

Exhibit No.: _____
Witness: Larry Gervy
Type of Exhibit: Direct Testimony
Issue: Need for MGE to Replace Lines and Regulator to
Provide 8.5 psig at Superior Bowen Burner Tip
Sponsoring Party: Superior Bowen Asphalt Company
Case No.: GC-2011-0101

MISSOURI PUBLIC SERVICE COMMISSION

SUPERIOR BOWEN ASPHALT COMPANY

CASE NO. GC-2011-0101

DIRECT TESTIMONY OF

LARRY GERVY

June 3, 2011

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

Superior Bowen Asphalt Company, LLC)
v.) Case No. GC-2011-0101
Missouri Gas Energy)

AFFIDAVIT OF LARRY GERVY

STATE OF Missouri)
COUNTY OF Jackson) ss

Larry Gervy, of lawful age, on his oath states: That he has reviewed the attached written testimony in question and answer form, all to be presented in the above case, that the answers in the attached written testimony were given by him; that he has knowledge of the matters set forth in such answers; that such matters are true to the best of his knowledge, information and belief.

Larry Gervy
Larry Gervy

Subscribed and sworn to before me this 3rd day of June, 2011.

Laura L. Roehrich
Notary Public

LAURA L. ROEHRICH
NOTARY PUBLIC-NOTARY SEAL
STATE OF MISSOURI, JACKSON COUNTY
COMMISSION #08446238
MY COMMISSION EXPIRES OCT 27, 2012

[SEAL]

My Commission expires: _____

SUPERIOR BOWEN ASPHALT COMPANY

GC-2011-0101

DIRECT TESTIMONY OF LARRY GERVY

1Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

2A. My name is Larry Gervy. My business address is: Superior
3 Bowen Asphalt Company, 2501 Manchester Trafficway, Kansas
4 City, MO 64129.

5Q: ON WHOSE BEHALF ARE YOU APPEARING?

6A: Superior Bowen Asphalt Company.

7Q: WHAT IS YOUR POSITION WITH THE COMPANY?

8A: I am plant manager of the Company.

9Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

10A. I am providing testimony that supports Superior Bowen's
11 complaint that there was little or no need for Missouri Gas
12 Energy to increase operating pressure in its gas
13 distribution system in order for Superior Bowen to receive a
14 pressure increase of an additional 2 psig at the customer's
15 delivery point (the new asphalt plant).

16Q. WHAT IS THE BACKGROUND OF SUPERIOR BOWEN'S COMPLAINT?

17A. Superior Bowen is in the business of making asphalt and uses
18 a gas fired furnace to heat the materials used in making

1 asphalt. In late July of 2008, we informed MGE that
2 Superior Bowen was considering installing a new, more
3 efficient natural gas fired furnace that would replace our
4 existing natural gas furnace at our 2501 Manchester
5 Trafficway asphalt plant. At the time, we were being served
6 by MGE from MGE's mains in the street at 15 psi of pressure,
7 which Superior reduced by its own regulator to 6.5 psi at
8 the burner tip of the furnace to be replaced. After
9 informing MGE of the proposal, we had a meeting with MGE
10 personnel on our premises sometime in August 2008, at which
11 time we relayed to MGE personnel the information Superior
12 Bowen personnel had received from Mike James at Astec, Inc.,
13 the supplier of the new furnace, stating that the needed
14 natural gas was 137,000 SCFH with a pressure of 8.5 psi at
15 the burner inlet. A copy of the e-mail from Astec is
16 attached as Schedule LG-1. I gave a copy to Ray Wilson of
17 MGE at our August meeting stating the natural gas
18 requirements for the Phoenix 125 Burner on the new Astec
19 Plant.

20 **Q. THEN WHAT HAPPENED?**

21A. On the day of our on-site meeting with MGE personnel, I
22 walked the entire site with Ray Wilson of MGE, Richard
23 Bosley of MGE and a third MGE employee, whose name I cannot
24 recall at this time. They wanted to check regulators on all
25 of our buildings on site to see if any of them would be

1 replaced. They told us that they were probably all right
2 and that the cost of the conversion to Superior Bowen would
3 be minimal.

4Q. WHAT DID SUPERIOR BOWEN DO THEN?

5A. With that assurance, Superior Bowen then proceeded to follow
6 through on its plans to replace its furnace.

**7Q. DID THE COST OF THE CONVERSION TO SUPERIOR BOWEN TURN OUT TO
8 BE MINIMAL?**

9A. No. In early October 2008, MGE subsequently informed
10 Superior Bowen that in order for MGE to provide Superior
11 Bowen with its requested 2 psi increase in pressure, it
12 would be necessary for MGE to replace 1553 linear feet of
13 pipe, increase the pressure from 15 psi to 50 psi, and
14 install a replacement regulator at a substation to reduce
15 the pressure from 50 psi to 25 psi. MGE estimated the cost
16 thereof at \$273,573 and advised Superior Bowen that it would
17 be required to pay MGE \$238,570 for its portion of the work
18 to be done before MGE would take any action to provide
19 Superior Bowen with the additional 2 psi of pressure it
20 needed for the operation of its replacement furnace.
21 Attached as Schedule LG-2 is an e-mail from me to Trey
22 Bowen, Superior Bowen's Vice President, dated October 6,
23 2008 advising him of MGE's demand.

24Q. WHAT DID SUPERIOR BOWEN DO THEN?

25A. Superior Bowen then engaged the services of American Energy

1 Solutions to review and make an assessment of MGE's cost and
2 work proposal in an effort to more fully understand where
3 MGE was coming from and what could be done to attempt to
4 convince MGE to change its determination.

5 **Q. WAS AMERICAN ENERGY SOLUTIONS SUCCESSFUL IN CHANGING MGE'S**
6 **DETERMINATION?**

7 **A.** Not significantly. The only change was to the proposed
8 contract Superior Bowen needed to sign in order to obtain
9 the increase of 2 psi in pressure. MGE adjusted its
10 estimated sum that Superior Bowen was required to contribute
11 to MGE and changed the terms of the potential refund that
12 Superior Bowen would be provided for usage in excess of a
13 specified amount of natural gas in a 12 month period. The
14 new sum that Superior Bowen was required to contribute to
15 MGE was \$175,032, which amount Superior Bowen paid to MGE
16 under protest in February 2009 in order to get the new
17 furnace in operation prior to the 2009 asphalt season.

18 **Q. WHAT INFORMATION HAVE YOU SUPPLIED THE COMMISSION STAFF AND**
19 **MGE WITH IN RESPONSE TO STAFF DATA REQUESTS CONCERNING THE**
20 **CHARACTERISTICS OF THE CUSTOMER OWNED PIPING SYSTEM THAT**
21 **EXISTED IN JULY 2008 AND AS IT EXISTED AFTER THE**
22 **INSTALLATION OF THE NEW FURNACE?**

23 **A.** In response to Staff DR 0003, I provided Staff with the
24 following information concerning the customer owned piping
25 system, as it existed in July of 2008 attached hereto as

1 Schedule LG-3. In response to Staff DR 0004, I provided
2 Staff with the following information concerning the
3 reconfigured customer owned piping system, as it existed
4 with the new furnace in place attached hereto as Schedule
5 LG-4.

6**Q. WHAT DID SUPERIOR BOWEN DO NEXT?**

7A. We tried to handle this with an informal complaint with the
8 Staff and when that failed to reach the desired results, we
9 filed this formal complaint.

10**Q. DOES THIS CONCLUDE YOUR TESTIMONY AT THIS TIME?**

11A. Yes it does.

Larry Gervy

From: Larry Gervy
Sent: Friday, August 01, 2008 4:31 PM
To: Mathew Bowen
Subject: FW: Superior Bowen 08AP0199.6
Attachments: 08SP0199.6List.pdf

-----Original Message-----

From: Mike James [<mailto:mjames@astecinc.com>]
Sent: Friday, August 01, 2008 12:59 PM
To: Larry Gervy
Subject: FW: Superior Bowen 08AP0199.6

Larry,
I appears the required gas pressure at the burner as you can see from the following, is 8.5 ps.
Mike J.

----- Forwarded Message

> From: Kevin Risley <krisley@astecinc.com>
> Date: Thu, 31 Jul 2008 10:19:16 -0400
> To: Aimie Bates <abates@astecinc.com>
> Cc: Martin McCanless <mmccanless@astecinc.com>, Mike James
> <mjames@astecinc.com>, Michael Swanson <mikeswanson@astecinc.com>,
> Mike Varner <mvarner@astecinc.com>
> Subject: FW: Superior Bowen 08AP0199.6
>
> From what I find in the operation manual for the Phoenix 125 (Burning
> Natural Gas), 137,000 SCFH of gas is required with a pressure of 8.5
> psi at the burner inlet.
>
> I am hoping Michael will correct me if I am in error.
>
> ~k

> -----Original Message-----

> From: Martin McCanless
> Sent: Wednesday, July 30, 2008 2:49 PM
> To: Kevin Risley
> Subject: Fw: Superior Bowen 08AP0199.6
>
>
>
>

> -----Original Message-----

> From: Aimie Bates
> To: Martin McCanless
> CC: Mike James; Phil Tippitt
> Sent: Wed Jul 30 14:46:58 2008
> Subject: FW: Superior Bowen 08AP0199.6
>
>

> Mike James got an order for Superior Bowen. Here's the equipment list.
> I already sent it to Eddie for #1 below. Can y'all take it from here
> and follow up on that and help him with #2?

>
> Thanks, Aimie
>
>
> ----- Forwarded Message
>> From: Mike James <mjames@astecinc.com>
>> Date: Wed, 30 Jul 2008 14:28:21 -0400
>> To: Aimie Bates <abates@astecinc.com>
>> Cc: Phil Tippitt <ptippitt@astecinc.com>
>> Subject: Superior Bowen 08AP0199.6
>>
>> Aimie,
>> Superior Bowen is asking for a couple of things.
>> 1. They need a power requirement. Please give a HP list to Jeff Richard.
>> 2. They need to know the gas required to operate this plant.
>> Thanks,
>> Mike
>>
>
> ----- End of Forwarded Message
>
> <<08SP0199.6List.pdf>>

----- End of Forwarded Message

</pre>

<p>

</p>

<p>

DISCLAIMER:

</p>

<p>

This transmission from Astec Industries or one of its subsidiaries is confidential and solely for the use of the intended recipient. If you have received this email in error, please notify the sender and delete and destroy the original transmission and all copies. Our company accepts no liability for the contents of this email, or for the consequences of any actions taken on the basis of the information provided, unless that information is subsequently confirmed in writing. Please note that any personal views or opinions presented in this email are solely those of the author and do not necessarily represent those of the company. Finally, the recipient should check this email and any attachments for the presence of viruses. The company accepts no liability for any damage caused by any virus transmitted by this email.

</p>

Here are some of the project details....though as discussed, the price has been reduced about \$50 K.

Trey Bowen
Superior Bowen Asphalt Co. L.L.C.
2501 Manchester Tfwy
Kansas City, MO 64129
816-921-8200

Confidentiality Notice: The information in this electronic mail message and in any attachments hereto is confidential, privileged and/or proprietary and is intended for the use of the addressee(s). Any use of this information by anyone other than the addressee(s) is strictly prohibited. If you receive this message and are not the intended addressee immediately notify the sender by email or telephone and destroy every electronic, paper and other copy of this message and all attachments. Thank you

From: Larry Gervy
Sent: Monday, October 06, 2008 3:33 PM
To: Trey Bowen
Subject: RE: mge

MGE is saying they will put 50 psi of gas to our side of the meter. We need 137,000 SCFH of gas at 8.5 psi at our burner. MGE told me to do this they would have to replace 460 lf of 8" plastic, 130 lf of 4" steel, and 963 lf of 8" steel. They will also have to replace a regulator at a substation to get the pressure we need. The cost of doing the work is \$273,573.00. They want to charge us \$238,570.00 for our portion of the work done.

From: Trey Bowen
Sent: Monday, October 06, 2008 1:34 PM
To: Larry Gervy (lgervy@superiorbowen.com)
Subject: FW: mge

Larry,

You have any of this info he is requesting below?

Trey Bowen
Superior Bowen Asphalt Co. L.L.C.
2501 Manchester Tfwy
Kansas City, MO 64129
816-921-8200

Confidentiality Notice: The information in this electronic mail message and in any attachments hereto is confidential, privileged and/or proprietary and is intended for the use of the addressee(s). Any use of this information by anyone other than the addressee(s) is strictly prohibited. If you receive this message and are not the intended addressee immediately notify the sender by email or telephone and destroy every electronic, paper and other copy of this message and all attachments. Thank you

From: Ernie Wassmann
Sent: Monday, October 06, 2008 1:27 PM
To: Trey Bowen
Subject: mge

Trey,

Will meet with Patti tomorrow at her downtown office. Any info you can give me to prepare for the mtg on your plant would help. Don't need major details perhaps address of plant and some specs like from what size to what? Expected increase? Minor stuff enough for her to get started.

E

Schedule
LG-3

DR 0003 Provide a detailed description and diagram of the configuration of the customer-owned piping system that existed on July 2008 starting at the outlet of the MGE meter running to the inlet of the furnace. This information would include, but not be limited to: data on the customer-owned regulator indicating capacities, operating pressures, pressure ranges, orifice size, inlet and outlet pipe sizes, etc.; piping configurations, piping sizes, piping lengths, fittings, piping restrictions (including, but not limited to valves, reducers, elbows, changes in pipe sizes, etc.).

Answer: The customer owned piping system that existed in July 2008 is shown on the attached copy of the utility plan on the property prepared by Phoenix Engineering, Attachment 2. Beginning at the west property line, there is a customer-owned 8" natural gas pipeline marked with a "G" that initially runs south then goes in a southeast direction parallel with the existing administration building after which it starts to run in a southerly direction to a point identified as "connect to existing 8" natural gas service at riser. This was the general location of the plant in existence in July 2008.

I have also attached Attachment 3, a sketched drawing showing the configuration of the gas line went from that point to the burner then in service.

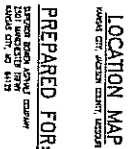
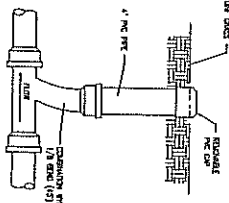
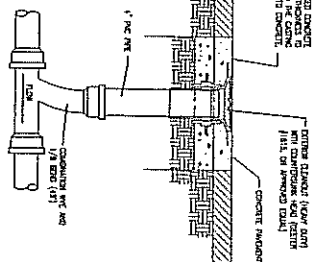
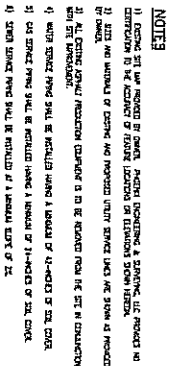
The regulator was a Fisher Type 1098-EGR. We replaced that 28-year old regulator at the new location some 260' to the south where a new Fisher Type 1098-EGR was installed. Attached as Attachment 4, are the relevant pages of the Fisher Instruction Manual setting forth the Specifications of the Type 1098-EGR Regulator.

The replaced regulator is still available. The information on the tags on the regulator is as follows:

Serial number: 10645284
Type: 1098-EGR
ANSI class: 125
Port size: 4-3/8
Seat material: 416SS
Cage: linear
Actuator size: 40
Maximum rated travel: 2
Maximum operating inlet pressure: 95 PSIG
Maximum operating outlet pressure: 75 PSIG
Maximum differential pressure: 60 PSIG
Minimum differential pressure: 5 PSIG

Maximum Emer. Outlet (casing): 82
Temperature: -20 degrees to 150 degrees
Hydro: 350 PSI/2 min.

The burner at the old location was a Cedarapids Model CR16-130. Pertinent information from the Operation and Maintenance Manual is attached as Attachment 5.

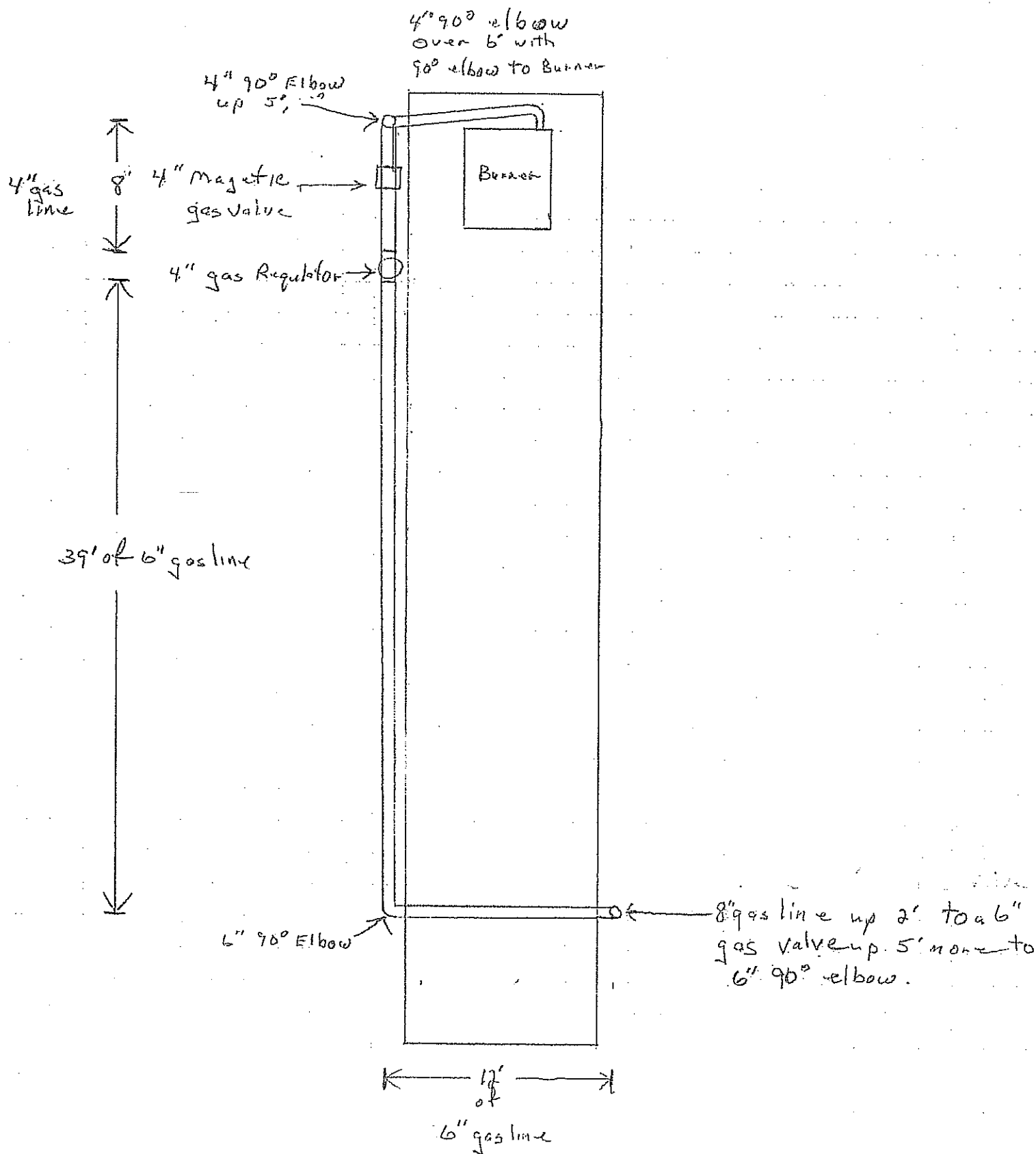


**PHOENIX ENGINEERING
& SURVEYING, LLC**

1000 N. MOUNTAIN BLVD., SUITE 200, MESA, AZ 85201
 480-742-8000 FAX 480-742-8700

AS AGENT OF
FOREIGN INTELLIGENCE
A SERVICEING IIC

THE SERVICEING IIC SHALL APPLY ONLY TO THE DELEGATION TO WHICH THEY ARE APPOINTED AND EXPRESSLY DISCLAIM ANY RESPONSIBILITY FOR ALL OTHER PLANS, SPECIFICATIONS, STRATEGIES, REPORTS, OR OTHER DOCUMENTS OR INSTRUMENTS RELATING TO AN AGENCY OR IN USED FOR ANY PART OR PARTS OF THE SERVICEING IIC.



Types 1098-EGR and 1098H-EGR Pressure Reducing Regulators



WARNING

Failure to follow these instructions or to properly install and maintain this equipment could result in an explosion, fire and/or chemical contamination causing property damage and personal injury or death.

Fisher® regulators must be installed, operated, and maintained in accordance with federal, state, and local codes, rules and regulations, and Fisher instructions.

If the regulator vents gas or a leak develops in the system, service to the unit may be required. Failure to correct trouble could result in a hazardous condition.

Installation, operation, and maintenance procedures performed by unqualified personnel may result in improper adjustment and unsafe operation. Either condition may result in equipment damage or personal injury. Use qualified personnel when installing, operating, and maintaining the Types 1098-EGR and 1098H-EGR pressure reducing regulator.

Introduction

Scope of Manual

This manual describes and provides instructions and parts list for Type 1098-EGR or 1098H-EGR regulator complete with a standard P590 Series filter and either a 6350 Series regulator, a 61 Series pilot, or a Type Y600AM Pilot. The Type 1806 relief valve is also covered when a 61 Series pilot is used. Instructions and parts lists for monitoring pilots and other equipment used with this regulator are found in separate manuals.

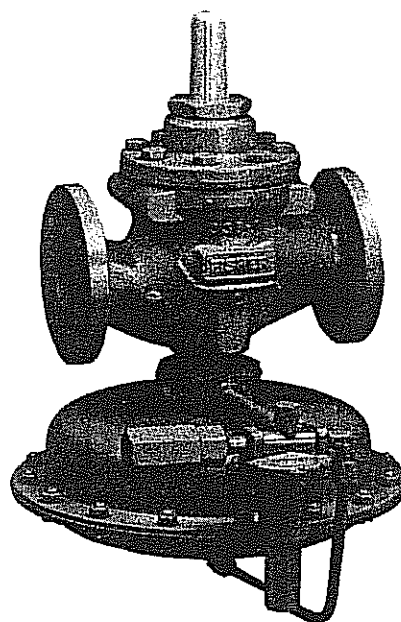


Figure 1. Type 1098-EGR

Description

Types 1098-EGR and 1098H-EGR regulators provide economical and accurate pressure control in a wide variety of applications; natural gas distribution systems; fuel gas supply to industrial boilers, furnaces, ovens, and mixers; and large commercial/industrial establishments such as shopping centers and schools. They are also used in plant air service and in liquid service where a slow stroking time (approximately 30 to 90 seconds) is desired on both opening and closing the main valve.

Specifications

The Specifications section lists pressure limitations and other specifications for various Types 1098-EGR and 1098H-EGR constructions. Specifications for a given regulator as it originally comes from the factory are stamped on nameplates located on both the

Types 1098-EGR and 1098H-EGR

Specifications

Body Sizes and End Connection Styles

See Table 1

Main Valve Maximum Inlet Pressure⁽¹⁾

400 psig (27,6 bar) or body rating limit whichever is lower

Maximum Pilot Supply Pressure^(1,2)

600 psig (41,4 bar)

Outlet Pressure Ranges

See Table 2

Maximum and Minimum Differential Pressures

See Table 4

Actuator Sizes and Maximum Pressures

See Table 3

Main Valve Flow Characteristic

Linear (standard) or Quick opening

Main Valve Flow Direction

In through the seat ring and out through the cage

Pressure Registration

External

Material Temperature Capabilities⁽²⁾

Nitrile (NBR):

-20° to 180°F (-29° to 82°C)

Fluorocarbon (FKM):

0° to 300°F (-18° to 149°C),

Water is limited to 0° to 180°F (-18° to 82°C)

Ethylene propylene (EPR):

-20° to 275°F (-29° to 135°C)

Options

- NACE Construction
- Boiler Fuel Construction
- Aqueous Service Construction
- Monitor Configuration
- Noise Abatement Trim

1. The pressure/temperature limits in this instruction manual or any applicable standard limitation should not be exceeded.

2. For stability or overpressure protection, a reducing regulator may be installed upstream of the pilot according to the Installation section.

Table 1. Body Sizes and End Connection Styles

BODY SIZE, INCHES (DN)	CAST IRON	STEEL OR STAINLESS STEEL
1 or 2 (25 or 50)	NPT, CL125 FF, or CL250 RF	NPT, CL150 RF, CL300 RF, CL600 RF, BWE, SWE, or PN 16/25/40
3, 4, or 6 (80, 100 or 150)	CL125 FF or CL250 RF	CL150 RF, CL300 RF, CL600 RF, BWE, or PN 16/25/40
8 x 6 or 12 x 6 (200 x 150 or 300 x 150)	----	CL150 RF, CL300 RF, CL600 RF, BWE, or PN 16/25/40

Table 2. Outlet Pressure Ranges

PILOT TYPE	OUTLET (CONTROL) PRESSURE RANGES	SPRING COLOR	SPRING PART NUMBER
6351	3 to 20 psig (0,21 to 1,4 bar)	Green	1B986027212
	5 to 35 psig (0,34 to 2,4 bar)	Silver	1B788327022
	35 to 100 psig (2,4 to 6,9 bar)	Red	1K748527202
6352	14-inches w.c. to 2 psig (35 mbar to 0,14 bar)	Yellow	14A9672X012
	2 to 10 psig (0,14 to 0,69 bar)	Black	1LA9673X012
6353	3 to 40 psig (0,21 to 2,8 bar)	Yellow	1E392527022
	35 to 125 psig (2,4 to 8,6 bar)	Red	1K748527202
6354L ⁽¹⁾	85 to 200 psig (5,9 to 13,8 bar) ⁽¹⁾	Blue	1L346127142
6354M ⁽²⁾	175 to 220 psig (12,1 to 15,2 bar) ⁽²⁾	Blue	1L346127142
6354H	200 to 300 psig (13,8 to 20,7 bar) ⁽²⁾	Green	15A9258X012
61L 61LD 61LE	0.25 to 2 psig (0,02 to 0,14 bar)	Red	1B886327022
	1 to 5 psig (0,07 to 0,34 bar)	Yellow	1J857827022
	2 to 10 psig (0,14 to 0,69 bar)	Blue	1B886427022
	5 to 15 psig (0,34 to 1,0 bar)	Brown	1J857927142
	10 to 20 psig (0,69 to 1,4 bar)	Green	1B886527022
61H	10 to 65 psig (0,69 to 4,5 bar)	Green Stripe	0Y066427022
61HP	15 to 45 psig (1,0 to 3,1 bar)	Yellow	1E392527022
	35 to 100 psig (2,4 to 6,9 bar)	Blue	1D387227022
	100 to 300 psig (6,9 to 20,7 bar)	Red	1D465127142
Y600AM	4 to 8-inches w.c. (10 to 20 mbar)	Red	1B653827052
	7 to 16-inches w.c. (17 to 40 mbar)	Olive Drab	1B653927022
	15-inches w.c. to 1.2 psig (37 mbar to 0,08 bar)	Yellow	1B537027052
	1.2 to 2.5 psig (0,83 to 0,17 bar)	Light Green	1B537127022
	2.5 to 4.5 psig (0,17 to 0,31 bar)	Light Blue	1B537227022
	4.5 to 7 psig (0,31 to 0,48 bar)	Black	1B537327052

1. Without diaphragm limiter.

2. With diaphragm limiter.

Types 1098-EGR and 1098H-EGR

Table 3. Actuator Sizes and Maximum Pressures

ACTUATOR		OUTLET (CONTROL) PRESSURE, PSIG (bar)	EMERGENCY CASING PRESSURE, PSIG (bar)
Type	Size		
1098	30	100 (6,9)	115 (7,9)
	40 (standard)	75 (5,2)	82 (5,7)
	70	50 (3,5)	65 (4,5)
1098H	30	300 (20,7)	400 (27,6)

Table 4. Maximum and Minimum Differential Pressures for Main Valve Selection

BODY SIZE, INCHES (DN)	SPRING PART NUMBER AND COLOR	MAXIMUM ALLOWABLE DIFFERENTIAL PRESSURE, PSIG (bar) ⁽¹⁾	MINIMUM DIFFERENTIAL PRESSURE REQUIRED FOR FULL STROKE, PSIG (bar)		
			Size 30 Actuator	Size 40 Actuator	Size 70 Actuator
1 (25)	14A9687X012 Green	60 (4,1)	3.5 (0,24)	2.5 (0,17)	1 (0,07)
	14A9680X012 Blue	125 (8,6)	5 (0,34)	4 (0,28)	1.5 (0,10)
	14A9679X012 Red	400 (27,6) or body rating limit, whichever is lower	7 (0,48)	5 (0,34)	2.5 (0,17)
2 (50)	14A6768X012 Yellow	20 (1,4)	----	2 (0,14)	1 (0,07)
	14A6626X012 Green	60 (4,1)	4 (0,28)	3 (0,21)	1.5 (0,10)
	14A6627X012 Blue	125 (8,6)	6 (0,41)	5 (0,34)	2 (0,14)
	14A6628X012 Red	400 (27,6) or body rating limit, whichever is lower	11 (0,76)	10 (0,69)	3 (0,21)
3 (80)	14A6771X012 Yellow	20 (1,4)	----	2.5 (0,17)	1 (0,07)
	14A6629X012 Green	60 (4,1)	5 (0,34)	4 (0,28)	2 (0,14)
	14A6630X012 Blue	125 (8,6)	8 (0,55)	6 (0,41)	2.5 (0,17)
	14A6631X012 Red	400 (27,6) or body rating limit, whichever is lower	14 (0,97)	11 (0,76)	4 (0,28)
4 (100)	14A6770X012 Yellow	20 (1,4)	----	3.5 (0,24)	1.3 (0,09)
	14A6632X012 Green	60 (4,1)	10 (0,69)	5 (0,34)	2.5 (0,17)
	14A6633X012 Blue	125 (8,6)	13 (0,90)	8 (0,55)	3 (0,21)
	14A6634X012 Red	400 (27,6) or body rating limit, whichever is lower	22 (1,5)	13 (0,90)	5 (0,34)
6, 8 x 6, and 12 x 6 (150, 200 x 150, and 300 x 150)	15A2253X012 Yellow	20 (1,4)	----	6 (0,41)	2.2 (0,15)
	14A9686X012 Green	60 (4,1)	13 (0,90)	9.5 (0,66)	4 (0,28)
	14A9685X012 Blue	125 (8,6)	19 (1,3)	14 (0,97)	6 (0,41)
	15A2615X012 Red	400 (27,6) or body rating limit, whichever is lower	28 (1,9) ⁽²⁾	19 (1,3)	8 (0,55)

1. Maximum inlet pressure is equal to set pressure plus maximum differential.

2. Requires special 6300 Series pilot construction without integral relief valve and with external Type 1806 40 psid (2,8 bar d) relief valve.

Table 5. Supply Pressure Settings Required for the Type 95H Regulator

BODY SIZE, INCHES (DN)	TYPE EGR SPRING COLOR	SUPPLY PRESSURE, PSIG (bar)					
		Type Y600AM Spring Color					
		Red	Olive Drab	Yellow	Green	Light Blue	Black
1 (25)	Green	6 (0,41)	6 (0,41)	7 (0,48)	8 (0,55)	11 (0,76)	13 (0,90)
	Blue	7 (0,48)	7 (0,48)	8 (0,55)	10 (0,69)	13 (0,90)	14 (0,97)
	Red	8 (0,55)	8 (0,55)	9 (0,62)	11 (0,76)	14 (0,97)	15 (1,0)
2 (50)	Green	6 (0,41)	6 (0,41)	7 (0,48)	9 (0,62)	12 (0,83)	13 (0,90)
	Blue	8 (0,55)	8 (0,55)	9 (0,62)	11 (0,76)	14 (0,97)	15 (1,0)
	Red	13 (0,90)	13 (0,90)	14 (0,97)	16 (1,1)	19 (1,3)	20 (1,4)
3 (80)	Green	7 (0,48)	7 (0,48)	8 (0,55)	10 (0,69)	13 (0,90)	14 (0,97)
	Blue	9 (0,62)	9 (0,62)	10 (0,69)	12 (0,83)	15 (1,0)	16 (1,1)
	Red	14 (0,97)	14 (0,97)	15 (1,0)	17 (1,2)	20 (1,4)	21 (1,5)
4 (100)	Green	8 (0,55)	8 (0,55)	9 (0,62)	11 (0,76)	14 (0,97)	15 (1,0)
	Blue	11 (0,76)	11 (0,76)	12 (0,83)	14 (0,97)	17 (1,2)	18 (1,2)
	Red	16 (1,10)	16 (1,1)	17 (1,2)	19 (1,3)	22 (1,5)	23 (1,6)
6 (150) 8 X 6 (200)	Green	13 (0,90)	13 (0,90)	14 (0,97)	15 (1,0)	18 (1,2)	20 (1,4)
	Blue	17 (1,17)	17 (1,2)	18 (1,2)	20 (1,4)	23 (1,6)	24 (1,6)
	Red	22 (1,5)	22 (1,5)	23 (1,6)	25 (1,8)	28 (1,9)	29 (2,0)

1. The pressures shown in the table are the minimum supply pressures required by the pilot. If the inlet pressure is less than shown, an external pilot supply is necessary.

Natural Gas

Specifications

Cedarapids Standard Havens burners are designed for 1000 BTU per cubic foot heating value gas. Pipeline quality gas must be used. (See Table 6.) For complete combustion, 25% excess air is required. Gas must be provided at regulated pressure in the correct volume to the safety cutoff valve. If additional safety valves, vents, controls, or sequencing should be required in the local area, the customer and/or gas company is responsible. Cedarapids Standard Havens can engineer and provide equipment that will meet different local requirements.

Components of the Natural Gas Supply Line

(Supplied by Cedarapids Standard Havens unless noted)

- (A) Pressure Gauge: 0 to 5 PSI, 1/4 inch NP fitting.
- (B) Fuel Modulating Valve: This valve is not a positive shutoff valve!
- (C) Two Safety Shutoff Valves with an electronic control system for automatic shutoff and flame safeguard. Valves are mounted on manifold nipples. Vent the valve between shutoffs.
- (D) Pipe, size "D", per Table 2 (supplied by customer). Must be at least 72 inches (183 cm) long.
- (E) Control Line for Gas Pressure Regulator "F" (supplied by customer), to be connected to the main gas supply line at least 60 inches (150 cm) downstream from the pressure regulator "F" and within 6 inches (15 cm) of the safety shutoff valve "C".
- (F) Gas Pressure Regulating Valve (supplied by customer).
- (G) Pilot Valve for Gas Pressure Regulator "F" (supplied by customer). See "E" for connection requirements.
- (H) Manual Shutoff Valve (supplied by customer): If a lubricated type plug is used, the valve should be two sizes larger than normal for the main piping size. This valve must be closed at the end of each day's operation.
- (I) Gas Line Trap (supplied by customer): Suggested construction: 12 inch (30.5 cm) standard pipe by 24 inches (61 cm) long with 3/8 inch (9 mm) plate welded on both ends. Central baffle is 1/4 inch (6 mm) plate.
- (J) Pilot Burner Gas Pressure Regulator
- (K) Flex-line section of the supply line (supplied by customer). Use flex metal hose at least 33 inches long. To determine the diameter, see Table 2, "D Pipe Size". Install in a straight line as close to the burner as possible, without stretch, compression or twist.

- (L) Pilot Burner Fuel Supply Line (supplied by customer). The supply line must maintain 8 to 12 PSI pressure at the outlet of regulator "J". Install a propane gas supply tank with a pressure regulator and gauge within 15 feet (4.6 m) of the burner. Use 3/8 inch (9 mm) copper tubing for the CRX12R series burner. Use 1/2 inch (12.7 mm) copper tubing for all larger burners up to CRX24-280R.
- (M) Pilot Burner Manual Shutoff Valve
- (N) Solenoid Operated Shutoff Valve: Electronic control for solenoid operation.
- (O) Pilot Burner for Natural Gas or Propane Gas Fuel Operation: Electric spark plug ignition with control.
- (P) Plugged 1/4 inch Threaded Port for Pressure Gauge (supplied by customer). Gas pressure at this point must be 15 PSI minimum.
- (R) 4 inch Standard Half Coupling
- (S) 4 inch Standard Pipe Plug or Reducing Bushing and Bleeder Valve
- (T) Vent Valve
- (U) High Pressure (3.6 PSI) Switch
- (V) Low Pressure (1.8 PSI) Switch

Natural Gas Supply Piping to Burner

Gas piping for the low pressure burner is to be installed in strict accordance with the drawing. All notations and dimensions must be followed. The supply line is to be ground-mounted with a flexible connection to the plant-mounted piping.

The hydrometer safety valve must be mounted in an upright position to avoid damaging the drive mechanism. The gas pressure regulator must also be mounted in an upright position to operate properly.

CAUTION! Gas piping must be purged of foreign matter.

After the gas has been turned on, make this final check for the presence of foreign matter in the piping system:

- (1) Turn off the manual gas valve.
- (2) Inspect the gas trap cleanout.
- (3) Remove a side cover from the regulator and examine the regulator seat.

Specifications are based on a 15 PSI inlet pressure. The regulator can be located as close as 6 feet, but not more than 15 feet, from the burner (between 1.8 and 4.6 m).

Sizes and types of gas pressure regulators are specified by Fisher Governor Co., Marshalltown, Iowa.

A regulator is not furnished by Cedarapids Standard Havens as standard equipment, but will be supplied if specified as a purchased option.

WARNING! Always start plant exhaust fan and burner blower at least 3 minutes before igniting burner. Operator must also open exhaust fan damper before burner is opened up toward high fire. If these procedures are not followed Cedarapids Inc cannot be responsible for damage incurred.

Basic Linkage Arrangement for Natural Gas Fuel

Gas Valve Linkage (Reference Figure 2-2). These settings should be considered as the starting point for fine tuning burner operation.

- (1) Check that all fuel sources are isolated to ensure the safety of personnel making adjustments.
- (2) With the drive motor off, the output sector should be at the home position as shown in Figure 2-1.
- (3) The swivel joint of the gas valve linkage rod is connected to the same carriage bolt as the main air valve.
- (4) Set the burner gas valve stem pointer at 10-20% open.
- (5) Install the other end of the gas valve linkage rod to the gas valve actuating arm and tighten all clamp and bolts.
- (6) Drive the motor open to 100% as described in "How to Drive the Burner Open". The gas valve pointer should move to 80 to 100% open. If it does not, make the following adjustment:
 - (a) Set the drive motor back to 0% stroke (closed).
 - (b) If the pointer showed less than 80% open at full stroke, loosen the clamp at the gas valve actuating arm. While maintaining the 10-20% setting on the gas valve, move the clamp away from the gas valve. This will increase the travel of actuating arm. Retighten all clamps and bolts and retest.
 - (c) If the pointer passes the 100% open point, loosen the clamp at the gas valve actuating arm. While maintaining the 10-20% setting on the gas valve, move the clamp closer to the gas valve. This will decrease the travel of actuating arm. Retighten all clamps and bolts and retest.

IMPORTANT! Before making a test firing, see the Cedarapids Burner Adjustment and Operating Policy.

TABLE 2 - NATURAL GAS DATA

Burner Size	Regulator F Specifications		Safety Shutoff & Modulating Valve Sizes		
	Fisher Regulator	Outlet PSI	B	C	D Pipe Size
CR14-90	3" Flanged Type 1098-EGR-6352	2 - 3 psi	4"	4" ITT	4"
CR16-110	4" Flanged Type 1098-EGR-6352	2 - 3 psi	4"	4" Maxon	6"
CR16-130	4" Flanged Type 1098-EGR-6352	2 - 3 psi	4"	4" Maxon	6"
CR20-160	6" Flanged Type 1098-EGR-6352	2 - 3 psi	4"	4" Maxon	6"
CR20-200	6" Flanged Type 1098-EGR-6352	2 - 3 psi	4"	4" Maxon	6"

Refer to Figure 22

TABLE 3 - LIQUID PROPANE DATA

Burner Size	Valve Setting		Nozzle Cap No. & Part Number	Central Hole Diameter	Peripheral Hole Dia. Number of Holes
	Closed	Open			
CR14-90	1-1/2 - 2	8	#6 45652-524-25	5/64"	1/16" (6)
CR16-110	1-1/2 - 2	8	#10 45652-524-27	7/64"	1/16" (8)
CR16-130	1-1/2 - 2	8	#12 45652-524-28	1/8"	1/16" (8)
CR20-160	1-1/2 - 2	8	#14 45652-524-30	1/8"	#47 Drill (8)
CR20-200	1-1/2 - 2	8	#15 45652-524-31	5/32"	#47 Drill (8)

TABLE 4 - PROPERTIES OF FUELS

Refinery Source Liquid Fuel	Heating Value	Constituents in Fuel by %							Preheat Temp for 100 SSU °F	Specific Gravity Rel to Water	Lbs/Gal
	BTU/LB (BTU/GAL)	C Avail/(Total)	H Avail.	S (Max)	O	N	ASH	MOIS.			
#2 Distillate	18,993 (137,080)	87.3 (87.3)	12.5	0.21	0.0	0.0	0.0	0.0	40-70	0.865	7.251
#4 Fuel Oil	18,844 (143,010)	86.4 (86.4)	11.6	1.99	0.0	0.0	0.018	0.2	100-125	0.910	7.676
#5 Residual Oil	18,909 (149,960)	88.7 (88.7)	10.7	3.5	0.0	0.0	0.020	0.4	120-175	0.951	8.044
#6 Residual Oil	18,126 (153,120)	88.3 (88.3)	9.3	3.5	0.7	0.3	0.04	0.4	150-225	1.013	8.212

TABLE 5
OIL FUEL PREHEAT REQUIREMENTS

#2/#3 oil	None
#4 oil	Ambient to 120°F
#5 oil	180° to 220°F
#6 oil	200° to 250°F
Required Oil Viscosity ...	100 SSU

Heavy oils should be examined for indications of contaminations, asphalt ends or carbon, before pumping into the system.

CAUTION: Heavy preheated oils should always be circulated through the manifold until the gauge at the manifold is within the range specified on the chart before firing the burner. See paragraphs on fuel policy and Table 4 for fuel information.

TABLE 6
PROPERTIES OF NATURAL GAS

Heating Value	1000 BTU per cu ft
Total Carbon availability	69.4%
Hydrogen availability	22.5%
Nitrogen	8.1%
Maximum Sulphur	0.0%
Oxygen	0.0%
Ash	0.0%
Moisture	0.0%

TABLE 7
PROPERTIES OF LIQUID PROPANE (LP)

Heating Value	21,591 BTU/LB	91,547 BTU/GAL
Total Carbon availability	81.6%	
Hydrogen availability	18.4%	
Maximum Sulphur	0.0%	
Oxygen	0.0%	
Nitrogen	0.0%	
Ash	0.0%	
Moisture	0.0%	
Specific gravity relative to water.....	0.509	
Lbs/Gal	4.240	

TABLE 8
RECOMMENDED LUBRICANTS SHOWING
RANGE OF OPERATING TEMPERATURES

Use an extreme pressure type oil with the proper viscosity grade. Typical brand names are:

Amoco Amogear EP - Exxon Spartan EP
 Gulf EP Lube HD - Shell Omala
 Texaco Meropa
 Viscosity #220 - Ambient Above 32° F
 Viscosity #150 - Ambient Below 32° F
 Mobil Mobilgear
 Viscosity #630 - Ambient Above 32° F
 Viscosity #629 - Ambient Below 32° F

Schedule
LG-4

DR 0004 Has Superior Bowen changed their customer piping configuration from the outlet of the MGE meter to the inlet of the furnace since July 2008? If yes, explain the changes that were made to the piping configuration that existed on July 2008 and provide detailed information and a diagram of the re-configured customer piping system and equipment.

Answer: Yes. A review of the utility plan provided in response to DR 0003 (Attachment 2) shows that the asphalt plant was relocated some 260' south of the plant existing in July 2008 and an 8" HDPE Natural Gas Service line was installed from the location of the line serving the old plant site to the location of the new plant site.

A sketch of the re-configured customer piping system at the relocated new asphalt plant site is attached as Attachment 6.

The burner at the new plant site is an Astec Phoenix Talon Burner Model PT-125. Attached as Attachment 7, are pertinent pages from the Astec Phoenix Talon Burner Operation and Service Manual.

DR 0005 Did MGE request access or was MGE allowed access to Superior Bowen premises to assess the customer piping configuration and equipment? If MGE was allowed access, did MGE look for possible flow restrictions from the MGE meter to the inlet of the furnace? If MGE was allowed access, did MGE make recommendations on the customer-owned piping configuration?

Answer: MGE did not request access to Superior Bowen's property. However, it is not necessary to request access since there is no barrier preventing MGE from accessing the premises virtually at anytime during working hours so it had access. We do not know if MG looked for possible flow restrictions from the MGE meter to the inlet of the new furnace, however, from a view of the location of the additional 8" gas line from the old plant to the new plant appears to be without any flow restrictions.

Whether MGE accessed or did not access the premises to assess the customer piping configuration and equipment, we never made any recommendations one way or the other on the customer-owned piping configuration.

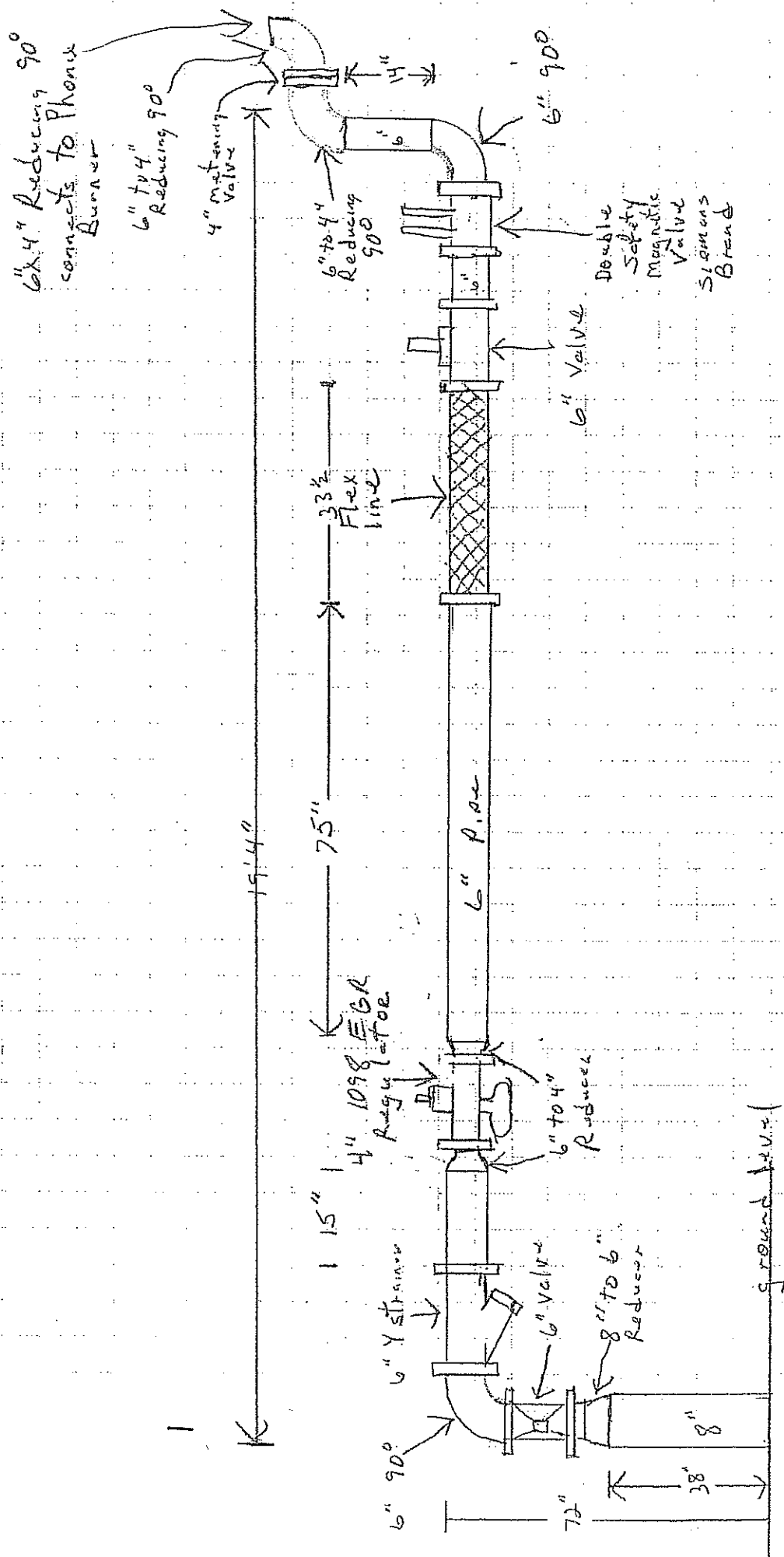
The only time Superior Bowen is aware of MGE making access of the premises was on the day of our first meeting with MGE. At that time, I walked the entire site with Ray Wilson, Richard Bosley of MGE and a third MGE employee, whose name I cannot recall at this time. They wanted to check regulators on all of our buildings on site to see if any of them would need to be replaced. They told us at the time that they were probably alright.

January 28, 2011


Larry Gervy

Gas Line to Phoenix Burner

Attachment 6



**ASTEC Burner Systems Group PHOENIX Talon Burner
Operation and Service Manual**

NOTE: If the Gas run is more than 25', use the connection size on the burner shown in Table-3 below.

FEED PIPE SIZE, FOR GAS RUNS OVER 25 FEET				
Burner Model	PT-75	PT-100	PT-125	PT-150
Pipe Size (Minimum Dia.)	6"	6"	8"	8"

Table-3, Gas Pipe Size (For runs over 25 feet)

NOTE: If the Gas run is 25 feet or less, use the connection size on the burner shown in Table-4 below.

FEED PIPE SIZE, FOR RUNS OF 25 FEET OR UNDER				
Burner Model	PT-75	PT-100	PT-125	PT-150
Pipe Size (Minimum Dia.)	4"	4"	6"	6"

Table-4, Gas Pipe Size (For runs under 25 feet)

- | | |
|--|--|
| <p>4. A manual shutoff valve, and gas strainer must be installed upstream of the gas control regulator.</p> <p>a. The strainer protects the regulator from destructive dirt that could lodge in it.</p> <p>b. This shutoff valve facilitates servicing of the gas control regulator.</p> | <p>c. The factory supplied burner gas train contains a strainer upstream of the Automatic Safety Shutoff Valves.</p> <p>5. The gas company should purge the main gas line for scale and dirt before it is attached to the burner gas manifold.</p> |
|--|--|

NOTE: Install the flexible fitting supplied with the burner gas manifold to reduce flexing of the manifold coming from plant vibrations.

ASTEC PART NUMBERS, FLEXABLE PIPE NIPPLES				
Burner Model	PT-75	PT-100	PT-125	PT-150
ASTEC Part Number	048292	048292	048292	048292

Table-5, Recommended Pipe Nipples

NOTE: The low and high gas pressure switches should be set just above and below the safe operating range of gas inlet pressures respectively. This should be individually determined on each installation. Typically this would be a low gas pressure switch setting of 28 inches of water column (1 PSIG), and a high gas pressure switch setting of 10 PSIG.

ASTEC Burner Systems Group PHOENIX Talon Burner
Operation and Service Manual

NATURAL GAS REGULATOR REQUIREMENTS				
Burner Model	PT-75	PT-100	PT-125	PT-150
Maximum Capacity	83,000	110,000	136,000	165,000
	Cu Ft/Hr	Cu Ft/Hr	Cu Ft/Hr	Cu Ft/Hr
Gas Inlet Pressure	6.5 PSI	7.0 PSI	8.5 PSI	6.0 PSI
Gas Inlet Pipe Size	6"	6"	6"	7"

Table-6, Natural Gas Regulators

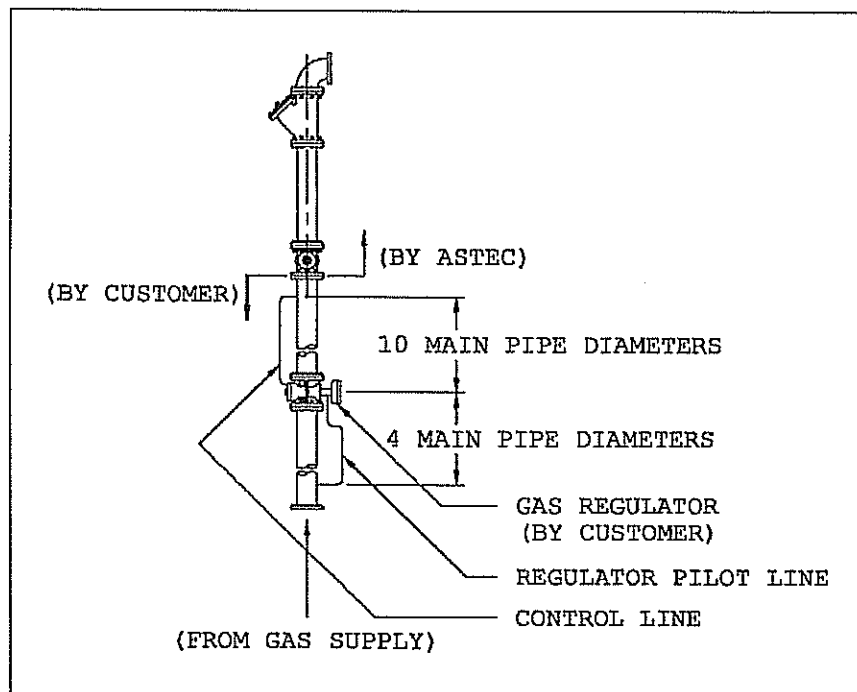


Illustration – 7, Regulator Requirements

- | | |
|---|--|
| <p>6. The gas valve is close coupled to its actuator, eliminating all linkages. (Check the coupling to ensure that no slippage has occurred.)</p> | <p>7. See individual burner performance sheets for air and gas flows. (See pages 20 & 21)</p> <p>8. Use the utmost care in making any adjustment to prevent an unsafe condition.</p> |
|---|--|

WARNING!

1. These settings are for the initial set-up only.
2. Final settings will have to be adjusted for the particular operating conditions.
3. Be sure not to have more fuel flow than there is combustion air available to burn, or "puffing", and a dangerously rich firing condition could occur.

PHOENIX Talon Burner ASTEC Parts Department
Operation and Service Manual

PT-125, GAS W/MODULATING CONTROL VALVE – BURNER PERFORMANCE DATA SHEET, 0% TO 50%																
Burner Output, in Percent	0%	5%	10%	15%	20%	25%	30%	35%	40%	45%	50%					
Heat Input, Millions of BTU per Hour	3.75	13.75	20.26	26.78	33.29	39.80	46.32	52.83	59.34	65.86	72.37					
Gas Flow, in thousands of SCFH	3.75	13.75	20.26	26.78	33.29	39.80	46.32	52.83	59.34	65.86	72.37					
Mini-Main Status, O (Open) or C (Closed)	O	O	O	O	O	O	C	C	C	C	C					
Pressure at Gas Train Inlet, in PSIG	6.50	6.40	6.40	6.30	6.30	6.30	6.30	6.20	6.30	6.20	6.20					
Pressure at Manifold, Inches of Water Column	0.10	0.70	1.30	3.40	5.20	7.50	7.70	13.60	13.80	18.80	19.30					
Pressure Manifold Body, Inches of Water Column	-0.30	0.30	0.75	2.40	3.75	5.55	5.40	10.80	10.40	14.80	14.90					
Pressure Drop, Orifice, Inches of Water Column	0.0	0.30	0.30	0.80	1.40	1.90	1.90	3.30	3.0	4.40	4.40					
Main Air Flow, in thousands of SCFH	500	500	560.8	621.6	682.4	743.2	803.9	864.7	925.5	986.3	1,047					
Blower Output, in Percent	0.0%	0.0%	5.50%	15.0%	18.0%	25.2%	30.2%	35.2%	41.3%	47.3%	51.4%					
Blower Speed, HZ	11.0	11.0	12.6	16.4	17.6	20.3	22.2	24.2	26.5	29.2	30.4					
Blower Body Pressure, Inches of Water Column	0.40	0.40	0.55	1.00	1.45	1.95	2.30	2.80	3.40	4.00	4.40					
Power, Combustion Air Blower, in HP	2.25	2.30	2.45	3.95	4.50	6.25	8.10	11.50	11.90	16.40	17.60					
Current Draw, Combustion air blower, in Amps	57	57	57	57.5	57.4	58	59.8	59.8	62.1	64.7	66.7					
Flame Length, in Feet	4	2-6	3-5	3-7.5	3-7.5	4-8	4-8	5-8	4-7	4-7	4-10					
Flame Diameter, in Feet	2.58	3.88	3.88	3.88	3.23	3.88	3.88	3.88	3.88	3.88	3.88					
Excess Air Flow (Calculated), in Percent	122.5%	261%	175%	131%	104%	86%	73%	63%	55%	49%	44%					

LIMIT SWITCH SETUP			
VFD SETUP PT-125-G	UNITS	AIR VFD	SETTINGS
Minimum Reference	Hz	8.3	-0.20
Maximum Reference	Hz	57.3	Inches of Water Column
Ramp Up Time	In Seconds	40	Inches of Water Column
Ramp Down Time	In Seconds	40	Inches of Water Column
Normal motor Speed	RPM	1780	PSIG
Motor Current	Amps	N/A	PSIG
Motor Frequency	Hz	N/A	PSIG
Motor Voltage	Volts	N/A	N/A
Motor Power	kW	N/A	

Table-19a, PT-125-G, 0-50%

PHOENIX Talon Burner ASTEC Parts Department
Operation and Service Manual

PT-125, GAS W/MODULATING CONTROL VALVE - BURNER PERFORMANCE DATA SHEET 50% TO 100%													
Burner Output, in Percent	50%	55%	60%	65%	70%	75%	80%	85%	90%	95%	100%		
Heat Input, Millions of BTU per Hour	72.37	78.88	85.39	91.91	98.42	104.9	111.4	118.0	124.5	131.0	137.5		
Gas Flow, in thousands of SCFH	72.37	78.88	85.39	91.91	98.42	104.9	111.4	118.0	124.5	131.0	137.5		
Mini-Main Status, O (Open) or C (Closed)	C	C	C	C	C	C	C	C	C	C	C		
Pressure at Gas Train Inlet, in PSIG	6.20	6.20	6.10	6.10	6.10	6.10	6.30	6.0	5.90	6.0	5.90		
Pressure at Manifold, Inches of Water Column	19.30	27.50	32.30	34.20	39.0	40.30	50.80	52.90	59.10	63.0	70.80		
Pressure Manifold Body, Inches of Water Column	14.90	22.35	26.75	28.20	31.50	32.50	42.50	43.70	49.40	54.60	59.40		
Pressure Drop at Orifice, Inches of Water Column	4.40	6.50	7.60	8.10	9.10	9.90	13.50	13.80	15.50	17.70	19.20		
Main Air Flow, in thousands of SCFH	1.047	1.108	1.169	1.229	1.290	1.351	1.412	1.473	1.533	1.594	1.655		
Blower Output, in Percent	51.4%	57.0%	61.0%	64.5%	75.0%	78.0%	79.6%	86.7%	89.8%	94.0%	100%		
Blower Speed, HZ	30.4	32.7	33.9	35.4	39.3	40.5	41.3	44.0	45.2	46.7	49.1		
Blower Body Pressure, Inches of Water Column	4.40	5.15	5.55	6.00	7.50	7.80	8.30	9.20	9.70	10.40	11.40		
Power, Combustion Air Blower, in HP	17.60	21.30	24.10	27.40	38.50	40.90	43.60	52.50	56.60	63.60	72.00		
Current Draw, Combustion air blower, in Amps	66.7	69.5	72	76	83	85	87	94	97.9	102.3	108		
Flame Length, in Feet	4-10	4-9	4-11	4-10	4-10	4-10	4-12	4-12	4-12	4-12	4-12		
Flame Diameter, in Feet	3.88	3.88	3.88	3.88	3.88	4.52	4.52	4.52	4.52	4.52	4.52		
Excess Air Flow (Calculated), in Percent	44%	40%	36%	33%	30%	28%	26%	24%	22%	21%	20%		

LIMIT SWITCH SETUP			
VFD SETUP PT-125-G	UNITS	AIR VFD	SETTINGS
Minimum Reference	Hz	8.3	
Maximum Reference	Hz	57.3	
Ramp Up Time	In Seconds	40	
Ramp Down Time	In Seconds	40	
Normal motor Speed	RPM	1780	
Motor Current	Amps	N/A	
Motor Frequency	Hz	N/A	
Motor Voltage	Volts	N/A	
Motor Power	kW	N/A	

Table-19b, PT-125-G, 50-100%