FläktGroup®
SEMCO®

SPECIALIZED
HEALTHY
AIR SOLUTIONS

NOVA II IQFI

EXPOSED CHILLED BEAM

INSTALLATION & OWNER'S MANUAL

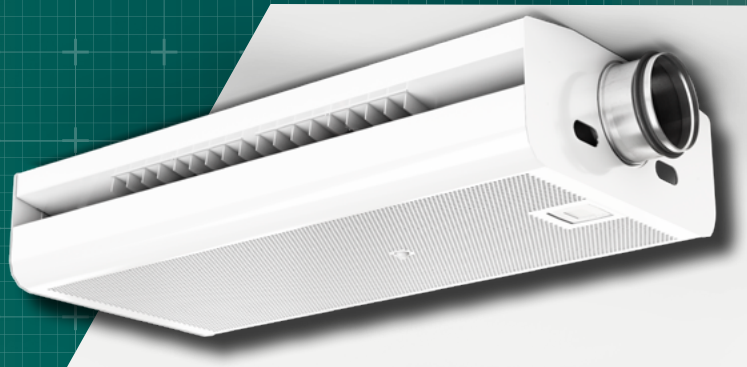


TABLE OF CONTENTS

INTRODUCTION

This manual describes how to erect, store, clean and maintain FläktGroup® SEMCO® NOVA II IQFI chilled beams. Each section provides information to guide the installation and maintenance of all components. It should also be noted that a section or sections of this manual might not apply to your system.

DIMENSIONS AND WEIGHT

	OVERALL LENGTH	WEIGHT	
	ACTUAL LENGTH (IN)	DRY (LBS)	WET (LBS)
NOVA II - 120	47.3	44	46
NOVA II - 150	59.1	53	55
NOVA II - 180	70.9	62	64
NOVA II - 210	82.7	71	73
NOVA II - 240	94.5	79	82
NOVA II - 270	106.3	88	90
NOVA II - 300	118.1	97	101
NOVA II - 330	129.9	106	110

FIGURE 1. Overall heights and weights of the NOVA II IQFI

STANDARD SUBMITTAL: ACTIVE CHILLED BEAMS

A) GENERAL:

1) Chilled beam to be an integrated system for ventilation, cooling and heating. The beams shall consist of galvanized steel housing encasing the integral water coil(s), a plenum feeding a series of adjustable induction slots, a grille, and diffusers. Chilled beam to be active with primary ventilation introduced through the end duct connection. End duct connection may be located at the opposite end of the beam as the coil connections. Chilled beam shall be designed to be installed exposed. Beam to have adjustable air flow, cooling effect and flow pattern.

B) QUALITY ASSURANCE:

1) Hydronic cooling capacities shall be established by testing accordance with European standard EN-15116.

C) CASING:

1) Casing shall be mainly made of galvanized steel sheet.

2) Beam face shall consist of a room air induction section of perforated steel with a circular, perforation pattern flanked by two linear supply slots. The entire visible face section, shall be finished in standard RAL 9003 white, 30% gloss, which corresponds to NCS 0500-N.

3) The overall height of the beam shall not exceed 7.6".

D) COILS:

1) Coils shall be manufactured of seamless smooth copper tubes with aluminum fins. An optional purging nipple may be included with each beam.

2) Coils have a maximum recommended working pressure of 95 psi.

E) DUCT CONNECTION:

1) A 4.9" diameter spin fit primary supply air duct connection to the IQFI beam is located at the end.

F) ADJUSTABLE INDUCTION:

1) The chilled beam shall be complete with energy control and be regulated by means of variable geometry slots and shall provide either uni-or-bi-directional supply.
2) Slots will be adjustable without tools or removal of the beam from its installation.
3) Slots will permit 0-100% airflow from each side of the beam with the opposing side providing the converse percentage. Slots will be shipped from the factory fully opened.
4) Air measurement barb shall be included, along with a chart relating nozzle position, pressure, and flow for test and balance of primary airflow after installation.

G) DIFFUSERS

1) Diffusers shall provide the possibility to adjust the airflow pattern at different angles 0+15+30+45 mounted within the air-outlet of the beam.
2) Diffusers shall be provided for directional airflow adjustment along the length of the beam. No tools shall be required for adjustment of the diffusers.

H) CONTROLS

1) Standard configuration ships without controls. Optional 24V integrated controller with room controller, condensate sensor and/or occupancy sensor (PIR), may be ordered for use with 0-10V control valves by others.
2) Automatic temperature controls shall be provided by others.

I) INSTALLATION:

1) Chilled beams shall be supported by adjustable hanging brackets supported from threaded rods (by others) with manufacturer's rigid mounting kit.

PRE-INSTALLATION

Chilled beams can accumulate dust, dirt and corrosive matter (like salt) during shipment. If chilled beams appear to be dirty when received, follow the maintenance instructions on **PAGE 16** to clean soon after arrival. Abrasives and solvents should not be used without first consulting FläktGroup® SEMCO®.

RECEIVING AND INSPECTION

Upon delivery, confirm that the quantity and model(s) received matches the bill of lading. If there is any discrepancy, immediately notify FläktGroup® SEMCO®.

Inspect the packages for signs of damage. If damage is suspected, contact FläktGroup® SEMCO® immediately. If no visible damage is apparent, the beam should be properly stored until installation.

If the chilled beams must be stored before installation, store indoors on a hard, dry surface and protected from damage and moisture.

SYSTEM INSTALLATION

SUPPORT:

1) Chilled beams shall be independently suspended from a suspension bracket by four (4) threaded rods of 3/8" diameter. (See **FIGURE 2**) The upper end of the rods shall be suspended from the structure above that is:

   a. Mounted perpendicular to the beam length

   b. At least four inches wider than the beam

2) Fastening brackets shall be provided for rod installation (See **FIGURE 3**). These brackets will have a snap type connection with the beam that will allow for the beam to be repositioned along the length of the supports. The brackets will have oval mounting holes which will allow for the beam to have fine adjustment perpendicular to the length beam while the angled bracket will have gross adjustment along the same adjustment path.

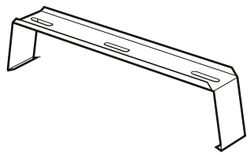


FIGURE 2. NOVA II IQFI fastening bracket (QFAZ-18-1-2)

I) INSTALLATION TIGHT TO STRUCTURE WITH ONLY THE FASTENING BRACKET (QFAZ-18-1-2):

1) Fasten the fastening bracket into the ceiling. (**FIGURE 2**)

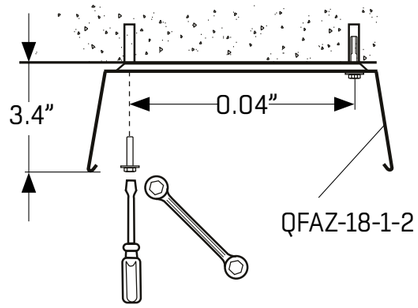


FIGURE 3

2) Snap the NOVA IQFI into the fastening bracket. (See **FIGURE 3**)

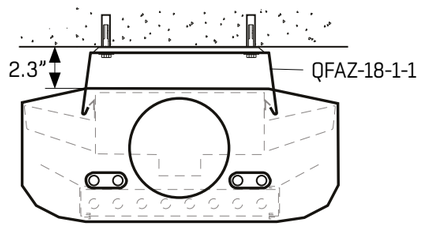


FIGURE 4

II) INSTALLATION USING FASTENING BRACKET (QFAZ-11-1) AND SUSPENSION RODS (QFAZ-12) DIRECTLY ATTACHED TO THE STRUCTURE:

1) Thread the suspension rods up through the suspension bracket and down into the fastening bracket and tighten the nuts with a wrench. (See **FIGURE 5**)

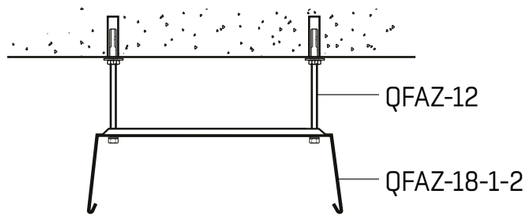


FIGURE 5

2) Next, snap the NOVA II IQFI into the fastening brackets. (See **FIGURE 8**)

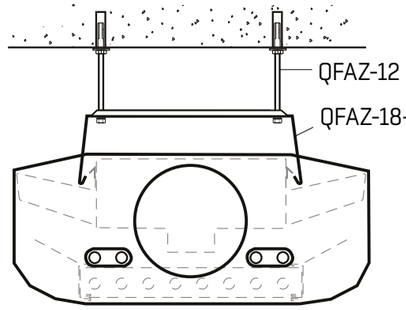


FIGURE 6

III) INSTALLATION USING A SUSPENSION BRACKET (QFAZ-11-1), SUSPENSION RODS (QFAZ-12), AND FASTENING BRACKETS (QFAZ-18-1-2):

1) Affix the suspension bracket to the ceiling. Then, thread the suspension rods up through the suspension bracket and down into the fastening bracket and tighten the nuts with a wrench. (See **FIGURE 7**)

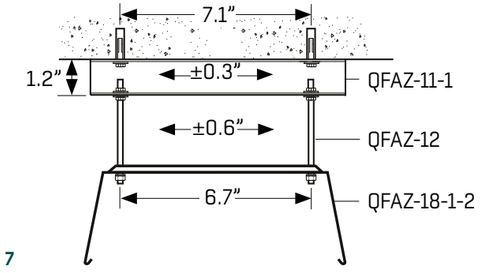


FIGURE 7

2) Next, snap the NOVA II IQFI into the fastening brackets. (See **FIGURE 6**)

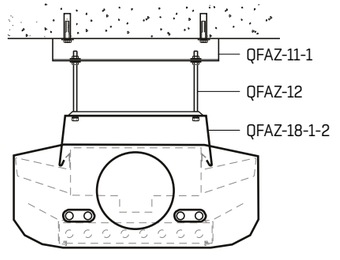


FIGURE 8

LOW-BUILD INSTALLATION

1) When installing the NOVA IQFI in areas with limited ceiling height, use the QFAZ-19 fastening bracket in place of QFAZ-18. (See **FIGURE 9**)

FIGURE 9

I) LOW-BUILD INSTALLATION TIGHT TO STRUCTURE WITH ONLY THE FASTENING BRACKET (QFAZ-19-1-1):

1) Secure the low-build fastening bracket to the ceiling. (See **FIGURE 10**)

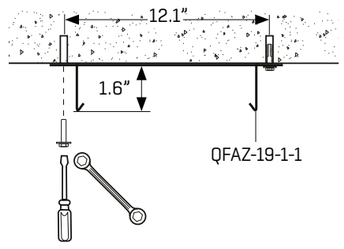


FIGURE 10

2) Snap the NOVA II IQFI into the low-build fastening brackets. (See **FIGURE 11**)

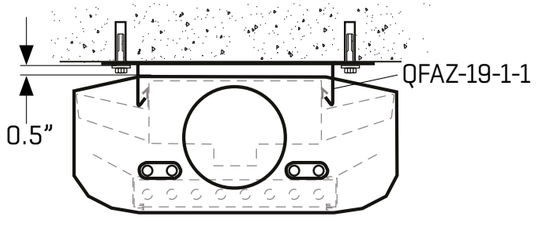


FIGURE 11

II) LOW-BUILD INSTALLATION USING A SUSPENSION BRACKET (QFAZ-19-1-1) FASTENING BRACKET (QFAZ-11-1), SUSPENSION RODS (QFAZ-12) AND FASTENING BRACKETS (QFAZ-18-1-2):

1) Affix the suspension bracket to the ceiling. Then, thread the suspension rods up through the suspension bracket and down into the low-build fastening bracket and tighten the nuts with a wrench. (See **FIGURE 12**)

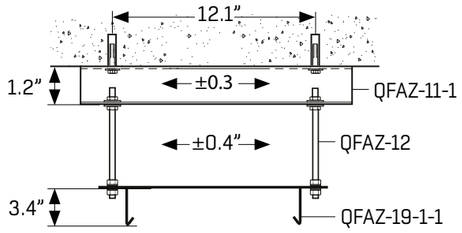


FIGURE 12

2) Next, snap the NOVA II IQFI into the low-build fastening brackets. (See **FIGURE 13**)

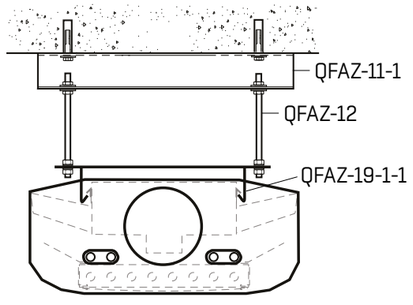


FIGURE 13

III) LOW-BUILD INSTALLATION USING FASTENING BRACKET (QFAZ-19-1-1) AND SUSPENSION RODS DIRECTLY ATTACHED TO STRUCTURE (QFAZ-12):

1) Thread the suspension rods up through the suspension bracket and down into the low-build fastening bracket and tighten the nuts with a wrench. (See **FIGURE 14**)

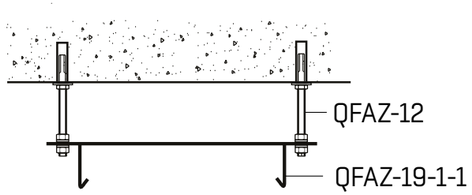


FIGURE 14

2) Next, snap the NOVA II IQFI into the low-build fastening brackets. (See **FIGURE 15**)

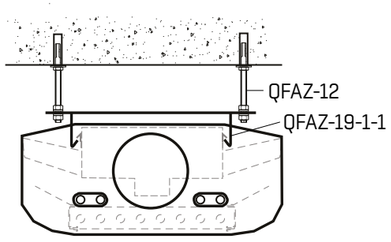


FIGURE 15

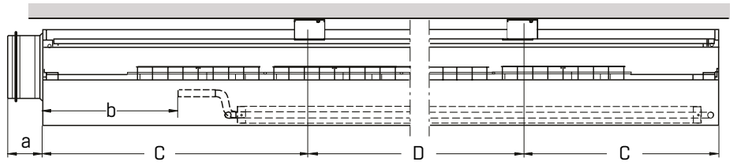
AIR AND WATER CONNECTIONS

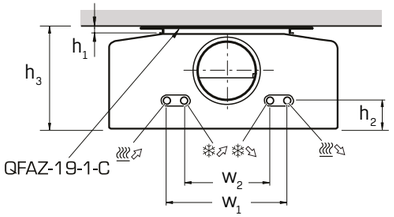
SYSTEMS FLUSHING:

Before connecting the water supply water system(s) to the beams, contractor shall flush the piping system to assure that all debris, air, and other matter have been removed. (See **BELOW** for water connection locations).

IQFI-aaa-11-05-d
IQFI-aaa-11-06-d
IQFI-aaa-11-09-d
IQFI-aaa-11-10-d

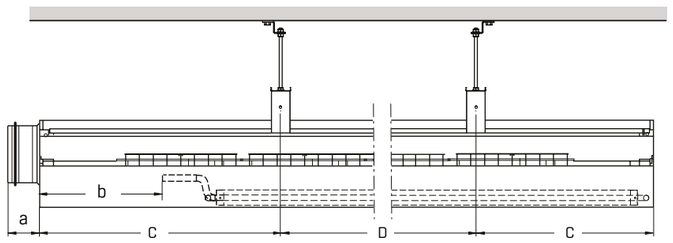
aaa	C	D
47.2"	11.8"	23.6
59.1"	14.8	29.5
70.9"	17.7"	35.4"
82.7"	20.7"	41.3"
94.5"	23.6"	47.2"
106.3"	26.6"	53.1"
118.1"	29.5"	59.1"
130.0"	24.6"	65.1"

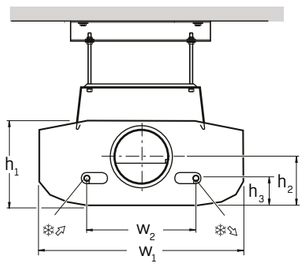




a	b	w1	w2	h1	h2	h3
2.7"	10.7"	9.1"	6.2"	0.5"	3.3"	8.0"

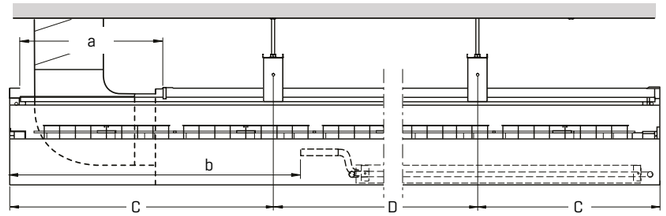
IQFI-aaa-21-03-d
IQFI-aaa-21-04-d
IQFI-aaa-21-07-d
IQFI-aaa-21-08-d
IQFI-aaa-21-13-d
IQFI-aaa-21-14-d

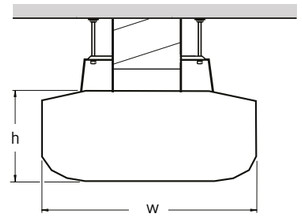




a	b	w1	w2	h1	h2	h3
2.7"	10.7"	17.7"	9.1"	7.6"	4.6"	2.6"

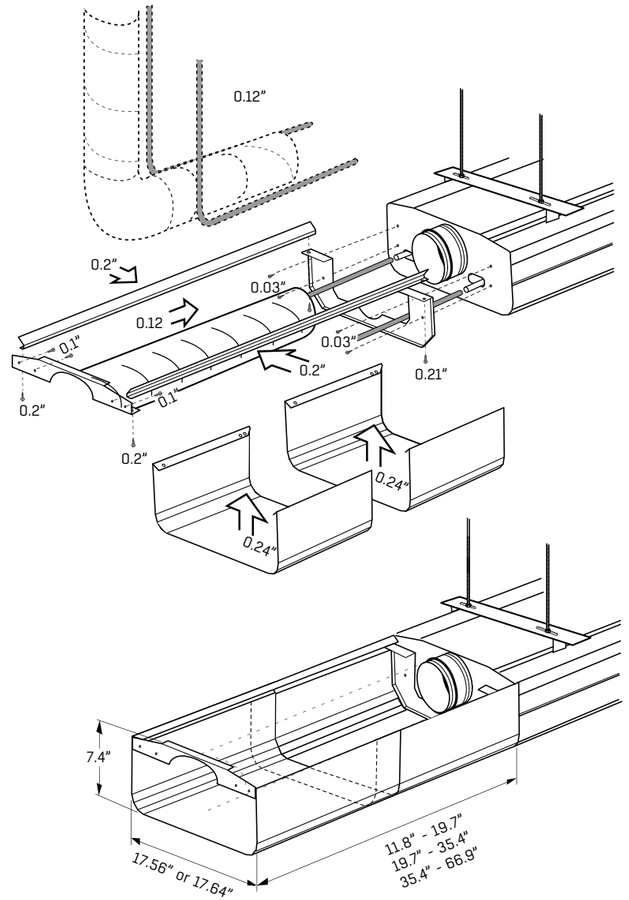
IQFI-aaa-13-cc-d
IQFI-aaa-23-cc-d





a	b	w	h
11.0"	22.6"	17.7"	7.6"

IQAZ-30-bbb-c



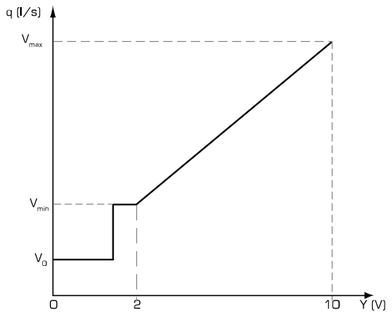
CONTROLS

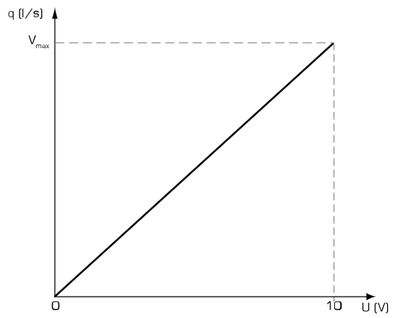
PI® ACTUATOR

309VM-024-150-MB-003
150 N
3 W (1 W), • 5 VA
0.5 in/min • 1.4 in
0.02 PSI • max 33.5 ft. H_2O

1	2	3	4	a	b
24 VAC ( )⊥ 24 VDC (-)	24 VAC (-) 24 VDC (+)	0....10V	0....10V	MODBUS®	
OPERATING VOLTAGE		CONTROL SIGNAL (Y)	FEEDBACK SIGNAL (U)		
BLUE (BU)	BROWN (BN)	BLACK (BK)	GRAY (GY)		

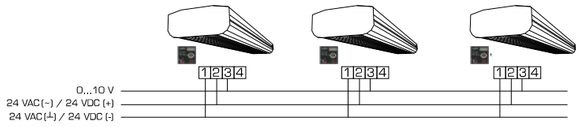
FIGURE 22. Wiring Diagram

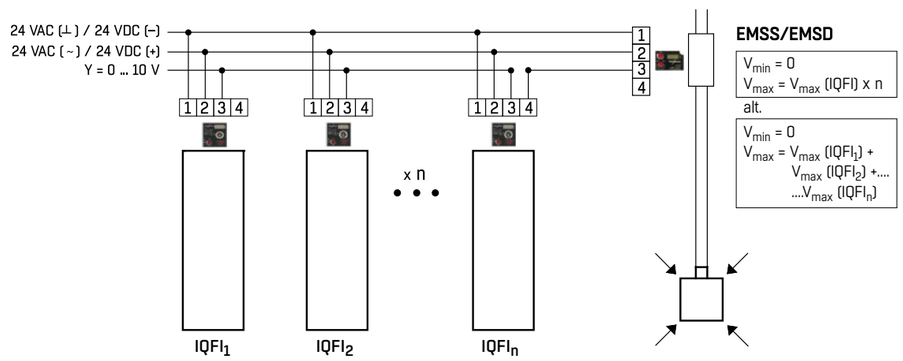




$$q_{act} = V_{min} + \frac{Y - 2}{8} \times (V_{max} - V_{min})$$

$U = 0 - 10$ (VDC) (0 V = 0 l/s, 10 V = V_{max})





EMSS/EMSD

$V_{min} = 0$
$V_{max} = V_{max}$ (IQFI) x n

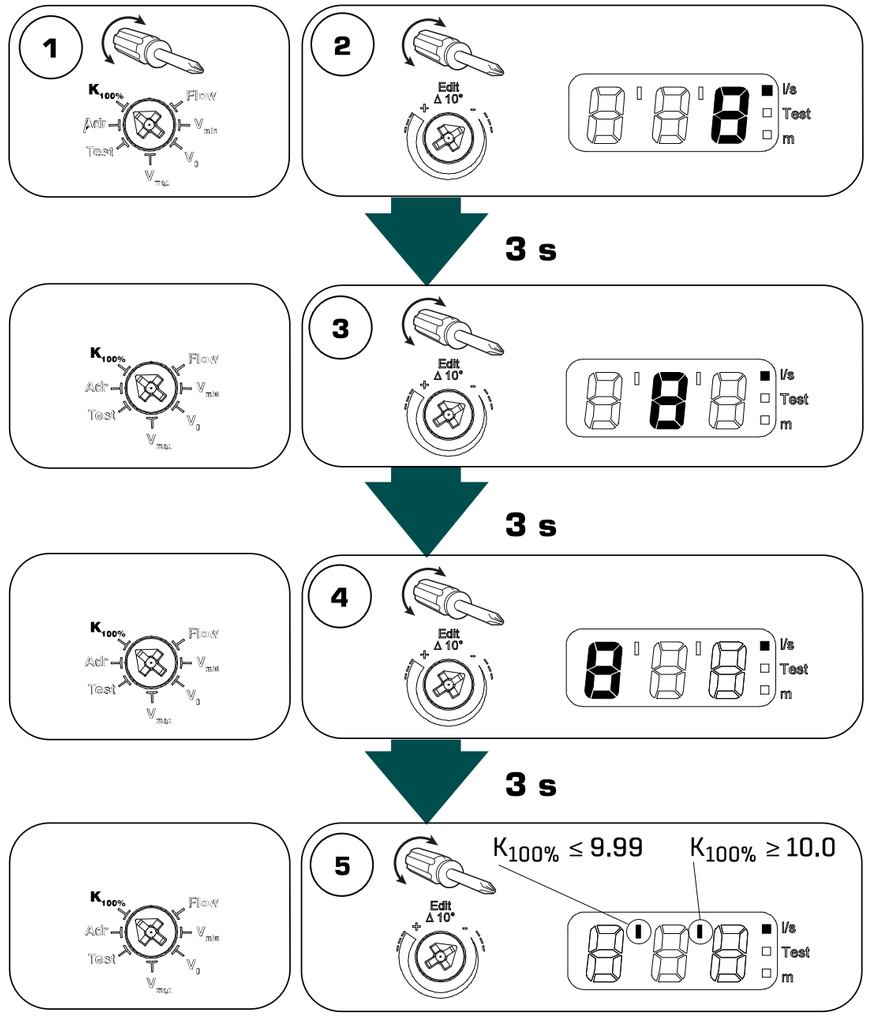
alt.

$V_{min} = 0$
$V_{max} = V_{max}$ ($IQFI_1$) +
V_{max} ($IQFI_2$) +....
....V_{max} ($IQFI_n$)

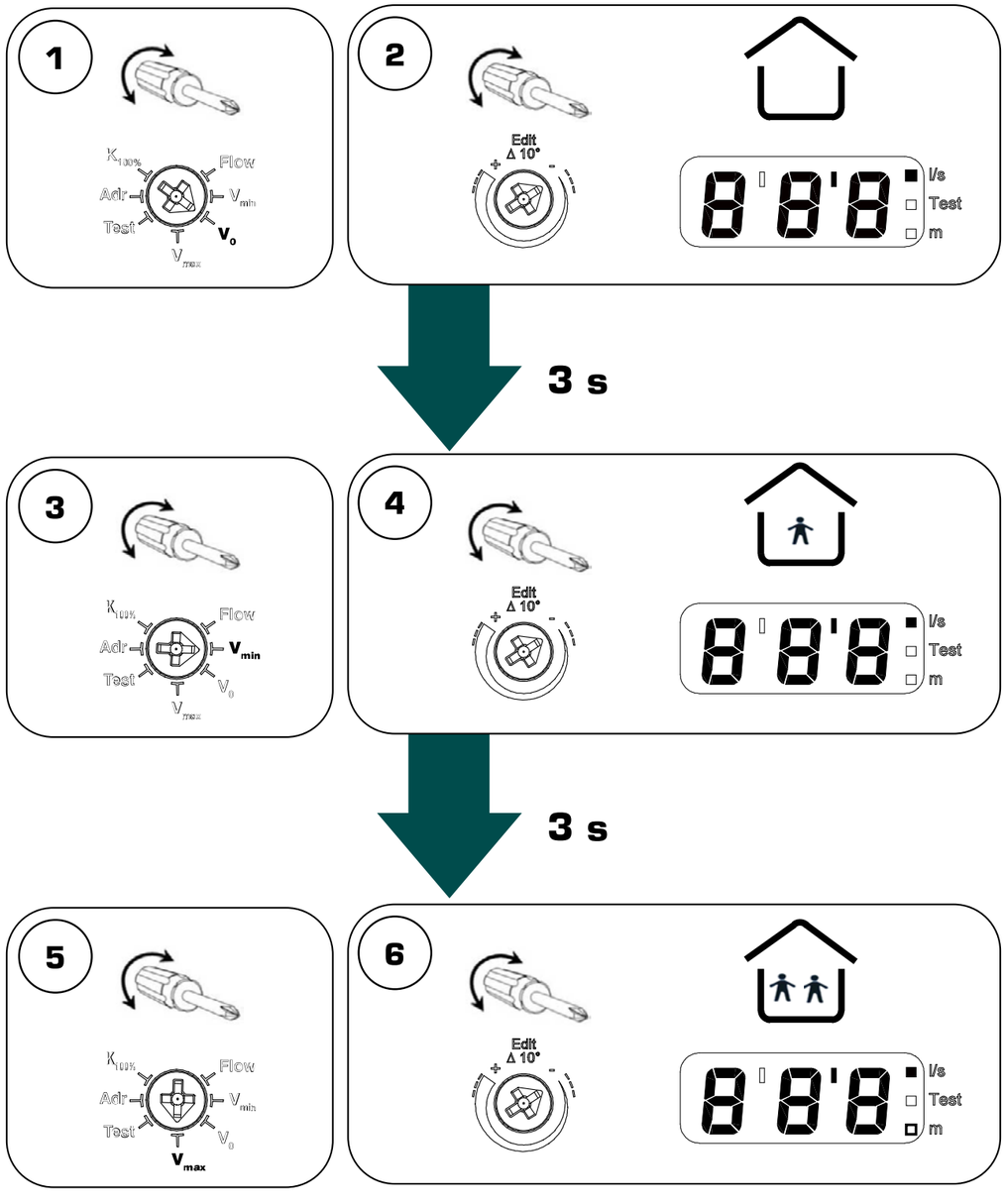
$K_{100\%}$

aaa (IN)	$K_{100\%}$
47.2"	2.5
59.1"	3.6
70.9"	4.6
82.7"	5.5

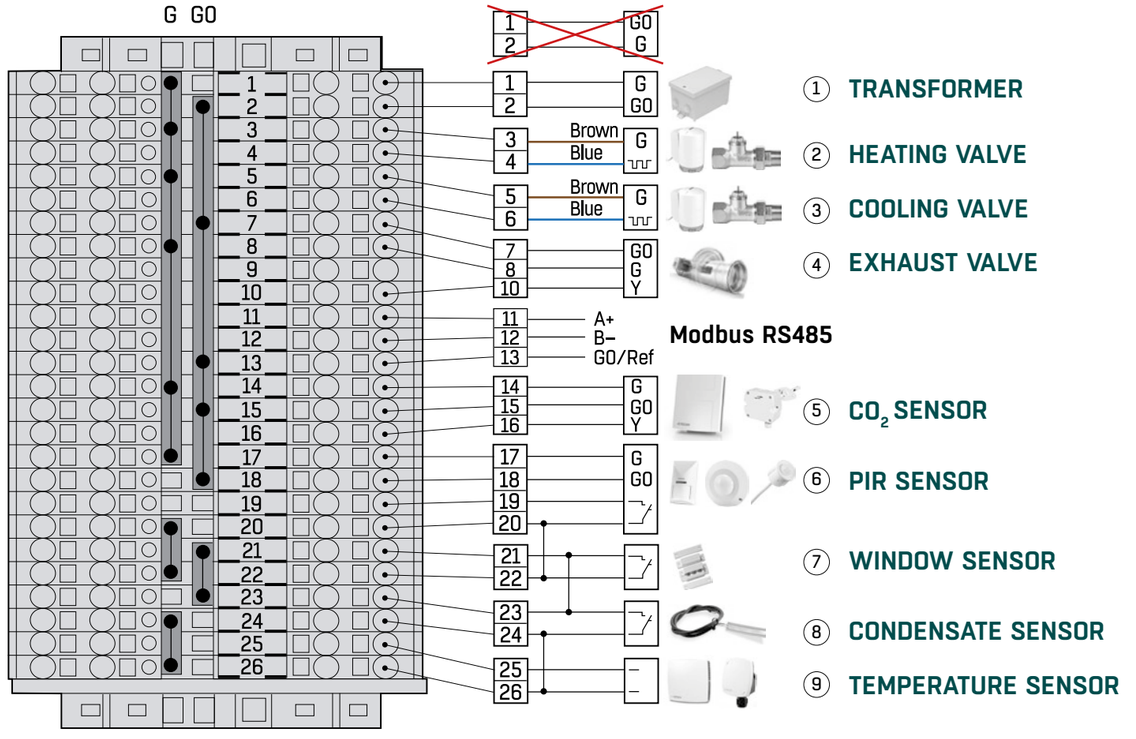
aaa (IN)	$K_{100\%}$
94.5"	3.7
106.3"	4.8
118.1"	5.7
130.0"	6.8



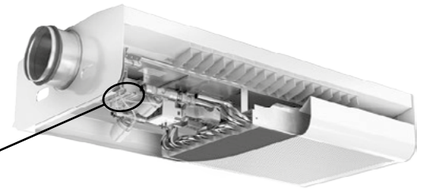
V_0, V_{MAX} AND V_{MIN}

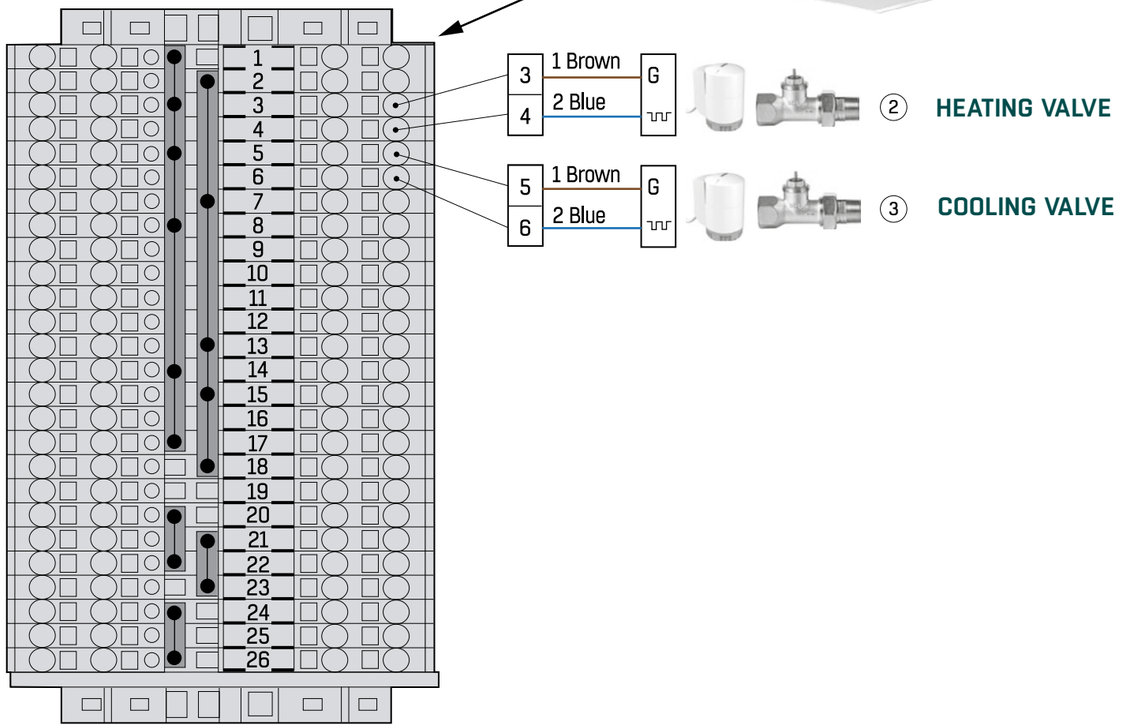


LEADER BEAM - STRZ-76 ROOM CONTROLLER



FOLLOWER BEAM - STRZ-76 ROOM CONTROLLER

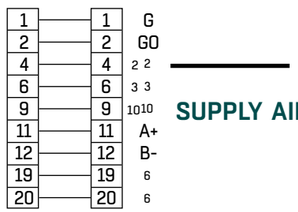




② HEATING VALVE

③ COOLING VALVE

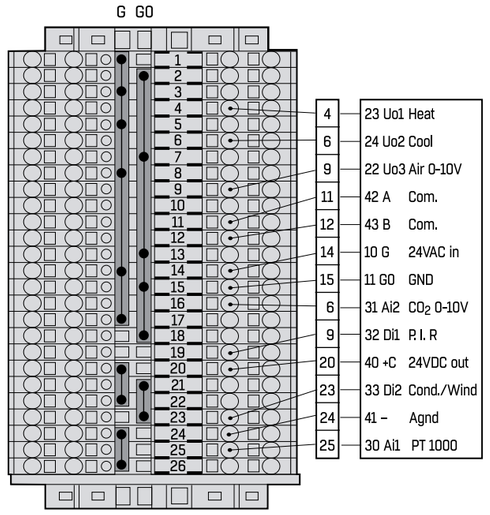
SLAVE → SLAVE BEAM
MASTER → SLAVE BEAM



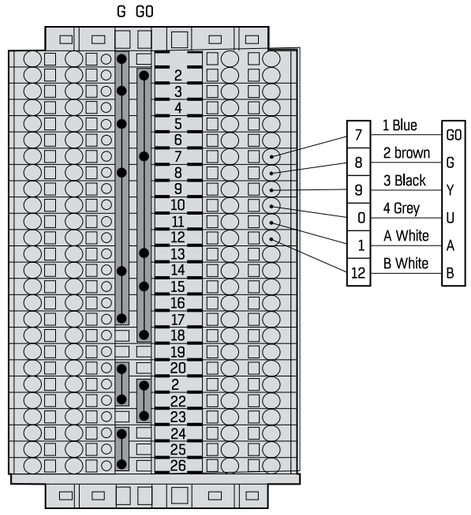
SUPPLY AIR VALVE

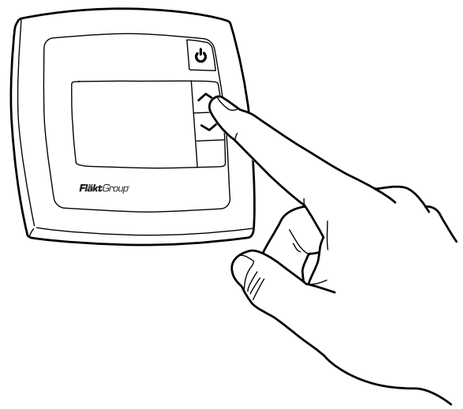
STRZ-76 ROOM CONTROLLER

STRA - CONTROL UNIT



Pi ACTUATOR

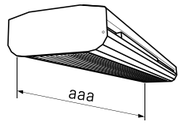




STRZ-76-02-cc-d-ee	Parameter 15 = 1
STRZ-76-bb-02/04/06/08-d-ee	Parameter 18 = 2
STRZ-76-bb-03/04/07/08	Parameter 45 = 1, Parameter 17 = 3

NOVA II IQFI PRIMARY AIRFLOW (CFM) COMMISSIONING

IQFI-120-bb-cc-d
IQFI-150-bb-cc-d
IQFI-180-bb-cc-d
IQFI-210-bb-cc-d
IQFI-240-bb-cc-d
IQFI-270-bb-cc-d
IQFI-300-bb-cc-d
IQFI-330-bb-cc-d

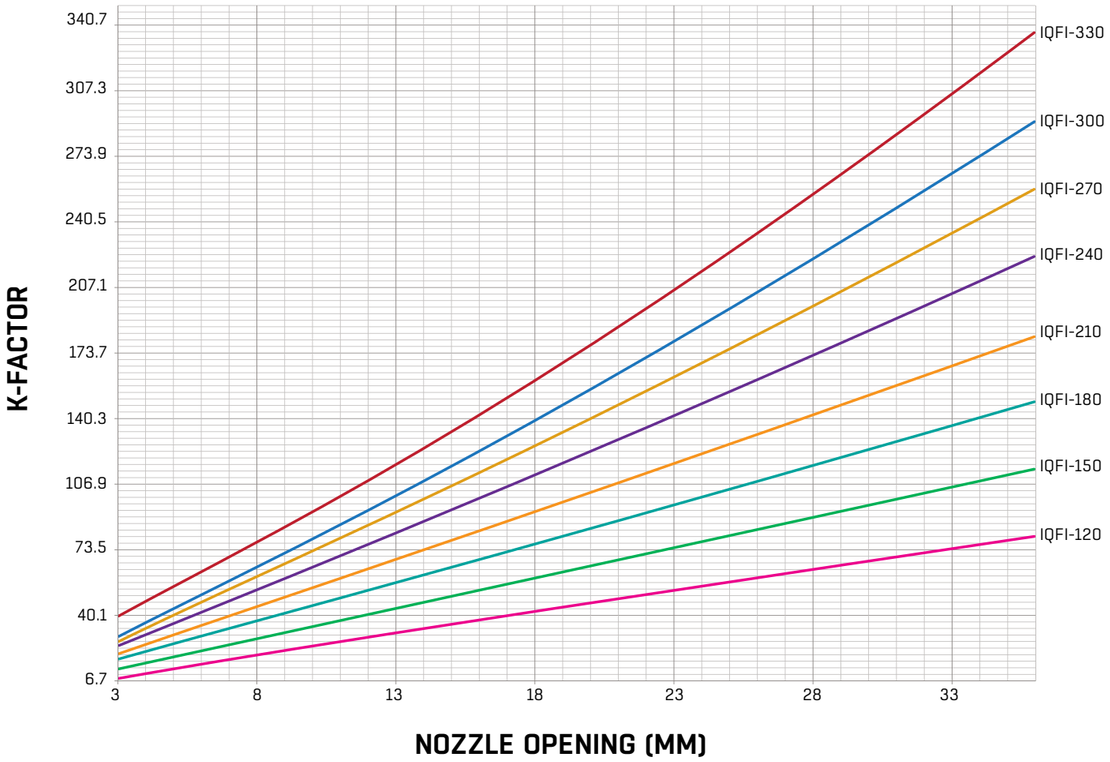


Where $D_1=D_2$

$$q(cfm) = k\sqrt{\Delta p\ (in.\ w.c.)}$$

Where $D_1 \neq D_2$

$$q_{(cfm)} = \frac{k_{D1}}{2} + \frac{k_{D2}}{2} = \sqrt{\Delta P(in.\ w.c.)}$$



ADJUSTING ENERGY CONTROL

1) To see if the energy control needs to be adjusted, first, check the NOVA II IQFI's air pressure. (See **FIGURE 16**)

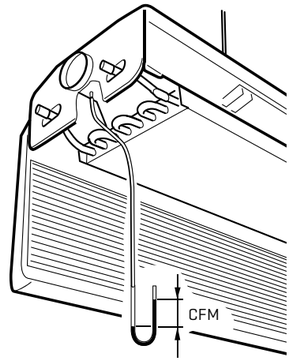


FIGURE 16

2) If the air pressure needs to be adjusted, determine which nozzles need to be adjusted. (See **FIGURE 17**)

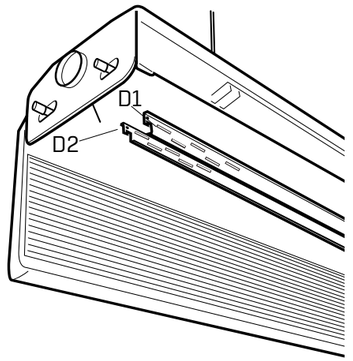


FIGURE 17

2) Once you determine, which nozzles need to be adjusted, use a screwdriver to adjust the energy control. (See **FIGURE 18**)

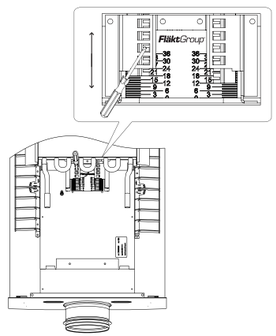


FIGURE 18

CLEANING & MAINTENANCE

1) Wipe down the exterior of the chilled beam with soap and water as needed. (See **FIGURE 19**)

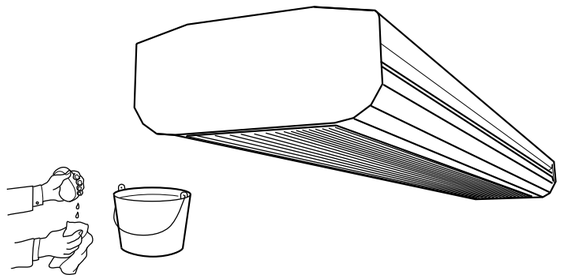


FIGURE 19

2) Push the slider over (See **FIGURE 20**) to pop open the face plate and then vacuum the coil with a vacuum brush attachment every 5-10 years, or as needed.

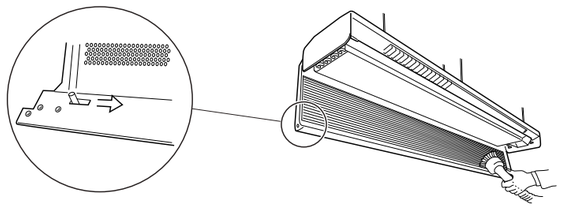


FIGURE 20

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