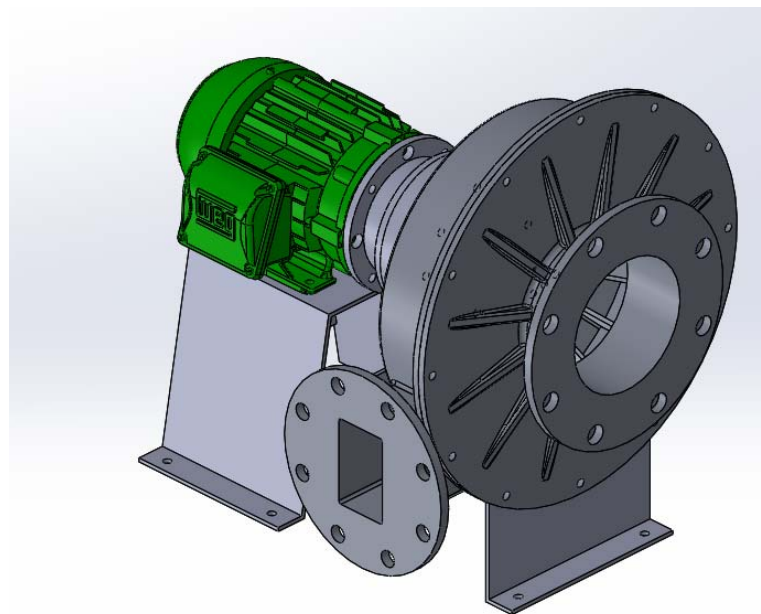


GT1400

Hermetic Gas Booster



Installation, Operation, Maintenance
Manual



SAFETY INSTRUCTIONS

1. Do not operate before reading the enclosed instruction manual.
2. Use adequate protection, warning and safety equipment necessary to protect against hazards involved in installation and operation of this equipment.



SAFETY WARNINGS

1. Keep hands and clothing away from rotating machinery, inlet and discharge openings.
2. Gas booster mounting bolts must be secured.
3. Noise level may require ear protection.



SAFETY PRECAUTIONS

1. It is important that all personnel observe safety precautions to minimize the chances of injury.
2. Internal rotating parts of the gas booster can produce serious physical injuries. Do not reach into any opening in the gas booster while it is operating, or while subject to accidental starting.
3. Disconnect power before doing any work, and avoid bypassing or rendering inoperative any safety or protective devices.
4. Avoid extended exposure in close proximity to machinery with high intensity noise levels.
5. Use proper care and good procedures in handling, lifting, installing, operating, and maintaining the equipment.
6. Avoid exposing the gas booster to any pipe tests involving high pressure air. The gas booster is rated to 10 PSIG maximum operating pressure. The booster should be isolated from the system during any such tests or removed from the system entirely.
7. Other potential hazards to safety may also be associated with operation of this equipment. All personnel working in or passing through the area should be warned by signs and trained to exercise adequate general safety precautions.

INTRODUCTION

Congratulations on your purchase of a new GT1400 Gas Booster from Action Blower & Equipment. Please examine the gas booster for shipping damage, and if any damage is found, report it immediately to the carrier. If the gas booster is to be installed at a later date, make sure it is stored in a clean, dry location free from dirt, contaminants, extreme temperatures, and vibration. Inlet and discharge connections should remain capped.

INSTALLATION



WARNING: *Customers are cautioned to provide adequate protection, warning and safety equipment necessary to protect personnel against hazards involved in the installation and operation of this equipment in the system or facility.*

HANDLING

All GT1400 Gas Boosters have been tested at the factory before shipment. The gas booster is a balanced and sealed assembly. Extreme care should be taken during handling to ensure the booster's integrity is not compromised.

BASE

The GT1400 Gas Booster should be mounted to either a level concrete floor or equipment pad or attached to a steel base/frame that is mounted to a level concrete floor or equipment pad. The gas booster should be lagged to the floor or base using the provided mounting holes.

LOCATION

The GT1400 Gas Booster should be installed in a cool, dry location free from dirt and other contaminants. Ample space should be allowed on all sides of the gas booster to provide sufficient access for inspection and maintenance.

PIPING

Inlet and discharge piping connections are large enough to handle maximum volume with minimum friction loss. All attempts should be made to provide adequate size piping to the gas booster to minimize friction loss.

Be sure that all piping is clean internally before connecting to the gas booster.

Flexible connections should be used to connect to the gas booster's inlet and discharge to isolate any vibration from the system piping.

All piping must be properly supported with suitable brackets, hangers, supports, etc. Piping must not be supported by the gas booster.

Avoid exposing the gas booster to any pipe tests involving high pressure air. The gas booster is rated to 10 PSIG maximum operating pressure. The booster should be isolated from the system during any such tests or removed from the system entirely.

Installation of the GT1400 without flexible connections and/or without properly supported piping will void the gas booster's warranty. Exposure of the gas booster to pressures above 10 PSIG will also void the gas booster's warranty.

ELECTRICAL

Electrical connections to the gas booster should be made only by a licensed electrician. All federal, state, and local electrical codes should be followed.

Wiring of the GT1400 Gas Booster's motor should be performed according to the motor's wiring diagram for the applicable input voltage.

It is recommended that the GT1400 Gas Booster be controlled using a *greenbooster* control panel from Action Blower & Equipment. If a *greenbooster* control panel is not used, a VFD or soft starter must be used in order to maintain the gas booster's limited warranty.

ROTATION

The rotation of the impeller should be in a clockwise direction when observing from the inlet of the gas booster. Rotation may be determined by observing the rotational direction of the motor fan at the back of the motor. For packaged *greenbooster* systems, the rotation is pre-set at the factory.

OPERATION

The GT1400 Gas Booster is designed to be controlled by a VFD. This enables the GT1400 to provide a variety of flow and pressure boost conditions in a single package. A number of different control techniques are available in order to provide the best solution for each application. Some typical control techniques include the following:

1. PID control—This method of control is used when the demand for gas varies greatly over time. A pressure transmitter is used near the load. The pressure transmitter feeds a pressure signal back to the control panel. This signal is used to adjust the speed of the gas booster accordingly to maintain a constant pressure.
2. Constant speed with remote start— This method of control is used when the demand for gas is relatively constant but is not always needed. A remote signal is sent to the gas booster when a demand for gas pressure arises (boiler, burner, etc. starts). The speed of the gas booster has been preset using the VFD to properly accommodate the demand.

There are many other types of control including a combination of the two listed above as well as various types of control for duplex (2 x gas booster) systems. For various control techniques and recommendations, please contact Action Blower & Equipment.

LUBRICATION / MAINTENANCE



The GT1400 is virtually a maintenance free design. Motor and blower bearings are lubricated for the life of the gas booster. All seals are static so they will not wear.

PIPING ORIENTATION

Warning: The motor shaft contains a magnetic coupling. This coupling provides over 70 lbs of magnetic force. While adjusting the orientation, the motor mount should be kept as close to the motor as possible to keep the coupling protected. If exposed directly to metal objects, the coupling can result in serious bodily injury and/or damage to equipment.

The GT1400 is available in three discharge configurations—upward vertical, horizontal lower, and horizontal upper. The configuration may be changed using the following procedure:

1. With proper support underneath the gas booster housing (1), remove the four socket head cap screws that attach the motor mount (5) to the motor (15).
2. Rotate the gas booster assembly to achieve the desired configuration and reinstall the four socket head cap screws.
3. Before removing any bolts from the front cover (2), clamp the front cover to the housing to ensure the o-ring seal is not disturbed.
4. Remove the support (7) from the front cover (2) by removing the three hex head cap screws.

5. Remove the three hex head cap screws that are now in the three lower positions.
6. Attach the support (7) in the correct position to support the housing using the 1-3/4" long hex head cap screws.
7. Install the remaining three 1-1/2" long hex head cap screws in the three open holes where the support used to be located. Note: 1" long hex head cap screws are used for the two threaded holes near the discharge.

ASSEMBLY / DISASSEMBLY

Any disassembly of a GT1400 Gas Booster by anyone other than Action Blower & Equipment factory authorized service representatives will void all warranties. Any alterations or repairs to the GT1400 Gas Booster must be made by the manufacturer or their designated representative.

TROUBLESHOOTING

If the GT1400 is not delivering the required pressure, follow the following troubleshooting steps:

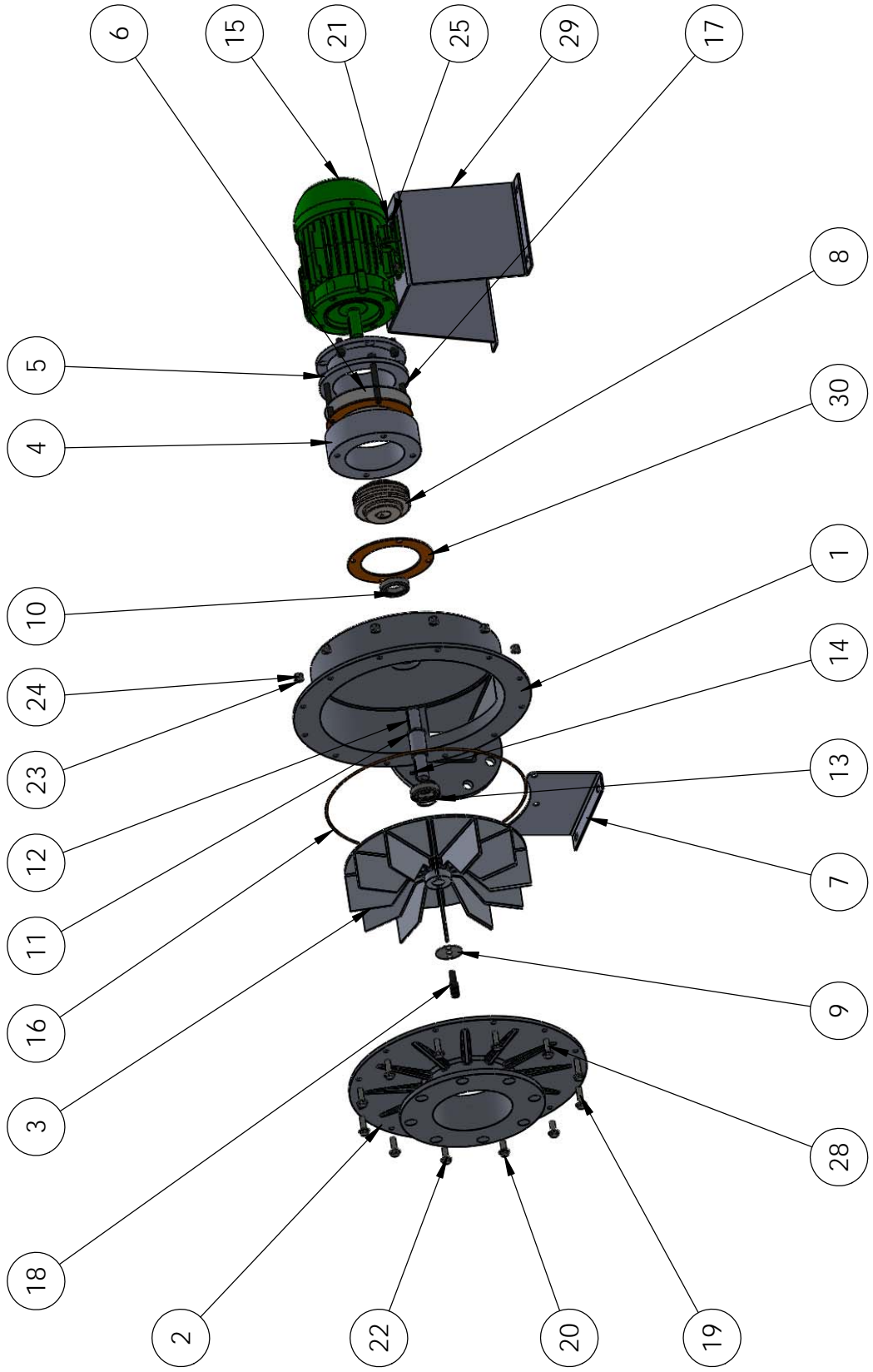
1. Adjust the blower speed by use of the VFD (depending on control method).
2. Check rotation. Correct by switching any two of the three motor leads.
3. Ensure that the impeller is turning. Because the impeller is magnetically coupled to the motor, it is possible that the motor is turning but there is an obstruction preventing the impeller from turning. Clear the obstruction to allow the impeller to turn freely.
4. Ensure that piping connecting the GT1400 to the gas supply and the load are adequate to prevent high frictional loss.

If the GT1400 is experiencing drive faults, refer to the VFD manual to address the specific type of fault. Some typical troubleshooting steps are as follows:

1. Make sure wiring and voltage applied to system are correct.
2. Make sure that there are no obstructions preventing the impeller from turning.

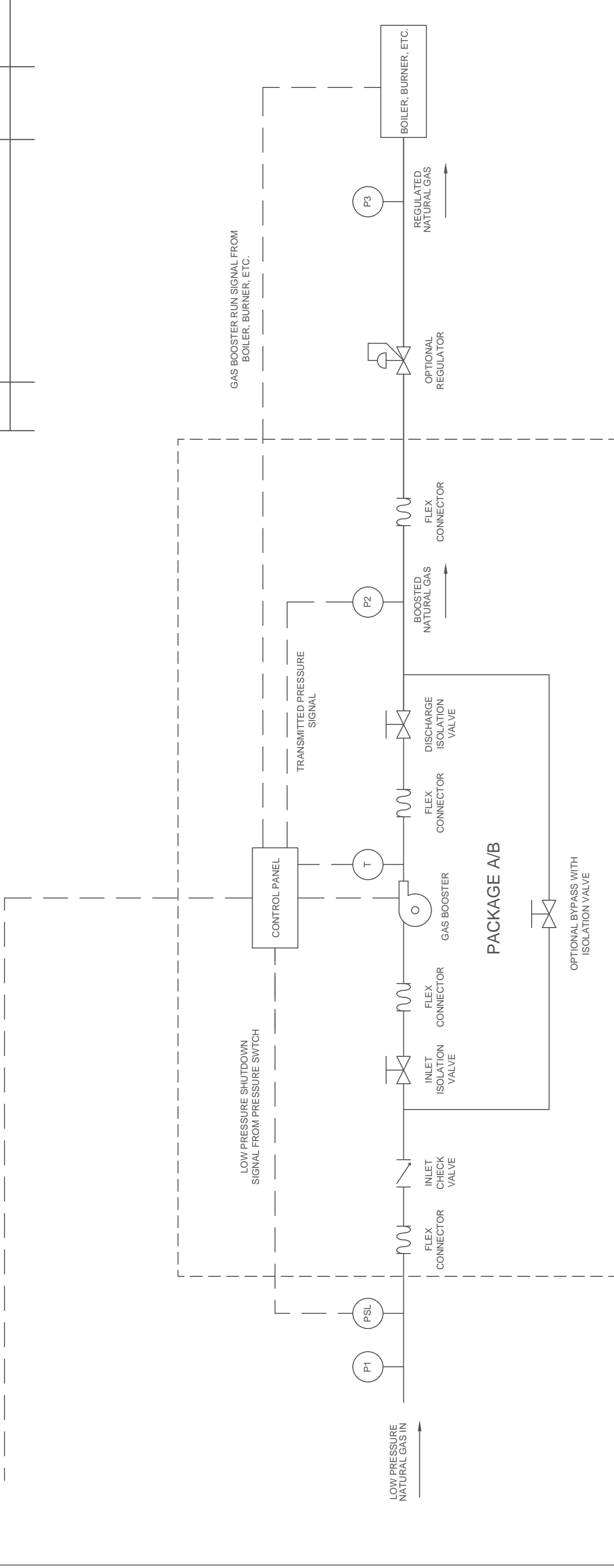
If the GT1400 is vibrating or making excessive noise, the following items should be checked:

1. Check for damage to the blower housing and impeller.
2. Ensure all bolts are tightened properly.
3. Make sure there are adequate flex connectors at the inlet and discharge of the gas booster.
4. Make sure connected piping is adequately supported so it is not putting unnecessary torque or stress on the gas booster.



Item No.	Part Number	Description	Quantity
1	GT140022	Housing	1
2	GT140023	Front cover	1
3	GT140005	Impeller	1
4	GT140006	Sleeve	1
5	GT140008	Motor mount	1
6	GT140028	Solid barrier	1
7	GT140020	Support	1
8	GT140027	Magnetic coupling halves	2
9	GT140045	Impeller retainer	1
10	GT140031	6006 ball bearing	2
11	GT140009	Shaft	1
12	GT140030	.1875 x 1.575 key	2
13	GT140021	SH-118 retaining ring	1
14	GT140037	10-32 x .375 set screw	1
15	GT140026	143TC 1.5HP motor	1
16	GT140032	2-281 o-ring	1
17	GT140034	3/8-16 x 3.5 socket head cap screw	4
18	GT140033	3/8-16 x 1 socket head cap screw	7
19	GT140036	3/8-16 x 1.75 hex head cap screw	3
20	GT140046	3/8-16 x 1 hex head cap screw	2
21	GT140041	5/16-18 x 1.25 hex head cap screw	4
22	GT140038	3/8 SAE washer	12
23	GT140039	3/8 lock washer	20
24	GT140040	3/8-16 nut	10
25	GT140042	5/16 SAE washer	8
26	GT140043	5/16 lock washer	4
27	GT140044	5/16-18 nut	4
28	GT140035	3/8-16 x 1.5 hex head cap screw	7
29	GT140019	Pedestal	1
30	GT140029	Gasket	2

REVISIONS		
REV	DESCRIPTION	DATE



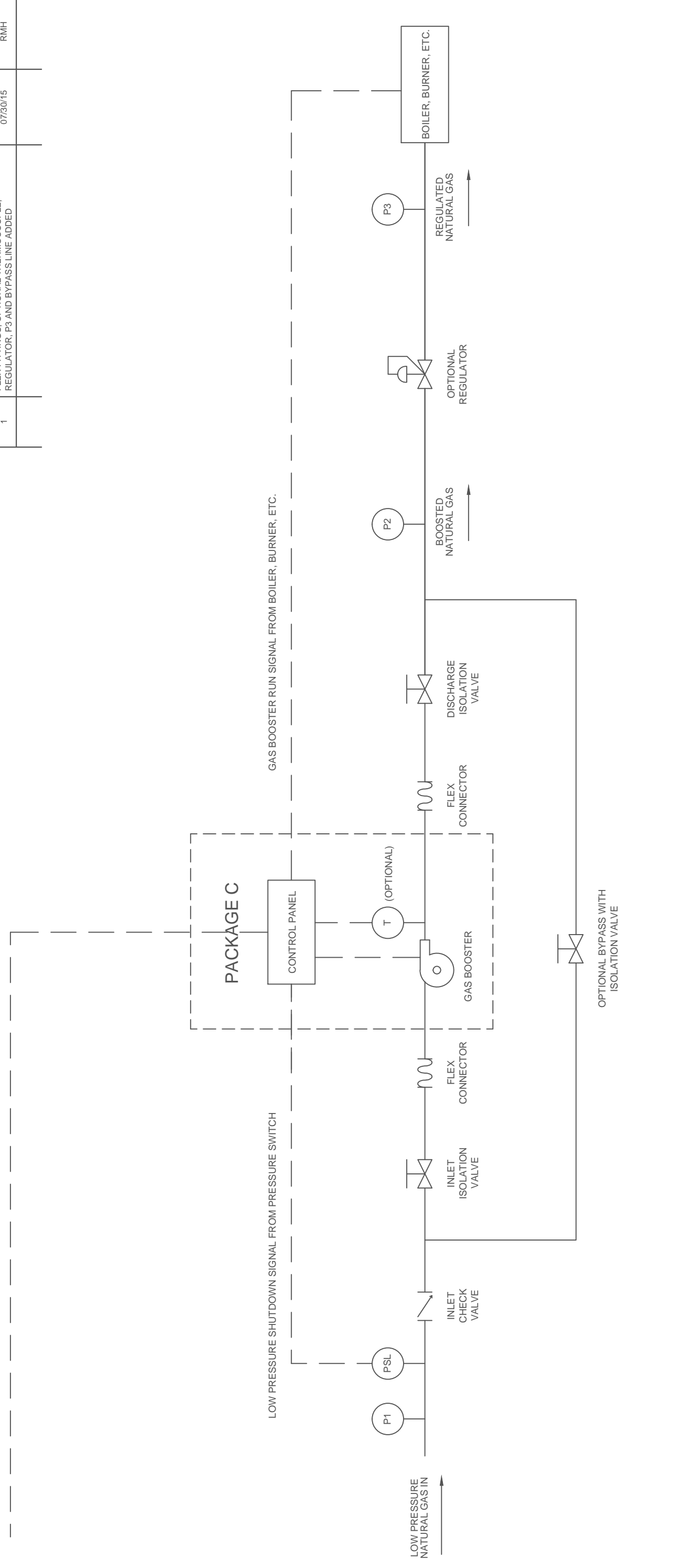
NOTES

- SOLID LINES INDICATE NATURAL GAS PIPING. DASHED LINES INDICATE ELECTRICAL WIRING.
- DIAGRAM DEMONSTRATES TYPICAL SETUP FOR GAS BOOSTER FEEDING A BOILER, BURNER, ETC.
- P1 INDICATES INCOMING PRESSURE GAUGE, P2 INDICATES BOOSTED PRESSURE GAUGE, P3 INDICATES REGULATED PRESSURE. FOR SYSTEM A, P2 IS A PRESSURE TRANSMITTER. FOR SYSTEM B, P2 IS A PRESSURE GAUGE.
- PSL INDICATES LOW PRESSURE SHUTDOWN SWITCH.
- T INDICATES THERMOCOUPLE TO SENSE GAS BOOSTER TEMPERATURE AND SHUTDOWN SYSTEM UPON HIGH TEMPERATURE CONDITION.
- PACKAGES A AND B INCLUDE ITEMS AS INDICATED. GAS BOOSTER AND INSTRUMENTS WIRED TO CONTROL PANEL AS INDICATED.
- RUN SIGNAL FROM BOILER, BURNER ETC. ALLOWS GAS BOOSTER TO RUN ONLY WHEN BOOSTED GAS IS REQUIRED.
- ISOLATION VALVES MAY BE PLUG VALVES OR BUTTERFLY VALVES DEPENDING ON INSTALLATION.
- SOME SYSTEMS MAY HAVE MULTIPLE REGULATORS DOWNSTREAM OF THE GAS BOOST SYSTEM DEPENDING ON QUANTITY AND VARIOUS PRESSURE REQUIREMENTS OF EQUIPMENT BEING SUPPLIED.

TOLERANCES		action blower & equipment, inc.	
TITLE P&ID, Packages A and B Gas Boost Systems			
DRAWN BY	RMH	SIZE	DWG NO
CHECKED BY	RMH	B	Gas Booster Package AB P&ID.dwg
APPROVED BY	RMH	REV	0
DATE	07/30/2015	SHEET	1 of 1
		SCALE	N/A

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REVISIONS		
REV	DESCRIPTION	DATE
1	FLEX FITTINGS, OPTIONAL THERMOCOUPLE, REGULATOR, P3 AND BYPASS LINE ADDED	07/30/15
		APPROVED RMH



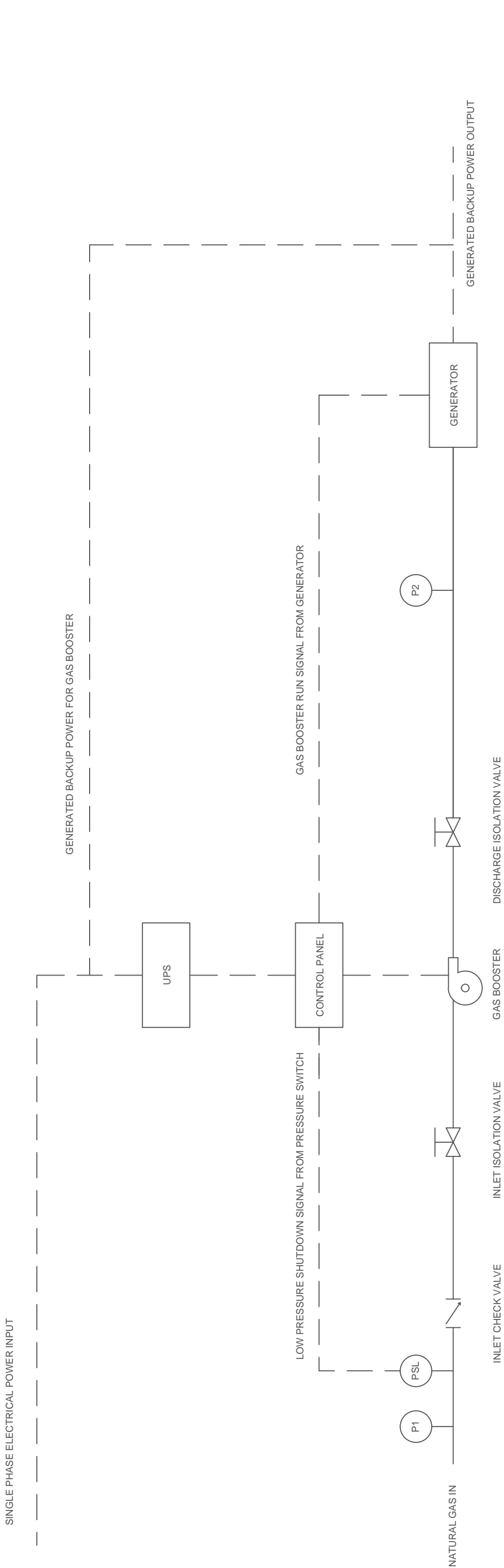
- NOTES
- SOLID LINES INDICATE NATURAL GAS PIPING. DASHED LINES INDICATE ELECTRICAL WIRING.
 - DIAGRAM DEMONSTRATES TYPICAL SETUP FOR GAS BOOSTER FEEDING A BOILER, BURNER, ETC.
 - P1 INDICATES INCOMING PRESSURE GAUGE, P2 INDICATES BOOSTED PRESSURE GAUGE, P3 INDICATES REGULATED PRESSURE.
 - PSL INDICATES LOW PRESSURE SHUTDOWN SWITCH.
 - T INDICATES OPTIONAL THERMOCOUPLE TO SENSE GAS BOOSTER TEMPERATURE AND SHUTDOWN SYSTEM UPON HIGH TEMPERATURE CONDITION.
 - PACKAGE C INCLUDES CONTROL PANEL WIRED TO GAS BOOSTER AS INDICATED.
 - RUN SIGNAL FROM BOILER, BURNER ETC. ALLOWS GAS BOOSTER TO RUN ONLY WHEN BOOSTED GAS IS REQUIRED.
 - ISOLATION VALVES MAY BE PLUG VALVES OR BUTTERFLY VALVES DEPENDING ON INSTALLATION.
 - SOME SYSTEMS MAY HAVE MULTIPLE REGULATORS DOWNSTREAM OF THE GAS BOOST SYSTEM DEPENDING ON QUANTITY AND VARIOUS PRESSURE REQUIREMENTS OF EQUIPMENT BEING SUPPLIED.

TOLERANCES	
TITLE P&ID, Package C Gas Boost System	
DRAWN BY RMH	REV
CHECKED BY RMH	SIZE B
APPROVED BY RMH	DWG NO Gas Booster Package C P&ID.dwg
DATE 06/24/2015	1
SHEET 1 of 1	SCALE N/A

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action blower & equipment, inc.

REVISIONS		
REV	DESCRIPTION	DATE



- NOTES
- SOLID LINES INDICATE NATURAL GAS PIPING. DASHED LINES INDICATE ELECTRICAL WIRING.
 - DIAGRAM DEMONSTRATES TYPICAL SETUP FOR GAS BOOSTER FEEDING A BACKUP GENERATOR.
 - P1 INDICATES INCOMING PRESSURE GAUGE, P2 INDICATES BOOSTED PRESSURE GAUGE.
 - PSL INDICATES LOW PRESSURE SHUTDOWN SWITCH.
 - UPS PROVIDES POWER TO GAS BOOSTER FOR THE PERIOD OF TIME AFTER GENERATOR IS ABLE TO PROVIDE BACKUP POWER.
 - RUN SIGNAL FROM GENERATOR ALLOWS GAS BOOSTER TO RUN ONLY WHEN THE GENERATOR IS RUNNING.

TOLERANCES		action blower & equipment, inc.	
TITLE P&ID, Gas Boost System for Backup Generator			
DRAWN BY	RMH	SIZE	DWG NO
CHECKED BY	RMH	B	Gas Booster Generator P&ID.dwg
APPROVED BY	RMH	REV	0
DATE	01/28/2014	SHEET	1 of 1
		SCALE	N/A

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LIMITED WARRANTY

Action Blower & Equipment warrants all new complete units that are manufactured by Action Blower & Equipment to be free from defects in material and workmanship for a period of 24 months from date of shipment of the product from Action Blower & Equipment. Action Blower & Equipment warrants that all manufactured replacement parts from Action Blower & Equipment for the GT1400 Gas Booster will be free from defects in material and workmanship for a period of 180 days from date of shipment of the product from Action Blower & Equipment. Any factory rebuilt equipment will be warranted to be free from defects in material and workmanship for a period of 180 days from date of shipment of the product from Action Blower & Equipment.

If within that period, Action Blower & Equipment receives from purchaser written notice of any alleged defect in, or non-conformance of any product, and in the sole judgment of Action Blower & Equipment, the product does not conform or is found to be defective in material or workmanship, then the purchaser shall, at the request of Action Blower & Equipment, return the part or product FOB Action Blower & Equipment. At its option and expense, Action Blower & Equipment shall repair or replace the defective part or product. Dismounting and reinstallation of defective or nonconforming parts is done at the purchaser's expense. Action Blower & Equipment's sole responsibility and purchaser's exclusive remedy hereunder shall be limited to such repair or replacement as provided above.

The warranties of Action Blower & Equipment do not cover:

1. Failures not reported to Action Blower & Equipment within the warranty period specified above.
2. Failure or damage due to misapplication, abuse, improper installation, abnormal conditions of temperature, contaminants or other corrosive matter.
3. Failure due to damage due to operation, either intentional or otherwise, above rated capacity or in an otherwise improper manner.
4. Products that have been tampered with or altered in any way by anyone other than an authorized representative of Action Blower & Equipment.
5. Products damaged in shipment or otherwise without fault of Action Blower & Equipment.
6. Expenses incurred by purchaser in an attempt to rework or repair any alleged defective product.

Action Blower & Equipment's sole responsibility and purchaser's sole and exclusive remedy with respect to any breach of warranty under this agreement shall be limited to repair and/or replacement. Action Blower & Equipment's total responsibility and liability for any and all claims, damages of any nature, losses, liabilities or costs of corrective efforts, including but not limited to those relating to any warranty or guarantee arising out of, or related to performance of this agreement or the products covered hereunder, or the performance thereof shall not exceed the original product's purchase price. In no event shall Action Blower & Equipment be liable for any special, indirect, incidental or consequential damages of any kind, including but not limited to loss of use of productive facilities or equipment, lost profits, personal and property damage, expense incurred in reliance on Action Blower & Equipment performance hereunder, or lost production, whether suffered by purchaser or any third party. Action Blower & Equipment disclaims all liability for any and all costs, claims, demands, charges, expenses or other damages, either direct or indirect, incidental to all property damages arising out of any cause of action based on strict liability. Freight charges on warranty replacements are the sole responsibility of the purchaser.