Excel Engineering, Inc.

SHOP DRAWING TRANSMITTAL

62080

CONTRACTOR:	Gray Construction
Attention:	Benjamin Biddle
	10 Quality Street
	Lexington, KY 40507

CLIENT:	Warabeya North America, Inc.
Attention:	Michael Norris
	1301A Ridgeview Drive, Suite 200
	Lewisville, TX 75057-6016

Job: 2236840 - Warabeya Project 2

Item Reviewed:

Circulating Pumps Subm 230500-4-2

P-11/12/13 PAGE 8
P-15/16/17 PAGE 13
P-19/20/21 PAGE 18
P-22/23 PAGE 23
P-24 PAGE 27
P-25/26 PAGE 29

THESE ARE TRANSMITTED as checked below:

- ☐ No Exceptions Taken
- ☑ Make Corrections
- ☐ Rejected and Resubmit
- ☐ No Action Taken
- ☐ Test Results Meet Spec.
- ☐ Test Results Fail Spec.
- ☑ See Shop Drawing Review Sheet

This review is to determine general compliance with the design concept of the construction documents. Corrections and comments or lack there-of marked on this submission does not relieve the contractor from compliance with the requirements of the project construction drawings and specifications.

The contractors shall remain responsible for determining quantities, dimensions, fabrication process, techniques for assembly and installation, and coordination of all measurements. Site conditions shall be checked and verified by the contractor at the job site. Contractor shall insure all work is performed in a safe manner.

Remarks:

Signed:

Jim Krizenesky, AIA

100 Camelot Drive Fond du Lac, WI 54935
P: 920-926-9800
www.excelengineer.com

SHOP DRAWING REVIEW

ITEM	No exceptions taken	Make corrections noted	Rejected and resubmit	
All Pumps		X		Basis of design was Taco, Contractor responsible for coordinating any changes and costs required due to change in housekeeping pad.
		X		Verify with EC that all Pump VFDs are correct size.
P-11/12/13	X			
P-15/16/17	X			
P-19/20/21	X			
P-22/23	X			
P-24	X			
P-25/26	X			
Basket strainer (P-11/12/13)	X			
Suction diffuser (P-15/16/17)	X			
Suction diffuser (P-19/20/21)	X			
Suction diffuser (P-22/23)	X			
Y-strainer (P-24)	X			
Basket strainer (P-25/26)	X			
Triple duty valve (P-11/12/13)	X			
Triple duty valve (P-15/16/17)	X			
Triple duty valve (P-19/20/21)	X			
Triple duty valve (P-22/23)	X			
Triple duty valve (P-25/26)	X			

Engineer's review is for general conformance with the design concept and contract documents. Markings or comments shall not be construed as relieving the contractor from compliance with the project plans and specifications, nor departures therefrom. The contractor remains responsible for details and accuracy, for confirming and correlating all quantities and dimensions, for selecting fabrication processes, for techniques of assembly, and for performing his work in a safe manner.

Submittal #230500-4.2 230500 - Basic HVAC Requirements

Gray Construction
10 Quality St.
Lexington, Kentucky 40507
Phone: (859) 281-5000
Fax: (859) 252-5300

Project: 2024052 - Warabeya-Project Excel
1575 Southern Rail Ct
Columbus Ohio, Ohio 43217

Circulating Pumps Submittal REV. 2

REVISION:	2	**SUBMITTAL MANAGER:**	Christopher Prichard **(Gray Construction)**
STATUS:	Open	**DATE CREATED:**	07/29/2024
ISSUE DATE:		**SPEC SECTION:**	230500 - Basic HVAC Requirements
RESPONSIBLE CONTRACTOR:	Mullins Mechanical	**RECEIVED FROM:**	Nathan Andrews
RECEIVED DATE:		**SUBMIT BY:**	
FINAL DUE DATE:	08/12/2024	**LOCATION:**	Warabeya
		TYPE:	Product Data
APPROVERS:	Lisa Dickmann **(Excel Engineering)**, Eric Morgan **(Gray Construction)**, Christopher Prichard **(Gray Construction)**		

BALL IN COURT:
Lisa Dickmann **(Excel Engineering)**, Christopher Prichard **(Gray Construction)**

DISTRIBUTION:
Christopher Prichard **(Gray Construction)**, Daryl Charbonneau **(Mullins Mechanical)**, Nathan Andrews **(Mullins Mechanical)**

DESCRIPTION:
See the attached revised Circulating Pumps submittal package.

USE THIS LINK TO ACCESS THE BLUEBEAM STUDIO SESSION. (WHEN APPLICABLE):

SUBMITTAL WORKFLOW

NAME	SENT DATE	DUE DATE	RETURNED DATE	RESPONSE	ATTACHMENTS	COMMENTS
General Information Attachments					230500-4-2 Circulating Pumps Submittal REV. 2.pdf	
Lisa Dickmann	07/30/2024	08/12/2024		Pending		
Eric Morgan		08/12/2024	07/30/2024	Correct and Resubmit		see comments from Excel on suction diffusers and revise discharge head duty point.
Christopher Prichard	07/30/2024	08/12/2024		Pending		

BY **DATE** **COPIES TO**

Project Warabeya

Project # 2024052
Submittal Cover Sheet

To: Chris Prichard
Gray Construction

Submittal Date: 7/29/2024
Submittal # 230500-4-2

From: Mullins Mechanical (Company Name)
115 Greenway Blvd (Address)
Carrollton, GA 30117 (City, State, and Zip)

Contact: Nathan Andrews
Email: nandrews@mullins-mechanical.com
Phone: 404-326-8965

Spec Section: 230500
Spec Section Title: Basic HVAC Requirements
Reference Drawing #'s: H4.2
Submittal Description: Circulating Pumps Submittal REV. 2

Submittal: [X] Action Submittal or [ ] For Information Only
Submittal Type: [X] Product Data [ ] Shop Drawing [ ] Sample [ ] O&M [ ] Other

Gray Construction

SHOP DRAWING & PLAN REVIEW

GRAY CONSTRUCTION, INC.
10 Quality Street
Lexington, Kentucky 40507-1450

Review is for general coordination of construction elements. Markings or comments shall not be construed as relieving the Subcontractor or Supplier from compliance with the intent of the plans and specifications, nor departures there from. The Subcontractor or Supplier remains responsible for details and accuracy, for confirming and correlating all quantities and dimensions, compliance and design criteria, and for selecting fabrication processes, or to the means and methods of construction, and for performing their work in a safe manner.

[ ] No Exceptions Taken
[ ] Exception Noted, Revise And Resubmit, fabrication may proceed.
[ ] Exceptions Noted, Resubmittal not required.
[ ] Rejected, Submit specified Item
[ ] For Information Only

Reviewed By: _____
Authorized Representative Date

Excel Engineering

Warabeya

SHOP DRAWING REVIEW

ITEM	No exceptions taken	Make corrections noted	Rejected and resubmit	
All Pumps		X		Basis of design was Taco, Contractor responsible for coordinating any changes and costs required due to change in housekeeping pad.
		X		Verify with EC that all Pump VFDs are correct size.
P-11/12/13	X			
P-15/16/17	X			
P-19/20/21	X			
P-22/23	X			
P-24	X			
P-25/26			X	Resubmit with Duty Point Head of 75 ft. JMP-Selection revised to reflect 75 ft head; no change in pump selection.
Basket strainer (P-11/12/13)	X			
Suction diffuser (P-15/16/17)			X	Keep as Type X suction diffuser, resubmit with stainless steel orifice cylinder.
Suction diffuser (P-19/20/21)			X	Resubmit as B & G Type X suction diffuser as specified.
Suction diffuser (P-22/23)			X	Keep as Type X suction diffuser, resubmit with stainless steel orifice cylinder.
Y-strainer (P-24)	X			
Basket strainer (P-25/26)	X			
Triple duty valve (P-11/12/13)	X			
Triple duty valve (P-15/16/17)	X			
Triple duty valve (P-19/20/21)	X			
Triple duty valve (P-22/23)	X			
Triple duty valve (P-25/26)	X			

JMP-Suction diffuser can either be Type X (steel internals) or type Z (stainless steel internals). A Type X with SS orifice is a Type Z. All suction diffusers have been resubmitted as Type Z. Previous suction diffuser submittal included for reference to show the only difference is internal materials.

Engineer's review is for general conformance with the design concept and contract documents. Markings or comments shall not be construed as relieving the contractor from compliance with the project plans and specifications, nor departures therefrom. The contractor remains responsible for details and accuracy, for confirming and correlating all quantities and dimensions, for selecting fabrication processes, for techniques of assembly, and for performing his work in a safe manner.

Bell & Gossett
a xylem brand

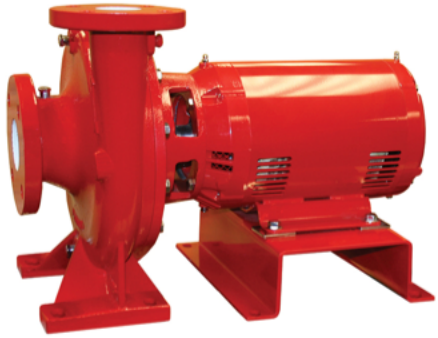
P-11/12/13

Submittal

Job/Project: Warabeya R1	Representative:	
ESP-Systemwize: WIZE-933DF0A4 Created On: 06/21/2024	Phone:	
Location/Tag: P-11/12/13	Email:	
Engineer:	Submitted By:	Date:
Contractor:	Approved By:	Date:

Close Coupled Foot Mounted End Suction Pump

Series: e-1532
Model: 6G



Features & Design

- "Best in Class" hydraulic performance
- Best choice for lowest life cycle cost
- Internally self-flushing mechanical seals
- Hydrostatic testing of each pump standard

*The Bell & Gossett Series e-1532 is available in 26 sizes and a variety of configuration options that enables customization and flexibility to fit a broad range of operating conditions.

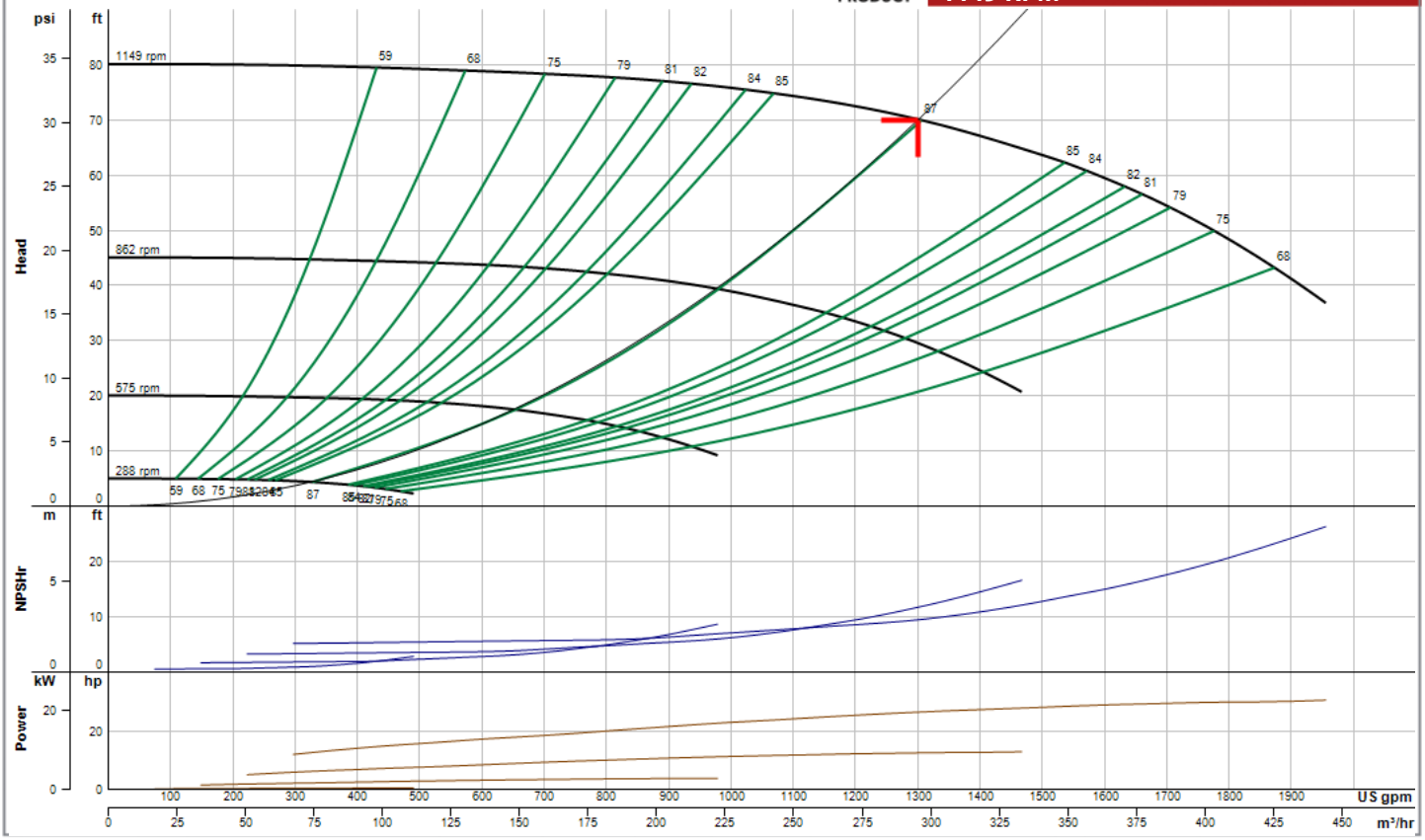
Pump Selection Summary

Duty Point Flow	1300 US gpm
Duty Point Head	70 ft
Control Head	0 ft
Duty Point Pump Efficiency	86.9 %
Part Load Efficiency Value (PLEV)	86.9 %
Impeller Diameter	13.25 in
Motor Power	30 hp
Duty Point Power	26.4 bhp
Motor Speed	1200 rpm
RPM @ Duty Point	1149 rpm
NPSHr	9.51 ft
Minimum Shutoff Head	80.1 ft
Minimum Flow at RPM	300 US gpm
Flow @ BEP	1306 US gpm
Fluid Temperature	85 °F
Fluid Type	Water
Weight *(approx. - consult rep for exact)*	1339 lbs
Pump Floor Space Calculation	5.35 ft²

Performance Curve

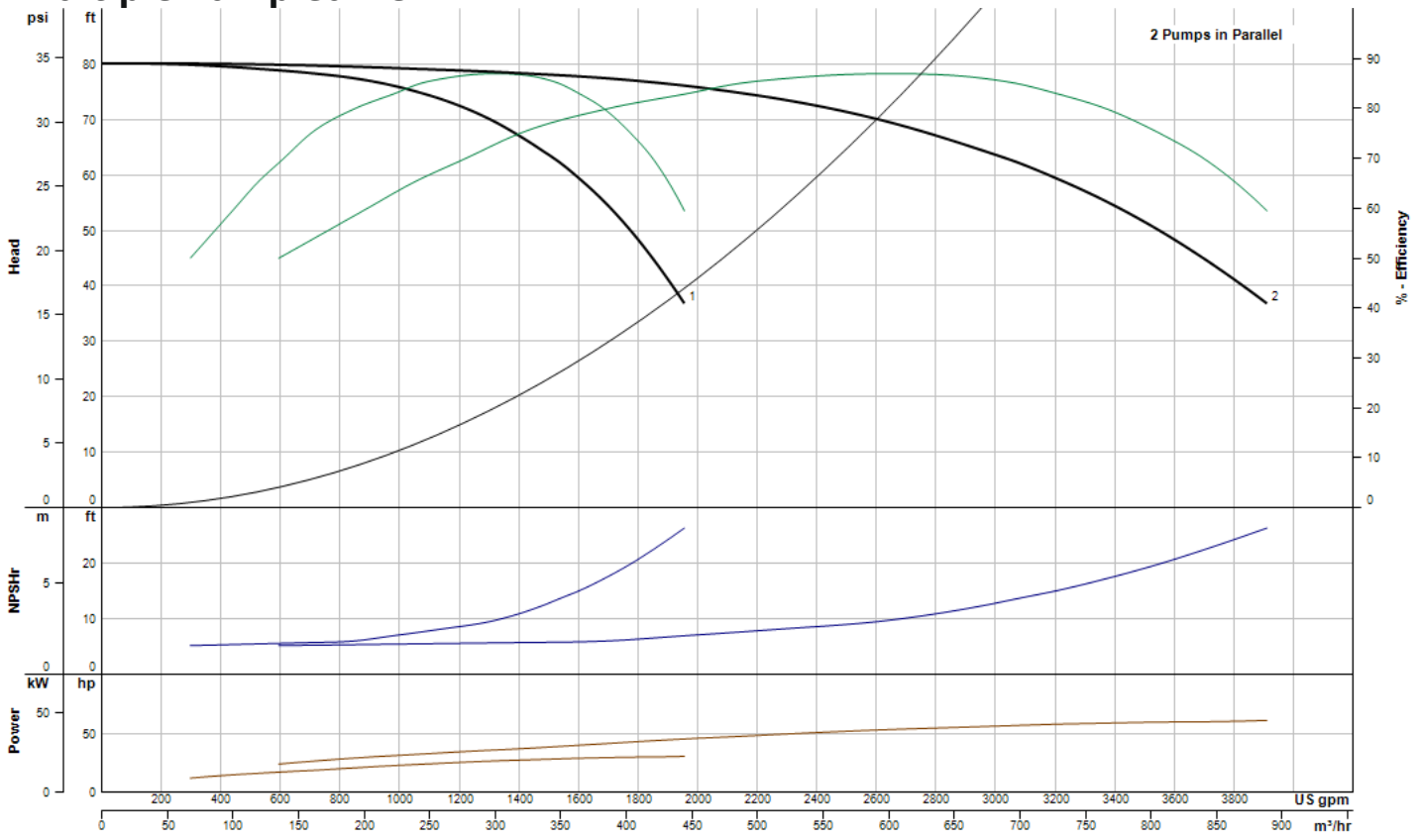
PREMIUM EFFICIENCY PRODUCT

e-1532
6G
1149 RPM



Performance curve meets 14.6 / ISO 9906 acceptance criteria | Available Phase: 3, Available Voltage(s) [V]: 200, 575, 230/460

Multiple Pump Curve



Best Efficiency Staging

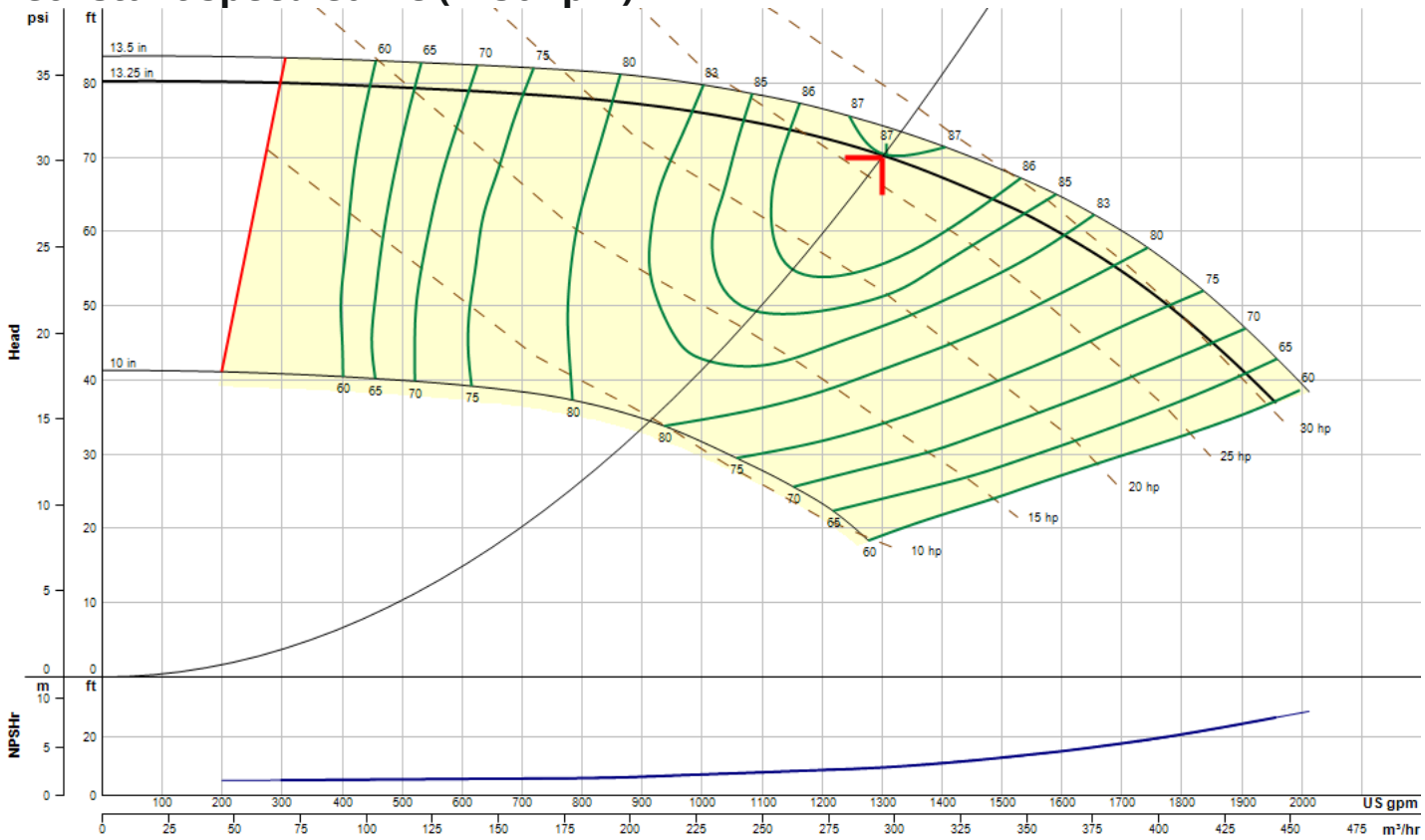
Single pump variable staging possible?			Yes	
System curve crosses full speed curve			Yes	Yes
Load	Weight	Best eff	1 Pump	2 Pumps
100%	1%	86.9		86.9
75%	42%	86.9		86.9
50%	45%	86.9	61.9	86.9
25%	12%	86.9	62.0	86.9
Optimal Staging PLEV		86.9		

Single Pump Variable Staging - This determination is based on whether the system curve crosses the variable speed curves for the pumps. A "NO" in this box indicates that even at 25% load you need to stage more than one pump to meet system demand. A "YES indicates that the required head and flow for 25% can be satisfied by a single pump. If the system curve does not cross the single pump curve at full speed, then protections for overload will need to be configured in the drive to avoid falling off the curve.

Grid values - A blank box on the grid indicates that the load listed in the row cannot be satisfied by the number of pumps listed in the column. An efficiency value on the grid indicates the approximate hydraulic efficiency for the load in that row based upon staging the number of pumps in the column at the required speed to achieve that flow point. The darkest shaded green box indicates the optimal number of pumps to stage for maximum efficiency at that load.

Optimal staging PLEV - This is the estimated weighted average PLEV achieved based upon the maximum efficiency staging at each of the four load points.

Constant Speed Curve (1150 rpm)

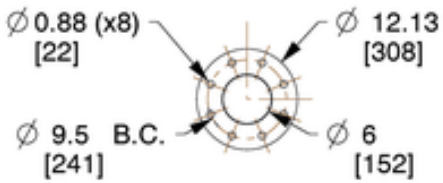


Operating Point

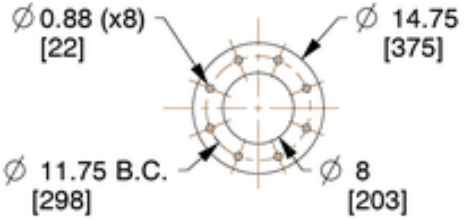
Flow: 1301 US gpm **Head:** 70.1 ft **Speed:** 1149 **Efficiency:** 86.9% **Point BHP:** 26.4 **End Of Curve:** 66.5%

Maximum Duty Point (at rated motor speed)

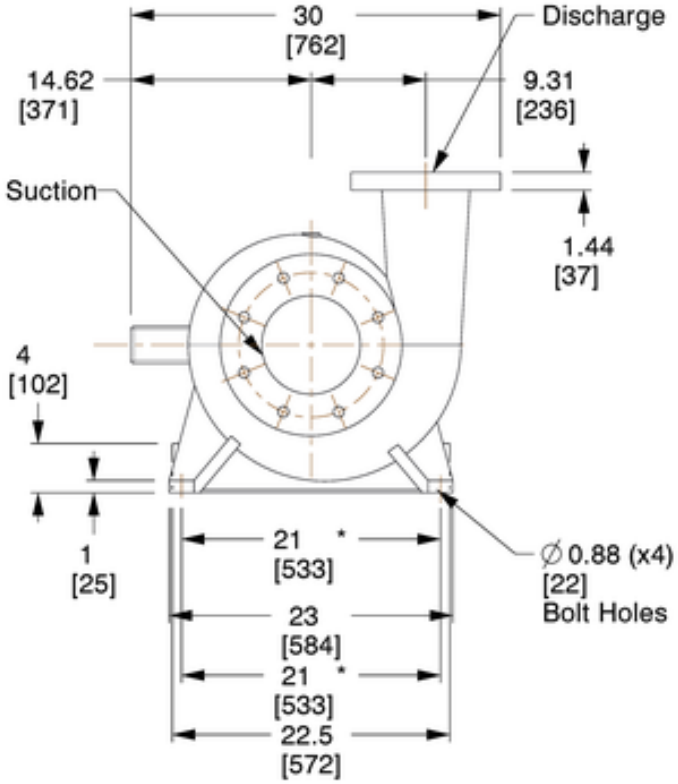
Flow: 1302 US gpm **Head:** 70.2 ft **Speed:** 1150 **Efficiency:** 86.9% **Point BHP:** 26.5 **NOL Flow:** 1957 US gpm **Runout Flow:** 1957 US gpm **NOL (BHP):** 30.6

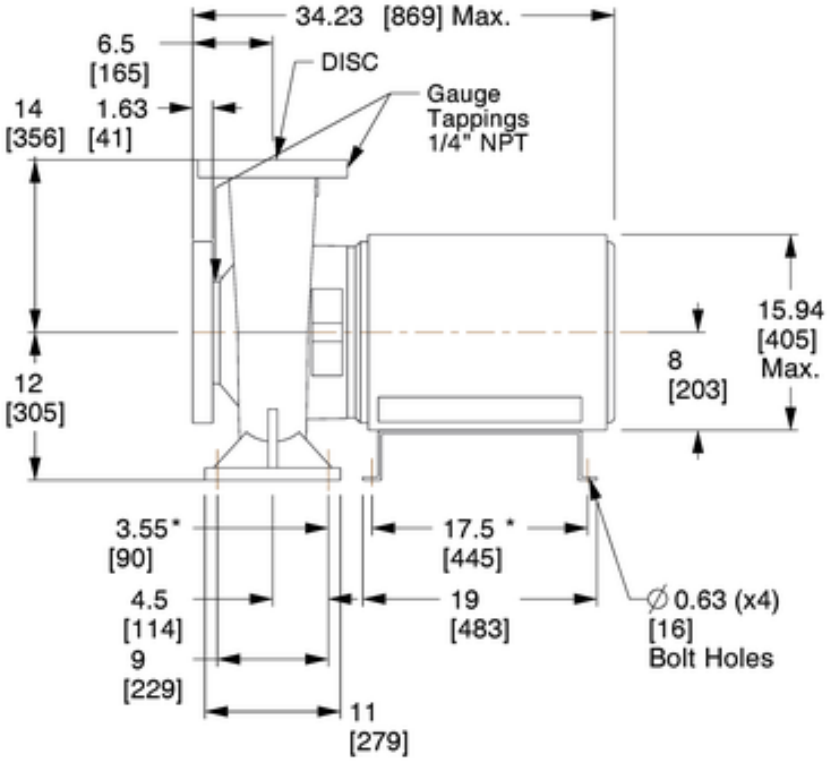


6" DISCHARGE FLANGE
ANSI 125#



8" SUCTION FLANGE
ANSI 125#





* Dist. Between Bolt Holes

Bell & Gossett
a xylem brand

8200 N. Austin Ave.
Morton Grove, IL 60053, USA

Dimensions are subject to change

Not to be used for construction unless certified

BG-E1532-600G-326-SS

Series e-1532 Close Coupled Foot Mounted Centrifugal Pump

Motor Frame:326JM | Seal Type:Standard Seal | Flange:ANSI 125#

Dimensions : IN (mm)	Scale : N.T.S.	Submittal # : B-881.48A

Standard Materials of Construction *contact your local rep for optional ES Bearing Frame

Construction:	Stainless Steel Fitted
1 Shaft:	Carbon Steel Grade per Motor Manufacturer
2 Volute:	Cast Iron ASTM A48 Class 30B
3 Impeller:	ASTM A743 Grade CF8 - 304 Stainless Steel
4 Shaft Sleeve:	ASTM 312 Grade TP304 - 304 Stainless Steel
5 Impeller Key:	#304 Stainless Steel
6 Impeller Washer:	Steel
7 Impeller Lock Washer:	#304 Stainless Steel
8 Impeller Cap Screw:	#304 Stainless Steel
9 Volute Gasket:	Cellulose Fiber

Pump Options *contact your local rep to configure

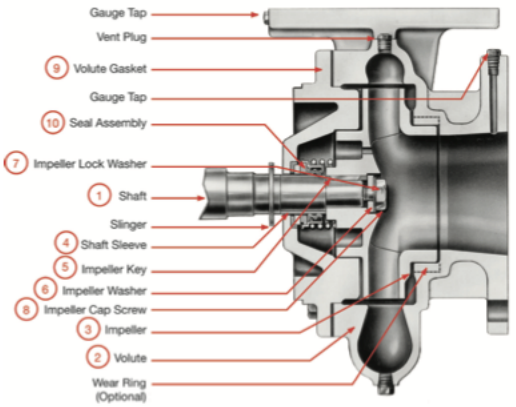
Stainless Steel Volute Wear Ring	Stuffing Box Configuration
External Flush Line	Epoxy Coated Internal Cast Iron Components
Certified Performance Tests (Per HI Standard 14.6)	Special Impeller Balancing (ISO 1940 G2.5 or G1.0)
Heavy Duty Baseplate	Galvanized Steel Drip Pan

10 Standard Mechanical Seal Assembly

Elastomer:	Buna
Rotating Face:	Carbon
Stationary Face:	Ceramic
Hardware	Stainless Steel/Brass

Maximum Working Pressure

Max Working Pressure (standard)	175 psi (12 bar) W..P.



Xylem Inc.
8200 N. Austin Avenue, Morton Grove, IL 60053
Phone: (847)966-3700 Fax: (847)965-8379
www.bellgossett.com

P-15/16/17

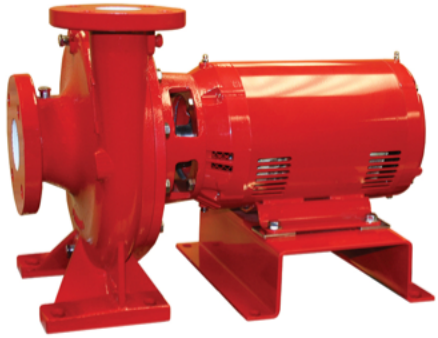
Bell & Gossett
a xylem brand

Submittal

Job/Project: Warabeya R1		Representative:	
ESP-Systemwize: WIZE-933DF0A4	Created On: 06/21/2024	Phone:	
Location/Tag: P-15/16/17		Email:	
Engineer:		Submitted By:	Date:
Contractor:		Approved By:	Date:

Close Coupled Foot Mounted End Suction Pump

Series: e-1532
Model: 6G



Features & Design

- "Best in Class" hydraulic performance
- Best choice for lowest life cycle cost
- Internally self-flushing mechanical seals
- Hydrostatic testing of each pump standard

*The Bell & Gossett Series e-1532 is available in 26 sizes and a variety of configuration options that enables customization and flexibility to fit a broad range of operating conditions.

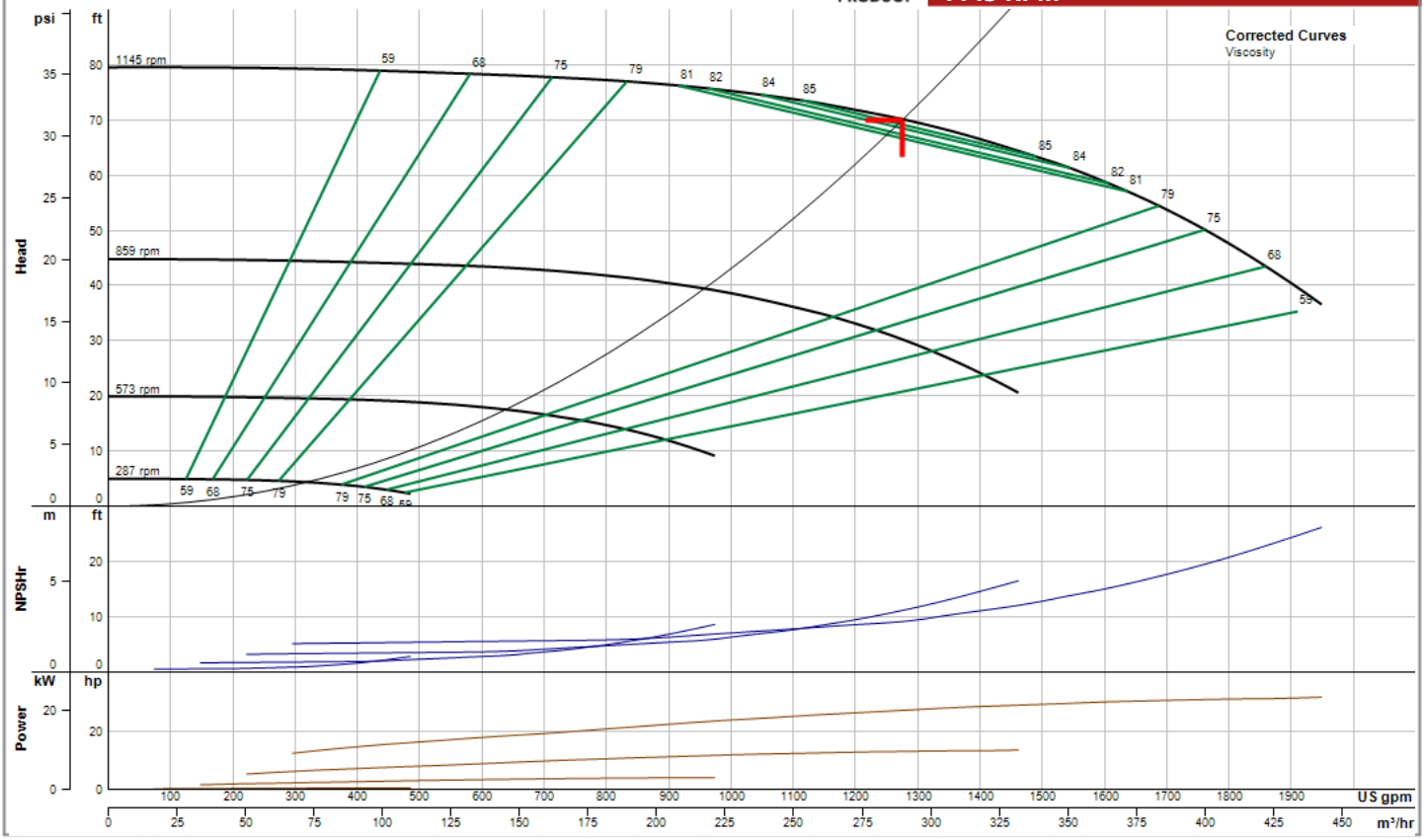
Pump Selection Summary

Duty Point Flow	1275 US gpm
Duty Point Head	70 ft
Control Head	0 ft
Duty Point Pump Efficiency	86.3 %
Part Load Efficiency Value (PLEV)	84.1 %
Impeller Diameter	13.25 in
Motor Power	30 hp
Duty Point Power	27 bhp
Motor Speed	1200 rpm
RPM @ Duty Point	1145 rpm
NPSHr	9.28 ft
Minimum Shutoff Head	79.6 ft
Minimum Flow at RPM	299 US gpm
Flow @ BEP	1302 US gpm
Fluid Temperature	26 °F
Fluid Type	30% Propylene glycol
Weight *(approx. - consult rep for exact)*	1339 lbs
Pump Floor Space Calculation	5.35 ft²

Performance Curve

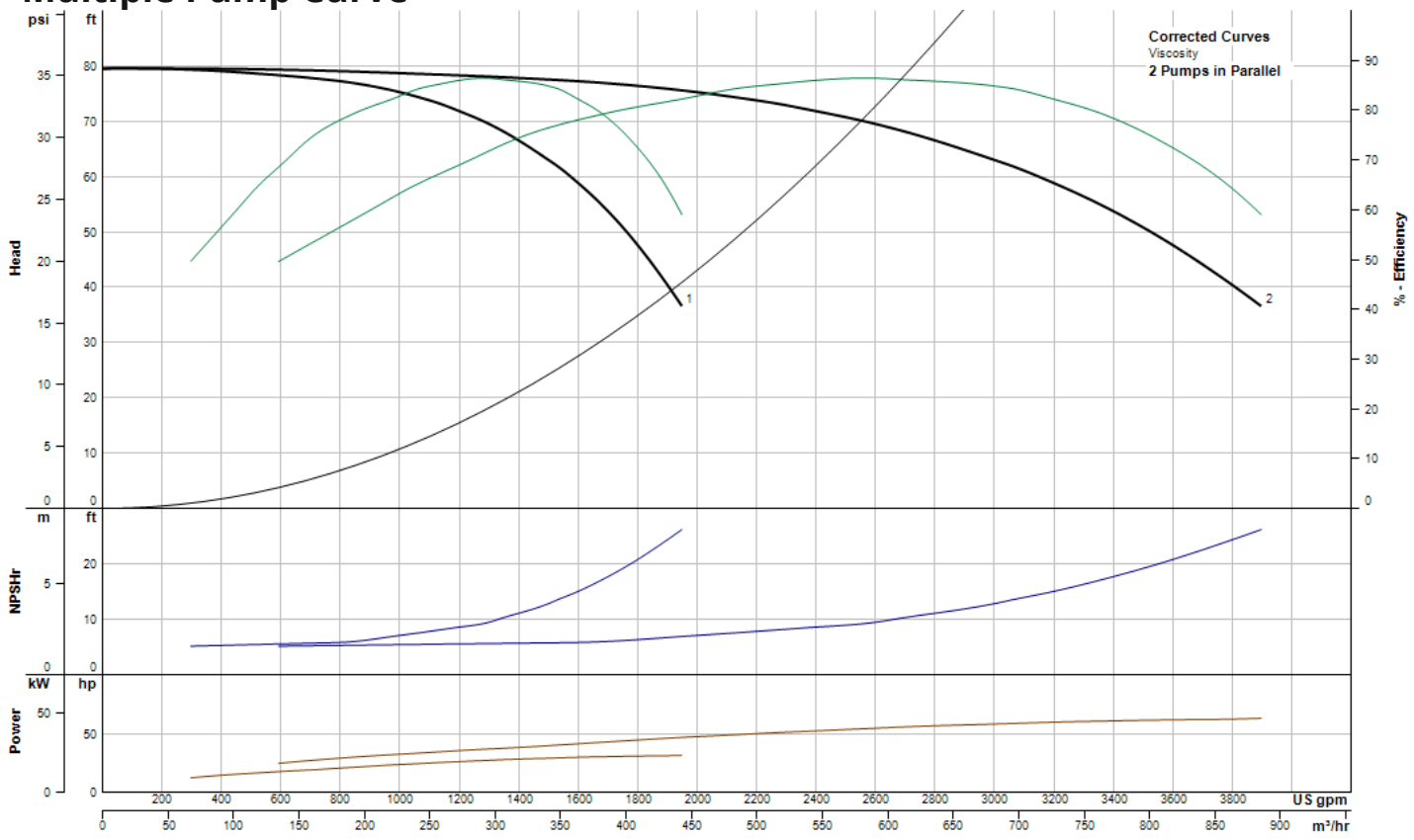
PREMIUM EFFICIENCY PRODUCT

e-1532
6G
1145 RPM



Specific Gravity: 1.0339, Viscosity: 8.1267 | Performance curve meets 14.6 / ISO 9906 acceptance criteria | Available Phase: 3, Available Voltage(s) [V]: 200, 575, 230/460

Multiple Pump Curve



Best Efficiency Staging

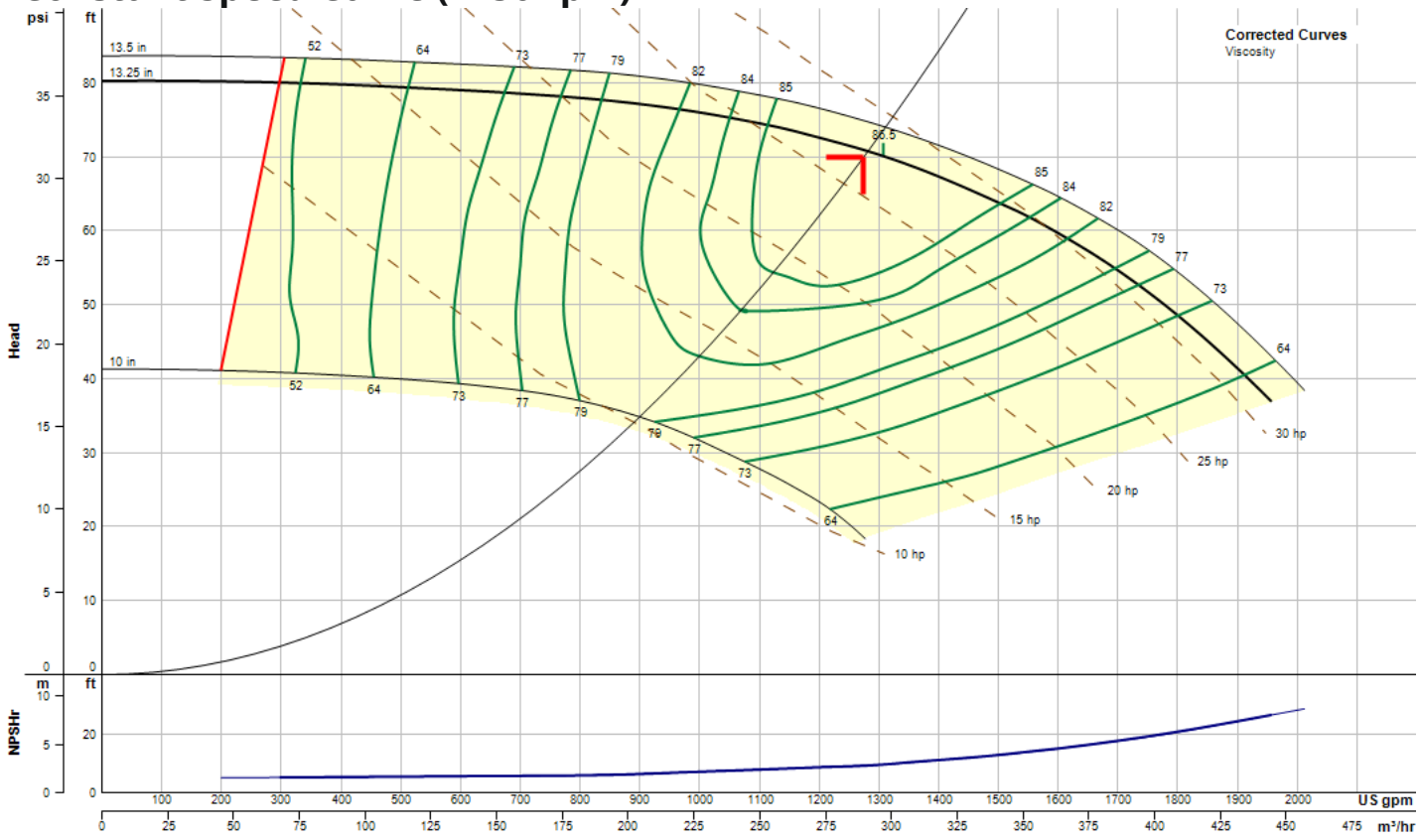
Single pump variable staging possible?			Yes	
System curve crosses full speed curve			Yes	Yes
Load	Weight	Best eff	1 Pump	2 Pumps
100%	1%	86.3		86.3
75%	42%	85.4		85.4
50%	45%	83.9	62.5	83.9
25%	12%	80.4	62.5	80.4
Optimal Staging PLEV		84.1		

Single Pump Variable Staging - This determination is based on whether the system curve crosses the variable speed curves for the pumps. A "NO" in this box indicates that even at 25% load you need to stage more than one pump to meet system demand. A "YES indicates that the required head and flow for 25% can be satisfied by a single pump. If the system curve does not cross the single pump curve at full speed, then protections for overload will need to be configured in the drive to avoid falling off the curve.

Grid values - A blank box on the grid indicates that the load listed in the row cannot be satisfied by the number of pumps listed in the column. An efficiency value on the grid indicates the approximate hydraulic efficiency for the load in that row based upon staging the number of pumps in the column at the required speed to achieve that flow point. The darkest shaded green box indicates the optimal number of pumps to stage for maximum efficiency at that load.

Optimal staging PLEV - This is the estimated weighted average PLEV achieved based upon the maximum efficiency staging at each of the four load points.

Constant Speed Curve (1150 rpm)

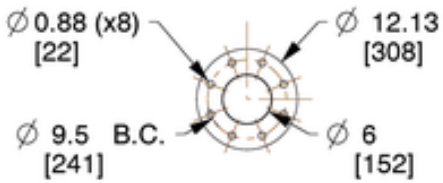


Operating Point

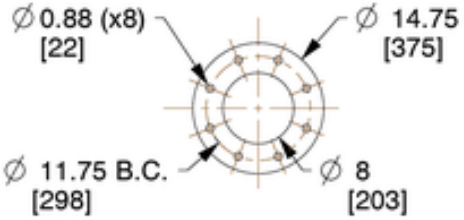
Flow: 1276 US gpm **Head:** 70.1 ft **Speed:** 1145 **Efficiency:** 86.3% **Point BHP:** 27 **End Of Curve:** 65.5%

Maximum Duty Point (at rated motor speed)

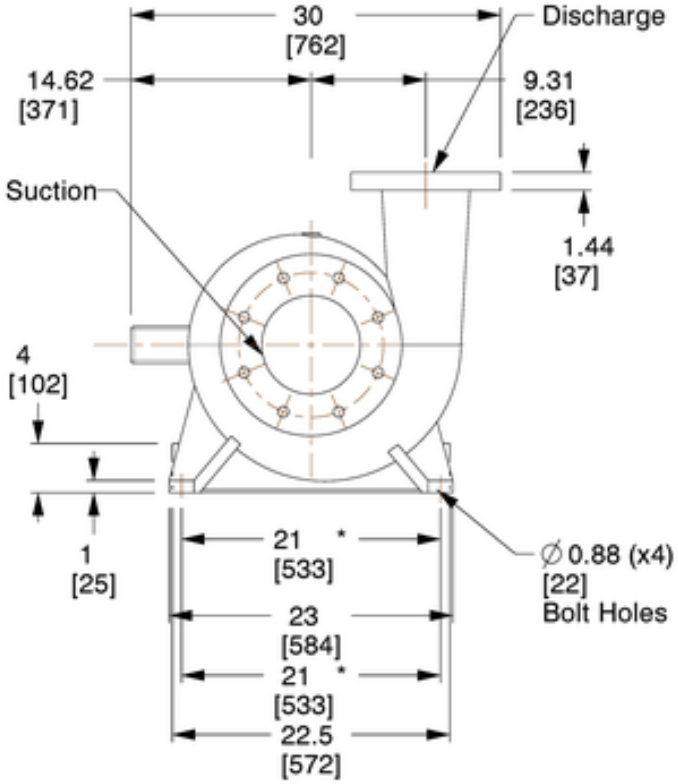
Flow: 1281 US gpm **Head:** 70.7 ft **Speed:** 1150 **Efficiency:** 86.3% **Point BHP:** 27.4 **NOL Flow:** 1957 US gpm **Runout Flow:** 1957 US gpm **NOL (BHP):** 31.9

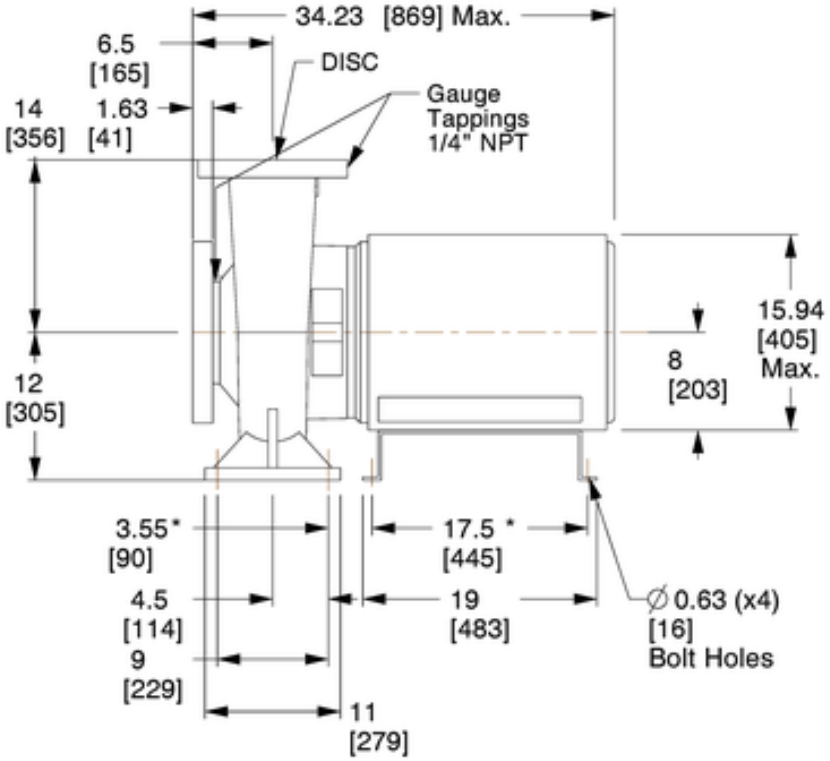


6" DISCHARGE FLANGE
ANSI 125#



8" SUCTION FLANGE
ANSI 125#





* Dist. Between Bolt Holes

Bell & Gossett
a xylem brand

8200 N. Austin Ave.
Morton Grove, IL 60053, USA

Dimensions are subject to change

Not to be used for construction unless certified

BG-E1532-600G-326-SS

Series e-1532 Close Coupled Foot Mounted Centrifugal Pump

Motor Frame:326JM | Seal Type:Standard Seal | Flange:ANSI 125#

Dimensions : IN (mm)	Scale : N.T.S.	Submittal # : B-881.48A

Standard Materials of Construction *contact your local rep for optional ES Bearing Frame

Construction:	Stainless Steel Fitted
1 Shaft:	Carbon Steel Grade per Motor Manufacturer
2 Volute:	Cast Iron ASTM A48 Class 30B
3 Impeller:	ASTM A743 Grade CF8 - 304 Stainless Steel
4 Shaft Sleeve:	ASTM 312 Grade TP304 - 304 Stainless Steel
5 Impeller Key:	#304 Stainless Steel
6 Impeller Washer:	Steel
7 Impeller Lock Washer:	#304 Stainless Steel
8 Impeller Cap Screw:	#304 Stainless Steel
9 Volute Gasket:	Cellulose Fiber

Pump Options *contact your local rep to configure

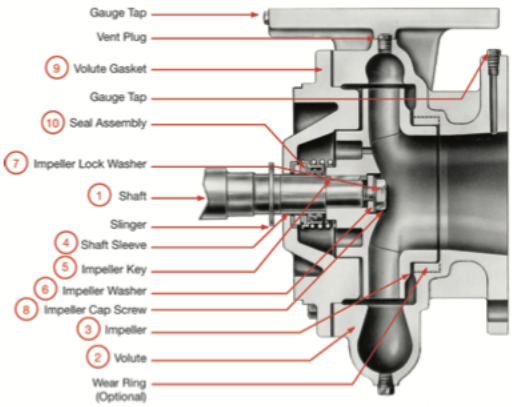
Stainless Steel Volute Wear Ring	Stuffing Box Configuration
External Flush Line	Epoxy Coated Internal Cast Iron Components
Certified Performance Tests (Per HI Standard 14.6)	Special Impeller Balancing (ISO 1940 G2.5 or G1.0)
Heavy Duty Baseplate	Galvanized Steel Drip Pan

10 Standard Mechanical Seal Assembly

Elastomer:	Buna
Rotating Face:	Carbon
Stationary Face:	Ceramic
Hardware	Stainless Steel/Brass

Maximum Working Pressure

Max Working Pressure (standard)	175 psi (12 bar) W..P.



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8200 N. Austin Avenue, Morton Grove, IL 60053
Phone: (847)966-3700 Fax: (847)965-8379
www.bellgossett.com

Bell & Gossett
a xylem brand

P-19/20/21

Submittal

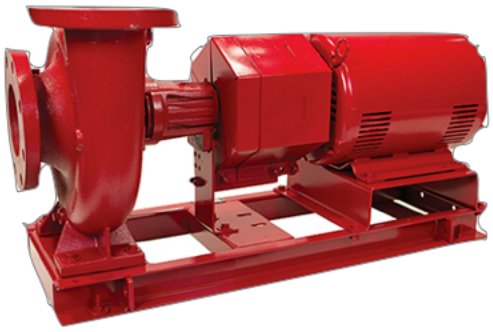
Job/Project: Warabeya R1		Representative:	
ESP-Systemwize: WIZE-933DF0A4	Created On: 06/21/2024	Phone:	
Location/Tag: P-19/20/21		Email:	
Engineer:		Submitted By:	Date:
Contractor:		Approved By:	Date:

Base Mounted End Suction Pump

Series: e-1510
Model: 6G

Features & Design

- ANSI/OSHA Coupling Guard
- Center Drop Out Spacer Coupling
- Fabricated Heavy Duty Baseplate
- Internally Self-Flushing Mechanical Seal



*The Bell & Gossett Series e-1510 is available in 26 sizes and a variety of configuration options that enable customization and flexibility to fit a broad range of operating conditions.

http://bellgossett.com/pumps-circulators/end-suction-pumps/e-1510/

Pump Selection Summary

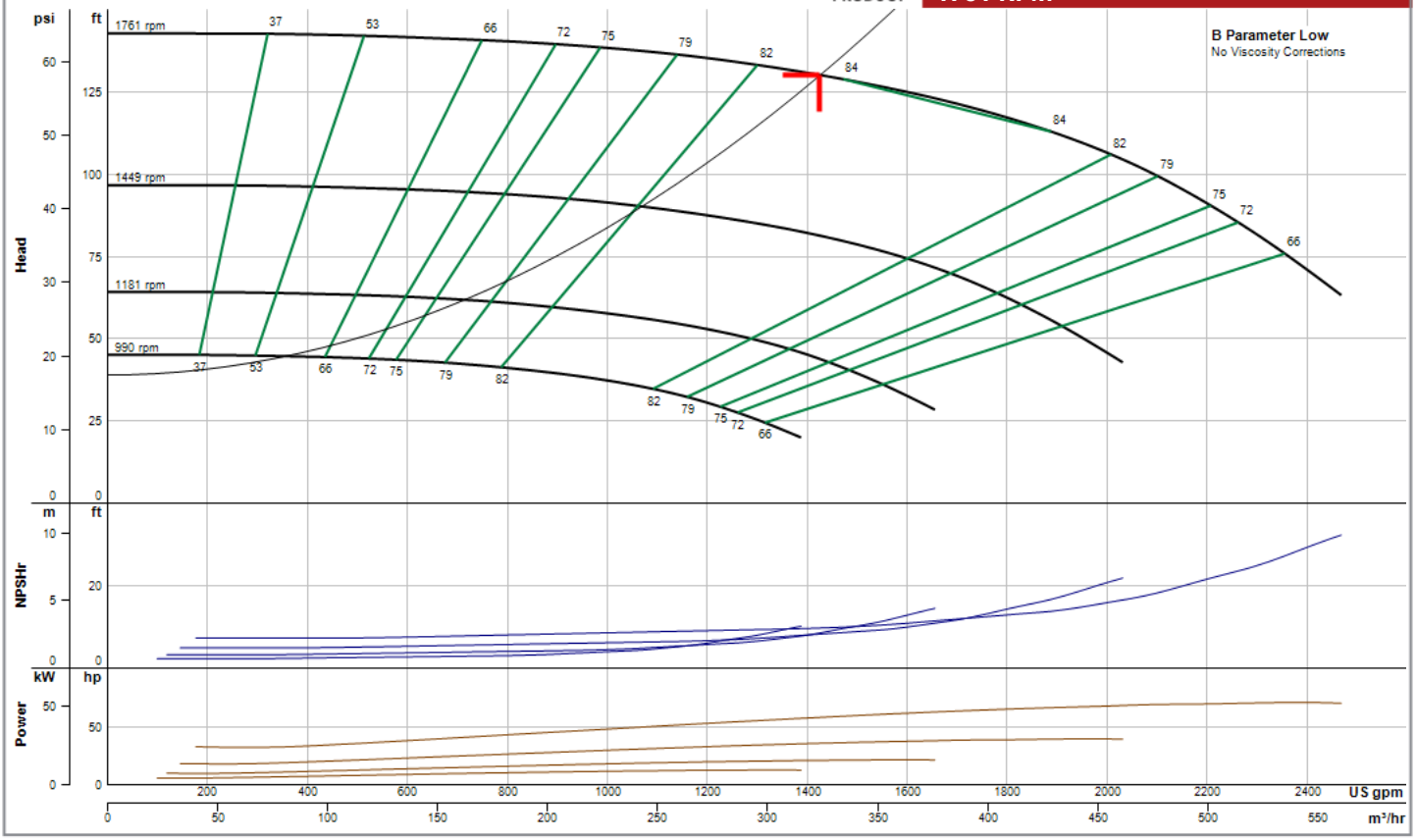
Duty Point Flow	1425 US gpm
Duty Point Head	130 ft
Control Head	39 ft
Duty Point Pump Efficiency	83.5 %
Part Load Efficiency Value (PLEV)	75.8 %
Impeller Diameter	11.75 in
Motor Power	60 hp
Duty Point Power	57.9 bhp
Motor Speed	1800 rpm
RPM @ Duty Point	1761 rpm
NPSHr	9.84 ft
Minimum Shutoff Head	143 ft
Minimum Flow at RPM	388 US gpm
Flow @ BEP	1686 US gpm
Fluid Temperature	26 °F
Fluid Type	30% Propylene glycol
Weight *(approx. - consult rep for exact)*	1409 lbs
Pump Floor Space Calculation	13.69 ft²

Performance Curve

Energy Efficiency Ratings:
Pump & Motor PEIcl: 0.93 ERcl: 7
Pump, Motor & Drive: PEIvl: 0.46 ERvl: 54

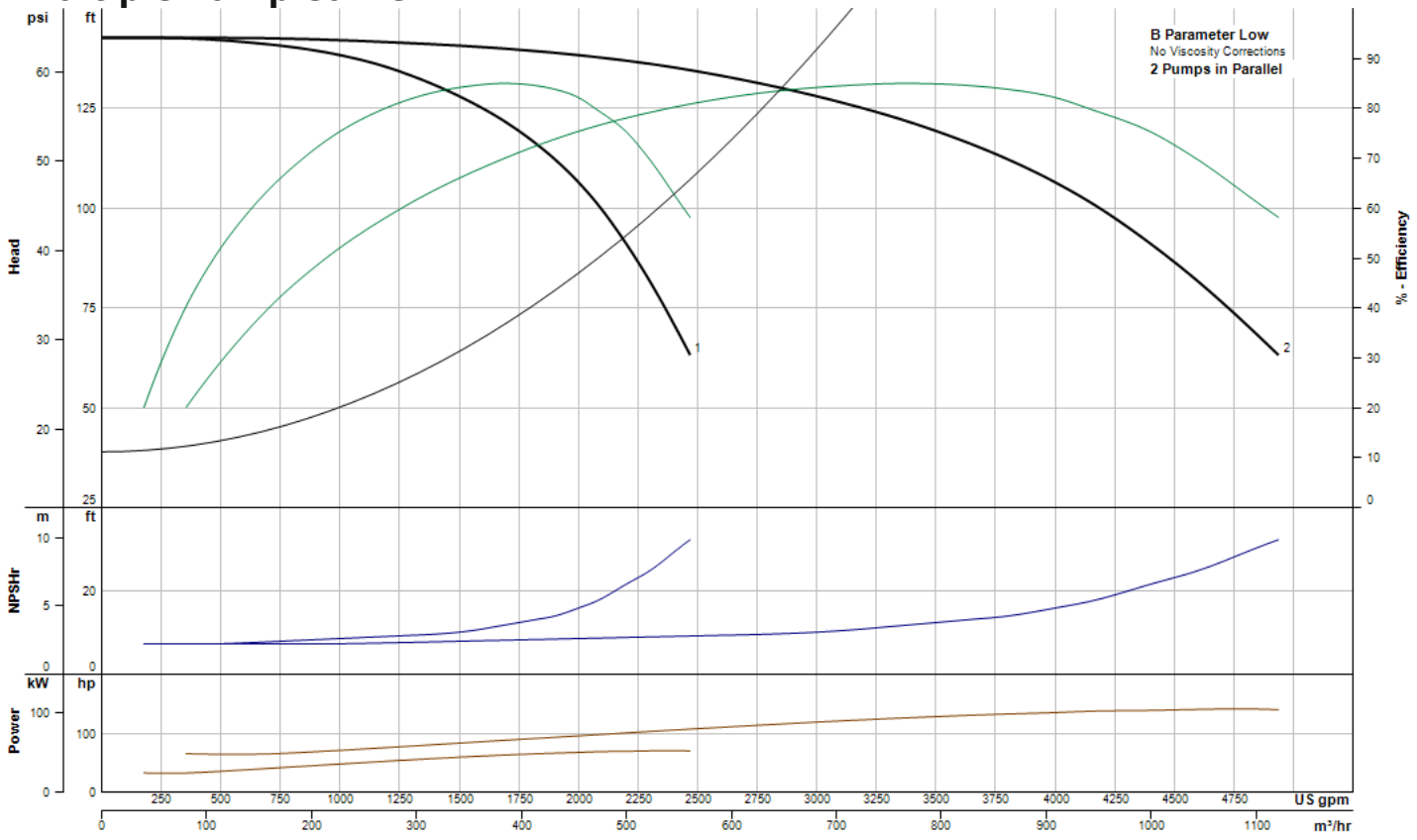
PREMIUM EFFICIENCY PRODUCT

e-1510
6G
1761 RPM



Specific Gravity: 1.0339, Viscosity: 8.1267 | Performance curve meets 14.6 / ISO 9906 acceptance criteria | Available Phase: 3, Available Voltage(s) [V]: 575, 200, 230/460

Multiple Pump Curve



Best Efficiency Staging

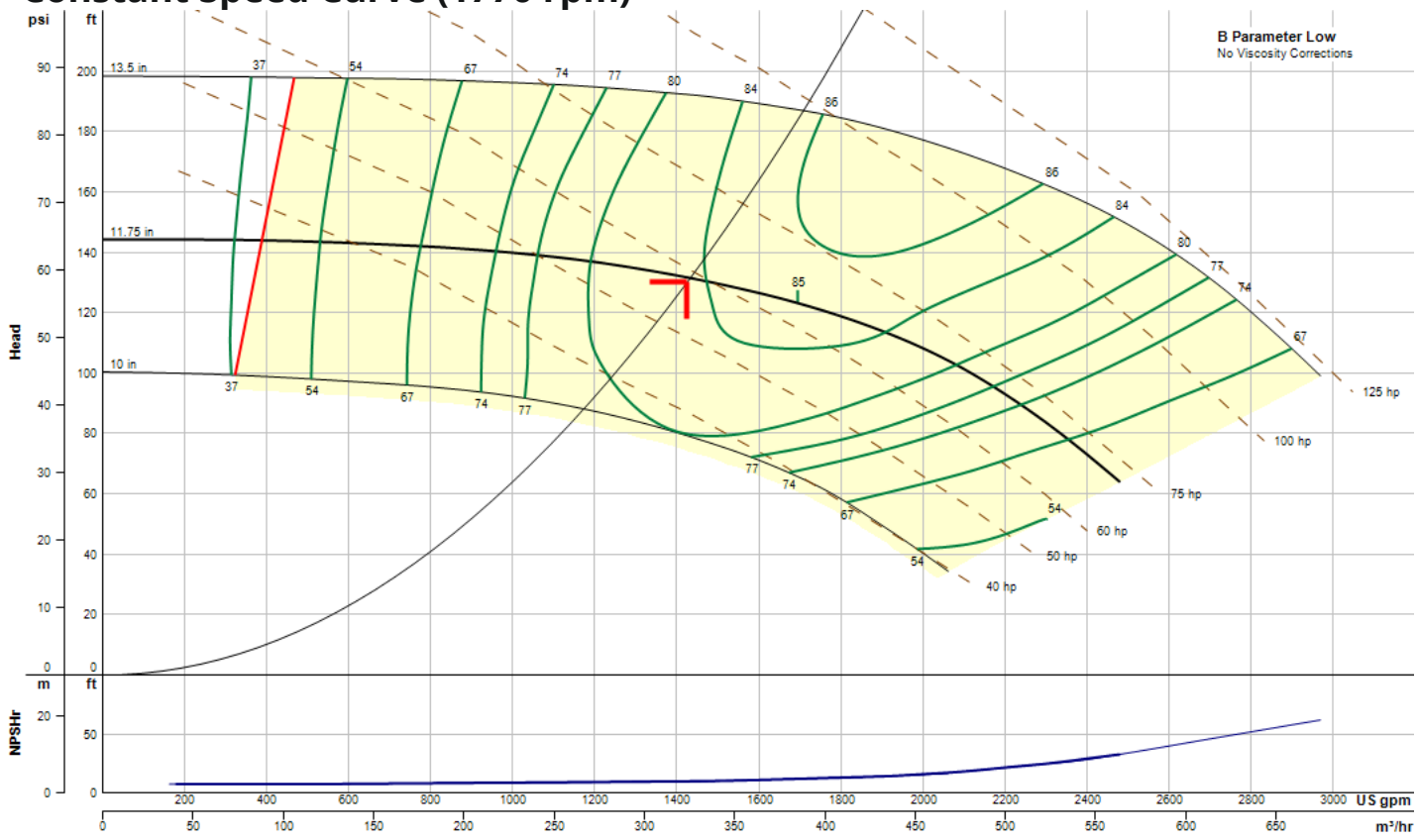
Single pump variable staging possible?			Yes	
System curve crosses full speed curve			Yes	Yes
Load	Weight	Best eff	1 Pump	2 Pumps
100%	1%	83.5		83.5
75%	42%	81.7		81.7
50%	45%	79.2	79.2	76.2
25%	12%	76.5	76.5	59.3
Optimal Staging PLEV		80.0		

Single Pump Variable Staging - This determination is based on whether the system curve crosses the variable speed curves for the pumps. A "NO" in this box indicates that even at 25% load you need to stage more than one pump to meet system demand. A "YES indicates that the required head and flow for 25% can be satisfied by a single pump. If the system curve does not cross the single pump curve at full speed, then protections for overload will need to be configured in the drive to avoid falling off the curve.

Grid values - A blank box on the grid indicates that the load listed in the row cannot be satisfied by the number of pumps listed in the column. An efficiency value on the grid indicates the approximate hydraulic efficiency for the load in that row based upon staging the number of pumps in the column at the required speed to achieve that flow point. The darkest shaded green box indicates the optimal number of pumps to stage for maximum efficiency at that load.

Optimal staging PLEV - This is the estimated weighted average PLEV achieved based upon the maximum efficiency staging at each of the four load points.

Constant Speed Curve (1770 rpm)

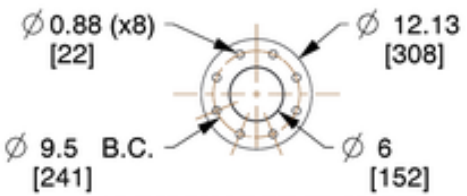


Operating Point

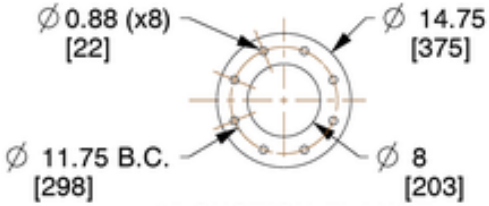
Flow: 1425 US gpm **Head:** 130 ft **Speed:** 1761 **Efficiency:** 83.5% **Point BHP:** 57.9 **End Of Curve:** 57.7%

Maximum Duty Point (at rated motor speed)

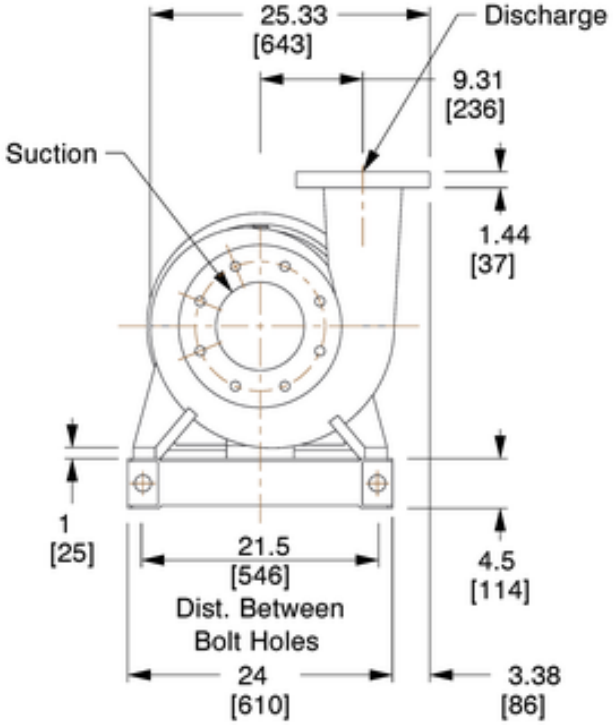
Flow: 1433 US gpm **Head:** 131 ft **Speed:** 1770 **Efficiency:** 83.5% **Point BHP:** 58.8 **NOL Flow:** 2454 US gpm **Runout Flow:** 2481 US gpm **NOL (BHP):** 71.5

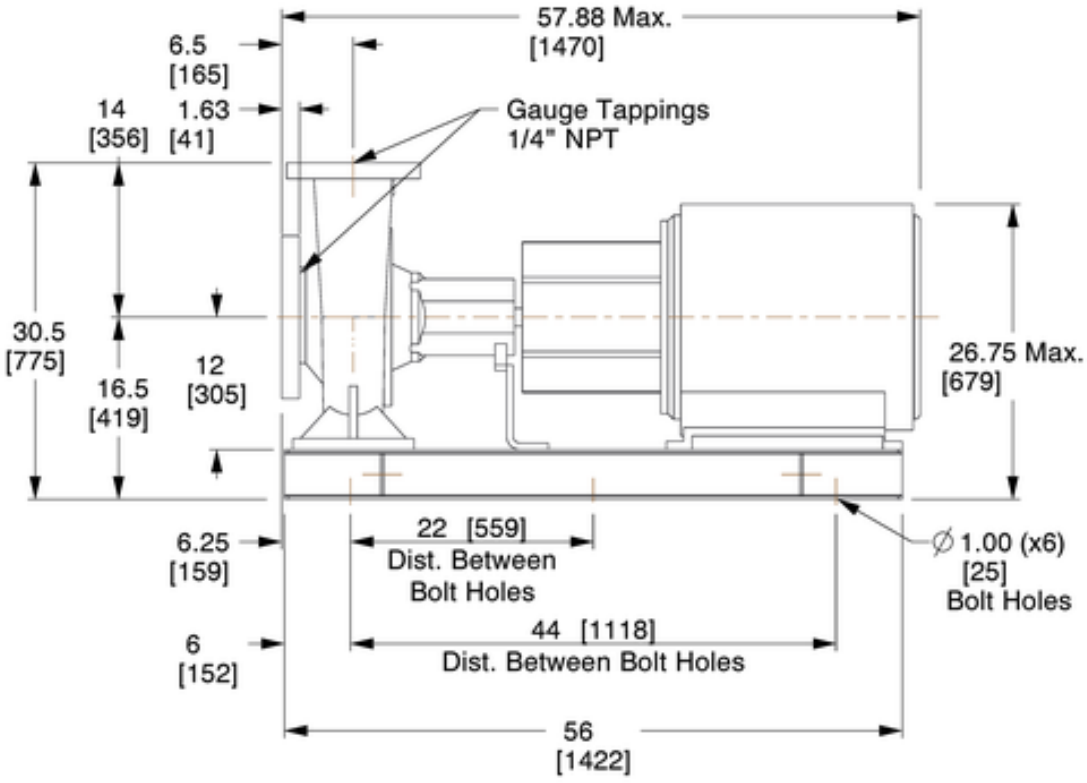


6" DISCHARGE FLANGE
ANSI 125#



8" SUCTION FLANGE
ANSI 125#





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8200 N. Austin Ave.
Morton Grove, IL 60053, USA

Dimensions are subject to change

Not to be used for construction unless certified

BG-E1510-6G-SS-364T-L

Series e-1510 Centrifugal Pumps - Base Mounted

Seal Type: Standard Seal | Motor Frame: 364T | Frame Type: L | Flange: ANSI 125#

Dimensions : IN (mm)	Scale : N.T.S.	Submittal # : B-880.48B

Standard Mechanical Configuration

Standard Mechanical Seal	SM, LG, & XL Bearing Frames	ES Bearing Frame
Temperature Range	-20 to 225°F	-20 to 225°F
Maximum Pressure	175 PSI	175 PSI
pH Limitations	7.0 - 9.0	7.0 - 9.0
Elastomer	Buna	Buna
Rotating Face	Carbon	Carbon
Stationary Face	Ceramic	Silicon Carbide
Hardware	Stainless Steel / Brass	Stainless Steel

Mechanical Seal Options	SM, LG, & XL Bearing Frames		
Temperature Range	-20 to 250°F	-10 to 225°F	-20 to 250°F
Maximum Pressure	175 PSI	175 PSI	175 PSI
pH Limitations	7.0 - 11.0	7.0 - 9.0	7.0 - 12.5.0
Elastomer	EPR (Ethylene Propylene Rubber)	FKM (Viton™ or Fluoroelastomer)	EPR (Ethylene Propylene Rubber)
Rotating Face	Carbon	Carbon	Silicon Carbide
Stationary Face	Tungsten Carbide	Ceramic	Silicon Carbide
Hardware	Stainless Steel / Brass	Stainless Steel	Stainless Steel

Mechanical Seal Options	ES Bearing Frame		
Temperature Range	-20 to 250°F	-10 to 225°F	-20 to 250°F
Maximum Pressure	175 PSI	175 PSI	175 PSI
pH Limitations	7.0 - 11.0	7.0 - 9.0	7.0 - 12.5.0
Elastomer	EPR (Ethylene Propylene Rubber)	FKM (Viton™ or Fluoroelastomer)	EPR (Ethylene Propylene Rubber)
Rotating Face	Silicon Carbide	Carbon	Silicon Carbide
Stationary Face	Tungsten Carbide	Silicon Carbide	Silicon Carbide
Hardware	Stainless Steel / Brass	Stainless Steel	Stainless Steel

Stuffing Box Configuration

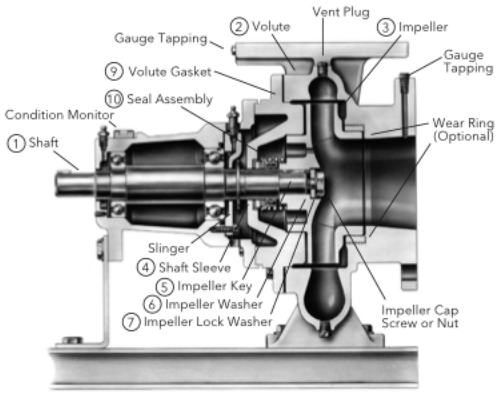
Mechanical Seal	SM, LG, & XL Bearing Frames
Temperature Range	-20 to 250°F*
Maximum Pressure	175 PSI (Optional 250 PSI)
pH Limitations	7.0 - 11.0
Elastomer	EPR (Ethylene Propylene Rubber)
Rotating Face	Tungsten Carbide
Stationary Face	Carbon
Hardware	Stainless Steel

Packing Option	
Temperature Range	0 to 250°F
Maximum Pressure	175 PSI
pH Limitations	7.0 - 9.0
Material	Braided Graphite Impregnated PTFE

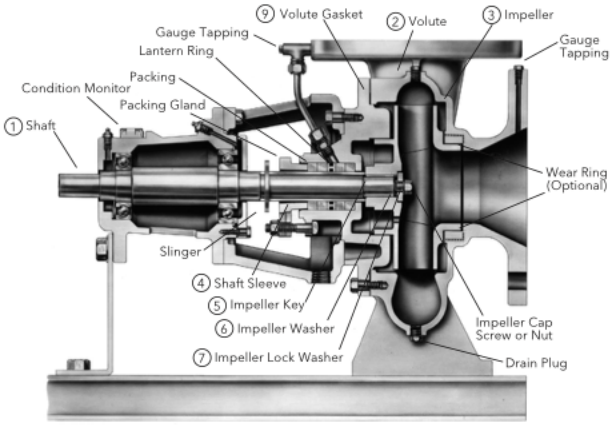
* For operating temperatures above 250°F a cooled flush is required and is recommended for temperatures above 225°F for optimum seal life. On closed systems cooling is accomplished by inserting a small heat exchanger in the flush line to cool the seal flushing fluid.

Flush-line Filters and Sediment Separators are available on special request.

Materials of Construction



Standard Configuration



Optional - S Configuration

Description	SM, LG, & XL Bearing Frames	ES Bearing Frame
1 Shaft	ASTM 108 Grade 1144	ASTM 108 Grade 1144
2 Volute	Cast Iron ASTM A48 Class 30B	Cast Iron ASTM A48 Class 30B
3 Impeller	ASTM A743 Grade CF8 - 304 Stainless Steel	ASTM A743 Grade CF8 - 304 Stainless Steel
4 Shaft Sleeve	ASTM 312 Grade TP304 - 304 Stainless Steel	ASTM 312 Grade TP304 - 304 Stainless Steel
5 Impeller Key	#304 Stainless Steel	NA
6 Impeller Washer	Steel	NA
7 Impeller Lock Washer	#304 Stainless Steel (18-8 XL FRM)	NA
8 Impeller Cap Screw	#304 Stainless Steel	NA
8 Impeller Nut	NA	316 Stainless Steel
9 Volute Gasket	Cellulose Fiber	Cellulose Fiber
10 Seal Assembly	Reference Seal Data Tables	Reference Seal Data Tables

Pump Options

- Stainless Steel Volute Wear Ring
- Galvanized Steel Drip Pan
- Stainless Steel Shaft
- Rexnord Omega Spacer Coupling
- Falk T31 Spacer Coupling
- External Flush Line
- Stuffing Box Configuration
- Epoxy Coated Internal Cast Iron Components
- Special Impeller Balancing (ISO 1940 G2.5 or G1.0)
- Certified Performance Tests (Per HI Standard 14.6)
- 250 PSI Working Pressure

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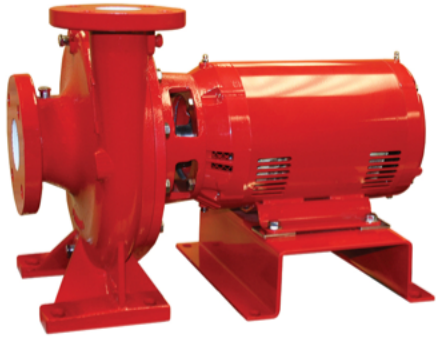
P-22/23

Submittal

Job/Project: Warabeya R1		Representative:	
ESP-Systemwize: WIZE-933DF0A4	Created On: 06/21/2024	Phone:	
Location/Tag: P-22/23		Email:	
Engineer:		Submitted By:	Date:
Contractor:		Approved By:	Date:

Close Coupled Foot Mounted End Suction Pump

Series: e-1532
Model: 6E



Features & Design

- "Best in Class" hydraulic performance
- Best choice for lowest life cycle cost
- Internally self-flushing mechanical seals
- Hydrostatic testing of each pump standard

*The Bell & Gossett Series e-1532 is available in 26 sizes and a variety of configuration options that enables customization and flexibility to fit a broad range of operating conditions.

Pump Selection Summary

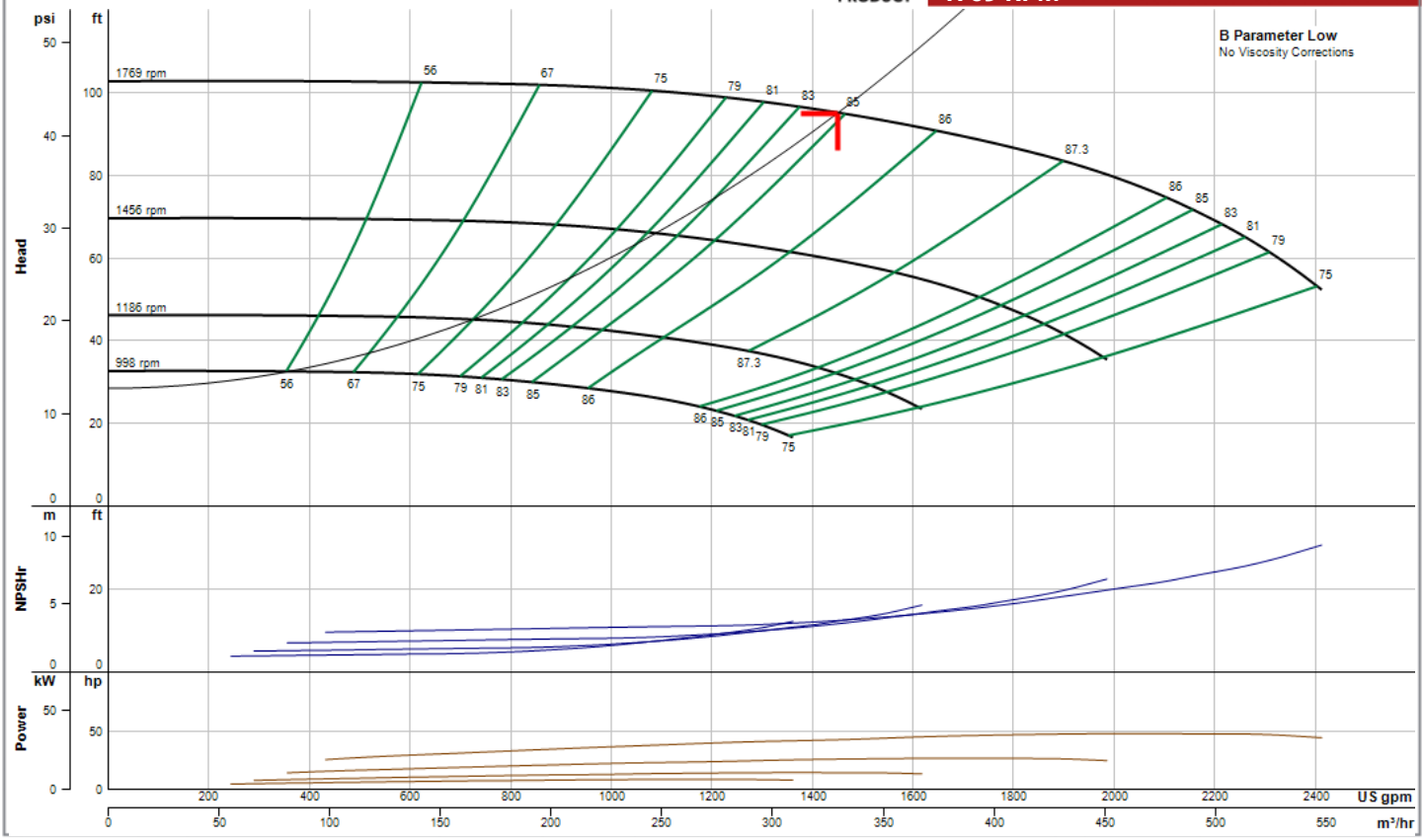
Duty Point Flow	1450 US gpm
Duty Point Head	95 ft
Control Head	28.5 ft
Duty Point Pump Efficiency	84.7 %
Part Load Efficiency Value (PLEV)	74.7 %
Impeller Diameter	10.5 in
Motor Power	50 hp
Duty Point Power	42.5 bhp
Motor Speed	1800 rpm
RPM @ Duty Point	1769 rpm
NPSHr	12.5 ft
Minimum Shutoff Head	103 ft
Minimum Flow at RPM	437 US gpm
Flow @ BEP	1899 US gpm
Fluid Temperature	34 °F
Fluid Type	30% Propylene glycol
Weight *(approx. - consult rep for exact)*	1498 lbs
Pump Floor Space Calculation	5.91 ft²

Performance Curve

Energy Efficiency Ratings:
Pump & Motor PEIcl: 0.92 ERcl: 8
Pump, Motor & Drive: PEIvl: 0.45 ERvl: 55

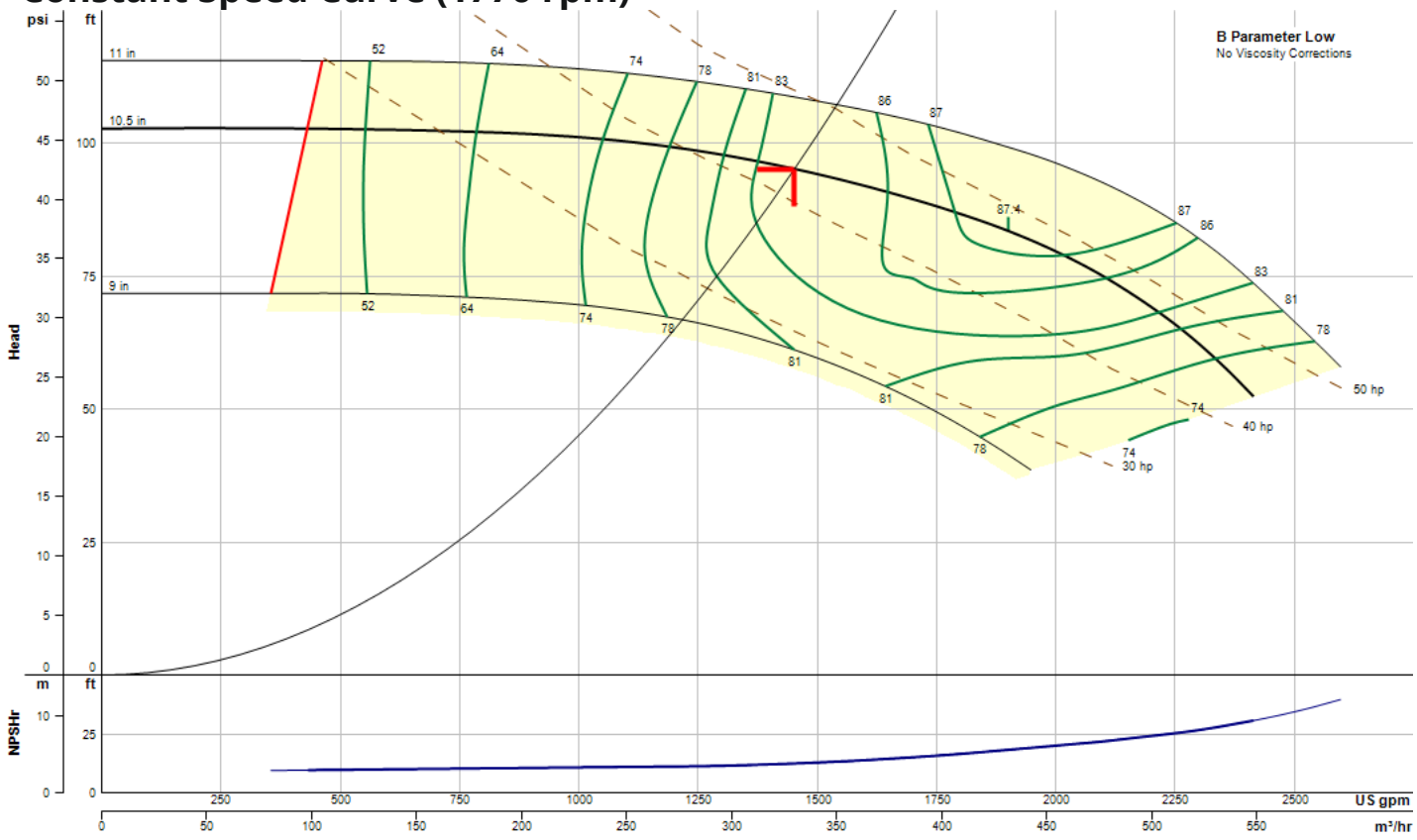
PREMIUM EFFICIENCY PRODUCT

e-1532
6E
1769 RPM



Specific Gravity: 1.0326, Viscosity: 6.5133 | Performance curve meets 14.6 / ISO 9906 acceptance criteria | Available Phase: 3, Available Voltage(s) [V]: 575, 230/460, 200

Constant Speed Curve (1770 rpm)

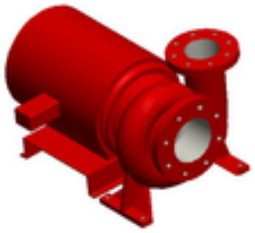


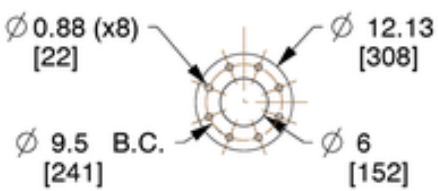
Operating Point

Flow: 1451 US gpm **Head:** 95.1 ft **Speed:** 1769 **Efficiency:** 84.7% **Point BHP:** 42.5 **End Of Curve:** 60.1%

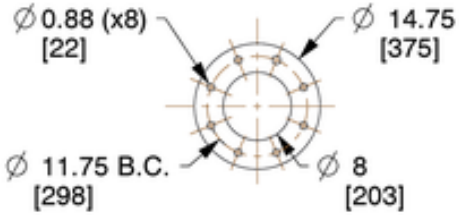
Maximum Duty Point (at rated motor speed)

Flow: 1452 US gpm **Head:** 95.2 ft **Speed:** 1770 **Efficiency:** 84.6% **Point BHP:** 42.5 **NOL Flow:** 2016 US gpm **Runout Flow:** 2414 US gpm **NOL (BHP):** 47.7

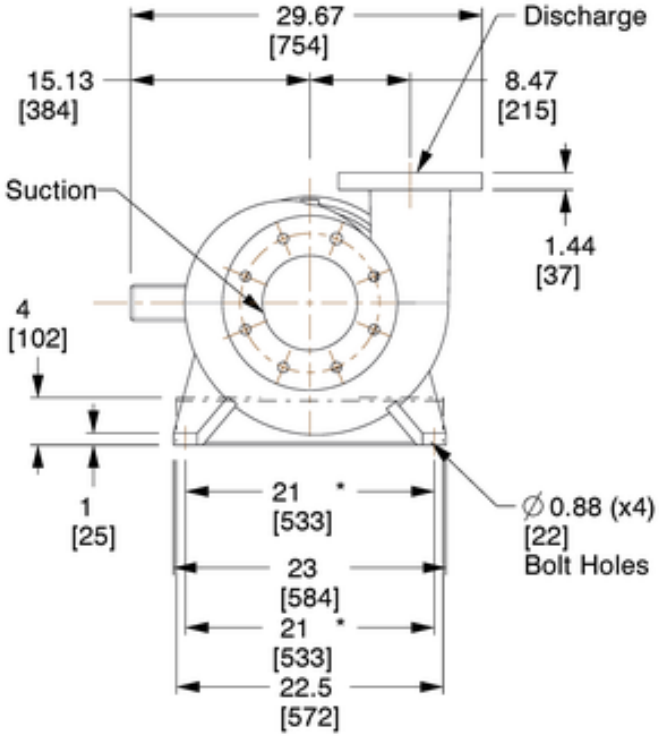


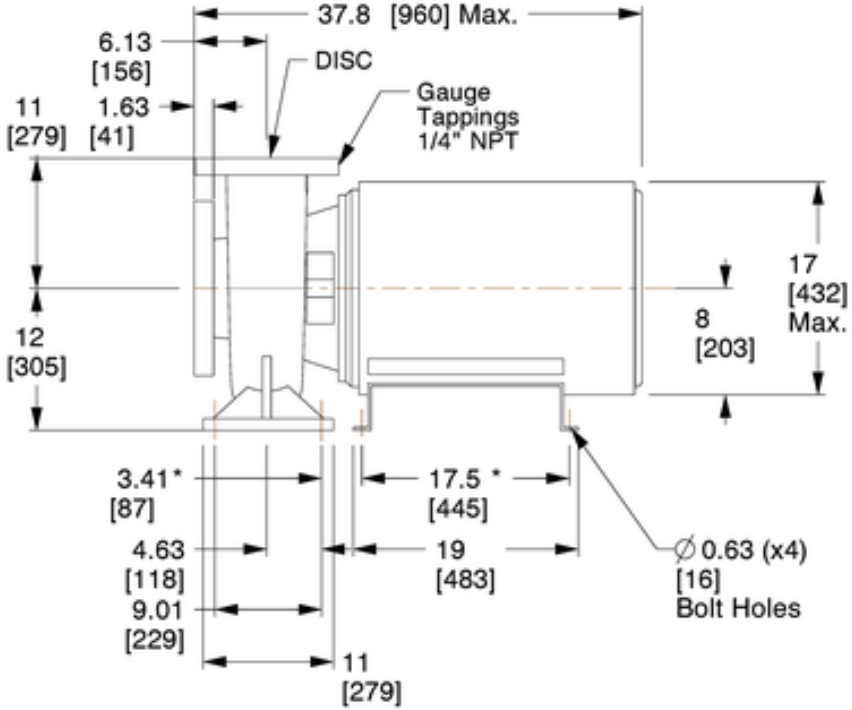


6" DISCHARGE FLANGE
ANSI 125#



8" SUCTION FLANGE
ANSI 125#





* Dist. Between Bolt Holes

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8200 N. Austin Ave.
Morton Grove, IL 60053, USA

Dimensions are subject to change

Not to be used for construction unless certified

BG-E1532-600E-326-SS

Series e-1532 Close Coupled Foot Mounted Centrifugal Pump

Motor Frame:326JM | Seal Type:Standard Seal | Flange:ANSI 125#

Dimensions : IN (mm)	Scale : N.T.S.	Submittal # : B-881.38A

Standard Materials of Construction *contact your local rep for optional ES Bearing Frame

Construction:	Stainless Steel Fitted
1 Shaft:	Carbon Steel Grade per Motor Manufacturer
2 Volute:	Cast Iron ASTM A48 Class 30B
3 Impeller:	ASTM A743 Grade CF8 - 304 Stainless Steel
4 Shaft Sleeve:	ASTM 312 Grade TP304 - 304 Stainless Steel
5 Impeller Key:	#304 Stainless Steel
6 Impeller Washer:	Steel
7 Impeller Lock Washer:	#304 Stainless Steel
8 Impeller Cap Screw:	#304 Stainless Steel
9 Volute Gasket:	Cellulose Fiber

Pump Options *contact your local rep to configure

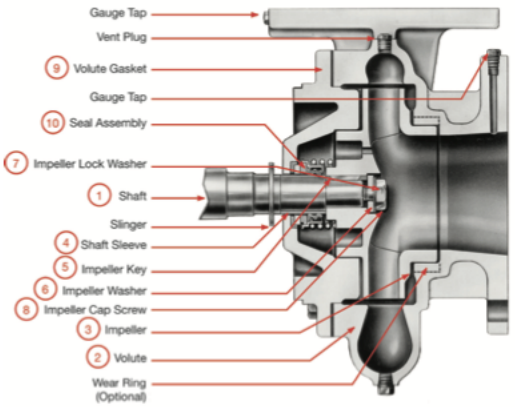
Stainless Steel Volute Wear Ring	Stuffing Box Configuration
External Flush Line	Epoxy Coated Internal Cast Iron Components
Certified Performance Tests (Per HI Standard 14.6)	Special Impeller Balancing (ISO 1940 G2.5 or G1.0)
Heavy Duty Baseplate	Galvanized Steel Drip Pan

10 Standard Mechanical Seal Assembly

Elastomer:	Buna
Rotating Face:	Carbon
Stationary Face:	Ceramic
Hardware	Stainless Steel/Brass

Maximum Working Pressure

Max Working Pressure (standard)	175 psi (12 bar) W..P.



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www.bellgossett.com

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P-24

Submittal

Job/Project: Warabeya R1	Representative:	
ESP-Systemwize: WIZE-933DF0A4 Created On: 06/21/2024	Phone:	
Location/Tag: P-24	Email:	
Engineer:	Submitted By:	Date:
Contractor:	Approved By:	Date:

Circulators Dry Rotor

Series: PL Maintenance Free Pumps

Model: PL-55

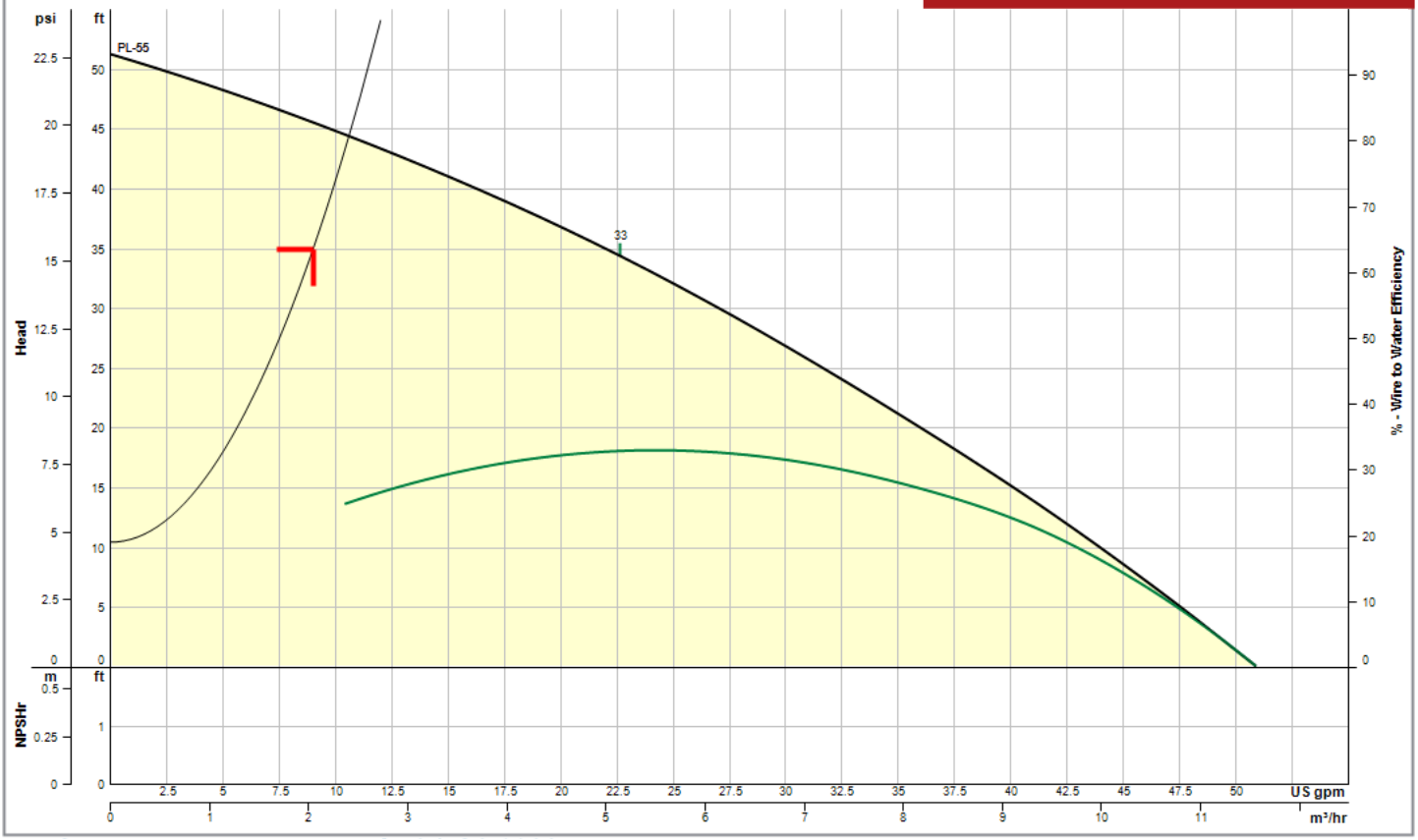
These dry motor, close coupled circulator pumps are specifically designed for quiet operation in hydronic, radiant and geothermal heating and cooling systems. These inline permanently lubricated pumps are available in cast iron or lead free bronze body constructions.

Pump Selection Summary

Duty Point Flow	9 US gpm
Duty Point Head	35 ft
Control Head	10.5 ft
Duty Point Pump Efficiency	--- %
Part Load Efficiency Value (PLEV)	0.0 %
Impeller Diameter	PL-55
Motor Power	---
Duty Point Power	---
Motor Speed	--- rpm
RPM @ Duty Point	3250 rpm
NPSHr	---
Minimum Shutoff Head	51.3 ft
Minimum Flow at RPM	--- US gpm
Flow @ BEP	--- US gpm
Fluid Temperature	45 °F
Fluid Type	40% Propylene glycol
Weight *(approx. - consult rep for exact)*	0 lbs
Pump Floor Space Calculation	--- ft²

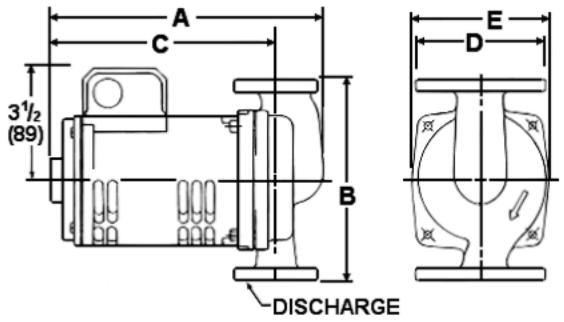
Performance Curve

PL-55



Specific Gravity: 1.02, Viscosity: 3.1539 | Performance curve meets 14.6 / ISO 9906 acceptance criteria

Dimensional Data



c UL us LISTED

Note: Where potable water is pumped, use a lead-free† bronze booster.
PL boosters equipped with a drip-proof motor are recommended for indoor use only.

DIMENSIONS AND WEIGHTS

MODEL NUMBER	FLANGE SIZE INCHES - NPT	MOTOR HP	DIMENSIONS - INCHES (mm)					APPROXIMATE SHIPPING WT. LBS. (KG)
			A	B	C	D	E	
PL-30	3/4, 1, 1-1/4 & 1-1/2	1/12	8 5/8 (219)	6 3/8 (162)	7 1/8 (181)	4 3/16 (106)	4 3/8 (111)	11.6 (5.3)
PL-36	3/4, 1, 1-1/4 & 1-1/2	1/6	8 5/8 (219)	6 3/8 (162)	7 1/8 (181)	4 3/16 (106)	4 3/8 (111)	13.1 (6.0)
PL-45	1, 1-1/4 & 1-1/2	1/6	9 1/8 (232)	8 1/2 (216)	7 1/4 (184)	4 5/8 (117)	4 1/2 (114)	14.5 (6.6)
PL-50	1, 1-1/4 & 1-1/2	1/6	9 1/8 (232)	8 1/2 (216)	7 1/4 (184)	4 5/8 (117)	4 1/2 (114)	14.5 (6.6)
PL-55	3/4, 1, 1-1/4 & 1-1/2	2/5	9 9/16 (243)	6 3/8 (162)	7 15/16 (202)	4 3/16 (106)	4 3/4 (121)	13.1 (6.0)
PL-75	2	1/6	9 15/16 (252)	8 1/2 (216)	7 3/8 (187)	5 3/16 (132)	4 5/8 (117)	18.5 (8.4)
PL-100	1, 1-1/4 & 1-1/2	2/5	9 1/8 (232)	8 1/2 (216)	7 1/4 (184)	4 5/8 (117)	4 1/2 (114)	14.5 (6.6)
PL-130/2"	2	2/5	10 3/4 (273)	8 1/2 (216)	8 1/4 (210)	5 3/16 (132)	5 1/8 (130)	22 (10)
PL-130/3"	3	2/5	10 3/4 (273)	8 1/2 (216)	8 1/4 (210)	6 (152)	5 1/8 (130)	27 (12.2)

Dimensions are approximate and subject to change. Contact factory for certified dimensions.

CONSTRUCTION MATERIALS

Booster Body: Cast Iron or Lead-Free† Bronze
Face Plate: Stainless Steel

Impeller: PL-55, PL-100, PL-130, PL-130 are Glass Filled PPS
PL-30, PL-36, PL-45, PL-50, PL-75, are 30% Glass Filled Noryl®

Shaft: PL-55, PL-100, PL-130, PL-130 are Stainless Steel
PL-30, PL-36, PL-45, PL-50, PL-75, are Carbon Steel with Stainless Steel Sleeve

Seal: Mechanical, Carbon on Silicon Carbide
Elastomers: EPDM
Motor Bearings: Sealed Precision Steel Ball Bearing
Permanently Lubricated Motor Type: ODP

OPERATING DATA

Maximum working Pressure: 150 psi (10 Bar)
Maximum Operating Temperature: 225°F (107°C)

†Contains less than 0.25% Lead content by weight on wetted surfaces.

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Phone: (847)966-3700 Fax: (847)965-8379
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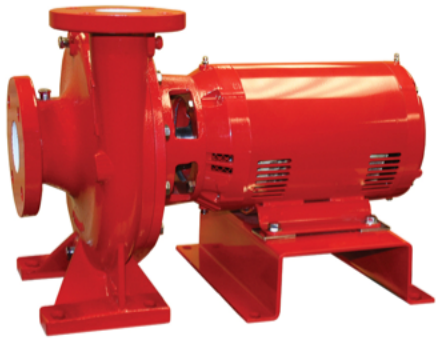
P-25/26

Submittal

Job/Project: Warabeya Additional		Representative:	
ESP-Systemwize: WIZE-57ECD792	Created On: 07/24/2024	Phone:	
Location/Tag: P-25/26		Email:	
Engineer:		Submitted By:	Date:
Contractor:		Approved By:	Date:

Close Coupled Foot Mounted End Suction Pump

Series: e-1532
Model: 1.25BC



Features & Design

- "Best in Class" hydraulic performance
- Best choice for lowest life cycle cost
- Internally self-flushing mechanical seals
- Hydrostatic testing of each pump standard

*The Bell & Gossett Series e-1532 is available in 26 sizes and a variety of configuration options that enables customization and flexibility to fit a broad range of operating conditions.

Pump Selection Summary

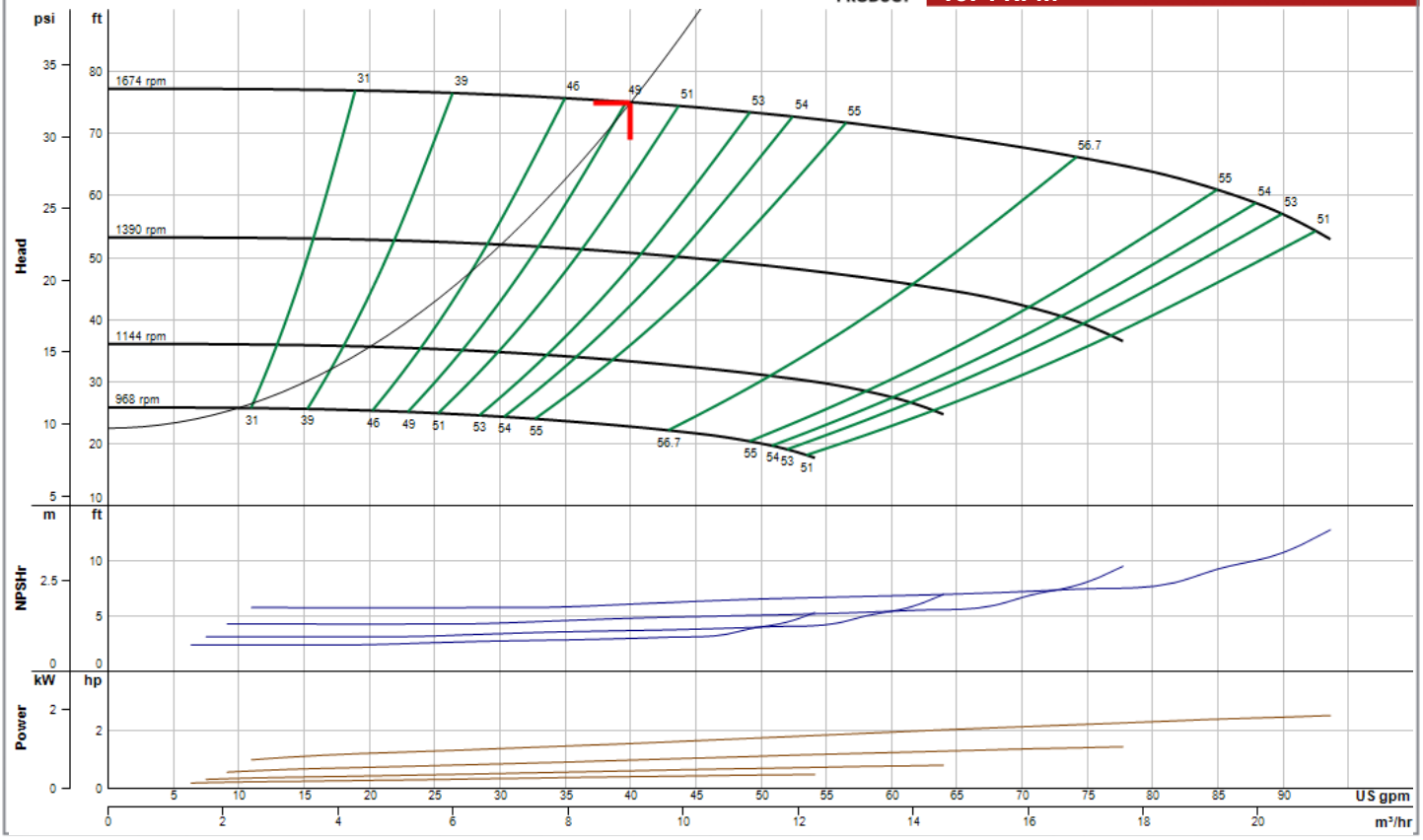
Duty Point Flow	40 US gpm
Duty Point Head	75 ft
Control Head	22.5 ft
Duty Point Pump Efficiency	48.7 %
Part Load Efficiency Value (PLEV)	41.3 %
Impeller Diameter	8.75 in
Motor Power	3 hp
Duty Point Power	1.54 bhp
Motor Speed	1800 rpm
RPM @ Duty Point	1674 rpm
NPSHr	6.1 ft
Minimum Shutoff Head	77.2 ft
Minimum Flow at RPM	11.1 US gpm
Flow @ BEP	74.2 US gpm
Fluid Temperature	85 °F
Fluid Type	Water
Weight *(approx. - consult rep for exact)*	199 lbs
Pump Floor Space Calculation	2.32 ft²

Performance Curve

Energy Efficiency Ratings:
Pump & Motor PEIcl: 0.82 ERcl: 18
Pump, Motor & Drive: PEIvl: 0.43 ERvl: 57

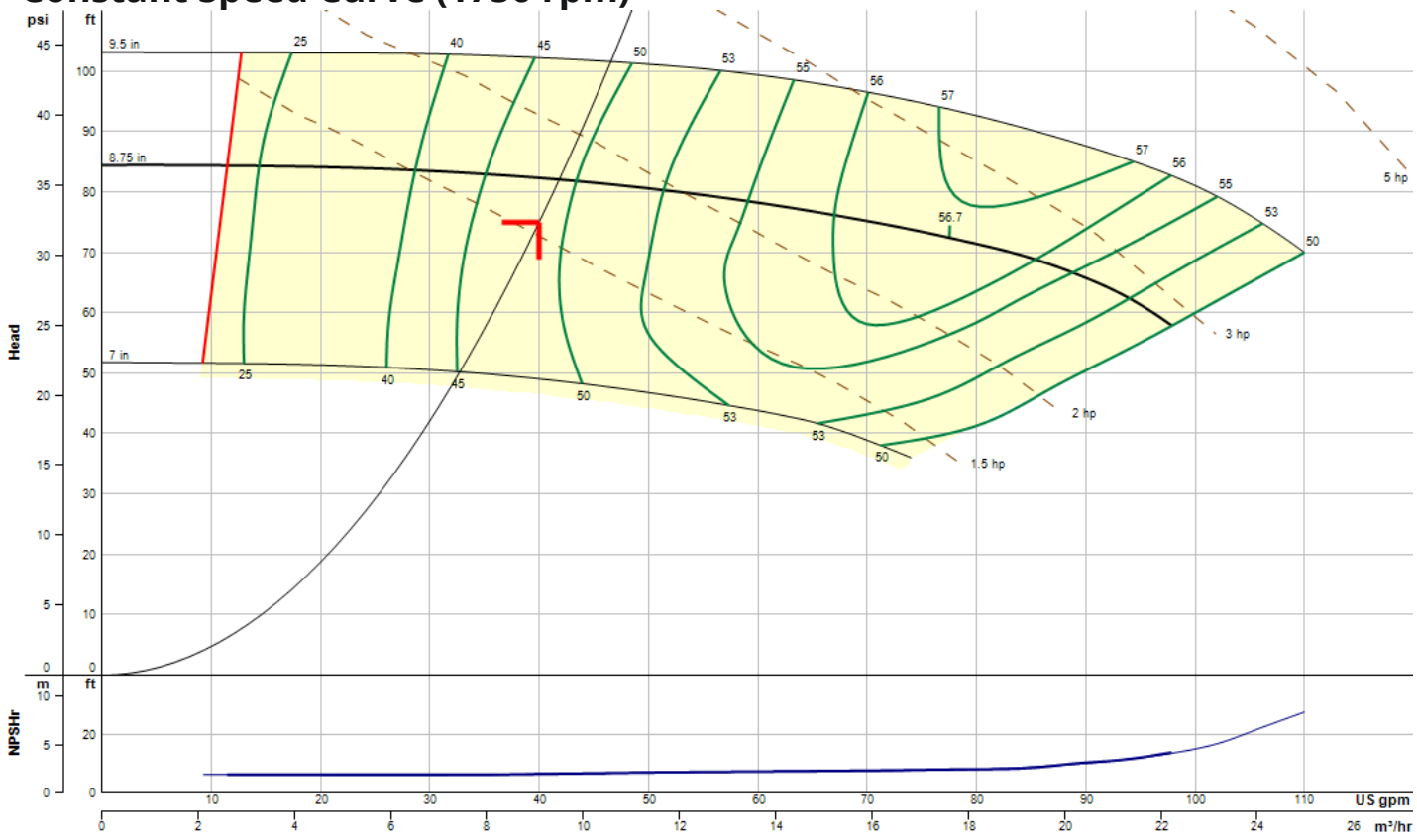
PREMIUM EFFICIENCY PRODUCT

e-1532
1.25BC
1674 RPM



Performance curve meets 14.6 / ISO 9906 acceptance criteria | Available Phase: 1, 3, Available Voltage(s) [V]: 115/230, 230/460, 200, 575

Constant Speed Curve (1750 rpm)

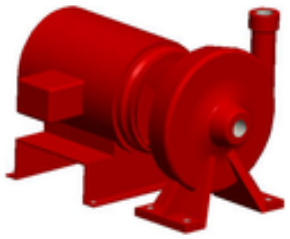


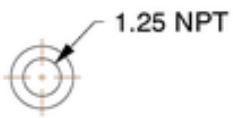
Operating Point

Flow: 40 US gpm **Head:** 75.1 ft **Speed:** 1674 **Efficiency:** 48.7% **Point BHP:** 1.54 **End Of Curve:** 42.8%

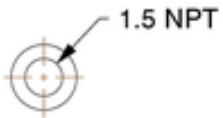
Maximum Duty Point (at rated motor speed)

Flow: 41.8 US gpm **Head:** 82 ft **Speed:** 1750 **Efficiency:** 49.1% **Point BHP:** 1.76 **NOL Flow:** 97.9 US gpm **Runout Flow:** 97.9 US gpm **NOL (BHP):** 2.85

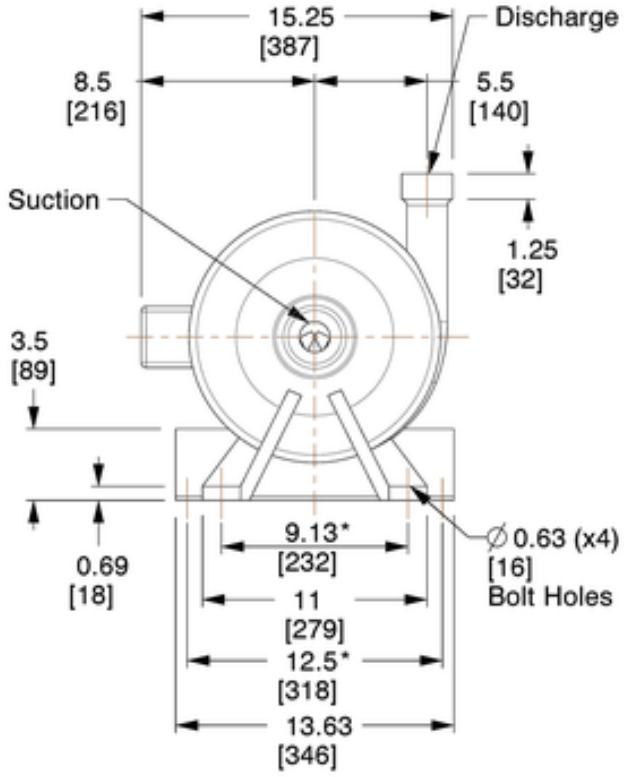


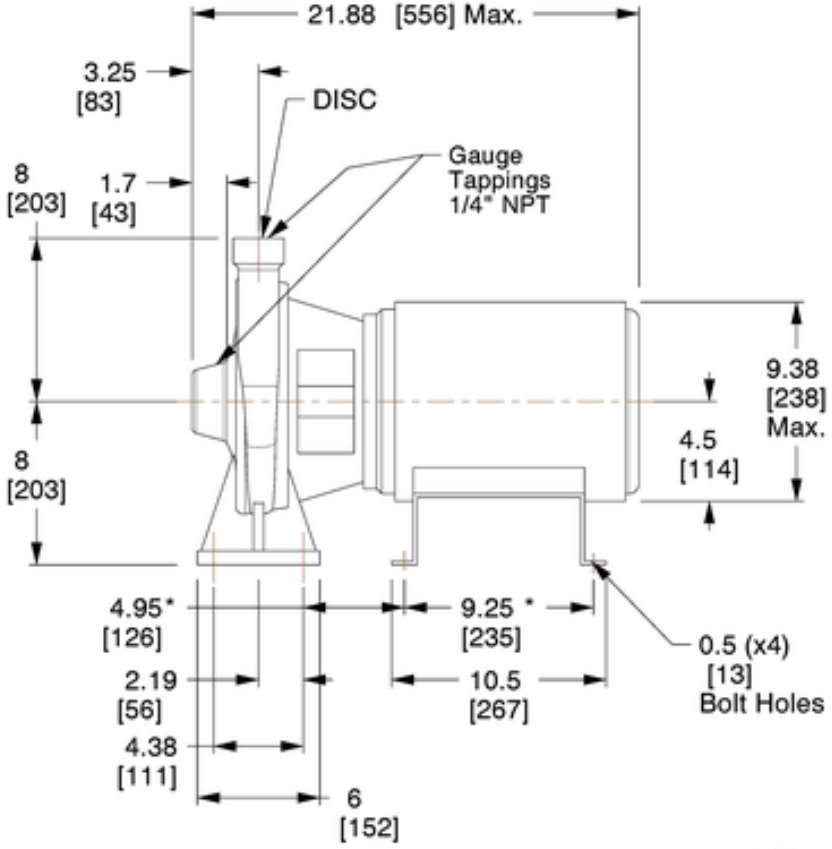


1.25 NPT DISCHARGE DETAILS



1.5 NPT SUCTION DETAILS





* Dist. Between Bolt Holes

Bell & Gossett
a xylem brand
8200 N. Austin Ave.
Morton Grove, IL 60053, USA

Dimensions are subject to change

Not to be used for construction unless certified

BG-E1532-125BC-182-SS

Series e-1532 Close Coupled Foot Mounted Centrifugal Pump

Motor Frame : 182JM | Seal Type : Standard Seal

Dimensions : IN (mm)	Scale : N.T.S.	Submittal # : B-881.14D

Standard Materials of Construction *contact your local rep for optional ES Bearing Frame

Construction:	Stainless Steel Fitted
1 Shaft:	Carbon Steel Grade per Motor Manufacturer
2 Volute:	Cast Iron ASTM A48 Class 30B
3 Impeller:	ASTM A743 Grade CF8 - 304 Stainless Steel
4 Shaft Sleeve:	ASTM 312 Grade TP304 - 304 Stainless Steel
5 Impeller Key:	#304 Stainless Steel
6 Impeller Washer:	Steel
7 Impeller Lock Washer:	#304 Stainless Steel
8 Impeller Cap Screw:	#304 Stainless Steel
9 Volute Gasket:	Cellulose Fiber

Pump Options *contact your local rep to configure

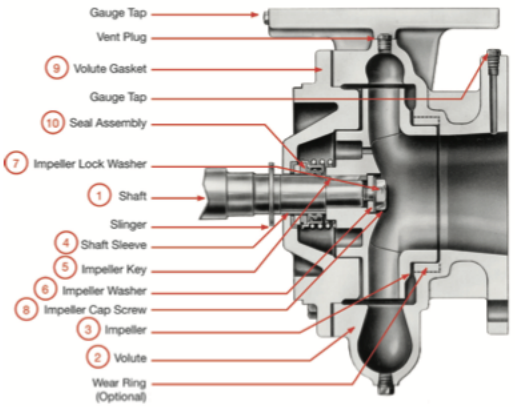
Stainless Steel Volute Wear Ring	Stuffing Box Configuration
External Flush Line	Epoxy Coated Internal Cast Iron Components
Certified Performance Tests (Per HI Standard 14.6)	Special Impeller Balancing (ISO 1940 G2.5 or G1.0)
Heavy Duty Baseplate	Galvanized Steel Drip Pan

10 Standard Mechanical Seal Assembly

Elastomer:	Buna
Rotating Face:	Carbon
Stationary Face:	Ceramic
Hardware	Stainless Steel/Brass

Maximum Working Pressure

Max Working Pressure (standard)	175 psi (12 bar) W..P.



Xylem Inc.
8200 N. Austin Avenue, Morton Grove, IL 60053
Phone: (847)966-3700 Fax: (847)965-8379
www.bellgossett.com

Style GFVK

Basket Strainer
Cast Iron (ASTM A 126, Class B)
Class 125 FF Flanged
Clamp Cover

Cast Iron Basket Strainer

APPLICATIONS

The Keckley Style GFVK is designed for liquid service where a quick open cover and protection from foreign matter in pipelines is required.

CONSTRUCTION

The Keckley Style GFVK strainers are constructed from rugged cast iron castings and are machined to exacting specifications. These bodies have drilled flanges that are in accordance with ASME B16.1.

FEATURES

The Keckley Style GFVK strainers feature a basket with an angular cutaway design to allow straight through flow and extremely low pressure loss. All sizes have a quick opening clamped cover for ease in basket removal. The Style GFVK has an o-ring that is compressed between the body and cover for a positive shut off and to maximize durability. Keckley Style GFVK strainers are furnished standard with a tapped and plugged NPT drain connection.

BASKETS

Standard baskets are 304 stainless steel and are spot welded for maximum strength. Different size perforations and meshes are available in stainless steel, monel, and brass to meet specific media requirements.

CLEANING

Cleaning of the Style GFVK strainer is accomplished by removing the cover and pulling out the basket. **Warning**: See Maintenance Instructions on page S6 of the Strainer Information Section for additional precautions and detailed information on servicing the strainer.

WORKING PRESSURES - NON SHOCK

NOM. RATING	2” to 12”	50 mm to 300 mm
CLASS 125	200 PSI @ 100ºF	1379 KPa @ 38ºC

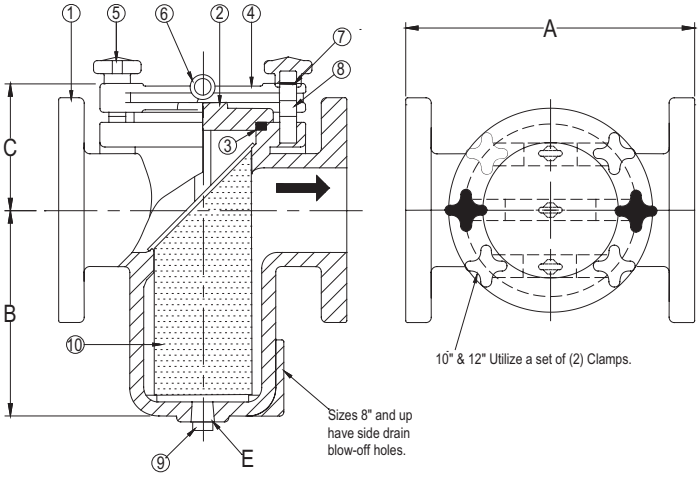
Values listed represent typical market and service applications. Due to numerous variables (concentrations, temperatures, and flow) present in any application, no representation or guarantee, expressed or implied, is given.

KECKLEY

TECHNICAL DATA
DIMENSIONS AND WEIGHTS

Style GFVK

Basket Strainer, Class 125 FF Flanged
Cast Iron (ASTM A 126, Class B)



PARTS LIST		
ITEM	DESCRIPTION	MATERIAL
1	Body	Cast Iron (ASTM A 126, Class B)
2	Cover	Cast Ductile Iron (ASTM A 536, Grade 65-45-12)
3	O-ring	Nitrile
4	Clamp	Cast Ductile Iron (ASTM A 536, Grade 65-45-12)
5	Hand Nut	Cast Ductile Iron (ASTM A 536, Grade 65-45-12)
6	Eye Bolt	Carbon Steel (ASTM A 307)
7	Bushing	Stainless Steel (304)
8	Full Bolt	Carbon Steel (ASTM A 307)
9	Pipe Plug	Malleable Iron
10	Basket	Stainless Steel (304)

STANDARD SCREENS SUPPLIED

SIZE		SCREEN PERFORATION FOR LIQUID		OPEN AREA
in	mm	in	mm	
2 to 4	50 to 100	1/16	1.6	30%
5 to 12	125 to 300	1/8	3.2	43%

Options: Other meshes, perforations, and screen materials are available.

SIZE		DIMENSIONS								WEIGHTS	
		A		B		C		E			
in	mm	in	mm	in	mm	in	mm	in	mm	lbs	kgs
2	50	8	203.2	4-7/8	123	3-3/4	95	3/4	20	27	12
2-1/2	65	8-1/4	209.6	5-13/16	147	3-13/16	97	3/4	20	38	17
3	80	9-3/4	247.7	7-1/8	181	4-3/4	120	3/4	20	49	22
4	100	11-1/2	292.1	8	203	5-3/8	137	1	25	63	28.5
5	125	13-1/8	333.4	8-1/2	216	6-3/4	171	1	25	95	43
6	150	14-3/4	374.7	9-3/8	238	6-15/16	177	1	25	127	57.6
8	200	18-1/2	740	11-1/2	291	9-1/4	235	1-1/2	40	230	104.4
10	250	20-1/8	511.2	13-9/16	344	11	280	1-1/2	40	408	185
12	300	26-1/4	666.8	16-3/16	411	13-3/8	340	2	50	536	243

Certified dimensional drawings are available upon request.
†This table reflects only the nearest metric equivalents.
Face to face values tolerance in compliance with ASME B16.1.

FLOW COEFFICIENTS

Size	C_v	Size	C_v	Size	C_v
2"	42.7	4"	276.7	8"	1486.3
2-1/2"	77.5	5"	442.7	10"	3051.6
3"	120.2	6"	743.1	12"	4980.6

TOTAL SCREEN AREA

Size	(in^2)	Size	(in^2)	Size	(in^2)
2"	23.63	4"	108.51	8"	310.23
2-1/2"	45.23	5"	142.25	10"	456.43
3"	78.11	6"	176.94	12"	690.83

*See DETERMINING RATIOS on page S5 of the Strainer Information Section for calculating NET FREE AREA of the screen to inside pipe area.

KECKLEY

PRESSURE DROP CHART

Basket Strainers (Styles D, DV, BD, BDV, SD, SDK, SSD, AND SSDK)

This pressure drop chart is based on the flow of clean water through the Keckley strainer styles listed above with screen perforations ranging from 3/64” through 1/8”.

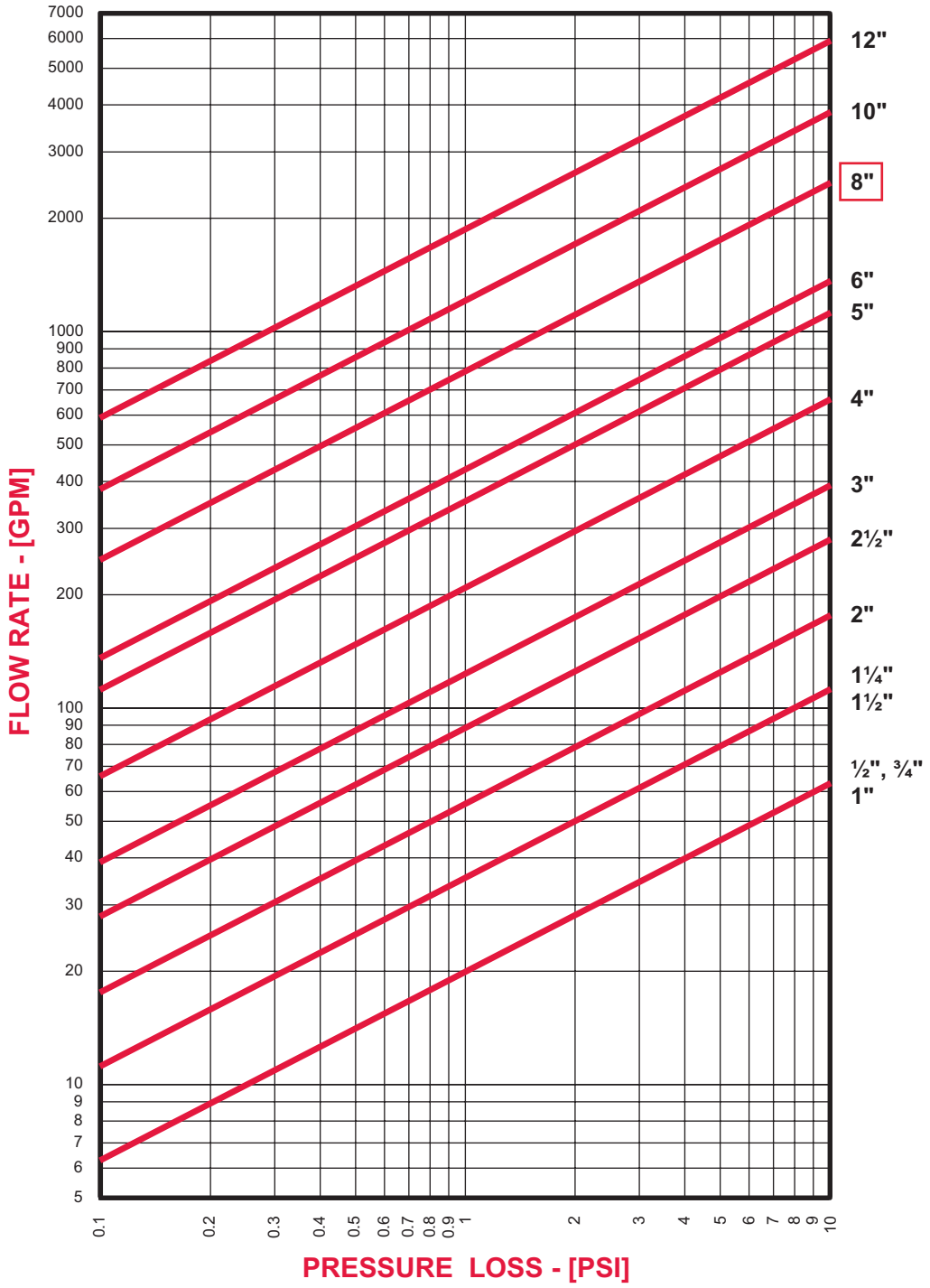
TO USE CHARTS:

Find your desired rate of flow (GPM) on the left hand side of the chart. Follow its corresponding horizontal line to the point where it intersects the diagonal line indicating the strainer pipe size. From this point of intersection, follow the vertical line down to the bottom of the chart to determine the approximate pressure drop.

CORRECTION FACTORS:

For finer mesh baskets that are backed with a perforated sheet, multiply the pressure drops shown at right by the following:

40 mesh	x 1.2
60 mesh	x 1.4
80 mesh	x 1.6
100 mesh	x 1.7
150 mesh	x 1.8
200 mesh	x 2.0



Bell & Gossett
a xylem brand

Submittal

Job/Project: Warabeya R1		**Representative:**	
ESP-Systemwize: WIZE-271C10F1	06/21/2024	**Phone:**	
Location/Tag: P-15/16/17		**Email:**	
Engineer:		**Submitted By:**	**Date:**
Contractor:		**Approved By:**	**Date:**

Suction Diffuser Plus

Bell & Gossett Model: HH-3X

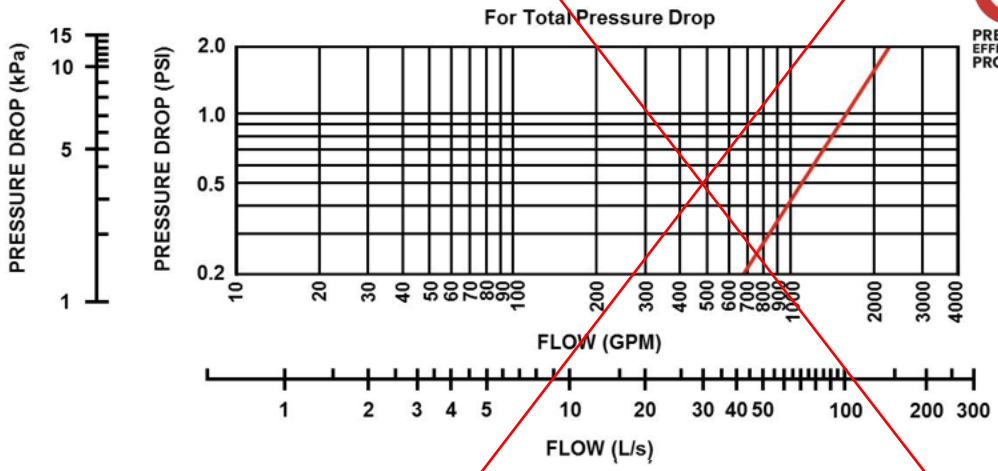
The Bell & Gossett Suction Diffuser Plus is designed for direct application to the pump suction and provides ideal flow conditions for the pump, providing NPSH requirements are met. Its integrated Flow Cone directs flow through the unit and into the pump suction while working with the full length straightening vanes to create a more uniform flow profile. The orifice cylinder has a free area equal to five times the cross section of the pump suction opening and serves as a coarse strainer to protect the pump from large sediment. Type X-For Closed Systems

http://bellgossett.com/hydronic-plumbing-accessories/pump-accessories/suction-diffuser/

Suction Diffuser Selection

Model	HH-3X
System Size	8.0 in
Pump Size	8.0 in
Pressure Drop @ Design Flow	1.44'
Connection Type	Flanged/Flanged
Cv	1640
Fluid Type	30% Propylene glycol
Fluid Temp	26 °F

Performance characteristics:



PREMIUM EFFICIENCY PRODUCT

HH-3X

Materials of construction

Body	Cast Iron
Inlet Vanes	Steel
Orifice Cylinder	Steel
Start-up Strainer	16 Mesh Bronze

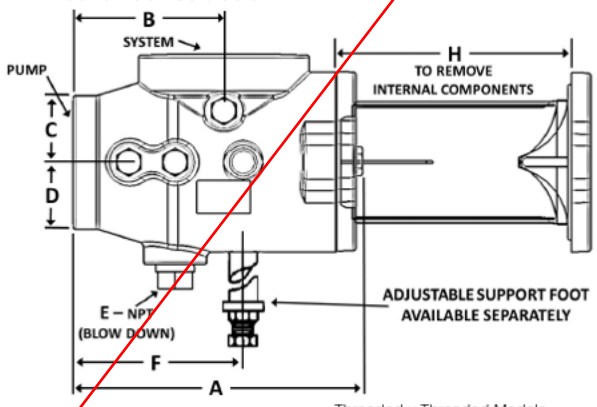
Operating Data

Max Working Pressure	175 psi
Max Temp	250°F

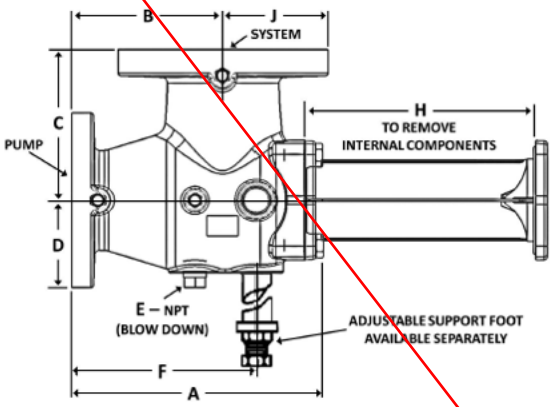
Dimensional data:

not for construction

'Dimensions include orifice cylinder + 2-1/2 (64) inch clearance.



Threaded x Threaded Models



Flange x Flange Models

DIMENSIONS – INCHES (mm)

Model No.	System Side		Pump Side		A	B	C	D	E	F	G	H	J	Orifice Cylinder Free Area in^2 (cm^2)	Approx. Shpg. Wt. Lbs. (Kg)
HH-3	8 (203.2)	F	8 (203.2)	F	19.55 (497)	9 (229)	9 (229)	6.75 (171)	3/4 (19)	12.62 (321)	N/A	18.25 (463.6)	6.75 (171)	218 (1406)	250 (113)

Bell & Gossett
a xylem brand

Submittal

Job/Project: Warabeya Additional		**Representative:**	
ESP-Systemwize: WIZE-57ECD792	07/24/2024	**Phone:**	
Location/Tag: P-15/16/17		**Email:**	
Engineer:		**Submitted By:**	**Date:**
Contractor:		**Approved By:**	**Date:**

Suction Diffuser Plus

Bell & Gossett Model: HH-3Z

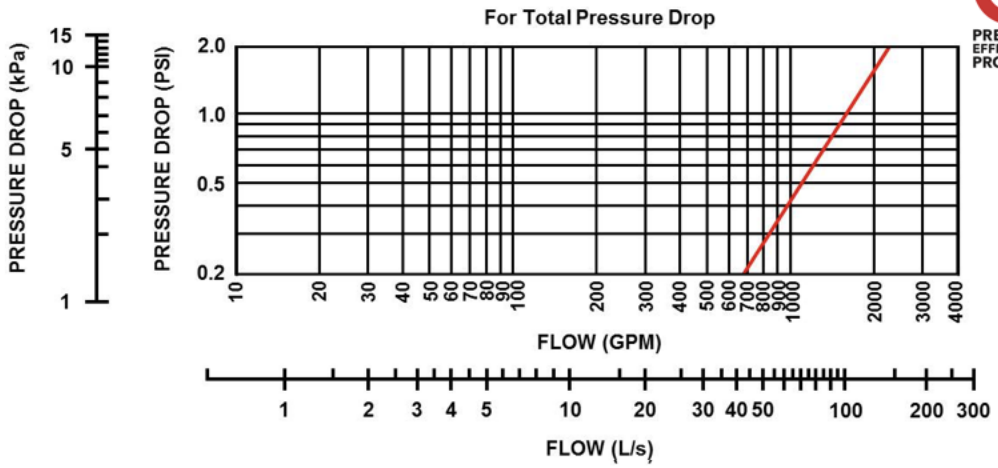
The Bell & Gossett Suction Diffuser Plus is designed for direct application to the pump suction and provides ideal flow conditions for the pump, providing NPSH requirements are met. Its integrated Flow Cone directs flow through the unit and into the pump suction while working with the full length straightening vanes to create a more uniform flow profile. The orifice cylinder has a free area equal to five times the cross section of the pump suction opening and serves as a coarse strainer to protect the pump from large sediment. Type Z-For Domestic Water and Tower Systems.

http://bellgossett.com/hydronic-plumbing-accessories/pump-accessories/suction-diffuser/

Suction Diffuser Selection

Model	HH-3Z
System Size	8.0 in
Pump Size	8.0 in
Pressure Drop @ Design Flow	1.44'
Connection Type	Flanged/Flanged
Cv	1640
Fluid Type	30% Propylene glycol
Fluid Temp	26 °F

Performance characteristics:



PREMIUM EFFICIENCY PRODUCT

HH-3Z

Materials of construction

Body	Cast Iron
Inlet Vanes	Stainless Steel
Orifice Cylinder	Stainless Steel
Start-up Strainer	16 Mesh Bronze

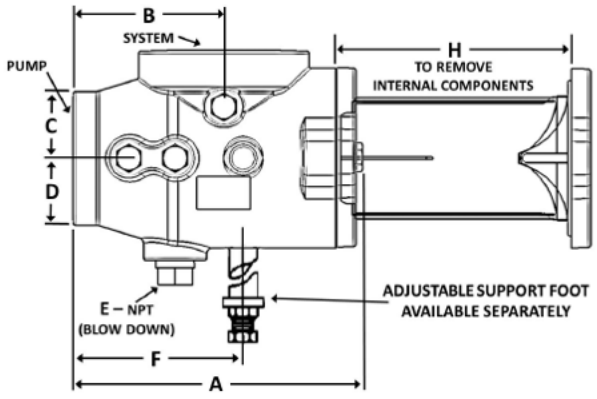
Operating Data

Max Working Pressure	175 psi
Max Temp	250°F

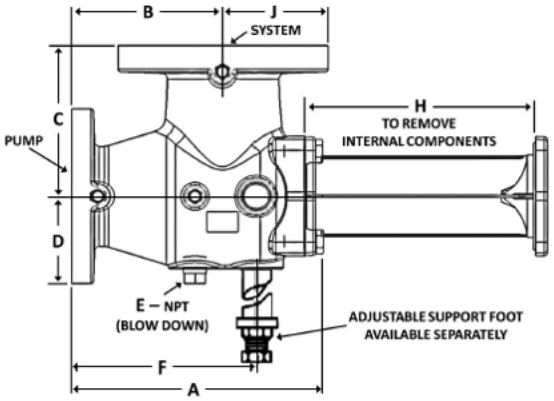
Dimensional data:

not for construction

'Dimensions include orifice cylinder + 2-1/2 (64) inch clearance.



Threaded x Threaded Models



Flange x Flange Models

DIMENSIONS – INCHES (mm)

Model No.	System Side		Pump Side		A	B	C	D	E	F	G	H	J	Orifice Cylinder Free Area in^2 (cm^2)	Approx. Shpg. Wt. Lbs. (Kg)
HH-3	8 (203.2)	F	8 (203.2)	F	19.55 (497)	9 (229)	9 (229)	6.75 (171)	3/4 (19)	12.62 (321)	N/A	18.25 (463.6)	6.75 (171)	218 (1406)	250 (113)

Bell & Gossett
a xylem brand

Submittal

Job/Project: Warabeya R1		**Representative:**	
ESP-Systemwize: WIZE-BD067133	06/26/2024	**Phone:**	
Location/Tag: P-19/20/21		**Email:**	
Engineer:		**Submitted By:**	**Date:**
Contractor:		**Approved By:**	**Date:**

Suction Diffuser Plus

Bell & Gossett Model: HH-3Z

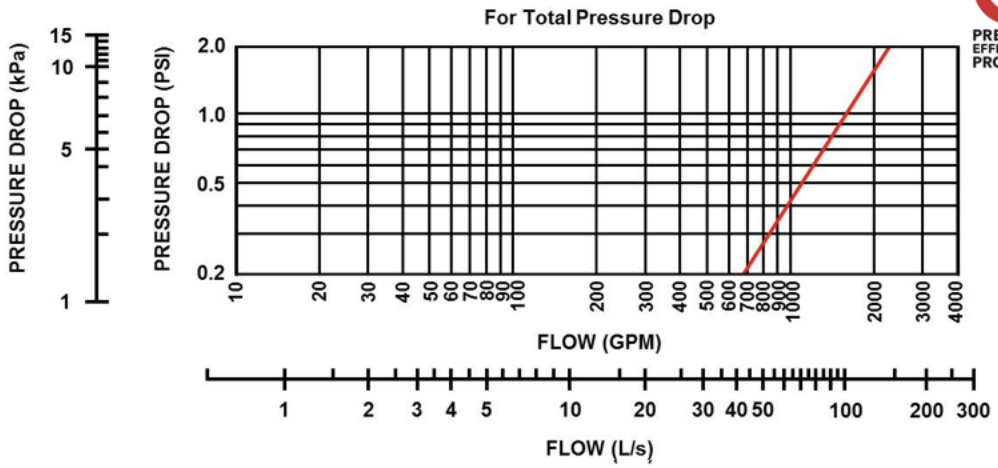
The Bell & Gossett Suction Diffuser Plus is designed for direct application to the pump suction and provides ideal flow conditions for the pump, providing NPSH requirements are met. Its integrated Flow Cone directs flow through the unit and into the pump suction while working with the full length straightening vanes to create a more uniform flow profile. The orifice cylinder has a free area equal to five times the cross section of the pump suction opening and serves as a coarse strainer to protect the pump from large sediment. Type Z-For Domestic Water and Tower Systems.

http://bellgossett.com/hydronic-plumbing-accessories/pump-accessories/suction-diffuser/

Suction Diffuser Selection

Model	HH-3Z
System Size	8.0 in
Pump Size	8.0 in
Pressure Drop @ Design Flow	1.8'
Connection Type	Flanged/Flanged
Cv	1640
Fluid Type	30% Propylene glycol
Fluid Temp	26 °F

Performance characteristics:



PREMIUM EFFICIENCY PRODUCT

HH-3Z

Materials of construction

Body	Cast Iron
Inlet Vanes	Stainless Steel
Orifice Cylinder	Stainless Steel
Start-up Strainer	16 Mesh Bronze

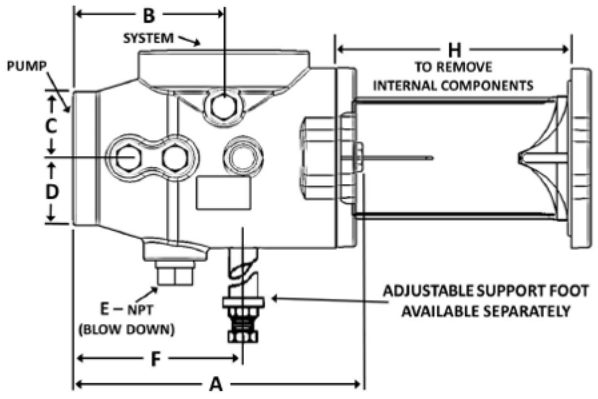
Operating Data

Max Working Pressure	175 psi
Max Temp	250°F

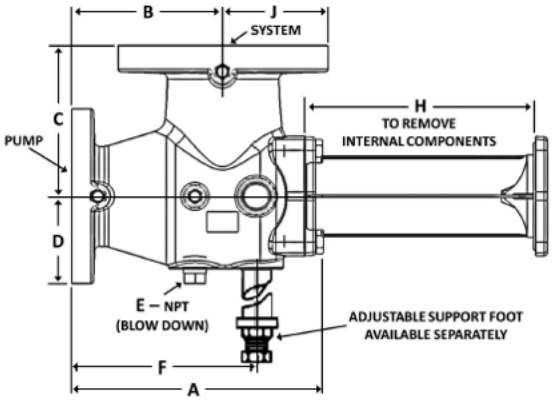
Dimensional data:

not for construction

'Dimensions include orifice cylinder + 2-1/2 (64) inch clearance.



Threaded x Threaded Models



Flange x Flange Models

DIMENSIONS – INCHES (mm)

Model No.	System Side		Pump Side		A	B	C	D	E	F	G	H	J	Orifice Cylinder Free Area in^2 (cm^2)	Approx. Shpg. Wt. Lbs. (Kg)
HH-3	8 (203.2)	F	8 (203.2)	F	19.55 (497)	9 (229)	9 (229)	6.75 (171)	3/4 (19)	12.62 (321)	N/A	18.25 (463.6)	6.75 (171)	218 (1406)	250 (113)

Bell & Gossett
a xylem brand

Submittal

Job/Project: Warabeya R1		**Representative:**	
ESP-Systemwize: WIZE-8BA29E1D	06/21/2024	**Phone:**	
Location/Tag: P-22/23		**Email:**	
Engineer:		**Submitted By:**	**Date:**
Contractor:		**Approved By:**	**Date:**

Suction Diffuser Plus

Bell & Gossett Model: HH-3X

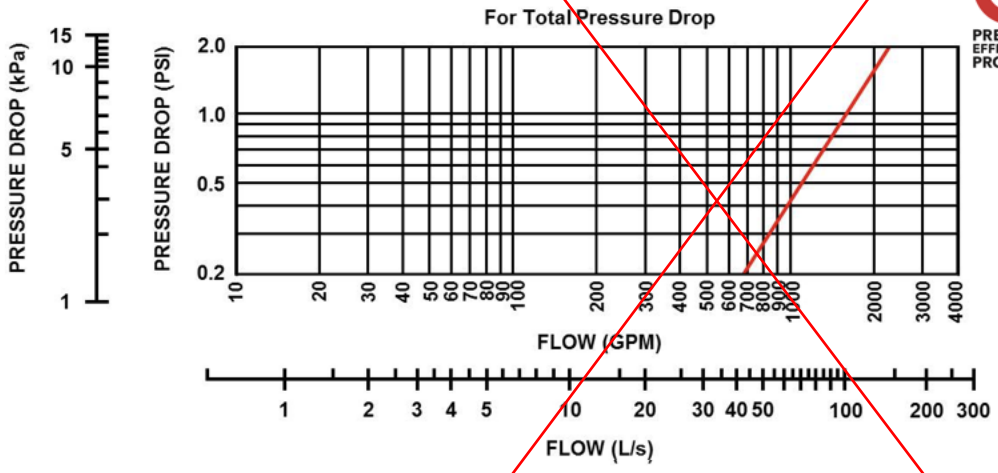
The Bell & Gossett Suction Diffuser Plus is designed for direct application to the pump suction and provides ideal flow conditions for the pump, providing NPSH requirements are met. Its integrated Flow Cone directs flow through the unit and into the pump suction while working with the full length straightening vanes to create a more uniform flow profile. The orifice cylinder has a free area equal to five times the cross section of the pump suction opening and serves as a coarse strainer to protect the pump from large sediment. Type X-For Closed Systems

http://bellgossett.com/hydronic-plumbing-accessories/pump-accessories/suction-diffuser/

Suction Diffuser Selection

Model	HH-3X
System Size	8.0 in
Pump Size	8.0 in
Pressure Drop @ Design Flow	1.86'
Connection Type	Flanged/Flanged
Cv	1640
Fluid Type	30% Propylene glycol
Fluid Temp	34 °F

Performance characteristics:



PREMIUM EFFICIENCY PRODUCT

HH-3X

Materials of construction

Body	Cast Iron
Inlet Vanes	Steel
Orifice Cylinder	Steel
Start-up Strainer	16 Mesh Bronze

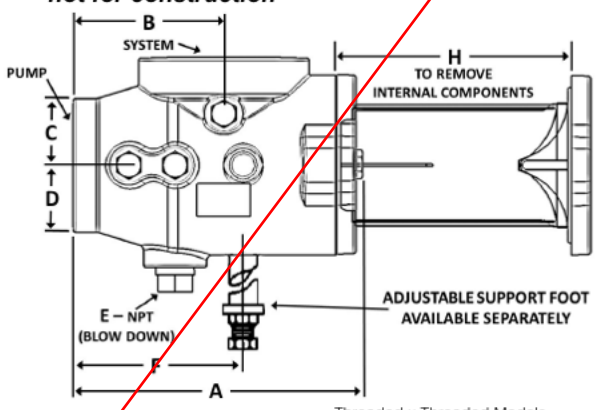
Operating Data

Max Working Pressure	175 psi
Max Temp	250°F

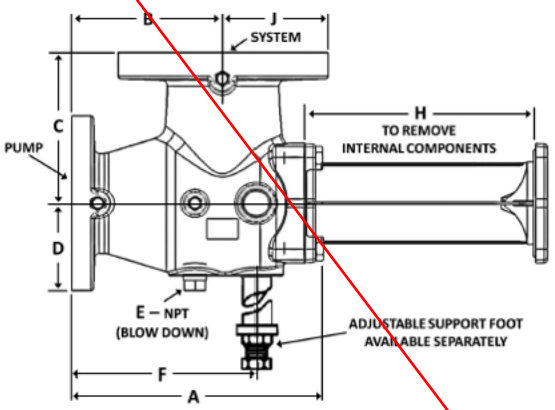
Dimensional data:

not for construction

'Dimensions include orifice cylinder + 2-1/2 (64) inch clearance.



Threaded x Threaded Models



Flange x Flange Models

DIMENSIONS - INCHES (mm)

Model No.	System Side		Pump Side		A	B	C	D	E	F	G	H	J	Orifice Cylinder Free Area in^2 (cm^2)	Approx. Shpg. Wt. Lbs. (Kg)
HH-3	8 (203.2)	F	8 (203.2)	F	19.55 (497)	9 (229)	9 (229)	6.75 (171)	3/4 (19)	12.62 (321)	N/A	18.25 (463.6)	6.75 (171)	218 (1406)	250 (113)

Bell & Gossett
a xylem brand

Submittal

Job/Project: Warabeya Additional		**Representative:**	
ESP-Systemwize: WIZE-57ECD792	07/24/2024	**Phone:**	
Location/Tag: P-22/23		**Email:**	
Engineer:		**Submitted By:**	**Date:**
Contractor:		**Approved By:**	**Date:**

Suction Diffuser Plus

Bell & Gossett Model: HH-3Z

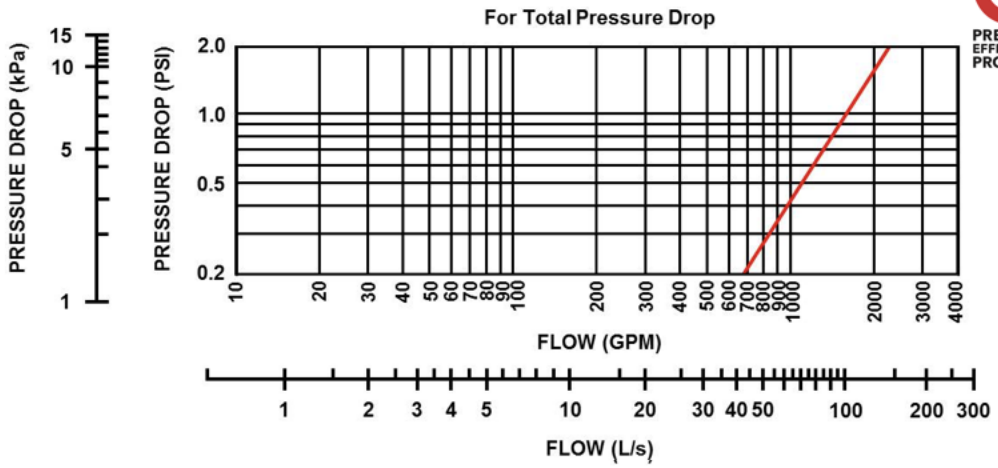
The Bell & Gossett Suction Diffuser Plus is designed for direct application to the pump suction and provides ideal flow conditions for the pump, providing NPSH requirements are met. Its integrated Flow Cone directs flow through the unit and into the pump suction while working with the full length straightening vanes to create a more uniform flow profile. The orifice cylinder has a free area equal to five times the cross section of the pump suction opening and serves as a coarse strainer to protect the pump from large sediment. Type Z-For Domestic Water and Tower Systems.

http://bellgossett.com/hydronic-plumbing-accessories/pump-accessories/suction-diffuser/

Suction Diffuser Selection

Model	HH-3Z
System Size	8.0 in
Pump Size	8.0 in
Pressure Drop @ Design Flow	1.86'
Connection Type	Flanged/Flanged
Cv	1640
Fluid Type	30% Propylene glycol
Fluid Temp	34 °F

Performance characteristics:



PREMIUM EFFICIENCY PRODUCT

HH-3Z

Materials of construction

Body	Cast Iron
Inlet Vanes	Stainless Steel
Orifice Cylinder	Stainless Steel
Start-up Strainer	16 Mesh Bronze

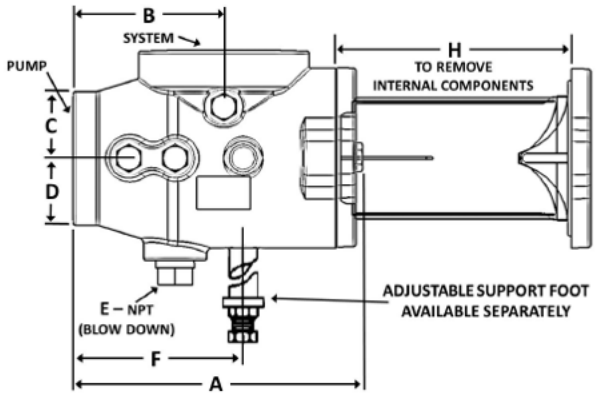
Operating Data

Max Working Pressure	175 psi
Max Temp	250°F

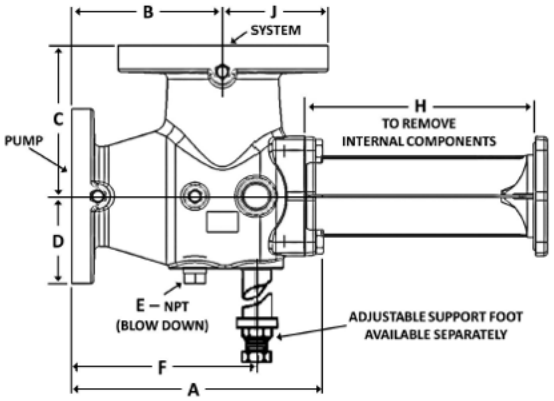
Dimensional data:

not for construction

'Dimensions include orifice cylinder + 2-1/2 (64) inch clearance.



Threaded x Threaded Models



Flange x Flange Models

DIMENSIONS – INCHES (mm)

Model No.	System Side		Pump Side		A	B	C	D	E	F	G	H	J	Orifice Cylinder Free Area in^2 (cm^2)	Approx. Shpg. Wt. Lbs. (Kg)
HH-3	8 (203.2)	F	8 (203.2)	F	19.55 (497)	9 (229)	9 (229)	6.75 (171)	3/4 (19)	12.62 (321)	N/A	18.25 (463.6)	6.75 (171)	218 (1406)	250 (113)

Style B

Y-Strainer
Cast Iron (ASTM A 126, Class B)
Class 250 NPT

*The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.

Cast Iron Y-Strainer (Lead Free*)

APPLICATIONS

Where protection from foreign matter in a pipeline is required.

CONSTRUCTION

The Keckley Style B strainers are constructed from rugged cast iron castings that are machined to exacting specifications.

FEATURES

The Keckley Style B features a tapered bushing in sizes ¼" thru 2" and bolted cover with gasket for sizes 2-1/2", 3" and 4". All Keckley Style B strainers are furnished standard with a NPT blow-off connection and can be supplied with a cast iron blow-off plug upon request.

SCREENS

Standard screens are 20 mesh 304 stainless steel through size 2". Sizes 2-1/2", 3" and 4" are furnished with 1/16" perforated 304 stainless steel screens. All screens are spot welded for maximum strength. Different size perforations and meshes are available in stainless steel, monel, and brass to meet specific media requirements. If media is not indicated, screens for *water* will be supplied.

SELF CLEANING

Self cleaning is accomplished by opening the valve or drain plug connected to the blow-off port. **Warning:** See Maintenance Instructions on page S6 of the Strainer Information Section for additional precautions and detailed information on servicing the strainer.

WORKING PRESSURES - NON SHOCK

NOM. RATING	1/4" to 4"	8 mm to 100 mm
CLASS 250	400 PSI @ 150ºF	2759 KPa @ 66ºC
	250 PSI @ 406ºF	1724 KPa @ 208ºC

Values listed represent typical market and service applications. Due to numerous variables (concentrations, temperatures, and flow) present in any application, no representation or guarantee, expressed or implied, is given.

GOVERNMENT/MILITARY SPECIFICATIONS

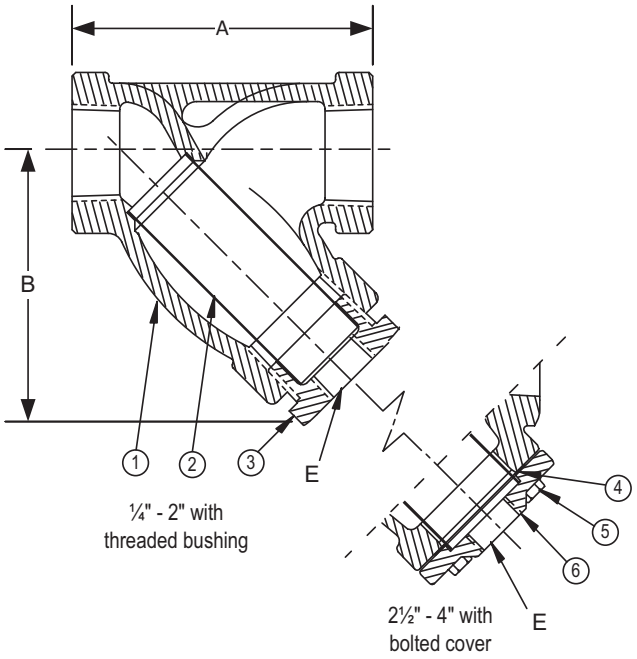
Style B cast iron threaded strainers meet or exceed government specification WW-S-2739 (Supersedes MIL-S-16293).

KECKLEY

TECHNICAL DATA
DIMENSIONS AND WEIGHTS

Style B

Y-Strainer, Class 250 NPT
Cast Iron (ASTM A 126, Class B) Lead Free*



PARTS LIST		
ITEM	DESCRIPTION	MATERIAL
1	Body	Cast Iron (ASTM A 126, Class B)
2	Screen	Stainless Steel (304)
3	Bushing	Malleable Iron
4	Gasket*	Composition
5	Cap Screw*	Steel
6	Cover*	Cast Iron (ASTM A 126, Class B)

Optional: Blow-off Plug, Malleable Iron *2 ½", 3" & 4" only.

*The wetted surface of this product contacted by consumbale water contains less than 0.25% of lead by weight.

STANDARD SCREENS SUPPLIED

SIZE		SCREEN PERFORATION					
		FOR LIQUID		OPEN AREA	FOR STEAM		OPEN AREA
in	mm	in	mm		in	mm	
1/4 to 2	8 to 50	20 MESH STAINLESS STEEL					49%
2-1/2 to 4	65 to 100	1/16	1.6	30%	3/64	1.2	33%

Standard screens supplied are for **liquid service**, unless otherwise specified.
Options: Other meshes, perforations, and screen materials are available.

SIZE		DIMENSIONS						WEIGHTS	
		A		B		E			
in	mm	in	mm	in	mm	in	mm	lbs	kgs
1/4	8	3	76	2-5/8	67	3/8	10	2	0.9
3/8	10	3	76	2-5/8	67	3/8	10	2	0.9
1/2	15	3	76	2-5/8	67	3/8	10	2	0.9
3/4	20	4	102	3-5/8	92	1/2	15	3	1.4
1	25	4-7/8	124	4-1/2	114	3/4	20	4.5	2.0
1-1/4	32	5-1/8	130	4-3/4	121	3/4	20	6	2.7
1-1/2	40	5-3/4	146	4-7/8	124	1	25	8	3.6
2	50	7-1/4	184	5-3/4	146	1-1/4	32	15.5	7.0
2-1/2	65	8-7/8	225	7-1/2	191	1-1/4	32	25	11.3
3	80	10	254	8	203	1-1/2	40	36	16.3
4	100	15-1/4	387	12-1/2	318	2	50	95	43.1

†This table reflects only the nearest metric equivalents.
Dimensions and weights are for reference only. When required, request certified drawings.
Face to face values have a tolerance in compliance with ASME B16.4.

FLOW COEFFICIENTS

Size	C_v	Size	C_v	Size	C_v
1/2"	9.5	1-1/4"	44.9	2-1/2"	129.7
3/4"	18.7	1-1/2"	61	3"	161.3
1"	30	2"	98	4"	256.2

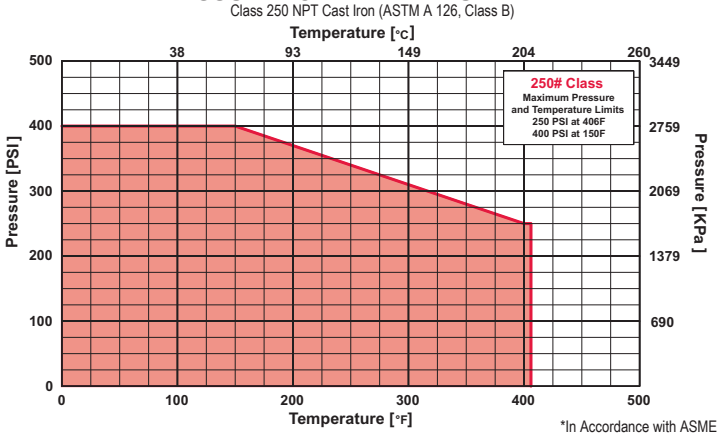
TOTAL SCREEN AREA

Size	(in^2)	Size	(in^2)	Size	(in^2)
1/2"	5.50	1-1/4"	18.69	2-1/2"	54.13
3/4"	8.59	1-1/2"	23.37	3"	73.51
1"	15.22	2"	36.23	4"	154.98

*See DETERMINING RATIOS on page S5 of the Strainer Information Section for calculating NET FREE AREA of the screen to inside pipe area.

PRESSURE vs. TEMPERATURE CHART

Class 250 NPT Cast Iron (ASTM A 126, Class B)



*In Accordance with ASME B16.4

KECKLEY

PRESSURE DROP CHART

"Y" Pattern Strainers

(Styles B, BDI, E150, F150, E300, F300, E7, F7, SB7, SB7BC, SBF, SSB7, SSB7BC and SSBF)

This pressure drop chart is based on the flow of clean water through the Keckley "Y" strainers listed above with screen perforations ranging from 3/64" through 1/8" and is additionally for use with those units equipped with a 20 mesh screen as standard.

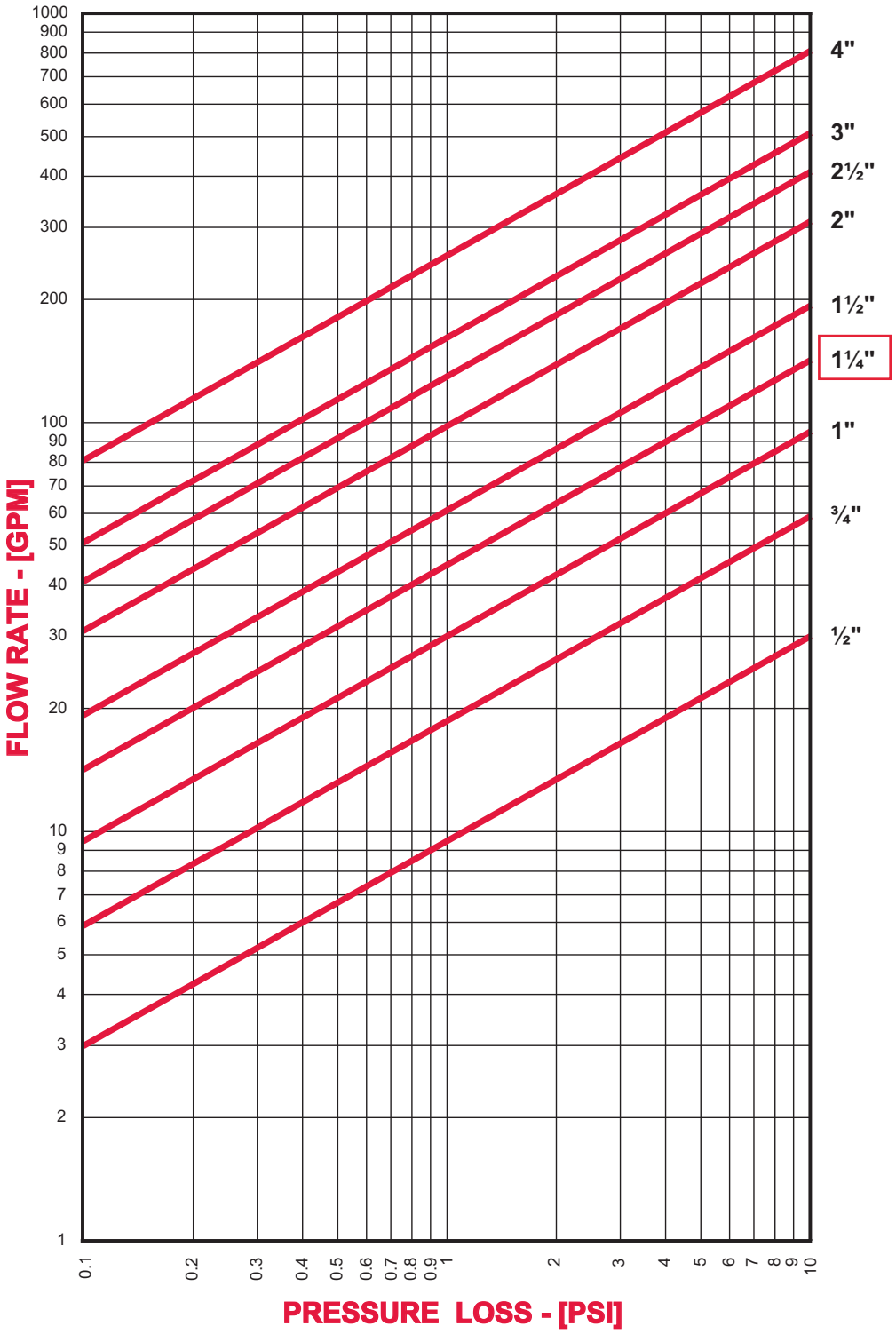
TO USE CHARTS:

Find your desired rate of flow (GPM) on the left hand side of the chart. Follow its corresponding horizontal line to the point where it intersects the diagonal line indicating the strainer pipe size. From this point of intersection, follow the vertical line down to the bottom of the chart to determine the approximate pressure drop.

CORRECTION FACTORS:

For finer mesh screens that are backed with a perforated sheet, multiply the pressure drops shown at right by the following:

40 mesh	x 1.2
60 mesh	x 1.4
80 mesh	x 1.6
100 mesh	x 1.7
150 mesh	x 1.8
200 mesh	x 2.0



KECKLEY

Style SGFV

Basket Strainer
Carbon Steel (ASTM A 216, Grade WCB)
Class 150 & 300 RF Flanged

Style SGFVK

Basket Strainer
Carbon Steel (ASTM A 216, Grade WCB)
Class 150 RF Flanged

Carbon Steel Basket Strainer

APPLICATIONS

Where protection from foreign matter in a pipeline is required.

CONSTRUCTION

The Keckley Style SGFV and SGFVK strainers are constructed from rugged carbon steel castings and are machined to exacting specifications. These bodies have raised faced and drilled flanges that are in accordance with ASME B16.5. All flanges come standard with back-faced bolt holes.

FEATURES

The Keckley Style SGFV and SGFVK strainers feature a basket with an angular cutaway design to allow straight through flow and extremely low pressure loss. The Style SGFV has a bolted top cover flange for ease in basket removal. The Style SGFVK is furnished with studs and knobs for easy cleaning. The Style SGFV gasket is spiral wound 304 stainless steel and is compressed between the body and cover (for maximum strength and durability) and designed for high pressure and high temperature service. The Style SGFVK is furnished with a Buna-N gasket suitable for temperatures up to 200°F. Keckley Style SGFV strainers have carbon steel hex head cap crews and are furnished standard with a tapped and plugged NPT drain connection.

BASKETS

Standard baskets are 304 stainless steel and are spot welded for maximum strength. Different size perforations and meshes are available in stainless steel, monel, and brass to meet specific media requirements. If media is not indicated, screens for *water* will be supplied.

CLEANING

Cleaning of the Style SGFV and SGFVK strainers are accomplished by removing the cover and pulling out the basket. **Warning:** See Maintenance Instructions on page S6 of the Strainer Information Section for additional precautions and detailed information on servicing the strainer.

WORKING PRESSURES - NON SHOCK

NOM. RATING		2" to 12"	50 mm to 300 mm
CLASS 150	BOLTED COVER	285 PSI @ 100ºF	1966 KPa @ 38ºC
		200 PSI @ 200ºF	1379 KPa @ 93ºC
	KNOB TYPE COVER	150 PSI @ 565ºF	1035 KPa @ 296ºC
NOM. RATING		**2" to 12"**	**50 mm to 300 mm**
CLASS 300	BOLTED COVER	740 PSI @ 100ºF	5104 KPa @ 38ºC
		300 PSI @ 838ºF	2069 KPa @ 448ºC

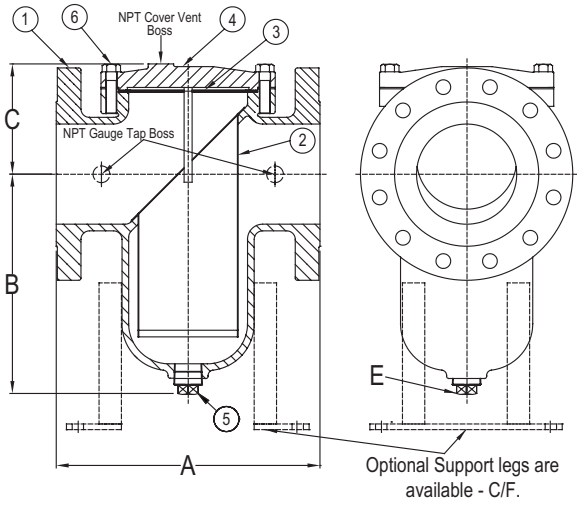
Values listed represent typical market and service applications. Due to numerous variables (concentrations, temperatures, and flow) present in any application, no representation or guarantee, expressed or implied, is given.

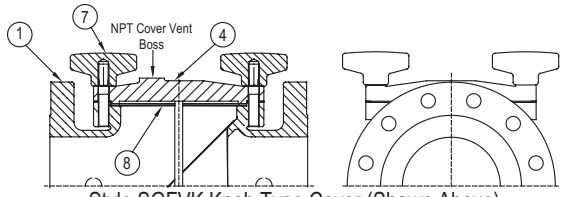
KECKLEY

TECHNICAL DATA
DIMENSIONS AND WEIGHTS

Style SGFV & SGFVK

Basket Strainer, RF Flanged
Carbon Steel (ASTM A 216, Grade WCB)





Style SGFVK Knob Type Cover (Shown Above)
Only Available in 150 lb. Class

PARTS LIST		
ITEM	DESCRIPTION	MATERIAL
1†	Body	Carbon Steel (ASTM A 216, Grade WCB)
2	Basket	Stainless Steel (304)
3	Gasket	Spiral Wound Stainless Steel (304)
4	Cover	Carbon Steel (ASTM A 216, Grade WCB)
5	Pipe Plug	Carbon Steel (ASTM A 105)
6	Hex Head Cap Screw	Carbon Steel (ASTM A 193, Grade B7)
7*	Knob	Steel
8*	Gasket	Buna-N (Max Temperature 200°F)

*Denotes parts for the Style SGFVK 150 lb. class only.
†Optional Body Materials Available in LCB, WC6, and WC9.

STANDARD SCREENS SUPPLIED

SIZE		SCREEN PERFORATION					
		FOR LIQUID		OPEN AREA	FOR STEAM		OPEN AREA
in	mm	in	mm		in	mm	
1-1/2 to 4	40 to 100	1/16	1.6	30%	3/64	1.2	33%
5 to 14	125 to 350	1/8	3.2	43%	1/16	1.6	30%

Standard screens supplied are for **liquid service**, unless otherwise specified.
Options: Other meshes, perforations, and screen materials are available.

SIZE		DIMENSIONS															
		A				B				C				E			
		Class 150		Class 300		Class 150		Class 300		Class 150		Class 300		Class 150		Class 300	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
1-1/2	40	6-1/2	165	7	178	4-1/2	114	4	102	4	102	3-3/4	95	1/2	15	1/2	15
2	50	8-1/2	216	8-13/16	224	5-7/8	149	4-3/4	121	4-3/4	121	3-3/4	95	1/2	15	1	25
2-1/2	65	8	203	9	229	5-7/16	138	5-5/8	143	4-1/4	108	4-5/8	117	3/4	20	1	25
3	80	8-3/4	222	10-1/16	256	5-11/16	144	5-11/16	144	5-5/8	143	5-5/8	143	3/4	20	3/4	20
4	100	11-3/16	284	12	305	8-1/4	210	8-1/4	210	6-1/16	154	6-1/16	154	1	25	1	25
5	125	12-1/4	311	13-1/8	333	10-1/4	260	10-1/4	260	5-5/8	143	5-5/8	143	1	25	1	25
6	150	13-7/8	352	15-9/16	395	12-13/64	310	12-13/64	310	6-5/16	149	6-5/16	160	1-1/4	32	1-1/4	32
8	200	17-3/8	441	18-7/8	479	15-9/16	395	15-9/16	395	8-3/16	208	8-3/16	208	1-1/2	40	1-1/2	40
10	250	22	559	21-5/16	541	16	406	14-3/8	365	10-3/8	264	9-7/8	251	1-1/2	40	2	50
12	300	25	635	25-3/8	645	23-3/4	603	23-3/4	603	12-3/8	314	12-3/8	314	2	50	2	50
14	350	34-5/16	871	34-5/16	871	28	711	34-3/8	873	16-1/2	419	20-3/16	513	2	50	2	50

†This table reflects only the nearest metric equivalents.
Dimensions and weights are for reference only. When required, request certified drawings.
Face to face values tolerance in compliance with ASME B16.5.

Additional Notes:

- Optional NPT Cover vent is available - C/F.
- Optional NPT Gauge taps are available - C/F.
- Optional Support legs are available - C/F.
- Steam jacketed designs are available - C/F.
- Epoxy coating is available - C/F.
- Designed for horizontal pipelines only.

WEIGHTS

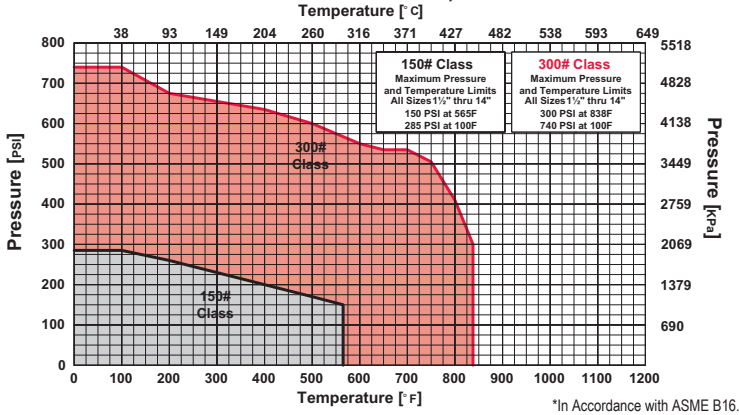
Size		1-1/2"	2"	2-1/2"	3"	4"	5"	6"	8"	10"	12"	14"
150	lbs	21	26	29	39	69	79	116	194	324	717	1275
	kgs	10	12	13	18	31	36	53	88	147	325	578
300	lbs	23	32	40	54	99	195	195	333	530	903	1424
	kgs	10	15	18	24	45	88	88	151	240	410	646

FLOW COEFFICIENTS

Size	C_V	Size	C_V	Size	C_V	Size	C_V
1-1/2"	32	3"	120.2	6"	743.1	12"	4980.6
2"	42.7	4"	276.7	8"	1486.3	14"	7600.0
2-1/2"	84	5"	442.7	10"	3051.6		

PRESSURE vs. TEMPERATURE CHART

Class 150 & 300 RF Flanged Carbon Steel (ASTM A 216, Grade WCB)
For use with Bolted Cover Only



*In Accordance with ASME B16.5

KECKLEY

PRESSURE DROP CHART

Basket Strainers (Styles GFV, GFVK, GFVK7, BGFV, SGFV, SGFVK, SSGFV, and SSGFVK)

This pressure drop chart is based on the flow of clean water through the Keckley strainer styles listed above with screen perforations ranging from 3/64" through 1/8".

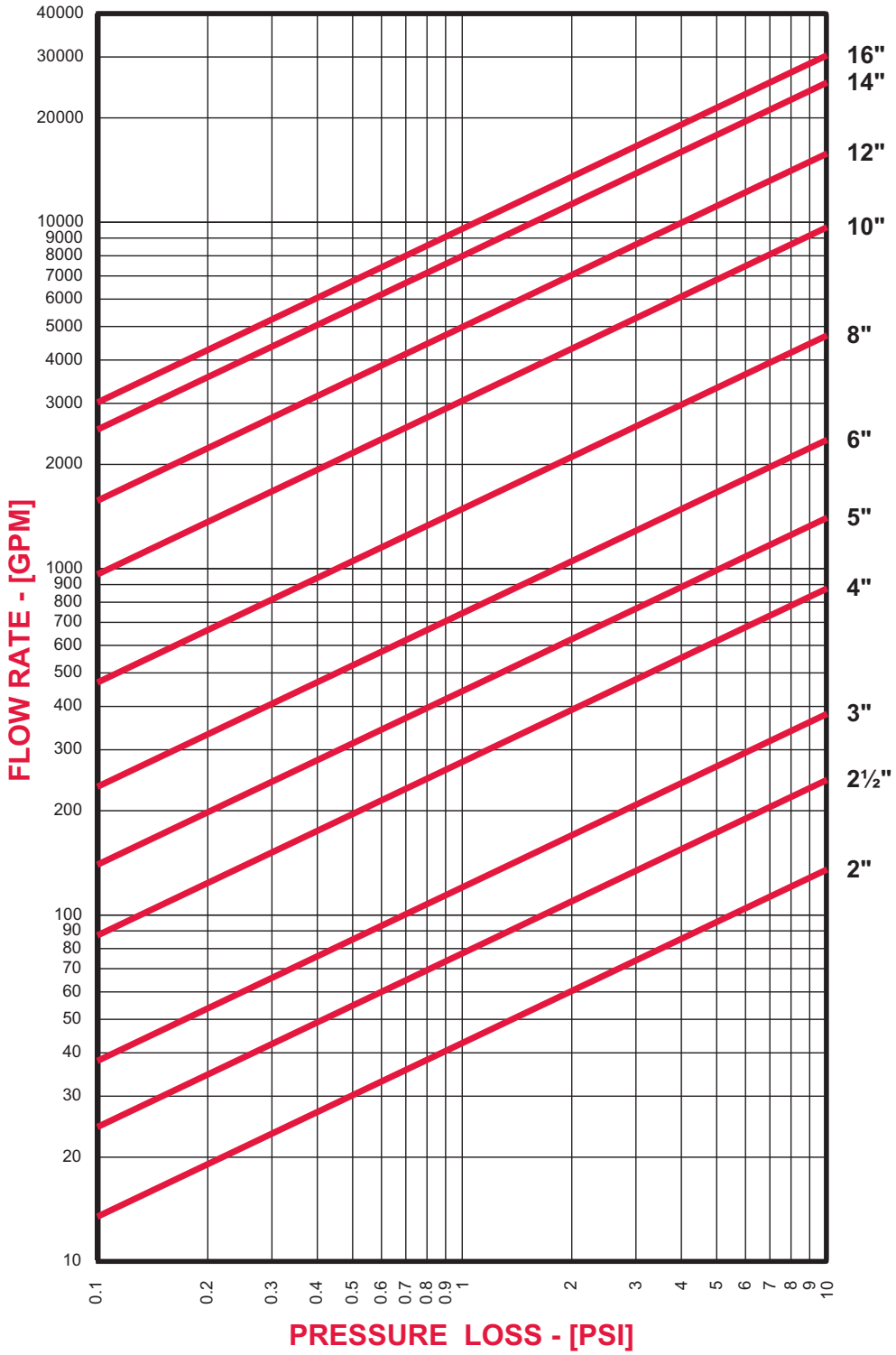
TO USE CHARTS:

Find your desired rate of flow (GPM) on the left hand side of the chart. Follow its corresponding horizontal line to the point where it intersects the diagonal line indicating the strainer pipe size. From this point of intersection, follow the vertical line down to the bottom of the chart to determine the approximate pressure drop.

CORRECTION FACTORS:

For finer mesh baskets that are backed with a perforated sheet, multiply the pressure drops shown at right by the following:

40 mesh	x 1.2
60 mesh	x 1.4
80 mesh	x 1.6
100 mesh	x 1.7
150 mesh	x 1.8
200 mesh	x 2.0



Bell & Gossett
a xylem brand

Submittal

Job/Project: Warabeya		**Representative:**	
ESP-Systemwize: WIZE-F16655BF	05/21/2024	**Phone:**	
Location/Tag: P-11/12/13		**Email:**	
Engineer:		**Submitted By:**	**Date:**
Contractor:		**Approved By:**	**Date:**

Triple Duty Valve

Bell & Gossett Model: 3DS-8S

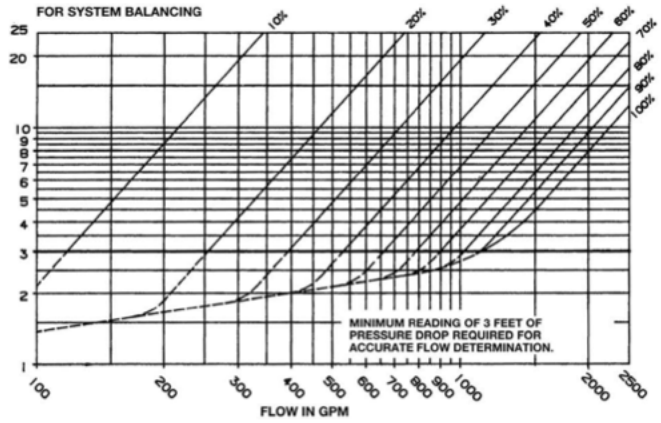
The Triple Duty Valve is a quiet operating heavy-duty valve which performs all of the functions normally required on the discharge side of hydronic system pumps. The valve serves as a nonslam check valve as needed for zoned pumping, parallel and standby pumping, and condenser water applications. The spring loaded disk prevents valve chatter, and assures positive shutoff.. The Triple Duty Valve is also equipped with Model RV-125A readout valves for more accurate system balance. The calibrated nameplate allows the valve to be returned to the original balance position after shutoff.

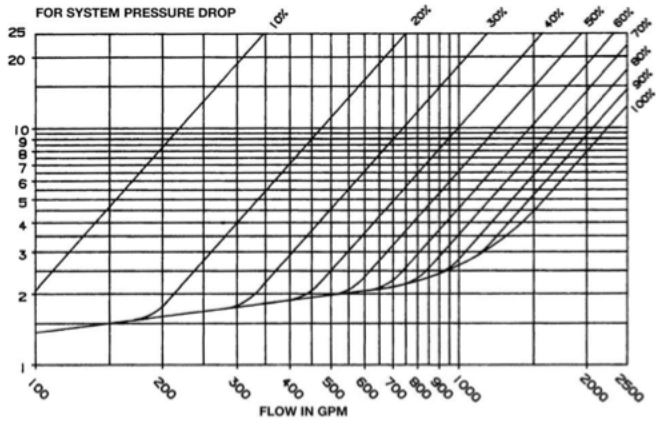
Triple Duty Valve Selection

Model	3DS-8S
Size	8.0 in
Pressure Drop @ Design Flow & Designated Stem Position	3.43'
Stem Position	100%
Connection Type	Flanged
Cv @ Designated Stem Position	1079

Performance Characteristics:

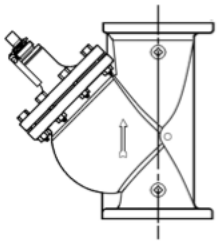
3DS-8S





Materials of construction

Body:	Cast Iron with Bronze seat
Disc	Brass with EPDM Seat Ring
Stem	Stainless Steel
Spring	Stainless Steel
Packing	Teflon-Graphite (asbestos-free)
Gasket	Non-Asbestos
Readout Valve	Brass with EPT insert, check valve & gasket



PROPER INSTALLATION
SHOWING STEM UPRIGHT

Operating Limits

Max Working Pressure (standard)	175 psi
Max Temp (standard)	250°F

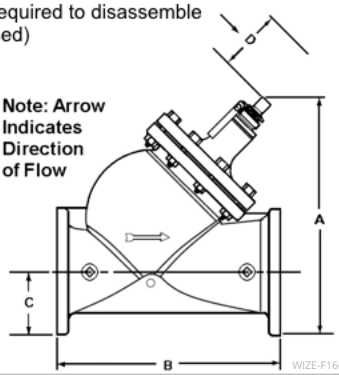
Dimensional Data:

not for construction

DIMENSIONS IN INCHES (mm)							APPROX. SHPG. WT. LBS. (Kg)
FLANGE SIZE*	A		B	C	D	E	
	OPEN	CLOSED					
8 (203.2)	24-3/4 (629)	23-1/4 (591)	21-1/2 (546)	6-3/4 (172)	20-7/16 (519)	10-3/8 (264)	316 (144)

*STANDARD 125 PSIG (862 kPa) ANSI FLANGES.
Dimensions are subject to change. Not to be used for construction purposes unless certified.

Distance required to disassemble (valve closed)



Bell & Gossett
a xylem brand

Submittal

Job/Project: Warabeya		**Representative:**	
ESP-Systemwize: WIZE-F16655BF	05/21/2024	**Phone:**	
Location/Tag: P-15/16/17		**Email:**	
Engineer:		**Submitted By:**	**Date:**
Contractor:		**Approved By:**	**Date:**

Triple Duty Valve

Bell & Gossett Model: 3DS-8S

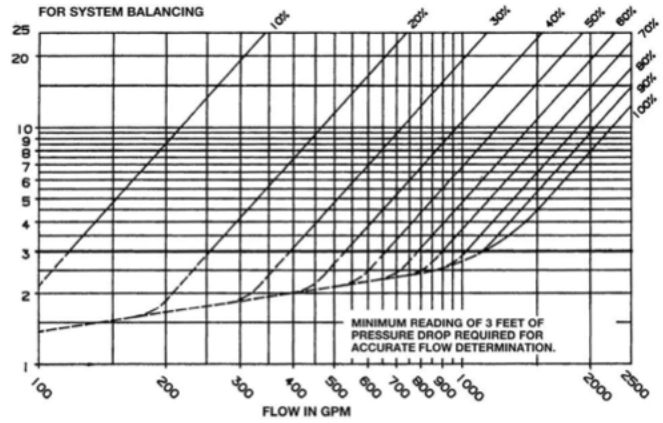
The Triple Duty Valve is a quiet operating heavy-duty valve which performs all of the functions normally required on the discharge side of hydronic system pumps. The valve serves as a nonslam check valve as needed for zoned pumping, parallel and standby pumping, and condenser water applications. The spring loaded disk prevents valve chatter, and assures positive shutoff.. The Triple Duty Valve is also equipped with Model RV-125A readout valves for more accurate system balance. The calibrated nameplate allows the valve to be returned to the original balance position after shutoff.

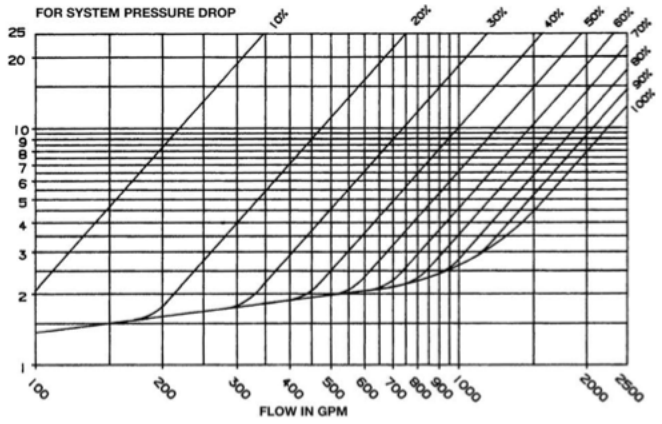
Triple Duty Valve Selection

Model	3DS-8S
Size	8.0 in
Pressure Drop @ Design Flow & Designated Stem Position	3.3'
Stem Position	100%
Connection Type	Flanged
Cv @ Designated Stem Position	1079

Performance Characteristics:

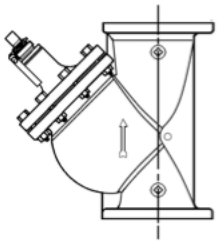
3DS-8S





Materials of construction

Body:	Cast Iron with Bronze seat
Disc	Brass with EPDM Seat Ring
Stem	Stainless Steel
Spring	Stainless Steel
Packing	Teflon-Graphite (asbestos-free)
Gasket	Non-Asbestos
Readout Valve	Brass with EPT insert, check valve & gasket



PROPER INSTALLATION SHOWING STEM UPRIGHT

Operating Limits

Max Working Pressure (standard)	175 psi
Max Temp (standard)	250°F

Dimensional Data:

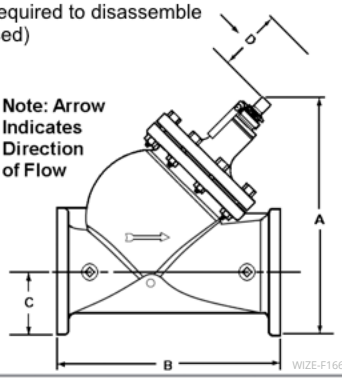
not for construction

DIMENSIONS IN INCHES (mm)							APPROX. SHPG. WT. LBS. (Kg)
FLANGE SIZE*	A		B	C	D	E	
	OPEN	CLOSED					
8 (203.2)	24-3/4 (629)	23-1/4 (591)	21-1/2 (546)	6-3/4 (172)	20-7/16 (519)	10-3/8 (264)	316 (144)

*STANDARD 125 PSIG (862 kPa) ANSI FLANGES.

Dimensions are subject to change. Not to be used for construction purposes unless certified.

Distance required to disassemble (valve closed)



Bell & Gossett
a xylem brand

Submittal

Job/Project: Warabeya		**Representative:**	
ESP-Systemwize: WIZE-F16655BF	05/21/2024	**Phone:**	
Location/Tag: P-19/20/21		**Email:**	
Engineer:		**Submitted By:**	**Date:**
Contractor:		**Approved By:**	**Date:**

Triple Duty Valve

Bell & Gossett Model: 3DS-8S

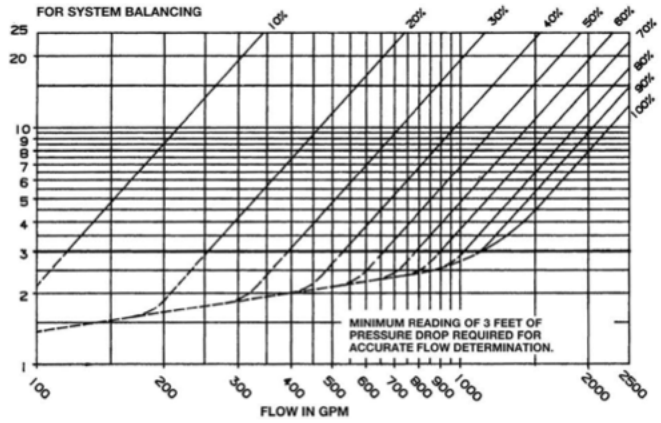
The Triple Duty Valve is a quiet operating heavy-duty valve which performs all of the functions normally required on the discharge side of hydronic system pumps. The valve serves as a nonslam check valve as needed for zoned pumping, parallel and standby pumping, and condenser water applications. The spring loaded disk prevents valve chatter, and assures positive shutoff.. The Triple Duty Valve is also equipped with Model RV-125A readout valves for more accurate system balance. The calibrated nameplate allows the valve to be returned to the original balance position after shutoff.

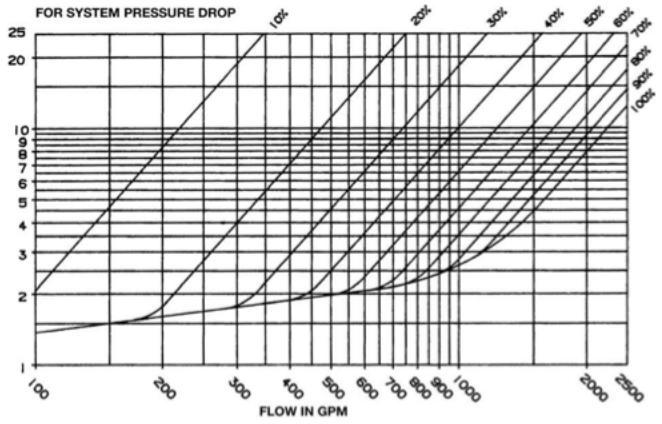
Triple Duty Valve Selection

Model	3DS-8S
Size	8.0 in
Pressure Drop @ Design Flow & Designated Stem Position	4.13'
Stem Position	100%
Connection Type	Flanged
Cv @ Designated Stem Position	1079

Performance Characteristics:

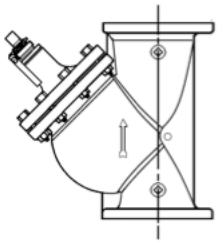
3DS-8S





Materials of construction

Body:	Cast Iron with Bronze seat
Disc	Brass with EPDM Seat Ring
Stem	Stainless Steel
Spring	Stainless Steel
Packing	Teflon-Graphite (asbestos-free)
Gasket	Non-Asbestos
Readout Valve	Brass with EPT insert, check valve & gasket



PROPER INSTALLATION
SHOWING STEM UPRIGHT

Operating Limits

Max Working Pressure (standard)	175 psi
Max Temp (standard)	250°F

Dimensional Data:

not for construction

DIMENSIONS IN INCHES (mm)							APPROX. SHPG. WT. LBS. (Kg)
FLANGE SIZE*	A		B	C	D	E	
	OPEN	CLOSED					
8 (203.2)	24-3/4 (629)	23-1/4 (591)	21-1/2 (546)	6-3/4 (172)	20-7/16 (519)	10-3/8 (264)	316 (144)

*STANDARD 125 PSIG (862 kPa) ANSI FLANGES.
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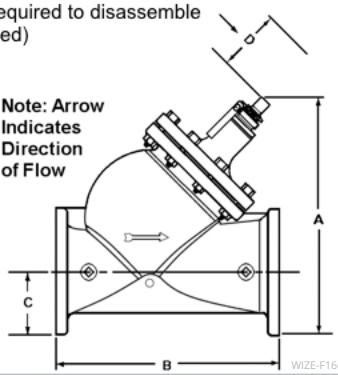
Distance required to disassemble (valve closed)



Bell & Gossett
a xylem brand

Submittal

Job/Project: Warabeya		**Representative:**	
ESP-Systemwize: WIZE-F16655BF	05/21/2024	**Phone:**	
Location/Tag: P-22/23		**Email:**	
Engineer:		**Submitted By:**	**Date:**
Contractor:		**Approved By:**	**Date:**

Triple Duty Valve

Bell & Gossett Model: 3DS-8S

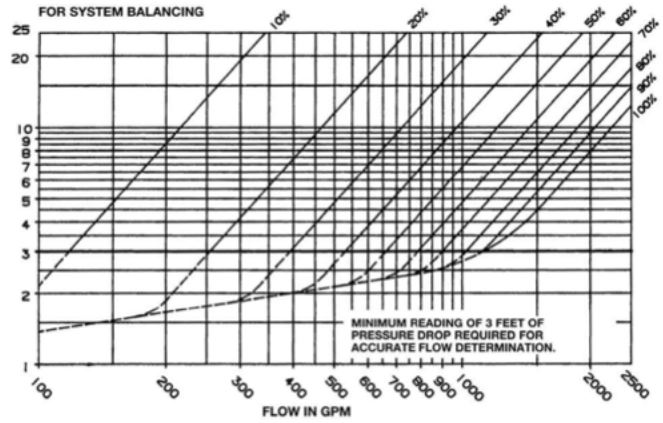
The Triple Duty Valve is a quiet operating heavy-duty valve which performs all of the functions normally required on the discharge side of hydronic system pumps. The valve serves as a nonslam check valve as needed for zoned pumping, parallel and standby pumping, and condenser water applications. The spring loaded disk prevents valve chatter, and assures positive shutoff.. The Triple Duty Valve is also equipped with Model RV-125A readout valves for more accurate system balance. The calibrated nameplate allows the valve to be returned to the original balance position after shutoff.

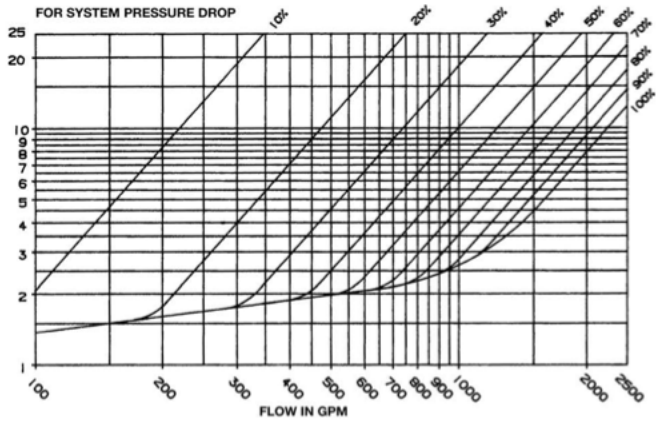
Triple Duty Valve Selection

Model	3DS-8S
Size	8.0 in
Pressure Drop @ Design Flow & Designated Stem Position	4.27'
Stem Position	100%
Connection Type	Flanged
Cv @ Designated Stem Position	1079

Performance Characteristics:

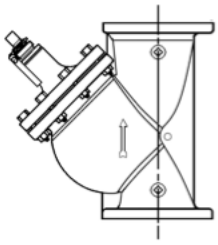
3DS-8S





Materials of construction

Body:	Cast Iron with Bronze seat
Disc	Brass with EPDM Seat Ring
Stem	Stainless Steel
Spring	Stainless Steel
Packing	Teflon-Graphite (asbestos-free)
Gasket	Non-Asbestos
Readout Valve	Brass with EPT insert, check valve & gasket



PROPER INSTALLATION SHOWING STEM UPRIGHT

Operating Limits

Max Working Pressure (standard)	175 psi
Max Temp (standard)	250°F

Dimensional Data:

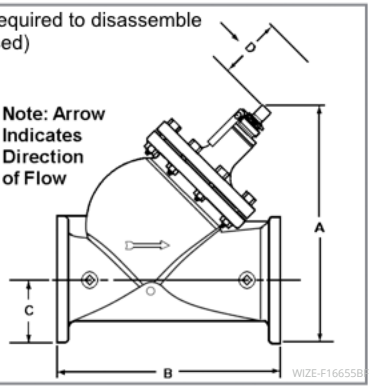
not for construction

DIMENSIONS IN INCHES (mm)							APPROX. SHPG. WT. LBS. (Kg)
FLANGE SIZE*	A		B	C	D	E	
	OPEN	CLOSED					
8 (203.2)	24-3/4 (629)	23-1/4 (591)	21-1/2 (546)	6-3/4 (172)	20-7/16 (519)	10-3/8 (264)	316 (144)

*STANDARD 125 PSIG (862 kPa) ANSI FLANGES.

Dimensions are subject to change. Not to be used for construction purposes unless certified.

Distance required to disassemble (valve closed)



Bell & Gossett
a xylem brand

Submittal

Job/Project: Warabeya		**Representative:**	
ESP-Systemwize: WIZE-F16655BF	05/21/2024	**Phone:**	
Location/Tag: P-25/26		**Email:**	
Engineer:		**Submitted By:**	**Date:**
Contractor:		**Approved By:**	**Date:**

Triple Duty Valve

Bell & Gossett Model: 3DV-1-1/2NMF

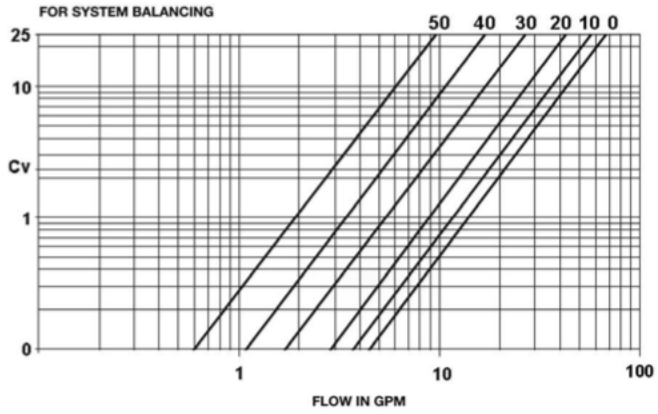
The Bell & Gossett Triple Duty Valve Model 3DV is a combination shut-off, check, and balance valve for use in HVAC systems. The full port ball valve provides complete shut-off to allow your pump to be removed without draining the system. The spring loaded check prevents gravity circulation and backflow in systems utilizing zoned or parallel pumping, while allowing the valve to be rotated in any direction. The calibrated nameplate with memory stop provides basic balance capabilities for your entire system. The valve features a FNPT fixed outlet connection and a choice of rotatable flange union tailpiece or MNPT union tailpiece inlet connection. The valve also features an extended handle design as well as two extended 1/4" PT valves for insulated systems.

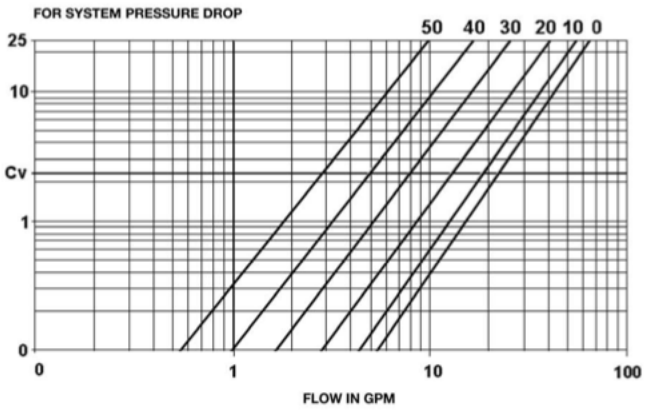
Triple Duty Valve Selection

Model	3DV-1-1/2NMF
Size	1.5 in
Pressure Drop @ Design Flow & Designated Stem Position	5.91'
Stem Position	0
Connection Type	NPT Male
Cv @ Designated Step Position	25

Performance Characteristics:

3DV-1 1/2 NMF





Materials of construction

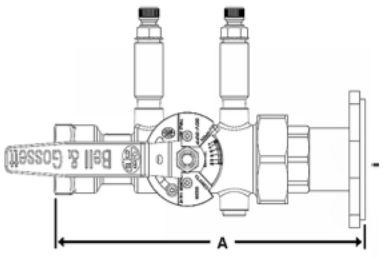
Valve Body:	C37700 Brass
Ball	Chrome Plated C36000 Brass
Seating Rings	Glass & Carbon
PT Valves	C37700 Brass w/ EPDM Seals
Stem	C37700
Check Valve Body	Glass Filled Noryl
Check Valve Seals	EPDM

Operating Limits

Max Operating Pressure	200 psi
Max Temp Range	4°F - 250°F

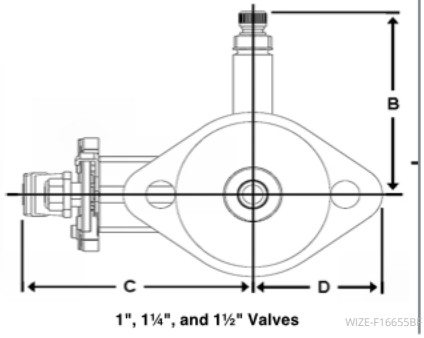
Dimensional Data:

not for construction



*All dimensions +/- 0.125 (3.2 mm) tolerance. Dimensions are subject to change. Not to be used for construction purposes unless certified.

Size	Inlet Connection Type	DIMENSIONS* IN INCHES (mm) A	B	C	D	Cv	Approx. Weight lbs. (kg)
1-1/2"	NPT Male	8.91 (226.3)	3.61 (91.7)	4.52 (114.8)	1.02 (25.9)	25	5.2 (2.4)



1", 1¼", and 1½" Valves