RAFAT
8850 GEORGE BOLTON PARKWAY, CALEDON, ONTARIO L7E 2Y4

Shop Drawings Transmittal No:	23-82-00-01R0

Project Name:	Construction of Victoria Park Arena and Brampton Sports Hall of Fame	**Project No.**	NRFP2024-232
		DATE:	16 Jul 2025
		Submittal Required Return Date:	30 Jul 2025
Submittal No:	96		

Title:	**Wall Fin Heaters**

To:	**Mark Falkenburger**		
Checked by:	**Veronica Soulaka**	**To Be Reviewed By the Following Consutlants**	Architecture49 & WSP

Submitted for:	Review and Approval
Consultants Response	

wsp

☑ REVIEWED
☐ REVIEWED AS NOTED
☐ REVISE & RESUBMIT

BY Jerry Nweisser
DIVISION Buildings - Sustainability
DATE 8/1/2025
SUBMITTAL# 21-21
PROJECT CA-WSP-221-05263-00

THE REVIEW OF THIS DRAWING DOES NOT IN ANY WAY RELIEVE THE VENDOR OR CONTRACTOR OF RESPONSIBILITY FOR ITS ACCURACY OR FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS.

RAFAT

SUBMITTAL REVIEW
For general compliance with the design concept and contract documents. Subcontractor is solely responsible for jobsite correlation and correctness of all ratings, sizings, type, style, dimensions, finish, quantities and satisfactory fitting to other work and equipment. This review does not change the intent of the contract document.

REVIEWED
RESUBMIT
REJECTED

SHOP DRAWING REVIEW

Project Name: Victoria Park Arena

Project No. CA-WSP-221-05263-00
Date Received: 2025-07-31

Shop Drawing:
Title: Wall Fin Heater
Revision: 00
Submission No.: 21-20

This review by consultant is for sole purpose of ascertaining conformance with general design concept. This review does not mean that consultant approves detail design inherent in shop drawings, responsibility for which remains with contractor, and such review does not relieve contractor of responsibility for errors or omissions in shop drawings or of contractor's responsibility for meeting all requirements of contract documents. Be responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication process or to techniques of construction and installation, and for coordination of the work of subtrades.

☒ **Reviewed**		**Mechanical Review Required** ☒		**Electrical Review Required** ☐	
☐ **Reviewed as Noted**		**Reviewed by:**	Jerry Nweisser	**Reviewed by:**	
☐ **Revise & Resubmit**		**Review Date:**	2025-07-31	**Review Date:**	

Item	Comments
1.	
2.	
3.	

End of Review

54 Audia Court, Unit 2
Concord, ON L4K 3N5
(905)-738-1400

Submittal 24-280-022

PROJECT NAME	PROJECT ADDRESS	DATE SUBMITTED
VICTORIA PARK ARENA 24-280	20 Victoria Crescent, Brampton, ON L6T 1E4	Jul 15, 2025

TO

Abdullah Hissamuddin

COMPANY

RAFAT GENERAL CONTRACTOR INC.

EMAIL

abdullah.hissam@rafat.ca

ADDRESS

8850 GEORGE BOLTON PKWY BOLTON, ON L7E 2Y4

FROM

PAUL LEDDY

COMPANY

Consult Mechanical Inc.

EMAIL

paul.l@consultmechanical.com

ADDRESS

54 Audia Court, Unit 2
Concord, ON L4K 3N5

Title

Wall Fin Heaters

Description

WF- B, C and F
Manufacturer - Runtal Radiators

Package Items

SPEC	SUBSECTION	ITEM	TYPE

Submittal # 90396 **APPROVAL REQUIRED**

Project	22104386-MECH-1- Brampton Victoria Park Arena
Leader	Nevin Wong
Job Site	Brampton Victoria Park Arena
Submission Date	2025-07-10
Sold To	CONSULT MECH
Submitted By	Emil Sebastiampillai

Contacts

Role	Customer	Our Rep
General Contractor	Rafat General Contracing Inc	
Mechanical Contractor	Con-Sult Mechanical Inc.*	Nevin Wong
Designer	WSP MMM Group	Alex Forsea

Notes:

- Contractor to confirm piping arrangement, supply side and connection type prior to release
- Color confirmation required prior to release
- Trim type to be confirmed prior to release

Deliverables

Track #	289001		
Tag	WF-B,C,F		
Description	Finned Wall / Floor Mounted Radiator		
Quantity	16		
Manufacturer	Runtal Radiators		
Model #	R2F-5, R2F-7, R3F-10		
Specification	23 82 00 2.01		
Production Lead Time	18-20 weeks		
Revision #	0		

Attention:

1) HTS will provide equipment in accordance with the attached shop drawings.
2) Upon approved submittal and customer release, HTS will release equipment to fabrication per the published lead times. Any storage fees associated with project schedule changes will be the responsibility of the purchaser.
3) HTS can provide freight and logistics to the purchaser as an added benefit of doing business with HTS. When freight is received by the purchaser, any noticeable damage must be recorded. Otherwise, HTS is not responsible for subsequent damage claims.

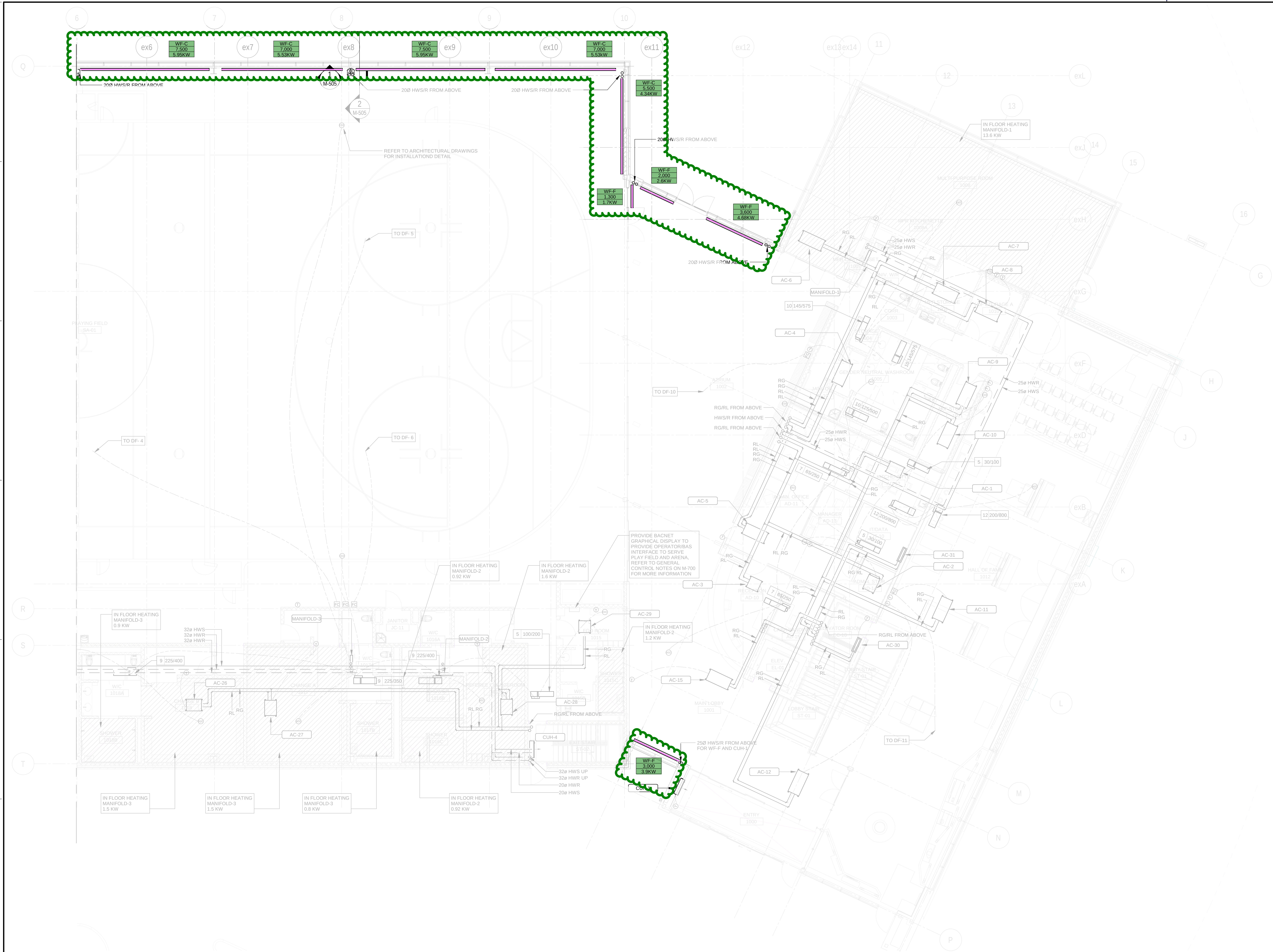
Approval Stamps

HTS Toronto

115 Norfinch Drive
Toronto, ON M3N 1W8
T 1.800.850.0567
F 416.661.0100

hts.com/ontario

COMPLIANCE - MECHANICAL DRAWINGS & SPECIFICATIONS



ARCHITECTURE 49

CONSULTANT - SUB CONSULTANT:

SEAL:

CLIENT:

BRAMPTON
CITY OF BRAMPTON

CLIENT REF. #:

PROJECT:

Victoria Park Arena

20 Victoria Crescent, Brampton, ON L6T 1E4

KEY PLAN:

ISSUED FOR - REVISION:

REV	DATE	DESCRIPTION
13	2024/11/08	ISSUED FOR CONSTRUCTION
12	2024/05/29	ISSUED FOR TENDER
11	2023/10/27	ISSUED FOR TENDER
10	2023/09/22	ISSUED FOR TENDER
9	2022/08/15	ISSUED FOR BUILDING PERMIT
8	2022/08/05	ISSUED FOR TENDER - FINAL
7	2022/04/13	ISSUED FOR TENDER
6	2022/03/25	ISSUED FOR BUILDING PERMIT
5	2022/03/02	ISSUED FOR TENDER REVIEW
4	2021/11/26	REISSUED FOR 90% REVIEW
3	2021/11/19	ISSUED FOR TENDER REVIEW
2	2021/09/27	ISSUED FOR PROGRESS REVIEW
1	2021/08/30	ISSUED FOR 60%DD

PROJECT NO: 209-00238-00
DATE: 2024/11/08
ORIGINAL SCALE: 1 : 100
IF THIS BAR IS NOT 1" LONG, ADJUST YOUR PLOTTING SCALE. 1"
DESIGNED BY: MK
DRAWN BY: SG/VO
CHECKED BY: MK
DISCIPLINE:

TITLE:

LEVEL 1 - EAST - HVAC PIPING

SHEET NUMBER:

M-401E

SHEET #: OF

ISSUE: ISSUED FOR CONSTRUCTION
REV #: 13
DATE OF: 2024/11/08

ARCHITECTURE 49

CONSULTANT - SUB CONSULTANT:

wsp

SEAL:

CLIENT:

BRAMPTON
CITY OF BRAMPTON

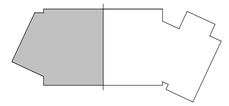
CLIENT REF. #:

PROJECT:

Victoria Park Arena

20 Victoria Crescent, Brampton, ON L6T 1E4

KEY PLAN:



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PROJECT NO: 209-00238-00

DATE: 2024/11/08

ORIGINAL SCALE: 1 : 100

IF THIS BAR IS NOT 1" LONG, ADJUST YOUR PLOTTING SCALE.

1"

DESIGNED BY: MK

DRAWN BY: SG/VO

CHECKED BY: MK

DISCIPLINE:

TITLE:

LEVEL 1 - WEST - HVAC PIPING

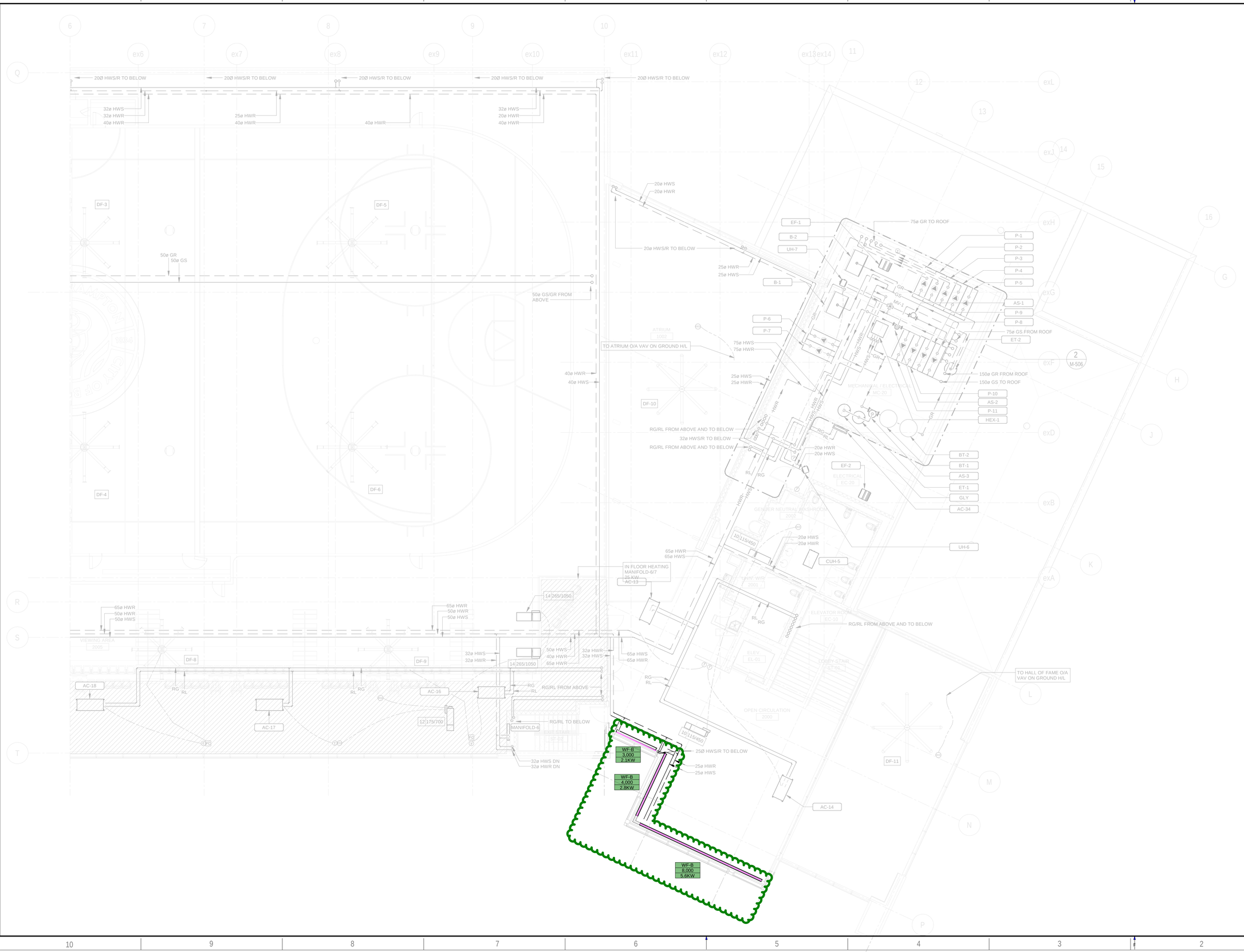
SHEET NUMBER: M-401W

SHEET #: OF

ISSUE: ISSUED FOR CONSTRUCTION

REV # 13

DATE OF: 2024/11/08



ARCHITECTURE 49

CONSULTANT - SUB CONSULTANT:

wsp

SEAL:

CLIENT:

BRAMPTON
CITY OF BRAMPTON

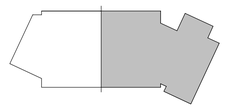
CLIENT REF. #:

PROJECT:

Victoria Park Arena

20 Victoria Crescent, Brampton, ON L6T 1E4

KEY PLAN:



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PROJECT NO: 209-00238-00

DATE: 2024/11/08

ORIGINAL SCALE: 1 : 100

IF THIS BAR IS NOT 1"LONG, ADJUST YOUR PLOTTING SCALE.

1"

DESIGNED BY: MK

DRAWN BY: SG/VO

CHECKED BY: MK

DISCIPLINE:

TITLE:

LEVEL 2 - EAST - HVAC PIPING

SHEET NUMBER: M-402E

SHEET #: OF

ISSUE: ISSUED FOR CONSTRUCTION

REV # 13

DATE OF: 2024/11/08

SILENCER SCHEDULE (VIBRO-ACOUSTICS)

TAG	SYSTEM	TYPE	DIMENSIONS			AIRFLOW,	VELOCITY,	IDEAL DP	MAX.DP WISYS EFF	MINIMUM DYNAMIC INSERTION LOSS, dB (NOTE...								BASIS OF DESIGN VIBRO-ACOUSTICS	
			WIDTH,	HEIGHT,	IN.	CFM	FPM	IN.W.G.	IN.W.G.	OCTAVE BAND CENTER FREQUENCY, HZ								MODEL NUMBER	NOTES
		(NOTE 1)	IN.	IN.	(NOTE 2)		(NOTE 3)	(NOTE 4)	(NOTE 5)	63	125	250	500	1000	2000	4000	8000		
RA-1	AHU1-Return	RED	28	20	60	4238	-1090	0.11	0.23	6	8	14	19	31	27	24	19	RED-UHV-27965	2, 7, 8, 9, 10
RA-2	AHU2-Return	RD	88	32	60	21190	-1096	0.12	0.14	3	8	19	33	34	26	16	11	RD-MHV-27965	7, 8, 9, 10
RA-3	AHU3-Return	RD	62	12	60	5403	-1099	0.11	0.14	3	9	15	27	33	24	15	10	RD-MHV-27965	7, 8, 9, 10
RA-ERV1	ERV1-Return	RD	64	24	60	11866	-1531	0.08	0.16	3	8	13	19	17	17	14	11	RD-UHV-27965	7, 8, 9, 10
SA-1	AHU1-Supply	RD	28	20	36	4238	+1090	0.09	0.14	3	6	11	14	15	13	11	9	RD-MHV-27965	7, 8, 9, 10
SA-2	AHU2-Supply	RD	56	40	36	21190	+1387	0.14	0.18	3	6	11	14	15	13	11	9	RD-MHV-27965	7, 8, 9, 10
SA-3	AHU3-Supply	RD	62	12	36	5403	+1099	0.09	0.16	3	7	11	13	14	13	12	10	RD-MHV-27965	7, 8, 9, 10
SA-ERV1	ERV1-Supply	RD	84	22	36	11866	+614	0.03	0.06	3	7	11	13	14	13	12	10	RD-MHV-27965	7, 8, 9, 10

Notes:

1. TYPE R - RECTANGULAR D - DISSIPATIVE

   RE - RECTANGULAR ELBOW

2. LENGTH SHOWN FOR ELBOW SILENCERS IS CENTERLINE LENGTH.
3. VELOCITY SHOWN IS + (FORWARD FLOW) OR - (REVERSE FLOW) AS DEFINED BY ASTM E477-13.
4. IDEAL PRESSURE DROP AS DETERMINED PER ASTM E477-13 IN A NVLAP-ACCREDITED ACOUSTICAL LABORATORY.
5. PRESSURE DROP PER ASTM E477-13 PLUS SYSTEM EFFECTS FOR NEARBY DUCT ELEMENTS.
6. MINIMUM DYNAMIC INSERTION LOSS DETERMINED PER ASTM E477-13 IN A NVLAP-ACCREDITED ACOUSTICAL LABORATORY.
7. NON-BASIS OF DESIGN SILENCER MANUFACTURER SHALL PROVIDE, FOR APPROVAL, PROFESSIONAL ENGINEER STAMPED ACOUSTICAL CALCULATIONS FOR ALL SYSTEMS WITH SILENCERS TO DEMONSTRATE THAT THE RESULTANT DUCTBORNE FAN SOUND LEVELS, INCLUDING AIRBORNE AND BREAKOUT NOISE, MEET THE REQUIRED CRITERIA.
8. NON-BASIS OF DESIGN SILENCER MANUFACTURER SHALL PROVIDE, FOR APPROVAL, PROFESSIONAL ENGINEER STAMPED PRESSURE DROP CALCULATIONS FOR ALL SYSTEMS WITH SILENCERS TO DEMONSTRATE THAT THE RESULTANT INSTALLED PRESSURE DROP WITH SYSTEM EFFECTS DOES NOT EXCEED SCHEDULED VALUES.
9. FOR NON-BASIS OF DESIGN PRODUCT SUPPLIED, CONTRACTOR IS FINANCIALLY RESPONSIBLE TO ENSURE NOISE CONTROL SOLUTION IS DELIVERED TO ACHIEVE SPECIFIED NC LEVEL IN SPACES.
10. SILENCER MEETS NC40 in the viewing area and change room / NC35 in the admin and multi purpose room

GRILLES AND DIFFUSER SCHEDULE

UNIT TAG	BASIS OF DESIGN				TYPE	VOLUME CONTROL	MATERIAL	FINISH	APPLICATION
	MANUFACTURER	MODEL	INLET SIZE (mm)	SIZE (mm x mm)					
A	PRICE	SPD	REFER TO FLOOR PLAN	600 x 600	CEILING SUPPLY DIFFUSER	YES	STEEL	MATCH ARCH.	
B	PRICE	510	REFER TO FLOOR PLAN		LOUVERED SUPPLY GRILLE - DOUBLE DEFFLECTION	YES	STEEL	MATCH ARCH.	
C	PRICE	635	REFER TO FLOOR PLAN		LOUVERED RETURN/EXHAUST GRILLE	YES	ALUMINIUM	MATCH ARCH.	
D	PRICE	RCDA	REFER TO FLOOR PLAN		ROUND CONE DIFFUSER - FULLY ADJUSTABLE	YES	STEEL	MATCH ARCH.	
E	PRICE	96	REFER TO FLOOR PLAN		HEAVY DUTY RETURN GRILLE	-	STEEL	MATCH ARCH.	
F	PRICE	ATGH	REFER TO FLOOR PLAN		HEAVY DUTY SIGHT-PROOF DOOR GRILLE	-	ALUMINIUM	MATCH ARCH.	TO BE WITH FIRE DAMPER WHERE INDICATED ON DRAWING
G	PRICE	CF	1" TWO SLOTS, 8" INLET, 60" LENGTH		SUPPLY SLOT DIFFUSER C/W ENGINEERED PLENUM BOX	YES	ALUMINIUM	MATCH ARCH.	TO BE COORDINATED WITH CEILING SUPPLIER

GENERAL NOTES:
1. All diffusers and grilles shall suit the ceiling construction, coordinate with architectural ceiling plan. diffusers in drywall ceiling to be c/w adaptor frame to accommodate installation, diffuser adaptor frame shall be of the same material as the diffuser.

2. All dampers shall be of the same material as the diffuser or grille unless otherwise noted.
3. Grille and diffuser colour to be approved by architect. where diffuser plenums are exposed, contractor to paint plenum to suit architect;

FAN SCHEDULE

UNIT TAG	AREA SERVED	LOCATION	BASIS OF DESIGN		AIR FLOW	E.S.P.	MOTOR				ELECTRICAL V/Φ/Hz	REMARKS
			MANUFACTURER	MODEL NO.	L/S	Pa	RPM	Watts	HP	FLA (AMPS)		
EF-1	MECHANICAL ROOM MC-20	MECHANICAL ROOM MC-20	COOK	16SQN17D (VF)	1,250	100	1725	-	5/8	-	208/1/60	1,2,3,4,5
EF-2	ELECTRICAL ROOM EC-20	ELECTRICAL ROOM EC-20	COOK	150SQN17D (VF)	1,000	100	1725	-	1/2	-	208/1/60	1,2,3,4,5
EF-3	WATER METER 1024	WATER METER 1024	COOK	90SQN17DEC	150	100	1725	-	1/6	-	115/1/60	1,2,3,4,5
EF-4	ELECTRICAL EC-10	ELECTRICAL EC-10	COOK	135SQN17DEC	700	100	1725	-	1/2	-	208/1/60	1,2,3,4,5

NOTES:
1. C/W CEILING VIBRATION HANGER/SPRING ISOLATORS
2. C/W BACKDRAFT DAMPER
3. ECM MOTOR
4. FAN MOUNTED SPEED CONTROLLER
5. LOCAL SWITCH
6. C/W MOTORIZED DAMPER AS INDICATED ON DRAWING

SCHEDULE OF DESTRATIFICATION FANS

UNIT TAG	LOCATION	BASIS OF DESIGN		DIAMETER	V/PH/HZ	MCA	MOTOR	VFD	OPERATING WEIGHT (KGS)	REMARKS
		MANUFACTURER	MODEL	METER			HP			
DF-1	PLAY FIELD	BIG ASS FANS	POWERFOILD X3.0 - PFX3-14	4.3	208-230/3/60	20	1.5	YES	115	
DF-2	PLAY FIELD	BIG ASS FANS	POWERFOILD X3.0 - PFX3-14	4.3	208-230/3/60	20	1.5	YES	115	
DF-3	PLAY FIELD	BIG ASS FANS	POWERFOILD X3.0 - PFX3-14	4.3	208-230/3/60	20	1.5	YES	115	
DF-4	PLAY FIELD	BIG ASS FANS	POWERFOILD X3.0 - PFX3-14	4.3	208-230/3/60	20	1.5	YES	115	
DF-5	PLAY FIELD	BIG ASS FANS	POWERFOILD X3.0 - PFX3-14	4.3	208-230/3/60	20	1.5	YES	115	
DF-6	PLAY FIELD	BIG ASS FANS	POWERFOILD X3.0 - PFX3-14	4.3	208-230/3/60	20	1.5	YES	115	
DF-7	VIEWING AREA	BIG ASS FANS	POWERFOILD X3.0 - PFX3-14	3.6	208-230/3/60	20	1.5	YES	115	
DF-8	VIEWING AREA	BIG ASS FANS	POWERFOILD X3.0 - PFX3-14	3.6	208-230/3/60	20	1.5	YES	115	
DF-9	VIEWING AREA	BIG ASS FANS	POWERFOILD X3.0 - PFX3-14	3.6	208-230/3/60	20	1.5	YES	115	
DF-10	ATRIUM	BIG ASS FANS	ESSENCE	4.3	208-230/1/60	10	1.5	YES	44	
DF-11	HALL OF FAME	BIG ASS FANS	ESSENCE	4.3	208-230/1/60	10	1.5	YES	44	

NOTES:
1. C/W PRE-WIRED ONBOARD VFD, MOUNTING KIT, EXTENSION TUBE AND BAFCON CONTROLLER, CONNECT TO BAS.
2. C/W OCCUPANCY SENSOR
3. INSTALL AS PER MANUFACTURER'S INSTRUCTIONS.
4. INTEGRATE TO FIRE CONTROL PANEL.
4. REFER TO SPECIFICATION FOR ADDITIONAL REQUIREMENTS.

SCHEDULE OF GLYCOL TANK

TAG	LOCATION	MANUFACTURE	MODEL	CAPACITY (L/MIN @ kPa)	PRESSURE RANGE (kPA)	DIMENSION D(MM) X H(MM)	WEIGHT (kG)	MOTOR (kW)	ELECTRICAL V/Φ/Hz	REMARKS
GLY	MECHANICAL ROOM	GMP	GMP13050	6.8@482	69-482	710 x1070	41	0.2	120/1/60	1

NOTES:
1. C/W MANIFOLD.

SCHEDULE OF AUTOMATIC CONTROL VALVES

SYSTEM	SERVICE	TYPE	FLOW (L/s)	P.D. (kPa)	VALVE C.V.	REMARKS
AHU-1	CENTRAL COOLING / HEATING	3-WAY	SEE NOTE 1	SEE NOTE 2	SEE NOTE 2	
AHU-2 & 3	CENTRAL COOLING / HEATING	2-WAY	SEE NOTE 1	SEE NOTE 2	SEE NOTE 2	
HEAT EXCHANGER	CENTRAL HEATING	3-WAY	SEE NOTE 1	SEE NOTE 2	SEE NOTE 2	
WALL FINS RADIATORS	PERIMETER HEATING	2-WAY	SEE NOTE 1	SEE NOTE 2	SEE NOTE 2	
INFLOOR RADIANT HEATING MANIFOLDS	PERIMETER HEATING	3-WAY MIXING	SEE NOTE 1	SEE NOTE 2	SEE NOTE 2	REFER TO MANIFOLD DETAIL DRAWING AND SPECIFICATION
CABINET UNIT HEATERS	PERIMETER HEATING	2-WAY	SEE NOTE 1	SEE NOTE 2	SEE NOTE 2	
UNIT HEATERS	PERIMETER HEATING	2-WAY	SEE NOTE 1	SEE NOTE 2	SEE NOTE 2	

NOTES:
1. FLUID FLOW TO BE DETERMINED BASED ON REQUIRED HEATING CAPACITY AS PER FLOOR PLANS AND SCHEDULES.
2. CONTROLS CONTRACTOR SHALL SELECT PROPER C.V. TO ENSURE MINIMUM OF 6.9 kPa PRESSURE DROP AT CONTROL VALVE.

SCHEDULE OF MOTORIZED HEATERS

UNIT TAG	LOCATION	BASIS OF DESIGN		ARRANGEMENT	CAPACITY	AIRFLOW		FLUID				MOTOR			REMARKS
		MANUFACTURER	MODEL NO.		kW	L/S	E.A.T. °C	TYPE	FLOW L/S	E.F.T. °C	L.F.T °C	PRESS. DROP kPa	RPM	HP	ELECTRICAL V/Φ/Hz	
UH-1	WATER METER ROOM	ENGINEERED AIR	H-1	HORIZONTAL	4.4	260	15.0	WATER	0.10	54.4	43.3	4.2	1500	1/20	115/1/60	1
UH-2	ELECTRICAL...	ENGINEERED AIR	H-1	HORIZONTAL	4.4	260	15.0	WAT...	0.10	54.4	43.3	4.2	1500	1/20	115/1/60	1
UH-3	STORAGE A	ENGINEERED AIR	H-6	HORIZONTAL	11.8	698	15.0	WAT...	0.26	54.4	43.3	4.2	1500	1/6	115/1/60	1
UH-4	STORAGE A	ENGINEERED AIR	H-6	HORIZONTAL	11.8	698	15.0	WAT...	0.26	54.4	43.3	4.2	1500	1/6	115/1/60	1
UH-5	STORAGE B	ENGINEERED AIR	H-4	HORIZONTAL	8.5	472	15.0	WAT...	0.19	54.4	43.3	4.2	1500	1/12	115/1/60	1
UH-6	ELECTRICAL...	ENGINEERED AIR	H-1	HORIZONTAL	4.4	260	15.0	WAT...	0.10	54.4	43.3	4.2	1500	1/20	115/1/60	1
UH-7	MECHANICAL...	ENGINEERED AIR	H-4	HORIZONTAL	8.5	472	15.0	WAT...	0.19	54.4	43.3	4.2	1500	1/12	115/1/60	1
CUH-1	ENTRY...	ENGINEERED AIR	CUH-12	ARRANGEMEN...	12.0	708	15.0	WAT...	0.27	54.4	43.3	10	1075	1/4	115/1/60	1
CUH-2	ARENA STAIR L-1	ENGINEERED AIR	CUH-9	ARRANGEMEN...	7.5	448	15.0	WAT...	0.17	54.4	43.3	4.9	1075	1/10	115/1/60	1
CUH-3	ARENA STAIR L-2	ENGINEERED AIR	CUH-9	ARRANGEMEN...	7.5	448	15.0	WAT...	0.17	54.4	43.3	4.9	1075	1/10	115/1/60	1
CUH-4	VIEWING AREA...	ENGINEERED AIR	CUH-4	ARRANGEMEN...	3.7	175	15.0	WAT...	0.08	54.4	43.3	4.9	1075	1/10	115/1/60	1
CUH-5	WASHROOM L-2	ENGINEERED AIR	CUH-3	ARRANGEMEN...	2.7	141	15.0	WAT...	0.06	54.4	43.3	4.9	1075	1/10	115/1/60	1

NOTES:
1. C/W INTEGRAL THERMOSTAT .
2. REMOTE TEMPERATURE SENSOR

SCHEDULE OF ELECTRIC BOOSTER COIL

TAG	AREA SERVED	TYPE	AIRFLOW (L/S)	CAPACITY (KW)	DUCT INLET SIZE (MM)	E.A.T. (°C)	L.A.T. (°C)	ELECTRICAL V/Φ/Hz	REMARKS
EBC-1	ERV-2	ELECTRIC	40	1.0	150x150	-21.0	-1.0	120/1/60	1
EBC-2	ERV-3	ELECTRIC	140	3.4	250x250	-21.0	-1.0	120/1/60	1
EBC-3	ERV-4	ELECTRIC	80	2.0	200x200	-21.0	-1.0	120/1/60	1

NOTES:
1. C/W THE REQUIRED CONTROL COMPONENT FOR FROST CONTROL. CONNECT TO ERV CONTROLLER.

SCHEDULE OF WALL PANEL RADIATORS

UNIT TAG	BASIS OF DESIGN		HEIGHT	OUTPUT CAPACITY		FLUID TYPE	E.W.T.	L.W.T.	E.A.T.	REMARKS
	MANUFACTURER	MODEL	MM	kW/M	BTU/HR/FT		°C	°C	°C	
WF-A	RESERVED/NOT USED									
WF-B	RUNTAL	R2F-5 ✓	365 ✓	0.70	733 ✓	HEATING WATER ✓	54.44 ✓	43.33 ✓	21.1 ✓	1,3,4,5,6,7
WF-C	RUNTAL	R2F-7 ✓	514 ✓	0.79	822 912	HEATING WATER ✓	54.44 ✓	43.33 ✓	21.1 ✓	1,2,4,5,6
WF-D	RESERVED/NOT USED									
WF-E	RESERVED/NOT USED									
WF-F	RUNTAL	R3F-10 ✓	737 ✓	1.30	1348 ✓	HEATING WATER ✓	54.44 ✓	43.33 ✓	21.1 ✓	1,3,4,5,6,7~~,~~

NOTES:
1. REFER TO FLOORPLANS FOR RADIATOR TYPE, LOCATION, CAPCITY (KW), AND LENGTH (MM). COMPLY
2. WALL MOUNTED RADIATOR C/W MOUNTING KIT.COMPLY
3. FLOOR STANDING C/W PEDESTAL KIT.NOT APPLICABLE
4. C/W RIBBED PIPE COVER TRIMS, FINISHED TO MATCH THE RADIATORS.COLOUR TO BE CONFIRMED PRIOR TO RELEASE
5. C/W SHUT-OFF VALVE/UNION.COMPLY
6. C/W RUNTAL FLEX CONNECTORS, WHICH SHALL BE USED TO PROVIDE EXPANSION COMPENSATION FOR RADIATORS.COMPLY
7. C/W FINISHED PANEL ON THE BACK SIDE. FINISHED BACK PANEL NOT AVAILABLE ON TRIPLE FINNED WALL MOUTNED RADIATORS, R3F TYPE.

SCHEDULE OF VIBRATION ISOLATION

SYSTEM	ISOLATOR TYPE	MINIMUM STATIC DEFLECTION	STATUS
CENTRIFUGALS FANS, FIXED FREQUENCY DRIVE	SPRING MOUNT OR HANGER	1800 RPM OR GREATER: 25mm (1"). 1400 to 1800 RPM: 50mm (2"). LESS THAN 1400 RPM: 75mm (3")	1, 2, 3, 4, 5, 6, 7, 8, 9
CENTRIFUGALS FANS, VARIABLE FREQUENCY DRIVE	SPRING HANGER	75mm (3")	
BASE MOUNTED PUMP	SPRING MOUNT	50mm (2")	
FLOOR MOUNTED VERTICAL INLINE PUMP	SPRING MOUNT	50mm (2")	
CEILING MOUNTED FAN COIL UNITS, ERV OR HEAT PUMP AIR CONDITIONING UNIT	SPRING HANGER	25mm (1")	

NOTES:
1. PIPING GREATER THAN 50MM (2") SHALL BE ATTACHED TO VIBRATING OR ROTATING EQUIPMENT USING FLEXIBLE CONNECTIONS.
2. ALL DUCTWORK SHALL BE ATTACHED TO FANS AND AIR HANDLING UNITS USING FLEXIBLE CONNECTORS.
3. ALL CONDUIT SHALL BE ATTACHED TO VIBRATING EQUIPMENT (INCLUDING TRANSFORMERS) WITH A SLACK SECTION FORMING A LOOP OR 'U' SHAPE. CONDUIT SHOULD NOT BE RIGIDLY CONNECTED TO BUILDING STRUCTURE. DISTRIBUTION PANELS SHOULD NOT BE TOUCHING WALLS.
4. PIPING SHALL BE SUPPORTED WITH VIBRATION ISOLATION HANGERS OR SUPPORTS HAVING THE SAME STATIC DEFLECTION OF THE EQUIPMENT FOR THE FIRST THREE SUPPORTS, UP TO 50MM. SUBSEQUENT SUPPORTS WITHIN THE EQUIPMENT ROOM TO HAVE A MINIMUM 20MM STATIC DEFLECTION.
5. ALL DUCTS TO BE ISOLATED FROM TRAPEZE WITH NEOPRENE OR MINERAL FIBRE SLEEVE
6. PIPES OUTSIDE THE MECHANICAL ROOM GERATER THAN 50MM DIAMETER TO BE SUPPORTED ON SPRING AND NEOPRENE HANGERS WITH MINIMUM 20MM STATIC DEFLECTION
7. PIPES OUTSIDE THE MECHANICAL ROOM LESS THAN OR EQUAL TO 50MM DIAMETER TO BE ISOLATED FROM CLAMP WITH NEOPRENE OR MINERAL WOOL SLEEVE
8. PIPE RISER SUPPORTS TO BE ISOLATED FROM BUILDING STRUCTURE WITH NEOPRENE PADS
9. SPRING ISOLATORS SHALL BE COMPLETE WITH INLINE NEOPRENE PADS

ARCHITECTURE 49

CONSULTANT - SUB CONSULTANT:

wsp

SEAL:

CLIENT:

BRAMPTON
CITY OF BRAMPTON

CLIENT REF. #:

PROJECT:

Victoria Park Arena

20 Victoria Crescent, Brampton, ON L6T 1E4

KEY PLAN:

DISCLAIMER: COPYRIGHT:

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THIS DRAWING IS NOT TO BE SCALED.

ISSUED FOR - REVISION:

REV	DATE	DESCRIPTION
10	2024/11/08	ISSUED FOR CONSTRUCTION
9	2024/07/15	ISSUED FOR ADDENDUM #4
8	2024/05/29	ISSUED FOR TENDER
7	2023/10/27	ISSUED FOR TENDER
6	2023/09/22	ISSUED FOR TENDER
5	2022/08/15	ISSUED FOR BUILDING PERMIT
4	2022/08/05	ISSUED FOR TENDER - FINAL
3	2022/04/13	ISSUED FOR TENDER
2	2022/03/25	ISSUED FOR BUILDING PERMIT
1	2022/03/02	ISSUED FOR TENDER REVIEW

PROJECT NO: 209-00238-00
DATE: 2024/11/08
ORIGINAL SCALE:
IF THIS BAR IS NOT 1" LONG, ADJUST YOUR PLOTTING SCALE.
1"
DESIGNED BY: MK
DRAWN BY: SG/VO
CHECKED BY: MK
DISCIPLINE:

TITLE:

MECHANICAL EQUIPMENT SCHEDULES #3

SHEET NUMBER: M-902
SHEET #: OF
ISSUE: ISSUED FOR CONSTRUCTION
REV #: 10
DATE OF: 2024/11/08

2.01 DOUBLE FINNED PANEL RADIATOR

COMPLY AS NOTED .1 Hot water fin-tube type direct radiation units with capacities/lengths as indicated on the drawings. Heating capacities and element lengths indicated are based on ~~51.6°C (125°F)~~ 54.4°C (130F) AS PER SCHEDULE average entering water temperature at a velocity of 0.0762 m/s (0.25 ft/sec) with an 11.1°C (20°F) temperature drop through the element, and 21.1°C (70°F) entering air temperature.

COMPLY .2 Provide steel double panel radiators of the lengths and in locations as indicated, and of capacities, style and having accessories as scheduled. The double heating panel radiation shall be of one-piece all-welded steel construction, consisting of a pair of flattened water tube panels welded to headers at each end. Welded to the inside of each panel shall be steel corrugated fins to increase the convective output of the radiator. The fins shall start at no less than 3" from the end of the radiator, and shall have no less than 32 fins per foot. The radiators shall include an integral heavy gauge (0.09" minimum) all-welded perforated top grille, which will cover the top of all of the finned areas. The headers shall include all necessary inlet, outlet and vent connections as required. Standard connection sizes are ½" NPT tapered thread for supply and return piping, and 1/8" for the vent connection. Internal baffling shall be provided for proper water flow. The radiant heating panels shall be available in lengths from 2'-0" to 29'-6" in two inch even increments without the need for splicing. The panel radiation shall be capable of being mounted to typical stud wall construction without additional blocking or strapping. Appropriate wall mounting brackets shall be provided with the radiation. The double panel radiators (up to four tubes tall) are to be provided with floor-mounted pedestals (OR Cantilever Wall Brackets) in lieu of the wall mounting brackets.

COMPLY AS NOTED .3 Finishes: The panel radiation shall be cleaned and phosphatized in preparation for the powder coat finish. The radiation is then finish painted with a gloss powder coat finish, for a total paint thickness of 2-3 mils (0.002" - 0.003"). The color shall be selected form the manufacturerl's standard colors, ~~or optional colors shall be available at and additional cost.~~ COLOUR SELECTION FROM RUNTAL STANDARD
COLOUR CHART TO BE CONFIRMED PRIOR TO RELEASE

COMPLY .4 Radiators shall be manufactured of cold rolled low carbon steel, fully welded and consisting of header pipes at each end, connected by flat oval water tubes.

COMPLY AS NOTED .5 Shall have finished panel on the back side. FINISHED PANEL ON BACK NOT AVAILABLE ON TRIPLE FINNED WALL MOUTNED RADIATORS, R3F TYPE

COMPLY .6 Radiator header pipes shall be square 0.109" min wall thickness and include all necessary supply, return, and air vent connections.

COMPLY .7 Pressure ratings for the radiation shall be as follows:

COMPLY .8 Standard: Working pressure-56 PSI maximum, Test Pressure-74 PSI maximum.

COMPLY .9 Panel radiation expansion shall not exceed 1/64" per foot of radiation at 215ºF. The installer shall provide adequate expansion compensation for each radiator.

COMPLY .10 Ribbed pipe cover trims, finished to match the radiators shall be provided with the radiation.

COMPLY .11 The radiation manufacturer shall provide combination shutoff valve/union fitting of less than two inches in width for the supply and return to each panel radiator, to be field installed by others.

COMPLY .12 Manufacturer-Flex connectors shall be used where appropriate to provide expansion compensation for the radiators.

COMPLY .13 Acceptable manufacturers are:

.1 Runtal North America Inc.;

.2 Panel Radiator Inc.

HTS Toronto

115 Norfinch Drive
Toronto, ON M3N 1W8
T 1.800.850.0567
F 416.661.0100

hts.com/ontario

MANUFACTURER'S PRODUCT PERFORMANCE

Job Name	Brampton Victoria Park Arena
Job No.	22104386
Tag	WF-B
Model	R2F-5
Mounting Type	Wall
Max Working Pressure (PSI)	56
AWT (F)	120
EAT (F)	70
Runtal Linear Capacity (BTUH/FT)	733

TAG: WF-B
MODEL: R2F-5

Please Note: Prior to releasing, piping arrangement, connection type, and left/right side supply must be confirmed. All information based on mech drawings. Length shown are release lengths.

Level	Location	Drawing Tag	Runtal Tag	Specified/Release Length (mm)	Height (IN)	Depth (IN)	Piping Arrangement (opposite/same end)	Supply Side (left/right)	Connection Type (A,B,C,D)	Mounting Notes	Specified Capacity (BTUH)	Runtal Capacity (BTUH)
2	OPEN CIRCULATION 2000	WF-B, 4000, 2.8 kW	R2F-5	4000	14.4	3.4	TBD	TBD	TBD	Wall	9554	9619
2	OPEN CIRCULATION 2000	WF-B, 8000, 5.6 kW	R2F-5	8000	14.4	3.4	TBD	TBD	TBD	Wall	19108	19239
2	OPEN CIRCULATION 2000	WF-B, 3000, 2.1 kW	R2F-5	3000	14.4	3.4	TBD	TBD	TBD	Wall	7165	7215

Job Name	Brampton Victoria Park Arena
Job No.	22104386
Tag	WF-C
Model	R2F-7
Mounting Type	Wall
Max Working Pressure (PSI)	56
AWT (F)	120
EAT (F)	70
Runtal Linear Capacity (BTUH/FT)	912

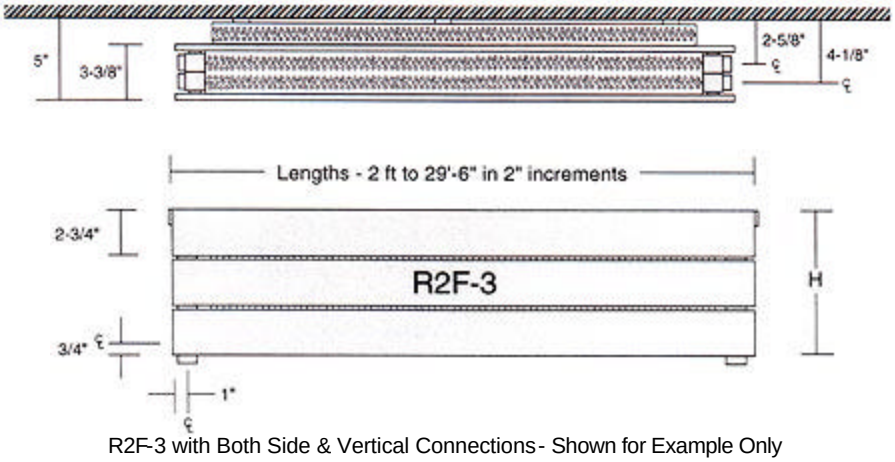
TAG: WF-C
MODEL: R2F-7

Please Note: Prior to releasing, piping arrangement, connection type, and left/right side supply must be confirmed. All information based on mech drawings. Length shown are release lengths.

Level	Location	Drawing Tag	Runtal Tag	Specified/Release Length (mm)	Height (IN)	Depth (IN)	Piping Arrangement (opposite/same end)	Supply Side (left/right)	Connection Type (A,B,C,D)	Mounting Notes	Specified Capacity (BTUH)	Runtal Capacity (BTUH)
1	Level 1 East	WF-C, 5500, 4.34 kW	R2F-7	5500	20.2	3.4	TBD	TBD	TBD	Wall	14809	16457
1	Level 1 West	WF-C, 6000, 4.74 kW	R2F-7	6000	20.2	3.4	TBD	TBD	TBD	Wall	16174	17953
1	Level 1 West	WF-C, 7000, 5.53 kW	R2F-7	7000	20.2	3.4	TBD	TBD	TBD	Wall	18869	20945
1	Level 1 West	WF-C, 7000, 5.53 kW	R2F-7	7000	20.2	3.4	TBD	TBD	TBD	Wall	18869	20945
1	Level 1 East	WF-C, 7000, 5.53 kW	R2F-7	7000	20.2	3.4	TBD	TBD	TBD	Wall	18869	20945
1	Level 1 East	WF-C, 7000, 5.53 kW	R2F-7	7000	20.2	3.4	TBD	TBD	TBD	Wall	18869	20945
1	Level 1 West	WF-C, 7500, 5.95 kW	R2F-7	7500	20.2	3.4	TBD	TBD	TBD	Wall	20302	22441
1	Level 1 East	WF-C, 7500, 5.95 kW	R2F-7	7500	20.2	3.4	TBD	TBD	TBD	Wall	20302	22441
1	Level 1 East	WF-C, 7500, 5.95 kW	R2F-7	7500	20.2	3.4	TBD	TBD	TBD	Wall	20302	22441

Model Type R2F

BTUH/ft Ratings



R2F-3 with Both Side & Vertical Connections - Shown for Example Only

Technical Data For All R2F Models Is Included Below

MODEL TYPE	HEIGHT H	BTUH/FT OUTPUT @ LISTED AWT & 65°F EAT									DRY WT lbs/ft
		215°F	190	180	170	160	150	140	130	120	
R2F-1	2-3/4"	979	769	689	612	537	465	395	327	263	3.6
R2F-2	5-3/4"	1589	1247	1118	993	872	754	640	531	427	6.9
R2F-3	8-5/8"	2019	1584	1421	1261	1108	958	813	675	542	10.1
R2F-4	11-1/2"	2417	1897	1701	1510	1326	1147	974	808	649	13.9
R2F-5	14-3/8"	3094	2498	2177	1933	1697	1457	1246	1034	831	16.8
R2F-6	17-1/4"	3470	2723	2443	2168	1904	1646	1398	1160	932	20.0
R2F-7	20-1/4"	3846	3018	2707	2403	2110	1824	1549	1286	1033	23.5
R2F-8	23-1/8"	4211	3304	2963	2631	2310	1997	1696	1408	1131	27.6
R2F-9	26-1/8"	4432	3478	3119	2769	2431	2102	1785	1481	1190	29.9
R2F-10	29"	4644	3645	3269	2901	2548	2203	1871	1552	1247	32.1

NOTE: Heat Outputs for various AWT's include 15% Heat Effect for placement along outside walls. Use the 215° F Output Rating with the Correction Factor for more specific design conditions. Medium Pressure increases Dry Weight by 10%, High Pressure increases Dry Weight by 15%

Model Type R2F
Detailed Specifications

General: Provide steel double panel radiators of the lengths and in locations as indicated, and of capacities, style and having accessories as scheduled. The double heating panel radiation shall be of one-piece all-welded steel construction, consisting of a pair of flattened water tube panels welded to headers at each end. Welded to the inside of each panel shall be steel corrugated fins to increase the convective output of the radiator. The fins shall start at no less than 3" from the end of the radiator, and shall have no less than 32 fins per foot. The radiators shall include an integral heavy gauge (0.09" minimum) all-welded perforated top grille, which will cover the top of all of the finned areas **(for curved radiators the grille is omitted)**.

The headers shall include all necessary inlet, outlet and vent connections as required. Standard connection sizes are ½" NPT tapered thread for supply and return piping, and 1/8" for the vent connection. Internal baffling is provided where required for proper water flow.

The radiant heating panels shall be available in lengths from 2'-0" to 29'-6" in two inch even increments without the need for splicing. The panel radiation shall be capable of being mounted to typical stud wall construction without additional blocking or strapping. Appropriate wall mounting brackets shall be provided with the radiation.

The panel radiation shall be manufactured in the USA.

ALTERNATE: The double panel radiators (up to four tubes tall) are to be provided with floor-mounted pedestals (OR Cantilever Wall Brackets) in lieu of the wall mounting brackets.

Pressure Ratings: Pressure ratings for the radiation shall be as follows:

STANDARD: Working pressure-56 PSI maximum, Test Pressure-74 PSI maximum

Panel radiation expansion shall not exceed 1/64" per foot of radiation at 215ºF. The installer shall provide adequate expansion compensation for each radiator.

Finishes: The panel radiation shall be cleaned and phosphatized in preparation for the powder coat finish. The radiation is then finish painted with a gloss powder coat finish, for a total paint thickness of 2-3 mils (0.002" - 0.003"). The color shall be selected form the Runtal's standard colors, or optional colors shall be available at and additional cost.

Warranty: All Runtal radiators are covered by a 5-Year Limited Warranty

Manufacturer: Subject to compliance with requirements, provide flat tube panel radiation as manufactured by Runtal North America, Inc.

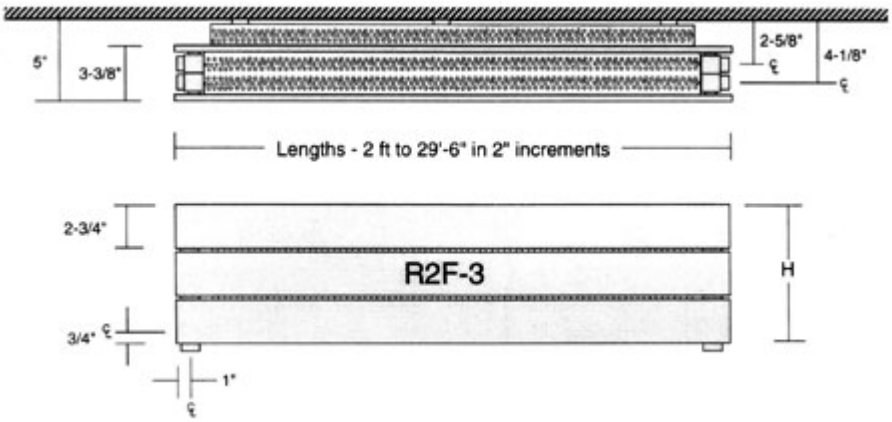
OPTIONAL ITEMS WHICH MAY BE ADDED TO THE SPECIFICATION:
Ribbed pipe cover trims, finished to match the radiators shall be provided with the radiation.

The radiation manufacturer shall provide combination shutoff valve/union fitting of less than two inches in width for the supply and return to each panel radiator, to be field installed by others.

Runtal-Flex connectors shall be used where appropriate to provide expansion compensation for the radiators.

Model Type R2F

Quick Specifications



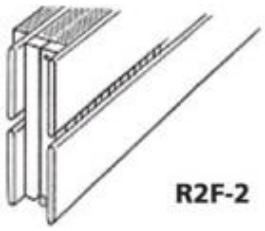
R2F-3 with Both Side & Vertical Connections - Shown for Example Only

Panel Radiator Specification

1. Radiators are manufactured of cold rolled low carbon steel, fully welded and consisting of header pipes at each end, connected by flat oval water tubes.
2. Three tube thicknesses are available:
   - Standard Pressure - 0.048" min wall thickness
   - Medium Pressure - 0.058" min wall thickness
   - High Pressure - 0.078" min wall thickness
3. Radiator header pipes are square 0.109" min wall thickness and include all necessary supply, return, and air vent connections. Internal baffling is provided as required.
4. Standard piping connections are 1/2" NPT taper threaded sockets, located in either side, or vertical positions. Optional 3/4" NPT connections are available. Air vent connections are 1/8" NPT taper threaded sockets.
5. Three working pressures are available:
   - Standard Pressure - 56 psi max (Tested at 74 psi)
6. Radiator expansion does not exceed 0.016 inch per linear foot at 215°F. Expansion compensation to be provided in the piping as required, by others.
7. Radiators are cleaned and phosphatized in preparation for the powder coat finish.
8. Radiators are painted with a gloss powder coat finish, for a total paint thickness of 2 to 3 mils (0.002"-0.003").
9. Color of the finish paint shall be selected from available standard or optional colors prior to ordering.
10. Wall mounting brackets are provided with radiators, unless floor posts are specified.
11. Necessary wall support blocking for proper radiator mounting shall be by others.
12. Radiators are manufactured in the USA to the sizes, capacities, and quantities as shown on the plans and schedules.

Model Type R2F

SPECIFICATIONS



R2F panel radiators are manufactured in the USA from cold rolled steel, and consist of two panels with two sets of fins. The panels are finished in a gloss powdercoat, and are available in many standard colors and over 100 optional colors. These panels are made in lengths from 2'-0" to 29'-6", and heights from 3" to 29". Standard piping connections are 1/2" NPT for inlet and outlet piping, and 1/8" NPT for vents (3/4" NPT inlets and outlets are available by special order). For more complete R2F specifications, please refer to the Runtal technical pages.

BTUH/FT RATINGS

Energy efficient as well as space saving, R2F panels are both radiant and convective. These panels provide more comfort at a lower room temperature than convective heaters. Various average water temperatures (AWT) are shown here for convenience, but for more specific conditions use the appropriate correction factor with the 215°F rating. Please see the technical pages for the correction factor best suited to the design conditions.

BTUH/ft Ratings @ 65°F EAT					
MODEL	**HEIGHT inches**	**DEPTH inches**	**215°F**	**180°F**	**140°F**
R2F-1	2.8	3.4	980	**690**	400
R2F-2	5.7	3.4	1590	**1120**	640
R2F-3	8.6	3.4	2020	**1420**	820
R2F-4	11.5	3.4	2420	**1700**	980
R2F-5	14.4	3.4	3100	**2180**	1250
R2F-6	17.3	3.4	3470	**2450**	1400

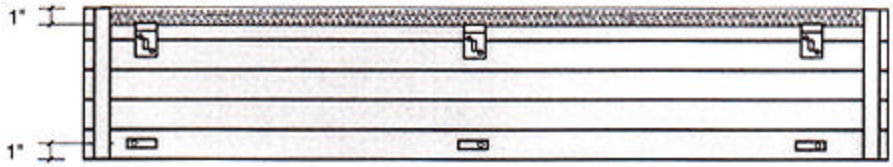
MOUNTING SYSTEMS

Wall mounting with a continuous mounting system (brackets included) is standard on all R2F Panels. Free standing, cantilever and recessed wall mounting systems are also available. Please see the R2F technical pages for more complete mounting details.

Model Type R2F

Wall Mounting

R2F Models (back view)



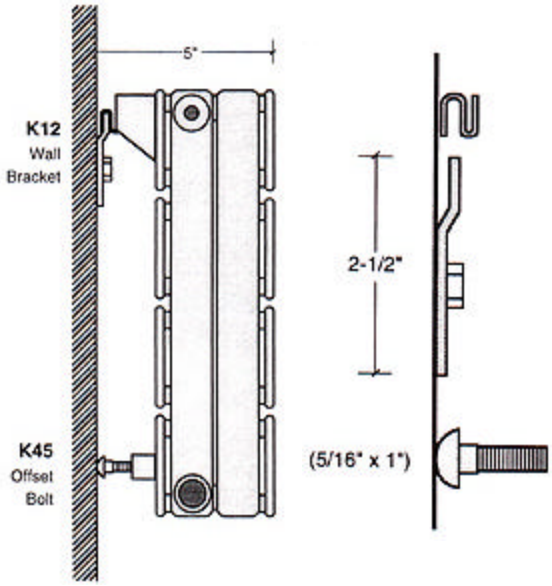
For Radiators **20" to 60"** Long - Use **2 K11** Brackets, one at each end

62" to 138" Long - Use **3 K11** Brackets, one at each end, one at the center

140" to 236" Long - Use **4 K11** Brackets, one at each end, two distributed evenly in the middle

238" to 296" Long - Use **5 K11** Brackets, one at each end, three distributed evenly in the middle

298" to 354" Long - Use **6 K11** Brackets, one at each end, four distributed evenly in the middle



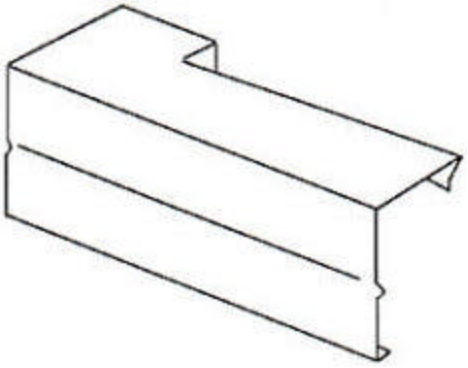
R clip - Mount to the grille back on the R Radiator at the K12 Positions

K12 Wall Bracket - Support Bracket used with R Radiators

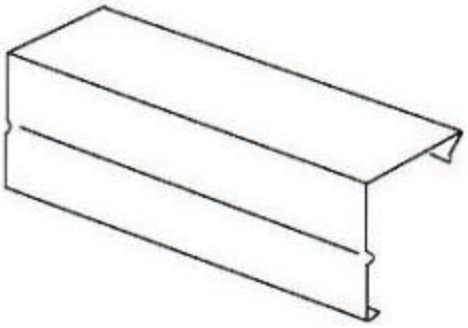
Normally shipped with the Radiators

K45 Offset Bolt - Carriage Bolt used at each weld nut at the bottom of the Radiator for leveling with the wall

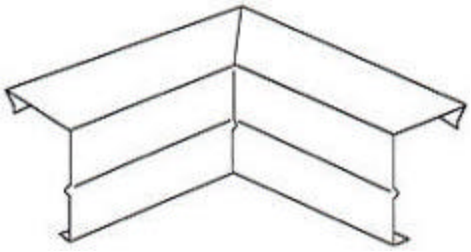
R2F Radiator Full Trims



R2F-2 FULL END CAP



R2F-2 FULL CENTER OR END TRIM



R2F-2 FULL INSIDE CORNER TRIM

NOTES:

1. R2F-2 shown, other model heights similar.
2. All trims are 12” long on the face, unless otherwise noted.
3. Trims are sized to overlap R2F models.

PRIOR TO RELEASE, TRIM TYPE MUST BE CONFIRMED FOR EACH RADIATOR

Job Name	Brampton Victoria Park Arena
Job No.	22104386
Tag	WF-F
Model	R3F-10
Mounting Type	Wall
Max Working Pressure (PSI)	56
AWT (F)	120
EAT (F)	70
Runtal Linear Capacity (BTUH/FT)	1348

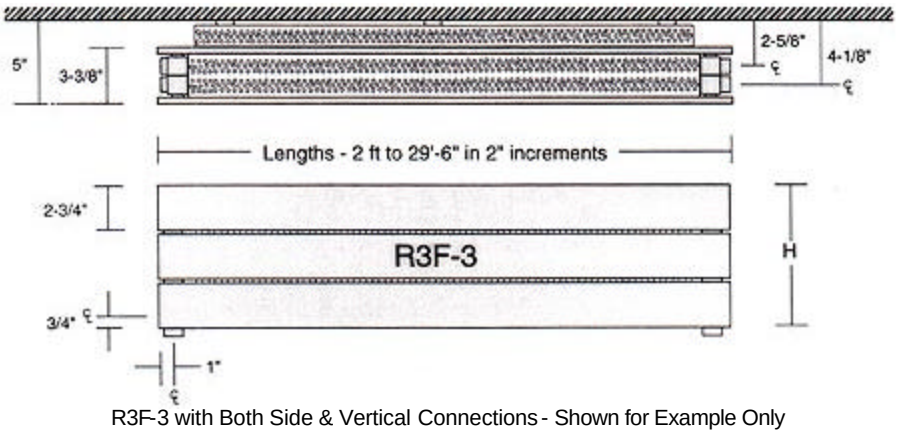
TAG: WF-F
MODEL: R3F-10

Please Note: Prior to releasing, piping arrangement, connection type, and left/right side supply must be confirmed. All information based on mech drawings. Length shown are release lengths.

Level	Location	Drawing Tag	Runtal Tag	Specified/Release Length (mm)	Height (IN)	Depth (IN)	Piping Arrangement (opposite/same end)	Supply Side (left/right)	Connection Type (A,B,C,D)	Mounting Notes	Specified Capacity (BTUH)	Runtal Capacity (BTUH)
1	Level 1 East	WF-F, 1300. 1.7 kW	R3F-10	1300	29.0	4.8	TBD	TBD	TBD	Wall	5801	5749
1	Level 1 East	WF-F, 2000, 2.6 kW	R3F-10	2000	29.0	4.8	TBD	TBD	TBD	Wall	8872	8845
1	MAIN LOBBY 1001	WF-F, 3000, 3.9 kW	R3F-10	3000	29.0	4.8	TBD	TBD	TBD	Wall	13307	13268
1	Level 1 East	WF-F, 3600, 4.68 kW	R3F-10	3600	29.0	4.8	TBD	TBD	TBD	Wall	15969	15921

Model Type R3F

BTUH/ft Ratings



R3F-3 with Both Side & Vertical Connections - Shown for Example Only

Technical Data For All R3F Models Is Included Below

MODEL TYPE	HEIGHT H	BTUH/FT OUTPUT @ LISTED AWT & 65°F EAT									DRY WT lbs/ft
		215°F	190	180	170	160	150	140	130	120	
R3F-1	2-3/4"	1299	1020	914	812	713	616	523	434	349	4.3
R3F-2	5-3/4"	2014	1581	1418	1258	1105	955	811	673	541	8.0
R3F-3	8-5/8"	2572	2018	1810	1607	1411	1220	1036	860	691	11.7
R3F-4	11-1/2"	3082	2418	2169	1925	1690	1462	1241	1030	828	16.4
R3F-5	14-3/8"	3788	2973	2666	2367	2078	1797	1526	1266	1017	19.6
R3F-6	17-1/4"	4263	3345	3000	2663	2338	2022	1717	1425	1145	23.2
R3F-7	20-1/4"	4738	3718	3335	2960	2599	2247	1909	1584	1273	27.4
R3F-8	23-1/8"	5200	4080	3660	3248	2852	2466	2095	1738	1396	32.5
R3F-9	26-1/8"	5451	4278	3836	3405	2990	2585	2196	1822	1464	34.7
R3F-10	29"	5691	4466	4005	3556	3122	2699	2293	1902	1528	36.9

NOTE: Heat Outputs for various AWT's include 15% Heat Effect for placement along outside walls. Use the 215° F Output Rating with the Correction Factor for more specific design conditions. Medium Pressure increases Dry Weight by 10%, High Pressure increases Dry Weight by 15%

Model Type R3F

Detailed Specifications

General: Provide steel double panel radiators of the lengths and in locations as indicated, and of capacities, style and having accessories as scheduled. The double heating panel radiation shall be of one-piece all-welded steel construction, consisting of a pair of flattened water tube panels welded to headers at each end. Welded to the inside of each panel shall be steel corrugated fins to increase the convective output of the radiator. The fins shall start at no less than 3" from the end of the radiator, and shall have no less than 32 fins per foot. A third set of fins shall be added to the backside of the radiator for maximum convective output. The radiators shall include an integral heavy gauge (0.09" minimum) all-welded perforated top grille, which will cover the top of all of the finned areas **(for curved radiators the grille is omitted)**.

The headers shall include all necessary inlet, outlet and vent connections as required. Standard connection sizes are ½" NPT tapered thread for supply and return piping, and 1/8" for the vent connection. Internal baffling is provided where required for proper water flow.

The radiant heating panels shall be available in lengths from 2'-0" to 29'-6" in two inch even increments without the need for splicing. The panel radiation shall be capable of being mounted to typical stud wall construction without additional blocking or strapping. Appropriate wall mounting brackets shall be provided with the radiation.

The panel radiation shall be manufactured in the USA.

ALTERNATE: The double panel radiators (up to four tubes tall) are to be provided with floor-mounted pedestals (***OR*** Cantilever Wall Brackets) in lieu of the wall mounting brackets.

Pressure Ratings: Pressure ratings for the radiation shall be as follows:

STANDARD: Working pressure-56 PSI maximum, Test Pressure-74 PSI maximum

Panel radiation expansion shall not exceed 1/64" per foot of radiation at 215ºF. The installer shall provide adequate expansion compensation for each radiator.

Finishes: The panel radiation shall be cleaned and phosphatized in preparation for the powder coat finish. The radiation is then finish painted with a gloss powder coat finish, for a total paint thickness of 2-3 mils (0.002" - 0.003"). The color shall be selected form the Runtal's standard colors, or optional colors shall be available at and additional cost.

Warranty:

All Runtal radiators are covered by a 5-Year Limited Warranty.

Manufacturer: Subject to compliance with requirements, provide flat tube panel radiation as manufactured by Runtal North America, Inc.

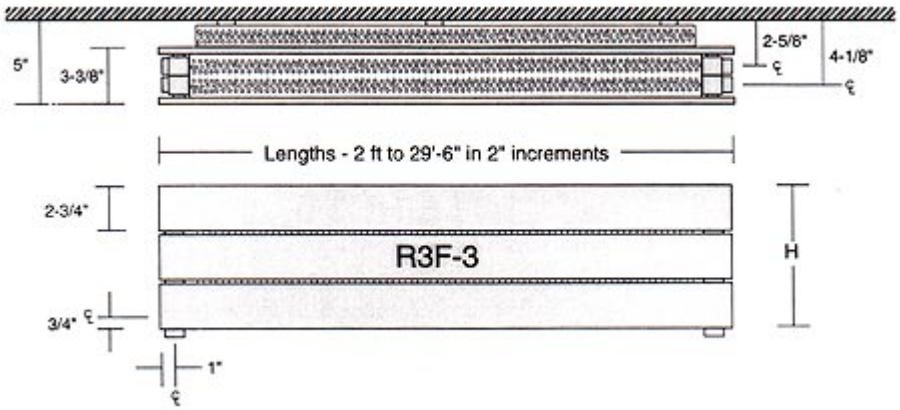
OPTIONAL ITEMS WHICH MAY BE ADDED TO THE SPECIFICATION:
Ribbed pipe cover trims, finished to match the radiators shall be provided with the radiation.

The radiation manufacturer shall provide combination shutoff valve/union fitting of less than two inches in width for the supply and return to each panel radiator, to be field installed by others.

Runtal-Flex connectors shall be used where appropriate to provide expansion compensation for the radiators

Model Type R3F

Quick Specifications



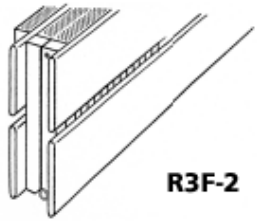
R3F-3 with Both Side & Vertical Connections - Shown for Example Only

Panel Radiator Specification

1. Radiators are manufactured of cold rolled low carbon steel, fully welded and consisting of header pipes at each end, connected by flat oval water tubes.
2. Three tube thicknesses are available:
   - Standard Pressure - 0.048" min wall thickness
   - High Pressure - 0.078" min wall thickness
3. Radiator header pipes are square 0.109" min wall thickness and include all necessary supply, return, and air vent connections. Internal baffling is provided as required.
4. Standard piping connections are 1/2" NPT taper threaded sockets, located in either side, or vertical positions. Optional 3/4" NPT connections are available. Air vent connections are 1/8" NPT taper threaded sockets.
5. Three working pressures are available:
   - Standard Pressure - 56 psi max (Tested at 74 psi)
6. Radiator expansion does not exceed 0.016 inch per linear foot at 215°F. Expansion compensation to be provided in the piping as required, by others.
7. Radiators are cleaned and phosphatized in preparation for the powder coat finish.
8. Radiators are painted with a gloss powder coat finish, for a total paint thickness of 2 to 3 mils (0.002"-0.003").
9. Color of the finish paint shall be selected from available standard or optional colors prior to ordering.
10. Wall mounting brackets are provided with radiators, unless floor posts are specified.
11. Necessary wall support blocking for proper radiator mounting shall be by others.
12. Radiators are manufactured in the USA to the sizes, capacities, and quantities as shown on the plans and schedules.

Model Type R3F

SPECIFICATIONS



R3F panel radiators are manufactured in the USA from cold rolled steel and consist of two panels with three sets of fins. The panels are finished in a gloss powdercoat, and are available in many standard colors and over 100 optional colors. These panels are made in lengths from 2'-0" to 29'- ", and heights from 3" to 29". Standard piping connections are 1/2" NPT for inlet and outlet piping, and 1/8" NPT for vents (3/4" NPT inlets and outlets are available by special order). For more complete R3F specifications, please refer to the Runtal technical pages.

BTUH/FT RATINGS

Energy efficient as well as space saving, R3F panels are both radiant and convective. These panels provide more comfort at a lower room temperature than convective heaters. Various average water temperatures (AWT) are shown here for convenience, but for more specific conditions use the appropriate correction factor with the 215°F rating. Please see the technical pages for the correction factor best suited to the design conditions.

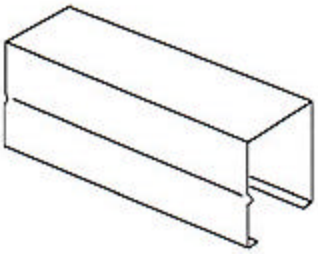
BTUH/ft Ratings @ 65°F EAT					
MODEL	**HEIGHT inches**	**DEPTH inches**	**215°F**	**180°F**	**140°F**
R3F-1	2.8	4.8	1300	**920**	530
R3F-2	5.7	4.8	2020	**1420**	820
R3F-3	8.6	4.8	2580	**1810**	1040
R3F-4	11.5	4.8	3090	**2170**	1250
R3F-5	14.4	4.8	3790	**2670**	1530
R3F-6	17.3	4.8	4270	**3000**	1720
R3F-7	20.2	4.8	4738	**3335**	1909
R3F-8	23.1	4.8	5200	**3660**	2095
R3F-9	26.0	4.8	5451	**3836**	2196
R3F-10	29.0	4.8	5691	**4005**	2293

MOUNTING SYSTEMS

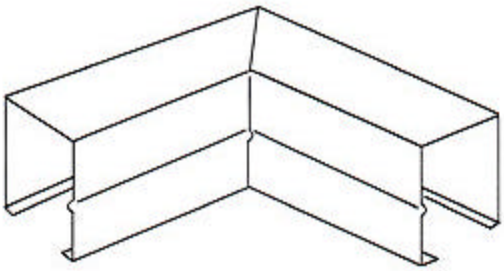
R3F-3

Wall mounting with a continuous mounting system (brackets included) is standard on all R3F panels. Free standing, cantilever and recessed wall mounting systems are also available. Please see the R3F technical pages for more complete mounting details.

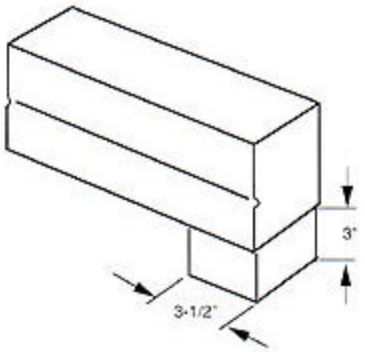
R3F Radiator Double Sided Full Trims



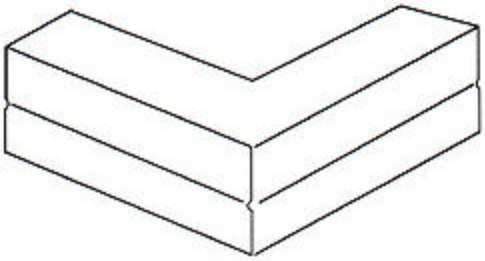
R3F-2 Full Center or End Trim



R3F-2 Full Inside Corner Trim



R3F-2 Full End Cap With Floor Return



R3F-2 Full Outside Corner Trim

NOTES:

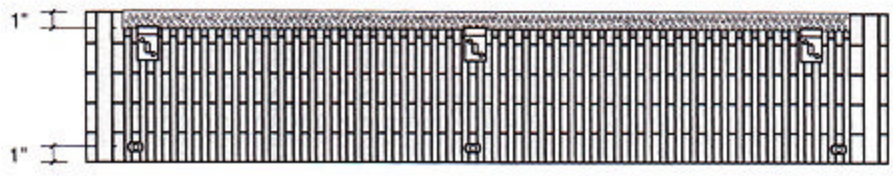
1. R3F-2 shown, other model heights similar.
2. All trims are 12” long on the face, unless otherwise noted.
3. Trims are sized to overlap R3F models.

PRIOR TO RELEASE, TRIM TYPE MUST BE CONFIRMED FOR EACH RADIATOR

Model Type R3F

Wall Mounting

R3F Models (back view)



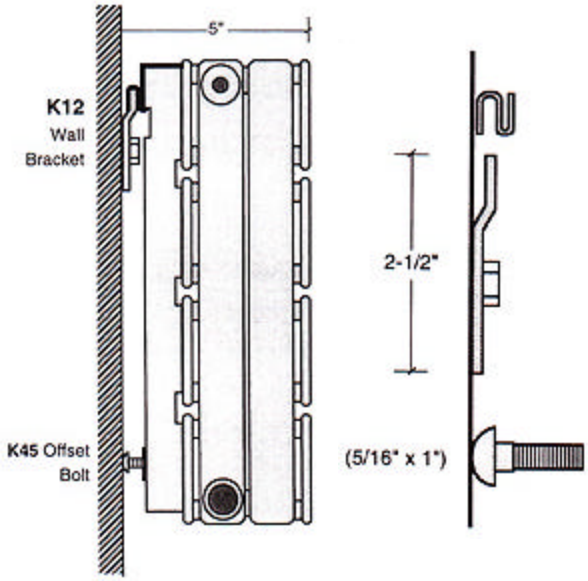
For Radiators **20" to 60"** Long - Use **2 K12** Brackets, one at each end

62" to 138" Long - Use **3 K12** Brackets, one at each end, one at the center

140" to 236" Long - Use **4 K12** Brackets, one at each end, two distributed evenly in the middle

238" to 296" Long - Use **5 K12** Brackets, one at each end, three distributed evenly in the middle

298" to 354" Long - Use **6 K12** Brackets, one at each end, four distributed evenly in the middle



R clip - Mount to the Cutouts on the RF Radiator at the K12 Positions

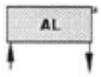
K12 Wall Bracket - Support Bracket used with RF Radiators

Normally shipped with the Radiators

K45 Offset Bolt - Carriage Bolt used at each weld nut at the bottom of the Radiator for leveling with the wall

Piping Options

A Type Connections — **Opposite End**



A Type
Supply Left

A Type
Supply Right

B Type Connections — **Opposite End**

B Type
Supply Left

B Type
Supply Right

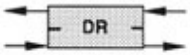
C Type Connections — **Same End**

C Type
Supply Left

C Type
Supply Right

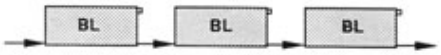
D Type Connections — **Same End**

D Type
Supply Left



D Type
Supply Right

Opposite End Series



NOTES:

- Air Vent standard on the Return side of each Panel
- Lower Pressure Drop than Same End Series
- Up to 7 Radiators (100 ft) in an Opposite End Series
- Expansion Compensation Piping is Recommended

Same End Series

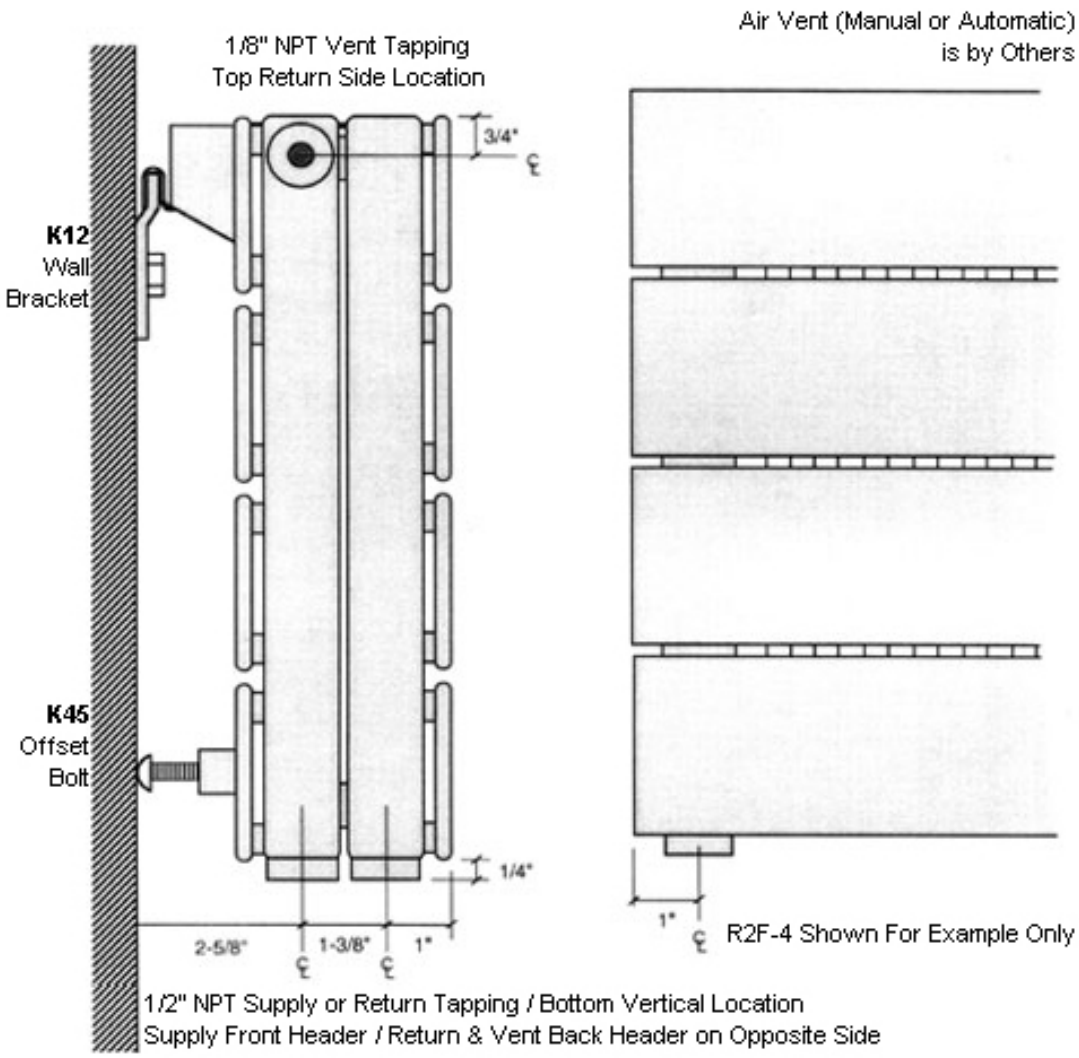
NOTES:

- Same AWT over the entire Same End Series
- Can Eliminate Costly Risers
- Higher Pressure Drop than Opposite End Series
- No More than 3 Radiators in a Same End Series
- Expansion compensation Piping is Recommended

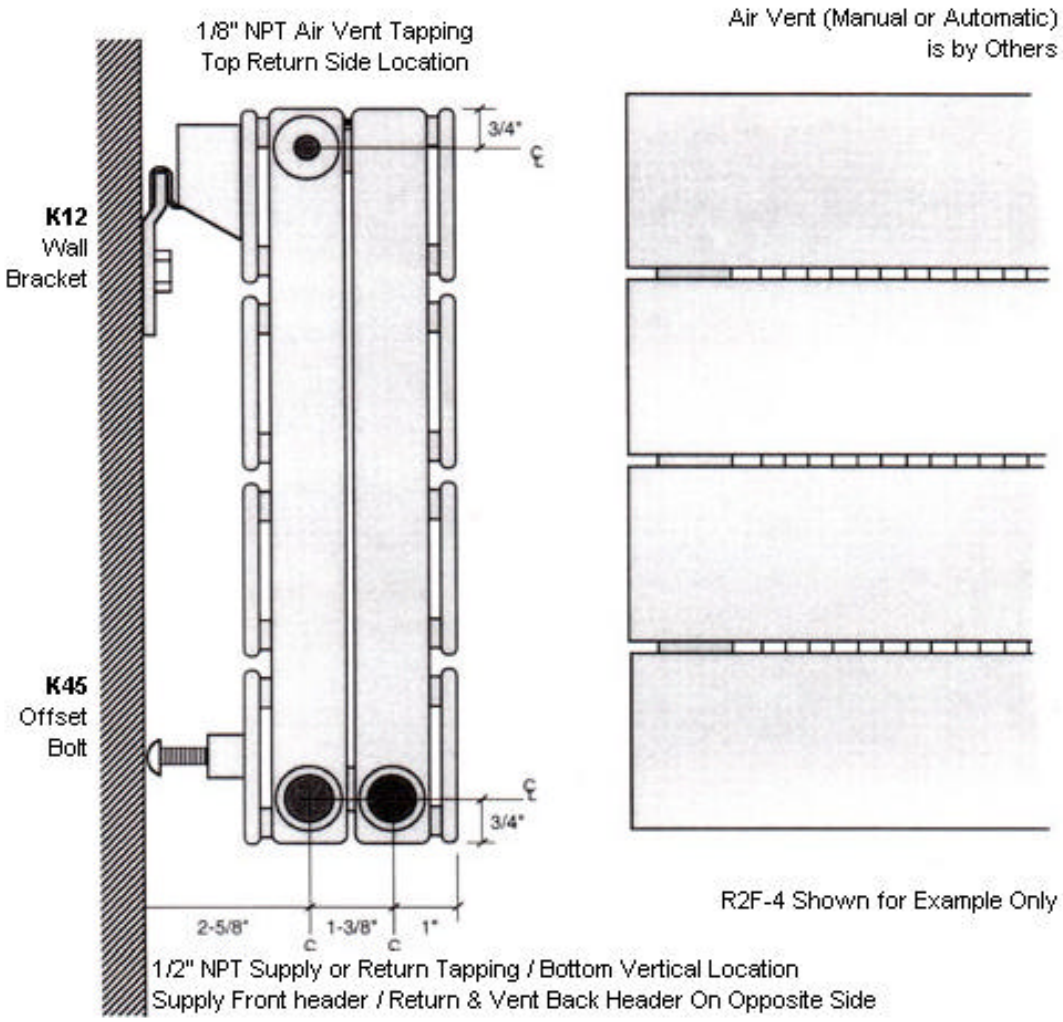
CONTRACTOR TO CONFIRM PIPING ARRANGEMENT, SUPPLY SIDE, AND CONNECTION TYPE PRIOR TO ORDERING. FOLLOWING PIPING DETAILS SHOW EACH CONNECTION TYPE (FOR REFERENCE)

Piping Details

A Type

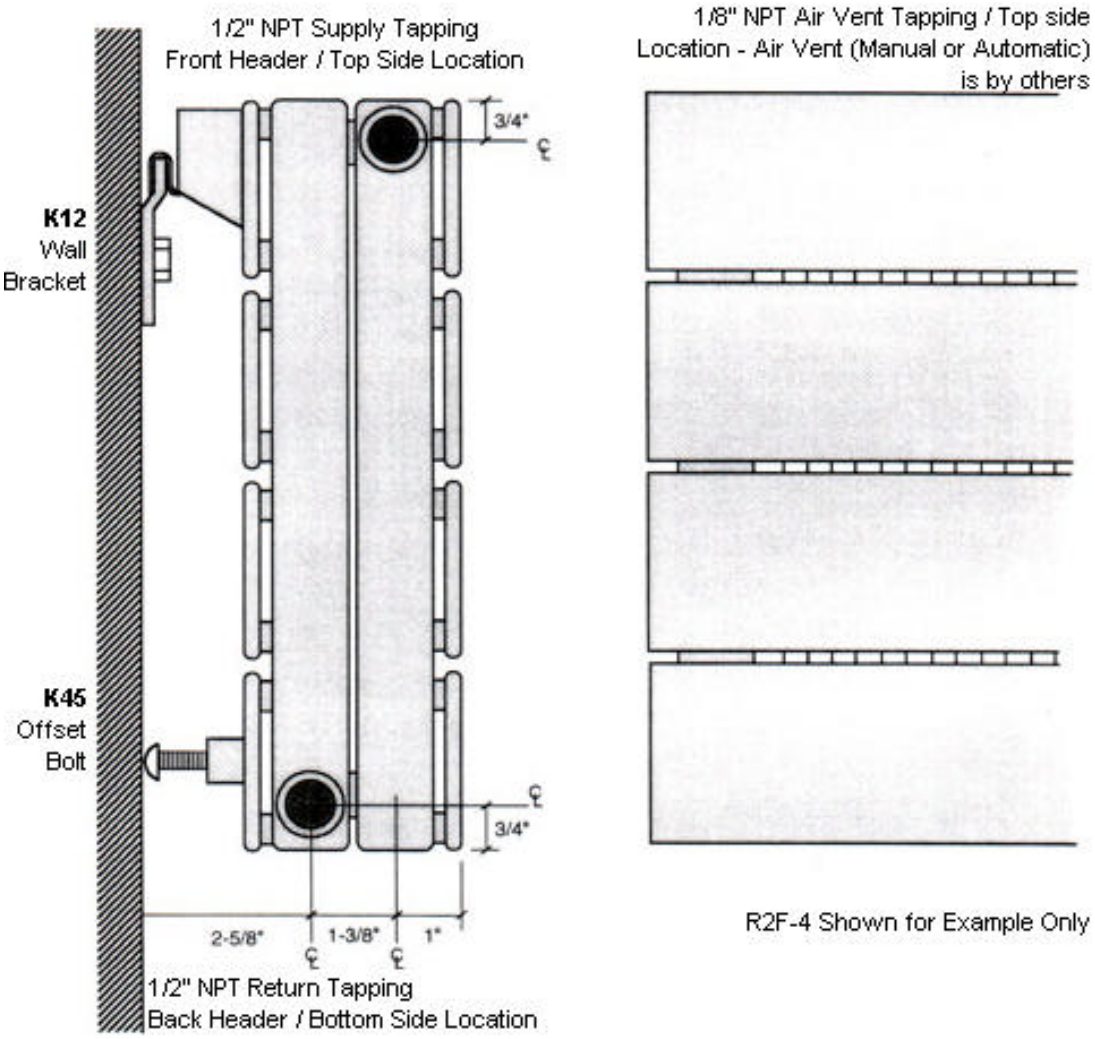


Piping Details
B Type



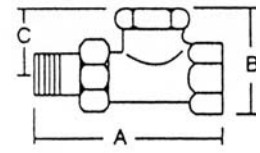
Piping Details

C or D Type



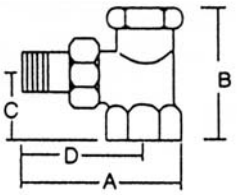
R2F-4 Shown for Example Only

Valves & Vent



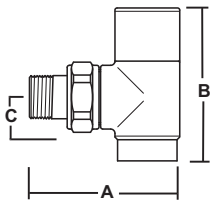
VALVE-ST

SIZE	A	B	C
1/2"	3.15"	1.43"	1.18"
3/4"	3.58"	1.58"	1.20"



VALVE-ANG

SIZE	A	B	C	D
1/2"	3.15"	1.43"	1.18"	2.28"
3/4"	3.58"	1.58"	1.20"	2.60"

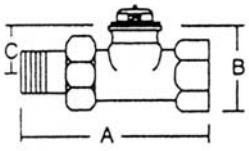


DEC-ANG

SIZE	A	B	C
1/2"	2.82"	2.80"	1.22"

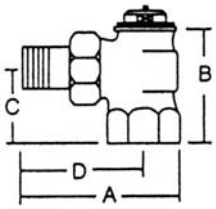
Combination Union – Shut Off Valves

Runtal offers two types of combination shut off/ union valves that are suitable for balancing and shut off isolation. The VALVE-ST and VALVE-ANG are available in both ½" and ¾" NPT sizes (male threaded union x female threaded connection). The nickel plated VALVE-ST and VALVE-ANG are available in either a straight or angle pattern and may be used in pairs or in combination with the control valves. The DEC-ANG is a decorative chrome angle valve used in pairs to provide elegant connections for towel radiators or radiators .



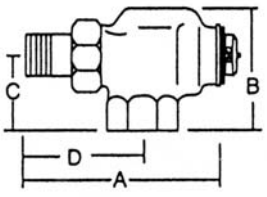
CONTROL-ST

SIZE	A	B	C
1/2"	3.74"	1.50"	1.12"
3/4"	4.17"	1.50"	1.12"



CONTROL-ANG

SIZE	A	B	C	D
1/2"	2.78"	1.97"	1.02"	2.28"
3/4"	3.10"	2.09"	1.14"	2.60"

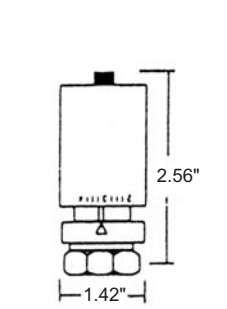


CONTROL-REV

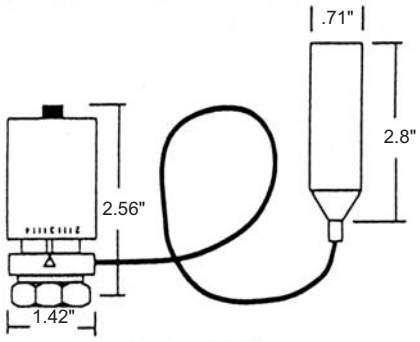
SIZE	A	B	C	D
1/2"	3.86"	1.97"	1.02"	2.28"

Self-Contained Thermostatic Control Valves

These nickel plated control valves, combined with the proper control head (as shown below) provide thermostatic control at the radiator. The are available in straight, angle, or reverse angle configurations in both 1/2" and 3/4" sizes (male threaded union X female threaded connections).



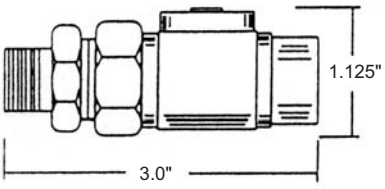
CONTROL-SENSOR



REMOTE-SEN

Sensor Control Heads

These control sensors are used in conjunction with self-contained control valves above. The CONTROL-SENSOR should be used with the straight or reverse angle valves, where the control sensor head is in the open air. The REMOTE-SEN should be used where the valve and sensor head are behind a pipe trim. The CONTROL-SENSOR is available with a white or black finish.



VALVE-PC

Compact Union-Ball Valve

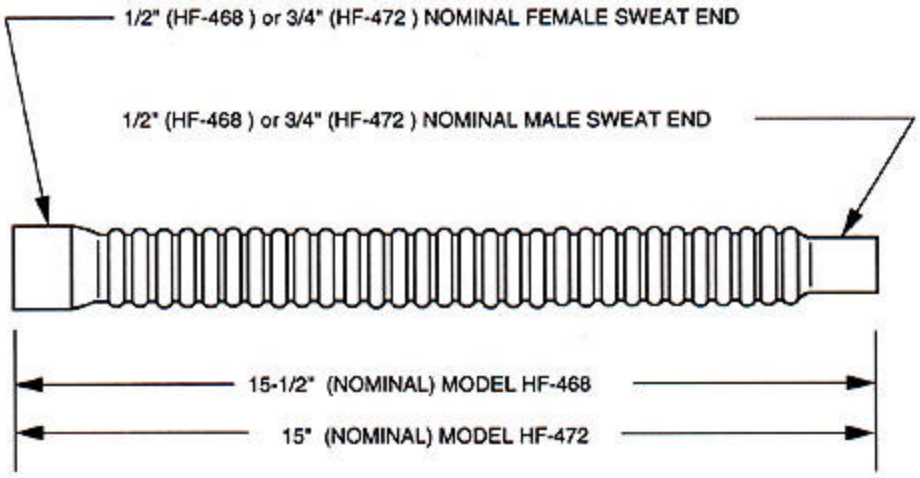
The VALVE-PC is a chrome plated handleless union-shutoff valve, suitable for exposed installation, or installation inside the PC pipe cover. It is available in 1/2" male NPT X 1/2" sweat connection only.

NPT-MV

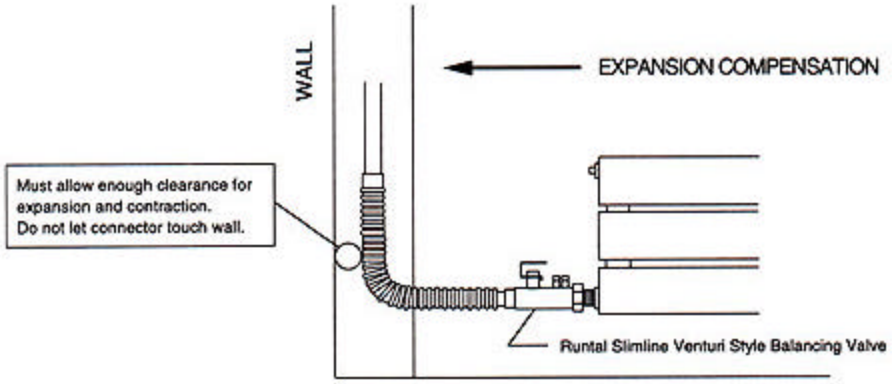
Air Vent

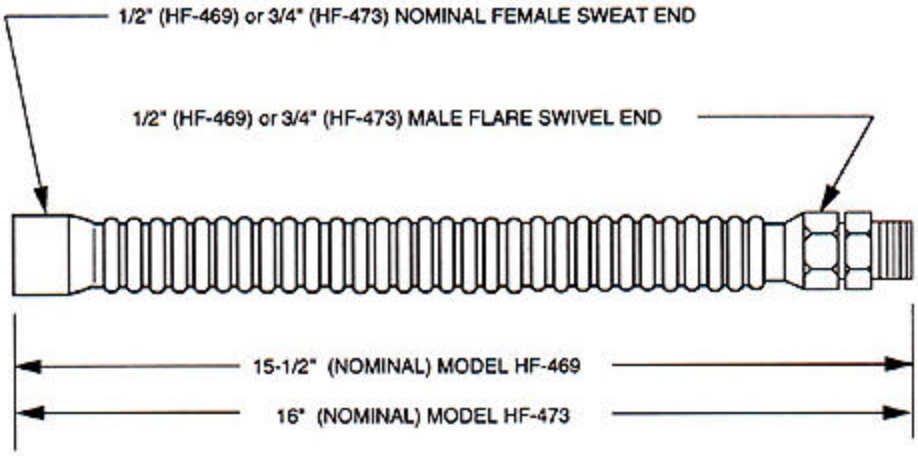
The chrome plated NPT-MV is the standard air vent available from Runtal.

Runtal-Flex Connector

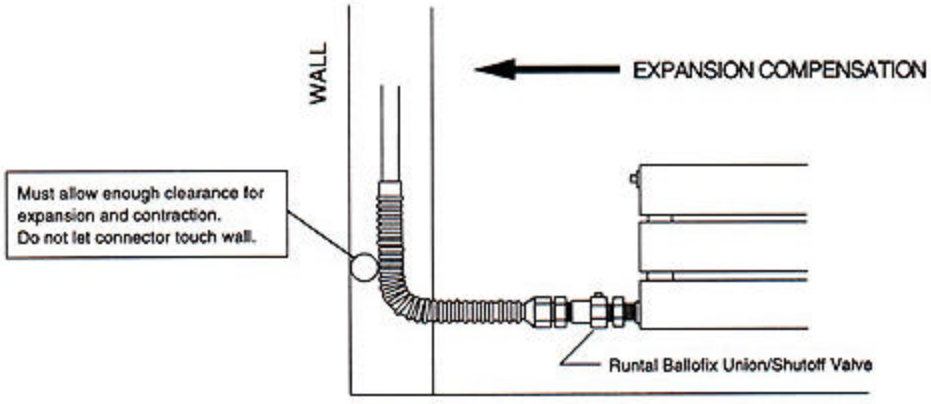


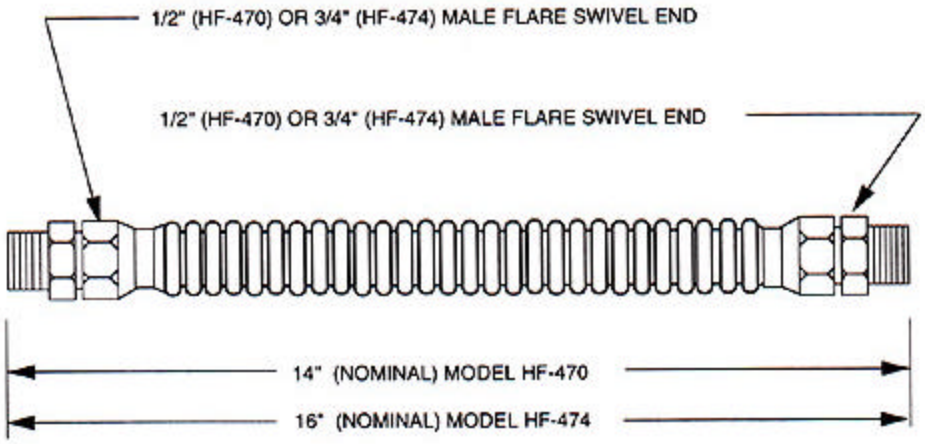
1/2" SIZE - MODEL # HF-468
3/4" SIZE - MODEL # HF-472



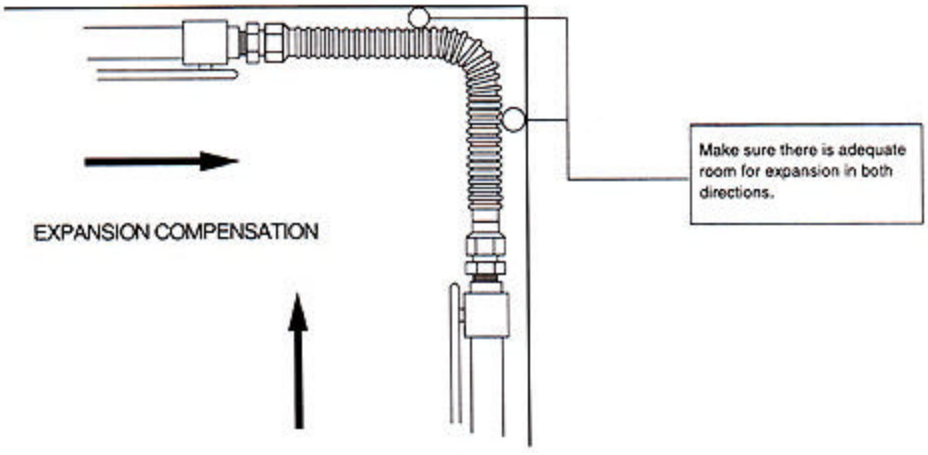


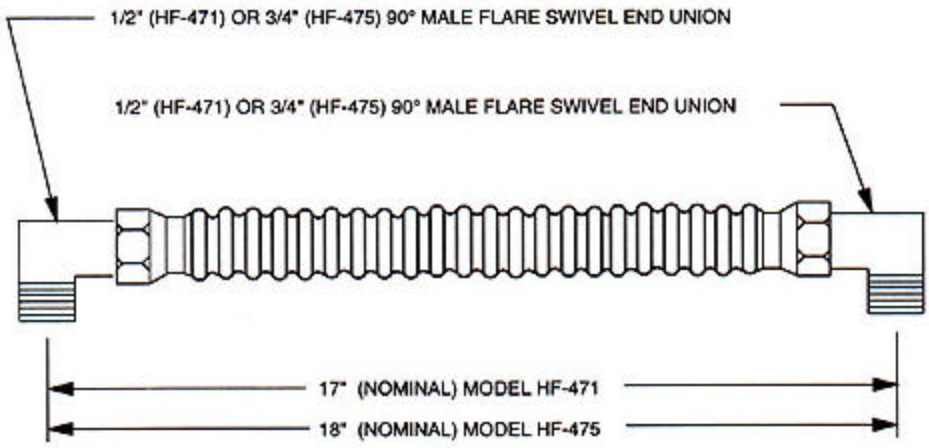
1/2" SIZE - MODEL # HF-469
3/4" SIZE - MODEL # HF-473



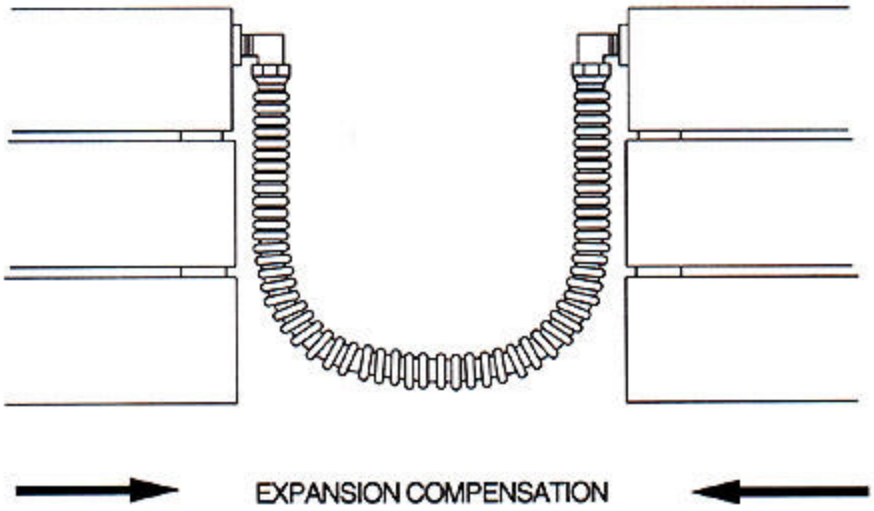


1/2" SIZE - MODEL # HF-470
3/4" SIZE - MODEL # HF-474





1/2" SIZE - MODEL # HF-471
3/4" SIZE - MODEL # HF-475



COLOUR TO BE CONFIRMED PRIOR TO RELEASE

Runtal Color Selection Guide

Viewing color samples on a computer monitor is not an exact representation.
Contact us for color samples. Please specify color number when ordering.

Important Color Notes

- Variations in color and gloss may occur in the manufacturing and baking process.

Standard Colors

Grey White

Cream White

Glacier Grey

Almond


Runtal Steel


Wine Red


Moss Green


Grey Blue


Grey Brown


Runtal White

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MANUFACTURER'S INSTALLATION AND OPERATION MANUAL

PLEASE CLICK BOX ABOVE FOR THE LINK TO ACCESS THE INSTALLION AND OPERATION MANUALS