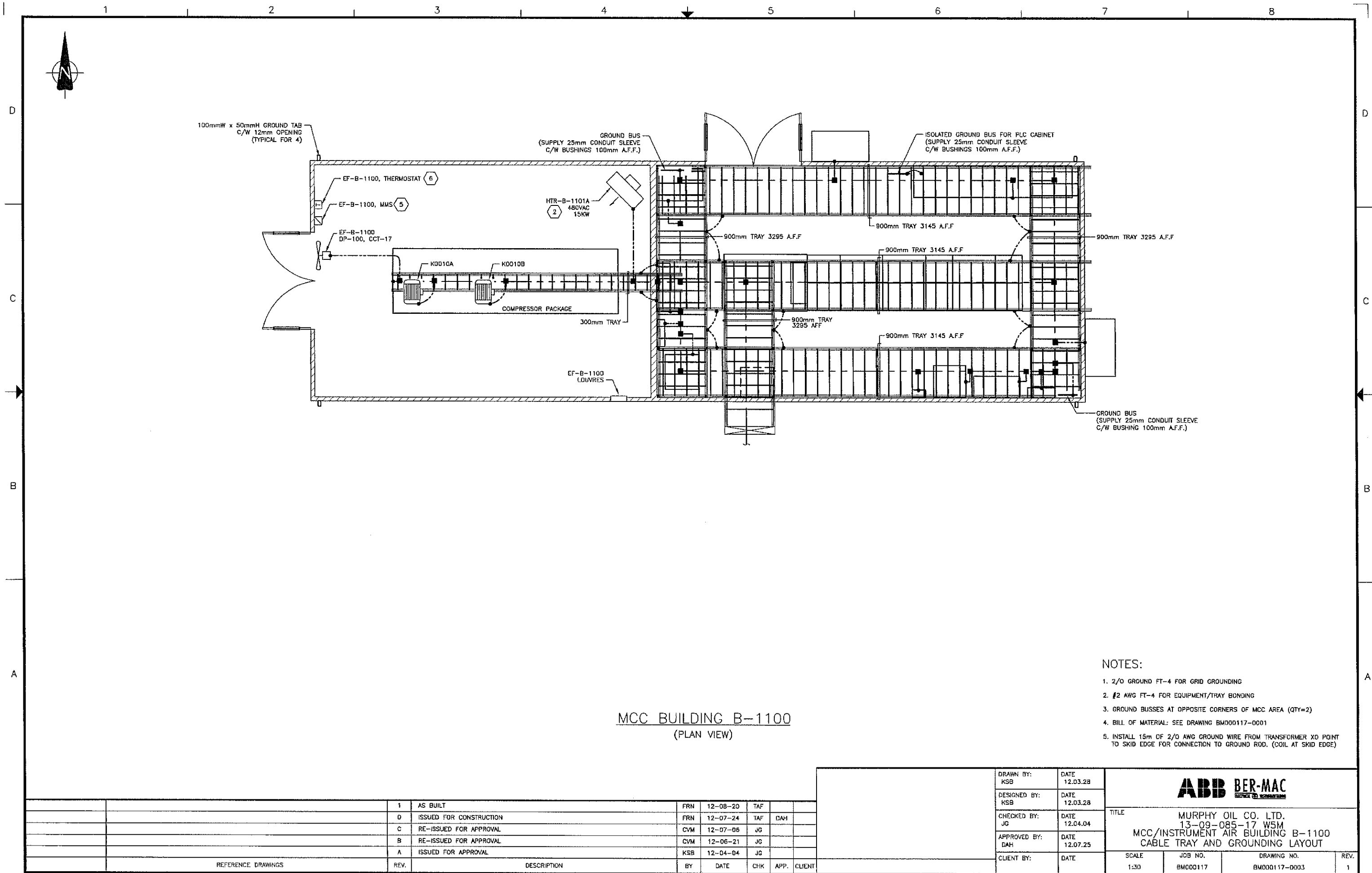
VENDOR NAME: ABB Ber-Mac

DOCUMENT
NUMBER: BM000117-0003

VENDOR
REVISION: 1

DOCUMENT
DESCRIPTION: MCC/Instrument Air Building B-1100 Cable Tray and
Grounding Layout

VENDOR
TRANSMITTAL
NUMBER: 2012-08-21 BM000117 As-Built Transmittal





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SDR CODE	EQUIPMENT TAG	REVIEWED BY	DATE
DE02	B-1100	T.VALLA	Aug. 24, 2012

PROJECT NAME: Murphy Cadotte / 1780-024

VENDOR NAME: ABB Ber-Mac

DOCUMENT
NUMBER: BM000117-0004

VENDOR
REVISION: 4 /

DOCUMENT
DESCRIPTION: MCC/Instrument Air Building B-1100 Engraving Schedule

VENDOR
TRANSMITTAL
NUMBER: 2012-08-21 BM000117 As-Built Transmittal

EQUIPMENT ENGRAVING SCHEDULE			
ITEM	LINE	DESCRIPTION	SIZE
D	1	CPNL-100 CONTACTOR PANEL 240/120VAC, 1PH,60Hz	75mm X 100mm BLACK LETTERS ON WHITE
	2		
	3		
	1	DP-100 UTILITY DISTRIBUTION PANEL 225A, 240/120VAC, 1PH, 3W,60 Hz	75mm X 100mm BLACK LETTERS ON WHITE
	2		
	3		
C	1	TNS-100 UTILITY DISTRIBUTION TRANSFORMER 50kVA, 480-240/120VAC, 1PH,3W,60Hz	75mm X 100mm BLACK LETTERS ON WHITE
	2		
	3		
	1	PNL-HVAC-100 HVAC CONTROLLER 24VAC, 24VDC	75mm X 100mm BLACK LETTERS ON WHITE
	2		
	3		
B	1	HVAC-100 HVAC UNIT 480,3PH,20A,60Hz	75mm X 100mm BLACK LETTERS ON WHITE
	2		
	3		
	1	HVAC-101 HVAC UNIT 480,3PH,20A,60Hz	75mm X 100mm BLACK LETTERS ON WHITE
	2		
	3		
A	1	ESD-1100A	100mm X 100mm WHITE LETTERS ON RED
	2		
	3		
	1	ESD-1100B	100mm X 100mm WHITE LETTERS ON RED
	2		
	3		
A	1	DP-UPS-100 UPS DISTRIBUTION PANEL 125A, 120VAC, 1PH, 2W, 60Hz	75mm X 100mm BLACK LETTERS ON WHITE
	2		
	3		

	1	AS BUILT	FRN	12-08-20	TAF			-	
	0	ISSUED FOR CONSTRUCTION	FRN	12-07-24	TAF	DAH		-	
	B	RE-ISSUED FOR APPROVAL	CVM	12-07-06	JG			-	
	A	ISSUED FOR APPROVAL	KSB	12-06-21	JG			-	
	REV.	DESCRIPTION	BY	DATE	CHK	APP.	CLIENT		

DRAWN BY:	DATE
KSB	12.06.20
DESIGNED BY:	DATE
KSB	12.06.20
CHECKED BY:	DATE
JG	12.06.20
APPROVED BY:	DATE
DAH	12.07.25
CLIENT BY:	DATE

ABB BER-MAC
ELECTRICAL & INSTRUMENTATION

TITLE
MURPHY OIL CO. LTD.
13-09-085-17 WSM
MCC/INSTRUMENT AIR BUILDING B-1100
ENGRAVING SCHEDULE

SCALE	JOB NO.	DRAWING NO.	REV.
NTS	BM000117	BM000117-0004	1



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SDR CODE	EQUIPMENT TAG	REVIEWED BY	DATE
DMØ9	B-1100	PVALLA	AUG. 16, 2012.

PROJECT NAME: Murphy Cadotte / 1780

VENDOR NAME: ABB Ber-Mac / 1780-024

DOCUMENT
NUMBER: M1.0

VENDOR
REVISION: 1

DOCUMENT
DESCRIPTION: BU-1100 - MCC / IA Building IA Comp Room H & V Flow Diagram

VENDOR
TRANSMITTAL
NUMBER: 9

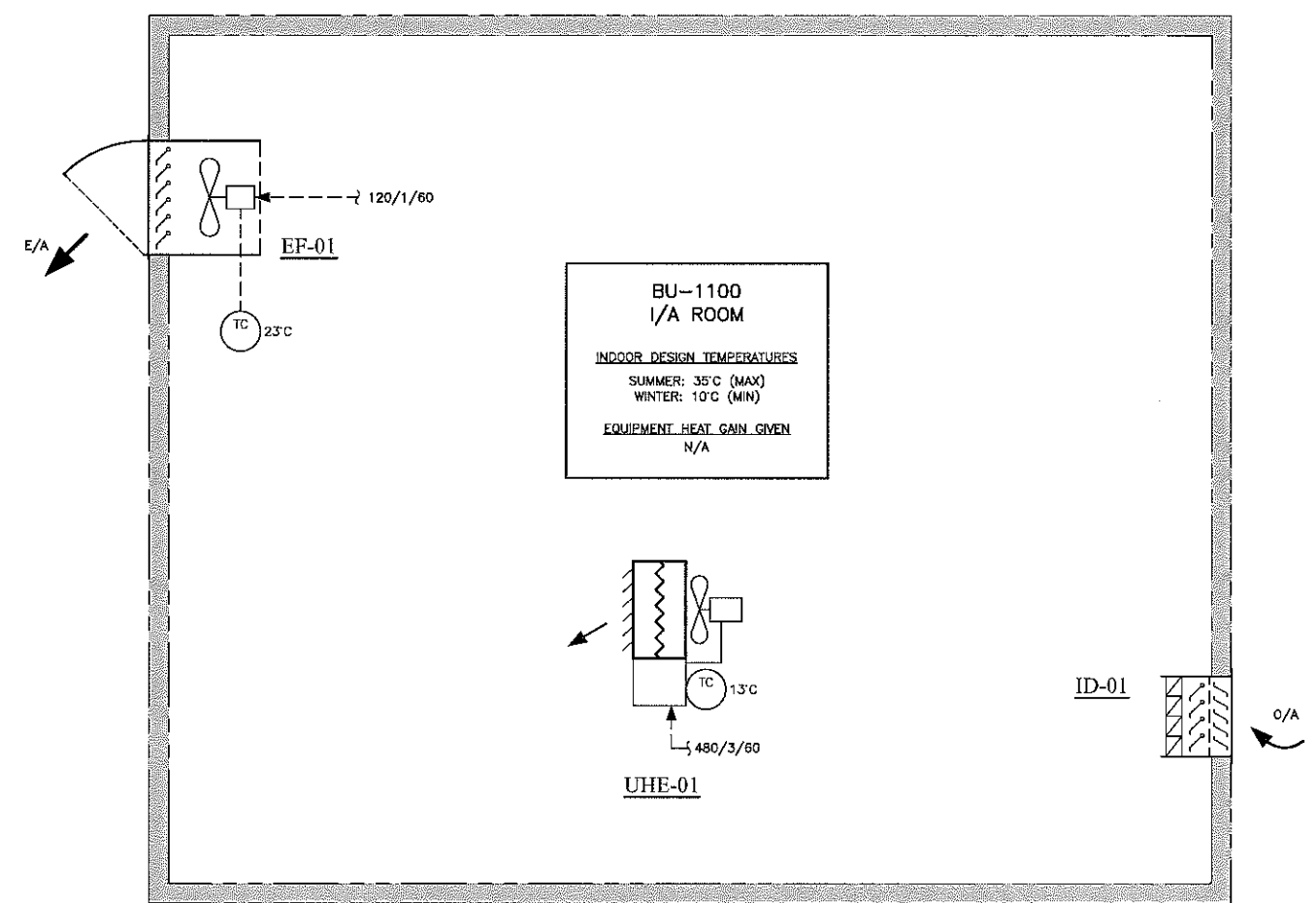
UHE-01
ELECTRIC
UNIT HEATER
OUELLET MODEL QAS
15kW HEATING CAPACITY
480/3/60
c/w WALL BRACKET AND
BUILT-IN THERMOSTAT

EF-01
EXHAUST
FAN
ENERTECH MODEL ET12-1GP
236L/s [500CFM]
120/1/60
c/w SHUTTER, BACKGUARD
AND T'STAT

ID-01
INTAKE
DAMPERS
WESTVENT MODEL XF-445W
FIXED EXTERIOR INTAKE LOUVRE
610x610 [24x24]
c/w BACKDRAFT DAMPER
BDX-3C3-LB BIRDSCREEN AND
CARTRIDGE FILTER

- LEGEND**
(**devices not by EnerTech UNO)
- PROP FAN w/ MOTOR
 - BACKDRAFT DAMPER
 - DAMPER
 - FILTERS
 - ELECTRIC HEATING ELEMENT
 - DAMPER ACTUATOR
 - DISCONNECT SWITCH
 - ACH AIR CHANGE PER HOUR
 - S/A SUPPLY AIR
 - R/A RETURN AIR
 - O/A OUTSIDE AIR
 - E/A EXHAUST AIR
 - EM ECONOMIZER MODULE
 - ES ENTHALPY SENSOR
 - TE TEMP SENSOR
 - TC TEMP CONTROLLER
 - FIELD WIRING
 - FACTORY WIRING
 - BLDG OUTLINE
 - SL REFRIG SUCTION LINE
 - LL REFRIG LIQUID LINE
 - AIR FLOW
 - ** NOT PROVIDED BY ENERTECH

- NOTES**
- THIS DRAWING TO BE READ IN CONJUNCTION WITH THE PROJECT DRAWINGS AND SPECS. REFER TO THE APPLICABLE EQUIPMENT DATASHEETS FOR FURTHER DETAILS.
 - AREA CLASS.: NON-CLASSIFIED
 - THIS DRAWING IDENTIFIES "SCOPE OF WORK" FOR ENERTECH SUPPLY. ONLY THE CONTROL DEVICES DESCRIBED HERE OR ON EQUIPMENT DATASHEETS ARE BY ENERTECH UNLESS NOTED OTHERWISE. EQUIPMENT INSTALLATION BY BUILDING VENDOR.
 - DISCONNECT SWITCHES ARE NOT SUPPLIED BY ENERTECH UNLESS OTHERWISE NOTED.
 - ALL FIELD WIRING BY ELECTRICAL CONTRACT.
 - WEATHER HOODS ARE PROVIDED AS SHOWN. EXHAUST HOODS SHALL BE 45° AND INTAKE HOODS SHALL BE 90°. ALL HOODS SHALL BE c/w 25mm BIRD SCREEN AND SUPPLIED BY BUILDING VENDOR.



HEATING & VENTILATION - SEQUENCE OF OPERATION

1.0 H&V SYSTEM - DESIGN OVERVIEW

- ROOM CONSISTS OF ONE ELECTRIC UNIT HEATER, ONE EXHAUST FAN AND ONE INTAKE DAMPER.
- HEATING IS BY THE UNIT HEATER AND IS CONTROLLED BY ITS BUILT-IN THERMOSTAT.
- COOLING IS BY OUTDOOR AIR CONTROLLED BY THE EXHAUST FAN'S THERMOSTAT.
- DESIGN INDOOR TEMP/PRESSURE LIMITS:
 - MAX TEMP: 30°C
 - MIN TEMP: 10°C
 - BLDG PRESSURE: NEGATIVE WHEN EXHAUST FAN IS RUNNING
- RUN TIME SCHEDULES, INITIAL SET POINTS ETC. SHALL BE EVALUATED DURING COMMISSIONING AND ADJUSTED TO MEET THE FINAL DESIGN REQUIREMENTS/INTENT.

2.0 H&V SYSTEM - VENTILATION AND COOLING

- ROOM IS MECHANICALLY VENTILATED WHEN ROOM TEMPERATURE REACHES ITS COOLING SET POINT.
- COOLING VENTILATION OF EF-01 IS CYCLED ON/OFF BASED ON THE THERMOSTAT SET POINT.
- ALL VENTILATION IS DRAWN INTO THE ROOM THROUGH ID-01.

3.0 H&V SYSTEM - HEATING OPERATION

- WHEN THE ROOM TEMP FALLS BELOW THE HEATING SET POINT THE UNIT HEATER STARTS.
- ONCE THE ROOM TEMP REACHES SET POINT THE UNIT HEATER SHUTS DOWN.

1 BU-1100 - MCC/IA BLDG.
M1.0 HVAC - FLOW DIAGRAM
SCALE NTS

11 2012-04-05 ISSUED FOR REVIEW	
REV	DATE DESCRIPTION
REVISIONS	
MURPHY OIL CANADA Vista Projects Limited Warwick INDUSTRIES LTD	
ENERTECH 17321 - 106th Ave, Edmonton, Alberta 780.483.0141	
Project: Murphy Oil Canada - Cadotte Cyclic Steam Stimulation (CSS) Pilot Project near Peace River/Slave Lake, AB. LSD: 13-09-085-17 WSM	
Eng Title: BU-1100 - MCC/IA BUILDING IA COMP ROOM H&V FLOW DIAGRAM	
Drawn by: MS	checked by: MS
Scale: AS SHOWN	Scale: AS SHOWN
M1.0	



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SDR CODE	EQUIPMENT TAG	REVIEWED BY	DATE
DM09	B-1100	P. KALLA	AUG. 16, 2012

PROJECT NAME: Murphy Cadotte / 1780

VENDOR NAME: ABB Ber-Mac / 1780-024

DOCUMENT
NUMBER: M1.1

VENDOR
REVISION: 1

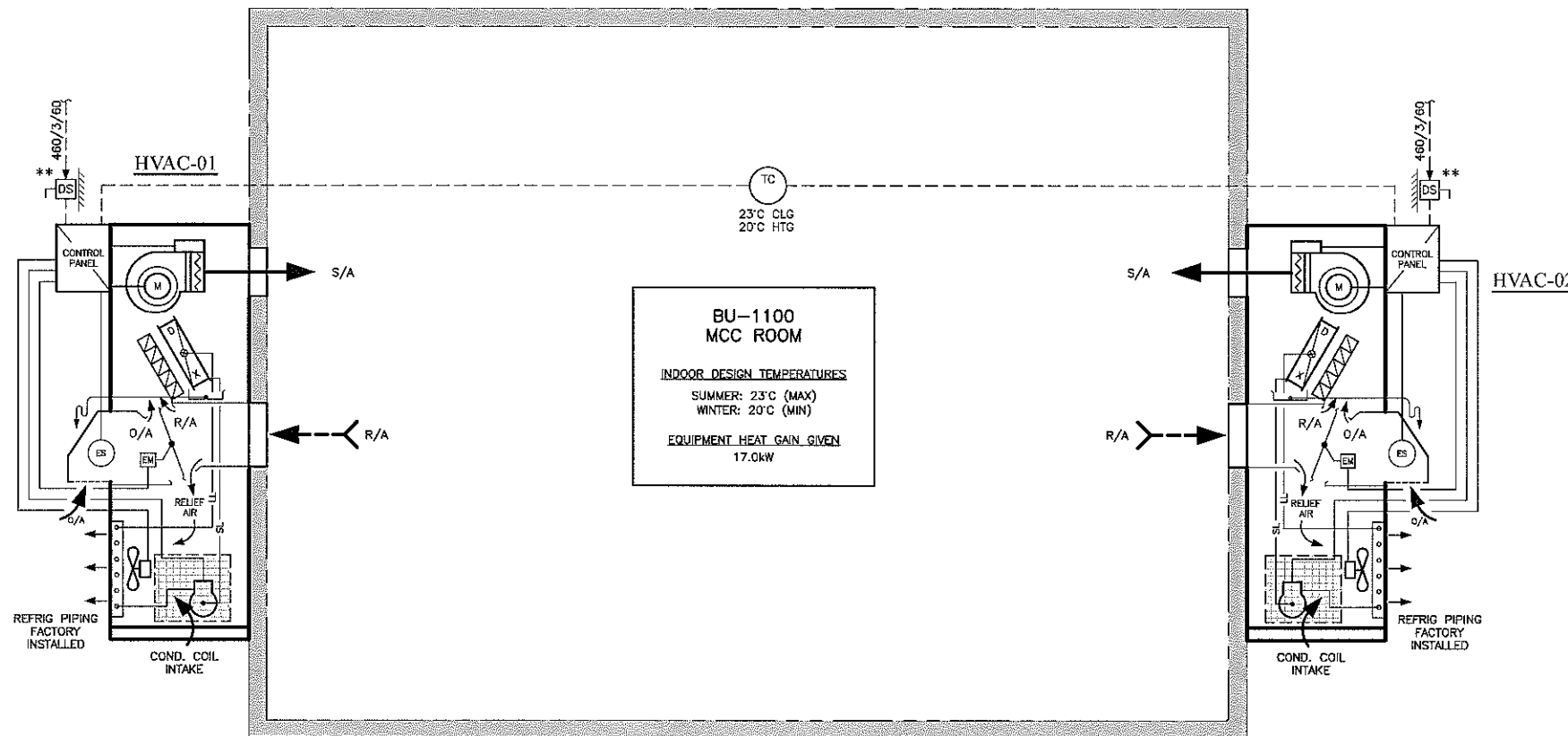
DOCUMENT
DESCRIPTION: BU-1100 - MCC / IA Building MCC Room HVAC Flow Diagram

VENDOR
TRANSMITTAL
NUMBER: 9

HVAC-01/02
WALL MOUNTED
HVAC UNIT

BARD MODEL W48A1-C15EPXXXJ
732L/s @ 20Pa ESP
10% 73L/s MIN O/A
0.37kW INDOOR BLOWER MOTOR
0.25kW OUTDOOR FAN MOTOR
450/3/60, MCA=27A
NOMINAL 4TON COOLING CAPACITY AT 35°C AMBIENT
13.8kW TOTAL, 10.6kW SENSIBLE
R410A REFRIGERANT
15kW ELECTRIC HEATING COIL
EACH UNIT IS SELF CONTAINED AND OPERATED BY THE
ROOM MOUNTED TEC-40 CONTROLLER,
c/w SUPPLY/RETURN GRILLES, FIRE SHUTDOWN CONTACT
AND COMMON TROUBLE ALARM.

VENDOR TO PROVIDE WIRING DIAGRAM
TO CONNECT TO THE CONTACTS.



LEGEND

(**devices not by EnerTech UNO)

- BLOWER
- MOTOR
- DX EVAPORATOR COOLING COIL
- CONDENSING COIL
- FILTERS
- DAMPER
- CONDENSER FAN
- COMPRESSOR
- ELECTRIC HEATING ELEMENT
- DAMPER ACTUATOR
- DISCONNECT SWITCH
- AIR CHANGE PER HOUR
- S/A SUPPLY AIR
- R/A RETURN AIR
- O/A OUTSIDE AIR
- RC/A RECIRCULATED AIR
- E/A EXHAUST AIR
- EM ECONOMIZER MODULE
- ES ENTHALPY SENSOR
- TE TEMP SENSOR
- TC TEMP CONTROLLER
- FIELD WIRING
- FACTORY WIRING
- BLDG OUTLINE
- SL REFRIG SUCTION LINE
- LL REFRIG LIQUID LINE
- AIR FLOW
- ** NOT PROVIDED BY ENERTECH

NOTES

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- DISCONNECT SWITCHES ARE NOT SUPPLIED BY ENERTECH UNLESS OTHERWISE NOTED.
- ALL FIELD WIRING OF HVAC SYSTEM AND VFD RECIRC/EXHAUST DUCT BY ELECTRICAL.
- WEATHER HOODS ARE PROVIDED AS SHOWN. EXHAUST HOODS SHALL BE 45° AND INTAKE HOODS SHALL BE 90°. ALL HOODS SHALL BE c/w 25mm BIRD SCREEN AND SUPPLIED BY BUILDING VENDOR.

HVAC - SEQUENCE OF OPERATION

1.0 HVAC SYSTEM - DESIGN OVERVIEW

- ROOM CONSISTS OF TWO HVAC UNITS AND ONE TEMP CONTROLLER.
- THE TEMP CONTROLLER, OPERATES THE HVAC UNITS IN A STAGED ARRANGEMENT BASED ON THE SPACE TEMP.
- DESIGN INDOOR TEMP/PRESSURE LIMITS:
 - MAX TEMP: 23°C
 - MIN TEMP: 20°C
 - BLDG PRESSURE: POSITIVE (UNMONITORED)
- RUN TIME SCHEDULES, INITIAL SETPOINTS ETC. SHALL BE EVALUATED DURING COMMISSIONING AND ADJUSTED TO MEET THE FINAL DESIGN REQUIREMENTS/INTENT.

2.0 HVAC SYSTEM - VENTILATION

- VENTILATION OCCURS ONLY WHEN UNIT(S) ARE RUNNING. EACH UNIT PROVIDES 1.5ACH.

3.0 HVAC SYSTEM - 'FREE COOLING' OPERATION

- HVAC UNITS ARE EACH EQUIPPED WITH AN ECONOMIZER TO PROVIDE FREE COOLING WHEN THE CONDITIONS ARE RIGHT. THIS IS CONTROLLED WITHIN EACH UNIT BASED ON THE OUTDOOR AIR ENTHALPY AND THE INDOOR SPACE TEMP.
- ONCE THE HVAC UNITS CAN NO LONGER HOLD THE COOLING SET POINT BY FREE COOLING THEY WILL AUTOMATICALLY SWITCH OVER TO MECHANICAL COOLING. SEE 4.0.

4.0 HVAC SYSTEM - 'MECHANICAL COOLING'

- WHEN THE HVAC UNITS CAN NO LONGER HOLD THE COOLING SET POINT WITH FREE COOLING PER 3.0, MECHANICAL COOLING IS INITIATED. THIS IS CONTROLLED BY THE J MODULE OF THE HVAC UNITS.
- WHEN MECHANICAL COOLING IS ENERGIZED THE ECONOMIZER DAMPER RETURNS TO ITS MIN O/A POSITION AND THE DX COOLING SYSTEM IS STARTED.
- IF THE COOLING SET POINT IS NOT MET WITHIN 10 MINUTES, THE CONTROLLER CALLS FOR THE DX COOLING FROM THE SECONDARY UNIT.
- ONCE COOLING SET POINT IS MET, THE DX COOLING FROM EACH UNIT IS CYCLED OFF. WHILE THE DX COOLING IS OFF AND THE O/A TEMP IS >10°C, THE ECONOMIZER DAMPER WILL BE IN ITS MIN O/A POSITION TO CONTINUE TO VENTILATE THE BUILDING. IF THE BUILDING TEMP RISES ABOVE SET POINT THE MECHANICAL COOLING CYCLE BEGINS AGAIN FROM 4.3.
- MECHANICAL COOLING IS LOCKED OUT WHEN THE O/A TEMP IS ≤10°C.

5.0 HVAC SYSTEM - 'HEATING' OPERATION

- EACH HVAC UNIT IS EQUIPPED WITH AN ELECTRIC HEATER SIZED TO COVER THE VENTILATION AND THE ROOM LOSSES TO MAINTAIN THE ROOM AT ITS MINIMUM TEMPERATURE OF 20°C.
- THE UNIT'S HEATERS ARE CONTROLLED INTERNALLY BY THEIR CONTROLLER.
- WHEN THE ROOM TEMP DROPS BELOW THE HEATING SET POINT, THE LEAD UNIT ENERGIZES THE HEATING. THE ECONOMIZER DAMPERS WILL ALREADY BE IN THEIR MINIMUM O/A POSITION AS THEY COME OFF THEIR 'FREE COOLING' CYCLE DESCRIBED IN 3.0.
- IF THE HEATING SET POINT IS NOT MET WITHIN 5 MINUTES, HEATING FROM THE SECOND UNIT IS ENERGIZED.
- ONCE HEATING SET POINT IS MET, THE HEATERS IN EACH UNIT ARE CYCLED OFF.
- IF THE ROOM TEMP FALLS BELOW THE HEATING SET POINT THE HEATING CYCLE BEGINS AGAIN FROM 5.3.

6.0 HVAC SYSTEM - EMERGENCY SHUTDOWN

- ON A REMOTE EMERGENCY SHUT DOWN SIGNAL FROM OTHERS STOPS HVAC UNITS.
- UNITS ARE PERMITTED TO OPERATE ONCE SHUTDOWN CONTACT IS CLOSED AGAIN.

BU-1100 - MCC/IA BLDG.
HVAC - FLOW DIAGRAM
1 M1.0 SCALE NTS

REV	DATE	DESCRIPTION
1	2012-08-03	ISSUED FOR REVIEW

REVISIONS



project
Murphy Oil Canada - Cadotte
Cyclic Steam Stimulation (CSS)
Pilot Project
near Peace River/Slave Lake, AB,
LSD: 13-09-096-17 W3M

Rev title
BU-1100 - MCC/IA BUILDING
MCC ROOM HVAC FLOW DIAGRAM

Drawn by DD	checked by MS	approved by
sheet no. A1	sheet size A1	scale AS SHOWN
sheet no.		

M1.1



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DM09	B-1100	P. VALLA	AUG. 16, 2012

PROJECT NAME: Murphy Cadotte / 1780

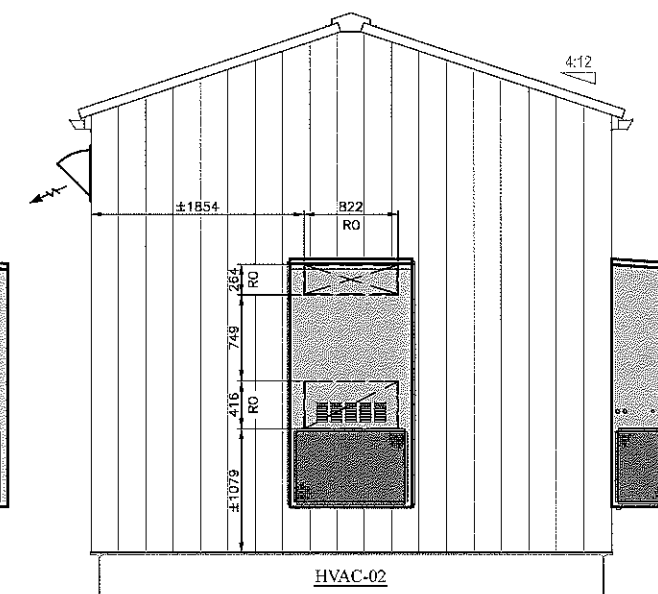
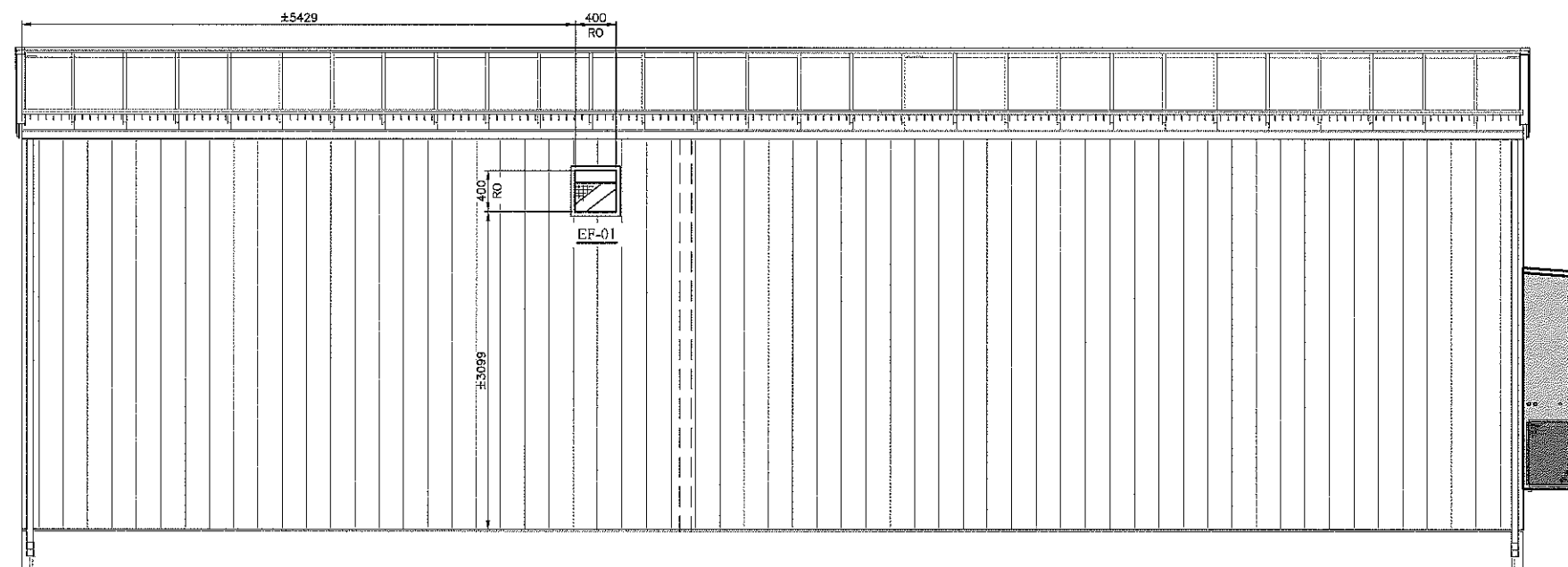
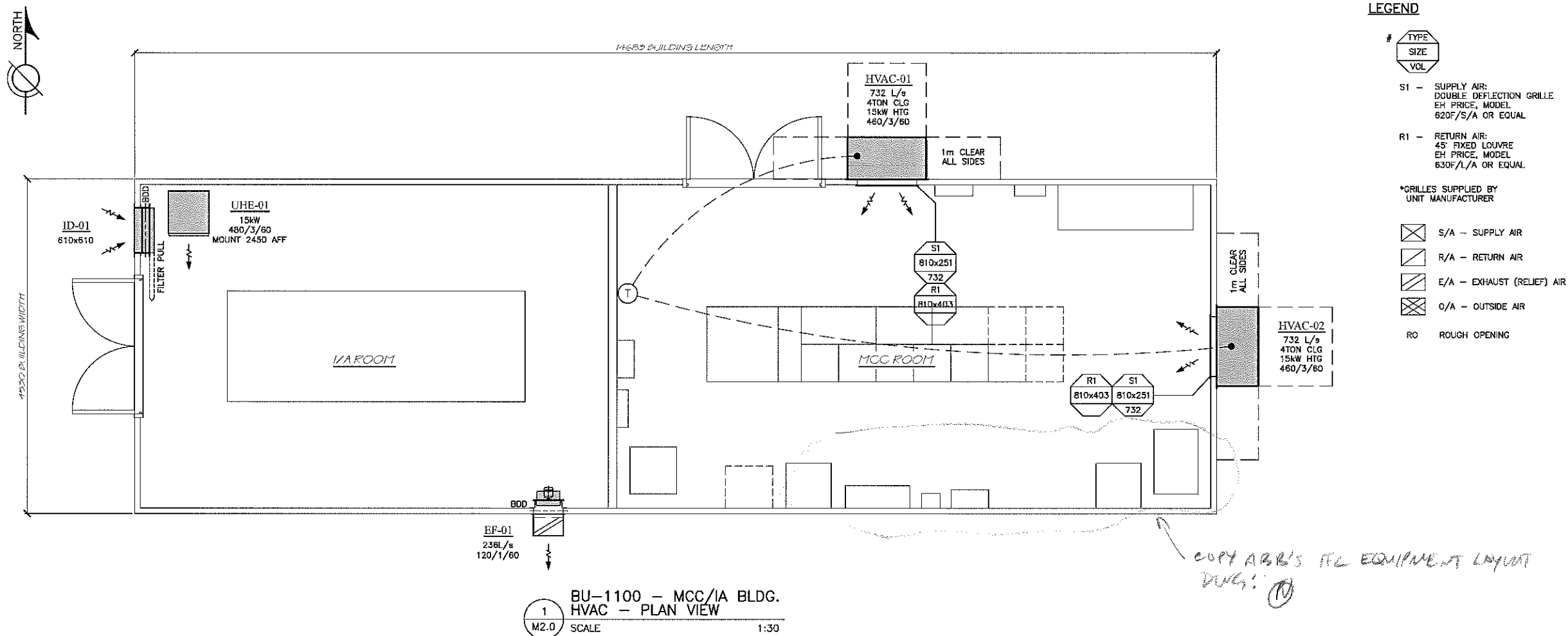
VENDOR NAME: ABB Ber-Mac / 1780-024

DOCUMENT
NUMBER: M2.0

VENDOR
REVISION: 1

DOCUMENT
DESCRIPTION: BU-1100 - MCC / IA Building HVAC General Arrangement

VENDOR
TRANSMITTAL
NUMBER: 9



- LEGEND

#	TYPE	SIZE	VOL
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84	84	84	84
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94	94	94	94
95	95	95	95
96	96	96	96
97	97	97	97
98	98	98	98
99	99	99	99
100	100	100	100

S1 - SUPPLY AIR:
DOUBLE DEFLECTION GRILLE
EH PRICE, MODEL
620F/S/A OR EQUAL

R1 - RETURN AIR:
45' FIXED LOUVRE
EH PRICE, MODEL
630F/L/A OR EQUAL

*GRILLES SUPPLIED BY
UNIT MANUFACTURER

 S/A — SUPPLY AIR

 R/A - RETURN AIR

 E/A - EXHAUST (RELIEF) AIR

 O/A - OUTSIDE AIR

RO ROUGH OPENING

- ## NOTES

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH HVAC FLOW DIAGRAM AND THE PROJECT SPECS. REFER TO APPLICABLE EQUIPMENT DATASHEETS FOR FURTHER DETAILS.
2. ALL EQUIPMENT SHALL BE APPROVED FOR USE IN A GENERAL PURPOSE AREA.
3. AREA CLASS.: NON-CLASSIFIED
4. ALL DUCT/PENETRATION OPENINGS ARE STATED AS 'FREE & CLEAR' INTERNAL AREA.
5. HVAC EQUIPMENT INSTALLATION BY BUILDING VENDOR PER MANUFACTURER'S RECOMMENDATIONS. SUPPORT, SEALING, ACCESSORIES AS PER ASHRAE & SMACNA STANDARDS. MAKE WEATHERTIGHT.
6. "±" DIMENSIONS MAY BE ALTERED TO SUIT BUILDING STEEL, CABLE TRAYS, OVERHEAD CRANES, EQUIPMENT ETC.
7. INSTALL THERMOSTATS 1500mm AFF MINIMUM UNLESS NOTED OTHERWISE.
8. ALL FIELD WIRING OF HVAC SYSTEM BY OTHERS.
9. ALL WEATHER HOODS BY BUILDING VENDOR.

1	2012-08-03	ISSUED FOR REVIEW
REV	DATE	DESCRIPTION
REVISIONS		

Rev	Change	By	Date
REVISIONS			



project

**Murphy Oil Canada - Cadotte
Cyclic Steam Stimulation (CSS)
Pilot Project**

near Peace River/Slave Lake, AB
LSD: 13-08-08S-17 WSM

BU-1100-MCC/A BUILDING
HVAC GENERAL ARRANGEMENT

drawn by DD	checked by MS	approved by
enter-tech no.	sheet size A1	scale AS SHOWN

M2.0



CODE SHEET

VISTA Projects Limited			
VENDOR DRAWING/DOCUMENT SQUAD CHECK			
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B	Reviewed except as marked and/or noted. Proceed with fabrication and resubmit drawing/document. Shipment will not be released, if any drawings/documents requiring approval, as per purchase order conditions, are at this code.		
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SDR CODE	EQUIPMENT TAG	REVIEWED BY	DATE
DMP9	B-1100	P. VALLA	AUG. 16, 2012

PROJECT NAME: Murphy Cadotte / 1780

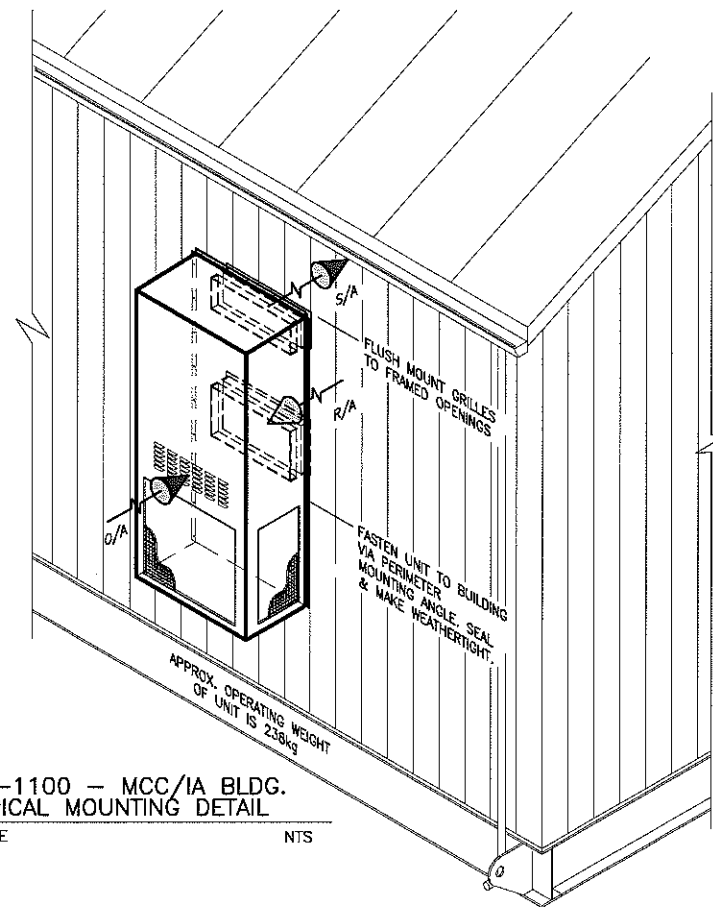
VENDOR NAME: ABB Ber-Mac / 1780-024

DOCUMENT
NUMBER: M2.1

VENDOR
REVISION: 1

DOCUMENT
DESCRIPTION: B
BU-1100 - MCC / IA Building HVAC General Arrangement

VENDOR
TRANSMITTAL
NUMBER: 9

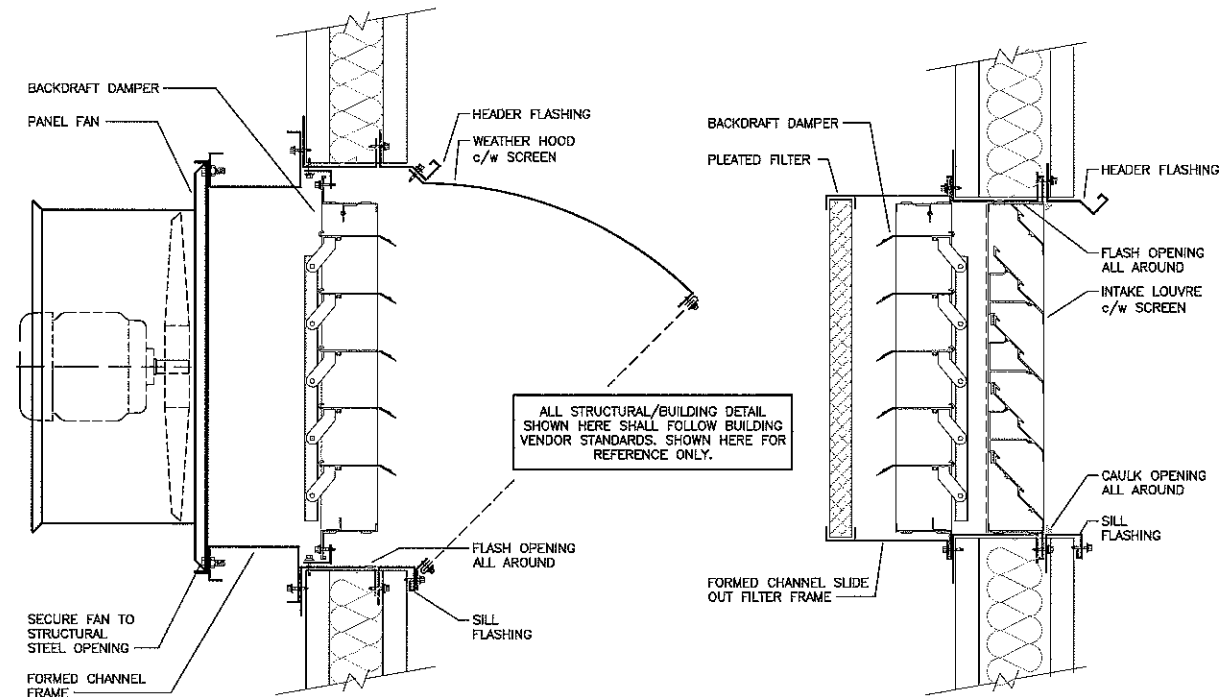


BU-1100 - MCC/IA BLDG.
TYPICAL MOUNTING DETAIL

2
M2.1

SCALE

NTS



EXHAUST FAN

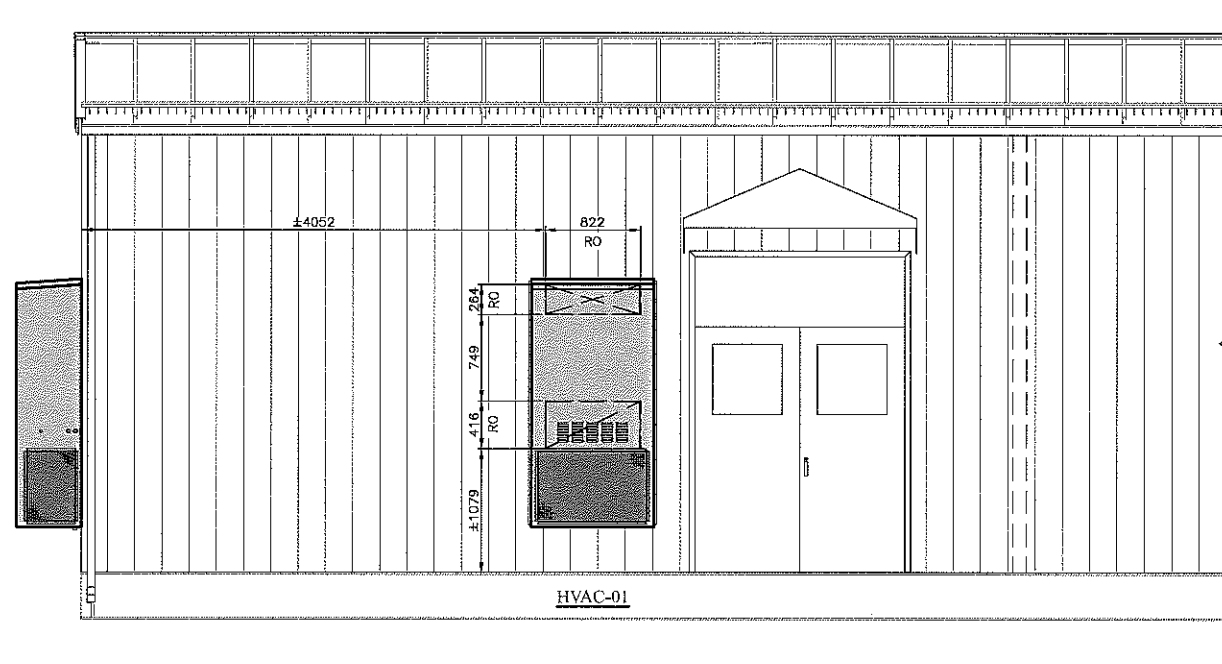
INTAKE

BU-1100 - MCC/IA BLDG.
TYPICAL WALL OPENING DETAILS

1
M2.1

SCALE

NTS

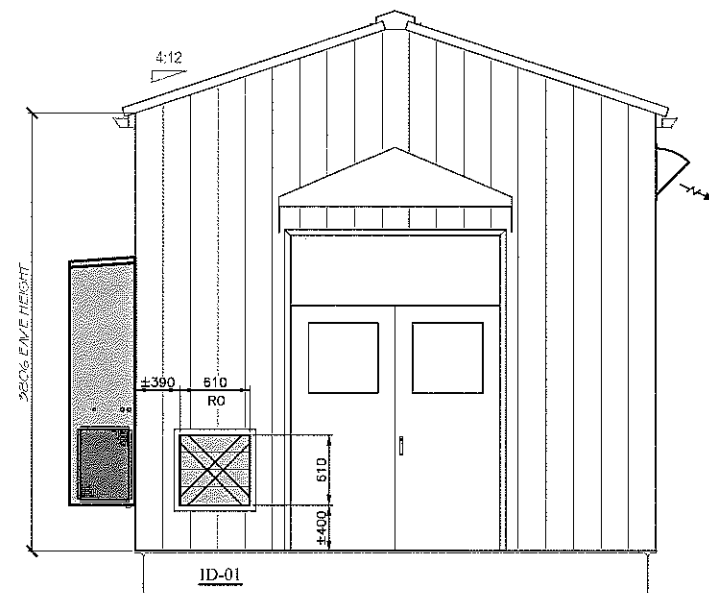


BU-1100 - MCC/IA BLDG.
HVAC - PARTIAL NORTH ELEVATION

3
M2.1

SCALE

1:30



BU-1100 - MCC/IA BLDG.
HVAC - WEST ELEVATION

4
M2.1

SCALE

1:30

LEGEND



S1 - SUPPLY AIR:
DOUBLE DEFLECTION GRILLE
EH PRICE, MODEL
620F/S/A OR EQUAL

R1 - RETURN AIR:
45° FIXED LOUVER
EH PRICE, MODEL
630F/L/A OR EQUAL

*GRILLES SUPPLIED BY
UNIT MANUFACTURER

S/A - SUPPLY AIR

R/A - RETURN AIR

E/A - EXHAUST (RELIEF) AIR

O/A - OUTSIDE AIR

RO - ROUGH OPENING

NOTES

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- "±" DIMENSIONS MAY BE ALTERED TO SUIT BUILDING STEEL, CABLE TRAYS, OVERHEAD CRANES, EQUIPMENT ETC.
- INSTALL THERMOSTATS 1500mm AFF MINIMUM UNLESS NOTED OTHERWISE.
- ALL FIELD WIRING OF HVAC SYSTEM BY OTHERS.
- ALL WEATHER HOODS BY BUILDING VENDOR.

REV	DATE	DESCRIPTION
1	2012-08-03	ISSUED FOR REVIEW

REVISIONS



ENERTECH
17321 - 108th Ave, Edmonton, Alberta
780.483.0141

Project:
Murphy Oil Canada - Cadotte
Cyclic Steam Stimulation (CSS)
Pilot Project
near Peace River/Savo Lake, AB
LSD: 13-08-08-17 WSM

BU-1100-MCC/IA BUILDING
HVAC GENERAL ARRANGEMENT

Drawn by DD	Created by MS	Approved by
Issue date A1	Issue date A1	Scale AS SHOWN

M2.1

CODE SHEET

VISTA Projects Limited			
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SDR CODE	EQUIPMENT TAG	REVIEWED BY	DATE
DCP1	B-1100	P. WALLS	12 JUN 2012

PROJECT NAME: Murphy Cadotte CSS

VENDOR NAME: ABB Ber-Mac

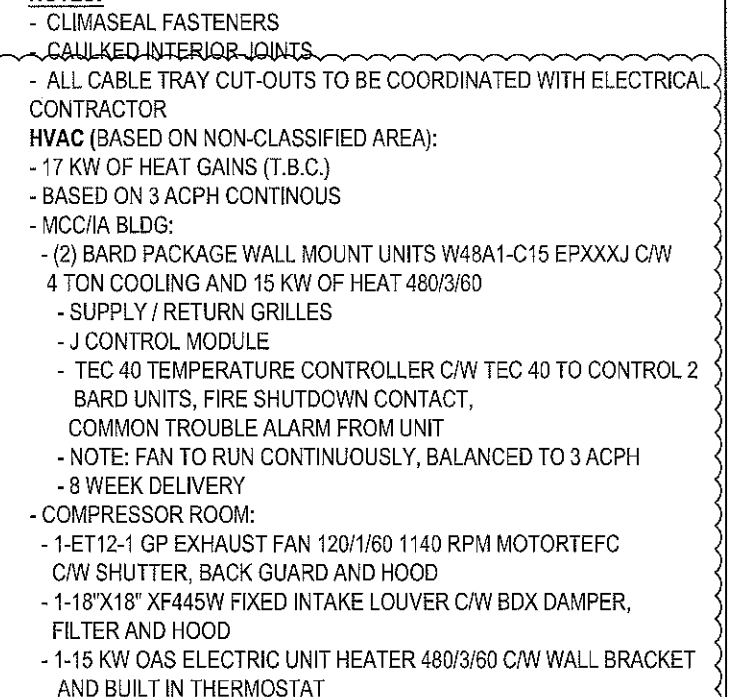
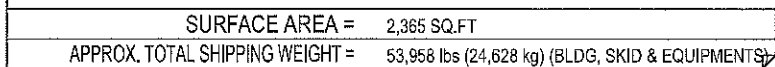
DOCUMENT
NUMBER: W28406-01

VENDOR
REVISION: E

DOCUMENT
DESCRIPTION: Building Drawing

VENDOR
TRANSMITTAL
NUMBER: XMTL-004 Bldg 1FA Rev C and E

- EXTERIOR WALLS TO BE: 22 GA. GALVALUME
- EXTERIOR ROOF TO BE: 22 GA. GALVALUME
- EXTERIOR TRIM TO BE: 22 GA. GALVALUME
- DOORS TO BE PAINTED: GREY
- ROLL-UP DOORS TO BE PAINTED: -NONE
- INTERIOR LINER TO BE: SEE DWG
- INSULATION IN WALLS: R12 BATT INSULATION
- INSULATION IN ROOF: R20 BATT INSULATION
- VAPOUR BARRIER TO BE: 6 mL




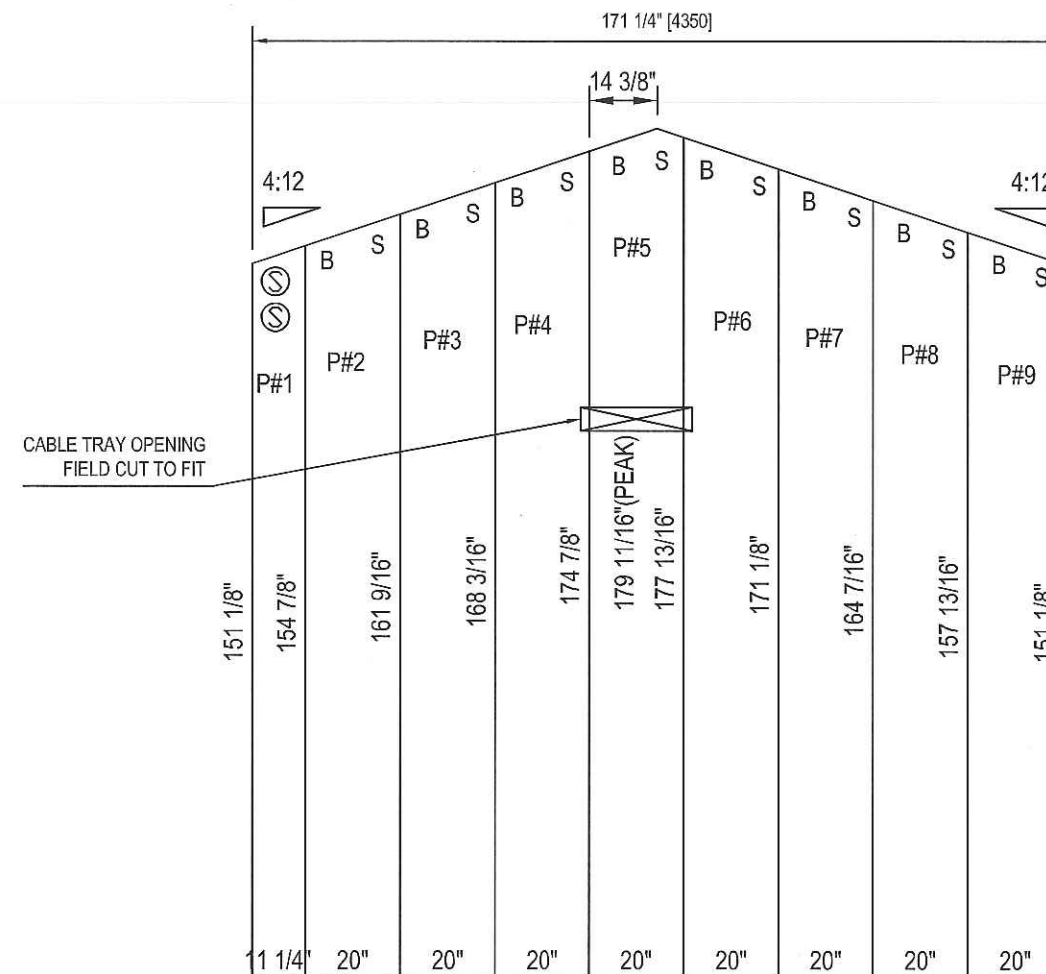
- ALL WALL PANELS ARE TO BE TYPICAL B/S (BIG / SMALL ENDS) PANELS UNLESS NOTED.
- ALL DIMENSIONS ARE IN INCHES AND DECIMAL INCHES.
- DO NOT SCALE DRAWINGS.
- ALL DIMENSIONS TO WINDOWS AND DOORS ARE TO ROUGH OPENINGS.
- CONFIRM LOCATION OF ANY LOUVERS AND OR FANS PRIOR TO INSTALLATION
- CENTER BUILDING ON SKID
- BUILDING INSTALLATION & ASSEMBLY SHALL BE AS PER WARWICK INSTALLATION MANUAL, AND DETAILS. WHERE THERE ARE CONFLICTS INFORMATION ON DRAWINGS SHALL BE TAKEN AS CORRECT

LEGEND	
DS = DOUBLE GLAZED	CC = CHECK CHAIN
IWG = INDUSTRIAL WIRE GLASS	WS = WEATHERSTRIPPING
RH = RIGHT HAND SWING	DC = HYDRAULIC CLOSURE
LH = LEFT HAND SWING	SG = INTERIOR SLIDE GATE
PH = PANIC HARDWARE	GA = GAUGE
LC= LOCK CYLINDER	INS = INSULATED
R-12 = CORE INSULATION (R-12)	LS= LOCK SET

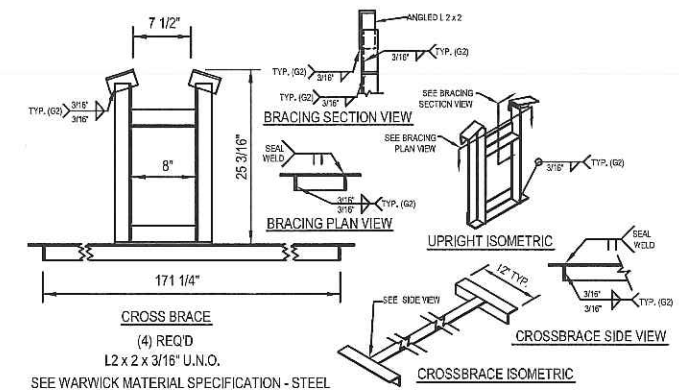
APPROX. BLDG. DIMENSIONS : (FOR SHIPPING)
- OVERALL WIDTH = 196" [16'-4"] (INCLUDED EAVESTROUGHS & LIFTING LUGS)
- OVERALL HEIGHT = 205" [17'-1"] (FROM BTM OF SKID TO RIDGE CAP)

SITE LOADS FOR AB P.ENG STAMP:
LOCATION: 13-09-085-17 W5M
NEAREST TOWN = PEACE RIVER, AB
1/50 SNOW = 2.2 kPa
1/50 WIND = 1.12 kPa
-BUILDING IS DESIGNED TO COMPLY WITH THE N.B.C 2005 AS PER THE
WIND AND SNOW LOAD SPECIFIED ON THE DRAWING. OWNER SHALL
CONTACT WARWICK INDUSTRIES IF ACTUAL BUILDING LOCATION DIFFERS
FROM THOSE SHOWN, IN ORDER TO VALIDATE THE SUITABILITY OF
DESIGN FOR THE INTENDED LOCATION.

		6999 84 ST SE, Calgary, Alberta, T2C 4T6 Telephone (403) 720-9425, Fax (403) 720-9426	
E	REVISED AS SHOWN	07/06/2012	SB
D	HVAC UPDATED. BLDG WT UPDATED, IFA	22/05/2012	JSG
C	REVISED AS NOTED	27/04/2012	KW
B	REVISED AS PER MARK-UPS	23/04/2012	KW
A	FOR APPROVAL	-03/04/2012	-KW
Rev. No.	Description:	Date:	Drawn By: Checked By:
CUSTOMER	-ABB BERMAC		
REFERENCE	CADOTTE PILOT CSS		
CUSTOMER P.O.#	-4500497048		
LOCATION	-WARWICK'S YARD		
DATE REQUIRED	-APRIL		
JOB NUMBER	W28406		
DRAWING #	W28406-01		
Dwg Name		SHOP & FIELD PRINT	



RIB SIDE



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SDR CODE	EQUIPMENT TAG	REVIEWED BY	DATE
DCD1	B-1100	P. VALLA	12 JUN 2012

PARTITION NOTES :

- 22 GA GALVANIZED
- 3" ROXUL INSULATION
- 6 MIL VAPOUR BARRIER
- 10% PERFORATED WHITE ALUMINUM LINER ON I/A ROOM SIDE, WHITE FLUTED ON MCC ROOM SIDE
- APPROX. 196.7 SQ FT (ONE SIDE)

Warwick INDUSTRIES LTD		6999 84 ST SE, Calgary, Alberta, T2C 4T6 Telephone (403) 720-9425, Fax (403) 720-9426	
Rev. No.	Description	Date	Drawn By: Checked By:
C	REVISED CABLE TRAY PENETRATION	07/06/2012	SB
B	REVISED AS PER MARK-UPS	23/04/2012	KW SB
A	FOR APPROVAL	03/04/2012	KW SB
CUSTOMER	-ABB BERMAC		
REFERENCE	-CADOTTE PILOT CSS		
CUSTOMER P.O.#	-4500497048		
LOCATION	-WARWICK'S YARD		
DATE REQUIRED	APRIL 2012		
JOB NUMBER	W28406		
DRAWING #	W28406-02		
Dwg Name	SKID DRAWING - SHOP & FIELD PRINT		

CODE SHEET

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SDR CODE	EQUIPMENT TAG	REVIEWED BY	DATE
DC 04	B-116U	P. VALLA	JUNE 7, 2012

PROJECT NAME: Murphy Oil Gabbie / 1780-024

VENDOR NAME: ABB Ber-Mac

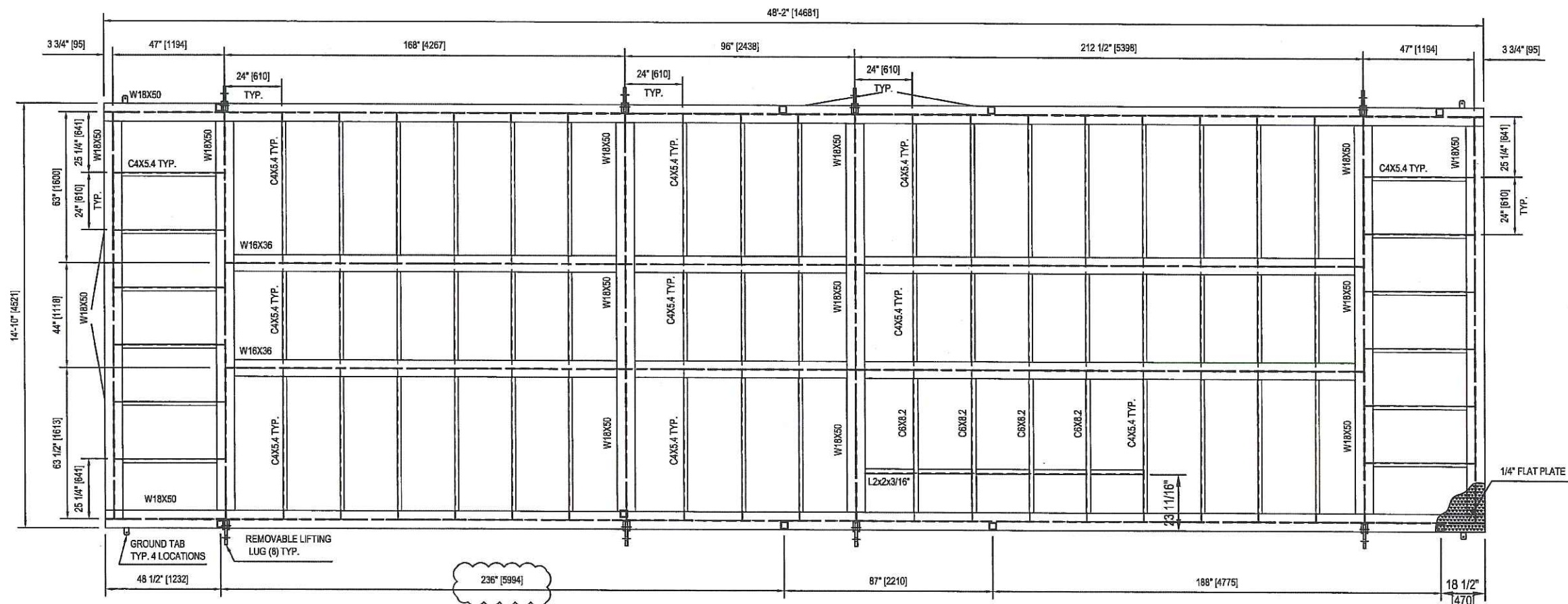
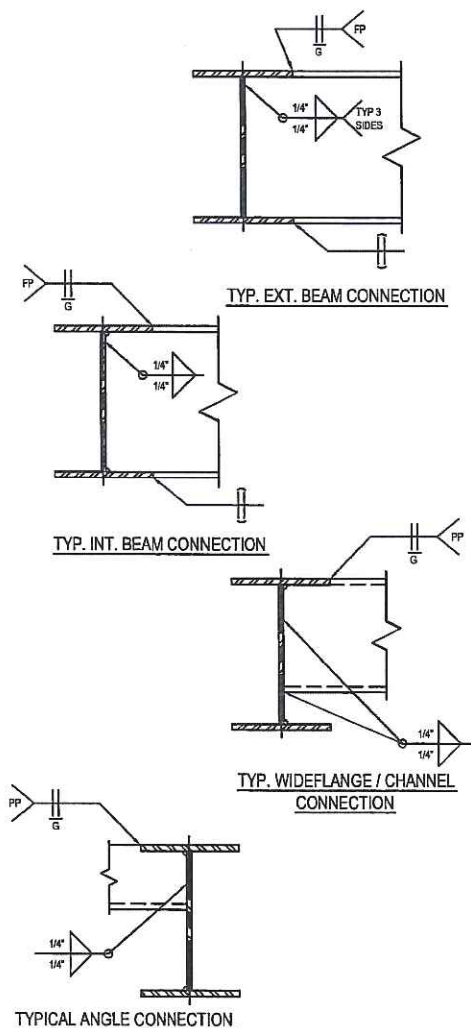
DOCUMENT NUMBER: W28406-03

VENDOR REVISION: 2

DOCUMENT DESCRIPTION: Skid Steel Layout

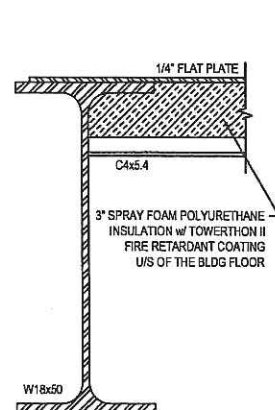
VENDOR TRANSMITTAL NUMBER: XMTL-003 2012-05-24

TYP. WELD DETAILS

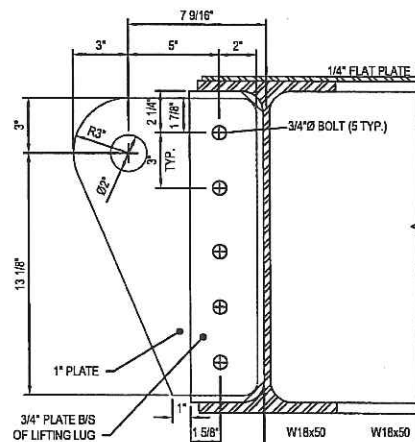


SKID / STEEL NOTES:

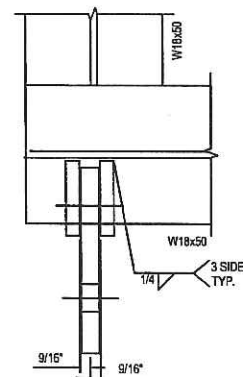
- WELDING SHALL BE IN GENERAL CONFORMANCE WITH CSA W59-2003.
- WELDS TO BE 1/4" CONTINUOUS FILLET WELD UNLESS NOTED.
- CHECKER PLATE TO BE STITCH WELDED TO SKID USING 3/16" FILLETS 2" AT 12" INTERVALS.
- CHECKER PLATE SEAMS TO BE WELDED CONTINUOUSLY ON ONE SIDE.
- ALL WORK SHALL GENERALLY CONFORM TO THE LATEST EDITIONS OF THE FOLLOWING CODES AND STANDARDS:
 - * CSA W47.1-09
 - * CISC HANDBOOK OF STEEL CONSTRUCTION
- ALL STEEL SHALL BE OF NEW STOCK AND SHALL BE IN ACCORDANCE WITH CSA G40.21-M.
 - * STRUCTURAL STEEL = GRADE 350W
 - * CHANNELS & ANGLES = GRADE 300W
 - * LIFTING LUGS = GRADE 300W
 - * CHECKER & FLAT PLATE = GRADE 300W
- FILLER METAL SHALL CONFORM TO CSA STD. W48.5-M - E4802C-6-CH.
- 3"-R20 SPRAY FOAM POLYURETHANE INSULATION w/ TOWERTHON II FIRE RETARDANT COATING U/S OF THE BLDG FLOOR
- 1/4" FLAT PLATE DECKING W/ ANTI-SLIP PAINT
- SSPC-SP-6 SURFACE PREPARATION
- PRIME WITH ONE COAT OF CLOVERDALE 710 SERIES PRIMER
- TOPCOAT WITH ONE COAT OF CLOVERDALE 74 SERIES INDUSTRIAL ENAMEL
- STANDARD QC PACKAGE
- FINISH COLOR IS TO BE BLACK



TYP. SKID SECTION w/ INSULATION



TYP. REMOVABLE LIFTING LUG DETAIL



TYP. LIFTING LUG DETAIL

Warwick INDUSTRIES LTD		6999 84 ST SE, Calgary, Alberta, T2C 4T6 Telephone (403) 720-9425, Fax (403) 720-9426			
2	REVISED AS SHOWN, IFC	22/05/2012	JSG		
1	REVISED DIM	14/05/2012	KW		
0	IFC	01/05/2012	KW	SB	
C	MOVED CABLE TRAY POST	27/04/2012	KW	SB	
B	REVISED AS PER MARK-UPS	23/04/2012	KW	SB	
A	-FOR APPROVAL	-03/04/2012	-KW	-SB	
Rev. No.	Description:	Date:	Drawn By:	Checked By:	
CUSTOMER		-ABB BERMAC			
REFERENCE		-CADOTTE PILOT CSS			
CUSTOMER P.O.#		-4500497048			
LOCATION		-WARWICK'S YARD			
DATE REQUIRED		-APRIL 2012			
JOB NUMBER		W28406			
DRAWING #		W28406-03			
Dwg Name		SKID DRAWING - SHOP & FIELD PRINT			



CODE SHEET

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SDR CODE	EQUIPMENT TAG	REVIEWED BY	DATE
DC 01	B-1100	P. VALLA	June 4, 2012

PROJECT NAME: Murphy Oil Cadotte / 1780-024

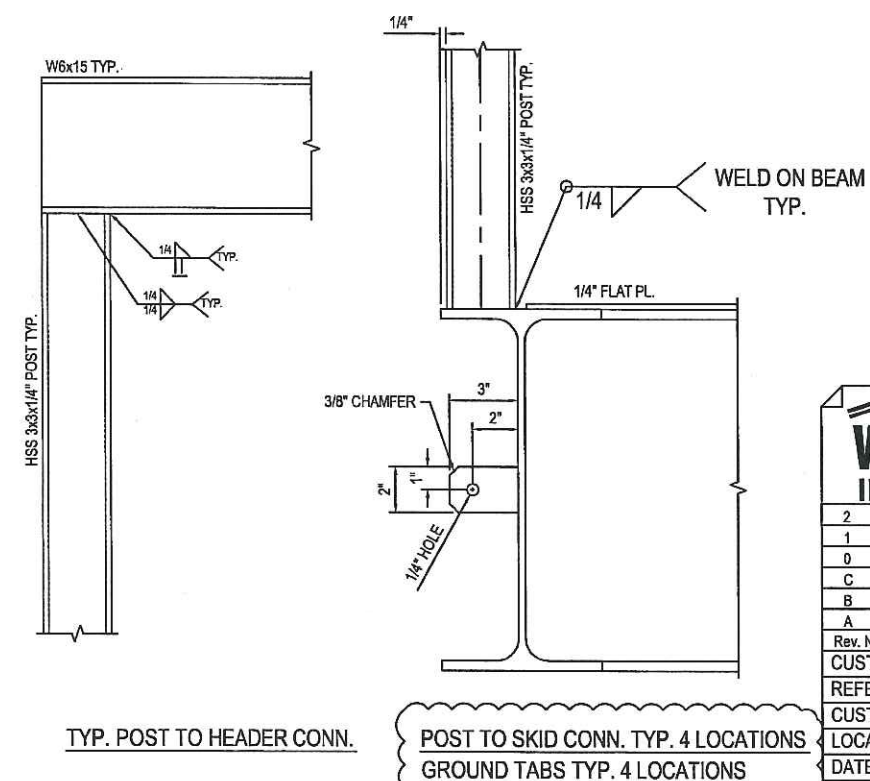
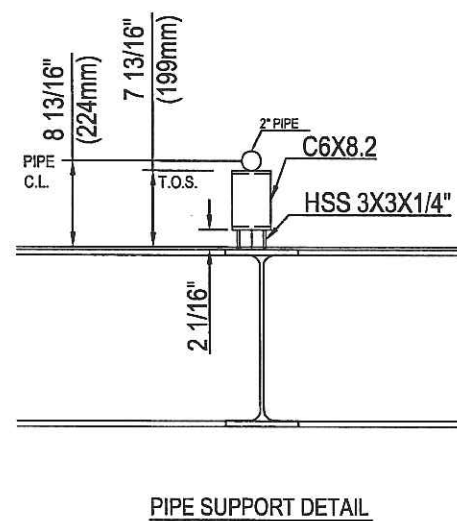
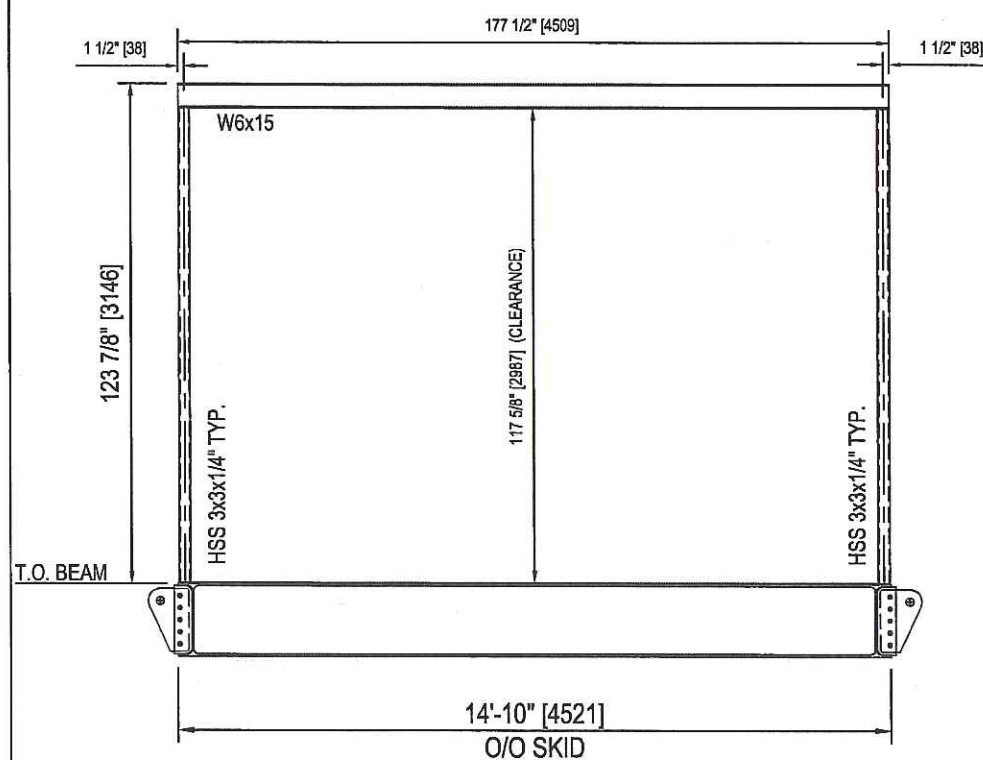
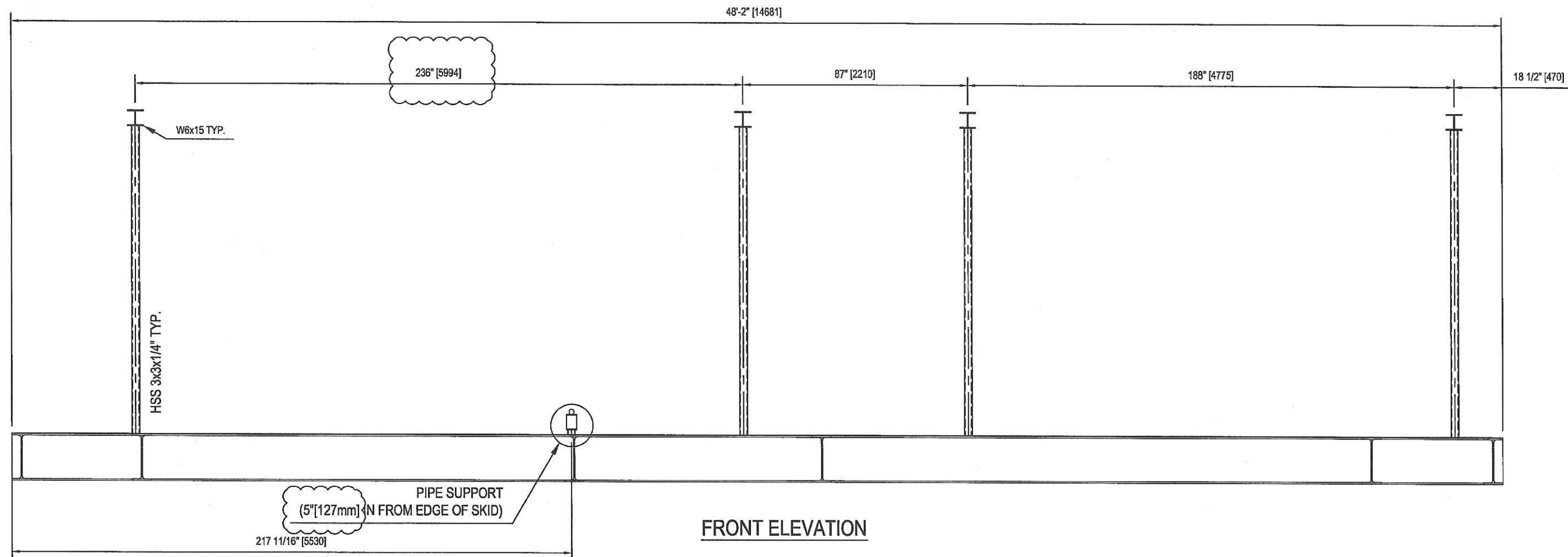
VENDOR NAME: ABB Ber-Mac

DOCUMENT
NUMBER: W28406-04

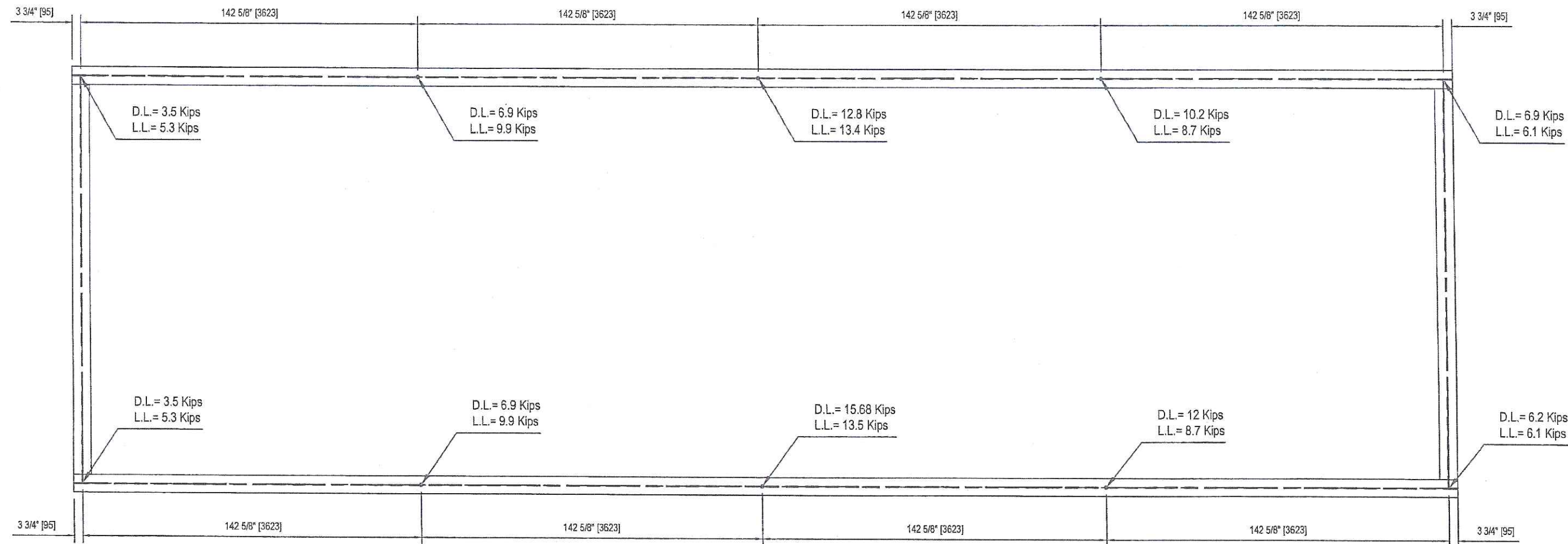
VENDOR
REVISION: 2

DOCUMENT
DESCRIPTION: Skid Drawing

VENDOR
TRANSMITTAL
NUMBER: XMTL-003 2012-05-24



Warwick INDUSTRIES LTD		6999 84 ST SE, Calgary, Alberta, T2C 4T6 Telephone (403) 720-9425, Fax (403) 720-9426		
2	REVISED AS SHOWN, IFC	22/05/2012	JSG	
1	ADDED UPPER STEEL DIM.	01/05/2012	KW	SB
0	IFC	01/05/2012	KW	SB
C	MOVED CABLE TRAY POST	27/04/2012	KW	SB
B	REVISED AS PER MARK-UPS	23/04/2012	KW	SB
A	FOR APPROVAL	03/04/2012	KW	SB
Rev. No.	Description:	Date:	Drawn By:	Checked By:
CUSTOMER		-ABB BERMAC		
REFERENCE		-CADOTTE PILOT CSS		
CUSTOMER P.O.#		-4500497048		
LOCATION		-WARWICK'S YARD		
DATE REQUIRED		APRIL 2012		
JOB NUMBER		W28406		
DRAWING #		W28406-04		
Dwg Name		SKID DRAWING - SHOP & FIELD PRINT		



- PILE LOADING NOTES :**
- SUGGESTED PILE LOCATIONS
 - PILE LOADS ARE UNFACTORED
 - PILE DESIGN BY OTHERS
 - LATERAL PILE LOADS BY OTHERS

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SDR CODE	EQUIPMENT TAG	REVIEWED BY	DATE
DC01	B-1100	P.VALLA	JUNE 4, 2012

Warwick INDUSTRIES LTD		6999 84 ST SE, Calgary, Alberta, T2C 4T6 Telephone (403) 720-9425, Fax (403) 720-9426	
Rev. No.	Description	Date	Drawn By: Checked By:
A	FOR APPROVAL	23/04/2012	KW SB
CUSTOMER	-ABB BERMAC		
REFERENCE	-CADOTTE PILOT CSS		
CUSTOMER P.O.#	-4500497048		
LOCATION	-WARWICK'S YARD		
DATE REQUIRED	APRIL 2012		
JOB NUMBER	W28406		
DRAWING #	W28406-05		
Dwg Name	SKID DRAWING - SHOP & FIELD PRINT		



CODE SHEET

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Reviewed only as to general conformity with the design concept and specifications provided. The engineer does not warrant or represent that the information contained on this drawing/document is either accurate or complete. Sole responsibility for correct design, detail and dimensions shall remain with the party submitting the drawing/document.			
SDR CODE	EQUIPMENT TAG	REVIEWED BY	DATE
G 344	B-1100	P. VALLO	AUG. 16, 2012

PROJECT NAME: Murphy Cadotte / 1780

VENDOR NAME: ABB Ber-Mac / 1780-024

DOCUMENT
NUMBER: W28406-P12495

VENDOR
REVISION: 1

DOCUMENT
DESCRIPTION: HVAC Equipment Data Sheets

VENDOR
TRANSMITTAL
NUMBER: 9



THE WALL-MOUNT™ AIR CONDITIONERS - 9.0 EER, (60HZ)

Models W18A to W60A
1.5 to 5 Ton (16,400 to 55,000 Btuh)
Right Side Control Panel 60Hz

GREEN REFRIGERANT
R-410A

The Bard Wall-Mount Air Conditioner is a self contained energy efficient system, which is designed to offer maximum indoor comfort at a minimal cost without using valuable indoor floor space or outside ground space. This unit is the ideal product for versatile applications such as: new construction, modular offices, school modernization, telecommunication structures, portable structures or correctional facilities. Factory or field installed accessories are available to meet specific job requirements.

Engineered Features

Aluminum Finned Copper Coils:

Grooved tubing and enhanced louvered fin for maximum heat transfer and energy efficiency.

Twin Blowers:

Move air quietly. Most models feature multispeed blower motors providing airflow adjustment for high and low static operation. Motor overload protection is standard on all models.

Air Conditioner Compressor:

Scroll Compressors eliminate need for crankcase heater. Standard on 1½ to 5 ton.

R-410A Refrigerant:

Designed with R-410A (HFC) non-ozone depleting refrigerant in compliance with the Montreal protocol and 2010 EPA requirements.

Phase Rotation Monitor:

Standard on all 3 phase scroll compressors. Protects against reverse rotation if power supply is not properly connected.

Galvanized 20 Gauge Zinc Coated Steel Cabinet:

Cleaned, rinsed, sealed and dried before the polyurethane primer is applied. The cabinet is handsomely finished with a baked on textured enamel, which allows it to withstand 1000 hours of salt spray tests per ASTM B117-03.

Foil Faced Insulation:

Standard on all units.

Full Length Mounting Brackets:

Built into cabinet for improved appearance and easy installation. NOTE: Bottom mounting bracket included to assist in installation.

Electrical Components:

Are easily accessible for routine inspection and maintenance through a right side, service panel opening. Features a lockable, hinged access cover to the circuit breaker or toggle disconnect switch.

Electric Heat Strips:

Features an automatic limit and thermal cut-off safety control. Heater packages can be factory or field installed for all 1½ through 5 ton models.

Filter Service Door:

Separate service door provides easy access for filter change.

One Inch, Disposable Air Filters:

Are standard equipment. Optional one inch washable filters available and filter racks permit the addition of 2" pleated filter. Factory or field installed.

Condenser Fan and Motor Shroud Assembly:

Slides out for easy access.

Barometric Fresh Air Damper:

Standard on all units. Allows up to 25% outside fresh air. Optional ventilation packages available.

Built-in Circuit Breakers:

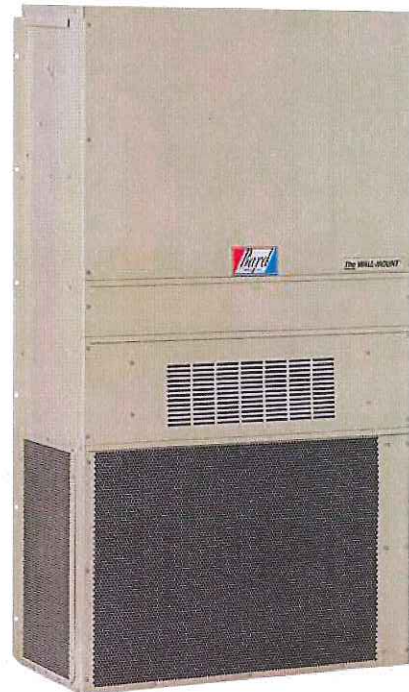
Standard on all electric heat versions of single (230/208 volt) and three phase (230/208 volt) equipment. Toggle disconnects are standard on all electric heat versions of three phase (460 volt) equipment.

Slope Top:

Standard feature for water run-off.

Top Rain Flashing:

Standard feature on all models.



MEA # 357-93-E

Liquid Line Filter Drier:

Standard on all units. Protects system against moisture.

Compressor Control Module:

Standard on all units. Built-in off-delay timer adjustable from 30 seconds to 5 minutes. 2-minute on-delay if power interrupt. 120-second bypass for low pressure control, and both soft and manual lockouts for high and low pressure controls. Alarm output for alarm relay.

High & Low Pressure Switches are Auto-Reset:

Standard on all units. Built-in lockout circuit resets from the room thermostat. Provides commercial quality protection to the compressor.

- Complies with efficiency requirements of ANSI/ASHRAE/IESNA 90.1-2007.
- Certified to ANSI/ARI Standard 390-2003 for SPVU (Single Package Vertical Units).
- Commercial Product - Not intended for Residential application.



Capacity and Efficiency Ratings

MODELS	W18A1	W24A1	W30A1	W36A1	W42A1	W48A1	W60A1
Cooling Capacity BTUH ①	16,400	24,000	29,400	35,400	41,000	47,000	55,000
EER ②	9.00	9.00	9.00	9.00	9.20	9.00	9.00

① Capacity is certified in accordance with ANSI/ARI Standard 390-2003.

② EER = Energy Efficiency Ratio and is certified in accordance with ANSI/ARI Standard 390-2003.

All ratings based on fresh air intake being 100% closed (no outside air introduction).

Specifications 1-1/2 Ton through 3 Ton

MODELS	W18A1-A	W24A1-A	W24A1-B	W24A1-C	W30A1-A	W30A1-B	W30A1-C	W36A1-A	W36A1-B	W36A1-C
Electrical Rating—60 Hz	230/208 - 1	230/208 - 1	230/208 - 3	460 - 3	230/208 - 1	230/208 - 3	460 - 3	230/208 - 1	230/208 - 3	460 - 3
Operating Voltage Range	197-253	197-253	197-253	414-506	197-253	197-253	414-506	197-253	197-253	414-506
Compressor—Circuit A										
Voltage	230/208	230/208	230/208	460	230/208	230/208	460	230/208	230/208	460
Rated Load Amps	6.5/7.2	11.1/12.4	7.2/8.1	5.0	11.7/13.3	7.5/8.5	5.3	15.9/17.7	11.8/13.1	6.0
Branch Circuit Selection Current	9.0	12.9	8.4	5.2	14.2	9.0	5.7	18	13.3	6.0
Lock Rotor Amps	48/48	64/64	58/58	28	78/78	71/71	38	112/112	88/88	44
Compressor Type	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
Fan Motor & Condenser										
Fan Motor—HP—RPM	1/5 - 1075	1/5 - 1075	1/5 - 1075	1/5 - 1075	1/5 - 1075	1/5 - 1075	1/5 - 1075	1/5 - 1075	1/5 - 1075	1/5 - 1075
Fan Motor—Amps	1.2	1.2	1.2	1.4	1.5	1.5	1.4	1.5	1.5	1.4
Fan—DIA/CFM	18" - 1600	18" - 1600	18" - 1600	18" - 1600	20" - 2100	20" - 2100	20" - 2100	20" - 1900	20" - 1900	20" - 1900
Blower Motor & Evap.										
Blower Motor—HP—RPM—SPD	1/6-1100-2	1/6-1100-1	1/6-1100-1	1/3-1100-2	1/3-1100-2	1/3-1100-2	1/3-1100-2	1/3-1100-2	1/3-1100-2	1/3-1100-2
Blower Motor—Amps	1.0	1.0	1.0	1.1	2.2	2.2	1.1	2.2	2.2	1.1
CFM Cooling & E.S.P. w/Filter (Rated-Wet Coil)	600 - .20	800 - .20	800 - .20	800 - .20	1000 - .40	1000 - .40	1000 - .40	1100 - .30	1100 - .30	1100 - .30
Filter Sizes (inches) STD.	16x25x1	16x25x1	16x25x1	16x25x1	16x30x1	16x30x1	16x30x1	16x30x1	16x30x1	16x30x1
Shipping Weight —LBS.	300	300	300	300	355	355	355	355	355	355

Specifications 3-1/2 Ton through 5 Ton

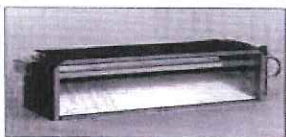
MODELS	W42A1-A	W42A1-B	W42A1-C	W48A1-A	W48A1-B	W48A1-C	W60A1-A	W60A1-B	W60A1-C
Electrical Rating—60 Hz	230/208-1	230/208-3	460-3	230/208-1	230/208-3	460-3	230/208-1	230/208-3	460-3
Operating Voltage Range	197-253	197-253	414-506	197-253	197-253	414-506	197-253	197-253	414-506
Compressor—Circuit A									
Voltage	230/208	230/208	460	230/208	230/208	460	230/208	230/208	460
Rated Load Amps	16.7/18.9	11/12.5	5.8	20/21.9	13.9/15.2	6.8	22.6/25.5	13.5/15.2	7.6
Branch Circuit Selection Current	19.9	13.2	6.1	23.1	16.1	7.1	26.3	15.7	7.8
Lock Rotor Amps	109/109	83.1/83.1	41	134/134	91/91	46	134/134	110/110	52
Compressor Type	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
Fan Motor & Condenser									
Fan Motor—HP—RPM—SPD	1/3-825-2	1/3-825-2	1/3-825-1	1/3-825-2	1/3-825-2	1/3-825-1	1/3-825-2	1/3-825-2	1/3-825-1
Fan Motor—Amps	2.5	2.5	1.3	2.5	2.5	1.3	2.5	2.5	1.3
Fan—DIA/CFM	24" - 2600	24" - 2600	24" - 2600	24" - 2600	24" - 2600	24" - 2600	24" - 2600	24" - 2600	24" - 2600
Blower Motor & Evap.									
Blower Motor—HP—RPM—SPD	1/2-1070-2	1/2-1070-2	1/2-1070-2	1/2-1070-2	1/2-1070-2	1/2-1070-2	1/2-1070-2	1/2-1070-2	1/2-1070-2
Blower Motor—Amps	3.3	3.3	1.9	3.3	3.3	1.9	3.3	3.3	1.9
CFM Cooling & E.S.P. w/Filter (Rated-Wet Coil)	1400 - .30	1400 - .30	1400 - .30	1550 - .20	1550 - .20	1550 - .20	1700 - .30	1700 - .30	1700 - .30
Filter Sizes (inches) STD.	20x30x1	20x30x1	20x30x1	20x30x1	20x30x1	20x30x1	20x30x1	20x30x1	20x30x1
Shipping Weight —LBS.	500	500	500	500	500	500	500	500	500

Ventilation System Packages

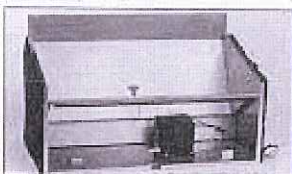
Bard Wall-Mounts are designed to provide optional ventilation packages to meet all of your ventilation and indoor air quality requirements. All units are equipped with a barometric fresh air damper as the standard ventilation package. All ventilation packages can be built-in at the factory or field-installed at a later date.



Barometric Fresh Air Damper



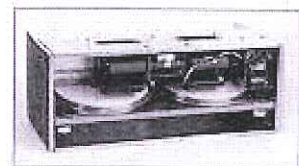
Motorized Fresh Air Damper



Commercial Room Ventilator



Economizer



Energy Recovery Ventilator

BAROMETRIC FRESH AIR DAMPER - BFAD

STANDARD

The barometric fresh air damper is a standard feature on all models. It is installed on the inside of the service door and allows outside ventilation air, up to 25% of the total airflow rating of the unit, to be introduced through the air inlet openings and to be mixed with the conditioned air. The damper opens during blower operation and closes when the blower is off. Adjustable blade stops allow different amounts of outside air to be introduced into the building and can be easily locked closed if required.

BLANK OFF PLATE - BOP

OPTIONAL

A blank off plate is installed on the inside of the service door. It covers the air inlet openings, which restricts any outside air from entering the unit. The blank off plate should be utilized in applications where outside air is not required to be mixed with the conditioned air.

MOTORIZED FRESH AIR DAMPER - MFAD

OPTIONAL

The motorized fresh air damper is internally mounted behind the service door and allows outside ventilation air, up to 25% of the total airflow rating of the unit, to be introduced through the air inlet openings and to be mixed with the conditioned air. The two position damper can be fully open or closed. The damper blade is powered open by a 24VAC motor with spring return on power loss. The damper can be controlled by indoor blower operation or can be field connected to be managed based on building occupancy.

NOTE: The above vent systems are intake only without built-in exhaust capability. Building will likely require separate field installed barometric relief or mechanical exhaust elsewhere within the conditioned space. Balancing dampers in the return air grille may be required to achieve specified amount of outdoor air intake.

COMMERCIAL ROOM VENTILATOR - CRV

OPTIONAL

The built-in commercial room ventilator is internally mounted behind the service door and allows outside ventilation air, up to 50% of the total airflow rating of the unit, to be introduced through the air inlet openings. It includes a built-in exhaust air damper.

The commercial room ventilator (CRV) is a simple and innovative approach to improving the indoor air quality by providing fresh air intake and exhaust capability through the CRV. The damper can be easily adjusted to control the amount of fresh air supplied into the building. The CRV can be controlled by indoor blower operation or field controlled based on room occupancy. Two versions available (except on 1.5 and 2-Ton models). The CRV and CRVS are power open - spring return on power loss, and CRVP is power open and power close. Complies with ANSI/ASHRAE Standard 62.1 "Ventilation for Acceptable Indoor Air Quality".

ECONOMIZER - EIFM

OPTIONAL

The built-in economizer system is internally mounted behind the service door and allows outdoor air to be introduced through the air inlet openings. The amount of outdoor air varies in response to the system controls and settings defined by the end user. It includes a built-in exhaust air damper. The economizer is designed to provide "free cooling" when outside air conditions are cool and dry enough to satisfy cooling requirements without running the compressor. This in turn provides lower operating costs, while extending the life of the compressor.

Standard Features:

- One Piece Construction - Easy to install with no mechanical linkage adjustment required.
- Exhaust Air Damper - Built in with positive closed position. Provides exhaust air capability to prevent pressurization of tight buildings.
- Actuator Motor - 24 volt, power open, spring return with built in torque limiting switch.
- Proportioning Type Control - for maximum "free cooling" economy and comfort.
- Moisture Eliminator & Prefilter - permanent, washable aluminum construction.
- Enthalpy Control - adjustable to monitor outdoor temperature and humidity.
- Minimum Position Potentiometer - adjustable to control minimum damper blade position for ventilation purposes.
- Mixed Air Sensor - to monitor outside and return air to automatically modulate damper position.

WALL-MOUNT ENERGY RECOVERY VENTILATOR - ERVF

OPTIONAL

The wall-mount energy recovery ventilator (ERV) is a highly innovative approach to meeting indoor air quality ventilation requirements as established by ANSI/ASHRAE Standard 62.1. The ERV allows from 200 to 450 CFM (depending upon model) of fresh air and exhaust through the unit while maintaining superior indoor comfort and humidity levels. In most cases this can be accomplished without increasing equipment sizing or operating costs. Heat transfer efficiency is up to 67% during summer and 75% during winter conditions.

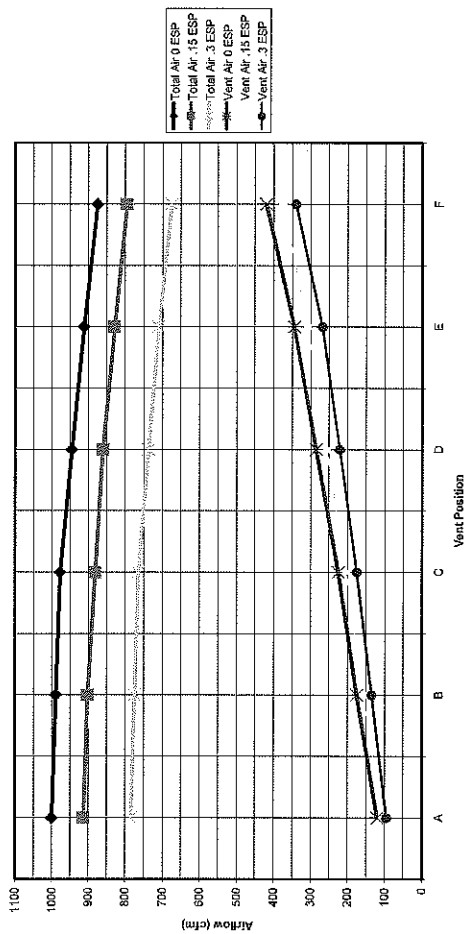
The ERV consists of a unique "rotary energy recovery cassette" that provides effective sensible and latent heat transfer capabilities during summer and winter conditions. Various control schemes are addressed including limiting ventilation during building occupancy only.

The ERV is designed to be internally mounted behind the service door in the W**A, W**H or W**L model wall-mount units. It can be built-in at the factory or field installed as an option. ERVF-*3 and ERVF-*5 can be independently adjusted for intake and exhaust rates.

Manufactured under U.S. Patent Nos. 5,485,878; 5,301,744;
5,002,116; 4,924,934; 4,875,520; 4,825,936; 6,310,330.

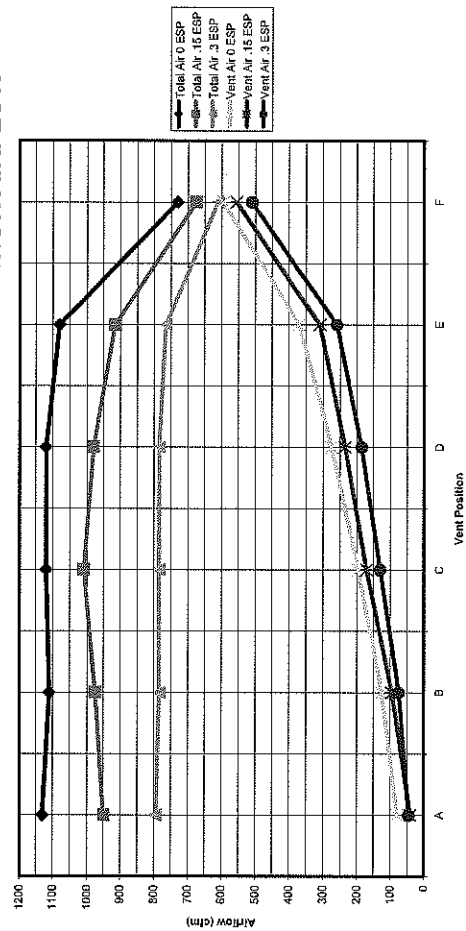
Commercial Room Ventilator Performance Data - CRV-2

W18A & W24A TOTAL AND VENTILATION AIRFLOW

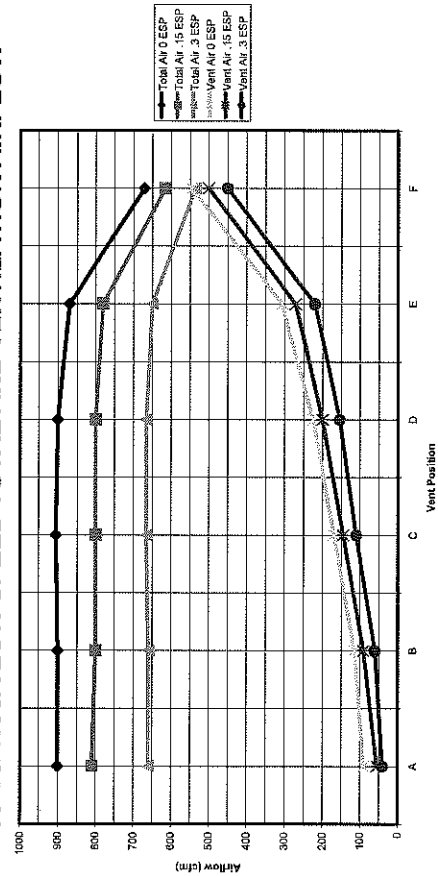


Commercial Room Ventilator Performance Data - CRVS-3 and CRVP-3

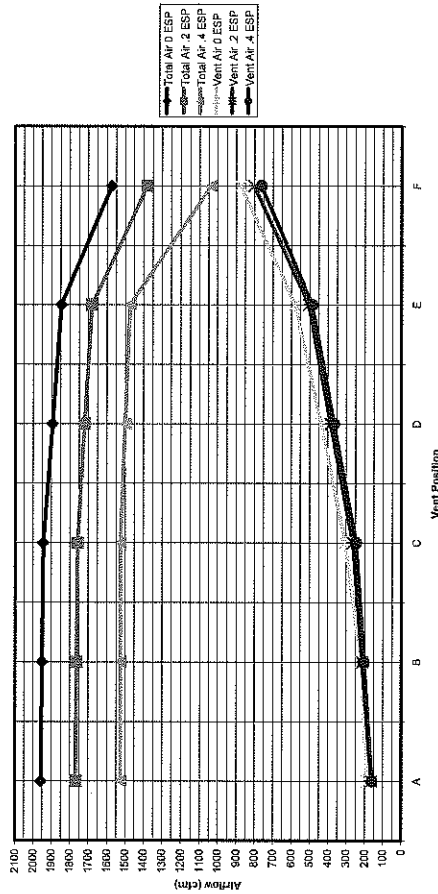
W30A & W36A HIGH SPEED TOTAL AND VENTILATION AIRFLOW



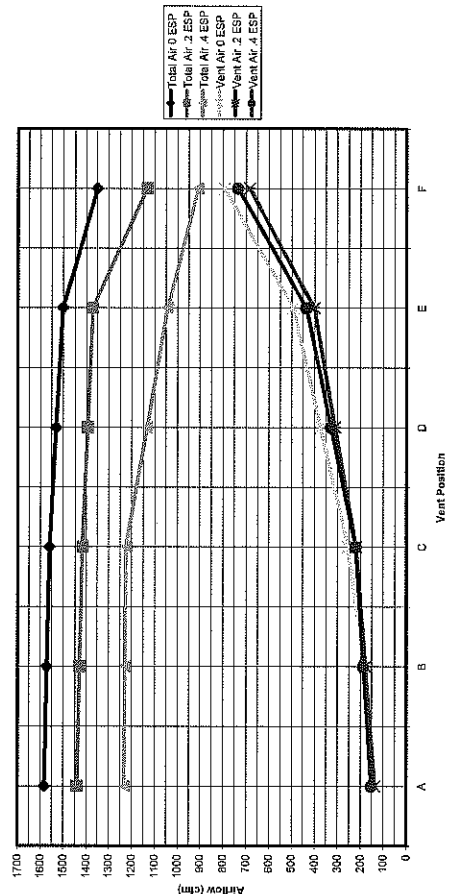
W30A & W36A LOW SPEED TOTAL AND VENTILATION AIRFLOW



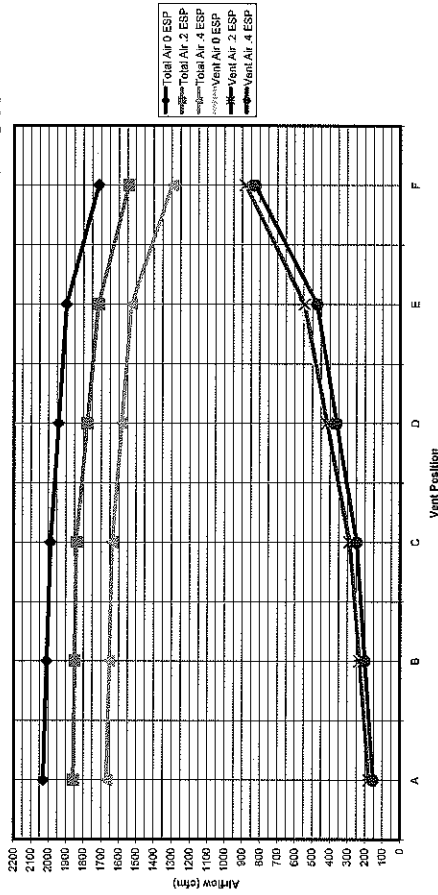
W42A & W48A HIGH SPEED TOTAL AND VENTILATION AIRFLOW



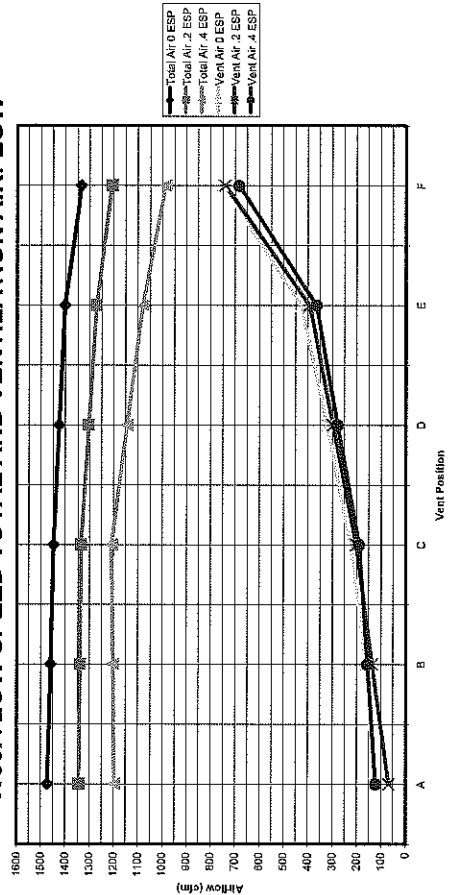
W42A & W48A LOW SPEED TOTAL AND VENTILATION AIRFLOW



W60A HIGH SPEED TOTAL AND VENTILATION AIRFLOW



W60A LOW SPEED TOTAL AND VENTILATION AIRFLOW



Performance and Application Data- ERVF-A2

SUMMER COOLING PERFORMANCE (INDOOR DESIGN CONDITIONS 75°DB/62°WB)

Ambient O.D.		VENTILATION RATE -- 250 CFM 62% EFFICIENCY						VENTILATION RATE -- 225 CFM 63% EFFICIENCY						VENTILATION RATE -- 200 CFM 63% EFFICIENCY					
DB/ WB	F	VLT	VLS	VLL	HRT	HRS	HRL	VLT	VLS	VLL	HRT	HRS	HRL	VLT	VLS	VLL	HRT	HRS	HRL
105	75	11925	8100	1325	7394	5022	822	10727	7287	3441	6758	4591	2168	9540	6480	3060	6010	4082	1928
	70	8100	8100	0	5022	5022	0	7287	7287	0	4591	4591	0	6480	6480	0	4082	4082	0
	65	8100	8100	0	5022	5022	0	7287	7287	0	4591	4591	0	6480	6480	0	4082	4082	0
100	80	17550	6750	10800	10881	4185	6696	15788	6072	9716	9946	3826	6121	14040	5400	8640	8845	3402	5443
	75	11925	6750	5175	7394	4185	3209	10727	6072	4655	6758	3826	2933	9540	5400	4140	6010	3402	2608
	70	6863	6750	113	4255	4185	70	6173	6072	101	3889	3826	64	5490	5400	90	3458	3402	56
	65	6750	6750	0	4185	4185	0	6072	6072	0	3826	3826	0	5400	5400	0	3402	3402	0
	60	6750	6750	0	4185	4185	0	6072	6072	0	3826	3826	0	5400	5400	0	3402	3402	0
95	80	17550	5400	12150	10881	3348	7533	15788	4858	10930	9946	3060	6886	14040	4320	9720	8845	2722	6124
	75	11925	5400	6525	7394	3348	4046	10727	4858	5870	6758	3060	3698	9540	4320	5220	6010	2722	3289
	70	6863	5400	1463	4255	3348	907	6173	4858	1315	3889	3060	829	5490	4320	1170	3458	2722	737
	65	5400	5400	0	3348	3348	0	4858	4858	0	3060	3060	0	4320	4320	0	2722	2722	0
	60	5400	5400	0	3348	3348	0	4858	4858	0	3060	3060	0	4320	4320	0	2722	2722	0
90	80	17550	4050	13500	10881	2511	8370	15788	3643	12145	9946	2295	7651	14040	3240	10800	8845	2041	6804
	75	11925	4050	7875	7394	2511	4883	10727	3643	7084	6758	2295	4463	9540	3240	6300	6010	2041	3969
	70	6863	4050	2813	4255	2511	1744	6173	3643	2530	3889	2295	1594	5490	3240	2250	3458	2041	1417
	65	4050	4050	0	2511	2511	0	3643	3643	0	2295	2295	0	3240	3240	0	2041	2041	0
	60	4050	4050	0	2511	2511	0	3643	3643	0	2295	2295	0	3240	3240	0	2041	2041	0
85	80	17550	2700	14850	10881	1674	9207	15788	2429	13359	9946	1530	8416	14040	2160	11880	8845	1361	7484
	75	11925	2700	9225	7394	1674	5720	10727	2429	8298	6758	1530	5228	9540	2160	7380	6010	1361	4649
	70	6863	2700	4163	4255	1674	2581	6173	2429	3744	3889	1530	2359	5490	2160	3300	3458	1361	2098
	65	2700	2700	0	1674	1674	0	2429	2429	0	1530	1530	0	2160	2160	0	1361	1361	0
	60	2700	2700	0	1674	1674	0	2429	2429	0	1530	1530	0	2160	2160	0	1361	1361	0
80	75	11925	1350	10575	7394	837	6557	10727	1214	9513	6758	765	5993	9540	1080	8460	6010	680	5330
	70	6863	1350	5513	4255	837	3418	6173	1214	4959	3889	765	3124	5490	1080	4410	3458	680	2778
	65	2363	1350	1013	1465	837	628	2125	1214	911	1339	765	547	1890	1080	810	1190	680	510
	60	1350	1350	0	837	837	0	1214	1214	0	765	765	0	1080	1080	0	680	680	0
75	70	6863	0	6863	4255	0	4255	6173	0	6173	6889	0	3889	5490	0	5490	3458	0	3458
	65	2363	0	2363	1465	0	1465	2125	0	2125	1339	0	1339	1890	0	1890	1190	0	1190
	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ERVF-A2 WINTER HEATING PERFORMANCE (INDOOR DESIGN CONDITIONS 70°F DB)

Ambient O.D.	VENTILATION RATE					
	250 CFM 74% EFF.		225 CFM 75% EFF.		200 CFM 75% EFF.	
DB/F	WVL	WHR	WVL	WHR	WVL	WHR
65	1350	999	1214	911	1080	810
60	2700	1998	2429	1822	2160	1620
55	4050	2997	3643	2733	3240	2430
50	5400	3996	4858	3643	4320	3240
45	6750	4995	6072	4554	5400	4050
40	8100	5994	7287	5465	6480	4860
35	9450	6993	8501	6376	7560	5670
30	10800	7992	9716	7287	8640	6480
25	12150	8991	10930	8198	9720	7290
20	13500	9990	12145	9108	10800	8100
15	14850	10989	13359	10019	11880	8910

NOTE: Sensible performance only is shown for winter application.

LEGEND:

VLT = Ventilation Load - Total
VLS = Ventilation Load - Sensible
VLL = Ventilation Load - Latent
HRT = Heat Recovery - Total
HRS = Heat Recovery - Sensible
HRL = Heat Recovery - Latent
WVL = Winter Ventilation Load
WHR = Winter Heat Recovery

Performance and Application Data- ERVF.*5

SUMMER COOLING PERFORMANCE
INDOOR DESIGN CONDITIONS 75°F DB/62°F WB)

Ambient C.O.D.	VENTILATION RATE 450 CFM 65% EFFICIENCY							VENTILATION RATE 375 CFM 68% EFFICIENCY							VENTILATION RATE 300 CFM 67% EFFICIENCY						
	DB/ WB	F	VLT	VLS	VLL	HRT	HRL	VLT	VLS	VLL	HRT	HRS	HRL	VLT	VLS	VLL	HRT	HRS	HRL		
105	75	21465	14580	6884	13952	9477	4475	17887	12150	5737	11805	8018	0	9720	9720	4590	9537	6512	3075		
	105	70	14580	14580	0	9477	9477	0	12150	12150	0	9018	9018	0	9720	9720	0	6512	6512		
	65	14580	14580	0	9477	9477	0	12150	12150	0	9018	9018	0	9720	9720	0	6512	6512	0		
100	75	21465	12150	19440	20533	7897	12635	26325	10125	16200	17374	6882	10692	21060	8100	12660	14110	5427	8683		
	100	70	12352	12150	202	8023	7897	131	10293	10125	168	6793	6692	111	8235	8100	135	5517	5427		
	65	12150	12150	0	7897	7897	0	10125	10125	0	6682	6682	0	8100	8100	0	5427	5427	0		
95	75	21465	9720	21770	20533	6318	14215	26325	8100	18225	17374	5345	12028	21060	6460	14580	14110	4341	9768		
	100	70	14580	9720	21844	13952	6318	7634	10293	8100	2793	11805	5345	6460	14310	6460	7857	4341	5246		
	65	9720	9720	0	6318	6318	0	8100	8100	0	6793	5345	1447	8235	6460	1755	5517	4341	1175		
80	75	21465	7290	24300	20533	4738	15794	26325	6075	20250	17374	4009	13665	21060	4850	16200	14110	3256	10554		
	100	70	14580	7290	24171	13952	4738	9213	10293	6075	11812	11805	4009	7796	14310	4850	9455	3256	8331		
	65	7290	7290	0	4738	4738	0	6075	6075	0	6793	4009	2794	8235	4850	3375	3256	3256	2261		
85	75	21465	4850	26730	20533	3159	17374	26325	4050	22275	17374	2872	14701	21060	3240	17820	14110	2170	11039		
	100	70	14580	4850	16905	13952	3159	10793	17887	4050	13637	11805	2672	9132	4310	3240	11070	9587	2170		
	65	4850	4850	7492	8023	3159	4870	10293	4050	6243	6793	2672	4120	8235	3240	4995	5517	2170	3346		
75	75	21465	2430	19035	13952	3159	17374	26325	4050	22275	17374	2872	14701	21060	3240	17820	14110	2170	11039		
	100	70	12352	2430	9922	9023	1579	6449	10293	2025	82068	6793	1336	5457	8235	1620	6615	5517	1083		
	65	2430	2430	1822	2764	1579	1184	3543	2025	1518	2338	1336	1026	2835	1620	1215	1899	1085	814		
60	75	21465	2430	19035	13952	3159	17374	26325	4050	22275	17374	2872	14701	21060	3240	17820	14110	2170	11039		
	100	70	12352	2430	9922	9023	1579	6449	10293	2025	82068	6793	1336	5457	8235	1620	6615	5517	1083		
	65	2430	2430	1822	2764	1579	1184	3543	2025	1518	2338	1336	1026	2835	1620	1215	1899	1085	814		
70	75	21465	2430	19035	13952	3159	17374	26325	4050	22275	17374	2872	14701	21060	3240	17820	14110	2170	11039		
	100	70	12352	2430	9922	9023	1579	6449	10293	2025	82068	6793	1336	5457	8235	1620	6615	5517	1083		
	65	2430	2430	1822	2764	1579	1184	3543	2025	1518	2338	1336	1026	2835	1620	1215	1899	1085	814		
75	75	21465	2430	19035	13952	3159	17374	26325	4050	22275	17374	2872	14701	21060	3240	17820	14110	2170	11039		
	100	70	12352	2430	9922	9023	1579	6449	10293	2025	82068	6793	1336	5457	8235	1620	6615	5517	1083		
	65	2430	2430	1822	2764	1579	1184	3543	2025	1518	2338	1336	1026	2835	1620	1215	1899	1085	814		
60	75	21465	2430	19035	13952	3159	17374	26325	4050	22275	17374	2872	14701	21060	3240	17820	14110	2170	11039		
	100	70	12352	2430	9922	9023	1579	6449	10293	2025	82068	6793	1336	5457	8235	1620	6615	5517	1083		
	65	2430	2430	1822	2764	1579	1184	3543	2025	1518	2338	1336	1026	2835	1620	1215	1899	1085	814		
70	75	21465	2430	19035	13952	3159	17374	26325	4050	22275	17374	2872	14701	21060	3240	17820	14110	2170	11039		
	100	70	12352	2430	9922	9023	1579	6449	10293	2025	82068	6793	1336	5457	8235	1620	6615	5517	1083		
	65	2430	2430	1822	2764	1579	1184	3543	2025	1518	2338	1336	1026	2835	1620	1215	1899	1085	814		
75	75	21465	2430	19035	13952	3159	17374	26325	4050	22275	17374	2872	14701	21060	3240	17820	14110	2170	11039		
	100	70	12352	2430	9922	9023	1579	6449	10293	2025	82068	6793	1336	5457	8235	1620	6615	5517	1083		
	65	2430	2430	1822	2764	1579	1184	3543	2025	1518	2338	1336	1026	2835	1620	1215	1899	1085	814		
60	75	21465	2430	19035	13952	3159	17374	26325	4050	22275	17374	2872	14701	21060	3240	17820	14110	2170	11039		
	100	70	12352	2430	9922	9023	1579	6449	10293	2025	82068	6793	1336	5457	8235	1620	6615	5517	1083		
	65	2430	2430	1822	2764	1579	1184	3543	2025	1518	2338	1336	1026	2835	1620	1215	1899	1085	814		
70	75	21465	2430	19035	13952	3159	17374	26325	4050	22275	17374	2872	14701	21060	3240	17820	14110	2170	11039		
	100	70	12352	2430	9922	9023	1579	6449	10293	2025	82068	6793	1336	5457	8235	1620	6615	5517	1083		
	65	2430	2430	1822	2764	1579	1184	3543	2025	1518	2338	1336	1026	2835	1620	1215	1899	1085	814		
75	75	21465	2430	19035	13952	3159	17374	26325	4050	22275	17374	2872	14701	21060	3240	17820	14110	2170	11039		
	100	70	12352	2430	9922	9023	1579	6449	10293	2025	82068	6793	1336	5457	8235	1620	6615	5517	1083		
	65	2430	2430	1822	2764	1579	1184	3543	2025	1518	2338	1336	1026	2835	1620	1215	1899	1085	814		
60	75	21465	2430	19035	13952	3159	17374	26325	4050	22275	17374	2872	14701	21060	3240	17820	14110	2170	11039		
	100	70	12352	2430	9922	9023	1579	6449	10293	2025	82068	6793	1336	5457	8235	1620	6615	5517	1083		
	65	2430	2430	1822	2764	1579	1184	3543	2025	1518	2338	1336	1026	2835	1620	1215	1899	1085	814		
70	75	21465	2430	19035	13952	3159	17374	26325	4050	22275	17374	2872	14701	21060	3240	17820	14110	2170	11039		
	100	70	12352	2430	9922	9023	1579	6449	10293	2025	82068	6793	1336	5457	8235	1620	6615	5517	1083		
	65	2430	2430	1822	2764	1579	1184	3543	2025	1518	2338	1336	1026	2835	1620	1215	1899	1085	814		
75	75	21465	2430	19035	13952	3159	17374	26325	4050	22275	17374	2872	14701	21060	3240	17820	14110	2170	11039		
	100	70	12352	2430	9922	9023	1579	6449	10293	2025	82068	6793	1336	5457	8235	1620	6615	5517	1083		
	65	2430	2430	1822	2764	1579	1184	3543	2025	1518	2338	1336	1026	2835	1620	1215	1899	1085	814		
60	75	21465	2430	19035	13952	3159	17374	26325	4050	22275	17374	2872	14701	21060	3240	17820	14110	2170	11039		
	100	70	12352	2430	9922	9023	1579	6449	10293	2025	82068	6793	1336	5457	8235	1620	6615	5517	1083		
	65	2430	2430	1822	2764	1579	1184	3543	2025	1518	2338	1336	1026	2835	1620	1215	1899	1085	814		
70	75	21465	2430	19035	13952	3159	17374	26325	4050	22275	17374	2872	14701	21060	3240	17820	14110	2170	11039		
	100	70	12352	2430	9922	9023	1579	6449	10293	2025	82068	6793	1336	5457	8235	1620	6615	5517	1083		
	65	2430	2430	1822	2764	1579	1184	3543	2025	1518	2338	1336	1026	2835	1620	1215	1899	1085	814		
75	75	21465	2430	19035	13952	3159	17374	26325	4050	22275	17374	2872	14701	21060	3240	17820	14110	2170	11039		
	100	70	12352	2430	9922	9023	1579	6449	10293	2025	82068	6793	1336	5457	8235	1620	6615	5517	1083		
	65	2430	2430	1822	2764	1579	1184	3543	2025	1518	2338	1336	1026	2835	1620	1215	1899	1085	814		
60	75	21465	2430	19035	13952	3159	17374	26325	4050	22275	17374	2872	14701	21060	3240	17820	14110	2170	11039		
	100	70	12352	2430	9922	9023	1579	6449	10293	2025	82068	6793	1336	5457	8235	1620	6615	5517	1083		
	65	2430	2430	1822	2764	1579	1184	3543	2025	1518	2338	1336	1026	2835	1620	1215	1899	1085	814		
70	75	21465	2430	19035	13952	3159	17374	26325	4050	22275	17374	2872	14701	21060	3240	17820	14110	2170	11039		
	100	70	12352	2430	9922	9023	1579	6449	10293	2025	82068										

LEGEND:

WLT = Ventilation Load - Total
WLS = Ventilation Load - Sensible
WLL = Ventilation Load - Latent
WHR = Heat Recovery - Total
HRS = Heat Recovery - Sensible
HRL = Heat Recovery - Latent
WWV = Winter Ventilation Load
WHR = Winter Heat Recovery

**ERV-F-5 WINTER HEATING PERFORMANCE
(INDOOR DESIGN CONDITIONS 70°F DB)**

Ambient O.D. DB/°F		VENTILATION RATE									
		450 CFM			375 CFM			300 CFM			
		80% EFFICIENCY	81% EFFICIENCY	82% EFFICIENCY	80% EFFICIENCY	81% EFFICIENCY	82% EFFICIENCY	80% EFFICIENCY	81% EFFICIENCY	82% EFFICIENCY	
		WVL	WHR	WVL	WHR	WVL	WHR	WVL	WHR	WVL	WHR
	65	2430	1944	2025	1640	1620	1328				
	60	4860	3888	4050	3280	3240	2656				
	55	7290	5832	6075	4920	4860	3985				
	50	9720	7776	8100	6561	6480	5313				
	45	12150	9720	10125	8201	8100	6642				
	40	14580	11564	12150	9841	9720	7970				
	35	17010	13608	14175	11481						
	30	19440	15552	16200	13122	12960	10627				
	25	21870	17496	18225	14762	14580	11955				
	20	24300	19440	20250	16402	16200	13284				
	15	26730	21384	22275	18043	17920	14612				

NOTE: Sensible performance only is shown for winter application.

NOTE: Sensible performance only is shown for winter application.

Electrical Specifications

Model	Rated Volts and Phase	No. Field Power Circuits	Single Circuit				Dual Circuit							
			Ⓢ Minimum Circuit Ampacity	Ⓢ Maximum External Fuse or Ckt. Brkr.	Ⓢ Field Power Wire Size	Ⓢ Ground Wire	Ⓢ Minimum Circuit Ampacity		Ⓢ Maximum External Fuse or Ckt. Brkr.		Ⓢ Field Power Wire Size		Ⓢ Ground Wire Size	
							Ckt. A	Ckt. B	Ckt. A	Ckt. B	Ckt. A	Ckt. B	Ckt. A	Ckt. B
W18A1 - A00, A0Z	230/208-1	1	16	20	12	12								
A05		1	30	30	10	10								
A08		1	46	50	8	10								
A10		1	56	60	6	10								
W24A1 - A00, A0Z	230/208-1	1	21	30	10	10								
A05		1	30	30	10	10								
A08		1	46	50	8	10								
A10		1	56	60	6	10								
W24A1 - B00, B0Z	230/208-3	1	15	15	14	14								
B06		1	22	25	10	10								
W24A1 - C00, C0Z	460-3	1	10	15	14	14								
C06		1	12	15	14	14								
W30A1 - A00*, A0Z*	230/208-1	1	24	35	8	10								
A05*		1	32	35	8	10								
A08		1	48	50	8	10								
A10*		1	58	60	6	10								
A15		1 or 2	84	90	4	8	58	26	60	30	6	10	10	10
W30A1 - B00*, B0Z*	230/208-3	1	18	20	12	12								
B06		1	24	25	10	10								
B09*		1	33	35	8	10								
B15		1	51	60	8	10								
W30A1 - C00*, C0Z*	460-3	1	11	15	14	14								
C06		1	12	15	14	14								
C09*		1	17	20	12	12								
C15		1	26	30	10	10								
W36A1 - A00*, A0Z*	230/208-1	1	29	35	8	10								
A05*		1	32	35	8	10								
A08		1	48	50	8	10								
A10*		1	58	60	6	10								
A15		1 or 2	84	90	4	8	58	26	60	30	6	10	10	10
W36A1 - B00*, B0Z*	230/208-3	1	23	30	10	10								
B06		1	24	30	10	10								
B09*		1	33	35	8	10								
B15		1	51	60	6	10								
W36A1 - C00*, C0Z*	460-3	1	12	15	14	14								
C06		1	12	15	14	14								
C09*		1	17	20	10	10								
C15		1	26	30	10	10								
W42A1 - A00, A0Z Ⓢ	230/208-1	1	33	50	8	10								
A05 Ⓢ		1	33	50	8	10								
A10 Ⓢ		1	59	60	6	10								
A15		1 or 2	85	90	4	8	59	26	60	30	6	10	10	10
A20		1 or 2	111	125	2	6	59	52	60	60	6	6	10	10
W42A1 - B00, B0Z Ⓢ	230/208-3	1	25	35	8	10								
B09 Ⓢ		1	34	35	8	10								
B15		1	53	60	6	10								
B18 Ⓢ		1	62	70	6	8								
W42A1 - C00, C0Z Ⓢ	460-3	1	13	15	14	14								
C09 Ⓢ		1	18	20	12	12								
C15		1	27	30	10	10								
W48A1 - A00, A0Z Ⓢ	230/208-1	1	37	50	8	10								
A05 Ⓢ		1	37	50	8	10								
A10 Ⓢ		1	59	60	6	10								
A15		1 or 2	85	90	4	8	59	26	60	30	6	10	10	10
A20		1 or 2	111	125	2	6	59	52	60	60	6	6	10	10
W48A1 - B00, B0Z Ⓢ	230/208-3	1	29	40	8	10								
B09 Ⓢ		1	34	40	8	10								
B15		1	52	60	6	10								
B18 Ⓢ		1	62	70	6	8								
W48A1 - C00, C0Z Ⓢ	460-3	1	14	20	12	12								
C09 Ⓢ		1	18	20	12	12								
C15		1	27	30	10	10								
W60A1 - A00, A0Z Ⓢ	230/208-1	1	41	60	8	10								
A05 Ⓢ		1	41	60	8	10								
A10 Ⓢ		1	59	60	6	10								
A15		1 or 2	85	90	4	8	59	26	60	30	6	10	10	10
A20		1 or 2	111	125	2	6	59	52	60	60	6	6	10	10
W60A1 - B00, B0Z Ⓢ	230/208-3	1	28	40	8	10								
B09 Ⓢ		1	34	40	8	10								
B15 Ⓢ		1	53	60	6	10								
B18 Ⓢ		1	62	70	6	10								
W60A1 - C00, C0Z Ⓢ	460-3	1	15	20	12	12								
C09 Ⓢ		1	18	20	12	12								
C15		1	27	30	10	10								

Ⓢ Maximum size of the time delay fuse or HACR type circuit breaker for protection of field wiring conductors.

Ⓢ Based on 75C copper wire. All wiring must conform to the National Electrical Code and all local codes.

Ⓢ These "Minimum Circuit Ampacity" values are to be used for sizing the field power conductors. Refer to the National Electrical code (latest version), Article 310 for power conductor sizing.

Ⓢ These models are available with dehumidification with hot gas reheat.

Caution: When more than one field power circuit is run through one conduit, the conductors must be derated. Pay special attention to note 8 of Table 310 regarding Ampacity Adjustment Factors when more than three (3) current carrying conductors are in a raceway.

* Top outlet supply option is available only factory installed and only on the selected models.

IMPORTANT: While this electrical data is presented as a guide, it is important to electrically connect properly sized fuses & conductor wires in accordance with the National Electrical Code & all local codes.

Indoor Blower Performance - CFM at Rated Volts

ESP in H ₂ O	W18A1		W24A1	W30A1 W36A1		W42A1 W48A1		W60A1	
	High Speed Dry/Wet Coil	Low Speed Dry/Wet Coil	Single Speed Dry/Wet Coil	High Speed Dry/Wet Coil	Low Speed Dry/Wet Coil	High Speed Dry/Wet Coil	Low Speed Dry/Wet Coil	High Speed Dry/Wet Coil	Low Speed Dry/Wet Coil
0	925/885	670/655	1020/975	1395/1315	950/935	1885/1800	1650/1600	2200/2000	1600/1450
.1	875/845	650/630	960/905	1340/1270	930/915	1770/1665	1550/1500	2100/1900	1525/1375
.2	825/795	625/600	865/800	1285/1190	910/885	1635/1550	1450/1400	2000/1800	1465/1200
.3	775/740	575/555	820/735	1205/1100	855/830	1500/1400	1350/1300	1875/1700	-/-
.4	710/670	525/500	735/650	1110/1000	800/755	1370/1285	1300/1175	1775/1600	-/-
.5	635/600	465/440	615/535	1005/870	-/-	1250/1150	-/-	1650/1475	-/-

Above data is with 1" standard throwaway filter and 1" washable filter.

For optional 2" pleated filter - reduce ESP by .15 in.

See installation instructions for maximum ESP information on various KW application.

Speeds marked "bold" above
are **Factory Connected**.

Electric Heat Table - Refer to Electrical Specifications for Availability by Unit Model

Nominal KW	At 240V (1)				At 208V (1)				At 480V (2)			At 460V (2)		
	Kw	1-Ph Amps	3-Ph Amps	Btuh	Kw	1-Ph Amps	3-Ph Amps	Btuh	Kw	3-Ph Amps	Btuh	Kw	3-Ph Amps	Btuh
5.0	5.0	20.8		17,065	3.75	18.0		12,799						
6.0	6.0		14.4	20,478	4.50		12.5	15,359	6.0	7.2	20,478	5.52	6.9	18,840
8.0	8.0	33.3		27,304	6.00	28.8		20,478						
9.0	9.0		21.7	30,717	6.75		18.7	23,038	9.0	10.8	30,717	8.28	10.4	28,260
10.0	10.0	41.7		34,130	7.50	36.1		25,598						
15.0	15.0	62.5	36.1	51,195	11.25	54.1	31.2	38,396	15.0	18.0	51,195	13.80	17.3	47,099
18.0	18.0		43.3	61,434	13.50		37.5	46,076	18.0	21.7	61,434	16.56	20.8	56,519
20.0	20.0	83.3		68,260	15.00	72.1		51,195						

(1) These electric heaters are available in 230/208V units only.

(2) These electric heaters are available in 480V units only.

Heater Packages - Field Installed

- Designed for adding Electric Heat to 0 KW Units
- Circuit Breaker Standard on 230/208V Models

- ETL US & Canada Listed
- Toggle Disconnect Standard on 460V Models

Air Conditioner Models	-A00 Models 230/208-1		-B00 Models 230/208-3		-C00 Models 460-3	
	Heater Model #	KW	Heater Model #	KW	Heater Model #	KW
W18A1	EHWA02-A05 EHW02A-A08 EHWA02A-A10	5 8 10	N/A		N/A	
W24A1	EHWA02-A05 EHW02A-A08 EHWA02A-A10	5 8 10	EHWA24-B06	6	EHWH24B-C06	6
W30A1	EHWA03-A05 EHWA03-A08 EHWA03-A10 EHWA03-A15	5 8 10 15	EHWA03-B06 EHWA03-B09 EHWA37-B15	6 9 15	EHWC03A-C06 EHWC03A-C09 EHWA03A-C15	6 9 15
W36A1	EHWA03-A05 EHWA03-A08 EHWA03-A10 EHWA03-A15	5 8 10 15	EHW36A-B06 EHWA03-B09 EHWA37-B15	6 9 15	EHWC03A-C06 EHWC03A-C09 EHWA03A-C15	6 9 15
W42A1 W48A1	EHWA05-A05 ① EHWA05-A10 ① EHWA05-A15 EHWA05-A20	5 10 15 20	EHWA05-B09 ① EHWA05-B15 EHW05A-B18 ①	9 15 18	EHWA05A-C09 ① EHWA05A-C15	9 15
W60A1	EHWA60-A05 ① EHWA05-A10 ① EHWA05-A15 EHWA05-A20	5 10 15 20	EHW60A-B09 ① EHWA05-B15 ① EHW05A-B18 ①	9 15 18	EHWA05A-C09 ① EHWA05A-C15	9 15

NOTE: Field installed Heater Packages are not approved for use with top supply opening models.

① These heater packages approved for use in dehumidification versions with hot gas reheat.

Cooling Application Data - Outdoor Temperature ①

Model	D.B./W.B. ②	Cooling Capacity	75°F	80°F	85°F	90°F	95°F	100°F	105°F	110°F	115°F	120°F
W18A1	75/ 62	Total Cooling	17,500	16,700	15,900	15,100	14,300	13,600	12,900	12,200	11,600	10,800
		Sensible Cooling	13,900	13,500	13,200	12,800	12,500	12,200	11,800	11,500	11,100	10,700
	80/ 67	Total Cooling	18,600	18,100	17,600	17,000	16,400	15,800	15,200	14,500	13,900	13,100
		Sensible Cooling	13,400	13,200	13,000	12,800	12,600	12,400	12,100	11,800	11,500	11,200
	85/ 72	Total Cooling	22,200	21,200	20,200	19,200	18,300	17,300	16,400	15,500	14,600	13,700
		Sensible Cooling	13,800	13,400	13,100	12,800	12,400	12,000	11,600	11,100	10,600	10,200
W24A1	75/ 62	Total Cooling	26,000	24,500	23,300	22,100	20,900	20,000	19,100	18,400	17,600	17,100
		Sensible Cooling	20,100	19,700	19,200	18,800	18,400	17,900	17,400	16,900	16,400	15,900
	80/ 67	Total Cooling	27,700	26,700	25,800	24,900	24,000	23,300	22,500	21,900	21,200	20,700
		Sensible Cooling	19,500	19,300	19,000	18,800	18,500	18,200	17,800	17,400	17,000	16,600
	85/ 72	Total Cooling	33,000	31,200	29,700	28,100	26,700	25,500	24,300	23,300	22,300	21,500
		Sensible Cooling	20,000	19,600	19,100	18,700	18,200	17,600	17,000	16,300	15,700	15,000
W30A1	75/ 62	Total Cooling	31,100	29,700	28,300	27,000	25,800	24,700	23,700	22,700	21,700	20,900
		Sensible Cooling	24,500	24,000	23,500	22,900	22,400	21,800	21,300	20,700	20,100	19,500
	80/ 67	Total Cooling	33,200	32,300	31,400	30,400	29,400	28,600	27,800	27,000	26,100	25,300
		Sensible Cooling	23,700	23,500	23,200	22,900	22,600	22,200	21,800	21,400	20,900	20,400
	85/ 72	Total Cooling	39,600	37,800	36,100	34,500	32,900	31,500	30,100	28,800	27,500	26,300
		Sensible Cooling	24,300	23,900	23,300	22,800	22,200	21,500	20,800	20,100	19,300	18,500
W36A1	75/ 62	Total Cooling	38,100	35,900	34,100	32,300	30,800	29,600	28,600	27,700	26,900	26,400
		Sensible Cooling	28,500	27,800	27,100	26,400	25,800	25,200	24,700	24,200	23,700	23,200
	80/ 67	Total Cooling	40,600	39,100	37,800	36,500	35,400	34,500	33,700	33,000	32,400	32,000
		Sensible Cooling	27,600	27,200	26,800	26,400	26,000	25,600	25,300	25,000	24,600	24,300
	85/ 72	Total Cooling	48,400	45,700	43,400	41,200	39,300	37,800	36,400	35,100	34,100	33,300
		Sensible Cooling	28,300	27,600	26,900	26,200	25,500	24,800	24,100	23,500	22,700	22,000
W42A1	75/ 62	Total Cooling	43,600	41,500	39,600	37,600	35,700	33,900	32,100	30,400	28,700	27,000
		Sensible Cooling	35,500	34,500	33,600	32,700	31,800	31,000	30,100	29,200	28,400	27,500
	80/ 67	Total Cooling	46,500	45,200	43,900	42,500	41,000	39,500	37,900	36,200	34,500	32,700
		Sensible Cooling	34,400	33,800	33,300	32,700	32,100	31,500	30,900	30,200	29,500	28,800
	85/ 72	Total Cooling	55,400	52,900	50,400	48,000	45,600	43,200	40,900	38,500	36,300	34,000
		Sensible Cooling	35,200	34,300	33,500	32,500	31,500	30,500	29,500	28,300	27,200	26,000
W48A1	75/ 62	Total Cooling	49,600	47,300	45,100	43,000	40,900	39,000	37,100	35,100	33,300	31,400
		Sensible Cooling	39,900	39,100	38,200	37,300	36,400	35,500	34,500	33,600	32,700	31,600
	80/ 67	Total Cooling	52,900	51,500	50,100	48,600	47,000	45,400	43,700	41,900	40,000	38,100
		Sensible Cooling	38,700	38,300	37,800	37,300	36,700	36,100	35,400	34,700	34,000	33,100
	85/ 72	Total Cooling	63,000	60,200	57,500	54,900	52,200	49,700	47,100	44,600	42,000	39,600
		Sensible Cooling	39,600	38,900	38,000	37,100	36,000	34,900	33,800	32,500	31,300	29,900
W60A1	75/ 62	Total Cooling	59,200	56,200	53,300	50,500	47,900	45,400	43,100	40,800	38,600	36,600
		Sensible Cooling	45,200	43,800	42,300	41,000	39,700	38,500	37,300	36,100	35,000	33,900
	80/ 67	Total Cooling	63,200	61,200	59,200	57,100	55,000	52,900	50,800	48,700	46,500	44,300
		Sensible Cooling	43,800	42,900	41,900	41,000	40,100	39,200	38,300	37,300	36,400	35,500
	85/ 72	Total Cooling	75,300	71,600	68,000	64,500	61,100	57,900	54,800	51,800	48,900	46,000
		Sensible Cooling	44,900	43,600	42,100	40,700	39,300	37,900	36,500	35,000	33,500	32,100

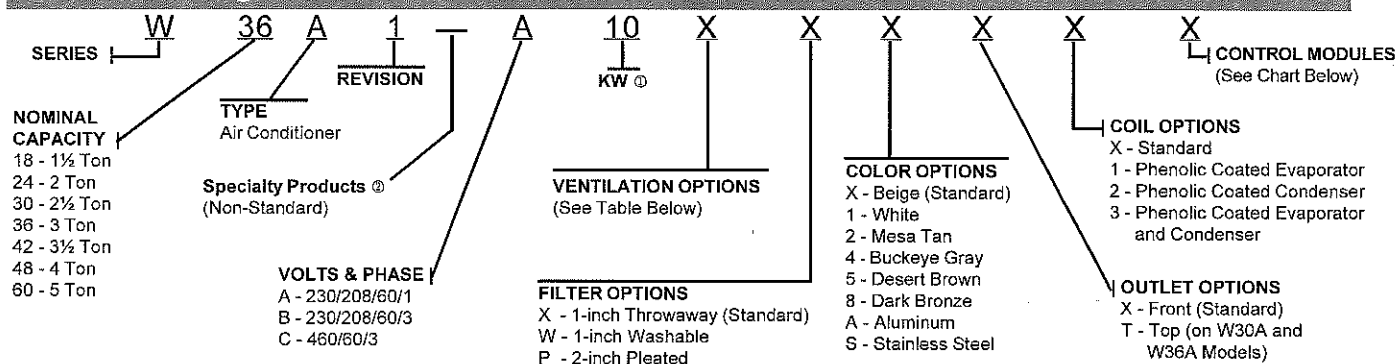
Capacity Multiplier Factors

% of Rated Airflow	-10	Rated	+10
Total BTUH	0.975	1.0	1.02
Sensible BTUH	0.950	1.0	1.05

① Below 65°F (18.3°C), unit requires a factory or field installed low ambient control.

② Return air temperature.

Air Conditioning Wall-Mount Model Nomenclature



① For 0KW and circuit breakers (230/208 Volt) or toggle disconnects (460 Volt) applications, insert 0Z in the KW field of the model number.

② Insert "D" for dehumidification with hot gas reheat — Models W42 - 60 only. See Form 7960-572 for complete details.

Ventilation Options

Models	W18A1, W24A1		W30A1, W36A1		W42A1, W48A1, W60A1	
	Factory Installed Code No.	Field Installed Part No.	Factory Installed Code No.	Field Installed Part No.	Factory Installed Code No.	Field Installed Part No.
Barometric Fresh Air Damper - Standard	X	BFAD-2	X	BFAD-3	X	BFAD-5
Blank-Off Plate	B	BOP-2	B	BOP-3	B	BOP-5
Motorized Fresh Air Damper	M	MFAD-2	M	MFAD-3	M	MFAD-5
Commercial Ventilator - Spring Return w/Exhaust	V	CRV-2	V	CRVS-3	V	CRVS-5
Commercial Ventilator - Power Return w/Exhaust	---	---	P	CRVP-3	P	CRVP-5
Economizer - Fully Modulating ①	E	EIFM-2B	E	EIFM-3C	E	EIFM-5C
Economizer - Fully Modulating ①②	D	N/A	D	N/A	D	N/A
Energy Recovery Ventilator - 230 Volt *	R	ERV-F-A2	R	ERV-F-A3 ③	R	ERV-F-A5 ③
Energy Recovery Ventilator - 460 Volt *	N/A	ERV-F-C2 ④	R	ERV-F-C3 ③	R	ERV-F-C5 ③
Door Kit for ERVF (Required)	N/A	WMDK2-*	N/A	WMDK3-*	N/A	WMDK5-*

① Low ambient control is required with economizer for low temperature compressor operation.

② For use only with "V" Control Module and TCS23 Controller.

③ Intake and exhaust can be independently adjusted.

④ Model W24A1-C only.

* WMDK Door Kit must be ordered in addition to ERVF Assembly and color matched to unit ("X" = Beige; "4" = Buckeye Gray; "8" = Dark Bronze)

Air Conditioning Control Modules

									All Models Except As Noted	
HPC ①	LPC ②	CCM ③	LAC ④⑤	ALR ⑥	SK ⑦	SK ⑦	ODT ⑧	DDC ⑨	Factory Installed Code	Field Installed Part
STD	STD	STD							X	N/A
STD	STD	STD	●						E ⑩	CMA-28
STD	STD	STD	●	●					J ⑪	Factory Only
STD	STD	STD	●		●				K ⑫	CMC-15 and CMA-28
STD	STD	STD	●	●	●				M ⑬	Factory Only
STD	STD	STD		●					N, W18A Only ⑭	N/A
STD	STD	STD			●				Field Installed Only	CMC-15
STD	STD	STD					●		Field Installed Only	CMA-14
STD	STD	STD	●	●				●	V ⑯⑰	Factory Only
STD	STD	STD						●	Field Installed Only	CMA-23 for W18-36A CMA-24 for W42-60A
STD	STD	STD				●			Field Installed Only	SK111

STD = Standard equipment for these specified models.

① HPC. High pressure control is auto reset. Always used with compressor control module (CCM) which is included. See note ③.

② LPC. Low pressure control is auto reset. Always used with compressor control module (CCM) which is included. See note ③.

③ CCM. Compressor control module has adjustable 30-second to 5-minute delay-on-break timer. On initial power-up, or any time the power is interrupted, the delay-on-make will be 2-minutes plus 10% of the delay-on-break setting. There is no delay-on-make during routine operation of the unit. The module also provides the lockout feature (with 1 retry) for high and/or low-pressure controls, and a 2-minute timed bypass for low-pressure control.

④ LAC. Low ambient control permits cooling operation down to 0°F

⑤ ALR. The alarm relay has a set of normally open and normally closed dry contacts to provide the ability to signal a condition of shutdown on either high or low pressure controls.

⑥ SK. PTCR start kit can be used with all -A single phase models. Increases starting torque 2-3x. Not used for -B or -C three phase models. Do not use if SK111 is used.

⑦ SK. Start capacitor and potential relay start kit can be used with all -A single phase models. Increases starting torque 9x. Not used for -B or -C three phase models. Do not use if CMC-15 is used.

⑧ ODT. Outdoor thermostat is adjustable from 0 to 50°F. It is suitable for use as a compressor cut-off thermostat.

⑨ DDC. Incorporates 4 additional sensors: discharge air temperature, indoor blower airflow, compressor current, and dirty filter. These sensing devices function to input analog data such as temperature, as well as digital data such as airflow, compressor status or filter status.

⑩ "V" control module should be ordered in conjunction with direct digital controller (DDC) model TCS23. Refer to DDC specification sheet S3280 for more information.

⑪ Option not available for Model W18A.

⑰ Use option N for Alarm Relay on Model W18A only.

Clearances Required for Service Access and Adequate Condenser Inlet Airflow

MODELS	LEFT SIDE	RIGHT SIDE
W18A, W24A, W30A, W36A	15"	20"
W42A, W48A, W60A	20"	20"

NOTE: For side by side installation of two (2) WA models there must be 20" between units. This can be reduced to 15" by using a WL model (left side compressor and controls) for the left unit and WA (right side compressor and controls) for right unit. See WL Specifications S3400.

Minimum Clearances Required to Combustible Materials

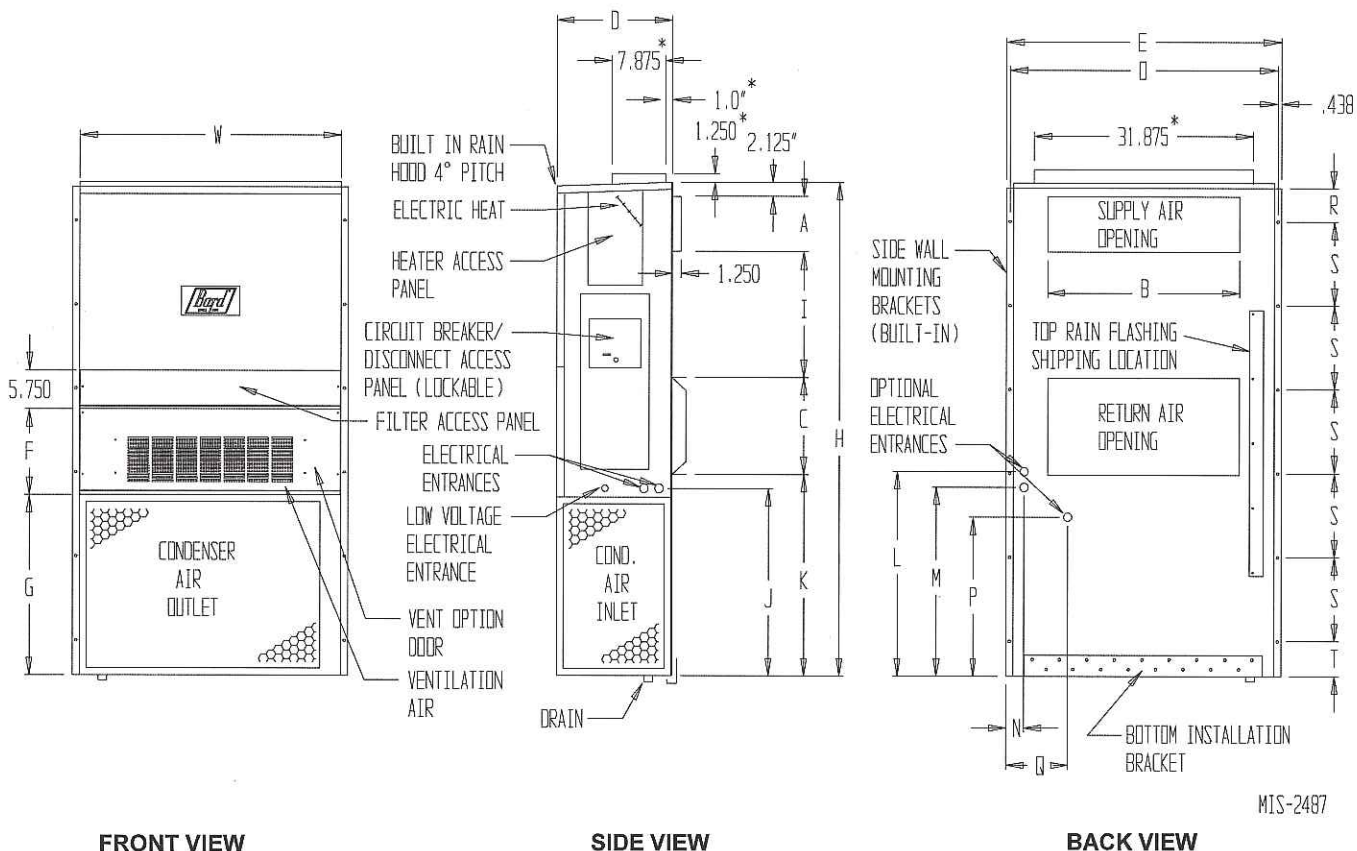
MODELS ①	SUPPLY AIR DUCT FIRST THREE FEET	CABINET
W18A, W24A	0"	0"
W30A, W36A	1/4"	0"
W42A, W48A, W60A	1/4"	0"

① Refer to the Installation Manual for more detailed information.

Dimensions of Basic Unit for Architectural and Installation Requirements (Nominal)

MODEL	WIDTH (W)	DEPTH (D)	HEIGHT (H)	SUPPLY		RETURN																
				A	B	C	B	E	F	G	I	J	K	L	M	N	O	P	Q	R	S	T
W18A W24A	33.300	17.125	70.563	7.88	19.88	11.88	19.88	35.00	18.50	25.75	20.56	26.75	28.06	29.25	27.00	2.63	34.13	22.06	10.55	4.19	12.00	5.00
W30A W36A	38.200	17.125	70.563	7.88	27.88	13.88	27.88	40.00	18.50	25.75	17.93	26.75	28.75	29.25	27.00	2.75	39.13	22.75	9.14	4.19	12.00	5.00
W42A W48A W60A	42.075	22.432	84.875	9.88	29.88	15.88	29.88	43.88	19.10	31.66	30.00	32.68	26.94	34.69	32.43	3.37	43.00	23.88	10.00	1.44	16.00	1.88

All dimensions are in inches. Dimensional drawings are not to scale.



MIS-2487

*Optional top outlet (factory installed only) for W30A and W36A models only.



Bard Manufacturing Company, Inc.
Bryan, Ohio 43506
www.bardhvac.com

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Form No.
S3397
January, 2009

Supersedes: S3397-1008



TEC40 Environmental Controller

The TEC40 is an electronic multi-stage controller for control of 3 or 4 air conditioners as 1 stage systems, or 2 air conditioners each operating as 2 stage systems. The latter is an excellent control method for dual air conditioners each with economizers, allowing maximum benefit of the economizer and switching to mechanical cooling based on building demand rather than a predetermined outdoor enthalpy condition.

Engineered Features

Unit Operation

LED's indicate the primary unit running and which stage(s) of cooling or heating are energized. The controller is powered (24VAC, 50/60 Hz) from any of the air conditioners controlled. In the event of a power loss to one or more air conditioners the controller will continue to operate from any other air conditioner still being powered. If all power is interrupted to the building the controller has a power loss memory and will remember the unit sequence when power is restored. An On/Off for controller activation is provided.

Thermostat

The thermostat is an integrated 4-stage cool and 4-stage heat electronic control with a 2°F differential between each stage. Adjustable thermostat range is 55°F (13°C) to 90°F (32°C) and has a thermistor type sensor. The "dead band" between heating and cooling is adjustable between 4°F and 20°F.

Staging Delay Periods

The following delays are built in for both cooling and heating: stage 1 - 0 seconds; stage 2 - 10 seconds; stage 3 - 15 seconds; stage 4 - 20 seconds.

Fire Suppression

Dedicated terminals (F1 and F2) are provided for use with a field supplied fire suppression system, and will de-energize all air conditioners in the event of a fire.

Compact size

The TEC40 controller is 7 inches wide, 11.5 inches high, and 3 inches deep. Twelve (12) .875 inch diameter knock-outs are provided for wiring connections.

Isolation Circuitry

The TEC40 circuitry totally isolates the 24VAC power supplies of all connected air conditioners from each other to prevent feedback or phasing problems.



Sequence Timer

The jumper selectable sequence timer can be set for 1, 3, 7, 14 or 24 days to rotate in sequence each connected air conditioner to the lead position and equalize run time. There is also a 0 day position available if necessary to halt rotation for test purposes or other reasons. There is a speed-up feature located inside controller to accelerate the timer switch over periods (approximately 1 second per day).

Manual Sequence Advance

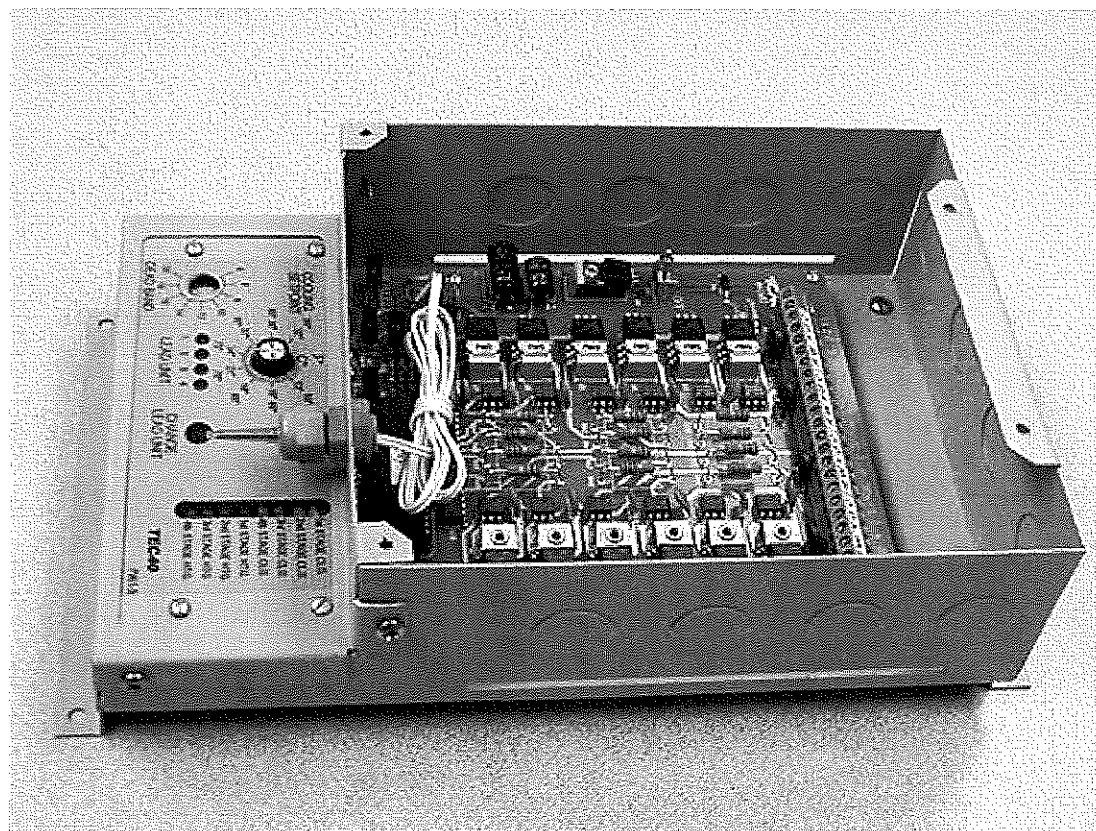
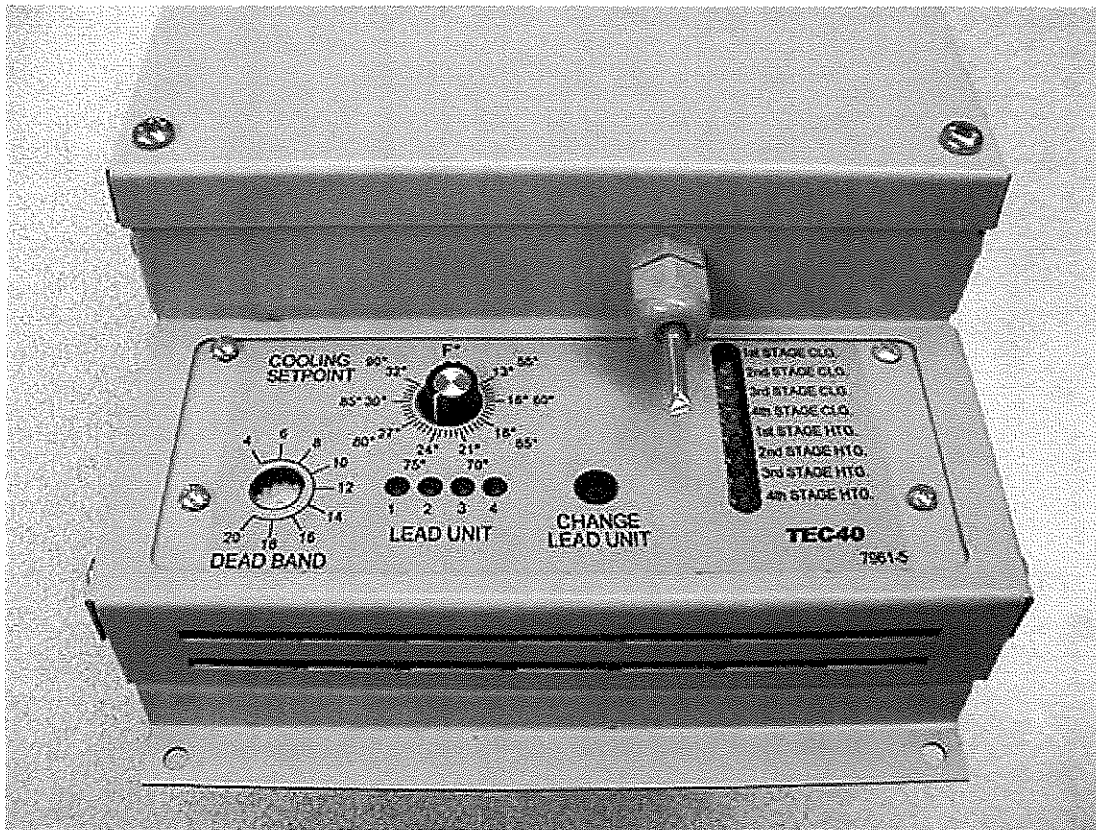
A recessed but externally accessible push-button advance button is provided for testing and service. This feature will force the lead unit to last place, and restart the selected sequence timer period.

Lead Unit Continuous Blower Option

The blower on the air conditioner in the number 1 (lead unit) position can be forced to run continuously if desired by making a simple jumper selection.

2 Unit / 2-Stage Operating Sequences

Both alternating and non-alternating sequence option can be selected to control 2 air conditioners with economizers.



BARD MANUFACTURING CO.
BRYAN, OH 43506

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just as planned

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improvement policy, all
specifications subject to
change without notice.

Form No.
S3353
May, 2001

NEW

ENER-TECH

ENER-TECH INDUSTRIES ALBERTA LTD.
VENTILATION SPECIALISTS

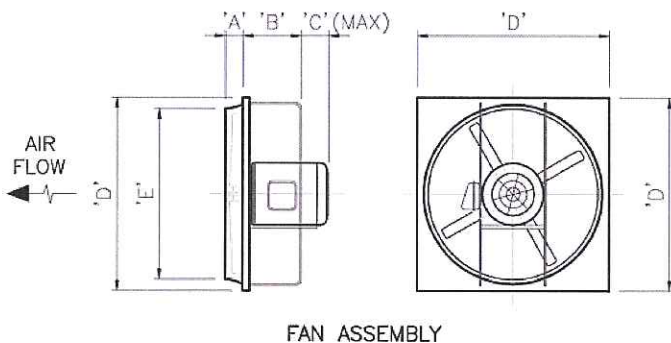
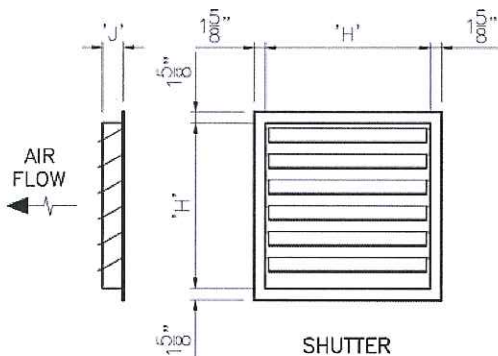
MODEL ET PROPELLER FANS

Standard Airflow

MODEL	A	B	C	D	E	H	J
ET-12	2 1/2"	8 1/2"	4"	16"	12 3/4"	12"	3"
ET-16	2 1/2"	8 1/2"	4"	20"	16 3/4"	16"	3"
ET-20	2 1/2"	8 1/2"	4"	24"	20 3/4"	20"	3"
ET-24	2 1/2"	8 1/2"	4"	28"	24 3/4"	24"	3"

Dimensions given on this sheet are correct within limits suitable for normal installation requirements

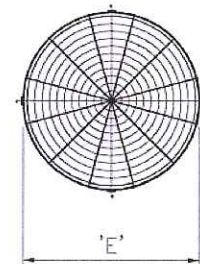
Project:	Murphy Oil W28406/P12495
Location:	
Architect:	
Engineer:	
Contractor:	WARWICK
Submitted By:	Ener-Tech Industries
Date:	July 30, 2012



FEATURES

ET FANS, designed for heavy-duty ventilation applications. Fans with explosion proof motors designed to exhaust atmospheres containing flammable, explosive vapors or gases. Explosion proof motors are CSA approved for Class I, Group D and Class II, Groups E, F and G hazardous locations. Air deliveries based on AMCA test code for exhaust systems. Heavy-duty venturi panel, fixed position motor base with rigid tubular supports. Fan blades are non-sparking cast or fabricated aluminium. Back guard is heavy gauge steel wire.

STANDARD SHUTTERS. For normal applications. Mill finish aluminum vanes with steel pivot pins. 19ga. welded steel frame. Gray enamel finish. Vanes counter-balanced for easy operation, steel reinforced, felted for quiet, weather tight closure. Tie rod attached to vanes on fan side. 9/32" Ø mounting holes.



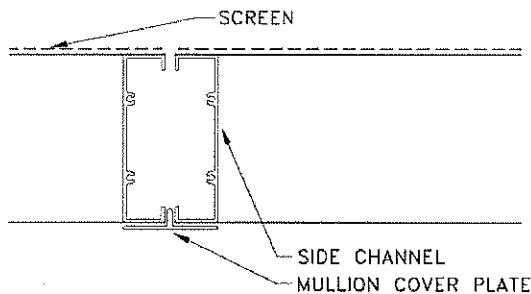
REAR & FRONT
FAN GUARD

SPECIFICATIONS		FAN		MOTOR					OPTIONAL ACCESSORIES
Reference	QTY	Size	Model	CFM	SP	HP	Current	Type	
	1	12"	ET12-1	500	.25	1/4	120/1/60	TE	Shutter & backguard

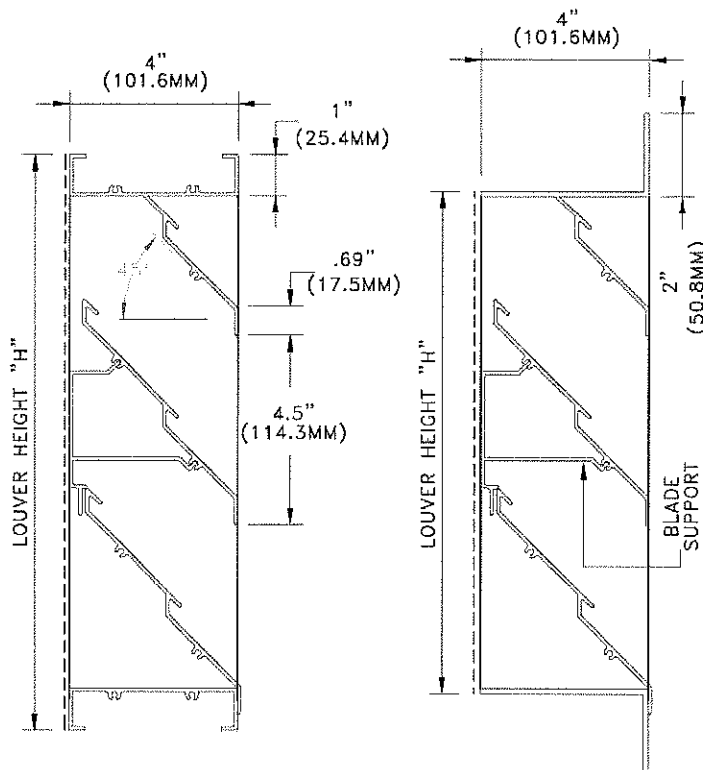
TE - totally enclosed
WC - wall collar

EX - explosion proof motor
BA - back (motor side) guard

2S - two speed motor
FA - front guard



HORIZONTAL SECTION



XC-445W

XF-445W

westvent®

ALUMINUM LOUVER XC-445W XF-445W

STANDARD SPECIFICATIONS

- CONST. - 6063-T5 EXTRUDED ALUMINUM, WELDED ASSEMBLY
- FRAME - 4" X 1" X .081" (101.6MM X 25.4MM X 2.1MM) CHANNEL UP TO 48" (1219.2MM), 4" X 1.5" X .081" (101.2MM X 38.1MM X 2.1MM) OVER 48" (1219.2MM), BUTT CORNERS
- BLADES - 4" X .081" (101.6MM X 2.1MM) SET AT 45° 4.5" (114.3MM) SPACING, SUPPORTS AT 48" (1219.2) W CENTERS
- FINISH - MILL ALUMINUM
- SCREEN - .5" X .5" (12.7MM X 12.7MM) X 18 GAUGE GALVANIZED, SCREW FASTENED
- SIZE - MINIMUM 12 "W" X 12 "H" (304.8MM X 304.8MM)
MAXIMUM SECTION WIDTH 144" (3657.6MM)
MAXIMUM SECTION HEIGHT 144" (3657.6MM)
MAXIMUM SECTION SIZE 72 SQ. FT.

OPTIONS

- CONST. - HEAVIER GAUGE, CONTINUOUS BLADES, ROUND, TRIANGULAR SHAPES, ETC.
- FRAME - XF-FLANGE FRAME 2" X .125" (50.8MM X 3.2MM), MITRED CORNERS
- SCREEN - AS PER REQUEST
- FINISH - BAKED ENAMEL, ANODIZED & OTHERS

TECHNICAL NOTES

MAX. REC. INTAKE VEL. - 744 FPM THROUGH FREE AREA
SHIPPING WEIGHT - APPROX. 5 LBS./SQ. FT.

LOUVERS ARE MANUFACTURED .5" (12.7MM) SMALLER THAN ORDERED SIZE UNLESS EXACT DIMENSIONS ARE STATED.

* FOR MORE INFORMATION, CONTACT OUR FACTORY *

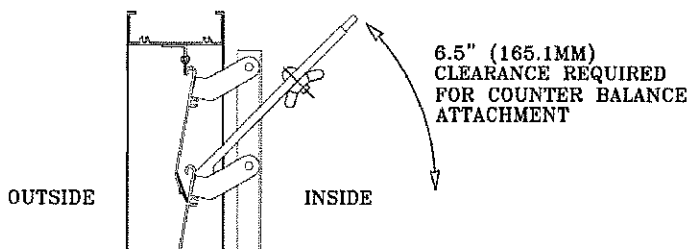
NOTES

1 - 24" X 24" XF445W fixed exterior louver with birdscreen mounted in common 20ga galv sleeve c/w Interior BDX-3C3-LB Barometric Intake Damper c/w 2" filter,

DATE: July 30/12
PROJECT: MURPHY OIL W28406/P12495
ENGINEER:
CUSTOMER: WARWICK
DISTRIBUTOR: ENER-TECH INDUSTRIES

APPROVAL

XC-445W

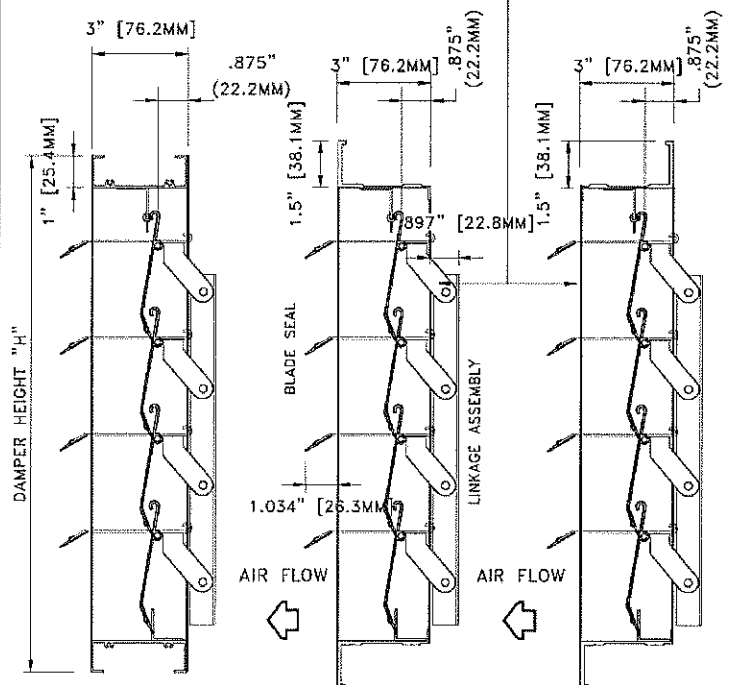


DETAIL



BACKDRAFT DAMPER BDX-3C3-LB

CUT .5" LEG OFF
ON SIDES OF FRAME
SO BLADES OPEN 90°



BDX-3C3-LB
SECTION

STANDARD
CHANNEL FRAME

BDX-3F3-LB
SECTION

OPTIONAL
FLANGED FRAME

BDX-3RF-LB
SECTION

OPTIONAL
REVERSE FLANGE
FRAME

NOTE: PLEASE SPECIFY WHETHER YOU WANT - CHANNEL FLANGE,
OR REVERSE FLANGE AND WALL MOUNT OR CEILING MOUNT.

STANDARD SPECIFICATIONS

- CONST. - EXTRUDED ALUMINUM, WELDED FRAME
- FRAME - 3" X 1" (76.2MM X 25.4MM) EXTRUDED ALUMINUM
- BLADES - 3.5" X .06" (88.9MM X 1.5MM) TAPERED EXTRUDED ALUMINUM, 3.06" (77.7MM) BLADE SPACING
- SEALS - DUAL DUROMETER VINYL BLADE SEAL, -40° F. TO +200° F.
- SHAFTS - .19" X 1.25" (4.8MM X 31.8MM) PLATED STEEL
- BEARINGS - .19" (4.8MM) NYLON BUSHINGS
- LINKAGE - INSIDE AIRSTREAM, ON ENTERING SIDE
- C.B. WTS. - AS REQUIRED
- FINISH - MILL ALUMINUM
- SIZE - MINIMUM 12" W X 12" H (304.8MM X 304.8MM)
- MAXIMUM 32" W X 60" H (812.8MM X 1524MM)

OPTIONS

- FRAME - FLANGE, REVERSE FLANGE 3" X 1.5" 76.2MM X 38.1MM
- SCREEN - AS REQUIRED, BDX-3C3-LB, SCREEN IS ON FACE. WHEN SCREEN IS USED BLADES ONLY OPEN TO APPROX. 45°.
- FINISH - ANODIZED, PRIME COAT, BAKED ENAMEL

TECHNICAL NOTES

- CAUTION - DO NOT USE FOR INTAKE UNLESS WITH OUTSIDE WEATHER COWL
- BDX-3C3-LB - RECOMMENDED ON LARGER DAMPERS BECAUSE OF LINKAGE WEIGHT
- MAX. RECOMMENDED VEL. - 3000 FPM
- MAXIMUM TEMPERATURE - 200° F.
- MAXIMUM WIDTH - 5.5" (139.7MM) WHEN BLADE IS IN FULL OPEN POSITION PLUS CLEARANCE FOR COUNTER BALANCE WEIGHTS SEE ABOVE
- SHIPPING WEIGHT - APPROX. 5 LB/SQ. FT.

DAMPERS 3F3 & 3RF ARE MANUFACTURED TO .5 (12.7MM) SMALLER THAN OPENING SIZE UNLESS EXACT DIMENSIONS ARE STATED AND 3C3 IS .25" (6.4MM) UNDERSIZED.

* FOR MORE INFORMATION, CONTACT OUR FACTORY *

NOTES

APPROVAL

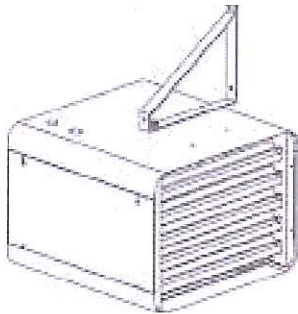
1 - 24" X 24" Interior BDX-3C3-LB Barometric Intake Damper c/w 2" filter, mounted in common 20ga galv sleeve c/w XF445W fixed exterior louver with birdscreen

DATE: July 30/12
PROJECT: Murphy Oil W28406/P12495
ENGINEER:
CUSTOMER: WARWICK
DISTRIBUTOR: Ener-Tech Industries

BDX-3C3-LB

SERIES
OAS

SUSPENDED UNIT HEATER
COMMERCIAL/INDUSTRIAL FORCED-AIR HEATER



Features

Colour	Almond.
Finish	Epoxy/polyester powder paint.
Voltage	208, 240, 277*, 347, 480* or 600 Volts, 1 or 3-phase units. Other voltages available upon request. Some units may be field converted from 3 to 1-phase.
Construction	18 and 20-gauge steel. Adjustable louvers to direct air flow.
Fan	High-limit temperature control with automatic reset. Motor mounted in cold compartment. Thermally-protected motor. Totally enclosed and factory-lubricated ball bearing motor (except for 15 to 25 kW at 208/240-volt). 58 dBA fan (2-10 kW), 67 dBA fan (15-30 kW) and 77 dBA fan (40-60 kW). Fan over-ride purges heater of residual heat.
Heating element	Durable tubular heating elements; stainless steel (2-10 kW); finned (15-60 kW). Concentric disposition of heating elements.
Control	All models have a factory-installed contactor. 240/208-Volt control circuit standard (with transformer if necessary). Also available with 24-Volt relay, with or without transformer. Optional built-in thermostat. 120-Volt control circuit available.
Installation	Horizontal mounting from wall or from ceiling using 1 of 2 supplied brackets which allow 360° rotation**. Vertical mounting using 4 threaded rods 1/2" X 13 UNC (not included). Diffuser cones available. Large and easily accessible control compartment. Maximum recommended height (horizontal): 2-10 kW: 2.4 m (8 ft); 15-30 kW: 3.0 m (10 ft); 40-60 kW: 4.5 m (15 ft). Protective screen allows lower mounting height (except 40-60 kW). Minimum height of 2.4 m (8 ft) for 40-60 kW heaters. 30°C (85°F) maximum operating temperature.
Warranty	1-year warranty against defects.

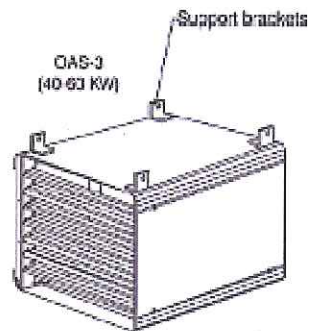
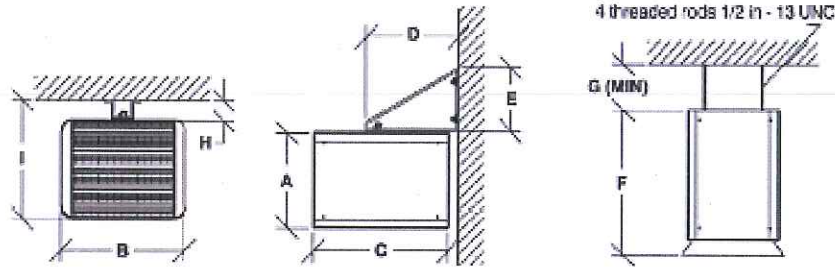
Applications Commercial hall, milk house, stair opening.

* 277- and 480-Volt models available upon request.

** Horizontal mounting only for 40, 50 and 60 kW secured by 4 hooks (ceiling only).

Ouellet highly recommend using a wall thermostat for a greater comfort.

OAS SERIES



	2-10 kW		15-30 kW		40-60 kW	
	mm	in	mm	in	mm	in
A	305.0	12.0	444.0	17.5	585.0	23.0
B	420.0	16.5	560.0	22.0	641.0	25.2
C	432.0	17.0	572.0	22.5	870.0	34.3
D	343.0	13.5	470.0	18.5	-	-
E	285.0	11.2	393.0	15.5	-	-
F	490.0	19.3	630.0	24.8	930.0	36.6
G	305.0	12.0	305.0	12.0	305.0	12.0
H	127.0	5.0	152.0	6.0	305.0	12.0
I	433.0	17.0	572.0	22.5	900.0	35.0
Weight	kg	lbs	kg	lbs	kg	lbs
	20.0	45.0	39.0	85.0	68.0	150.0

Type	Qty	Model and description Other informations	Volts	Phase	Watts	Length mm / in	Informations Color/Installation c/w built in thermostat
	1	OAS15034-T	480/3/60	3	15000	22.5"	

Specifications may change without prior notice.

Project : Murphy Oil W28406/P12495
 Engineer :
 Contractor : Warwick
 Distributor : Ener-Tech Industries
 Date: July 30/12

Shop Drawings
 Approval
 Information