

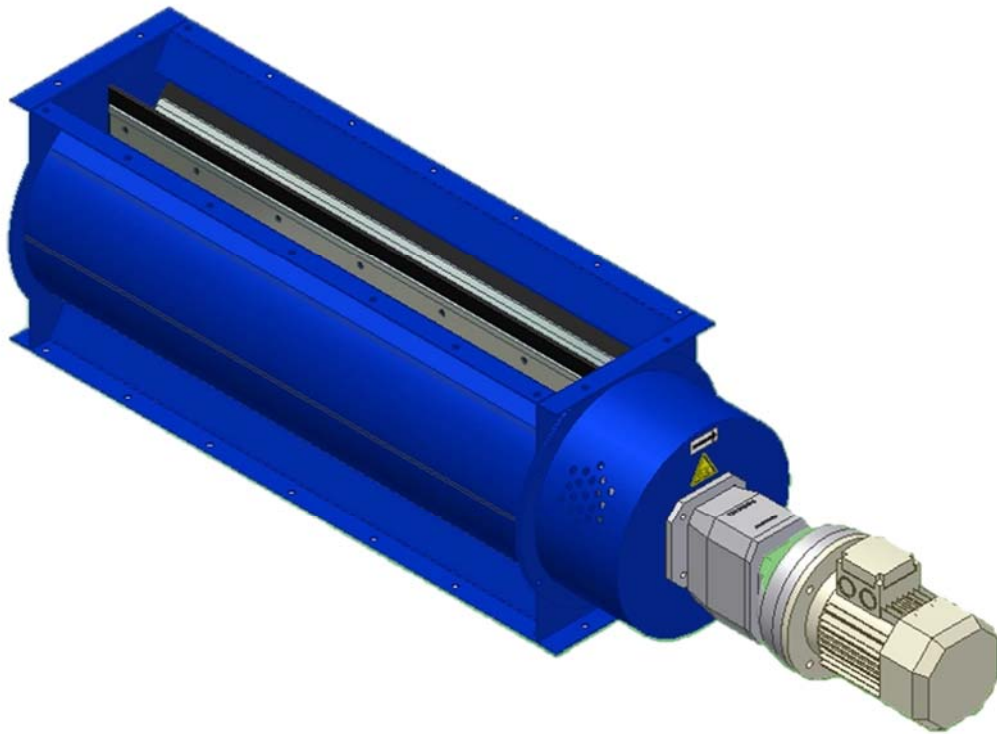
RS-EXL – Ex rotary valve

Maintenance manual

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1. INTRODUCTION



We are pleased that you have chosen an Ex rotary valve that has been thoroughly tested, and only materials and components from recognized suppliers are used. In order to obtain optimal use of the properties of the Ex rotary valve it is presumed that the user reads this manual thoroughly.

An Ex rotary valve (RS-EXL) is type approved for dust explosion class St 1.

Always read this manual thoroughly before commissioning of an Ex rotary valve. Please pay special attention to the section concerning maintenance, as correct maintenance of the Ex rotary valve is a prerequisite for trouble-free operation. Furthermore, it is a prerequisite that the manual is complied with in order to keep the warranty on the Ex rotary valve.

This manual must be kept throughout the life of the Ex rotary valve. In connection with reordering of the manual, the order number on the type plate must be stated.

You are welcome to contact us for further information and comments.

Please note that mounting, operation and maintenance of an Ex rotary valve only must be carried out by skilled personnel.

2. EC DECLARATION OF CONFORMITY

EC declaration of conformity

Manufacturer: **Moldow A/S**
Jørge Hansens Vej 1
DK-6670 Holsted

Hereby states that EX rotary valve type:

RS-EXL

is in compliance with the following provisions:

EC directive on machinery 2006/42/EC of 17th May 2006 with specific reference to exhibit I of the directive concerning important safety and health requirements in connection with construction and manufacture of machines.

EMC-directive 2014/30/EU of 26th February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility.

ATEX-directive 2014/34/EU of 26th February 2014 on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres.

Furthermore declare that the following harmonized standards have been used:

EN ISO 12100:2011	General principles for design - Risk assessment and risk reduction
EN 1127-1:2011	Explosive atmosphere – basic concepts and Methodology
	EN 15089:2009 - Explosion isolation systems
EN 60204-1:2006	Electrical equipment of machines

The rotary valve is constructed in accordance to the ATEX-directive Group II category 1 intended for use at **zone 20** (II 1/- D).

The technical dossier is kept with notified body: FTZU



Director

K. Preben Hansen



Holsted, the 03-12-2014

3. TYPE OF CERTIFICATE

 **Physical Technical Testing Institute**
Ostrava – Radvanice 

(1) **Supplement No. 1 to**
EC-Type Examination Certificate

(2) **Equipment or Protective Systems Intended for Use**
in Potentially Explosive Atmospheres
(Directive 94/9/EC)

(3) EC-Type Examination Certificate Number:

FTZÚ 05 ATEX 0184X

(4) Protective system: **Rotary valve, type RS -3 EXL; -7,5 EXL; -9 EXL**

(5) Manufacturer: **Moldow A/S**

(6) Address: **Jørgen Hansens Vej 1, DK-6670 Holsted, Denmark**

(7) This supplement of certificate is valid for:

- prolongation of the certificate
- check in accordance with valid standards
- change of product name
- change of company name

(8) Modification of certified apparatus (protective system) and any of its approved variants are specified in documentation, a list of which is mentioned in the schedule of this certificate.

(9) This supplement to type examination certificate is valid only for type examination of design and construction of product sample in accordance with Annex 3 Paragraph 6) of Directive No. 94/9/EC. The Directive contains other requirements, which the manufacturer shall fulfill before products are place on market or introduce in service.

(10) Safety requirements of modified parts were fulfilled by satisfying the following standards:

EN 15089:2009

(11) Marking of equipment shall contain symbols:

 **D St1**

(12) This type examination certificate is valid till: **01.04.2019**

Responsible person:

Dipl. Ing. Lukáš Martinák
Head of Certification Body



Date of issue: 01.04.2014

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This supplement to certificate may only be reproduced in its entirety and without any change, schedule included.

FTZÚ, s.p., Pikartská 1337/7, 716 07 Ostrava-Radvanice, Czech Republic,
tel +420 595 223 111, fax +420 596 232 672, ftzu@ftzu.cz, www.ftzu.cz



**Physical Technical Testing Institute
Ostrava – Radvanice**

Schedule

(13)

(14)

**Supplement No. 1 to
EC-Type Examination Certificate N° FTZÚ 05 ATEX 0184X**

(15) Description of Protective System:

The objects of this supplement are:

- check in accordance with valid standards,
- prolongation of the certificate,
- change of product name
- change of company name

Size	ot.min ⁻¹	P _{red,max}	K _{st,max}
RS – 3 EXL	37	75 kPa	20 MPa.m.s ⁻¹
RS – 7,5 EXL	18		
RS – 9 EXL	18		

(16) Report No.: FTZÚ 05/0184/1

FTZÚ 13.0096-47 – explosion test of the rotary valve RS-3

FTZÚ 13.0097-47 – explosion test of the rotary valve RS-9

(17) Special conditions for safe use:

17.1 User has to add such equipment that upon detection of an explosion the rotary valve will stop automatically and instantaneously.

(18) Essential Health and Safety Requirements:

Are satisfied by requirements of standards mentioned in (10) and marking in accordance with clause 1.0.5 Annex 2 of Directive 94/9/EC for protective system, which is specified in (11) of this certificate.

(19) LIST OF DOCUMENTATION

The drawing documentation remains unchanged. List of documentation is specified in the certificate.

Operating instruction for the rotary valves RS-EXL No. 89009-0049 03.2014

Responsible person:



Dipl. Ing. Lukáš Martinák
Head of Certification Body



Date of issue: 01.04.2014

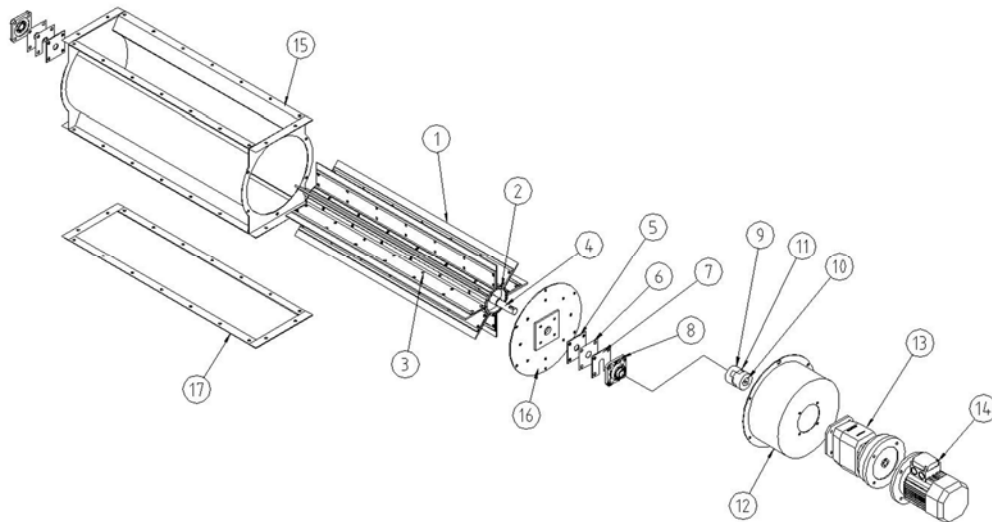
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4. USAGE & FUNCTIONAL DESCRIPTION

An Ex-rotary valve is constructed for following use :

- Safety component for isolation of explosions on a plant
- Non-compressed unloading of materials



The Ex rotary valve is functionally built up of the following main elements:

- Rotor casing
- Rotor
- Drive set (motor, gear and coupling)

4.1. Rotor casing

The rotor casing is made of sheet steel. Inlet and outlet are provided with flange connection. The end plate positioned at the drive set can be dismantled in a way that provides access to the rotor. The rotor casing is externally coated with primer and finish paint.

4.2. Rotor

The rotor is built up of a rotor shaft mounted with 8 sets of blade retainers in hot galvanized plate. Sealing blades in durable material are mounted in the blade retainers.

4.3. Drive set

The rotor is driven by an electric motor. The connection between rotor and electric motor is established by coupling and gear.

4.4. Protective system

The explosion resistant rotary valves (RS-EXL) have been tested as explosion blocking devices in dust explosive hazardous containers and/or equipment (zone 20 internally) for flammable dust types (Kst max). The explosion pressure impact strength and break-through resistance of the Ex rotary valves have been demonstrated with coal dust until the maximum reduced explosion pressure pred, max as flame break-through or spark break-through did not take place.

Break-through and flame break-through resistance in and against the transport direction have been secured.

The sealing lists must ensure impermeability between rotor and casing.

User has to add such equipment that upon detection of an explosion the rotary valve will stop automatically and instantaneously.

4.5. Technical data

Net weight	Max. 110 kg
Rotating speed RS-3	Max. 38 rpm
Rotating speed RS-7,5 / 9	Max. 18 rpm

4.6. Transport

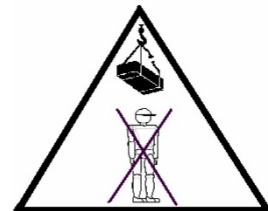
The type of transport, time, packaging and temperature has to be taken into consideration, by selecting a safe method of transport.

4.7. Lifting

In case of lifting, use only approved lifting equipment. Do not stay under overhanging loads – **DANGER ZONE!!!**

IMPORTANT:

The lifting equipment must be approved for the current load.



Make sure that lifting and lowering occur as slowly as possible. Shock, vibration and fall may cause imbalance and injury.

4.8. Failure

Any electrical failure must be rectified by authorized personnel only. Any mechanical failure must be rectified by authorized personnel only.



4.9. Cleaning

The power supply to the unit must be disconnected safely and secured against reconnection before cleaning.

5. WARNING & SAFETY INSTRUCTIONS

WARNING - WARNING - WARNING !!!

THE POWER SUPPLY TO THE PLANT MUST BE DISCONNECTED PROPERLY AND SECURED AGAINST RECONNECTING BEFORE ANY KIND OF MAINTENANCE MUST BE COMMENCED!



The Ex rotary valve is a safety component for which reason this warning sign is placed on it:

Unintended use may cause squeezing / crushing of hands and fingers.

Rotating shaft

If the motor is connected electrically, the rotor with rubber blades may be able to rotate, and the hands may get squeezed. Consequently, the motor must not be connected until the rotary valve has been installed under the filter and the duct for conveying the waste has been installed.

If the motor is to be installed in connection with a silo, the cyclone must be mounted on the rotary valve and the valve bolted on to the silo before connecting the motor.



6. DELIVERY / MARKINGS / STORAGE

6.1. Delivery

On delivery, the Ex rotary valve is equipped with motor and gear, which are selected by Moldow.

6.2. Marking

The rotary valve is marked according to current requirements. The type plate states among others type, order number and year of manufacture.

MOLDOW			
<small>Moldow A/S · Jørgen Hansens Vej 1 · DK-6670 Holsted mail@moldow.com · www.moldow.com · Tlf.: +45 39 26 44 · Fax.: +45 75 39 31 55</small>			
Type:	Order no.:	Serial no.:	Year:
RS-7,5 EXL	xxxxx	xx	2014
Speed:	Pred,max	KST _{max}	Power:
18 RPM	75 kPa	20 MPa.m.s ⁻¹	0,55 kW
Operating temperature:			
+20°C - +60°C			
			
0044		D St1	
FTZÚ-05-ATEX-0184X			

6.3. Storage

Until mounting is commenced, an Ex rotary valve must be stored under conditions that prevent rusting, corrosion, decomposition and deformations, or another kind of storage, which can lead to risk of malfunction.

7. MOUNTING

An Ex rotary valve must not be started until it has been mechanically connected on both sides.

The Ex rotary valve must be sealed on both sides of the hole series and bolted in the predrilled holes with M8 bolts.

Important: Always wear the safety equipment required.

7.1. Electrical connection

Electrical connection must only be carried out by a certified electrician.

In relation to electrical connection, the rotating direction of the rotary valve must be checked. The rotating direction is indicated by the arrow on the coupling housing.



The electrical connection must be carried out in accordance with current national regulation.

7.2. Electrostatic bond

Electrostatic bonding of an Ex rotary valve must be carried out before commissioning



8. OPERATION / MAINTENANCE

If there is any doubt whether an Ex rotary valve or any important hereof is intact until next overhaul, replacement must always be carried out.



parts

Important: Always wear the safety equipment required.
The national safety rules in force must be observed.

8.1. Periodic maintenance

In order for the Ex type approval to be guaranteed by the manufacturer, maintenance must be carried out by the manufacturer or a distributor appointed by the manufacturer.

Maintenance must always be in compliance with the directions in the manual.

8.2. Overhaul

In order for the manufacturer's guarantee for explosion-safeguard to apply, the customer must have regular maintenance carried out by the manufacturer or a distributor appointed by the manufacturer.

In order for distributors to be approved to carry out maintenance for the manufacturer, they must be trained by the manufacturer.

The following must be checked: Sealing blades, bearings, coupling, gear and motor.

Note !!! Sealing blades and sealing ring must be impermeable!

Overhaul must minimum take place every 6 months or according to this schedule:

Material	Operation hours annually	No. of times annually
Soft wood	1600	2
Hard wood	1600	3
Soft wood	3200	4
Hard wood	3200	6
Soft wood	4800	6
Hard wood	4800	8

8.3. Motor, gear & bearings

Maintenance according to the attached supplier documentation.

8.4. Rotor

If the sealing lamellas are not impermeable, they must be replaced. Visual inspection is carried out.

8.5. Noise

The noise ratio of the component in our scope of supply in connected condition and without media is below 70 dB(A) measured at a distance of 1 meter from the component.

Noise from transported media is not included.

Important:

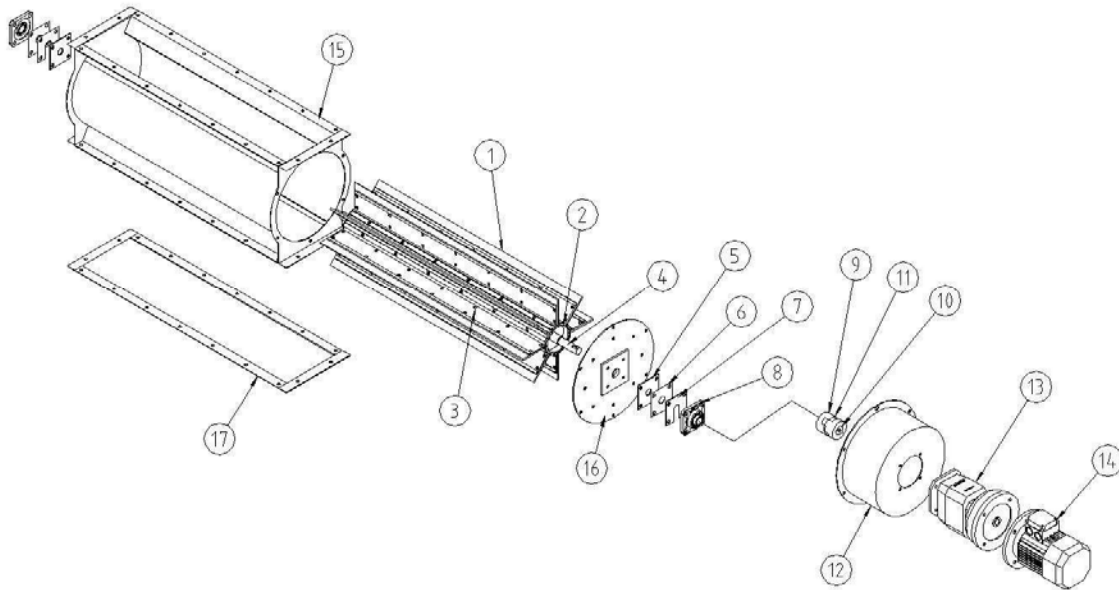
A higher noise level may occur depending on local conditions, like a machine which is connected with other machines. In this case separate measurements may be required.

If the total noise level in the area exceeds 85 dB(A), hearing protection must be used.

9. TROUBLESHOOTING

Failure	Possible causes	Proposed solutions
Rotary valve switches off thermally	<ul style="list-style-type: none"> - Foreign body got stuck - Rotor frozen - Gear motor defective - Rotor defective - Motor protection set incorrectly - Fuse defective - Big voltage drop in power supply 	<ul style="list-style-type: none"> - Remove foreign body - Thaw on the outside with hot air or water - Replace the gear motor - Replace the rotor - Adjust the motor protection - Replace the fuse - Replace the cables to a larger square
Rotary valve is not running	<ul style="list-style-type: none"> - Working switch is off - Motor protection switched off thermally - Conditions of operation are not met in the control system - Fuse defective 	<ul style="list-style-type: none"> - Stop the installation, switch on the working switch - See "Rotary valve switches off thermally" - Investigate why conditions are not met - Replace the fuse
Rotary valve makes "screaming" sound	<ul style="list-style-type: none"> - Foreign body got stuck - Rotor/rotor housing defective 	<ul style="list-style-type: none"> - Remove foreign body - Replace defective part
The material will not pass the valve without accumulation	<ul style="list-style-type: none"> - Volume of material per time unit in periods larger than planned - Airflow opposite through the valve prevents proper material flow - Settling velocity of material less than expected - The material accumulates in lumps which cannot pass - The material is not removed fast enough at the outlet of the valve 	<ul style="list-style-type: none"> - Reduce the volume of material feed, e.g. at chain filter. - More frequent regeneration - Shorter step-interval of chain conveyor - Replace sealing lamellae - Adjust the production machine to change the flow of material - Check the function of the emptying system

10. SPARE PARTS



Pos.	Part No. RS-3	Part No. RS-7,5	Part No. RS-9	Quan.	Description
1	80106-0731	80106-0726	80106-0719	8	Sealing blades
2	80106-0718	80106-0718	80106-0718	2	Sealing ring
3	80106-0730	80106-0725	80106-0720	8	blade retainer
4	80106-0733	80106-0734	80106-0735	1	Shaft complete
5	80105-0093	80105-0093	80105-0093	2	Felt plate for dust sealing
6	80105-0108	80105-0108	80105-0108	2	Base for dust sealing 0,63mm
7	80105-0088	80105-0088	80105-0088	2	Base for dust sealing 2mm
8	85282-0016	85282-0016	85282-0016	2	Flange bearing
9	85285-0018	85285-0018	85285-0018	2	Coupling, half
10	85177-0021	85177-0021	85177-0021	2	Bush for coupling
11	85285-0019	85285-0019	85285-0019	1	Coupling element
12	80106-0429	80106-0429	80106-0429	1	Coupling housing
13	85277-0103	85277-0041	85277-0041	1	Gear
14	85271-0002	85271-0047	85271-0047	1	Electric motor
15	80106-0732	80106-0721	80106-0710	1	Rotor casing
16	80106-0713	80106-0713	80106-0713	1	End plate for rotor casing
17	80106-0122	80106-0096	80106-0448	1	Counterflange

11. DISMANTLING AND RECYCLING

When dismantling a unit, be sure to keep in mind the following important information:

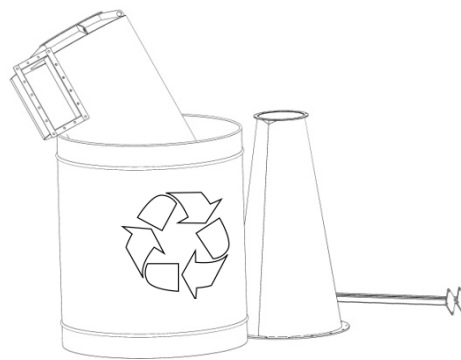
As the unit is dismantled, set aside all still functioning parts in order to re-use them on another unit.

You should always separate the different materials depending on their type : iron, rubber, oils, greases, etc...

Recyclable parts must be disposed of in the appropriate containers or brought to a local recycling company.

The rubbish must be collected in special containers with appropriate labels and disposed of in compliance with the national laws and/or local legislations in force.

CAUTION! It is strictly forbidden to dispose of toxic wastes in municipal sewerage and drain systems. This concerns all oils, greases, and other toxic materials in liquid or solid form.



12. CONTACTS

For spare parts please contact Formula Air Group.

Formula Air
The Netherlands
Bosscheweg 36
SX 5741 Beek en Donk
The Netherlands
Tel: +31 (0) 492 45 15 45
Fax: +31 (0) 492 45 15 99

info-nl@formula-air.com
[view Google Map](#)

Formula Air
Belgium
Rue des Dizeaux 4
1360 Perwez
Belgium
Tel: +32 (0) 81 23 45 71
Fax: +32 (0) 81 23 45 79

info-be@formula-air.com
[view Google Map](#)

Formula Air
Baltic
Televizorių G.20
LT-78137 Šiauliai
Lithuania
Tel: +370 41 54 04 82
Fax: +370 41 54 05 50

info-lt@formula-air.com
[view Google Map](#)

Formula Air
France
Zac de la Carrière Doree
BP 105, 59310 Orchies
France
Tel: +33 (0) 320 61 20 40
Fax: +33 (0) 320 61 20 45

info-fr-nord@formula-air.com
[view Google Map](#)

Formula Air
Est Agence France
2, rue Armand Bloch
25200 Montbéliard
France
Tel: +33 (0) 381 91 70 71
Fax +33 (0) 381 31 08 76

info-fr-est@formula-air.com
[view Google Map](#)

Formula Air
France Agence Ouest
19a rue Deshoulières
44000 Nantes
France
Tel: +33 (0) 251 89 90 75
Fax +33 (0) 251 89 94 06

info-fr-ouest@formula-air.com
[view Google Map](#)

Formula Air
France Agence Sud
Chemin de Peyrecave
09600 Regat
France
Tel: +33 561 66 79 70
Fax: +33 567 07 01 09

info-fr-sud@formula-air.com
[view Google Map](#)

Air Formula
Russia
Нижний Новгород
Россия
Tel: +7 (499) 609 23 45
Fax: +7 (831) 277 85 38

info-ru@formula-air.com
[View Google Map](#)

Formula Air
Vietnam
33, Lot 2, Den Lu 1
Hoang Mai District, Hanoi,
Vietnam
Tel: +84 (4) 38 62 68 01
Fax: +84 (4) 38 62 96 63

info@vinaduct.com
www.vinaduct.com
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NOTE : All drawings and references contained within this manual are non-contractual and are subject to change without prior notice at the discretion of the Formula Air group and its partners.