



04578753
Edition 6
February 2011

Air Motor

SM1, SM2, SM4, SM6, and SM8 Series Reversible

Operation and Maintenance Information

- EN** Operation and Maintenance Information
- ES** Operación y Mantenimiento de Información
- FR** L'utilisation et la Maintenance Informations



Save These Instructions

 **Ingersoll Rand**

WARNING**General Product Safety Information**

- **Important Safety Information enclosed.**
- **Read and understand this manual before operating this tool.**
- **It is your responsibility to make this safety information available to others that will operate this tool.**

WARNING**Failure to observe the following warnings could result in injury.****Placing the Motor in Service**

- Always install, operate, inspect and maintain this product in accordance with all applicable standards and regulations (local, state, country, federal, etc.).
- Always use clean, dry air at 90 psig (6.2 bar/620 kPa) maximum air pressure at the inlet. Higher pressure may result in hazardous situations including excessive speed, rupture, or incorrect output torque or force.
- Ensure an accessible emergency shut off valve has been installed in the air supply line, and make others aware of its location.
- Do not use damaged, frayed or deteriorated air hoses and fittings.
- Always turn off the air supply and disconnect the air supply hose

before installing, removing or performing any maintenance on this motor.

- Do not lubricate with flammable or volatile liquids such as kerosene, diesel or jet fuel. Use only recommended lubricants.
- Keep work area clean, uncluttered, ventilated and illuminated.
- Do not remove any labels. Replace any damaged label.

Using the Motor

- Always wear eye protection when operating or performing maintenance on this motor.
- Always wear hearing protection when operating this motor.
- Always use Personal Protective Equipment appropriate to the motor used. This may include dust mask or other breathing apparatus, safety glasses, ear plugs, gloves, apron, safety shoes, hard hat and other equipment.
- Keep others a safe distance from your work area, or ensure they use appropriate Personal Protective Equipment.
- This motor is not insulated against electric shock.
- Keep hands, loose clothing, long hair and jewelry away from motor.

- Motor and/or accessories may briefly continue their motion after throttle is released.
- Do not operate when tired, or under the influence of medication, drugs, or alcohol.
- Never use a damaged or malfunctioning motor or accessory.
- Do not modify the motor, safety devices, or accessories.
- Do not use this motor for purposes other than those recommended.
- Use accessories recommended for **Ingersoll Rand** Products.

Safety Symbol Identification

Wear Respiratory Protection



Wear Eye Protection



Wear Hearing Protection



Read Manuals Before Operating Products

(Dwg. MHP2598)

Safety Information - Explanation of Safety Signal

DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or property damage.
NOTICE	Indicates information or a company policy that relates directly or indirectly to the safety of personnel or protection of property.

Model Designation Breakout

SM	1AM	A	N
Select Series Air Motors	Series	Shaft/Interface	Mounting
SM	1AM 1UP 2AM 4AM 6AM 8AM	A = Round Shaft With Square Key (Round Shaft on SM1AM Series) B = Round Shaft with Woodruff key #3 C = Round Shaft with Flat on Shaft	N = NEMA Mount None = Face or Foot Mount (Foot Mount is an optional accessory)



IR# 10

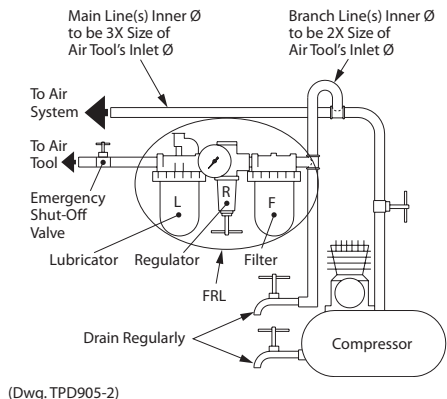
Lubrication

Ingersoll Rand suggests using an air line lubricator with these motors. We recommend a 1/2" Filter-Regulator-Lubricator (FRL) for optimum motor performance and life.

Ingersoll Rand Series vanes are made of a special material that does not require lubrication. While we suggest lube for optimum service life, our vanes have been shown to last substantially longer than standard laminate versions. This makes **Ingersoll Rand** motors a good choice for Food Grade or Clean Room environments where oil is not permitted.

Installation

The use of 1/2" Filter, Regulator, Lubricator (FRL), in the air supply line is recommended. Attach the unit as close to the motor as practical. Refer to Air Motor Catalog ("Components, Equipments and Accessories" Section) for the recommended **Ingersoll Rand** FRL that can provide optimal performance.



Servicing the Motor

Operation

NOTICE

If the motor operates sluggishly, flush it with a clean, non-toxic, nonflammable commercial solvent in a well ventilated area.

To flush the motor:

1. Disconnect the air line and muffler.
2. Pour 6 to 8 cc of solvent into each inlet.
3. Rotate the motor shaft by hand in both directions several times to ensure all internal parts of motor are thoroughly cleaned.
4. Apply air pressure to the inlet and slowly increase the air flow until there is no trace of the solvent in the exhaust.
5. After flushing, shut off the air supply and disconnect air supply line.
6. Pour 6 to 8 cc of a **Ingersoll Rand** # 10 motor oil into the air inlet.
7. Reconnect the air supply line, slowly increase the air pressure to

8. If the motor is still low in power, return motor to your nearest service repair center.

⚠ ADVERTENCIA**Información general sobre seguridad del producto**

- **Importante información de seguridad adjunta.**
- **Lea este manual y asegúrese de comprenderlo bien antes de utilizar este producto.**
- **Es su responsabilidad poner esta información de seguridad a disposición de quienes vayan a utilizar el producto.**

⚠ ADVERTENCIA**El hecho de hacer caso omiso a las advertencias siguientes podría ocasionar lesiones.****La colocación del motor en servicio**

- Instale, utilice, inspeccione y mantenga siempre este producto de acuerdo con todas las regulaciones y normas aplicables (locales, estatales, nacionales, federales, etc.).
- Use siempre aire limpio y seco a una presión máxima de 60 psig (4,2 bares/413 kPa) en la entrada de aire del dispositivo. Una presión superior puede redundar en situaciones peligrosas, entre ellas una velocidad excesiva, rotura, o un par o una fuerza de salida incorrectos.
- Asegúrese de que la válvula de cierre de emergencia accesible haya sido instalada en la línea de alimentación de aire y ponga su ubicación en conocimiento de los demás.

- No utilice mangueras de aire y accesorios dañados, desgastados ni deteriorados.
- Corte siempre el suministro de aire y desconecte la manguera de suministro de aire antes de instalar, desmontar o ajustar cualquier accesorio de esta herramienta, o antes de realizar cualquier operación de mantenimiento de la misma.
- No lubrique las herramientas con líquidos inflamables o volátiles tales como queroseno, gasoil o combustible para motores a reacción. Use sólo los lubricantes recomendados.
- Mantenga la zona de trabajo limpia, despejada, ventilada e iluminada.
- No retire ninguna etiqueta. Sustituya cualquier etiqueta dañada.

Usando el motor

- Use siempre protección ocular cuando utilice o realice operaciones de mantenimiento en este motor.
- Use siempre protección para los oídos cuando maneje esta motor.
- Utilice siempre el equipo de protección individual que corresponda a la correspondencia de la de motor usado. Esto puede incluir una mascarilla contra el polvo u otro aparato de respiración, gafas de seguridad, tapones para los oídos, guantes, delantal, zapatos de seguridad, casco y otros artículos.
- Mantenga a los demás a una distancia segura de la zona de trabajo o asegúrese de que utilizan el correspondiente equipo de protección individual.
- Este motor no está aislado contra descargas eléctricas.

- Mantenga las manos, la ropa suelta, el cabello largo y las alhajas apartados del extremo de trabajo de la motor.
- El movimiento de la Motor y / o accesorios puede prolongarse brevemente después de soltarse el mando.
- No utilice este producto cuando esté cansado o bajo la influencia de medicamentos, drogas o alcohol.
- No utilice nunca un motor o un accesorio dañado o que no funcione correctamente.
- No modifique la motor, los dispositivos de seguridad ni los accesorios.
- No utilice esta motor para otros fines que no sean los recomendados.
- Utilice accesorios recomendados por **Ingersoll Rand** Productos.

Identificación de los símbolos de seguridad

Utilice protección respiratoria



Utilice protección ocular



Utilice protección acústica



Lea los manuales antes de utilizar el producto

(Dwg. MHP2598)

Información de seguridad: Explicación de los mensajes de las señales de seguridad

PELIGRO

Indica una situación de peligro inminente que, de no evitarse, resultaría en lesiones graves o muerte.



ADVERTENCIA

Indica una situación potencialmente peligrosa que, de no evitarse, podría resultar en lesiones graves o muerte.



CUIDADO

Indica una situación potencialmente peligrosa que, de no evitarse, podría producir lesiones de leves a moderadas o daños en la propiedad.

AVISO

Indica información o una política de la empresa directa o indirectamente relacionada con la seguridad del personal o la protección de la propiedad.

Designación de modelo

SM
|
Select Series
Motor de Aire

SM

1AM
|
Series

1AM
1UP
2AM
4AM
6AM
8AM

A
|
Eje/Interfaz

A = Ronda del eje con la llave cuadrada (Eje de la Ronda SM1AM Series)
B = Ronda de eje con Woodruff tecla # 3
C = Ronda de eje con plano en el eje

N
|
Montaje

N = NEMA Monte
None = Cara o del pie del Monte (Pie del Monte es un accesorio opcional)



IR# 10

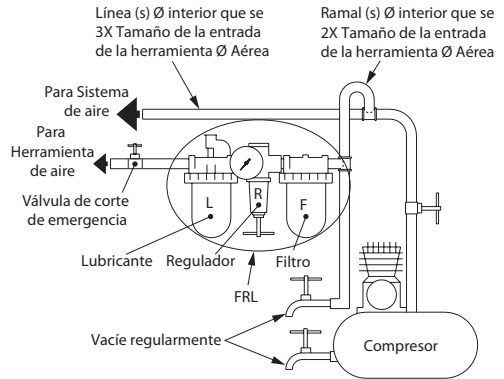
Lubricación

Ingersoll Rand sugiere el uso de un lubricante de aire comprimido con estos motores. Se recomienda de 1 / 2 "Filtro-Regulador-Lubricador (FRL) para un rendimiento óptimo del motor y la vida.

Ingersoll Rand paletas de la serie están hechas de un material especial que no requiere lubricación. Aunque le sugerimos lubricación para una vida útil óptima, nuestro paletas se ha demostrado que por última considerablemente más que las versiones laminado. Esto hace que **Ingersoll Rand** motores una buena opción para la alimentación de grado o limpieza en los entornos de la habitación donde el petróleo no está permitido.

Instalación

El uso de 1 / 2 "Filtro, regulador, lubricador (FRL), en la línea de suministro de aire se recomienda. Coloque la unidad lo más cerca del motor como sea posible. Consulte el Catálogo de aire del motor ("Componentes, Equipos y Accesorios" Sección) recomienda para la FRL **Ingersoll Rand** que puede proporcionar un rendimiento óptimo.



(Dwg. TPD905-2)

Mantenimiento del Motor

Funcionamiento

AVISO

Si el motor funciona lentamente, tirar de la cadena con un paño limpio, no tóxico, no inflamable solvente comercial en un área bien ventilada.

Para lavar el motor:

1. Desconecte la línea de aire y silenciador.
2. Vierta 6 a 8 cc de disolvente en cada orificio de salida.
3. Gire el eje del motor con la mano en ambos sentidos varias veces para asegurar que todas las partes internas del motor se limpian a fondo.
4. Aplique presión de aire a la entrada y poco a poco aumentar el flujo de aire hasta que no hay rastro del solvente en el escape.
5. Después de lavar, cortar el suministro de aire y desconectar la línea de suministro de aire.
6. Vierta 6 a 8 cc de **Ingersoll Rand** aceite de motor # 10 en la entrada de aire.

7. Vuelva a conectar la línea de suministro de aire, aumente lentamente la presión del aire para asegurar que todas las partes internas del motor se cubre con una capa de aceite.
8. Si el motor sigue siendo baja en el poder, el motor regresar a su centro de servicio de reparación.

AVERTISSEMENT**Informations générales relatives à la sécurité du produit**

- Des informations de sécurité importantes sont fournies à l'intérieur.
- Veuillez lire attentivement ce manuel avant d'utiliser ce l'outil.
- Il vous incombe de transmettre les présentes informations de sécurité à tous les utilisateurs du l'outil.

AVERTISSEMENT**Le non respect des avertissements suivants pourra entraîner des blessures.****Placer le moteur en service**

- Installez, utilisez, inspectez et entretenez toujours ce produit conformément à toutes les normes et réglementations en vigueur (locales, nationales, fédérales, européennes, etc.).
- Utilisez toujours de l'air propre et sec à une pression maximum de 90 psig (6,2 bar/620 kPa) en entrée. Une pression supérieure peut en effet générer des situations à risques, notamment une vitesse excessive, une rupture ou encore une force ou un couple de sortie inadéquat(e).
- Vérifiez qu'un robinet d'arrêt d'urgence accessible a bien été installé dans le circuit d'alimentation d'air et indiquez son emplacement à l'ensemble du personnel.

- N'utilisez pas des flexibles ni des raccords endommagés, efflochés ou détériorés.
- Toujours fermer l'alimentation en air et débrancher le tuyau d'alimentation avant d'installer, d'enlever ou de régler tout accessoire sur cet outil, ou avant de procéder à tout entretien.
- Ne lubrifiez pas les outils avec des liquides inflammables ou volatils, tels que le kérosène et le gasoil. Utilisez exclusivement les lubrifiants recommandés.
- Maintenir le lieu de travail propre, dégagé, aéré et bien éclairé.
- Do not remove any labels. Remplacer toutes les étiquettes endommagées.

Utilisation du moteur

- Portez toujours une protection oculaire lorsque vous utilisez ce moteur ou procédez à sa maintenance.
- Portez toujours une protection auditive lors de l'utilisation de cet moteur.
- Toujours utiliser des équipements de protection individuelle appropriés pour le moteur utilisé. Il peut s'agir de masques anti-poussière ou d'autres dispositifs respiratoires, de lunettes de sécurité, de bouchons anti-bruit, de gants, d'un tablier, de chaussures de sécurité, d'un casque, etc.
- Pour des raisons de sécurité, tenir les autres personnes à l'écart de la zone de travail ou vérifier qu'elles ont revêtu les équipements de protection individuelle appropriés.
- Ce moteur n'est pas isolé contre les chocs électriques.

- Maintenez les mains, les vêtements amples, les cheveux et les bijoux à distance de moteur.
- Moteur et/ou les accessoires peuvent continuer à se déplacer brièvement après que la gâchette a été relâchée.
- N'utilisez pas à lorsque vous êtes fatigué(e), sous l'effet de médicaments, ou sous l'emprise de drogues ou d'alcool.
- N'utilisez jamais un appareil ni un moteur endommagé, ou ne fonctionnant pas correctement.
- N'essayez jamais de modifier moteur, les dispositifs de sécurité ni les accessoires.
- N'utilisez pas ce moteur à des fins autres que celles recommandées.
- Utilisez les accessoires recommandés pour **Ingersoll Rand** Produits.

Identification du Symbole de Sécurité

Portez une protection respiratoire



Portez une protection oculaire



Portez une protection auditive



Lisez attentivement les manuels avant d'utiliser le produit

(Dwg. MHP2598)

Informations de sécurité - Explication des termes des signaux de sécurité**DANGER**

Signale une situation de danger imminent qui, si elle n'est pas évitée, peut entraîner la mort ou des blessures graves.

AVERTISSEMENT

Signale une situation de danger potentiel qui, si elle n'est pas évitée, peut provoquer la mort ou des blessures graves.

ATTENTION

Signale une situation de danger potentiel qui, si elle n'est pas évitée, peut provoquer des blessures mineures ou modérées ou des dommages matériels.

AVIS

Signale une information ou une règle de l'entreprise en rapport direct ou indirect avec la sécurité du personnel ou avec la protection des biens.

Désignation du modèle - Breakout

SM

 Select Series
Moteur à air

SM

1AM

Série

 1AM
1UP
2AM
4AM
6AM
8AM

A

Arbre / Interface

 A = Arbre ronde Avec
clé carrée (arbre
ronde sur SM1AM
Series)
B = Ronde Arbre avec
Woodruff clés # 3
C = Ronde Arbre avec
plat sur l'arbre

N

Montage

 N = NEMA Mount
None = Le visage ou Foot
Mount (Foot Mount
est un accessoire
optionnel)


IR# 10

Lubrification

Ingersoll Rand propose d'utiliser un lubrificateur avec ces moteurs. Nous recommandons une 1/2" Filtre-régulateur-lubrificateur (FRL) pour une performance optimale du moteur et de la vie.

Ingersoll Rand aubes de série sont faites d'un matériau spécial qui ne nécessitent pas de lubrification. Alors que nous vous suggérons de lubrifiant pour la durée de vie optimale, nos aubes ont été montré au dernier beaucoup plus long que des versions standard stratifié. Cela rend **Ingersoll Rand** moteurs un bon choix pour de qualité alimentaire ou Clean Room environnements où le pétrole n'est pas autorisée.

Installation

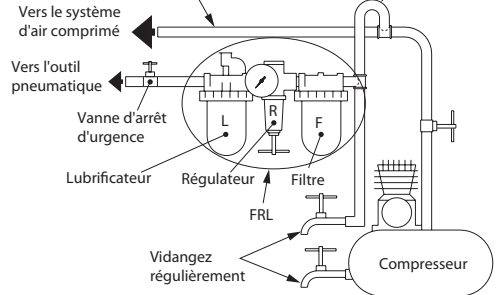
L'utilisation de 1/2" Filtre, régulateur, lubrificateur (FRL), dans la ligne d'alimentation en air est recommandé. Fixer l'unité au plus près du moteur en pratique.

Reportez-vous à moteur pneumatique Catalogue (composants, équipements et accessoires") pour le recommandé FRL

Ingersoll Rand qui peuvent fournir des performances optimales.

La section de la conduite principale doit être 3 fois supérieure à celle de l'alimentation de l'outil pneumatique.

La section du conduit de raccordement doit être 2 fois supérieure à celle de l'alimentation de l'outil pneumatique.



(Dwg. TPD905-2)

Entretien du moteur

Opération

AVIS

Si le moteur fonctionne lentement, rincez-le avec un chiffon propre, non-toxique, non inflammable commerciale solvant dans un endroit bien aéré.

Pour rincer le moteur:

1. Débranchez la conduite d'air et le silencieux.
2. Pour 6 à 8 cc de solvant dans chaque entrée.
3. Tournez l'arbre du moteur à la main dans les deux sens à plusieurs reprises pour s'assurer que toutes les pièces internes du moteur sont nettoyés à fond.
4. Appliquez la pression d'air à l'entrée et à augmenter lentement le débit d'air jusqu'à ce qu'il n'y a pas trace de solvant dans les gaz d'échappement.
5. Après le rinçage, couper l'alimentation en air et débrancher le tuyau d'alimentation en air.

6. Pour 6 à 8 cc **Ingersoll Rand # 10** Huile de moteur dans l'entrée d'air.
7. Rebranchez la conduite d'alimentation d'air, augmenter lentement la pression d'air pour assurer toutes les pièces internes du moteur sera recouverte d'une pellicule d'huile.
8. Si le moteur est encore faible en puissance, le moteur revenir à votre centre de service le plus proche de réparation.

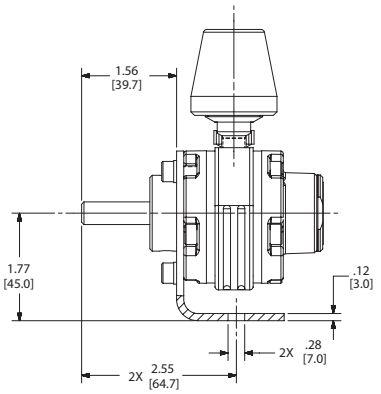
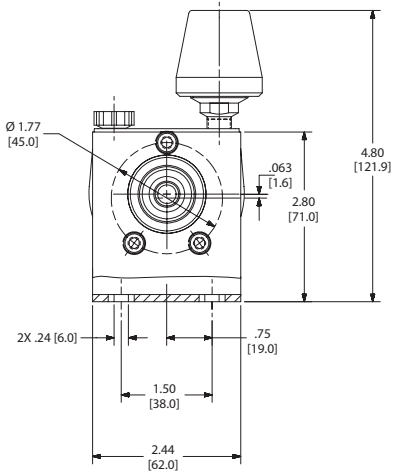
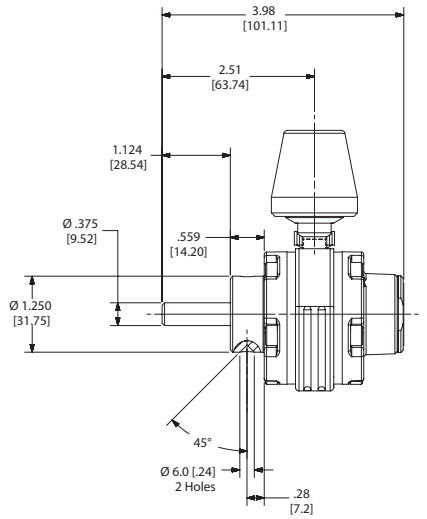
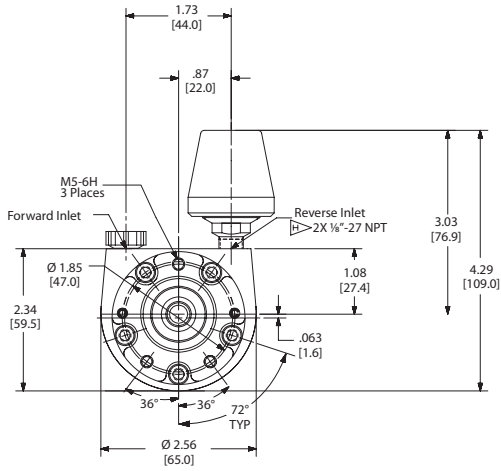
Specifications

Series	Max Power		Speed at Max. Power	Free Speed *	Starting Torque		Stall Torque		Air Consumption at Max. Power		Weight	
	hp	kw	rpm	rpm	lb.-ft.	Nm	lb.-ft.	Nm	scfm	m ³ /m	lb.	kg
SM1AM	0.33	0.25	7600	15200	0.29	0.39	0.38	0.52	17	0.5	1.50	0.70
SM1UP	0.60	0.37	6000	12500	0.45	0.61	0.60	0.81	42	1.2	1.75	0.80
SM2AM	0.88	0.66	3000	7900	1.70	2.30	2.30	3.10	48	1.4	7.50	3.40
SM4AM	1.50	1.10	3000	7900	2.60	3.50	4.10	5.60	67	1.9	8.25	3.70
SM6AM	3.60	2.70	3000	7900	5.30	7.20	8.70	11.80	120	3.4	16.25	7.40
SM8AM	4.80	3.60	2500	7000	10.00	13.60	14.00	19.00	152	4.3	22.50	10.20

* ALL models must be operated with sufficient load to prevent speed from exceeding maximum allowable speed shown on performance curve. Performance figures are at 90 psig (620 kPa) air pressure, with muffler installed.

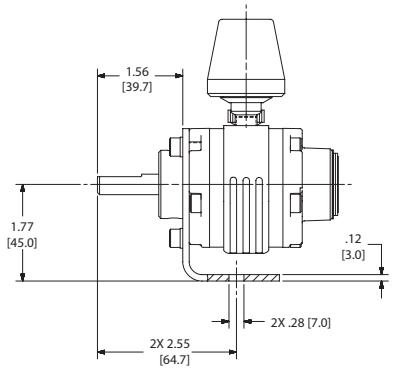
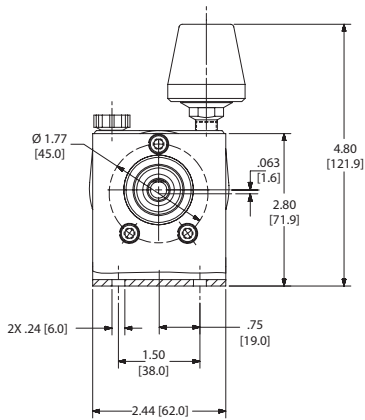
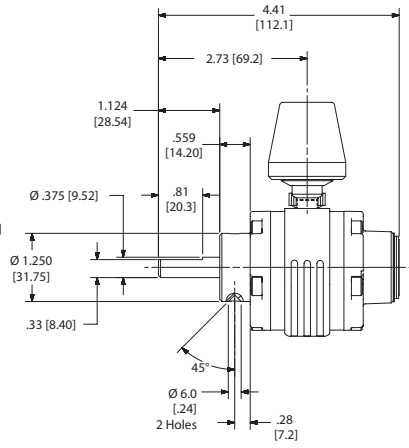
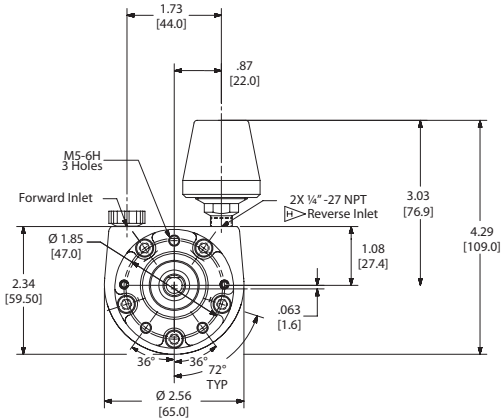
Dimension Drawings

Models SM1AMA



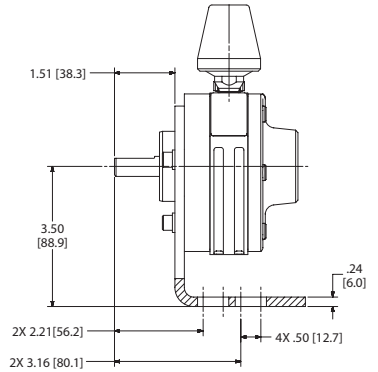
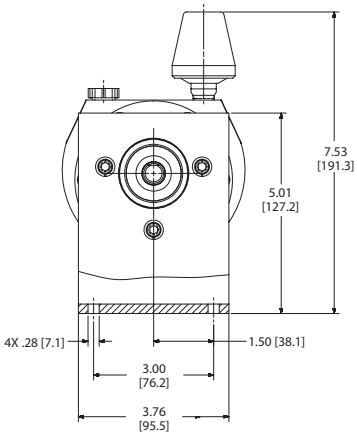
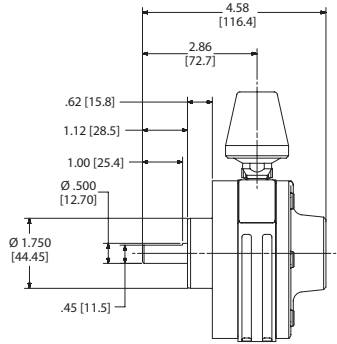
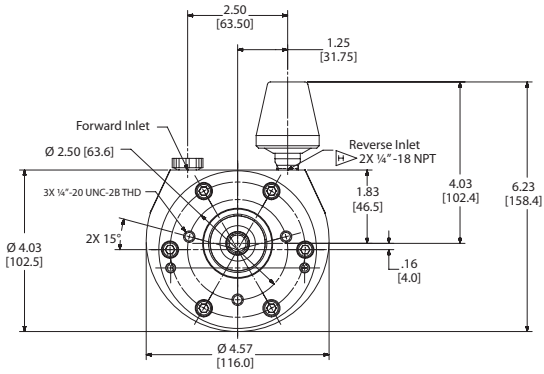
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Model SM1UPC



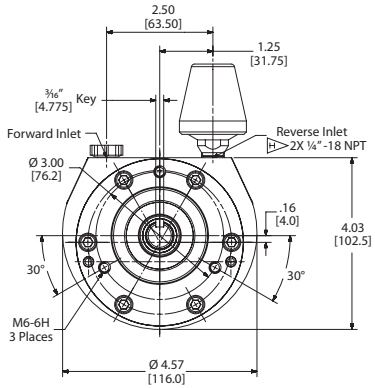
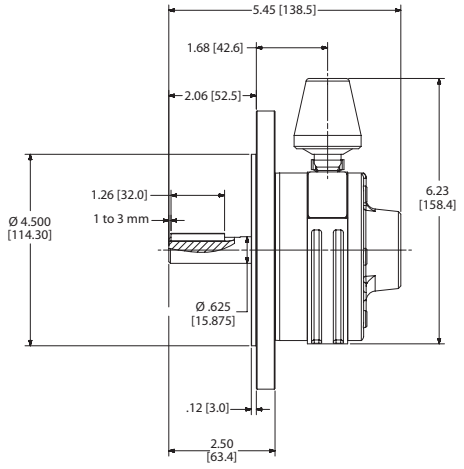
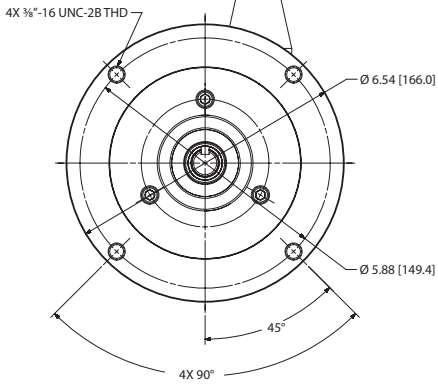
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Model SM2AMC



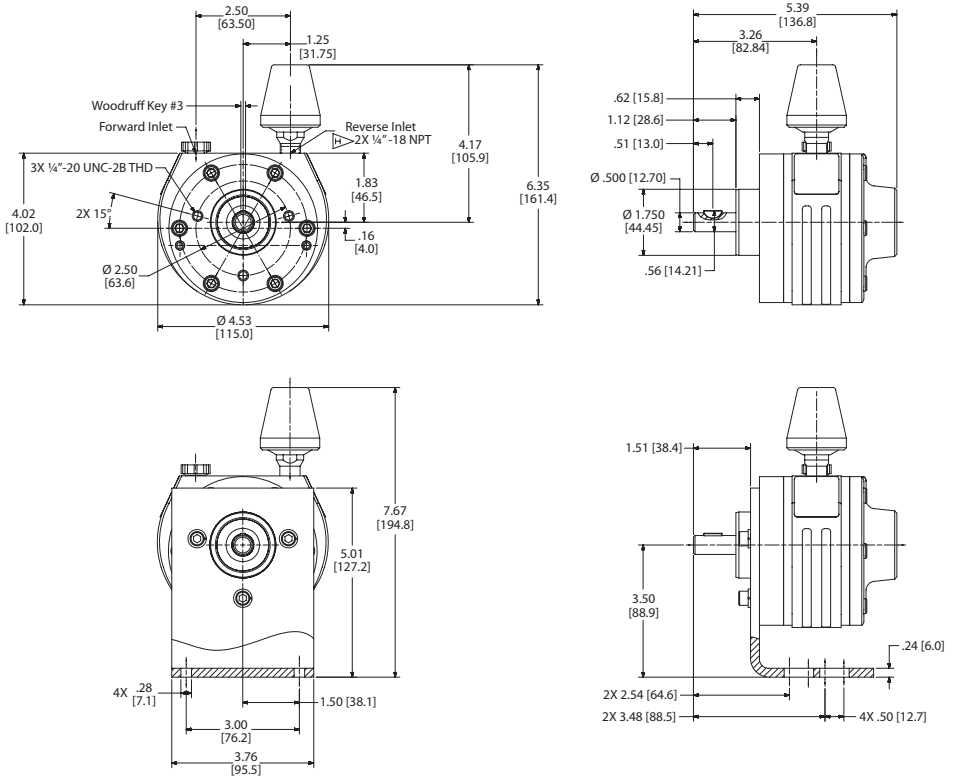
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Model SM2AMAN



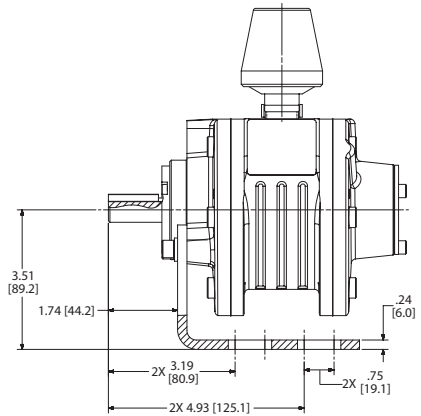
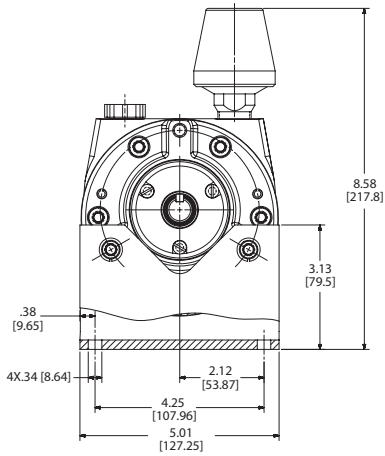
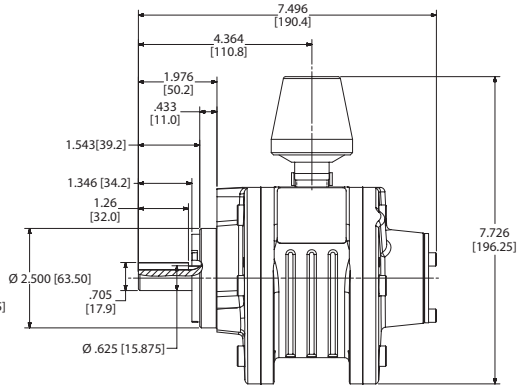
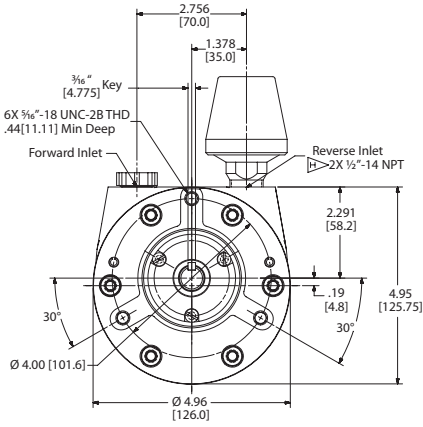
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Model SM4AMB



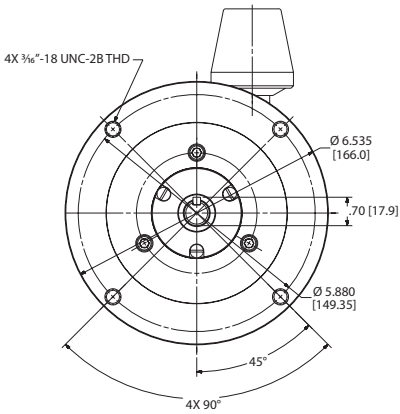
(Dwg. 10553857)

Model SM6AMA

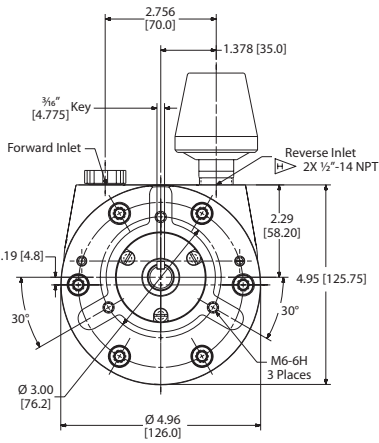
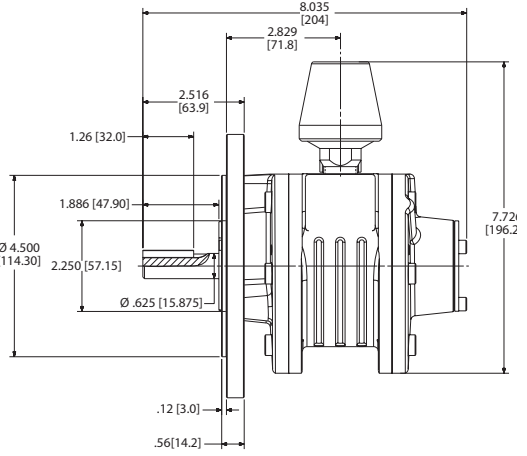


(Dwg. 10553725)

Model SM6AMAN



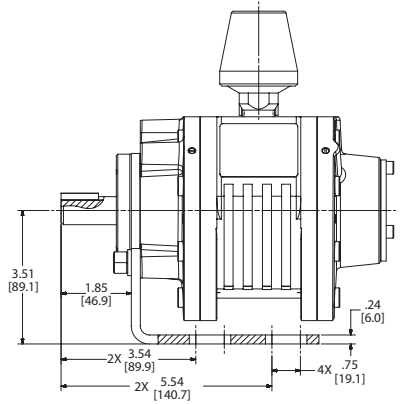
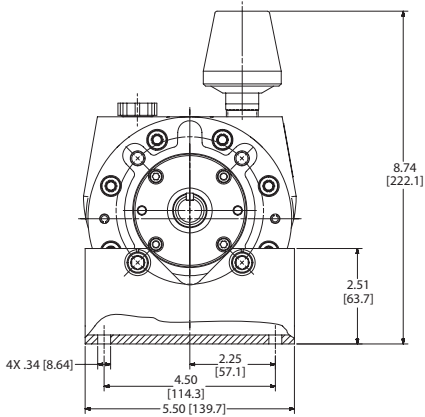
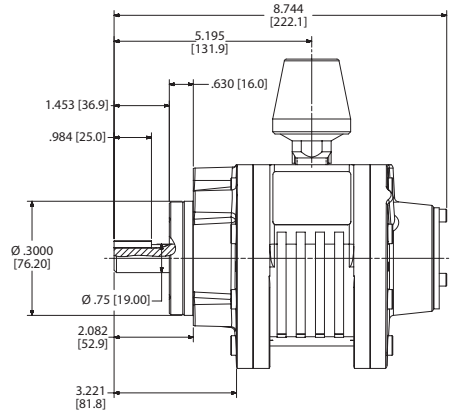
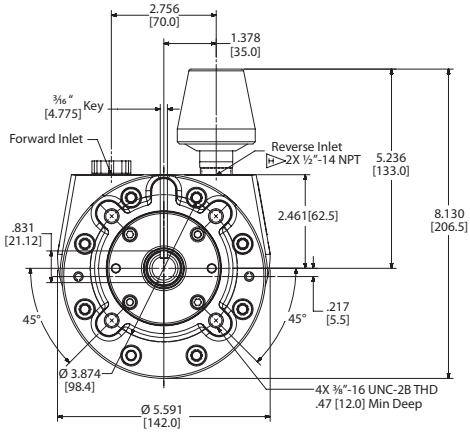
(Motor dimensions with Flange)



(Motor dimensions with Flange not shown)

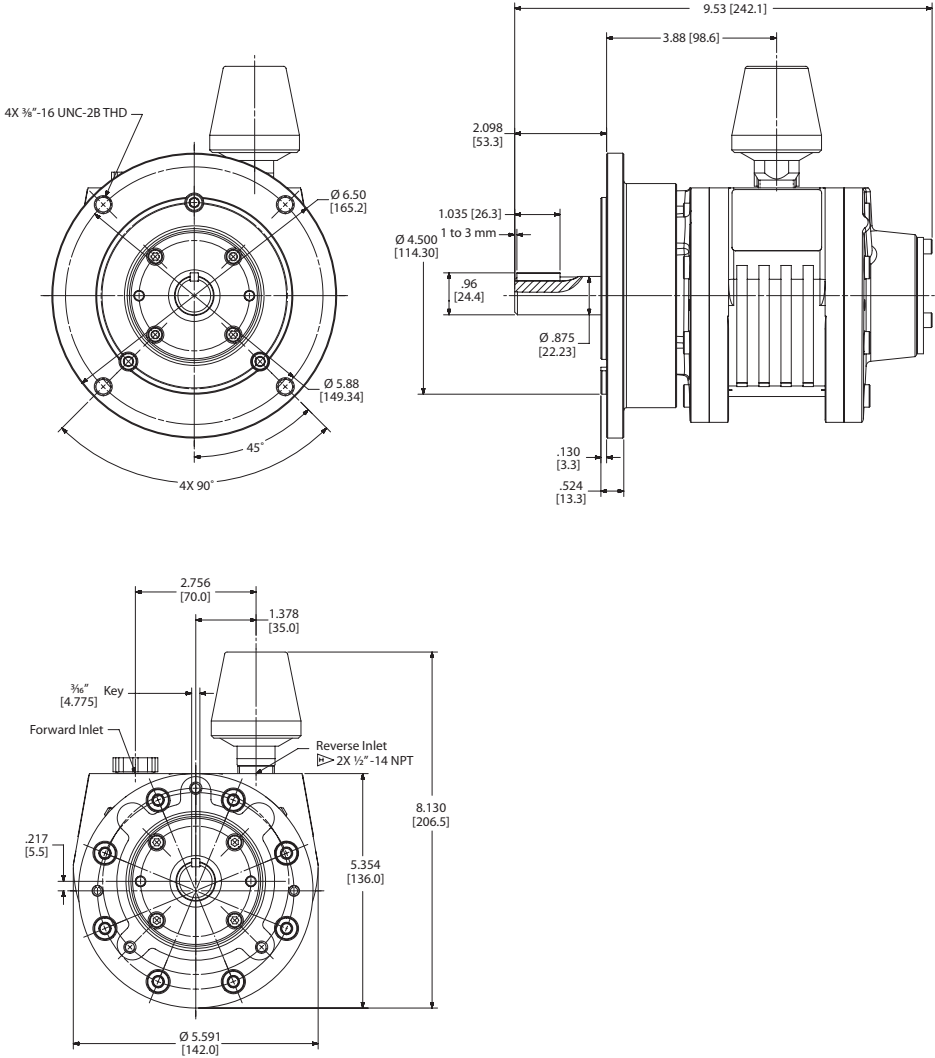
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Model SM8AMA



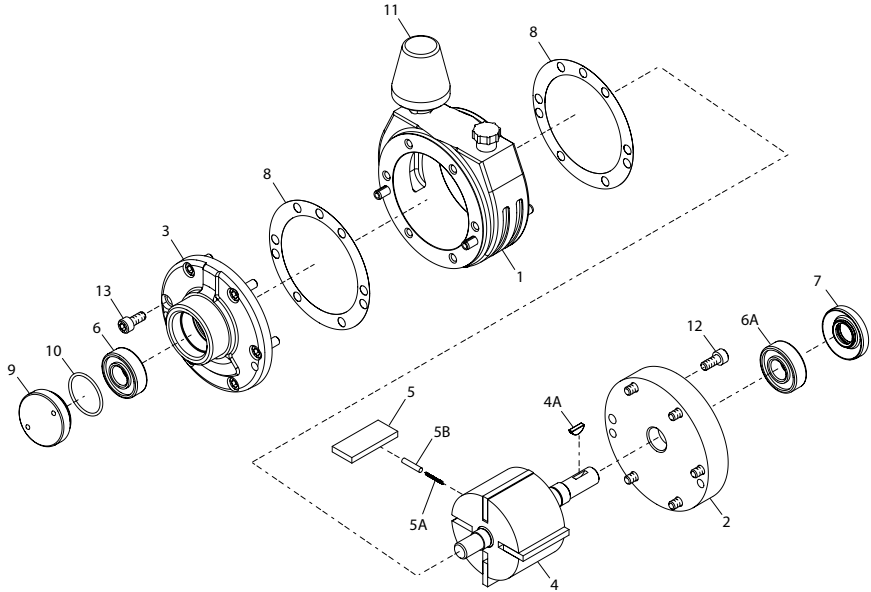
(Dwg. 10553766)

Model SM8AMAN



(Dwg. 10553998)

SM- Series Air Motor - Exploded View



(Dwg. TPM1002)

SM- Series Air Motor - Parts List

Item	Description	Part Number
1	Cylinder	**
2	Front End Plate	**
3	Rear End Plate	**
4	Rotor	**
4A	Drive Key	**
5	Vane (4)	See Service Kits
5A	Vane Spring (2)	**
5B	Vane Pin (4)	**
6	Rear Rotor Bearing	**
6A	Front Rotor Bearing	**
7	Rotor Shaft Seal	**
8	Gasket (2)	**
9	Rear End Cap	**
10	End Cap Gasket	**
11	Muffler Assembly	See Service Kits
12	Front End Plate Cap Screw (6)	**
13	Rear End Plate Cap Screw (6)	**
*	Mounting Foot	See Service Kits
*	Mounting Flange	See Service Kits

* Not shown

** Parts not sold separately (only sold in complete Motor or Tune-Up Kit)

Equipment Options

Series	Furnished with Catalogue Models		Optional Accessories
	Mounting	Muffler	
SM1AM	3 Hole Face Mount	Supplied with Motor	SM1AM-AG587 Mounting Foot
SM1UP			SM2AM-AH636 Mounting Foot
SM2AM	3 Hole Face Mount		---
	NEMA 56C Flange with SM2AMAN		SM4AM-AH634 Mounting Foot
SM4AM	3 Hole Face Mount		---
	NEMA 56C Flange with SM4AMAN		SM6AM-AH634 Mounting Foot
SM6AM	2 Hole Face Mount		---
	NEMA 56C Flange with SM6AMAN		SM8AM-AH640 Mounting Foot
SM8AM	2 Hole Face Mount	---	
	NEMA 56C Flange with SM8AMAN	---	

Service Kits

(includes illustrated parts 5, 6, 6A, 7, 8 and 10)

Model	Muffler Assembly	Mounting Foot	Vane Kit	Tune-up Kit
SM1AMA	MRV003A-010-RP	SM1AM-AG587	SM1AMA-005	SM1AMA-TK1
SM1UPC			SM1UPC-005	SM1UPC-TK1
SM2AMAN	MRV015A-010-RP	-	SM2AMC-005	SM2AMAN-TK1
SM2AMC		SM2AM-AH636		SM2AMC-TK1
SM4AMAN		-	SM4AMB-005	SM4AMAN-TK1
SM4AMB		SM4AM-AH634		SM4AMB-TK1
SM6AMA	MRV040A-010-RP	SM6AM-AH634	SM6AMA-005	SM6AMA-TK1
SM6AMAN		-		
SM8AMA		SM8AM-AH640	SM8AMA-005	SM8AMA-TK1
SM8AMAN		-		

Maintenance Section

NOTICE

If the motor operates sluggishly, flush it with a clean, non-toxic, nonflammable commercial solvent in a well ventilated area.

To flush the motor:

1. Disconnect the air line and muffler.
2. Pour 6 to 8 cc of solvent into each inlet.
3. Rotate the rotor shaft by hand in both directions several times to ensure all internal parts of motor are thoroughly cleaned.
4. Apply air pressure to the inlet and slowly increase the air flow until there is no trace of the solvent in the exhaust.
5. After flushing, shut off the air supply and disconnect air supply line.
6. Pour 6 to 8 cc of a high detergent IR# 10 motor oil into the air inlet.
7. Reconnect the air supply line, slowly increase the air pressure to ensure all internal parts of motor will be covered with a film of oil.
8. If the motor is still low in power, check for damaged vanes or foreign material in the vane slots in the Rotor.

Vane Replacement

Periodically, check the Vanes for wear. Always replace Vanes in sets, never replace an individual Vane.

Vanes life is dependant upon the Speed of the Motor, Operating pressure, Lubrication, and Preventive Maintenance. Periodically, you should check the Vanes for wear, and replace them if the width of the Vane is equal to or less than the replacement width shown below:

Model	Width of New Vane	Width of Replacement Vane
SM1AM	21/64 inch (8.33 mm)	5/16 inch (7.94 mm)
SM1UP	21/64 inch (8.33 mm)	5/16 inch (7.94 mm)
SM2AM	21/64 inch (8.33 mm)	9/32 inch (7.00 mm)
SM4AM	3/4 inch (19.05 mm)	9/16 inch (14.29 mm)
SM6AM	13/16 inch (20.60 mm)	25/32 (19.80 mm)
SM8AM	29/32 inch (23.00 mm)	57/64 inch (22.60 mm)

Always replace Vanes in sets; never replace an individual Vane.

Replace Vanes as follows:

1. Disconnect the air line at the motor.
2. Unscrew and remove the Rear End Cap.
3. Unscrew and remove the Rear End Plate Cap Screws.
4. Using a puller, pull the Rear End Plate along with the Rear Rotor Bearing from the motor.
5. Wipe each of the new Vanes to be installed with a thin film of light oil.
6. Orientate the Rotor with one open Vane slot facing down vertically in the Cylinder.
7. Insert Vane into slot with notch facing the center of the Rotor.
8. Rotate the Rotor 90 degrees and repeat the procedure.
9. Repeat the procedure with each Vane.

NOTICE

The use of other than genuine Ingersoll Rand replacement parts may result in decreased tool performance and increased maintenance, and may invalidate all warranties.



WARNING

Always wear eye protection when operating or performing maintenance on this motor.

Always turn off air supply and disconnect supply hose before installing, removing or adjusting any accessory on this motor, or before performing any maintenance on this motor.

Disassembly

General Instructions

1. Always disconnect the air line at the motor before attempting any disassembly.
2. Do not disassemble the motor any further than necessary to replace or repair damaged parts.
3. Do not withdraw the Rotor from the Cylinder unless it is absolutely necessary. Vanes can easily be replaced without withdrawing the Rotor. (see "Vane Replacement" section).
4. When grasping a part in a vise, always use leather-covered or copper-covered vise jaws to protect the surface of the part and help prevent distortion. This is particularly true of threaded members and housings.
5. Do not remove any part which is a press fit in or on a subassembly unless the removal of that part is necessary for repairs or replacement.
6. Important: After these motors were assembled at the factory, Cylinder Dowel alignment pins were pressed into the End Plates and Cylinder. During disassembly, these pins will usually remain with the Cylinder. Do not remove them.

Disassembly of the Rear End Plate

1. Unscrew and remove the Rear End Cap (9).
2. Unscrew and remove the Rear End Plate Screws (13).
3. Using a puller, pull the Rear End Plate (3) along with the Rear Rotor Bearing (6) from the motor.
4. The Rear Rotor Bearing is a slip fit in the Rear End Plate. Slide or push it from the bearing recess.

Disassembly of the Front End Plate

1. Unscrew the Front End Plate Cap Screws (12).
2. Using a puller, pull the Front End Plate (2) along with the Front Rotor Bearing (6A) from the rotor shaft.
3. The Rotor Shaft Seal (7) is pressed into the Front End Plate. Do not remove this Seal unless you have a new Seal on hand. This Seal is always destroyed in the removal process. If you have to remove the Rotor Shaft Seal, pry it out with a large screwdriver.
4. The Front Rotor Bearing is a slip fit in the Front End Plate. Slide or push it from the bearing recess.

Removal of the Rotor

1. If the Rotor (4) must be withdrawn from the Cylinder, remove the Rear End Plate as previously described.
2. Unscrew the Front End Plate Cap Screws.
3. Carefully withdraw the assembled Front End Plate and Rotor from the Cylinder. **Caution: As you withdraw the Rotor, grasp the rotor body so that the Vanes (5) do not fall out.**
4. After withdrawing the Rotor, remove the Vanes.
5. Support the Front End Plate as close to the rotor body as possible, and press the Rotor from the Front Rotor Bearing.

Assembly

General Instructions

1. Always wipe all parts with a thin film of oil before installing them in the motor.
2. Always press on the **inner ring** of a ball-type bearing when installing the bearing on a shaft.
3. Always press on the **outer ring** of a ball-type bearing when pressing the bearing into a bearing recess.
4. Whenever grasping a part in a vise, always use leather-covered or copper-covered vise jaws to protect the surface of the part and help prevent distortion. This is particularly true of threaded members and housings.

Assembly of the Rear End Plate

1. Support the Motor on the Front End Plate (2).
2. Place End Plate Gasket (10) on the rear face of the Cylinder (1), making certain that it is properly oriented relative to the Cylinder Dowels and tapped holes in the Cylinder.

NOTICE

If you are installing a new Gasket, you will have to punch or cut two holes in it to accommodate the Cylinder Dowels. Do this by placing the Gasket on the Gasket on the Rear End Plate to determine the location of the dowel holes. Use a proper size gasket punch to cut the required dowel holes.

3. Align the dowel holes in the Rear End Plate (3) with Cylinder Dowels in the Cylinder and, using a plastic hammer, tap the Rear End Plate into place against the Gasket.
4. Using a sleeve that contacts only the inner ring of the Bearing, press the Rear Rotor Bearing (6) onto the rotor shaft until it seats in the bearing recess in the Rear End Plate.

CAUTION

Do not bind the End Plate against the Rotor.

5. Rotate Rotor (4) by hand. It should rotate freely with no binding or rubbing against the Cylinder. If the Rotor rubs or binds, tap the top edge of the Rear End Plate with a plastic hammer in the area midway between the inlet and outlet ports. Tap the End Plate gently. The Rotor needs only 0.0015 inch (0.038 mm) clearance from the top of the Cylinder. If the Rotor continues to rub, it may be contacting the Front End Plate due to pressing on the Rear Rotor Bearing. Lightly tap the output end of the rotor shaft with a plastic hammer. The Rotor needs about 0.002 inch (0.05 mm) clearance between the rotor body and each End Plate.
6. When the Rotor turns freely, install the End Plate Cap Screws (13). Tighten them to 8 to 10 ft-lb (10.8 to 13.5 Nm).
7. Slip End Cap Gasket (10) over the threaded hub of Rear End Cap (9) and thread the Rear End Cap into Rear End Plate.

Assembly of the Front End Plate

1. Support the Motor on the Rear End Plate.
2. Place an End Plate Gasket on the front face of the Cylinder, making certain that it is properly oriented relative to the Cylinder Dowels and tapped holes in the Cylinder.

NOTICE

If you are installing a new Gasket, you will have to punch or cut two holes in it to accommodate the Cylinder Dowels. Do this by placing the Gasket on the Gasket on the Rear End Plate to determine the location of the dowel holes. Use a proper size gasket punch to cut the required dowel holes.

3. Align the dowel holes in the Front End Plate with the Cylinder Dowels in the Cylinder and, using a plastic hammer, tap the Front End Plate into place against the Gasket.
4. Using a sleeve that contacts only the inner ring of the Bearing, press the Front Rotor Bearing (6A) onto rotor shaft until it seats in the bearing recess in the Front End Plate.
5. Rotate the Rotor by hand. It should rotate freely with no binding or rubbing against the Cylinder. If the Rotor rubs or binds, tap the top edge of the Front End Plate with a plastic hammer in the area midway between the inlet and outlet ports. Tap the End Plate gently. The Rotor needs only 0.0015 inch (0.038 mm) clearance from the top of the Cylinder. If the Rotor continues to rub, it may be contacting the Rear End Plate due to pressing on the Front Rotor Bearing. Remove the Rear End Cap and lightly tap the end of the rotor hub with a plastic hammer. The Rotor needs about 0.002 inch (0.05 mm) clearance between the rotor body and each End Plate.
6. When the Rotor turns freely, install the Front End Plate Cap Screws (12). Tighten them to 8 to 10 ft-lb (10.8 to 13.5 Nm).

7. Moisten the lip of a new Rotor Shaft Seal (7) with O-Ring lubricant, and press the Seal, lip side first, into the Front End Plate until the trailing face of the Seal is flush with the face of the End Plate.

Assembly of the Motor

1. Position the Rotor vertically on the table of an arbor press so that the short hub is upward.
2. Place the Rear End Plate, flat side first, on the short hub of the Rotor.
3. Place a 0.002 inch (0.05 mm) thick shim on each side of the Rotor between the rotor body and the Rear End Plate.
4. Using a sleeve that contacts only the inner ring of the Bearing, press the Rear Rotor Bearing (6) onto the hub of the Rotor until it seats in the bearing recess in the Rear End Plate.
5. Withdraw the shims.
6. Stand the assembled Rotor and End Plate upright on on the hub of the Rear End Plate.
7. Moisten each Vane (5) with film of light oil.
8. Place a Vane, notched side first, in each vane slot.
9. Place an End Plate Gasket on the rear face of the Cylinder, making certain that it is properly oriented relative to the Cylinder Dowels and tapped holes in the Cylinder.

NOTICE

If you are installing a new Gasket, you will have to punch or cut two holes in it to accommodate the Cylinder Dowels. Do this by placing the Gasket on the Rear End Plate to determine the location of the dowel holes. Use a proper size gasket punch to cut the required dowel holes.

10. Slide the assembled Rotor and Rear End Plate into the Cylinder until the End Plate contacts the Cylinder Dowels.
11. Using a wire hook inserted between the End Plate Cylinder, pull the rubber band free of the rotor, thus leaving the Vanes, Vane Springs and Vane Pins trapped in the Cylinder.
12. Align the dowel holes in the Rear End Plate with the Cylinder Dowels in the Cylinder and, using a plastic hammer, tap the Rear End Plate into place against the Gasket.
13. Install the Front End Plate as described in Steps 1, 2, 3 and 4 in the section titled Assembly of the Front End Plate.
14. Rotate the Rotor by hand. It should rotate freely with no binding or rubbing against the Cylinder. If the Rotor rubs or binds, tap the top edge of the Rear End Plate with a plastic hammer in the area midway between the inlet and outlet ports. Tap the End Plates gently. The Rotor needs only 0.0015 inch (0.038 mm) clearance from the top of the Cylinder. If the Rotor continues to rub, it may be contacting the Rear End Plate due to pressing on the Front Rotor Bearing. Lightly tap the end of the rotor hub with a plastic hammer. The Rotor needs about 0.002 inch (0.05 mm) clearance between the rotor body and each End Plate.
15. When the Rotor turns freely, install the End Plate Cap Screws (12) and tighten them to 8 to 10 ft-lb (10.8 to 13.5 Nm).
16. Install the Rotor Shaft Seal (7) and Front End Cap as described in Step 7 in the section titled Assembly of the Front End Plate.
17. Install the Rear End Cap (9) as described in Step 7 in the section titled Assembly of the Rear End Plate.
18. Again, check the Rotor to see that it rotates freely. Make certain it is rotating freely before connecting the air supply line.

Troubleshooting Guide

Trouble	Probable Cause	Solution
Low power or low free speed	Low air pressure at the inlet	Check air pressure at the inlet. For top performance and durability of parts, the air pressure must be 90 psig (6.2 bar/620 kPa) at the inlet.
	Worn or broken Vanes	Install a new set of Vanes.
	Improper lubrication or dirt building up in the Motor	Lubricate as instructed under LUBRICATION. If this does not help, flush the Motor as instructed under OPERATION.
Rough operation	Worn or broken Rotor Bearings	Examine each Bearing. Install new bearing where necessary.
Scoring of End Plates and/or Cylinder	Rotor does not have proper clearance	Refer to Assembly of Motor section. (Step 16)

Parts and Maintenance

NOTICE

The use of other than genuine Ingersoll Rand replacement parts may result in safety hazards, decreased motor performance, and increased maintenance, and may invalidate all warranties.

Ingersoll Rand is not responsible for customer modification of motors for applications on which Ingersoll Rand was not consulted. Repairs should be made only by authorized trained personnel. Consult your nearest Ingersoll Rand Authorized Service center.

When the life of the tool has expired, it is recommended that the tool be disassembled, degreased and parts be separated by material so that they can be recycled.

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