CEC
CIVIL ENGINEERING CONSULTANTS, INC.
Civil & Environmental Engineering

Shop Drawing Transmittal

July 28, 2022

Mr. Lamine Diop
Veolia Water Technologies
4105 Rue Sartelon
Saint-Laurent, QC H4S 2B3 Canada

RE: City of Jefferson, GA I-85 Water Reclamation Facility Submittal Review

Dear Mr. Diop:

CEC has reviewed the Vortex Grit Separator equipment submittal. The mechanical portion of the submittal, Sections 1 – 4, is approved with no exceptions taken. The Control System Section 5 is incomplete and should be resubmitted for approval. Please see enclosed submittal and comments.

Very truly yours,
CIVIL ENGINEERING CONSULTANTS, Inc.

C.K. Butterfield, P.E.

Enclosures: 5000222018 VEOLIA Submittal Rev1.pdf
cc: Priscilla A. Murphy, City Manager, City of Jefferson

Sections 1-4 pg. 4-80

CIVIL ENGINEERING CONSULTANTS, INC. MARIETTA, GEORGIA 30068			
No Exceptions Taken	No Exceptions Taken With Comment	Make Corrections Noted	Rejected
✓			
DATE *Jul 28, 2022*			
BY			
APPROVED FOR DESIGN ONLY. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND QUANTITIES.			

Section 5 pg. 81-110

CIVIL ENGINEERING CONSULTANTS, INC. MARIETTA, GEORGIA 30068			
No Exceptions Taken	No Exceptions Taken With Comment	Make Corrections Noted	Rejected
		✓	
DATE *Jul 28, 2022*			
BY			
APPROVED FOR DESIGN ONLY. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND QUANTITIES.			

S:\21093 - Jefferson I-85 WWTP\Construction Administration\Submittals\Manufacturer Equipment Submittals\Equipment Submittals - Vortex Grit Separator.docx

I-85 WATER RECLAMATION FACILITY
City of Jefferson, GA
Grit Removal System
Purchase Order: 0000000493

JOHN MEUNIER Products

MECTAN® GRIT REMOVAL MECHANISM WITH GRIT PUMP
SAM® TYPE GDS GRIT DEWATERING SCREW

Equipment Shop Drawings Submittal
Project No.5000222018

Submitted to:
City of Jefferson
Attn: Priscilla A.Murphy, City Manager

Revision: 1
Date: 2022-07-26

WATER TECHNOLOGIES

Veolia Water Technologies Canada Inc.
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ISO 9001 • www.veoliawatertechnologies.ca • www.veoliawaterstna.com

No exceptions taken

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Resubmit control system with complete ladder logic diagram.

1 GENERAL

1.1 Statement of Confidentiality

This document and all information contained herein are the property of **VEOLIA Water Technologies Canada Inc. (VWTCI)**. The design concepts and information contained herein are proprietary to VWTCI and are submitted in confidence. They are not transferable and must be used only for the purpose for which the document is expressly loaned. They must not be disclosed, reproduced, loaned or used in any other manner without the express written consent of VWTCI. In no event shall they be used in any manner detrimental to the interest of VWTCI. All patent rights are reserved. Upon the demand of VWTCI, this document, along with all copies and extracts, and all related notes and analyses, must be returned to VWTCI or destroyed, as instructed by VWTCI. Acceptance of the delivery of this document constitutes agreement to these terms and conditions.

1.2 Quality System

Since December 7, 1998, John Meunier Inc. (JMI) now VEOLIA Water Technologies Canada Inc. has been certified ISO 9001 by the Quality Management Institute (QMI), a division of CSA International, North America's leading Management Systems Registrar. QMI certificates are recognized and accepted worldwide.

Each year, QMI performs extensive audits to verify the compliance of our Quality System to the ISO 9001 Standard. In year 2008, our registration made JMI one of the first companies in Montreal to be certified in the new ISO 9001:2008 Standard.

1.2.1 Quality Manual

One of the basic tools of ISO 9001 is the company's Quality Manual, which defines company policies, procedures, working instructions and forms.

The topics covered in our Quality Manual are explained below:

Management Responsibility

The company's management is responsible for defining the Quality Policy (objectives and responsibilities) and implementing it through

- Quality Planning,
- Quality Control,
- Quality Assurance,
- Quality Improvement.

Quality System

The company's Quality System comprises procedures, processes and resources needed to implement the Quality Policy.

Contract Review

The contract review is a procedure where every aspect of a newly signed contract that may relate to our Quality Policy is examined.

Design Control

Design control is a procedure where a design is examined to ensure that it fulfills the requirements of our Quality Policy, identify problems (if any) and propose solutions.

Document and Data Control

Document and data control is a procedure by which the company identifies and manages all documents and data (for example, drawings).

Purchasing

Purchasing procedures are defined so that purchased products conform to specified requirements.

Control of Customer Supplied Product

This procedure consists of the verification, storage and maintenance of customer supplied products.

Product Identification and Traceability

This procedure defines the methods of identifying products (tags), from receipt and all stages of production, to delivery and installation.

Process Control

The production, installation and servicing processes that directly affect Quality are carried out under controlled conditions.

Inspection and Testing

Inspection and testing are procedures that are meant to verify that a product meets the specified requirements.

Control of Inspection, Measuring and Test Equipment

This procedure defines the calibration of measuring and testing equipment used by JMI during the inspection and testing processes.

Inspection and Test Status

The inspection and test status of a product (conformity or non-conformity) is indicated by suitable means (tags).

Control of Non-Conforming Product

This procedure is established to ensure that a non-conforming product is not used or installed unintentionally. The procedure describes the identification, documentation, and evaluation and disposition means of the non-conforming product.

Corrective and Preventative Action

Procedures are established for implementing corrective and preventative actions. Corrective or preventative actions are taken to eliminate the causes of actual or potential non conformities.

Handling, Storage, Packaging, Preservation and Delivery

Procedures define handling, storage, packaging, preservation and delivery methods to prevent damage or deterioration of the products.

Control of Quality Records

Quality Records are maintained,

- to keep track of a product's quality and
- to demonstrate the efficiency of the Quality System.

Subcontractors' Quality Records are important elements of this control procedure.

Internal Quality Audits

Internal Quality Audits are performed regularly to verify whether activities are conducted according to the Quality System's requirements.

Training

All personnel performing activities affecting Quality are trained and a record of training is maintained. Personnel performing specific assigned tasks are qualified on the basis of appropriate education, training and/or experience, as required.

Servicing

Where servicing is a specified requirement, VWTCI has documented procedures for performing, verifying and reporting that the servicing meets the specified requirements.

Quality Coordinator

JMI has appointed a Quality Coordinator to help management and employees implement the company's Quality System.

1.2.2 Welding Compliance

This statement is to confirm that VEOLIA Water Technologies Canada Inc. manufactures equipment in compliance with the following information:

- VWTCI uses an internal welding procedure, JMI-91 based on the Canadian Welding Bureau (CWB) ACNOR W59. This procedure is in the French language and is available on request.
- VWTCI has six (6) welders with a technical degree in welding & assembly and an average of nearly 10 years of experience.
- All equipment quoted is standard manufacturing products at VWTCI and we have more than 800 references in the market.
- VWTCI is certified ISO9001 including quality procedures.
- VWTCI will obtain the services of an independent welding inspector and submit is qualification to the owner or representative should this be specifically required per contract.
- VWTCI will obtain a report from the inspector to confirm that the welds performed on the equipment meet the equipment designer requirements should this be specifically required per contract.

The end user or its representative is also welcome to visit our manufacturing facilities to acknowledge the quality of our equipment.

1.2.3 Quality Management System Certificate

CERTIFICATE
OF REGISTRATION

This is to certify that

Veolia Water Technologies Canada Inc.
4105, rue Sartelon, Ville St-Laurent, Québec H4S 2B3 Canada

operates a

Quality Management System

which complies with the requirements of

ISO 9001:2015

for the following scope of certification

Design (engineering, research & development), manufacturing, sales and after sales service, installation supervision, distribution and customer service for water treatment equipment and processes.

Certificate No.:	CERT-0113383	Original Certification Date:	January 17, 2005
File No.:	007971	Certification Effective Date:	January 26, 2018
Issue Date:	February 21, 2018	Certificate Expiry Date:	January 25, 2021

Nicole Grantham
General Manager SAI Global Certification Services

ISO 9001

Registered by:
QMI-SAI Canada Limited (SAI Global), 20 Carlson Court, Suite 200, Toronto, Ontario M9W 7K6 Canada. This registration is subject to the SAI Global Terms and Conditions for Certification. While all due care and skill was exercised in carrying out this assessment, SAI Global accepts responsibility only for proven negligence. This certificate remains the property of SAI Global and must be returned to them upon request.
To verify that this certificate is current, please refer to the SAI Global On-Line Certification Register: www.qmi-saiglobal.com/qmi_companies/

SAI GLOBAL
INFORM. INSPIRE. IMPROVE.

2 CONTRACTUAL INFORMATION

2.1 Scope of Supply

Item	Quantity	Description	Model Number	Price (USD)
A.	One (1)	MECTAN® Vortex Grit Removal System	JMDV/4-35SXH	Included
B.	One (1)	Gorman-Rupp® Grit Pump	Super T-Series 4x4	Included
C.	One (1)	SAM® Type GDS Grit Dewatering Screw	GDSC/9-10-25XA	Included
D.	One (1)	PLC/HMI Control System w/ local stations	VEOLIA Standard	Included

2.2 Clarifications

Installation of the main equipment shall be performed on site by the Contractor.
Items underlines are included in our scope and will be supplied loose for field installation by the Contractor.
Sensible instruments are not assembled on the equipment to avoid potential damages during shipping.

- Veolia manufacturing facilities do not have the AWS welding certification, however our facilities have welding standards that meet the intent of the specifications.
-

Anything outside of what is described in our scope of supply or presented in this proposal are to be provided by the Contractor. Majors items listed hereafter are not included in this offer (non-included items are not necessarily limited to this list).

• equipment anchors • equipment offloading & installation • all mechanical and electrical interconnections; • all piping, wiring and valve supports, outside each unit; • costs for substitution, evaluation, redesign and expenses required to accommodate modifications necessary to fit the described equipment. • installation of foundation bolts, pits and concrete work; • control panel installation, support and filed wiring; • motor local disconnect switch(es), if stated in the contract documents, • cost for local agency inspections, permits & approval (if required)	• grit removal basin/tank • stairways/walkway/bridge; • grating and hand railing (other than previously stated); • gates and valves (other than previously stated); • special chute if requested (other than previously stated); • screenings and grit receptacle(s); • Vibration & Noise tests if required; • performance test, laboratory expenses, support facilities and equipment to properly conduct these tests (should they be required);

The following anchors shall be supplied and installed by the contractor:

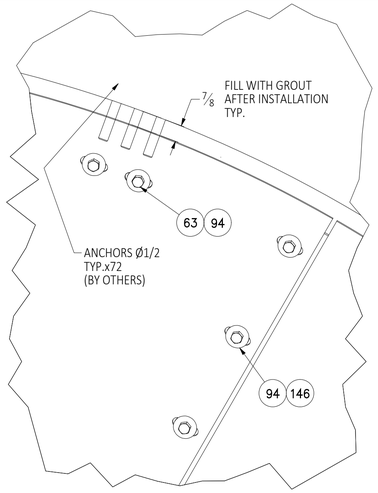
- Mectan gear case: Ø5/8” Internally Threaded Expansion type, made of 303 stainless steel
- Mectan extraction tube support: Ø3/8" Wedge Expansion type, made of 304 stainless steel
- Mectan V conical baffle: Adhesive type with Ø1/2" threaded rod, made of 304 stainless steel
- SAM floor supports: Ø5/8” Internally Threaded Expansion type, made of 303 stainless steel

3 DRAWINGS

3.1 Field Installation

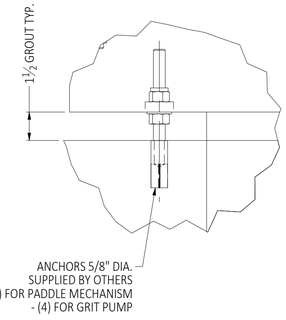
TABLE		
TI–POINT NO.	DESCRIPTION	DIMENSION / TYPE
TP–101	GRIT PUMP OUTLET	4" ANSI #150 FLANGE
TP–102	FLUIDISATION WATER INLET	1" FNPT
TP–103	FLUIDISATION WATER INLET	1" FNPT

1. ALL DIMENSIONS ARE IN INCHES AND ELEVATIONS ARE IN FEET.
2. PIPING IS NOT SUPPLIED BY VEOLIA (SEE P&ID DRAWING PI001 FOR PIPING DETAILS).



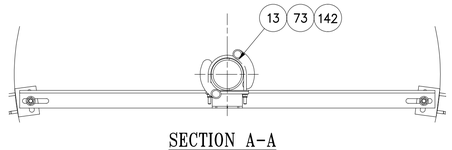
DETAIL 1

SCALE: 1/4" = 1"



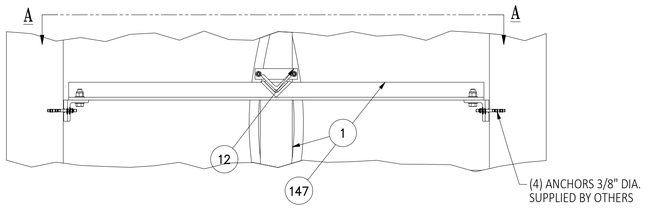
DETAIL 2

SCALE: 1/4" = 1"



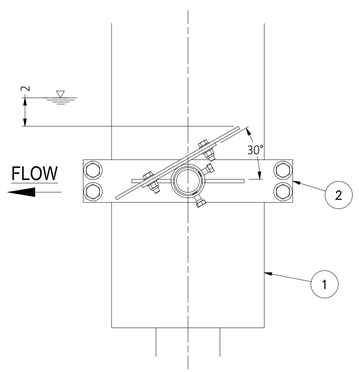
SECTION A–A

SCALE: 3/32" = 1"



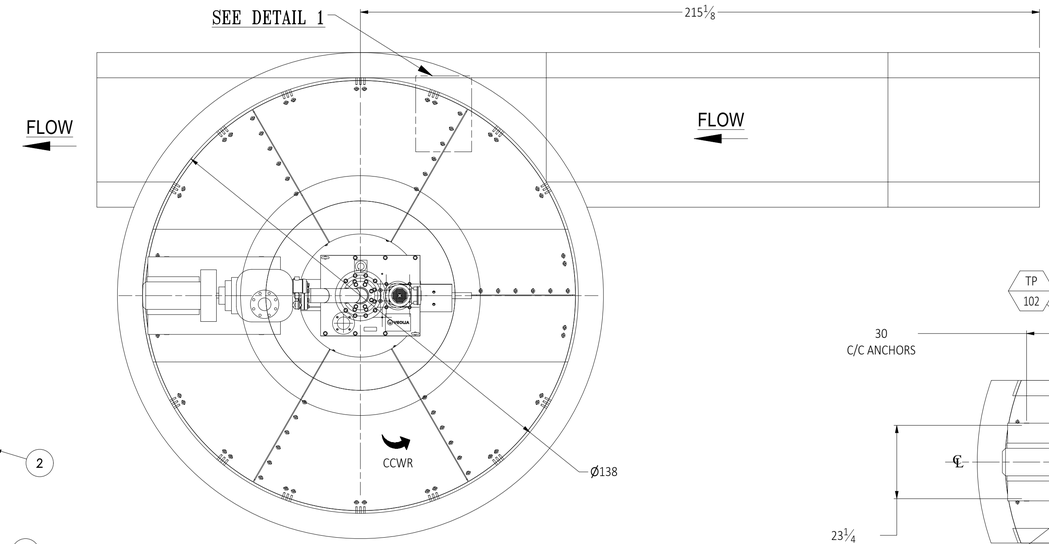
DETAIL 3

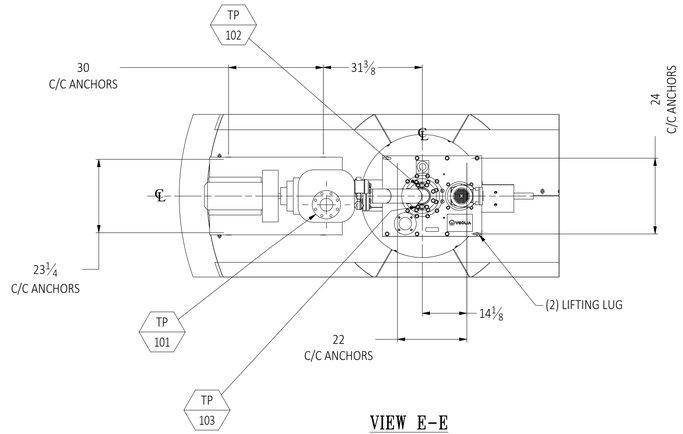
SCALE: 3/32" = 1"



SECTION B–B

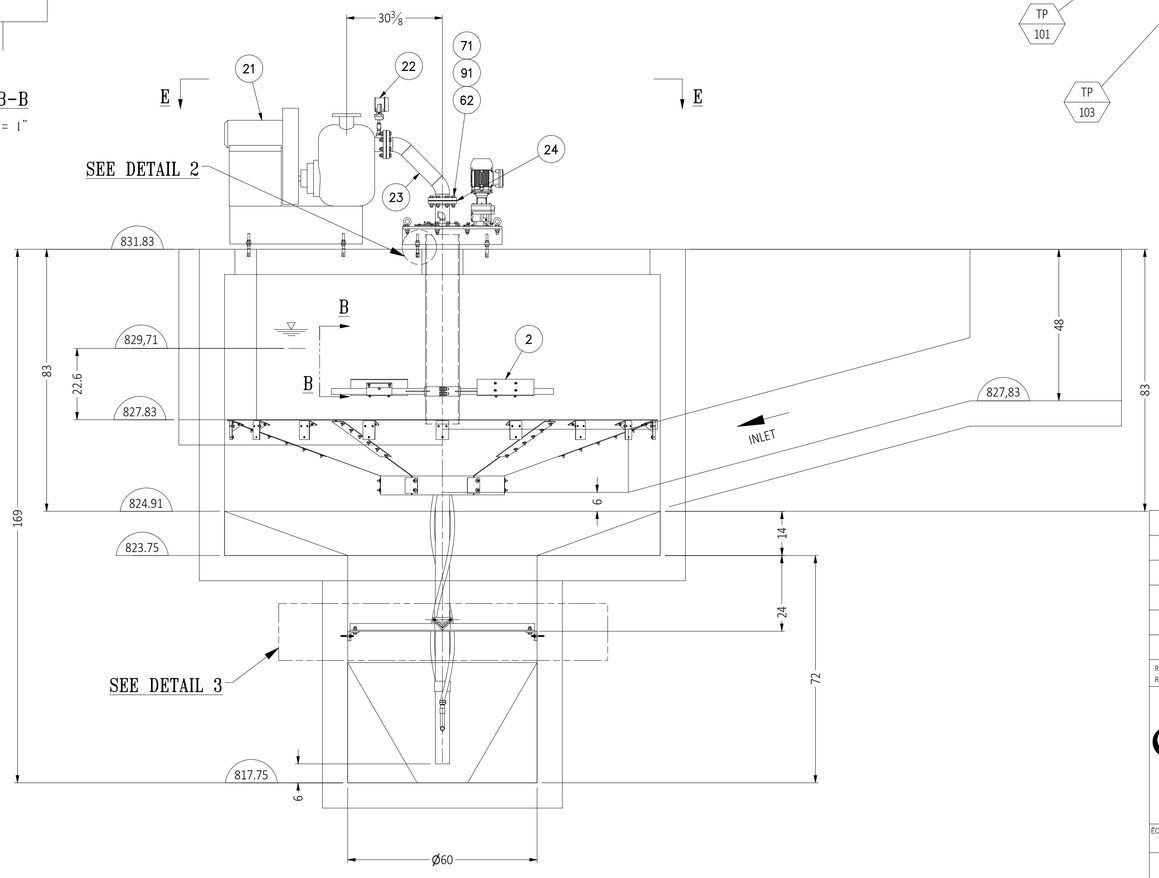
SCALE: 3/16" = 1"





VIEW E–E

SCALE: 1/2" = 1'
(WITHOUT WALKWAY)



RÉV. REV.	DESCRIPTION	DATE	DESSINÉ PAR/ DRAWN BY	PRÉPARÉ PAR/ PREPARED BY	VÉRIFIÉ PAR/ CHECKED BY
2	FOR APPROVAL II	2022-07-07	S.M.	M.B.	B.L.
1	FOR APPROVAL	2022-06-03	S.F	M.B	B.L

VEOLIA WATER TECHNOLOGIES

DESSINÉ PAR/DRAWN BY: S.FILLION — DATE: 2022-06-09
PRÉPARÉ PAR/PREPARED BY: MARC BÉLIVEAU, P.Eng. — DATE: 2022-06-09
VÉRIFIÉ PAR/CHECKED BY: BERTRAND LANDRY, P.Eng. — DATE: 2022-06-09

CLIENT: JEFFERSON, GA

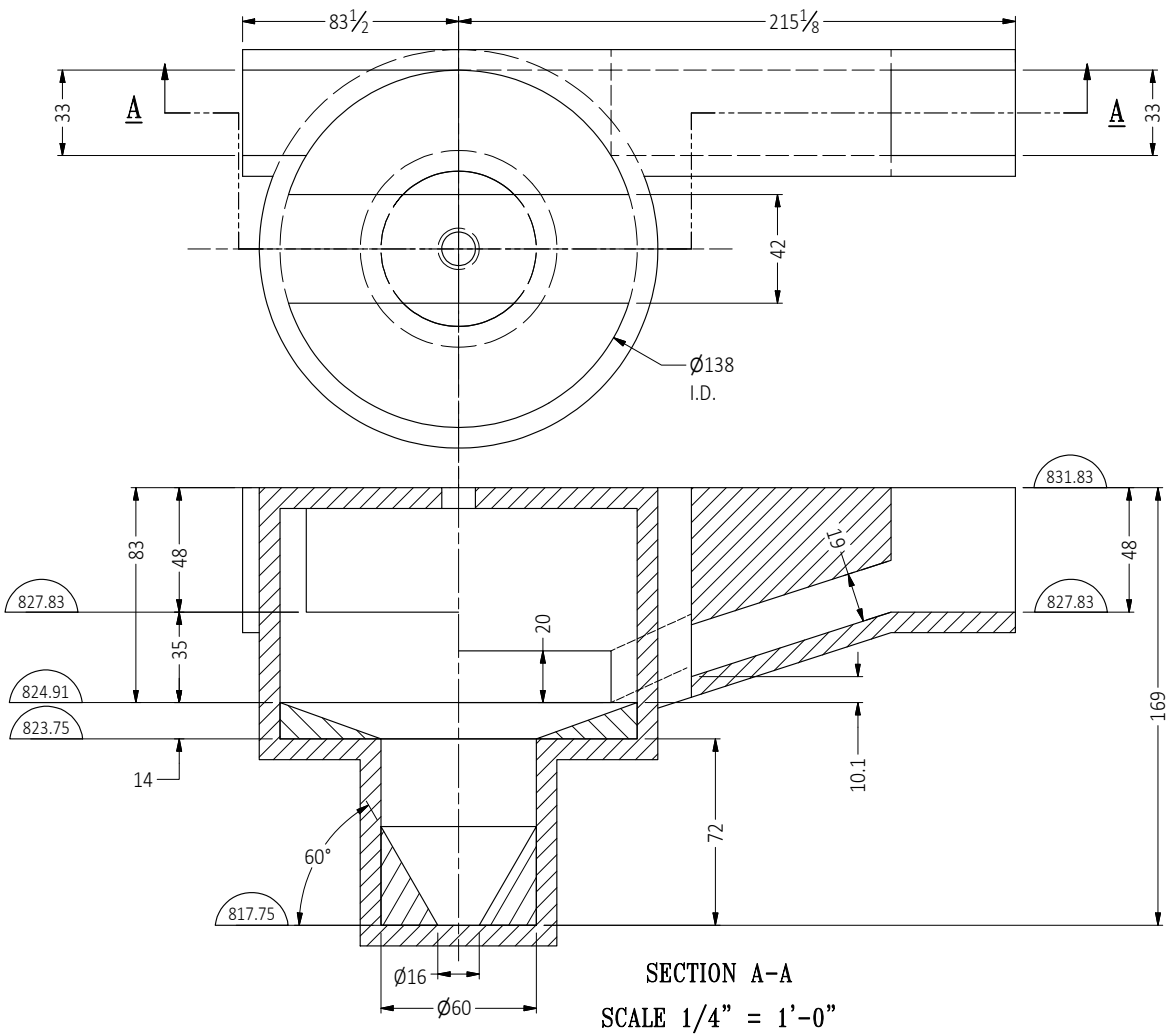
TITRE / TITLE:
MECTAN "V" GRIT CHAMBER
JMDV / 4-35 SXH
FIELD INSTALLATION

ÉCHELLE / SCALE: 1/2" = 1'

PROJET / PROJECT - DESSIN No / DRAWING No	INTERNE / INTERNAL	FEUILLET / SHEET	RÉV/REV
5000222018 - FI311010	-	1 / 1	2

REF:

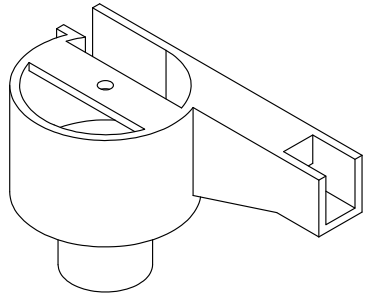
ANSI D



SECTION A-A
SCALE 1/4" = 1'-0"

NOTES:

1. CIVIL WORKS DRAWINGS SUPPLIED BY JMI ARE SUBMITTED ONLY TO CONFIRM TANK INTERNAL DIMENSIONS AND LOCATE PIPE SPOOLS (IF REQUIRED). WALL & SLAB THICKNESS WILL BE DETERMINED BY "CONSULTING ENGINEER"
2. DIMENSION ARE IN INCHES AND ELEVATION IN FT.



TOLÉRANCES GÉNÉRALES:

DIMENSIONS EN POUCES:	DIMENSIONS EN mm:
0 @ 24 : ± 1/32 [± .03]	0 @ 600 : ± 0.5
24 @ 160 : ± 1/16 [± .05]	600 @ 4000 : ± 1.0
> 160 : ± 1/8 [± .1]	> 4000 : ± 3.0

ANGLES: ± 0° 10'
BRISER TOUTES LES ARÊTES
TOUTES LES SURFACES USINÉES: 250

RÉV. REV.	DESCRIPTION	DATE	DESSINÉ PAR/ DRAWN BY	PRÉPARÉ PAR/ PREPARED BY	VÉRIFIÉ PAR/ CHECKED BY
2	FOR APPROVAL II	2022-07-26	S.F	M.B	B.L
1	FOR APPROVAL	2022-06-07	S.F	M.B.	B.L

DESSINÉ PAR/ DRAWN BY:	S.FILLION	DATE: 2022-06-07
PRÉPARÉ PAR/ PREPARED BY:	MARC BÉLIVEAU, P.Eng.	DATE: 2022-06-07
VÉRIFIÉ PAR/ CHECKED BY:	BERTRAND LANDRY, P.Eng.	DATE: 2022-06-07
ÉCHELLE: SCALE:	1/4" = 1'-0"	

VEOLIA
WATER TECHNOLOGIES

TITRE TITLE	MECTAN "V" GRIT CHAMBER JMDV/4-35SHX CONCRETE TANK
CLIENT	JEFFERSON GA

PROJET – DESSIN PROJECT – DRAWING	NUMÉRO INTERNE INTERNAL NUMBER	FEUILLETS PAGES	RÉV. REV.
5000222018 – CW311001	-	1 / 1	2

BARRE = 1" À L'ÉCHELLE D'IMPRESSION
BAR = 1" AT PLOT SCALE
REF:
ANSI B

VEOLIA

BILL OF MATERIALS

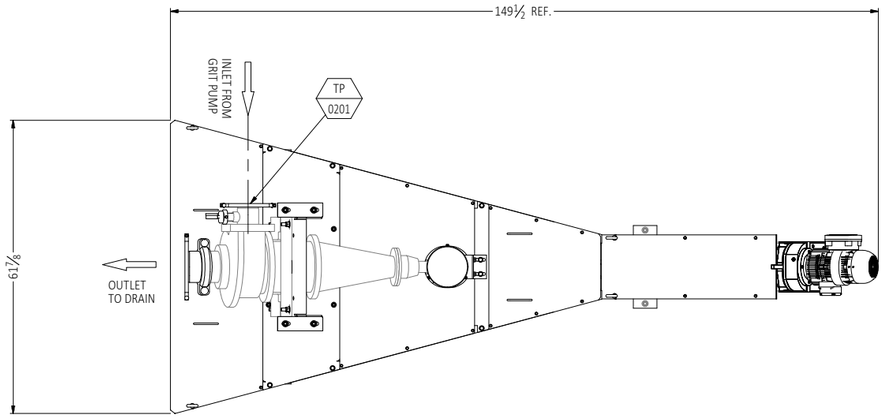
TITLE	Rev.	DESCRIPTION	DATE	Dessiné par/ Drawn by	Préparé par/ Prepared by	Vérifié par/ Checked by	CLIENT
MECTAN "V" GRIT CHAMBER JMDV / 4-35 SXH FIELD INSTALLATION	1	FOR APPROVAL	2022-06-02	S.F	B.L	M.B	JEFFERSON GA
							REF.No. 5000222018 Rev. 1
							Date: 2022-06-03
DWG # FI311010							

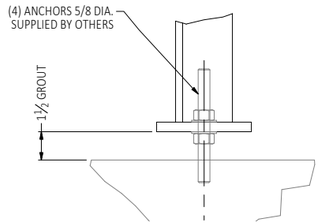
REV.	ITEM		QTY Unit.	QTY Total	DESCRIPTION	MATERIAL	REFERENCE NO.	P&ID I.D. / TAG	Comments
	5000222018-FI311010-	1	1	1	MECTAN GRIT CHAMBER MECHANISM		SA311100	JMD-001	
	5000222018-FI311010-	2	1	1	PADDLES		FAFRGM204906		
	5000222018-FI311010-	3	1	1	EXTRACTION PIPE SUPPORT		SA311110		
	5000222018-FI311010-	4	1	1	"V" BRACKET Ø4"	AISI 304L	FABKGM204934		
	5000222018-FI311010-	5	1	1	"U" BOLT PIPE Ø4", ROD Ø3/8"	AISI 304	FXUBZL200634		
	5000222018-FI311010-	6	1	1	PUMP "GORMAN-RUPP"	Generic	ST-012-X		
	5000222018-FI311010-	7	1	1	VACUUM SWITCH ASSEMBLY		SA311120		
	5000222018-FI311010-	8	1	1	PUMP SUCTION PIPE	AISI 304L	FAPIGM306109		
	5000222018-FI311010-	9	2	2	FLANGE GASKET Ø4", FP	CAOUTCHOUC ROUGE / RED RUBBER	SEGAFP200123		
	5000222018-FI311010-	10	16	16	HEX. BOLT Ø5/8"-11UNC X 3 1/4 LG.	ASTM-F593C-304	FXSCYY200498		
	5000222018-FI311010-	11	16	16	LOCK-NUT Ø5/8"-11UNC	ASTM-F594C-304	FXNUYY200222		
	5000222018-FI311010-	12	2	2	LOCK-NUT Ø3/8"-16UNC	ASTM-F594C-304	FXNUYS200207		
	5000222018-FI311010-	13	32	32	FLAT WASHER Ø5/8" NARROW (TYPE A)	AISI 304	FXWAYY200674		
	5000222018-FI311010-	15	2	2	FLAT WASHER Ø3/8" NARROW (TYPE A)	AISI 304	FXWAYS200666		
	5000222018-FI311010-	16	6	6	CONICAL BAFFLE SECTION	AISI 304L	FA311160		
	5000222018-FI311010-	17	36	36	HEX. BOLT Ø3/8"-16UNC X 1 LG.	ASTM-F593C-304	FXSCYS200374		
	5000222018-FI311010-	18	48	48	HEX. BOLT Ø3/8"-16UNC X 1 1/4 LG.	ASTM-F593C-304	FXSCYS200375		
	5000222018-FI311010-	19	18	18	CONICAL BAFFLE SUPPORTS	AISI 304L	FABKGM331881		
	5000222018-FI311010-	20	132	132	FLAT WASHER Ø3/8" WIDE (TYPE B)	AISI 304	FXWAYS309307		
	5000222018-FI311010-	21	54	54	WEDGE EXPANSION ANCHOR Ø1/2" X 3 3/4"	AISI 304	FXACYV200050		
	5000222018-FI311010-	22	54	54	FLAT WASHER Ø1/2" NARROW (TYPE A)	AISI 304	FXWAYV200670		
	5000222018-FI311010-	23	54	54	LOCK-NUT Ø1/2"-13UNC	ASTM-F594C-304	FXNUYV200214		
MISCELLANEOUS (Not Shown on Drawing)									
	5000222018-FI311010-	51	1	1	GREASE TUBE,NLGI2,400GR MULTI S2A,NON FOOD-GRADE T402185-400	Generic	TOLUGU200651		

TIE-POINT #	DESCRIPTION	DIMENSION / TYPE
TP-201	HYDROCYCLONE INLET	4" - FLANGE ANSI #150
TP-202	HYDROCYCLONE OUTLET	6" - FLANGE ANSI #150
TP-203	DEWATERING SCREW OVERFLOW	6" - FLANGE ANSI #150
TP-204	DEWATERING SCREW DRAIN	2" - FNPT
TP-205	DEWATERING SCREW DRIP-PAN-DRAIN OVERFLOW	3/4" - FNPT

NOTES:

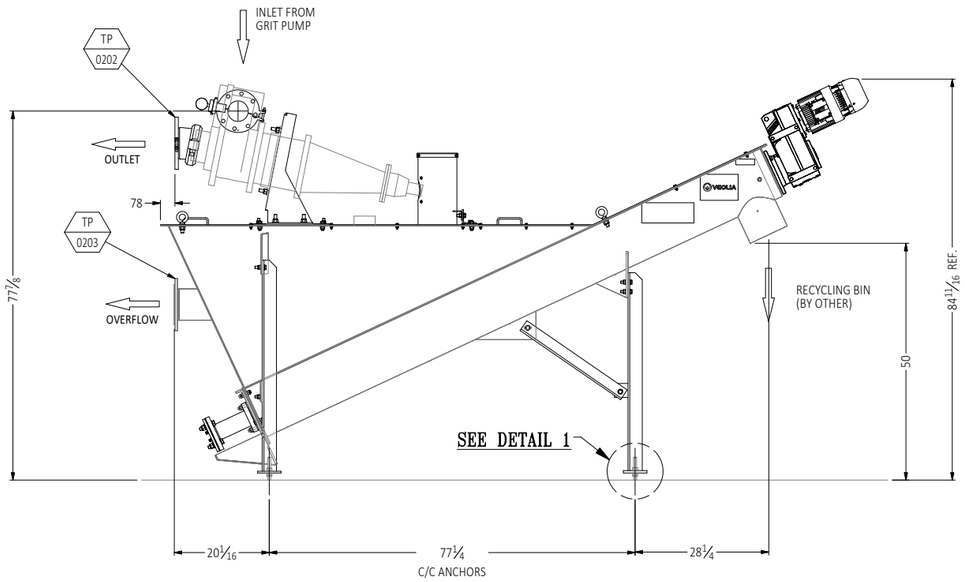
1. ALL DIMENSIONS ARE IN INCHES (in) AND ELEVATION ARE IN METER (m).
2. SEE PARTS LIST FOR ITEMS DESCRIPTION.
3. PIPING IS NOT SUPPLY BY VEOLIA. SEE P&ID DRAWING FOR PIPING DETAILS.
4. ACHORS (SUPPLIED BY OTHERS)

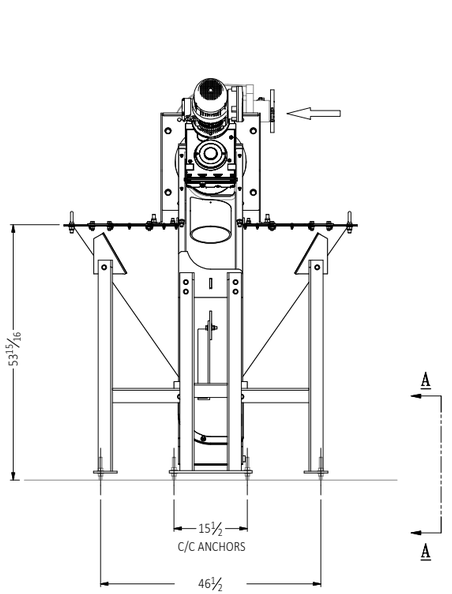


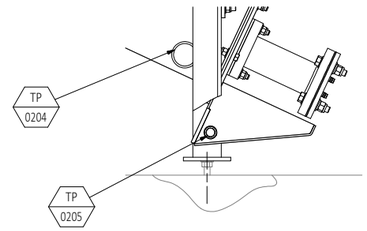


DETAIL 1

SCALE: 1/4" = 1"







VIEW A-A

SCALE: 1/8" = 1"

RÉV. REV.	DESCRIPTION	DATE	DESSINÉ PAR/ DRAWN BY	PRÉPARÉ PAR/ PREPARED BY	VÉRIFIÉ PAR/ CHECKED BY
1	FOR APPROVAL	2022-06-08	S.F	M.B	B.L

VEOLIA WATER TECHNOLOGIES

DESSINÉ PAR/DRAWN BY: S.FILLION DATE: 2022-06-08
PRÉPARÉ PAR/PREPARED BY: MARC BÉLIVEAU, P.Eng. DATE: 2022-06-08
VÉRIFIÉ PAR/CHECKED BY: BERTRAND LANDRY, P.Eng. DATE: 2022-06-08

CLIENT: JEFFERSON GA

TITRE / TITLE: SAM DEWATERING SCREW GDS 9-10-25XA FIELD INSTALLATION

ÉCHELLE / SCALE: 3/4" = 1'-0"

PROJET / PROJECT - DESSIN No / DRAWING No	INTERNE / INTERNAL	FEUILLET / SHEET	RÉV/REV
5000222018 - FI312010		1 / 1	1

REF: ANSI D

VEOLIA

BILL OF MATERIALS

TITLE		Rev.	DESCRIPTION	DATE	Dessiné par/ Drawn by	Préparé par/ Prepared by	Vérifié par/ Checked by	CLIENT
SAM DEWATERING SCREW GDS 9-10-25XA FIELD INSTALLATION		1	FOR APPROVAL	2022-06-08	S.F	M.B	B.L	JEFFERSON GA
								REF.No. 5000222018 Rev. 1
								Date: 2022-06-08
DWG #	FI312010							

REV.	ITEM		QTY Unit.	QTY Total	DESCRIPTION	MATERIAL	REFERENCE NO.	P&ID I.D. / TAG	Comments
	5000222018-FI312010-	1	1	1	SAM DEWATERING SCREW 9"		SA312100		
					MISCELLANEOUS (Not Shown on Drawing)				
	5000222018-FI312010-	50	1	1	GREASE TUBE,NLGI2,400GR MULTI S2A,NON FOOD-GRADE T402185-400	Generic	TOLUGU200651		
					VALVES AND CONTROL (SEE P&ID PI001)				
					SPARE PARTS (N/A)				

3.2 P&ID

TIE-IN POINT #	DESCRIPTION	SIZE / TYPE
TP-0101	GRIT PUMP OUTLET	4" ANSI #150 FLANGE
TP-0102	FLUIDISATION WATER INLET	1" FNPT
TP-0103	FLUIDISATION WATER INLET	1" FNPT
TP-0201	HYDROCYCLONE GRIT INLET	4" ANSI #150 FLANGE
TP-0202	HYDROCYCLONE OVERFLOW	6" ANSI #150 FLANGE
TP-0203	DEWATERING SCREW OVERFLOW	6" ANSI #150 FLANGE
TP-0204	DEWATERING SCREW DRAIN	2" FNPT
TP-0205	DEWATERING SCREW DRIP PAN DRAIN	3/4" FNPT

NOTES:

1- ALL ITEMS SHOWN IN A BOX ARE INDIVIDUALLY SHIPPED AND TO BE ASSEMBLED BY THE CONTRACTOR.

2- SENSOR(S) ARE SHIPPED WITH A MAXIMUM CABLE LENGTH. REFER TO PROJECT DOCUMENT FOR EXACT LENGTH.

3- REFER TO SCOPE OF SUPPLY FOR ENCLOSURE CLASSIFICATION.

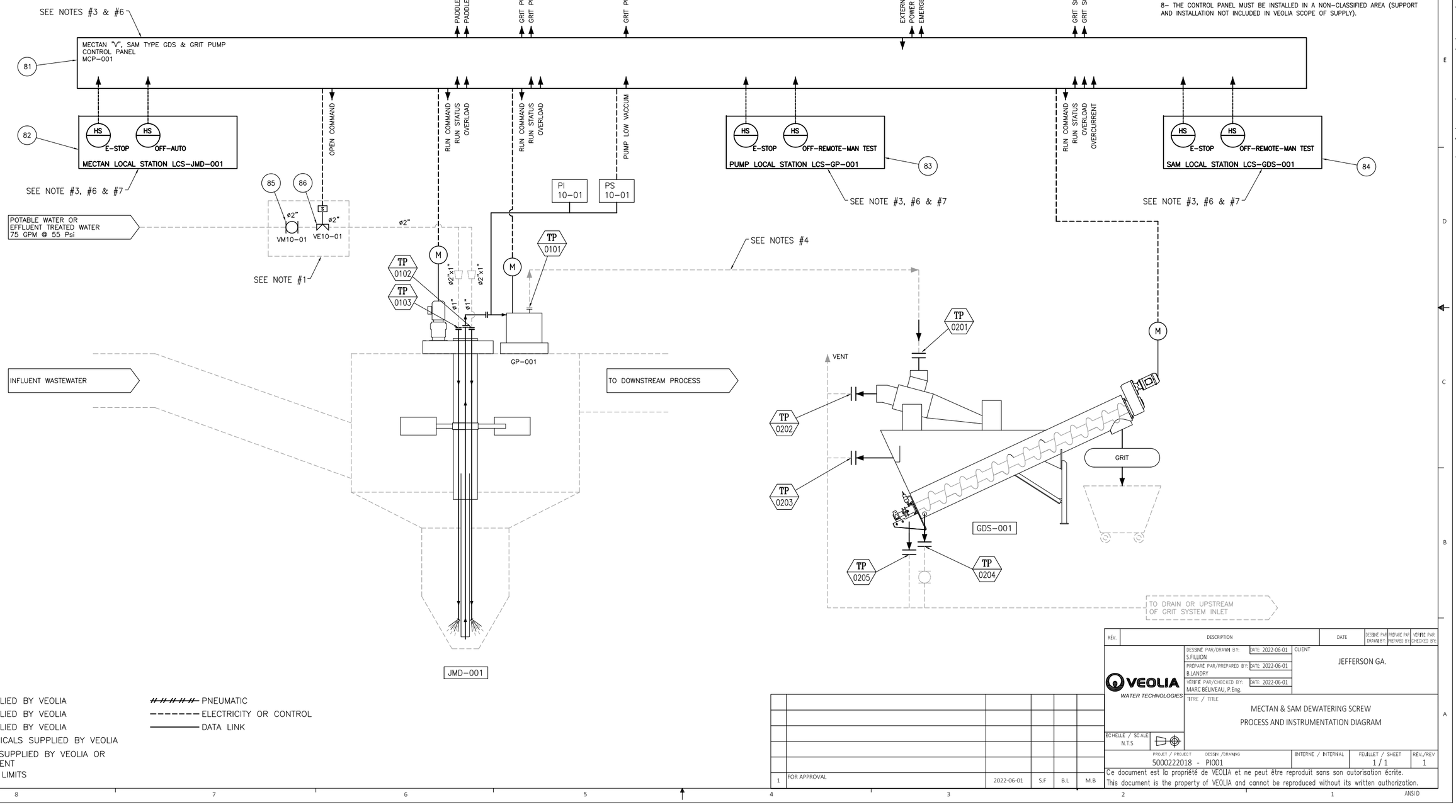
4- SUPPLY AND INSTALLATION OF ALL PIPING, CONNECTORS, HOSES AND SUPPORTS SHOWN IN HIDDEN LINES ARE NOT INCLUDED IN VEOLIA SCOPE OF SUPPLY.

5- CABLE TRAYS, SUPPORTS AND JUNCTION BOXES SHALL BE SUPPLIED AND INSTALLED BY CONTRACTOR. THEY SHALL BE LOCATED TO PREVENT INTERFERENCE WITH SERVICE ACCESS.

6- REFER TO ELECTRICAL DRAWINGS FOR CONTROL PANEL AND LOCAL STATION DETAILS.

7- LOCAL STATION MUST BE INSTALLED NEAR THE EQUIPMENT AT HAND REACH OF THE OPERATOR.

8- THE CONTROL PANEL MUST BE INSTALLED IN A NON-CLASSIFIED AREA (SUPPORT AND INSTALLATION NOT INCLUDED IN VEOLIA SCOPE OF SUPPLY).



- ✲ SUPPLIED BY VEOLIA
- ——— SUPPLIED BY VEOLIA
- ——— SUPPLIED BY VEOLIA
- —·—·— CHEMICALS SUPPLIED BY VEOLIA
- NOT SUPPLIED BY VEOLIA OR EXISTENT
- ▬·▬·▬ SKID LIMITS
- ////// PNEUMATIC
- - - - - - - ELECTRICITY OR CONTROL
- ——— DATA LINK

REV.	DESCRIPTION	DATE	DESSINÉ PAR/DRAWN BY:	PRÉPARÉ PAR/PREPARED BY:	VÉRIFIÉ PAR/CHECKED BY:
1	FOR APPROVAL	2022-06-01	S.F	B.L	M.B

VEOLIA WATER TECHNOLOGIES

DESSINÉ PAR/DRAWN BY: S.FILLION — DATE: 2022-06-01
PRÉPARÉ PAR/PREPARED BY: B.LANDRY — DATE: 2022-06-01
VÉRIFIÉ PAR/CHECKED BY: MARC BÉLIVEAU, P.Eng. — DATE: 2022-06-01

CLIENT: JEFFERSON GA.

TITRE / TITLE:
MECTAN & SAM DEWATERING SCREW
PROCESS AND INSTRUMENTATION DIAGRAM

ÉCHELLE / SCALE: N.T.S

PROJET / PROJECT: 5000222018 - PI001
DESSIN / DRAWING
INTERNE / INTERNAL
FEUILLET / SHEET: 1 / 1
RÉV./REV: 1

REF: 8 7 6 5 4 3 2 1 ANSI D

4 EQUIPMENT

4.1 MECTAN® Grit Removal Mechanism with Grit Pump

4.1.1 Technical Specifications

VEOLIA	VWS' DS #	PSDS_001_MECTAN
	Pretreatment equipment-MECTAN®	
	MECTAN® Vortex Grit Removal System	

Customer: 0000000493		REV: 1	BY: BL
	PROJECT NUMBER: 5000222018	DATE: 13-juin-22	
Project: Jefferson, GA	REQUISITION NUMBER:	PO NUMBER: City of Jefferson, GA	
	APPROVED BY:	CUSTOMER APPROVAL:	

REV.	BY	DATE	DESCRIPTION	VERIF.	APPROV.
1	Bertrand Landry	17-mai-22	For approval		

GENERAL	**TAG :**		**P&ID :**	5000222018-PI001 REV.1	
	SERVICE :				
	SUPPLIER: VEOLIA WATER SOLUTIONS AND TECHNOLOGIES				rev
General	**Quantity**		1		
	Reference model		JOHN MEUNIER / JMDV/4-35SXH		
	Installation Type		Concrete Chamber		
	Débit		10 MGD		
	Headloss at rated capacity		2.87 in.		
	Extraction Type		Grit Pump Top		
	Zone Classification		Cl.1 Div.1		
	Paddles Rotation Speed		17 RPM		
	Paddles Position		Horizontal		
	MECTAN®V Grit Removal Efficiency at 96%		≥ 300 Microns	≥ 50 Mesh	
	MECTAN®V Grit Removal Efficiency at 87%		(≥ 210 & < 300) Microns	(≥ 70 & < 50) Mesh	
	MECTAN®V Grit Removal Efficiency at 75%		(≥ 150 & < 210) Microns	(≥ 100 & < 70) Mesh	
	MECTAN®V Grit Removal Efficiency at 68%		(≥ 100 & < 150) Microns	(≥ 140 & < 100) Mesh	
	MECTAN V® Global Grit Removal Efficiency		95% Removal Down to 140 Mesh (100 Microns)		
Dimensions	**Equipment dimensions**		5000222018-FI311010 REV.1		
	Diameter of the tank		138 in		
	Inlet channel depth		48 in		
	Outlet channel depth		48 in		
	Channel Width		33 in		
	Outet Channel Width		33 in		
	Total Depth of Tank		169 in		
	Dry Weight		2038 lbs		
Option	**Steel Tank**	**Fabricated Tank**	N/R		
		Inlet/Outlet Flange	N/R		
		Drain Connection	N/R		
	Walkway Path		N/R		
	Anchors		N/R		
	Parshall Flume		N/R		
	Level / velocity control plates		N/R		
	Grit Pump Casing Heater		N/R		
	Grit Performance Testing		N/R		
	Odor Control Connection (for self-standing tank)		N/R		
Construction Material	**Steel Tank**	**Fabricated Tank**	N/R		
		Inlet/Outlet Flange	N/R		
		Drain Connection	N/R		
		Walkway Path	N/R		
		Handrail	N/R		
	Separator Plate	**Inner 360° Conical Baffle**	SS304		
		Outlet Channel Weir	N/R		
	Agitator and Paddle Arm Assembly	**Gear case**	Epoxy painted steel		
		Drive Torque	SS304, Ø250 mm		
		Paddles	SS304		
	Fluidization System	**Solenoid Valve**	Brass		
		Manual Valve	Brass		
		Fluidization Lines	PVC Reinforced Flexible Tubing		
		Eductor Nozzles	N/R		
		Grit Extraction Pipe	SS304		
Washing System (Process Water or Potable Water)	**Water Fluidization System**	**Water Fluidization System**	75 GPM @ 55 psi		
		Solenoid Valve	(1) Solenoid valve, Ø2 in FNPT [Ø51 mm], 120 V, NEMA-7		
		Manual Valve	(1) Ball valve, Ø2 in FNPT [Ø51 mm]		
	Booster Pump	**Eductor Nozzles**	N/R		
		Pumping Capacity	N/R		
		Motor	N/R		
Torque Tube Drive System	**Motor**	**Power**	1 HP (0.74 kW) , Cl.1 Div.1		
		Type / Model	WEG		
	Reducer	**Rotation speed**	17 RPM		
		Type / Model	SEW		
Grit Extraction System	**Gorman-Rupp® Grit Pump T-Series**	**Type**	Top Mounted		
		Grit Pump Motor	WEG 7.5 HP (5.59 kW), Cl.1 Div.1		
		Grit suction top connection	Ø4 in		
		Base Height	300 mm		
	Air Blower	**Manual Valve**	N/R		
		Manual Plug Valve	N/R		
		Flow Rate / Pressure	N/R		
		Motor	N/R		
Commentary	**Maintenance access**		At operation floor		

4.1.2 Components Details

4.1.2.1 Paddles Motor

		No.:
		Date: 10-JAN-2020

Customer :

TECHNICAL PROPOSAL

Three-phase induction motor - Squirrel cage rotor

Product line : TEFC - Explosion Proof - NEMA Premium Efficiency

Catalog Number :
List Price : $

Notes:

Performed by:	Checked:

No.:

Date: 10-JAN-2020

DATA SHEET

Three-phase induction motor - Squirrel cage rotor

Customer	:	
Product line	:	TEFC - Explosion Proof - NEMA Premium Efficiency

Frame	:	145T
Output	:	1 HP
Frequency	:	60 Hz
Poles	:	4
Full load speed	:	1760 rpm
Slip	:	2.22 %
Voltage	:	208-230/460 V
Rated current	:	3.16-2.86/1.43 A
Locked rotor current	:	24.6/12.3 A
Locked rotor current (Il/In)	:	8.6
No-load current	:	1.87/0.935 A
Full load torque	:	2.94 lb.ft
Locked rotor torque	:	290 %
Breakdown torque	:	370 %
Design	:	B
Insulation class	:	F
Temperature rise	:	80 K
Locked rotor time	:	18 s (hot)
Service factor	:	1.15
Duty cycle	:	S1
Ambient temperature	:	-20°C - +40°C
Altitude	:	1000 m
Degree of Protection	:	IP55
Approximate weight	:	62 lb
Moment of inertia	:	0.09753 sq.ft.lb
Noise level	:	51 dB(A)

	D.E.	N.D.E.
Bearings	6205 2RS	6204 2RS
Regreasing interval	---	---
Grease amount	---	---

Load	Power factor	Efficiency (%)
100%	0.77	85.5
75%	0.70	82.5
50%	0.57	80.0

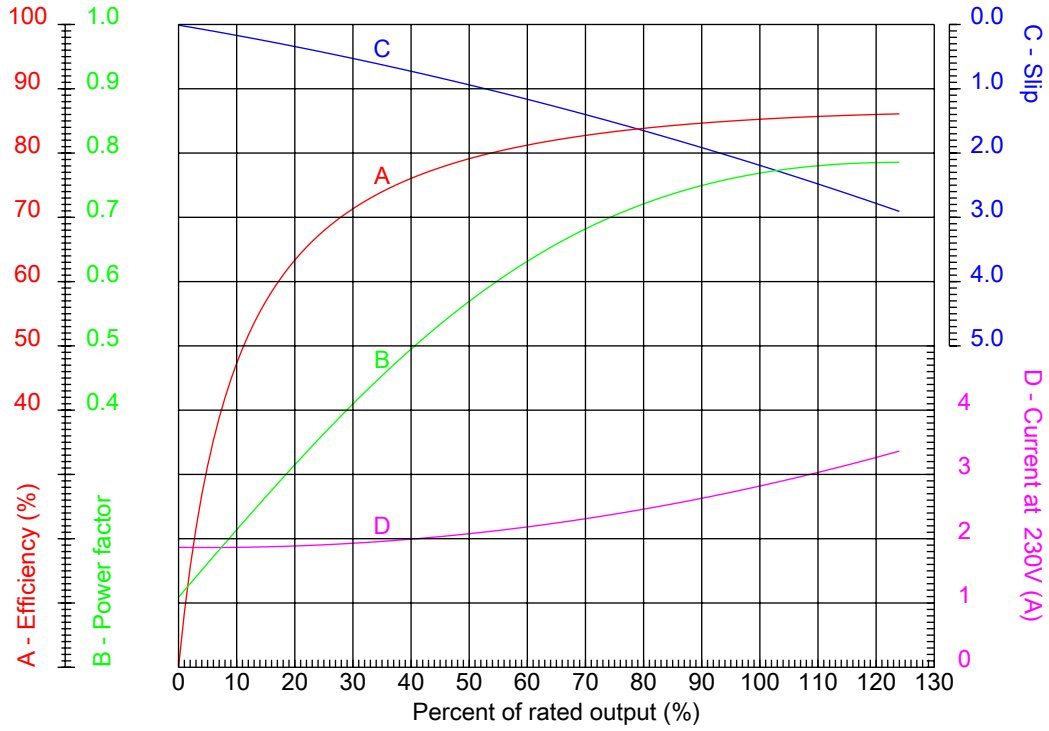
Notes:

Performed by	Checked

	No.:
	Date: 10-JAN-2020

PERFORMANCE CURVES RELATED TO RATED OUTPUT

Three-phase induction motor - Squirrel cage rotor



Customer	:
Product line	: TEFC - Explosion Proof - NEMA Premium Efficiency

Frame	: 145T	Locked rotor current (Il/In)	: 8.6
Output	: 1 HP	Duty cycle	: S1
Frequency	: 60 Hz	Service factor	: 1.15
Full load speed	: 1760 rpm	Design	: B
Voltage	: 208-230/460 V	Locked rotor torque	: 290 %
Rated current	: 3.16-2.86/1.43 A	Breakdown torque	: 370 %
Insulation class	: F		

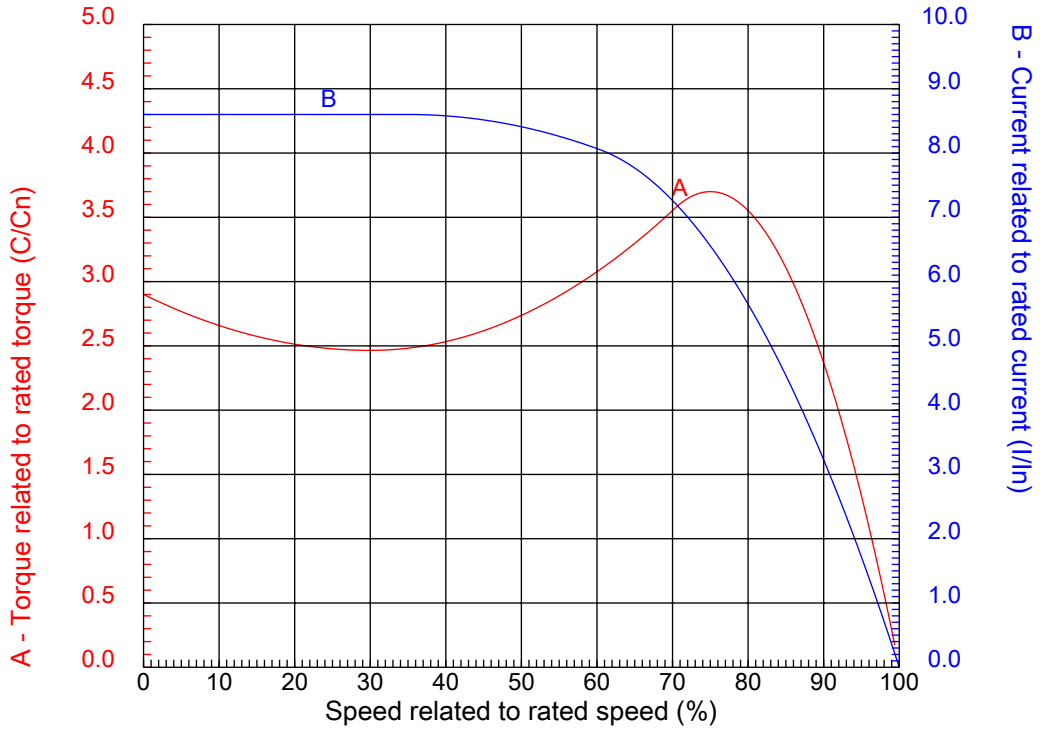
Notes:

Performed by	Checked

	No.:
	Date: 10-JAN-2020

CHARACTERISTIC CURVES RELATED TO SPEED

Three-phase induction motor - Squirrel cage rotor

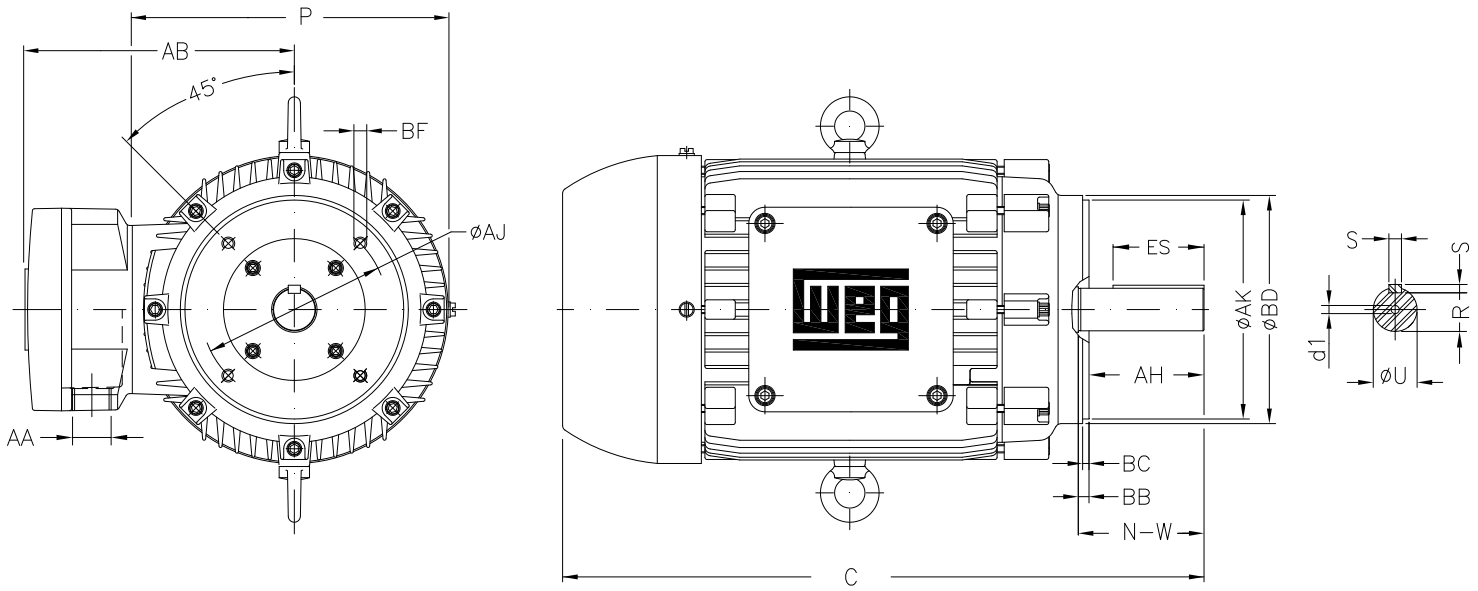


Customer	:
Product line	: TEFC - Explosion Proof - NEMA Premium Efficiency

Frame	: 145T	Locked rotor current (Il/In)	: 8.6
Output	: 1 HP	Duty cycle	: S1
Frequency	: 60 Hz	Service factor	: 1.15
Full load speed	: 1760 rpm	Design	: B
Voltage	: 208-230/460 V	Locked rotor torque	: 290 %
Rated current	: 3.16-2.86/1.43 A	Breakdown torque	: 370 %
Insulation class	: F		

Notes:

Performed by	Checked



Notes:

Performed by:

Checked:

Customer:

P 7.000	ES 1.575	S 0.187	depth 0.187	N-W 2.250
U 0.875	R 0.771	AB 6.811	C 13.740	AA NPT 3/4"
d1 A 4	d2 A 4	Flange FC-149	AJ 5.874	AK 4.500
BD 6.500	BF UNC 3/8"x16	BB 0.157	BC 0.125	AH 53.98

TEFC - Explosion Proof - NEMA Premium Efficiency

Three-phase induction motor

Frame 145T - IP55

10-JAN-2020

4.1.2.2 Paddles Reducer

R..AD..

RF..AD..

General Information

Introduction

The SEW-Eurodrive Parallel Helical Gear Units are designed for continuous duty under difficult operating conditions. Only materials of the highest quality are used in the manufacture of the units. These units have the following standard construction features:

- Helical gearing in compliance with ANSI/AGMA Standard 2001-B88.
- Gears are carburized to a hardness of 58 - 62 R_C for durability.
- Gearcase and flanges of high strength gray cast iron SAE Class 30.
- Double-lip oil seals on output shaft with additional inner seal made of Viton®.
- Captured keys on input and output shafts.
- Foot mounted, flange mounted, or foot/flange mounted.

Efficiency

The efficiency of the gear units is primarily determined by the gearing and bearing friction, and ranges from approximately 94% for 3 stages of gear reduction to 98% for single stage gear reduction.

Output Power, Torque, and Speed

The details on power, torque, and speed given in the selection tables always refer to the mounting position B3 or similar mounting position for standard features, standard ambient conditions, and standard lubricants. The output speeds have been rounded up or down. The actual output speed may vary slightly due to the motor frame size, the loading, or the supply voltage.

Design Variations

In addition to the foot or flange mount versions shown in the accompanying pages, the Parallel Helical Gear Units type R27-R87 are also available with the combination foot/flange mount. Additionally more than one flange size may be available for the flange mounted version. Please see the respective dimension pages for available flange sizes.

These gear units are available with an extended output shaft bearing housing designated as RM. The RM gear units are primarily used for agitation applications. With the exception of output overhung and axial loads the data of the RM gear units corresponds to those of the R-series of the same size.

Additional features available for the Parallel Gear units are:

- Adapters for IEC or NEMA C-Face motors.
- Adapters for mounting servomotors.
- Motor mounting platforms and scoops.
- Adapters for torque limiting couplings.
- Corrosion protection.

Please contact your SEW-Eurodrive representative for additional information.

Abbreviations

The following abbreviations are used in the selection tables:

f_B	Service Factor
F_{Ra}	Permissible output overhung load (lb) at the midpoint of the output shaft extension
F_{Re}	Permissible input overhung load (lb) at the midpoint of the input shaft extension
i	Gear unit ratio
n_a	Output speed in rpm
n_e	Input speed in rpm
P_a	Rated output power (Hp)
P_e	Calculated power input into the gear unit (Hp) P_e is calculated from $T_{a\ max}$ by taking into account the gear units' efficiency under standard operating conditions. For calculated Pe less than .2Hp, a dash (—) is shown in the respective selection tables since the actual values are subject to large variations.
P_n	Motor rated power (HP)
T_a	Output torque (lb-in.) with reference to the driving motor
$T_{a\ max}$	Maximum permissible output torque (lb-in.) at $f_B = 1.0$

Dimension Page Notes

The dimension sheets are valid for standard units with various basic features. In particular, accessories such as platforms, scoops, etc. will alter the basic dimensions. Please refer to the respective accessory dimension pages for additional dimensions.

The Parallel Helical Gear Units from size 67 are supplied with lifting eye bolts which can be removed. Smaller gear units do not have lifting eye bolts.

Certified dimension sheets are available from your SEW-Eurodrive Assembly Center.

Viton® is a registered trademark of DuPont Dow Elastomers

Service Factoring
Using AGMA Criteria

SEW-Eurodrive gear units may be service factored using criteria set forth in the various AGMA Standards.

For: a) Parallel Helical (type R and F) gearmotors.
b) Right angle Helical-Bevel (type K) gearmotors.

AGMA uses service classes I, II, and III, which are based on:

Class I: Steady loads not exceeding normal rating and 8-10 hours running time per day.
Service Factor 1.0 minimum

Class II: a. Steady loads not exceeding normal rating and 24 hours running time per day.
b. Moderate shock loads, not exceeding 1.25 × Rated Load Torque and 8-10 hours running time per day.
Service Factor 1.4 minimum

Class III: a. Moderate shock loads, 1.25 × Rated Load Torque and 24 hours running time per day.
b. Heavy shock loads, exceeding 1.25 × Rated Load Torque and 8-10 hours running time per day.
Service Factor 2.0 minimum

Reference AGMA Standard 6019-E89 for Service Class listings by application.

AGMA uses service factors for electric motors, turbines, and hydraulic motors as listed by the chart below.
In the chart, the reducer loading may be classified as follows:

(1) Uniform Load. Recurrent shock loads do not exceed the nominal specified input or prime mover power.

(2) Moderate Shock Load. Recurrent shock loads do not exceed 1.25 × the nominal specified input or prime mover power.

(3) Heavy Shock Load. Recurrent shock loads do not exceed 1.50 × the nominal specified input or prime mover power.

(4) Extreme Shock Load. Recurrent shock loads do not exceed 1.75 × the nominal specified input or prime mover power.

NOTE: The magnitude of any recurrent shock loads should be estimated or determined through test by the system designer. Recurrent shock loads can be of such a short duration that they may not be reflected in motor amperage readings. In these cases actual loads are usually determined by strain gaging the driven shaft of the machine.

Duration of Service (Hours per Day)	Uniform Load	Moderate Shock	Heavy Shock	Extreme Shock
Occasional .5 hour	—	—	1.00	1.25
Less than 3 hours	1.00	1.00	1.25	1.50
3-10 hours	1.00	1.25	1.50	1.75
Over 10 hours	1.25	1.50	1.75	2.00

When the prime mover is a single or multi-cylinder engine, the service factors must be modified by the following:

Steam and Gas Turbines, Hydraulic or Electric Motor	Single Cylinder Engines	Multi-Cylinder Engines
1.00	1.50	1.25
1.25	1.75	1.50
1.50	2.00	1.75
1.75	2.25	2.00
2.00	2.50	2.25
2.25	2.75	2.50
2.50	3.00	2.75
2.75	3.25	3.00
3.00	3.50	3.25

Starting conditions where peak loads exceed 200% of rated load and applications with frequent starts and stops require special load analysis.
Service Factor listings by application may be found in:
AGMA 6010-E88 for types R, F and K reducers.
AGMA 6034-B92 for type S reducers and gearmotors.

Unit Selection

In order to select the most suitable gear unit it is essential that a thorough knowledge of the characteristics of the driven machine are known. The gear units are normally designed for constant torque load and only a few starts/stops. If these conditions do not exist, it is necessary to determine a service factor, f_B, from the start/stop frequency, Load Class, and the daily operating time as shown in the diagram below.

For gearmotors, the appropriate service factor taken from the diagram is then compared with the service factor given with each speed/power combination listed in the gearmotor selection tables. To ensure a long, trouble free service life it is essential that the unit selected has a service factor equal to, or greater than, that determined from the diagram.

Load Classification

I = Uniform load. Permissible inertia acceleration factor 0.2

II = Moderate shock load. Permissible inertia acceleration factor 3.0

III = Heavy shock load. Permissible inertia acceleration factor 10

For inertia acceleration factor > 10, please contact your nearest SEW-Eurodrive representative.

Inertia acceleration factor = $\frac{J_L}{J_m}$

Where: J_L = Reflected Load Inertia
J_m = Motor Inertia

All external load inertias, J, must be reflected back to the input side of the gear unit.

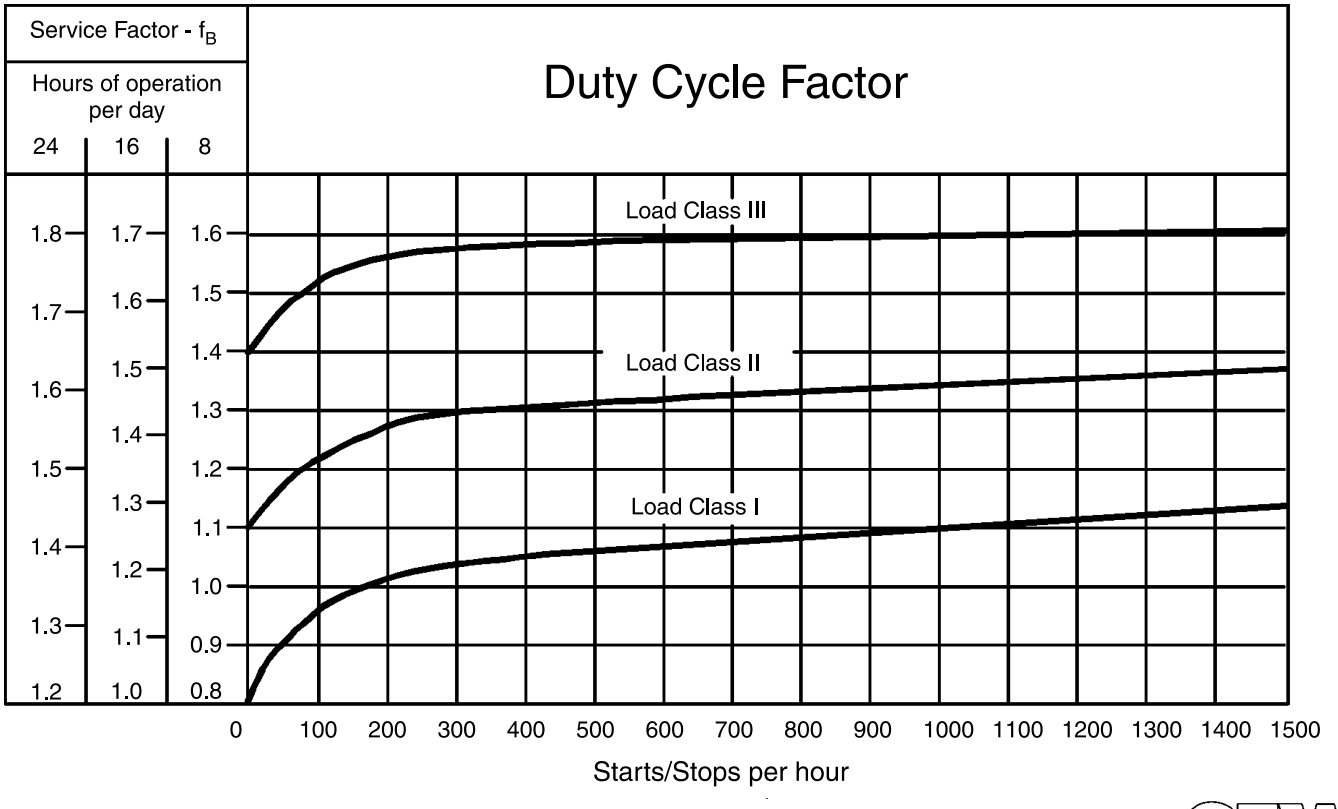
Example: $J_L \quad J \quad \frac{1}{(Gear\ Ratio)^2}$

Included in the number of starts and stops per hour must be all regenerative brake actions and the speed changes from high to low speed as experienced with multi-speed motors.

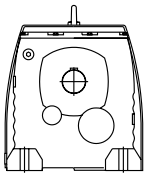
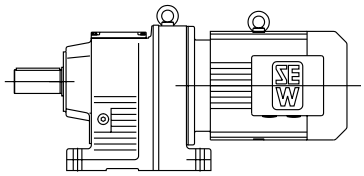
Example: Load Class I with 200 starts and stops per hour and operating time of 24 hours per day gives f_B = 1.36.

AGMA

For Service Factors using AGMA criteria, please refer to the guidelines on page 4.

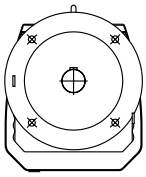
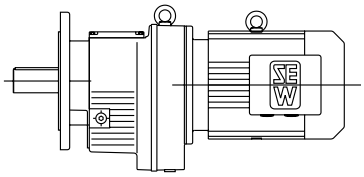


Mounting Options

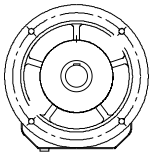
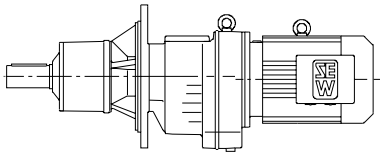
R

Solid shaft
Foot mount

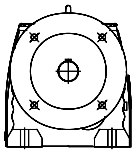
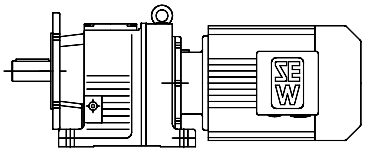
RF

Solid shaft
Flange mount (D & B5 style flange with through holes)

RM

Solid shaft
Agitator flange mount (D & B5 style flange with through holes)

R..F

Solid shaft (Available only on R27-R87)
Foot/flange mount (D & B5 style flange with through holes)

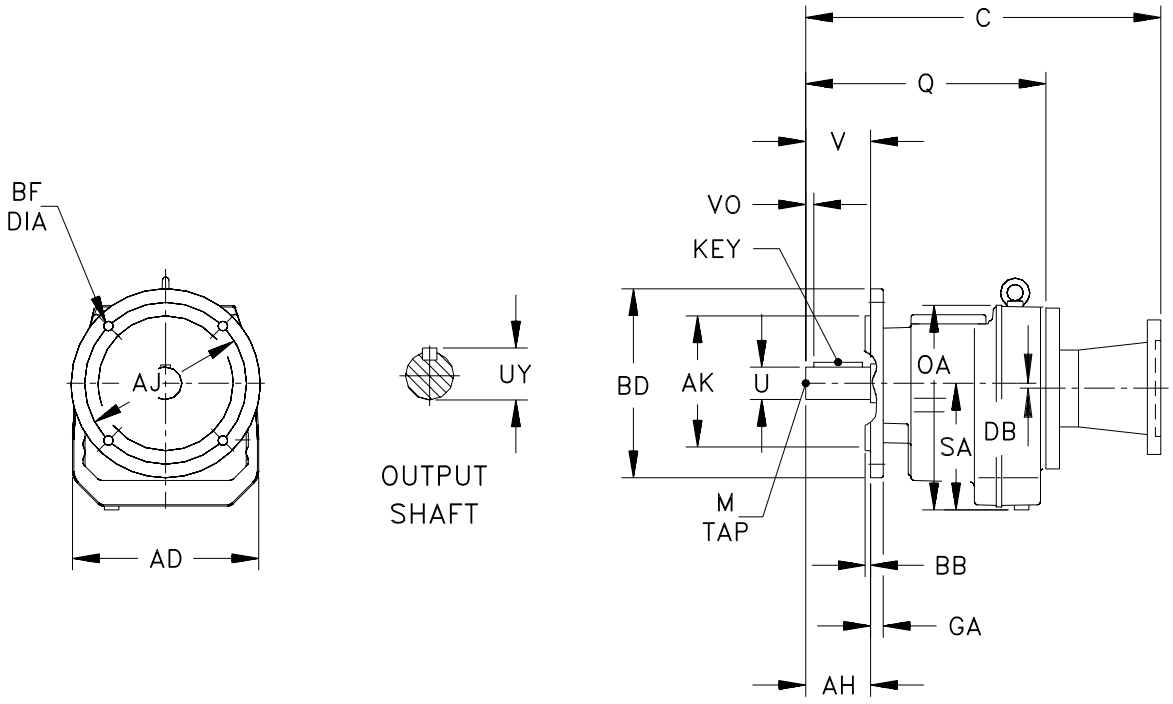
Selections
Speed Reducer with NEMA C-Face Adapter - Type R..LP..
Input Speed = 1750 rpm - Service Factor = 1.0

R..47

Gear Ratio *i*	Output Speed n_a rpm	Output Torque $T_{a\,max}$ lb-in	Output OHL F_{Ra} lb	Stages [1)] Pri.	Sec.	56	143	145	182	184
176.88	9.9	2650	1220	3	-					
162.94	11	2650	1220	3	-					
139.99	13	2650	1220	3	-					
121.87	14	2650	1220	3	-					
114.17	15	2650	1220	3	-					
100.86	17	2650	1220	3	-					
93.68	19	2650	1220	3	-					
84.90	21	2650	1220	3	-					
76.23	23	2650	1220	3	-					
68.54	26	2650	1220	3	-					
64.21	27	2650	1190	3	-					
56.73	31	2650	1130	3	-					
52.69	33	2650	1100	3	-					
47.75	37	2650	1060	3	-					
42.87	41	2650	1010	3	-					
36.93	47	2650	950	3	-					
34.73	50	2650	920	3	-					
29.88	59	2650	870	3	-					
26.70	66	2650	830	3	-					
23.59	74	2650	750	3	-					
33.79	52	2120	980	2	-					
31.12	56	1950	960	2	-					
26.74	65	2650	830	2	-					
23.28	75	2650	740	2	-					
21.81	80	2650	685	2	-					
19.27	91	2610	620	2	-					
17.89	98	2570	595	2	-					
16.22	108	2430	605	2	-					
14.56	120	2340	585	2	-					
12.54	140	2210	570	2	-					
11.79	148	2170	555	2	-					
10.15	172	2040	545	2	-					
9.07	193	1950	535	2	-					
8.01	218	1810	545	2	-					
7.76	226	1440	555	2	-					
6.96	251	1410	535	2	-					
6.00	292	1380	505	2	-					
5.64	310	1370	490	2	-					
4.85	361	1330	465	2	-					
4.34	404	1290	445	2	-					
3.83	457	1270	425	2	-					

[1)] Pri. = primary reducer, Sec. = secondary reducer

Dimension information begins on page 98.



Gearcase

Model	AD	DB	OA	Q	SA
RF37	6.34 161	0.40 10.1	6.10 155	8.15 207	3.70 94
RF47	7.01 178	0.55 14	7.48 190	9.25 235	4.65 118

Output Shaft Inch Series/*Optional Metric Series*

U	UY	V	VO	Key	M
1.000 $^{+0}_{-.0005}$ *25* $^{+.015}_{+.002}$	1.11 *28*	1.97 *50*	0.26 *3.5*	¼ ¼ 1 5/16 *8 x 7 x 40*	⅜ 16 0.87 *M10 x 22*
1.250 $^{+0}_{-.0005}$ *30* $^{+.015}_{+.002}$	1.36 *33*	2.36 *60*	0.26 *3.5*	¼ ¼ 1 11/16 *8 x 7 x 50*	½ 13 1.12 *M10 x 22*

Flange (Specify BD dimension when ordering)

Model		AH	AJ	AK	BB	BD	BF	GA
RF37	Option 1	1.97 50	3.94 100	3.150 $^{+.0005}_{-.0003}$ 80 $^{+.012}_{-.007}$	0.12 3	4.72 120	0.26 6.6	0.39 10
	Option 2	1.97 50	5.12 130	4.331 $^{+.0005}_{-.0004}$ 110 $^{+.013}_{-.009}$	0.14 3.5	6.30 160	0.35 9	0.39 10
	Option 3	1.97 50	6.50 165	5.118 $^{+.0006}_{-.0004}$ 130 $^{+.014}_{-.011}$	0.14 3.5	7.87 200	0.43 11	0.47 12
RF47	Option 1	2.36 60	4.53 115	3.740 $^{-.0005}_{-.001}$ 95 $^{-.012}_{-.034}$	0.12 3	5.51 140	0.35 9	0.39 10
	Option 2	2.36 60	5.12 130	4.331 $^{+.0005}_{-.0004}$ 110 $^{+.013}_{-.009}$	0.14 3.5	6.30 160	0.35 9	0.39 10
	Option 3	2.36 60	6.50 165	5.118 $^{+.0006}_{-.0004}$ 130 $^{+.014}_{-.011}$	0.14 3.5	7.87 200	0.43 11	0.47 12

Motor Compatibility - NEMA

Model		56C	NEMA LP 143TC 145TC	182TC 184TC
RF37	C	13.05 331.5	13.56 344.5	— —
RF47	C	13.90 353	14.41 366	17.05 433

Motor Compatibility - IEC

Model		63	71	80	IEC LP 90	100	112	132S/M
RF37	C	12.13 308	12.13 308	12.70 322.5	13.29 337.5	— —	— —	— —
RF47	C	12.97 329.5	12.97 329.5	13.54 344	14.13 359	16.02 407	16.02 407	17.05 433

Dimensions are inch / *mm*

Eye bolts are removable

Dimension C is to motor mounting surface

For the selected LP adapter size the pinion bore must be available in the desired gear ratio for the reducer. Please see the compatibility tables beginning on page 68.

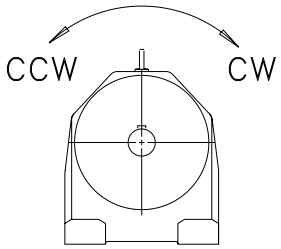
Refer to page 556 for standard NEMA C-Face dimensions.

See page 132 for available output shaft sizes.

Mounting Positions

It is essential when ordering a drive to select a desired mounting position from the following pages to ensure the correct amount of oil lubricant is supplied with the drive.
In addition the following details must also be specified:

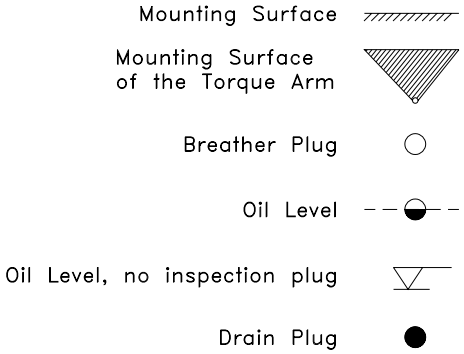
a. Direction of rotation of the output shaft (only if a backstop or a unidirectional torque monitor is required).



If these details are not specified then the drive will be supplied:

Mounting Position — B3 or B5

The mounting positions show the following (when applicable):



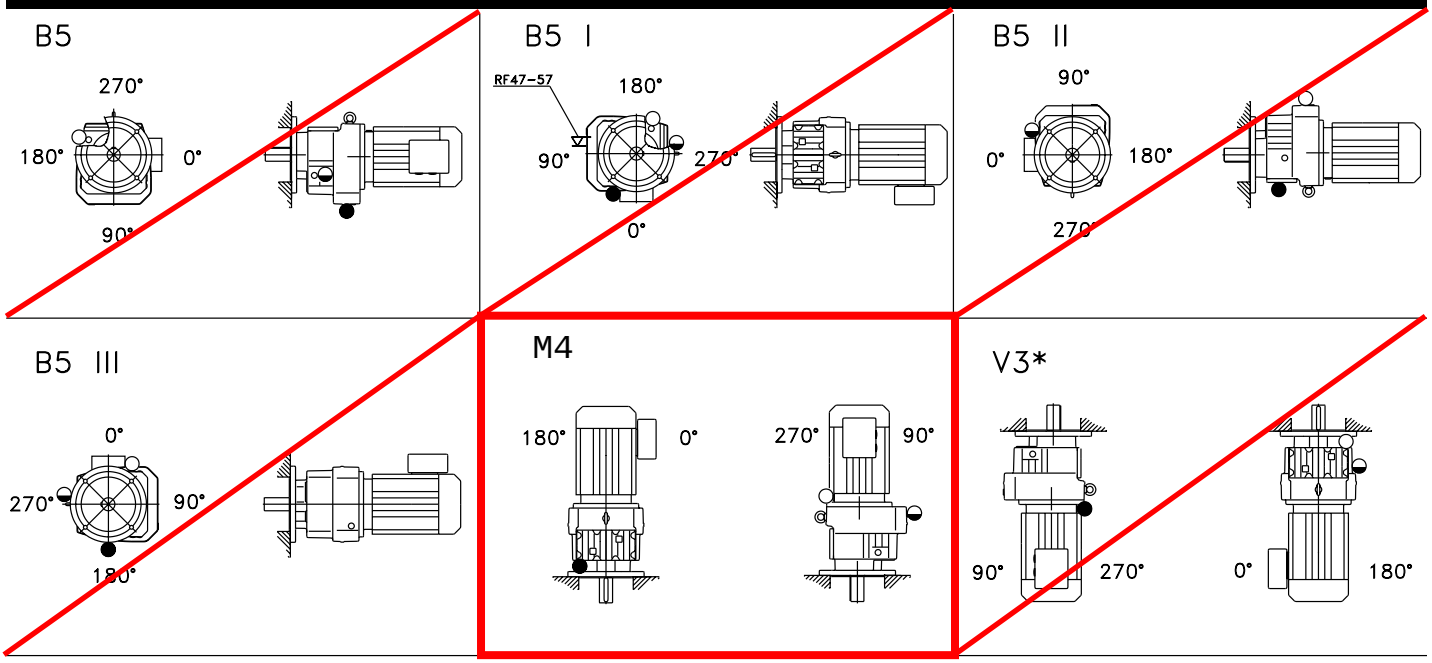
The R/RF27 does not have oil level plugs; fill to required quantity per the lubrication table. Breather plugs are only provided for mounting positions V1, V3, V5 and V6 for these units as well.

With certain mounting positions the first gear reduction stage is completely immersed in oil. On the larger gear unit sizes and with high peripheral speeds of the input stage (low reduction ratios) churning losses constitute a factor which must be taken into account. Please contact our engineering department on this issue (also see notes on the Mounting Position pages).

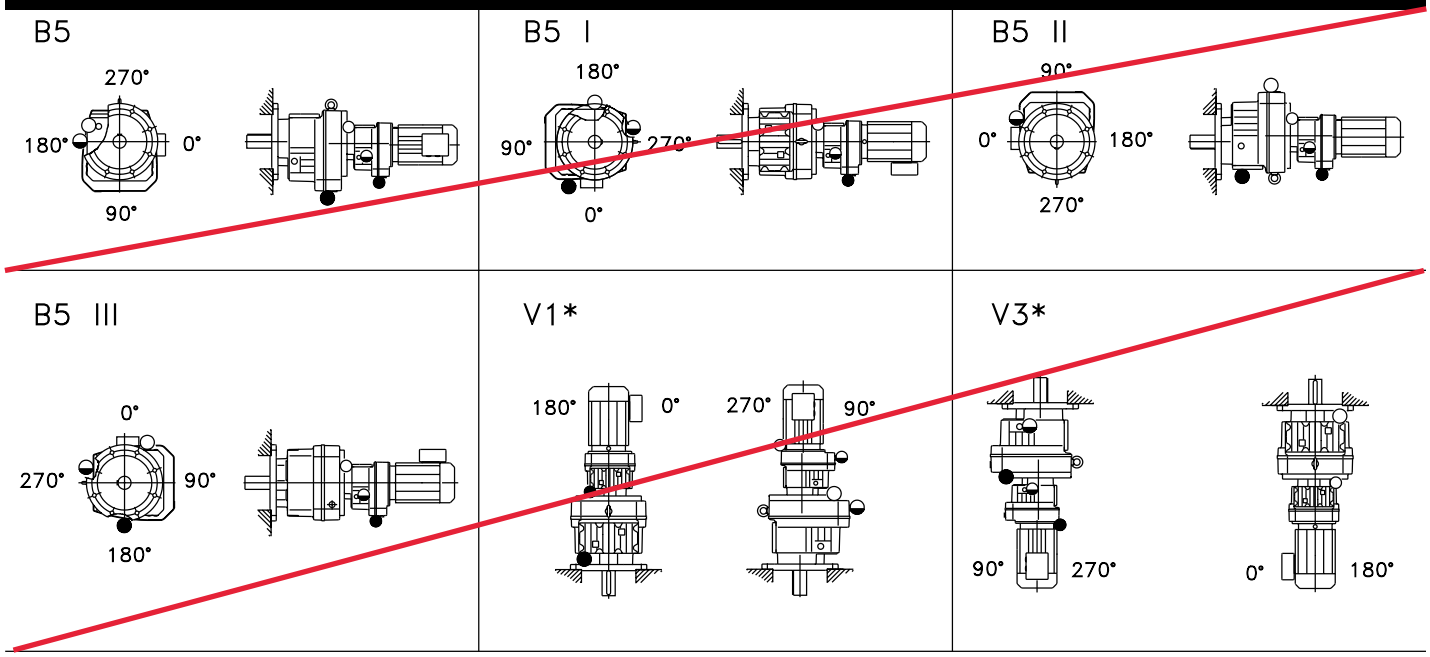
Additionally, the mounting positions V3 and V6 where the high speed input shaft seals are completely immersed in oil are acceptable though generally not preferred. Avoiding these positions provides additional security against oil leakage as the high speed input shaft seals wear.

Mounting Positions

Gearcase Sizes: RF27 - RF167



Gearcase Sizes: RF27R17 - RF167R107



* For primary gear unit size R/RF97 - R/RF107 with input speeds greater than 2500 rpm, and primary gear units size R/RF107-R/RF167 with input speeds greater than 1500 rpm please refer to our engineering department.

Each gear unit is supplied from the factory with the correct grade and quantity of lubricant for the specified mounting position. The following lubricants are supplied from our North American Facilities. Under special circumstances such as high or low ambient temperatures optional oils should be used.

Standard Oil

USA			
Gear Units	**Type**	**Manufacturer**	**Ambient Temperature °C**
R..27 – 167	Mobilgear 630 [M]	Mobil Oil Corp.	0 to +40
CANADA			
R..27 – 167	Omala 220 [M]	Shell Oil Co.	0 to +40

Optional Oil

USA			
Gear Units	**Type**	**Manufacturer**	**Ambient Temperature °C**
R..27 – 167	Mobilgear 629 [M]	Mobil Oil Corp.	-15 to +25
R..27 – 167	Mobil SHC630 [S]		-25 to +60
R..27 – 167	Mobil SHC629 [S]		-30 to +50
CANADA			
R..27 – 167	Omala RL220 [S]	Shell Oil Co.	-30 to +80

[M] Mineral Oil
[S] Synthetic Oil

For ball and roller bearings of gear units the following greases are recommended:

Mineral Grease

Type	Manufacturer	Ambient Temperature °C
Mobilux EP2	Mobil Oil Corp.	-20 to +40
Alvania Grease R3	Shell Oil Co.	-30 to +60

Synthetic Grease

Type	Manufacturer	Ambient Temperature °C
Mobiltemp SHC 32	Mobil Oil Corp.	-45 to +60

The approximate lubricant in US **gallons/liters** per mounting position is as follows:

Gear Unit	Mounting Position											
	B3 [1]	B5 [1]	B5I	B5II	B5III	B6 [2]	B7 [2]	B8 [1], [2]	M4	V3[1]	V5	V6[1]
RX/RXF57	0.16/0.6	0.13/0.5	0.18/0.7	0.29/1.1	0.18/0.7	0.24/0.9	0.24/0.9	0.34/1.3	0.29/1.1	0.21/0.8	0.34/1.3	0.21/0.8
RX/RXF67	0.21/0.8	0.18/0.7	0.26/1.0	0.40/1.5	0.26/1.0	0.29/1.1	0.29/1.1	0.45/1.7	0.45/1.7	0.21/0.8	0.50/1.9	0.21/0.8
RX/RXF77	0.29/1.1	0.24/0.9	0.42/1.6	0.63/2.4	0.42/1.6	0.42/1.6	0.42/1.6	0.69/2.6	0.66/2.5	0.40/1.5	0.71/2.7	0.40/1.5
RX/RXF87	0.45/1.7	0.42/1.6	0.77/2.9	1.29/4.9	0.77/2.9	0.77/2.9	0.77/2.9	1.27/4.8	1.24/4.7	0.66/2.5	1.27/4.8	0.66/2.5
RX/RXF97	0.55/2.1	0.55/2.1	1.27/4.8	1.87/7.1	1.27/4.8	1.27/4.8	1.27/4.8	1.95/7.4	1.85/7.0	0.95/3.6	1.85/7.0	0.90/3.4
RX/RXF107	1.03/3.9	0.82/3.1	1.90/7.2	2.96/11.2	1.90/7.2	2.03/7.7	2.03/7.7	3.06/11.6	2.77/10.5	1.56/5.9	3.14/11.9	1.48/5.6
R..27	0.07/0.25 (0.11/0.4)	0.07/0.25 (0.11/0.4)	0.11/0.4	0.11/0.4	0.11/0.4	0.11/0.4	0.11/0.4	0.11/0.4	0.18/0.7	0.18/0.7	0.18/0.7	0.18/0.7
R..37	0.08/0.3 (0.26/1.0)	0.11/0.4 (0.26/1.0)	0.21/0.8	0.26/1.0	0.26/1.0	0.21/0.8	0.26/1.0	0.26/1.0	0.29/1.1	0.24/0.9	0.29/1.1	0.24/0.9
R..47	0.18/0.7 (0.40/1.5)	0.18/0.7 (0.40/1.5)	0.40/1.5	0.40/1.5	0.40/1.5	0.40/1.5	0.40/1.5	0.40/1.5	0.45/1.7	0.42/1.6	0.45/1.7	0.42/1.6
R..57	0.21/0.8 (0.55/1.7)	0.21/0.8 (0.55/1.7)	0.58/1.7	0.45/1.7	0.45/1.7	0.45/1.7	0.45/1.7	0.45/1.7	0.53/2.0	0.48/1.8	0.55/2.1	0.50/1.9
R..67	0.29/1.1 (0.61/2.3)	0.32/1.2 (0.66/2.5)	0.50/1.9	0.71/2.7	0.55/2.1	0.48/1.8	0.53/2.0	0.74/2.8	0.82/3.1	0.71/2.7 (0.95/3.6)	0.84/3.2	0.69/2.6 (0.92/3.5)
R..77	0.32/1.2 (0.79/3.0)	0.32/1.2 (0.69/2.6)	0.63/2.4	0.87/3.3	0.79/3.0	0.66/2.5	0.90/3.4	1.0/3.8	0.98/3.7	1.0/3.8 (1.1/4.1)	1.2/4.7	1.0/3.8 (1.3/4.9)
R..87	0.61/2.3 (1.6/6.0)	0.63/2.4 (1.6/6.0)	1.7/6.3	1.9/7.1	1.7/6.4	1.7/6.3	1.7/6.5	1.9/7.2	2.1/7.9	1.8/6.8 (2.1/7.9)	2.1/8.1	1.8/6.7 (2.4/9.0)
R..97	1.2/4.6 (2.6/9.8)	1.3/5.1 (2.7/10.2)	3.0/11.2	3.0/11.2	3.1/11.8	3.0/11.3	3.1/11.7	3.1/11.7	3.7/14	3.1/11.9 (3.9/14.8)	3.5/13.4	3.1/11.7 (3.9/14.8)
R..107	1.6/6.0 (3.6/13.7)	1.7/6.3 (3.9/14.9)	3.5/13.1	4.5/17	4.2/15.9	3.5/13.2	4.2/15.9	4.5/16.9	5.1/19.2	4.2/15.9 (5.3/20)	5.1/19.2	4.3/16.3 (5.4/20.5)
R..137	2.6/10 (6.6/25)	2.5/9.5 (6.6/25)	6.6/25	7.7/29	6.6/25	6.6/25	6.6/25	7.8/29.5	8.6/32.5	7.1/27 (8.6/32.5)	8.3/31.5	7.4/28 (8.6/32.5)
R..147	4.1/15.4 (11/40)	4.3/16.4 (11/42)	11/42	13/48	11/42	10/39.5	11/41	13/48	14/52	12/47 (14.5/55)	14/52	12/46.5 (14.5/55)
R..167	7.1/27 (18.5/70)	6.9/26 (18.5 /70)	17.2/65	20.6/78	18.7/71	17.4/66	18.2/69	20.6/78	23.2/88	21.6/82 (24/91)	23.2/88	21.7/82 (24/91)

[1] On compound gear units the larger gear unit is to be provided with the oil quantity in parenthesis.

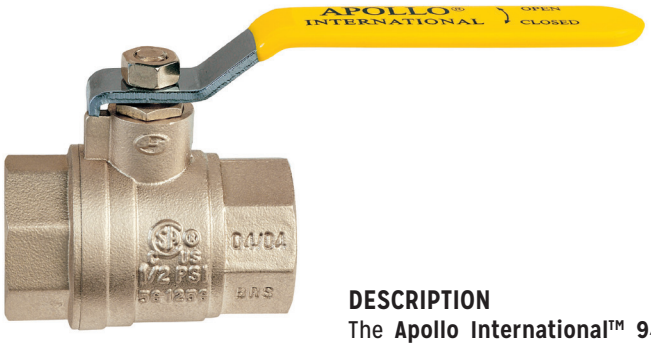
[2] On compound gear units having mounting positions B6, B7, or B8 the smaller gear unit is to be provided with the oil filling of the B5 mounting position.

4.1.2.3 Fluidization System

94A Series
Full Port Brass Ball Valve

SUBMITTAL SHEET

"Apollo" Flow Controls



Job Name:	
Job Location:	
Engineer:	
Contractor:	
Tag:	
PO#:	
Rep:	
Wholesale Dist.:	

DESCRIPTION
The **Apollo International™ 94A Forged Brass Ball Valve** combines reliable operation with maximum economy. Ideal for general flow control applications including HVAC, fuel gases, and fire protection trim and drain etc. Valves include most pertinent agency approvals.

FEATURES
- 2-Piece, Full Port Design
- Blowout-Proof Stem
- Adjustable Stem Packing Nut
- 100% Factory Tested
- Stem Seal O-Ring (Solder Version 1/2" - 2")

PERFORMANCE RATING
- 600 CWP – 1/4" to 2"
- 400 CWP – 2-1/2" to 4"
- Temperature Range: 0°F to 400°F

APPROVALS
- CSA: ¼"-4" NPT per ANSI Z21.15/ CGA 9.1 (1/2 psi) / CGA 3.16 (125 psi)
  ¼"-4" NPT per ASME B16.44 (5 psi)
  ½"-2" NPT per ASME B16.33 (125 psi)
  2 ½"-4" NPT per ASME B16.38 (125 psi)
- UL: Guides YQNZ, YRBX, YRPV, YSDT and MHKZ (1/4" - 4" NPT only)
- UL 258 – VQGU Trim & Drain 175# max (1/4" – 2")
- FM: ¼"-2" per FM1140 (<175 psi)
- MSS SP-110: Ball Valves

Note: Gas approvals apply to NPT valves only.

*Not for use in potable water applications in the United States.

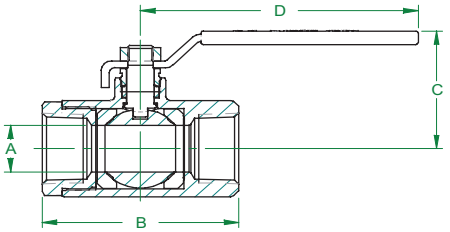
STANDARD MATERIALS LIST

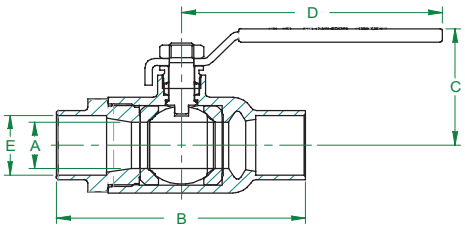
Body	Forged Brass (Cu >57%)
Retainer	Forged Brass (Cu >57%)
Ball	Brass, Cr plated
Stem	Brass, Cr plated
Stem Seal/O-Ring	EPDM
Seats	PTFE
Stem Packing	PTFE
Gland Nut	Brass
Handle	Steel, Plated (with PVC Grip)
Handle Nut	Steel, Plated

**94A-2xx intended for soft solder installation using solders with melting temperature < 500°F.

DIMENSIONS

PART NUMBER	SIZE (IN.)	DIMENSIONS (IN.)					WT. (LBS.)	KIT OPTIONS	
		A	B	C	D	E		2-1/4" STEM EXTENSION + MEMORY STOP	REPLACEMENT LEVER HANDLES
NPT									
94A-101-01	1/4"	0.395	1.746	1.840	3.543	-	0.3	78217101	W932400
94A-102-01	3/8"	0.407	1.756	1.840	3.543	-	0.3		
94A-103-01	1/2"	0.583	2.047	1.921	3.543	-	0.5	78217201	W932500
94A-104-01	3/4"	0.748	2.362	2.087	3.780	-	0.7	78217301	W936000
94A-105-01	1"	0.945	2.756	2.559	4.528	-	1.1	78217401	W932600
94A-106-01	1-1/4"	1.260	3.307	2.953	4.528	-	1.6	78217501	W932700
94A-107-01	1-1/2"	1.575	3.661	3.346	5.512	-	2.4	78217601	W932800
94A-108-01	2"	1.969	4.181	3.681	5.512	-	3.4		W233200
94A-109-01	2-1/2"	2.520	5.378	4.764	8.661	-	7.6	78217701	W932900
94A-100-01	3"	2.953	6.039	5.079	8.661	-	9.3		
94A-10A-01	4"	3.898	7.386	5.866	9.606	-	16.9	78217801	W933000
SOLDER									
94A-203-01	1/2"	0.583	2.047	1.839	3.543	0.630	0.3	78217201	W932500
94A-204-01	3/4"	0.748	2.748	1.996	3.780	0.878	0.6	78217301	W936000
94A-205-01	1"	0.945	3.228	2.441	4.528	1.130	1.0	78217401	W932600
94A-206-01	1-1/4"	1.260	3.819	2.854	4.528	1.378	1.4	78217501	W932700
94A-207-01	1-1/2"	1.575	4.425	3.169	5.512	1.630	2.2	78217601	W932800
94A-208-01	2"	1.969	5.315	3.449	5.512	2.130	3.0		W233200
94A-209-01	2-1/2"	2.520	6.283	4.764	8.661	2.630	6.4	78217701	W932900
94A-200-01	3"	2.953	7.150	5.079	8.661	3.130	8.5		
94A-20A-01	4"	3.945	9.276	5.866	9.606	4.130	15.8	78217801	W933000





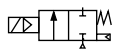
ASCO® Red-Hat®

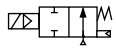
Pilot Operated

General Service Solenoid Valves

Brass or Stainless Steel Bodies

3/8" to 2 1/2" NPT

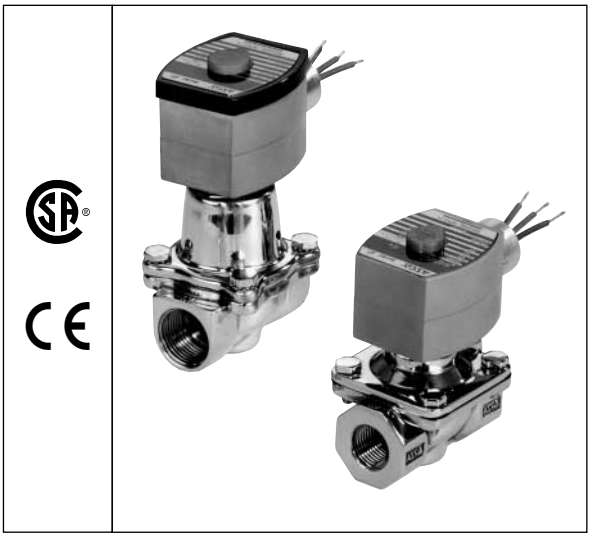
NC 

NO 

2/2 SERIES **8210**

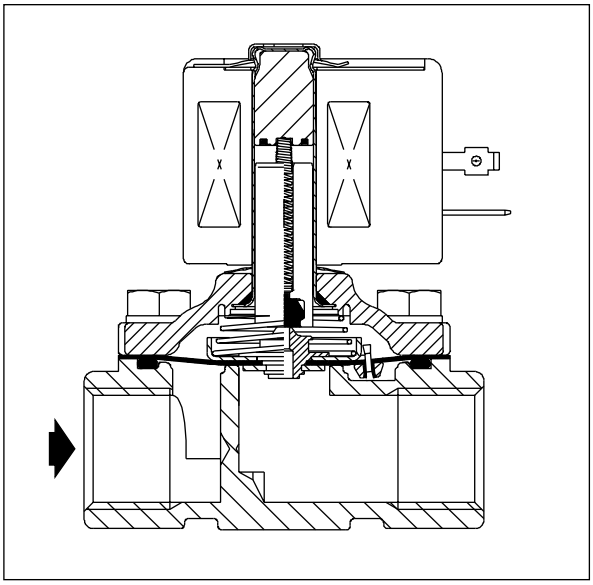
Features

- Wide range of pressure ratings, sizes, and resilient materials provide long service life and low internal leakage.
- High Flow Valves for liquid, corrosive, and air/inert gas service.
- Industrial applications include:
  - Car wash
  - Laundry equipment
  - Air compressors
  - Industrial water control
  - Pumps



Construction

Valve Parts in Contact with Fluids		
Body	Brass	~~304 Stainless Steel~~
Seals and Discs	NBR or PTFE	
Disc-Holder	PA	
Core Tube	305 Stainless Steel	
Core and Plugnut	430F Stainless Steel	
Springs	302 Stainless Steel	
Shading Coil	Copper	~~Silver~~



Electrical

Standard Coil and Class of Insulation	Watt Rating and Power Consumption				Spare Coil Part Number			
		AC			General Purpose		Explosionproof	
	DC Watts	Watts	VA Holding	VA Inrush	AC	DC	AC	DC
F	-	6.1	16	40	238210	-	238214	-
F	11.6	10.1	25	70	238610	238710	238614	238714
F	16.8	16.1	35	180	272610	97617	272614	97617
F	-	17.1	40	93	238610	-	238614	-
F	-	20	43	240	99257	-	99257	-
F	-	20.1	48	240	272610	-	272614	-
H	30.6	-	-	-	-	74073	-	74073
F	40.6	-	-	-	-	238910		238914

Standard Voltages: 24, 120, 240, 480 volts AC, 60 Hz (or 110, 220 volts AC, 50 Hz). 6, 12, 24, 120, 240 volts DC. Must be specified when ordering. Other voltages available when required.

Solenoid Enclosures

Standard: Red-Hat II - Watertight, Types 1, 2, 3, 3S, 4, and 4X; Red-Hat - Type I.
Optional: Red-Hat II - Explosionproof and Watertight, Types 3, 3S, 4, 4X, 6, 6P, 7, and 9; Red-Hat - Explosionproof and Watertight, Types 3, 4, 4X, 7, and 9.
(To order, add prefix "EF" to catalog number, except Catalog Numbers 8210B57, 8210B58, and 8210B59. Valves not available with Explosionproof enclosures.)
See Optional Features Section for other available options.

Nominal Ambient Temperature Ranges:

Red-Hat II/
Red-Hat AC: 32˚F to 125˚F (0˚C to 52˚C)
Red-Hat II DC: 32˚F to 104˚F (0˚C to 40˚C)
Red-Hat DC: 32˚F to 77˚F (0˚C to 25˚C)
(104˚F/40˚C occasionally)
Refer to Engineering Section for details.

Approvals:

CSA certified. Red-Hat II meets applicable CE directives.
Refer to Engineering Section for details.

ASCO®

Specifications (English units)

Pipe Size (ins.)	Orifice Size (ins.)	Cv Flow Factor	Operating Pressure Differential (psi)							Max. Fluid Temp. °F		Brass Body			Stainless Steel Body			Watt Rating/ Class of Coil Insulation ⑦	
			Min.	Max. AC			Max. DC												
				Air-Inert Gas	Water	Light Oil @ 300 SSU	Air-Inert Gas	Water	Light Oil @ 300 SSU	AC	DC	Catalog Number	Constr. Ref. No. ④	UL ⑤ Listing	Catalog Number	Constr. Ref. No. ④	UL ⑤ Listing	AC	DC
NORMALLY CLOSED (Closed when de-energized), NBR or PTFE ② Seating																			
3/8	3/8	1.5	①	150	125	-	40	40	-	180	150	8210G73 ③	1P	●	8210G36 ③	1P	●	6.1/F	11.6/F
3/8	5/8	3	0	150	150	-	40	40	-	180	150	8210G93	5D	❍	-	-	-	10.1/F	11.6/F
3/8	5/8	3	5	200	150	135	125	100	100	180	150	8210G1	6D	❍	-	-	-	6.1/F	11.6/F
3/8	5/8	3	5	300	300	300	-	-	-	175	-	8210G6	5D	❍	-	-	-	17.1/F	-
1/2	7/16	2.2	①	150	125	-	40	40	-	180	150	8210G15 ③	2P	●	8210G37 ③	2P	●	6.1/F	11.6/F
1/2	5/8	4	0	150	150	-	40	40	-	180	150	8210G94	5D	❍	-	-	-	10.1/F	11.6/F
1/2	5/8	4	0	150	150	125	40	40	-	175	150	-	-	-	8210G87	7D	●	17.1/F	11.6/F
1/2	5/8	4	5	200	150	135	125	100	100	180	150	8210G2	6D	❍	-	-	-	6.1/F	11.6/F
1/2	5/8	4	5	300	300	300	-	-	-	175	-	8210G7	5D	❍	-	-	-	17.1/F	-
1/2	5/8	4	5	300	300	-	300	300	-	180	125	8210G227	5D	❍	-	-	-	17.1/F	40.6/H
3/4	5/8	4.5	0	150	150	125	40	40	-	175	150	-	-	-	8210G88	7D	●	17.1/F	11.6/F
3/4	3/4	5	5	125	125	125	100	90	75	180	150	8210G9	9D	❍	-	-	-	6.1/F	11.6/F
3/4	3/4	5	0	150	150	-	40	40	-	180	150	8210G95	8D	❍	-	-	-	10.1/F	11.6/F
3/4	3/4	6.5	5	250	150	100	125	125	125	180	150	8210G3	11D	❍	-	-	-	6.1/F	11.6/F
3/4	3/4	6	0	-	-	-	200	180	180	-	77	8210B26 ② ‡	10P	-	-	-	-	-	30.6/H
3/4	3/4	6	0	350	300	200	-	-	-	200	-	8210G26 ② ‡	40P	●	-	-	-	16.1F	-
1	1	13	0	-	-	-	100	100	80	-	77	8210B54 ‡	31D	-	8210D89	15D	-	-	30.6/H
1	1	13	0	150	125	125	-	-	-	180	-	8210G54	41D	●	8210G89	45D	●	16.1/F	-
1	1	13	5	150	150	100	125	125	125	180	150	8210G4	12D	❍	-	-	-	6.1/F	11.6/F
1	1	13.5	0	300	225	115	-	-	-	200	-	8210G27 ‡	42P	●	-	-	-	20.1/F	-
1	1	13.5	10	300	300	300	-	-	-	175	-	8210G78 ②	13P	-	-	-	-	17.1/F	-
1 1/4	1 1/8	15	0	-	-	-	100	100	80	-	77	8210B55 ‡	32D	-	-	-	-	-	30.6/H
1 1/4	1 1/8	15	0	150	125	125	-	-	-	180	-	8210G55	43D	●	-	-	-	16.1/F	-
1 1/4	1 1/8	15	5	150	150	100	125	125	125	180	150	8210G8	16D	❍	-	-	-	6.1/F	11.6/F
1 1/2	1 1/4	22.5	0	-	-	-	100	100	80	-	77	8210B56 ‡	33D	-	-	-	-	-	30.6/H
1 1/2	1 1/4	22.5	0	150	125	125	-	-	-	180	-	8210G56 ‡	44D	●	-	-	-	16.1/F	-
1 1/2	1 1/4	22.5	5	150	150	100	125	125	125	180	150	8210G22	18D	●	-	-	-	6.1/F	11.6/F
2	1 3/4	43	5	150	125	90	50	50	50	180	150	8210G100	20P	●	-	-	-	6.1/F	11.6/F
2 1/2	1 3/4	45	5	150	125	90	50	50	50	180	150	8210G101	21P	●	-	-	-	6.1/F	11.6/F
NORMALLY OPEN (Open when de-energized), NBR Seating (PA Disc-Holder, except as noted)																			
3/8	5/8	3	0	150	150	125	125	125	80	180	150	8210G33	23D	●	-	-	-	10.1/F	11.6/F
3/8	5/8	3	5	250	200	200	250	200	200	180	180	8210G11 ⑧ ⑨	39D	●	-	-	-	10.1/F	11.6/F
1/2	5/8	4	0	150	150	125	125	125	80	180	150	8210G34	23D	●	-	-	-	10.1/F	11.6/F
1/2	5/8	3	0	150	150	100	125	125	80	180	150	-	-	-	8210G30	37D	●	10.1/F	11.6/F
1/2	5/8	4	5	250	200	200	250	200	200	180	180	8210G12 ⑧ ⑨	39D	●	-	-	-	10.1/F	11.6/F
3/4	3/4	5.5	0	150	150	125	125	125	80	180	150	8210G35	25D	●	-	-	-	10.1/F	11.6/F
3/4	5/8	3	0	150	150	100	125	125	80	180	150	-	-	-	8210G38	38D	●	10.1/F	11.6/F
3/4	3/4	6.5	5	-	-	-	250	200	200	-	180	8210C13	24D	●	-	-	-	-	16.8/F
3/4	3/4	6.5	5	250	200	200	-	-	-	180	-	8210G13	46D	●	-	-	-	16.1/F	-
1	1	13	0	125	125	125	-	-	-	180	-	8210B57 ⑥ ⑩	34D	●	-	-	-	20/F	-
1	1	13	5	-	-	-	125	125	125	-	180	8210D14	26D	●	-	-	-	-	16.8/F
1	1	13	5	150	150	125	-	-	-	180	-	8210G14	47D	●	-	-	-	16.1/F	-
1 1/4	1 1/8	15	0	125	125	125	-	-	-	180	-	8210B58 ⑥ ⑩	35D	●	-	-	-	20/F	-
1 1/4	1 1/8	15	5	-	-	-	125	125	125	-	180	8210D18	28D	●	-	-	-	-	16.8/F
1 1/4	1 1/8	15	5	150	150	125	-	-	-	180	-	8210G18	48D	●	-	-	-	16.1/F	-
1 1/2	1 1/4	22.5	0	125	125	125	-	-	-	180	-	8210B59 ⑥ ⑩	36D	●	-	-	-	20/F	-
1 1/2	1 1/4	22.5	5	-	-	-	125	125	125	-	180	8210D32	29D	●	-	-	-	-	16.8/F
1 1/2	1 1/4	22.5	5	150	150	125	-	-	-	180	-	8210G32	49D	●	-	-	-	16.1/F	-
2	1 3/4	43	5	-	-	-	125	125	125	-	150	8210103	30P	●	-	-	-	-	16.8/F
2	1 3/4	43	5	125	125	125	-	-	-	180	-	8210G103	50P	●	-	-	-	16.1/F	-
2 1/2	1 3/4	45	5	-	-	-	125	125	125	-	150	8210104	27P	●	-	-	-	-	16.8/F
2 1/2	1 3/4	45	5	125	125	125	-	-	-	180	-	8210G104	51P	●	-			16.1/F	-

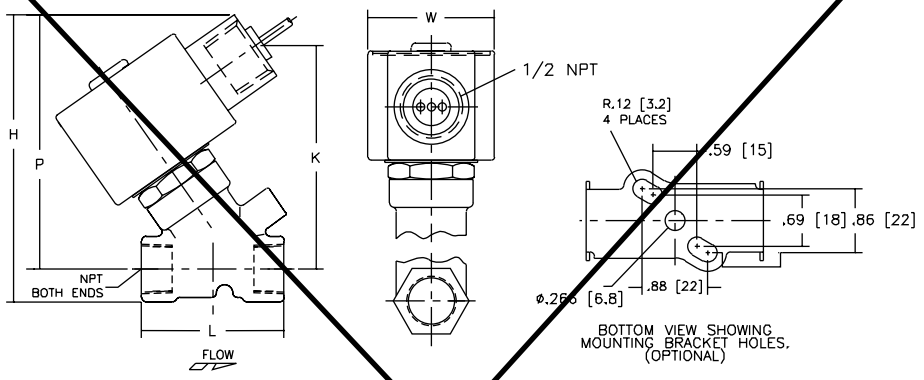
Notes: ① 5 psi on Air; 1 psi on Water.
② Valve provided with PTFE main disc.
③ Valve includes Ultem (G.E. trademark) piston.
④ Letter "D" denotes diaphragm construction; "P" denotes piston construction.
⑤ ❍ Safety Shutoff Valve; ● General Purpose Valve. Refer to Engineering Section (Approvals) for details.
⑥ Valves not available with Explosionproof enclosures.
⑦ On 50 hertz service, the watt rating for the 6.1/F solenoid is 8.1 watts.
⑧ AC construction also has PA seating.
⑨ No disc-holder.
⑩ Stainless Steel disc-holder.
‡ Must have solenoid mounted vertical and upright.

Dimensions: inches (mm)

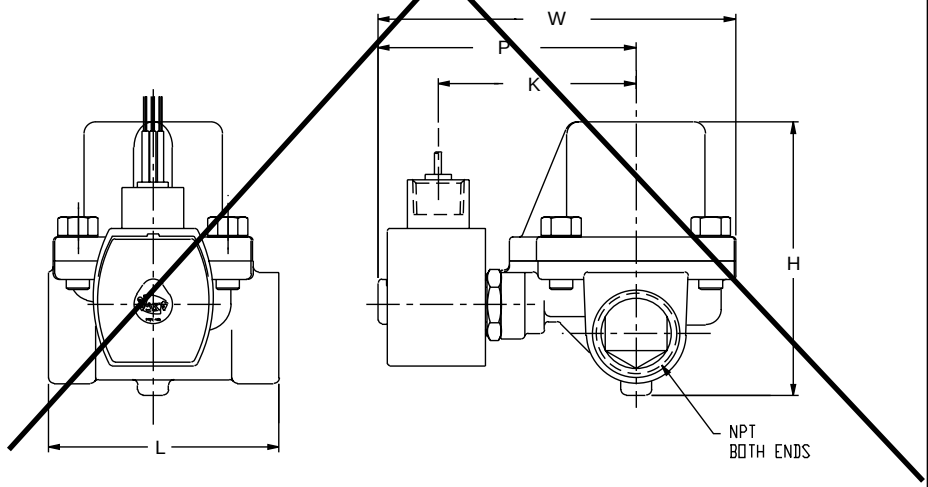
Constr. Ref. No.		H	K	L	P	W
1*	ins.	3.85	3.00	1.91	3.41	1.69
	mm	98	76	49	87	43
2*	ins.	4.17	3.25	2.28	3.63	1.69
	mm	106	83	58	92	43
13	ins.	4.44	3.22	3.75	4.19	5.81
	mm	113	82	95	106	147
5	ins.	3.84	2.31	2.75	3.28	2.28
	mm	98	59	70	83	58
6*	ins.	3.38	1.94	2.75	2.80	2.28
	mm	86	49	70	71	58
7	ins.	4.19	2.50	2.81	3.47	2.39
	mm	106	64	71	88	61
8	ins.	4.13	2.47	2.81	3.44	2.29
	mm	105	63	71	87	58
9*	ins.	3.66	2.10	2.81	2.96	2.28
	mm	93	53	71	75	58
10*①	ins.	5.25	X	2.81	4.59	2.31
	mm	133	X	71	117	59
11*	ins.	4.16	2.66	3.84	3.52	2.75
	mm	106	68	98	89	70
12	ins.	5.64	3.15	3.75	4.01	3.36
	mm	143	80	95	102	85
15*	ins.	5.34	X	3.75	4.47	3.84
	mm	136	X	95	114	98
16	ins.	5.64	3.15	3.66	4.01	3.56
	mm	143	80	93	102	90
18	ins.	6.11	3.30	4.38	4.16	3.92
	mm	155	84	111	106	100
20*	ins.	7.33	3.71	5.06	4.57	4.87
	mm	186	94	129	116	124
21*	ins.	7.33	3.71	5.50	4.57	4.87
	mm	186	94	140	116	124
23	ins.	4.35	2.65	2.75	3.79	2.28
	mm	110	67	70	96	58
24	ins.	5.06	X	3.78	4.44	2.75
	mm	129	X	96	113	70
25	ins.	4.64	2.81	2.81	3.94	2.28
	mm	118	71	71	100	58
26	ins.	6.53	X	3.75	4.91	3.19
	mm	166	X	95	125	81
27	ins.	8.22	X	5.50	5.47	4.87
	mm	209	X	140	139	124
28	ins.	6.53	X	3.66	4.91	3.19
	mm	166	X	93	125	81
29	ins.	7.03	X	4.38	5.06	4.40
	mm	179	X	111	129	112

① Valves must be mounted with solenoid vertical and upright.
* DC dimensions slightly larger.

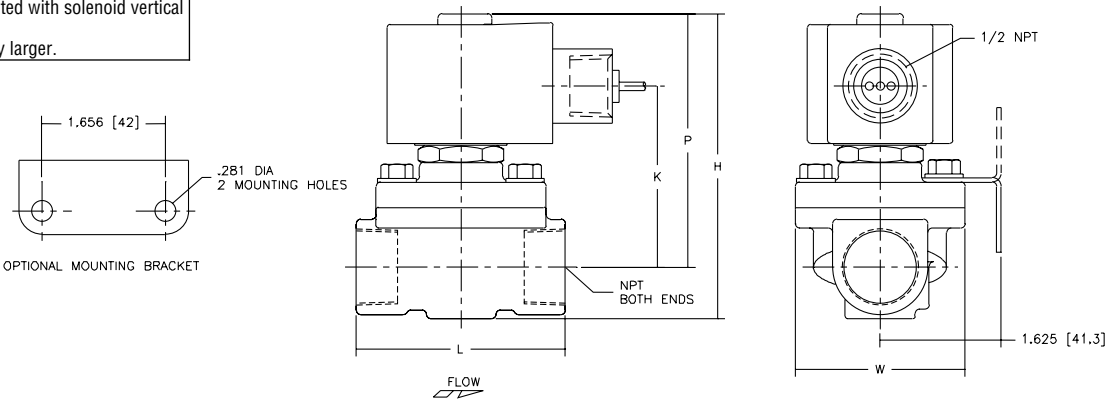
Constr. Refs. 1, 2



Constr. Ref. 13



Constr. Refs. 5-9, 11, 20, 21, 23 , 25, 37,38



4.1.2.4 Grit Pump

Self Priming Centrifugal Pump

Super TSERIES
VARIOUS PATENTS APPLY

Model T4A71S-B/F-VEOLIA

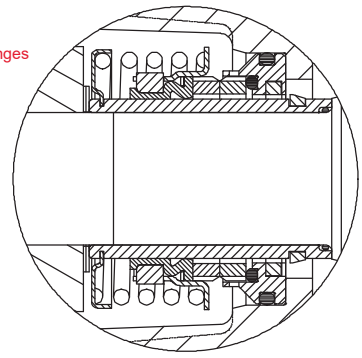
Size 4” x 4”

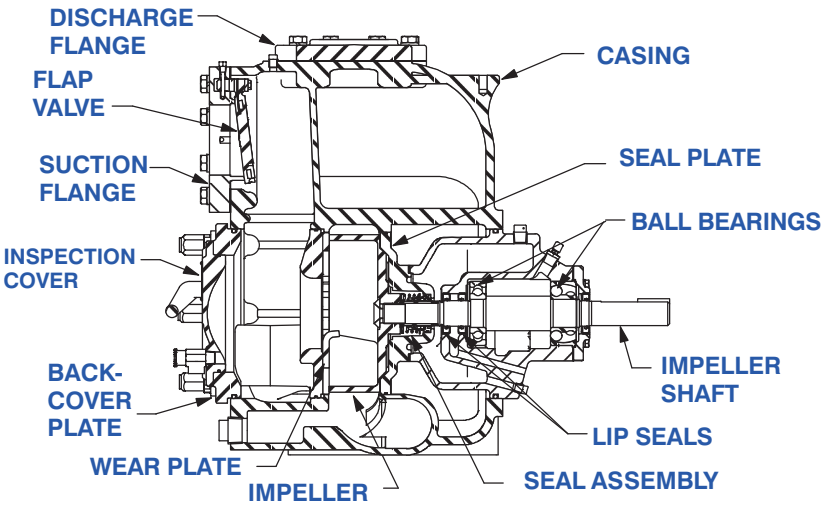
5 YEAR WARRANTY SUPER T SERIES

PUMP SPECIFICATIONS

Size: 4” x 4” (101 mm x 101 mm) NPT - Female.
Casing: Gray Iron 30.
Maximum Operating Pressure 86 psi (593 kPa).*
Semi-Open Type, Two Vane Impeller: Austempered Ductile Iron (ADI); Min 388 BNH
Handles 3” (76,2 mm) Diameter Spherical Solids.
Impeller Shaft: Stainless Steel 17-4 PH ASTM A564 / Rockwell hardness # C33
Shaft Sleeve: Sleeveless Shaft
Replaceable Wear Plate: Hardened Alloy Steel ASTM #A514 / 360-440 BNH
Removable Adjustable Cover Plate: Gray Iron 30.
Removable Inspection Cover Plate: Gray Iron 30; 12 lbs. (5,4 kg.).
Flap Valve: Neoprene w/Nylon and Steel Reinforcing.
Seal Plate: Austempered Ductile Iron (ADI); Min 388 BNH
Bearing Housing: Gray Iron 30.
Radial Bearing: Open Single Row Ball.
Thrust Bearing: Open Double Row Ball.
Bearing and Seal Cavity Lubrication: SAE 30 Non-Detergent Oil.
Flanges: Gray Iron 30.
Gaskets: Buna-N, Compressed Synthetic Fibers, Vegetable Fiber, PTFE, Cork, and Rubber.
O-Rings: Buna-N.
Hardware: Standard Plated Steel.
Brass Pressure Relief Valve.
Bearing and Seal Cavity Oil Level Sight Gauges.
Optional Equipment: Automatic Air Release Valve. Metal Bellows Seal. 120V/240V Casing Heater. High Pump Temperature Shutdown Kit. G-R Hard Iron Casing. High Chrome Cast Iron Impeller. Gray Iron 30 Suction and Discharge Spool Flanges:
4” ASA **(Specify Model T4A71S-B /F).** Compatibale withe ASME B16.1 class 125 and 150 Flanges
~~100 mm DIN 2527 (PN 16) (Specify Model T4A71S-B /FM).~~

Consult Factory for Applications Exceeding Maximum Pressure and/or Temperature Indicated.

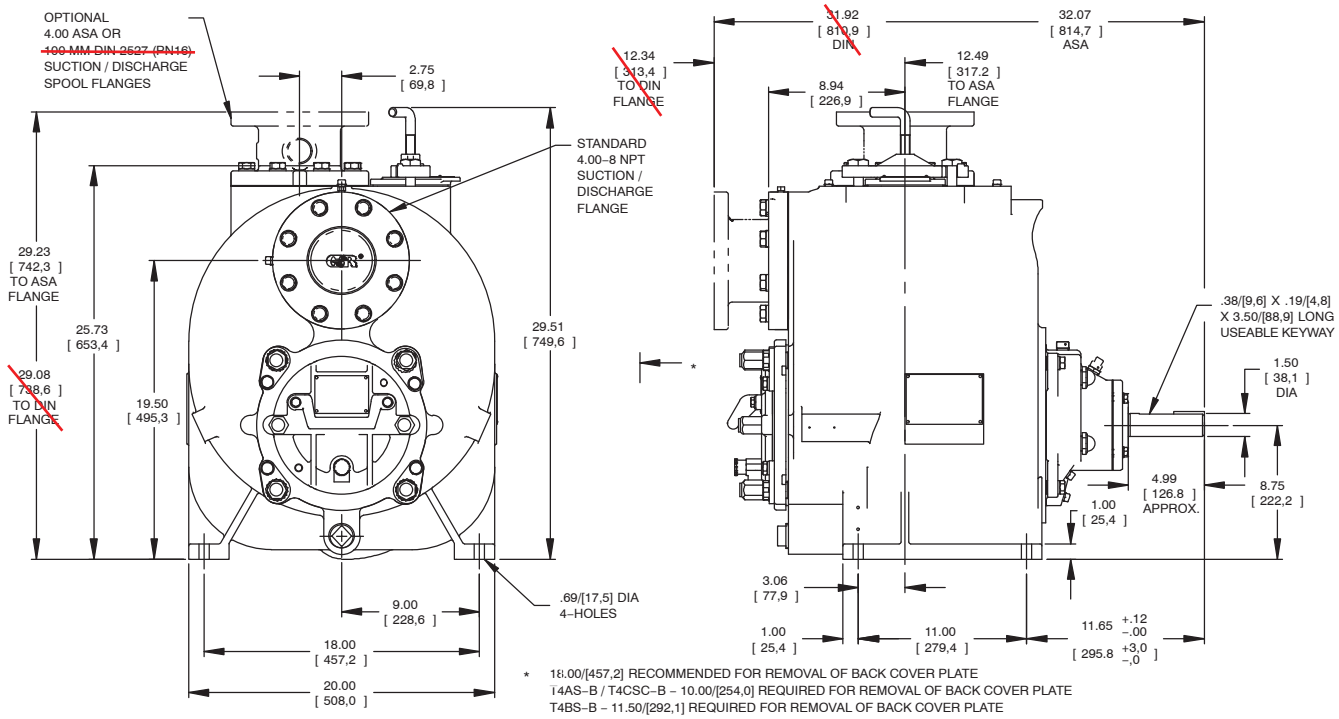




SEAL DETAIL

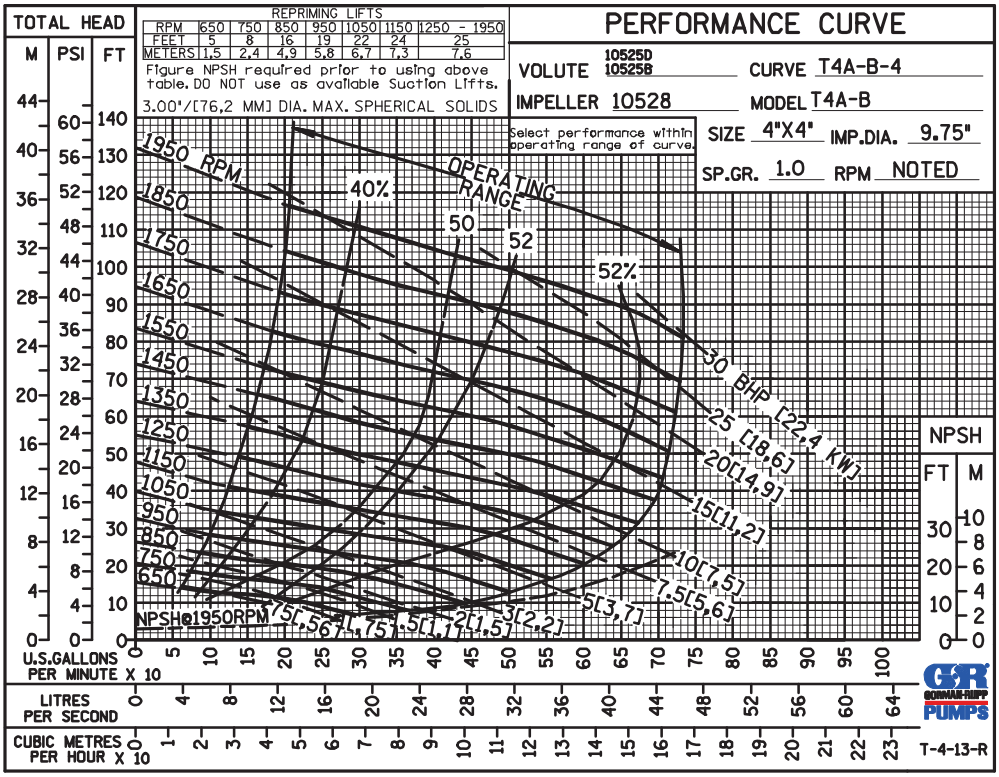
Mechanical, Oil-Lubricated, Double Floating, Self-Aligning. Silicon Carbide Rotating and Stationary Faces. Stainless Steel 316 Stationary Seat. Fluorocarbon Elastomers (DuPont Viton or Equivalent). Stainless Steel 316 Cage and Spring. Maximum Temperature of Liquid Pumped, 160F (71 deg C).*

Specification Data	APPROXIMATE DIMENSIONS and WEIGHTS	NET WEIGHT: 585 LBS. (265 KG.)*
SECTION 55, PAGE 2140C		SHIPPING WEIGHT: 624 LBS. (283 KG.)*
		EXPORT CRATE: 22.7 CU. FT. (0,64 CU. M.)
		*ADD 15 LBS. (6,8 KG.) W/EACH SPOOL FLANGE

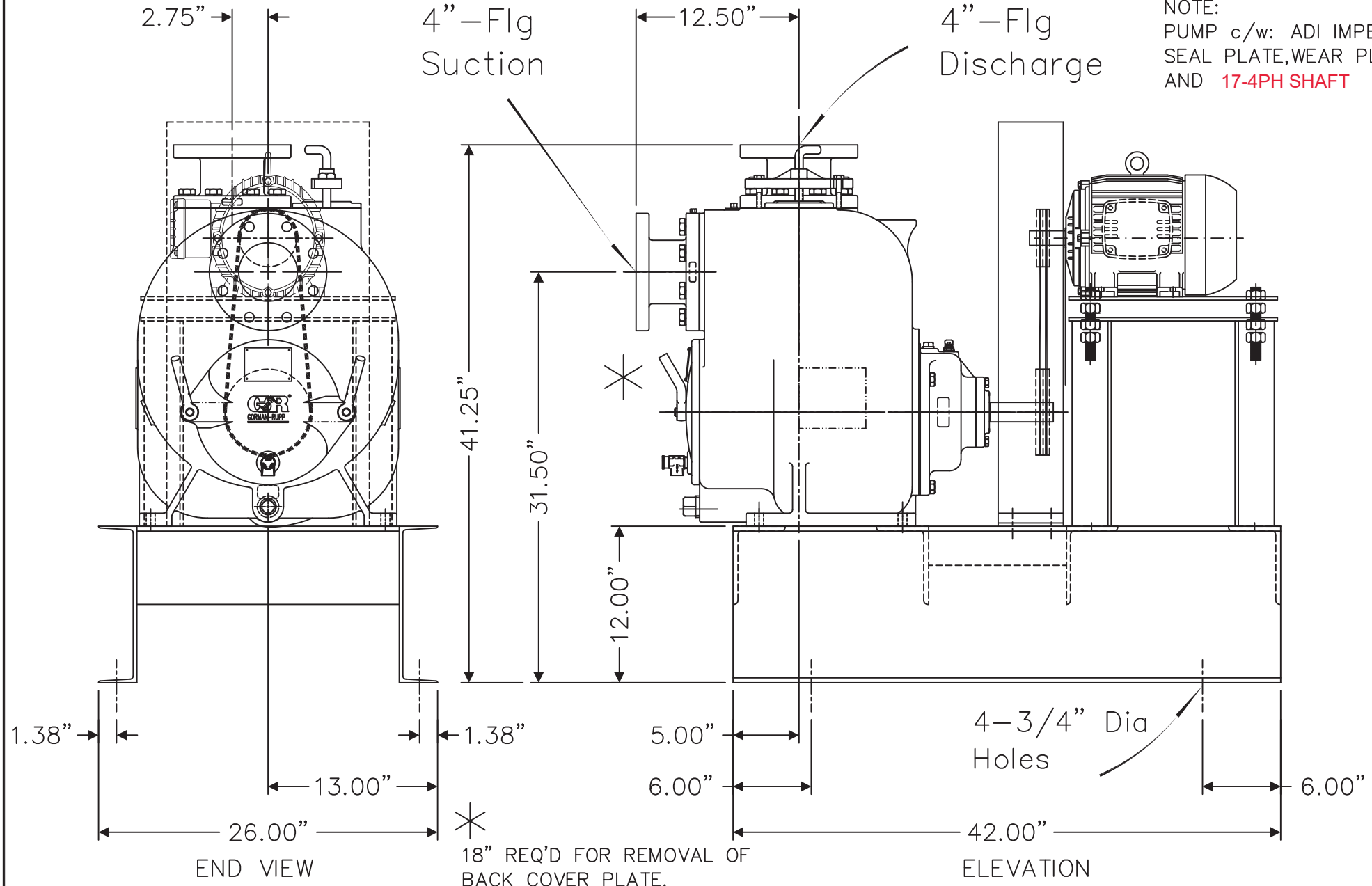


* 18.00/[457,2] RECOMMENDED FOR REMOVAL OF BACK COVER PLATE
T4AS-B / T4CSC-B – 10.00/[254,0] REQUIRED FOR REMOVAL OF BACK COVER PLATE
T4BS-B – 11.50/[292,1] REQUIRED FOR REMOVAL OF BACK COVER PLATE

NOTE: OPTIONAL ASA OR DIN STANDARD SUCITON & DISCHARGE SPOOL FLANGES AVAILABLE.



Rev.	Description Of Revision/Modifications	Date



BROOKS BROOKS
PRODUCTION & ENGINEERING

Customer: JOHN MEUNIER INC.

REFERENCE:	QUANTITY:	SCALE:	DESIGN BY:	DATE:
JB6585	(1) One	N.T.S.	J.R.C.	9/17/02

Title
GORMAN RUPP MODEL T4A3B/F# V-BELT DRIVEN @ NOMINAL SPEED OF 1150RPM BY 5HP,575/3/60, 1750RPM,TEFC,184T ELECTRIC MOTOR ON COMMON (STD J.B.EPOXY PAINTED) BASE.

DRAWING NUMBER: GAJB6978

Rev.

Pump Data Sheet - Gorman-Rupp SEW 60Hz

Company: Veolia
Name: Bertrand Landry P. Eng.
Date: 05/17/2022

Pump:

Size:	T4A-B-4	Dimensions:	
Type:	T-SERIES	Suction:	4 in
Synch Speed:	Adjustable	Discharge:	4 in
Dia:	9.75 in		
Curve:	T4A-B-4		
Impeller:	10528		

Fluid:

Name:	Water		
SG:	1	Vapor Pressure:	0.256 psi a
Density:	62.4 lb/ft³	Atm Pressure:	14.7 psi a
Viscosity:	1.1 cP	NPSHa:	24.8 ft
Temperature:	60 °F	Margin Ratio:	1

Search Criteria:

Flow:	200 US gpm	Near Miss:	---
Head:	32.34 ft	Static Head:	0 ft

Pump Limits:

Temperature:	---	Sphere Size:	3 in
Wkg Pressure:	---		

Motor:

Consult Gorman-Rupp SEW 60Hz to select a motor for this pump.

Pump Selection Warnings:

None

--- Duty Point ---

Flow:	200 US gpm
Head:	32.4 ft
Eff:	43.4%
Power:	3.7 hp
NPSHr:	4.49 ft
Speed:	1063 rpm

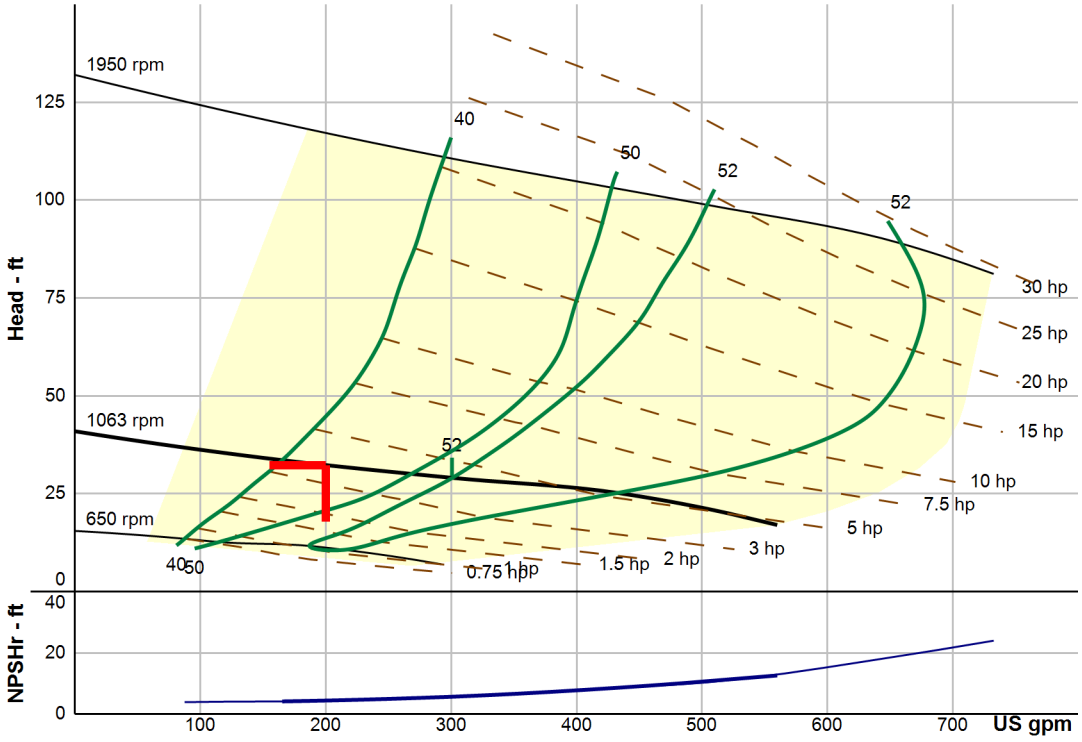
--- Design Curve ---

Shutoff Head:	41 ft
Shutoff dP:	17.7 psi
Min Flow:	--- US gpm

BEP: 52% @ 301 US gpm
NOL Power:
5.3 hp @ 433 US gpm

--- Max Curve ---

Max Power:
29.3 hp @ 733 US gpm



This curve is provided for preliminary selection only. Please consult factory before making final pump or motor selections. Not NSF certified.

Performance Evaluation:

Flow	Speed	Head	Efficiency	Power	NPSHr
US gpm	rpm	ft	%	hp	ft
240	1063	31	47	3.92	4.9
200	1063	32.4	43	3.7	4.49
160	1063	33.8	39	3.48	4.1
120	1063	35.6	36	3.25	3.82
80	1063	37.4	32	3.03	3.55

120 Series

EXPLOSION-PROOF PRESSURE, VACUUM, DIFFERENTIAL PRESSURE, TEMPERATURE SWITCHES

FEATURES

- Class I, Div. 1 & 2, (Zone 1)
  Class II, Div. 1 & 2
  Class III
- Worldwide approvals and certifications
- Choice of one or two SPDT, optional DPDT output
- Dual electrical conduit openings
- Terminal block wiring
- Welded diaphragm or bellows sensor
- Ultra-low pressure ranges

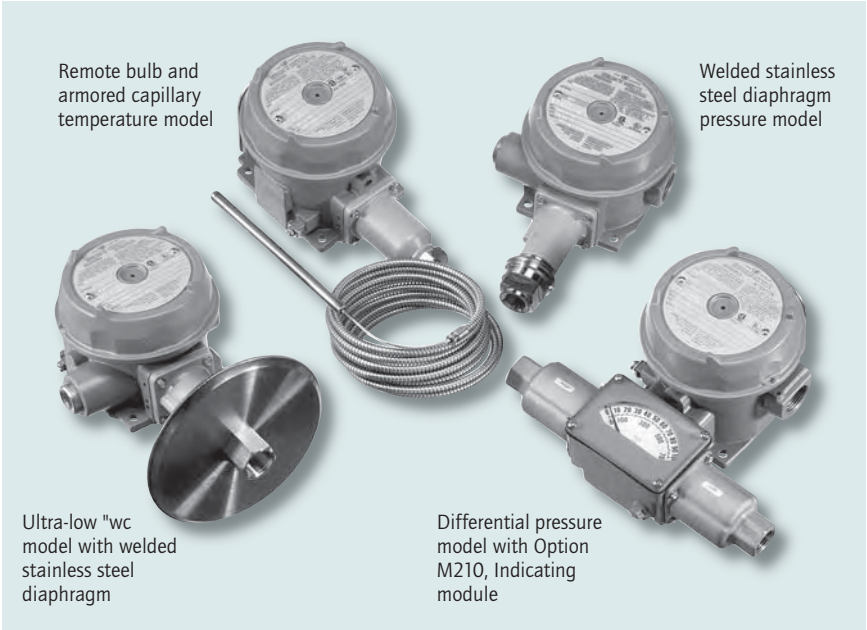
ISO 9001 CERTIFIED COMPANY

OVERVIEW

As safety requirements become more stringent, the determining factor in specifying an industrial pressure, differential pressure and/or temperature switch rests upon that switch protecting equipment, processes and personnel. Meeting hazardous location requirements through adherence to UL, CSA, and ATEX standards, UE's 120 Series is the choice where potentially explosive or highly corrosive atmospheres exist.

The 120 Series offers a variety of pressure, differential pressure, vacuum and temperature ranges, as well as port connections, wetted materials and sensor types. With common, flexible "platforms", models can quickly be adapted at the factory for special requirements, such as ranges, process connections and electrical ratings. Typical industries using 120 Series switches include chemical, petrochemical, refinery, oil and gas production and transmission, and pharmaceuticals.

An innovator in Threshold Detection and Switching™ technology since 1931, United Electric's primary focus remains the manufacture of switches and sensors for the protection of equipment, processes and people.



FEATURES

- Approvals include cULus, ATEX, GOST, CQST, IECEx; compliance with CE and NACE standards
- Internal adjustment or external adjustment via calibrated dials with tamper resistant cover
- Integral cover lock
- Single or Dual Output
- Wide variety of sensor materials
- Optional Hastelloy® and Monel® sensor material for corrosive media
- Wide adjustable deadband models
- Flush mount sanitary sensors
- Stainless steel, Hastelloy®, and Monel® flanges conforming to ANSI standards
- Heat tracing and freeze protection temperature models
- Most models available for immediate delivery!

SPECIFICATIONS

STORAGE TEMPERATURE	-65 to 160°F (-54 to 71°C)
AMBIENT TEMPERATURE LIMITS	-58 to 160°F (-50 to 71°C); models 36-39, 520-525, 540-548, 701-705: 0 to 160°F (-17 to 71°C); types 820E, 822E: -40 to 160°F (-40 to 71°C) set point typically shifts less than 1% of range for a 50°F (28°C) ambient temperature change; less than 2% for types E121& E122
SET POINT REPEATABILITY	Temperature models: Type B, C and F: ±1% of adjustable range Type E: ±2% of adjustable range Pressure models 126-164, S126B-S164B, 171-174, 270-274, 358-376, 520-535, 540-543, 560-564, 701-705: ±1% of adjustable range; models 450-559: ±1/2% of adjustable range; models 36-39, 183-194, 483-494, 544-548, 565-567, 612-680: ±1-1/2% of adjustable range
SHOCK	Set point repeats after 15 G, 10 millisecond duration
VIBRATION	Set point repeats after 2.5 G, 5-500 Hz
ENCLOSURE	Die cast aluminum, epoxy powder coated; gasketed; coverlock; internal set point lock standard on types J, C, F; gasketed stainless steel tamper-resistant dial cover on types B, H, E; aluminum nameplate
ENCLOSURE CLASSIFICATION	Certified to enclosure type 4X. Class I, Division 1 product meets enclosure type 7; Class II, Division 1 product meets enclosure type 9. Certified to IP66 requirements
SWITCH OUTPUT	One or two SPDT; dual switch may be separated up to 100% of range; except type 822E where switch #2 can be set up to 25% of range span below switch #1 setpoint; switches may be wired "normally open" or "normally closed". Two SPDT hermetic sealed switches available on H122P models
ELECTRICAL RATING	15A 125/250/480 VAC resistive (standard) except types J120-15622, 15834-15839: 20A 125/250/480 VAC resistive; H122P; 11A 125/250 VAC resistive; B121-13272, B122-13322, E121-13273, E122-13321; 22A 480VAC resistive. Electrical switches have limited DC capabilities. Consult factory for additional information
REFERENCE SCALES	Types B, E & H: external dial. Scale divisions vary with range (see model charts)
WEIGHT	3-8 lbs. Varies with type and model
ELECTRICAL CONNECTION	Type H, B, E; one 3/4" NPT E/C; type J, C, F, 820E, 822E; two 3/4" NPT E/C; terminal block standard
PRESSURE CONNECTION	Models S126B-S164B, 171-194, 483-494, 520-535: 1/2" NPT (female); models 560-564: 2" sanitary connection; models 565-567: 1-1/2" sanitary connection; models 540-548: 1/8" NPT (female); all others: 1/4" NPT (female)
TEMPERATURE ASSEMBLY	Bulb and capillary: 6 feet 304 stainless steel (standard) except for E121-13273 and E122-13321: 10 feet; Immersion stem: nickel-plated brass (standard) except for B121-13272 and B122-13322: stainless steel. Fill: Model 1BS: solvent filled; models 2BS-8BS: non-toxic oil filled
TEMPERATURE DEADBAND	Type F120, 820E, 822E: typically 1%; type B-, C-, and E- 121 and 122: typically 2% of range under laboratory conditions (70°F [21°C] ambient circulating bath at rate of 1/2°F per minute change)
PRESSURE DEADBAND	**See Individual model charts**
DIFFERENTIAL PRESSURE INDICATOR (OPTION M210)	Differential pressure indication available types H121K and H122K with option M210 (check model availability under options); accuracy approximately 1% mid 50% of range, 3% at ends; window is plexiglass and gasketed; indicator may be field adjusted for approximately ±1% accuracy at any set point within range
TEMPERATURE INDICATION	Temperature indication available types 820E and 822E. Indication accuracy is ±1% of adjustable range

PRESSURE MODEL CHART

- **Type J120, single switch with internal adjustment, dual conduits (cont.)**

Model	Adjustable Set Point Range Low end of range on fall; High end of range on rise		Deadband				Over Range Pressure*		Proof Pressure**	
			Lower 75% range span		Top 25% range span					
	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar
~~Welded 316 stainless steel diaphragm and 1/2" NPT (female) pressure connection, large 0.72" orifice for clean-out purposes (NACE MR-0175 compliant)~~										
~~190~~	~~5 to 30~~	~~0,3 to 2,1~~	~~1 to 3~~	~~0,1 to 0,2~~	~~6 max~~	~~0,4~~	~~1500~~	~~103,4~~	~~2500~~	~~172,4~~
~~191~~	~~10 to 100~~	~~0,7 to 6,9~~	~~1 to 8~~	~~0,1 to 0,6~~	~~15 max~~	~~1,0~~	~~1500~~	~~103,4~~	~~2500~~	~~172,4~~
~~192~~	~~15 to 300~~	~~1,0 to 20,7~~	~~3 to 18~~	~~0,2 to 1,2~~	~~25 max~~	~~1,7~~	~~1500~~	~~103,4~~	~~2500~~	~~172,4~~
~~193~~	~~20 to 500~~	~~1,4 to 34,5~~	~~4 to 30~~	~~0,3 to 2,1~~	~~45 max~~	~~3,1~~	~~1500~~	~~103,4~~	~~2500~~	~~172,4~~
~~194~~	~~80 to 1700~~	~~5,5 to 117,2~~	~~5 to 120~~	~~0,3 to 8,3~~	~~150 max~~	~~10,3~~	~~2000~~	~~137,9~~	~~2500~~	~~172,4~~
~~Welded 316 stainless steel diaphragm and 1/2" NPT (female) pressure connection, 0.06" orifice to dampen pulsations~~										
~~490~~	~~5 to 30~~	~~0,3 to 2,1~~	~~1 to 3~~	~~0,1 to 0,2~~	~~6 max~~	~~0,4~~	~~1500~~	~~103,4~~	~~2500~~	~~172,4~~
~~491~~	~~10 to 100~~	~~0,7 to 6,9~~	~~1 to 8~~	~~0,1 to 0,6~~	~~15 max~~	~~1,0~~	~~1500~~	~~103,4~~	~~2500~~	~~172,4~~
~~492~~	~~15 to 300~~	~~1,0 to 20,7~~	~~3 to 18~~	~~0,2 to 1,2~~	~~25 max~~	~~1,7~~	~~1500~~	~~103,4~~	~~2500~~	~~172,4~~
~~493~~	~~20 to 500~~	~~1,4 to 34,5~~	~~4 to 30~~	~~0,3 to 2,1~~	~~45 max~~	~~3,1~~	~~1500~~	~~103,4~~	~~2500~~	~~172,4~~
~~494~~	~~80 to 1700~~	~~5,5 to 117,2~~	~~5 to 120~~	~~0,3 to 8,3~~	~~150 max~~	~~10,3~~	~~2000~~	~~137,9~~	~~2500~~	~~172,4~~

Model	Adjustable Set Point Range Low end of range on fall; High end of range on rise		Deadband		Over Range Pressure*		Proof Pressure**	
	psi (unless noted)	bar (unless noted)	psi (unless noted)	bar (unless noted)	psi (unless noted)	bar	psi	bar
Brass bellows with nickel-plated brass 1/4" NPT (female) pressure connection; models 126 & 134 have zinc-plated steel spring which is exposed to media								
~~126~~	~~30 to 3 "Hg Vac~~	~~-1 to 0,1~~	~~0.2 to 0.6 "Hg~~	~~6,8 to 20,3 mbar~~	~~80 "wc~~	~~199,1 mbar~~	~~5~~	~~0,3~~
134	30 "Hg Vac to 20 psi	-1 to 1,4	0.2 to 0.6 "Hg	6,8 to 20,3 mbar	20	1,4	25	1,7
~~137~~	~~15 to 80 "wc~~	~~37,3 to 199,1 mbar~~	~~2 to 6 "wc~~	~~5,0 to 14,9 mbar~~	~~80 "wc~~	~~199,1 mbar~~	~~5~~	~~0,3~~
~~144~~	~~0.5 to 20~~	~~34,5 mbar to 1,4 bar~~	~~0.1 to 0.3~~	~~6,9 to 20,7 mbar~~	~~20~~	~~1,4~~	~~25~~	~~1,7~~
~~152~~	~~1 to 50~~	~~0,1 to 3,4~~	~~0.1 to 0.5~~	~~6,9 to 34,5 mbar~~	~~50~~	~~3,4~~	~~75~~	~~5,2~~
~~156~~	~~2 to 100~~	~~0,1 to 6,9~~	~~0.2 to 0.6~~	~~13,8 to 41,4 mbar~~	~~100~~	~~6,9~~	~~125~~	~~8,6~~
~~164~~	~~4 to 200~~	~~0,3 to 13,8~~	~~0.2 to 1~~	~~13,8 to 68,9 mbar~~	~~200~~	~~13,8~~	~~200~~	~~13,8~~
~~Welded 316L stainless steel bellows and 1/4" NPT (female) pressure connection~~								
~~356~~	~~15 to 100~~	~~1,0 to 6,9~~	~~0.7 to 1.8~~	~~48,3 to 124,1 mbar~~	~~100~~	~~6,9~~	~~800~~	~~55,2~~
~~358~~	~~15 to 200~~	~~1,0 to 13,8~~	~~1 to 3~~	~~0,1 to 0,2~~	~~200~~	~~13,8~~	~~800~~	~~55,2~~
~~361~~	~~20 to 300~~	~~1,4 to 20,7~~	~~1 to 4~~	~~0,1 to 0,3~~	~~300~~	~~20,7~~	~~800~~	~~55,2~~
~~376~~	~~25 to 500~~	~~1,7 to 34,5~~	~~1.5 to 5~~	~~0,1 to 0,3~~	~~500~~	~~34,5~~	~~800~~	~~55,2~~
~~Phosphor bronze bellows with nickel-plated brass 1/4" NPT (female) pressure connection~~								
~~270~~	~~4 to 200~~	~~0,3 to 13,8~~	~~1 to 4~~	~~0,1 to 0,3~~	~~200~~	~~13,8~~	~~250~~	~~17,2~~
~~274~~	~~6 to 300~~	~~0,4 to 20,7~~	~~1 to 5~~	~~0,1 to 0,3~~	~~300~~	~~20,7~~	~~350~~	~~24,1~~

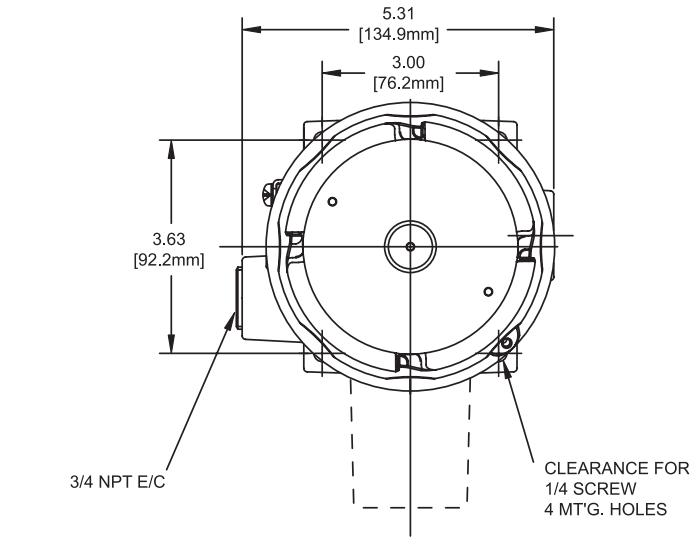
***Over Range Pressure:** The maximum pressure that may be applied continuously without causing damage and maintaining set point repeatability.
****Proof Pressure:** The maximum pressure to which a pressure sensor may be occasionally subjected, which causes no permanent damage. The unit may require calibration (e.g. start-up, testing)
***Deadband note:** Models 190-194, 490-494 are expressed as the lower 75 % and top 25% of the range span because of the operating characteristics of the diaphragm sensor and switch.

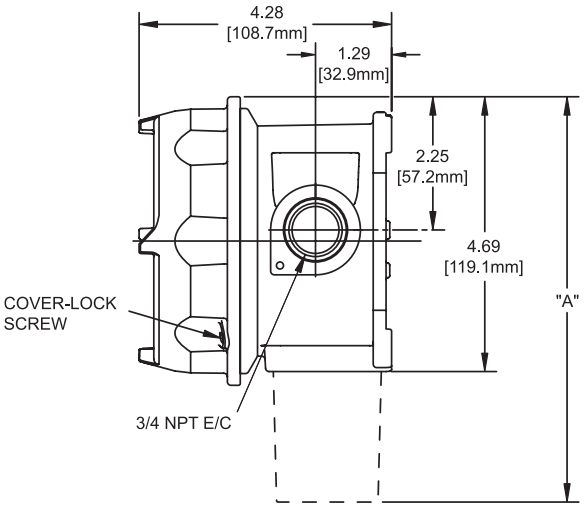
DIMENSIONAL DRAWINGS

(Dimensional drawings for all models may be found at www.ueonline.com)

Internal Set Point Adjustment, dual conduits

Types J120, J120K, C120, F120





Dimension A			
Models	**Inches**	**mm**	**NPT**
Pressure			
126-164	7.25	184.2	1/4
~~S126B-S164B~~	~~7.63~~	~~193.8~~	~~1/2~~
~~171-174~~	~~8.72~~	~~221.5~~	~~1/2~~
~~183-186, 483-486~~	~~8.41~~	~~213.6~~	~~1/2~~
~~188-189, 488-489~~	~~7.47~~	~~189.7~~	~~1/2~~
~~190-194, 490-494~~	~~7.44~~	~~189.0~~	~~1/2~~
~~270-274~~	~~8.13~~	~~206.5~~	~~1/4~~
~~356-361, 376~~	~~8.09~~	~~205.5~~	~~1/4~~
~~450, 452~~	~~8.81~~	~~223.8~~	~~1/4~~
~~451, 453, 454~~	~~8.06~~	~~204.7~~	~~1/4~~
~~520-525~~	~~9.25~~	~~235.0~~	~~1/2~~
~~530-535~~	~~8.84~~	~~224.5~~	~~1/2~~
~~550, 552~~	~~8.81~~	~~223.8~~	~~1/4~~
~~551, 553-555~~	~~8.34~~	~~211.8~~	~~1/4~~
~~560-564~~	~~7.53~~	~~191.3~~	~~2" Sanitary~~
~~565-567~~	~~7.53~~	~~191.3~~	~~1-1/2" Sanitary~~
~~612, 616~~	~~7.88~~	~~200.2~~	~~1/4~~
~~680~~	~~8.13~~	~~206.5~~	~~1/4~~
~~701-705, 15622~~	~~7.44~~	~~189.0~~	~~1/4~~
~~**Differential Pressure**~~			
~~36-39, 147-157, 367~~	~~7.59~~	~~192.8~~	~~1/4~~
~~S147B-S157B~~	~~7.59~~	~~192.8~~	~~1/2~~
~~455-457, 559~~	~~8.44~~	~~214.4~~	~~1/4~~
~~540-543~~	~~9.34~~	~~237.2~~	~~1/8~~
~~544-548~~	~~9.41~~	~~239.0~~	~~1/8~~
~~**Temperature**~~			
~~120-121~~	~~9.13~~	~~231.9~~	~~Immersion Stem~~
~~1BS-8BS~~	~~8.47~~	~~215.1~~	~~Bulb & capillary~~

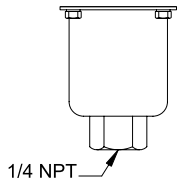
All dimensions stated in inches (millimeters)

DIMENSIONAL DRAWINGS

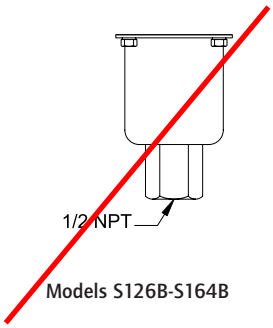
SENSORS

Pressure Sensors

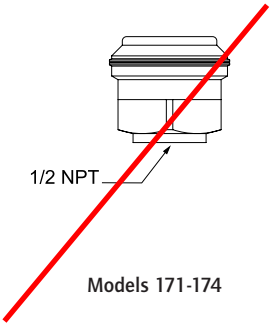
(see drawings and charts on page 21 & 22 for complete dimensions)



Models 126-164



Models S126B-S164B



Models 171-174

Bourdon Tube Pressure Gauges
Industrial Stainless Steel Gauge
Type 232.54 - Dry Case
Type 233.54 - Liquid-filled Case

Applications

- Intended for adverse service conditions where pulsating or vibration exists
- Process industry: chemical/petrochemical, power stations, mining, on and offshore, environmental technology, mechanical engineering and plant construction
- Suitable for gaseous or liquid media that will not obstruct the pressure system

Product features

- Vibration and shock resistant (with liquid filling)
- All stainless steel construction
- Pressure ranges up to 15,000 psi
- FlexWindow™ option with integrated pressure compensation and 100% case fill (*)

Bourdon Tube Pressure Gauge Model 232.54

Specifications

Design
ASME B40.100 & EN 837-1

Sizes
2½” & 4” (63 & 100 mm)

Accuracy class
2½”: ± 2/1/2% of span (ASME B40.100 Grade A)
4”: ± 1% of span (ASME B40.100 Grade 1A)

Ranges
Vacuum / Compound to 200 psi (16 bar)
Pressure from 15 psi (1 bar) to 15,000 psi (1000 bar)
or other equivalent units of pressure or vacuum

Working pressure

2½”:	Steady:	3/4 scale value
	Fluctuating:	2/3 full scale value
	Short time:	full scale value
4”:	Steady:	full scale value
	Fluctuating:	0.9 x full scale value
	Short time:	1.3 x full scale value

Operating temperature
Ambient: -40°F to +140°F (-40°C to +60°C) - dry
-4°F to +140°F (-20°C to +60°C) - glycerine filled
-40°F to +140°F (-40°C to +60°C) - silicone filled
Medium: +212°F (+100°C) maximum

Temperature error
Additional error when temperature changes from reference temperature of 68°F (20°C) ±0.4% of span for every 18°F (10°K) rising or falling.

Ingress protection
IP 65 per EN 60529 / IEC 60259
IP 66 (NEMA 4) with FlexWindow option (2½” only)

Pressure connection
Material: 316 stainless steel
Lower mount (LM) or center back mount (CBM) - 2½”
Lower mount (LM) or lower back mount (LBM) - 4”
1/4” NPT or 1/2” NPT limited to wrench flat area

Bourdon tube
Material: 316L stainless steel
< 1,500 psi (100 bar): C-shape,
≥ 1,500 psi (100 bar): Helical type

Movement
300-series stainless steel

Dial
White aluminum with black lettering; 2½” size with stop pin

(*) ASME B40.100 and EN837-1 do not apply to gauges with FlexWindow option

Pointer
Black aluminum, friction adjustable

Case
304 stainless steel with vent plug for ranges ≤ 300 psi (FlexWindow option without vent plug) and polished stainless steel bayonet ring. Suitable for liquid filling. Welded case/socket connection.

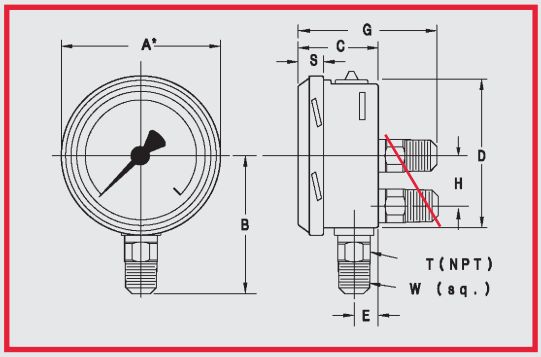
Window
Laminated safety glass with Buna-N gasket
FlexWindow (clear liquid silicone rubber)

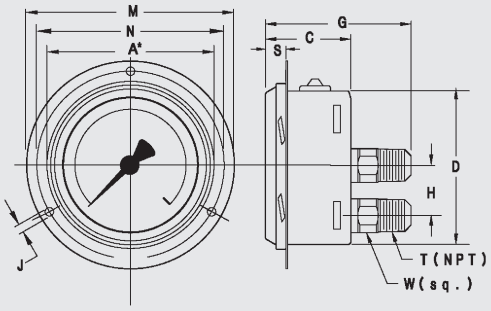
Case fill
Glycerine 99.7% - Type 233.54
100% Case fill with integrated pressure compensation with FlexWindow option (only available in 2½")

Optional extras
- 316SS restrictor
- Accuracy ±1.0% of full scale (2½" size)
- Stainless steel front or rear flange
- Zinc-plated steel or SS u-clamp bracket (field installable)
- Red drag pointer or mark pointer (*)
- Silicone or Halocarbon oil case filling (*)
- Special connections limited to wrench flat area
- Cleaned for O2 service (*)
- Custom dial layout
- Other pressure scales available
  bar, kPa, MPa, kg/cm² and dual scales

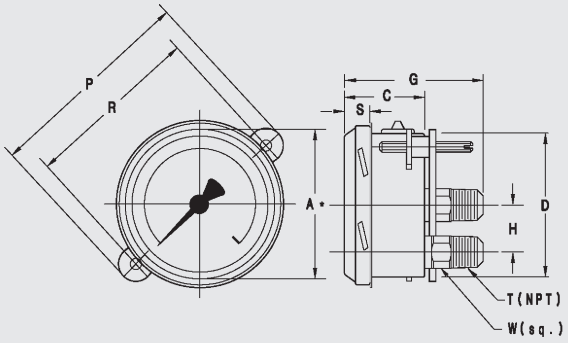
(*) Not available with FlexWindow

Dimensions

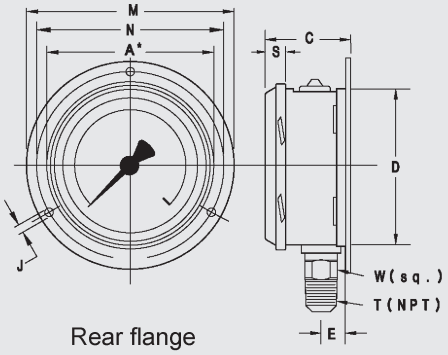




Front flange



U-clamp



Rear flange

Size		A	B	C	D	E	G	H	J	M	N	P	R	S	T	W	Weight	
2.5"	mm	70	54	33.5	62	13	55.5	-	3.6	85	75	87	72	12		14	~~0.36 lb.~~	~~dry~~
	in	2.75	2.13	1.32	2.44	0.51	2.19	-	0.14	3.35	2.95	3.43	2.83	0.47	1/4"	0.55	0.44 lb.	filled
4"	mm	110	87	49.5	100	15.5	81	30	4.8	132	116	125	110	15		22	1.10 lb.	dry
	in	4.30	3.43	1.95	3.94	0.61	3.19	1.18	0.19	5.20	4.57	4.92	4.33	0.59	1/2"	0.87	1.76 lb.	filled

Recommended panel cutout is dimension D + 3 mm

Standard Order Code - 23X.54 2½”

			Measuring System
1		3	Stainless Steel
			Case filling
		2	without
2		3	with
			Case
3		54	Removable bayonet ring
			Unit of outer Scale
		B	bar
		P	psi / -inHg
		L	kPa
		E	MPa
4		K	kg/cm2
			Measuring range
		G	gauge pressure range
5		V	vacuum- or compound-range
			Scale range
		310	0/15 psi (-30"Hg/0)
		321	0/30 psi (-30"Hg/15 psi)
		341	0/60 psi
		369	0/100 psi
		411	0/160 psi
		414	0/200 psi
		421	0/300 psi
		428	0/400 psi
		441	0/600 psi
		455	0/800 psi
		469	0/1000 psi
		510	0/1500 psi
		514	0/2000 psi
		521	0/3000 psi
		528	0/4000 psi
		534	0/5000 psi
		541	0/6000 psi
		552	0/7500 psi
		569	0/10000 psi
		610	0/15000 psi
		331	-30 inHg/30 psi
		352	-30 inHg/60 psi
		379	-30 inHg/100 psi
		412	-30 inHg/160 psi
		415	-30 inHg/200 psi
6		422	-30 inHg/300 psi

			2nd Scale / Special Scale
		Z	without
		B	2nd scale bar
		P	2nd scale psi
		L	2nd scale kPa
		E	2nd scale MPa
7		K	2nd scale kg/cm2
			Process Connection
		NB	1/4 NPT
		GB	G 1/4 B
8		NH	1/8 NPT
			Connector location
		U	lower mount
		B	center back mount
		E	3 o'clock
		G	9 o'clock
9		D	12 o'clock
			Mounting Flange/Bracket
		Z	Without (Standard)
		F	front flange, polished SS
		C	Rear Flange, Stainless Steel
10		K	Panel mount with Stainless steel U-clamp
			Restrictor
		Z	Without (Standard)
		Q	stainless steel, D 0.6
11		R	Stainless Steel, Orifice 0.3mm(0.012 inches)
			Special design features
		Z	without (Standard)
		G	for Oxygen, Cleanliness ASME B40.1 Level IV
		D	Cleanliness ASME B40.1 Level IV
12		N	NACE Sour Gas Service
			Certificates
		Z	without (Standard)
13		1	quality certificates
			Approvals
14		Z	without (Standard)
			Additional ordering information
		Z	Without (Standard)
15		T	Additional text

233.54.063-PV310L-NB-UZZZ-ZZZ

Modelcode: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

2 3 . 54 .063 - - - - - Z

Additional Text:

Additional scale ranges and options are available. Please contact the factory or access the product configurator for model 23X.54 on the WIKA US website.

Diaphragm-Type Diaphragm Seals

Mini Diaphragm Seal

Type L990.TB

Diaphragm Seals

Application
Process industry diaphragm seal to combine with Bourdon tube pressure gauges. Intended for corrosive, contaminated, hot or viscous pressure media.

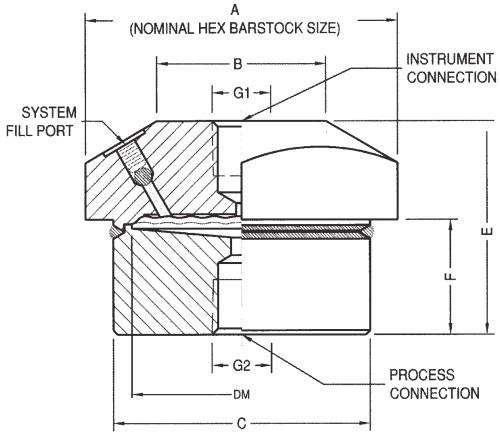
Design
Upper and lower housing welded with integral diaphragm
It requires hydraulic fluid to transmit pressure to instrument

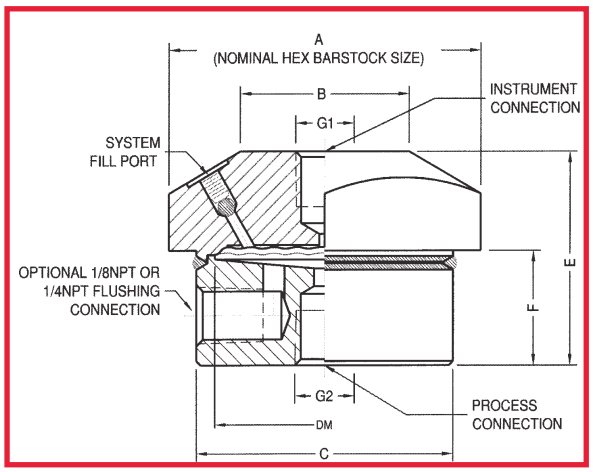
Process Connection
¼" or ½" NPT-female, other see options

Instrument Connection
¼" or ½" NPT-female

Suitable Pressure Ranges (MWP 2500PSI @250°F)
2 ½" gauge: 15 PSI to 2500 PSI
4 or 4 ½" gauge: 15 PSI to 2500 PSI

Available Options
See Selection Guide (over)





G1: INSTRUMENT CONNECTION
G2: PROCESS CONNECTION
DM: EFFECTIVE DIAPHRAGM DIAMETER
ALL DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED

G1	G2	A	B	C	DM	E	F	WEIGHT lbs.
1/4"NPT OR ~~1/2"NPT~~	1/4"NPT OR ~~1/2"NPT~~	2.50 ACROSS FLATS	1.56	2.38	2.1	1.94	1.04	1.4
1/4"NPT OR 1/2"NPT	3/4"NPT OR 1"NPT	2.50 ACROSS FLATS	1.56	2.38	2.1	2.24	1.34	1.5

DWG.#2089077-5

To determine the effects of temperature and response time in a specific application, contact the factory for an ***Application Questionnaire***. The information provided will allow WIKA Technical Support to accurately model your application parameters using state-of-the-art computer simulation techniques.

ACS L990.TB
(ACS 99.01.M)

Selection Guide – 990.TB

990.TB,1/4X1/4F,SS,SS-0,SS

Diaphragm Material
SS = 316 stainless steel
MO = Monel® 400 (See note 2)
HC = Hastelloy® C-276
HB = Hastelloy® B-2
CA = Carpenter® 20 (See note 2)

Flushing Connection
0 = None
1 = 1/8" NPT female
2 = 1/4" NPT female (see note 3)

Lower Housing Material
SS = 316 stainless steel
MO = Monel® 400 (See note 2)
HB = Hastelloy® B-2
HC = Hastelloy® C-276
CA = Carpenter® 20 (See note 2)

Upper Housing Material
SS = 316 stainless steel
MO = Monel® 400 (See note 2)
HC = Hastelloy® C-276
CA = Carpenter® 20 (See note 2)

Process Connection
1/4F = 1/4" NPT female
1/2F = 1/2" NPT female
3/4F = 3/4" NPT female
1.0F = 1" NPT female
1/4M = 1/4" NPT male
1/2M = 1/2" NPT male
3/4M = 3/4" NPT male
1.0M = 1" NPT male

Instrument Connection
1/4 = 1/4" NPT female
1/2 = 1/2" NPT female
CPL= Capillary connection (to weld capillary directly to seal)

Diaphragm Seal Design
990.TB = Large Diaphragm Design, d_M=2.1" (See note 1) MWP = 2500 PSI

Notes
1. Suitable pressure ranges 0-15 PSI to 0-2500 PSI.
2. Upper housing, lower housing and diaphragm must all be Monel®.
3. Available from stock with stainless steel lower housing only.

*Items in **bold** are available from stock (subject to prior sales). For optional items, consult factory for current lead-time.*

Options not listed may be available, please consult factory.
Fill Fluid & Mounting options: Please reference data sheet ACS 99.MO.

THE MEASURE OF
Total Performance™

Ordering Information:
State computer part number (if available) / type number / size / range / connection size and location / options required.

03/07

WIKA Instrument Corporation
1000 Wiegand Boulevard
Lawrenceville, Georgia 30043-5868
Tel: 770-513-8200 Fax: 770-338-5118
http://www.wika.com e-mail:diaphragmseal@wika.com

4.2 SAM® Type GDS Grit Dewatering Screw

4.2.1 Technical Specifications

VWS' DS #	PDS_001_SAM Type GDS
Pretreatment equipment - Grit dewatering screw system	
SAM Type GDS Grit dewatering screw	

Customer:		REV.	BY
City of Jefferson, GA		1	Bertrand Landry
	PROJECT NUMBER	DATE	
	5000222018	13-juin-22	
Project:	REQUISITION NUMBER	PO NUMBER	
Jefferson, GA		0000000493	
	APPROVED BY	CUSTEMER APPROVAL	

REV.	BY	DATE	DESCRIPTION	VERIF.	APPROV.
1	Bertrand Landry	17-mai-22	For approbation		

					rev
GENERAL	TAG:		P&ID:	5000222018-PI001 REV.1	
	SERVICE:				
	SUPPLIER: VEOLIA WATER SOLUTIONS AND TECHNOLOGIES				
General	Quantity		1		
	Reference model		JOHN MEUNIER / GDSC/9-10-25XA		
	Inlet capacity		200 GPM		
	Hydraulic capacity of the hopper		165 GPM		
	Screw handling capacity		60 ft³/h		
	Zone Classification		Cl.1 Div.1		
Dimensions	Equipment dimensions		5000222018-FI312010 REV.1		
	Type of screw		Shafted screw		
	Screw length		120 in		
	Screw diameter		Ø9 in		
	Screw pitch		9 in		
	Screw installation angle		25 °		
	U trough length		10 ft		
	U trough inside width		10 in		
	U trough thickness		0.25 in		
	Drain connection diameter		Ø2 in MNPT [Ø51 mm]		
	Drain connection for the drain pan		0		
	Inlet hopper thickness		0.1875 in		
	Covers thickness		18 Ga		
	Discharge height		49 in		
	Equipment weight		2022 lbs		
Options	Bagger system		N/R		
	Connection for odor control system		N/R		
	Cold weather protection package		N/R		
	Plug-in Flexible chute		N/R		
	Plug-in rigid chute		N/R		
	Settling plates		Included		
	Washing system		N/R		
	Anchor		Included		
Construction material	Inlet hopper		SS304		
	U screw trough		SS304		
	Covers		SS304		
	Screw		Abrasion Resistant Carbon Steel (CHT 400)		
	Settling plates		SS304		
	Supports		SS304		
	Cyclone support		SS304		
	Cyclone		Cyclone: Epoxy painted carbon steel; Apex housing: Aluminum; Vortex finder: Ni-Hard; Cylinder, cone and apex liners: Pure gum rubber		
	Support de tube de décharge		N/R		
Washing system (Potable water or process water)	Washing System	Connection diameter	N/R		
		Flow requirement	N/R		
		Operation	N/R		
		Manual Ball Valve	N/R		
		Control valve	N/R		
Drive system	Motor	Power	1 HP (0.74 kW), (460V / 3Ph / 60Hz), Cl.1 Div.1		
		Type / Model	WEG, 143T		
		Operation	Intermittent (On pumping cycle of the grit chamber)		
	Reducer	Rotation speed	11 RPM		
		Type / Model	SEW, FAF77		
Instrumentation	Emergency pull cord	Type	N/R		
		Model / CIssification	N/R		
	Mouvement detection system	Type	N/R		
		Controller model / Classification	N/R		
		Probe model / classification	N/R		
Accessory	Grit slurry separation	Type	Cyclone		
		Model	D10LB-SDM-844		
Commentary	Maintenance access		At operation floor		

4.2.2 Components Details

4.2.2.1 Screw Motor

		No.:
		Date: 10-JAN-2020

Customer :

TECHNICAL PROPOSAL

Three-phase induction motor - Squirrel cage rotor

Product line : TEFC - Explosion Proof - NEMA Premium Efficiency

Catalog Number :
List Price : $

Notes:

Performed by:	Checked:

No.:

Date: 10-JAN-2020

DATA SHEET

Three-phase induction motor - Squirrel cage rotor

Customer	:	
Product line	:	TEFC - Explosion Proof - NEMA Premium Efficiency

Frame	:	145T
Output	:	1 HP
Frequency	:	60 Hz
Poles	:	4
Full load speed	:	1760 rpm
Slip	:	2.22 %
Voltage	:	208-230/460 V
Rated current	:	3.16-2.86/1.43 A
Locked rotor current	:	24.6/12.3 A
Locked rotor current (Il/In)	:	8.6
No-load current	:	1.87/0.935 A
Full load torque	:	2.94 lb.ft
Locked rotor torque	:	290 %
Breakdown torque	:	370 %
Design	:	B
Insulation class	:	F
Temperature rise	:	80 K
Locked rotor time	:	18 s (hot)
Service factor	:	1.15
Duty cycle	:	S1
Ambient temperature	:	-20°C - +40°C
Altitude	:	1000 m
Degree of Protection	:	IP55
Approximate weight	:	62 lb
Moment of inertia	:	0.09753 sq.ft.lb
Noise level	:	51 dB(A)

	D.E.	N.D.E.
Bearings	6205 2RS	6204 2RS
Regreasing interval	---	---
Grease amount	---	---

Load	Power factor	Efficiency (%)
100%	0.77	85.5
75%	0.70	82.5
50%	0.57	80.0

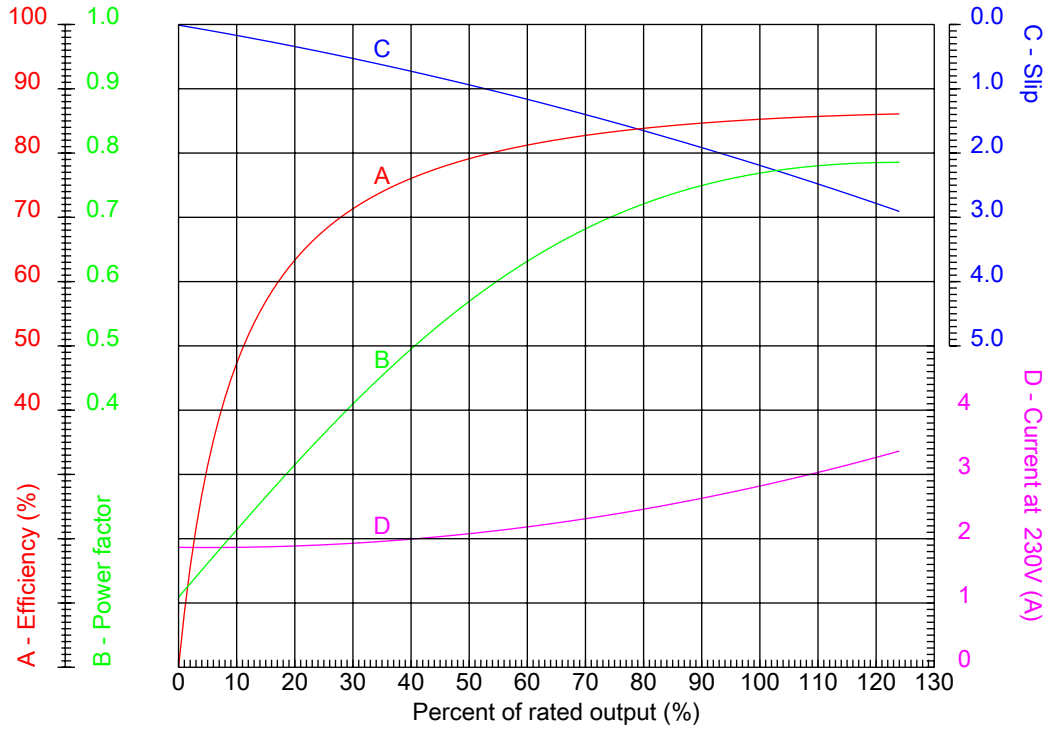
Notes:

Performed by	Checked

	No.:
	Date: 10-JAN-2020

PERFORMANCE CURVES RELATED TO RATED OUTPUT

Three-phase induction motor - Squirrel cage rotor



Customer	:
Product line	: TEFC - Explosion Proof - NEMA Premium Efficiency

Frame	: 145T	Locked rotor current (Il/In)	: 8.6
Output	: 1 HP	Duty cycle	: S1
Frequency	: 60 Hz	Service factor	: 1.15
Full load speed	: 1760 rpm	Design	: B
Voltage	: 208-230/460 V	Locked rotor torque	: 290 %
Rated current	: 3.16-2.86/1.43 A	Breakdown torque	: 370 %
Insulation class	: F		

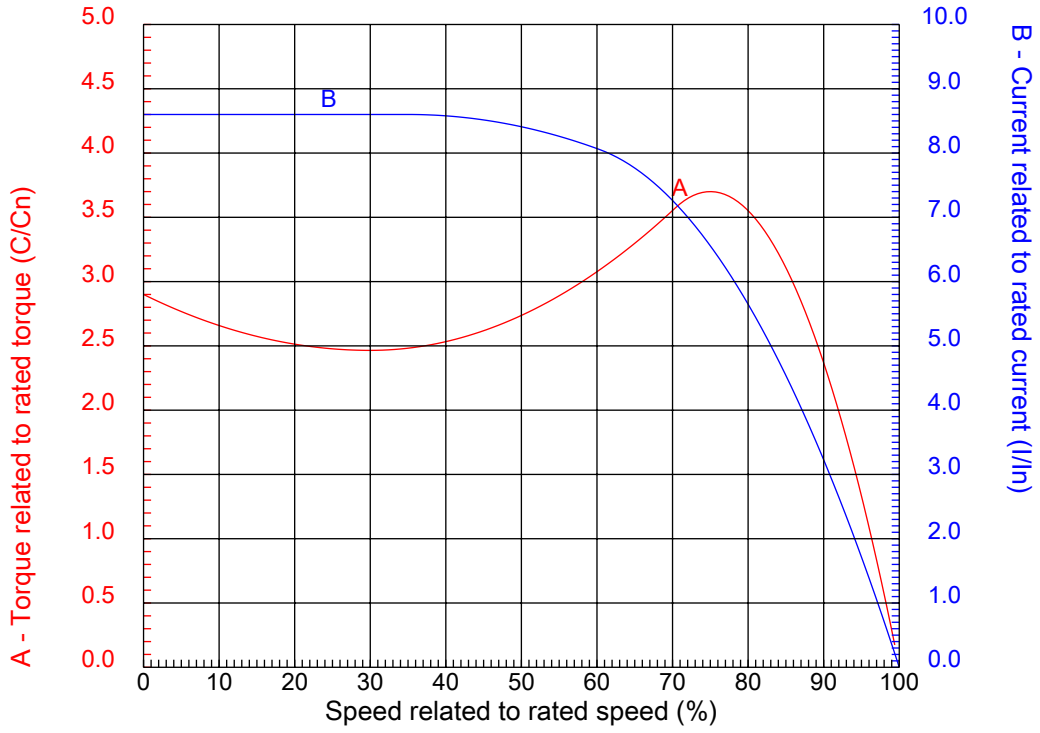
Notes:

Performed by	Checked

	No.:
	Date: 10-JAN-2020

CHARACTERISTIC CURVES RELATED TO SPEED

Three-phase induction motor - Squirrel cage rotor

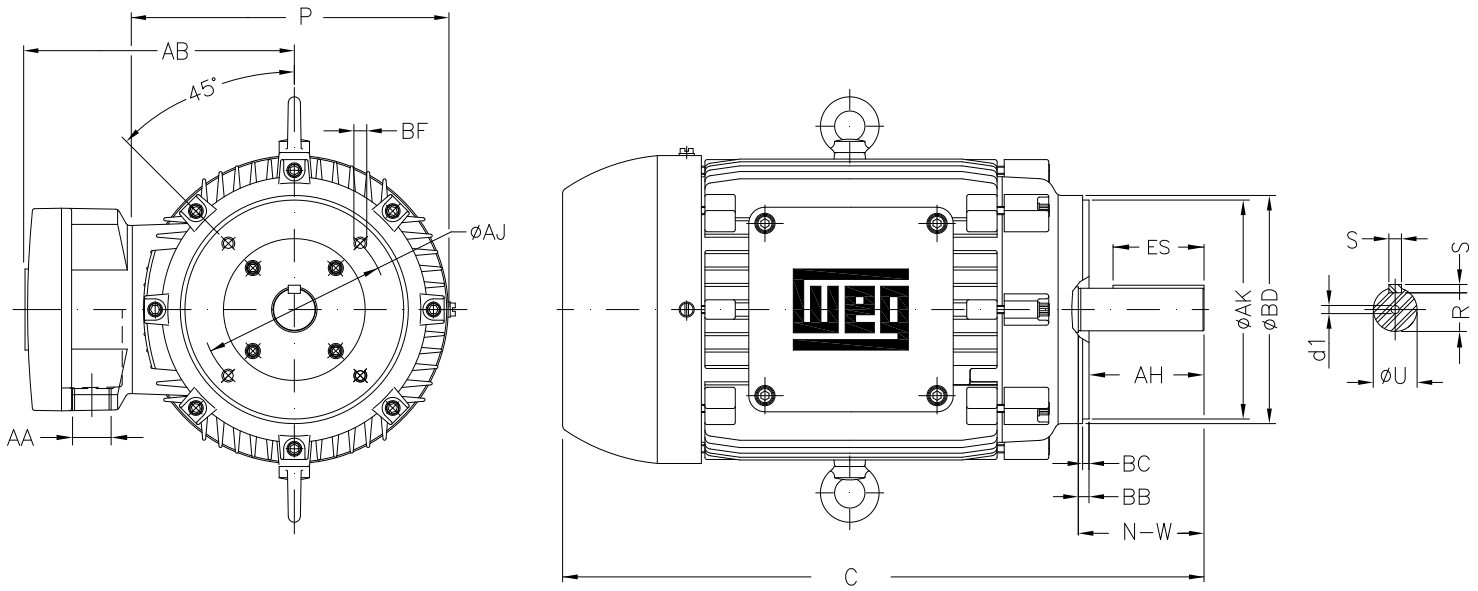


Customer	:
Product line	: TEFC - Explosion Proof - NEMA Premium Efficiency

Frame	: 145T	Locked rotor current (Il/In)	: 8.6
Output	: 1 HP	Duty cycle	: S1
Frequency	: 60 Hz	Service factor	: 1.15
Full load speed	: 1760 rpm	Design	: B
Voltage	: 208-230/460 V	Locked rotor torque	: 290 %
Rated current	: 3.16-2.86/1.43 A	Breakdown torque	: 370 %
Insulation class	: F		

Notes:

Performed by	Checked



Notes:

Performed by:

Checked:

Customer:

P 7.000	ES 1.575	S 0.187	depth 0.187	N-W 2.250
U 0.875	R 0.771	AB 6.811	C 13.740	AA NPT 3/4"
d1 A 4	d2 A 4	Flange FC-149	AJ 5.874	AK 4.500
BD 6.500	BF UNC 3/8"x16	BB 0.157	BC 0.125	AH 53.98

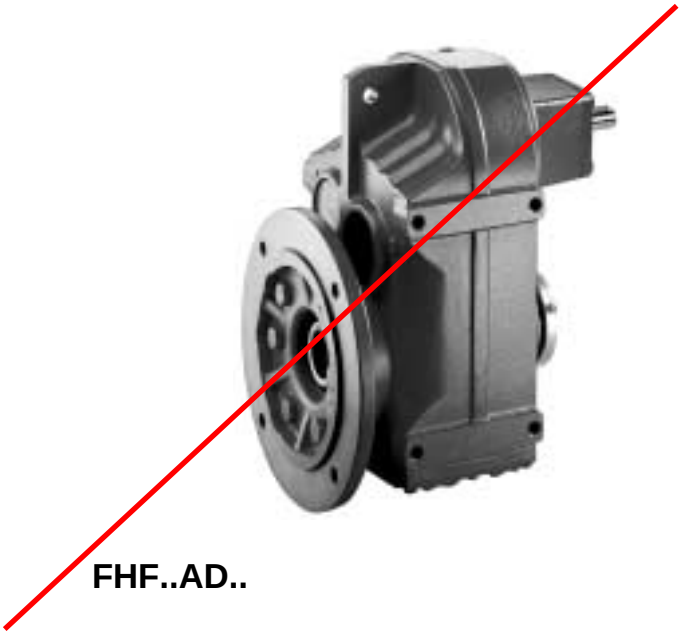
TEFC - Explosion Proof - NEMA Premium Efficiency

Three-phase induction motor

Frame 145T - IP55

10-JAN-2020

4.2.2.2 Screw Reducer



FHF..AD..

FA..AD..

General Information

Introduction

The SEW-Eurodrive theSNUGGLER® Helical Gear Units are designed for continuous duty under difficult operating conditions. Only materials of the highest quality are used in the manufacture of the units. These units have the following standard construction features:

Helical gearing in compliance with ANSI/AGMA Standard 2001-B88.

Gears are carburized to a hardness of 58 - 62 R_C for durability.

Gearcase and flanges of high strength gray cast iron SAE Class 30.

Double-lip oil seals on output shaft with additional inner seal made of Viton®.

Captured keys on input shafts.

Foot mounted, flange mounted, foot/flange mounted, shaft mounted, flange mounted with hollowshaft, or shaft/flange/foot mounted.

Integral torque arm.

Efficiency

The efficiency of the gear units is primarily determined by the gearing and bearing friction, and ranges from approximately 94% for 3 stages of gear reduction to 96% for 2 stages of gear reduction.

Output Power, Torque, and Speed

The details on power, torque, and speed given in the selection tables always refer to the mounting position H1 or similar mounting position for standard features, standard ambient conditions, and standard lubricants. The output speeds have been rounded up or down. The actual output speed may vary slightly due to the motor frame size, the loading, or the supply voltage.

Design Variations

Additional features available for theSNUGGLER® Gear Units are:

Adapters for IEC or NEMA C-Face motors.

Motor mounting platforms and scoops.

Adapters for torque limiting couplings.

Corrosion protection.

Shrink disc shaft mounting.

Please contact your SEW-Eurodrive representative for additional information.

Abbreviations

The following abbreviations are used in the selection tables:

f_B	Service Factor
F_{Ra}	Permissible output overhung load (lb) at the midpoint of the output shaft extension
F_{Re}	Permissible input overhung load (lb) at the midpoint of the input shaft extension
i	Gear unit ratio
n_a	Output speed in rpm
n_e	Input speed in rpm
P_a	Rated output power (HP)
P_e	Calculated power input into the gear unit (HP) P_e is calculated from $T_{a\ max}$ by taking into account the gear units' efficiency under standard operating conditions. For calculated P_e less than .2HP, a dash (—) is shown in the respective selection tables since the actual values are subject to large variations.
P_n	Motor rated power (HP)
T_a	Output torque (lb-in.) with reference to the driving motor
$T_{a\ max}$	Maximum permissible output torque (lb-in.) at $f_B = 1.0$

Dimension Page Notes

The dimension sheets are valid for standard units with various basic features. In particular, accessories such as platforms, scoops, etc. will alter the basic dimensions. Please refer to the respective accessory dimension pages for additional dimensions.

Certified dimension sheets are available from your SEW-Eurodrive Assembly Center.

Viton® is a registered trademark of DuPont Dow Elastomers

Service Factoring
Using AGMA Criteria

SEW-Eurodrive gear units may be service factored using criteria set forth in the various AGMA Standards.

For: a) Parallel Helical (type R and F) gearmotors.
b) Right angle Helical-Bevel (type K) gearmotors.

AGMA uses service classes I, II, and III, which are based on:

Class I: Steady loads not exceeding normal rating and 8-10 hours running time per day.
Service Factor 1.0 minimum

Class II: a. Steady loads not exceeding normal rating and 24 hours running time per day.
b. Moderate shock loads, not exceeding 1.25 × Rated Load Torque and 8-10 hours running time per day.
Service Factor 1.4 minimum

Class III: a. Moderate shock loads, 1.25 × Rated Load Torque and 24 hours running time per day.
b. Heavy shock loads, exceeding 1.25 × Rated Load Torque and 8-10 hours running time per day.
Service Factor 2.0 minimum

Reference AGMA Standard 6019-E89 for Service Class listings by application.

AGMA uses service factors for electric motors, turbines, and hydraulic motors as listed by the chart below.
In the chart, the reducer loading may be classified as follows:

(1) Uniform Load. Recurrent shock loads do not exceed the nominal specified input or prime mover power.

(2) Moderate Shock Load. Recurrent shock loads do not exceed 1.25 × the nominal specified input or prime mover power.

(3) Heavy Shock Load. Recurrent shock loads do not exceed 1.50 × the nominal specified input or prime mover power.

(4) Extreme Shock Load. Recurrent shock loads do not exceed 1.75 × the nominal specified input or prime mover power.

NOTE: The magnitude of any recurrent shock loads should be estimated or determined through test by the system designer. Recurrent shock loads can be of such a short duration that they may not be reflected in motor amperage readings. In these cases actual loads are usually determined by strain gaging the driven shaft of the machine.

Duration of Service (Hours per Day)	Uniform Load	Moderate Shock	Heavy Shock	Extreme Shock
Occasional .5 hour	—	—	1.00	1.25
Less than 3 hours	1.00	1.00	1.25	1.50
3-10 hours	1.00	1.25	1.50	1.75
Over 10 hours	1.25	1.50	1.75	2.00

When the prime mover is a single or multi-cylinder engine, the service factors must be modified by the following:

Steam and Gas Turbines, Hydraulic or Electric Motor	Single Cylinder Engines	Multi-Cylinder Engines
1.00	1.50	1.25
1.25	1.75	1.50
1.50	2.00	1.75
1.75	2.25	2.00
2.00	2.50	2.25
2.25	2.75	2.50
2.50	3.00	2.75
2.75	3.25	3.00
3.00	3.50	3.25

Starting conditions where peak loads exceed 200% of rated load and applications with frequent starts and stops require special load analysis.
Service Factor listings by application may be found in:
AGMA 6010-E88 for types R, F and K reducers.
AGMA 6034-B92 for type S reducers and gearmotors.

OHL and Axial Shaft Loads

Overhung loads, OHL, are a combination of live loads acting at right angles to the drive shaft caused by gears, sprockets, pulleys, couplings, etc., as well as dead loads applied directly to the shaft.
These overhung loads subject shaft bearings and shafts to stresses which, if exceeded, may cause premature failure of bearings and/or shaft breakage from bending fatigue.

Determination of Overhung Load - OHL

When determining the resulting overhung load, the type of transmission element mounted on the shaft end must be considered and a transmission element factor, f_z, must be included. The overhung load exerted on the output or input shafts can be then calculated from the following formula. The resultant overhung load F must not exceed the permissible overhung load F_{Ra} for the selected gear unit.

$$F \quad \frac{2T}{d_o} \quad f_z$$

F = equivalent OHL in lbs.
T = load torque on the drive in lb-in.
d_o = pitch diameter of the gear, sprocket, or sheave in inches
f_z = transmission element factor

The transmission element factor, f_z, takes into account an additional radial force that is imposed on the shaft due to the type of transmission element: gear, chain sprocket, or sheave. There are gear teeth separating forces, pre-tensioning of belts, etc. that must be taken into account to determine the total equivalent radial loads. From applicational experience the following values of f_z should be used:

Transmission Element	Comments	f_z Factor
Spur or helical gears	17 teeth	1.0
	< 17 teeth	1.15
Chain sprockets	20 teeth	1.0
	< 20 teeth	1.25
	< 13 teeth	1.4
V-belt pulleys		1.75
Flat belt pulleys		2.5
Timing belt pulleys		1.3

Permissible Output Shaft Loads

The output shaft of the SEW-Eurodrive gear units are capable of accepting the axial and radial loads normally encountered by the mounting of gears, chain sprockets, belt pulleys, and shaft couplings. The permissible OHL under the most unfavorable conditions which can be applied at the midpoint of the shaft extensions for the gear unit type F is shown in the respective speed/power selection tables as F_{Ra} in lbs. When the force is not applied at the midpoint of the shaft extension the F_{Ra} value must be adjusted according to the OHL conversion formulas.

It is possible in some instances for the OHL capacity to be substantially increased if the exact direction of the radial force is known. In such instances it is essential that full details be given to our engineering department to check the suitability of the unit selected.

For permissible axial loads for gear unit type F, please submit full details to our engineering department.

Output OHL Conversion

If the resultant OHL acts at a point other than at the midpoint of the output shaft extension, the permissible OHL, F_X, must be determined at the application point of the load according to the following formula:

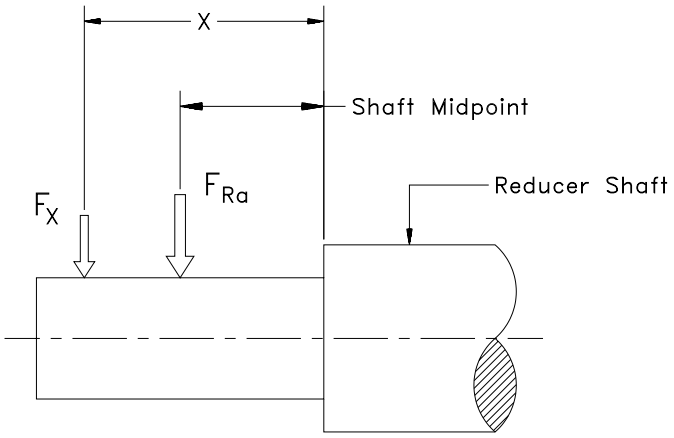
F_{Ra}-(lb.) Permissible overhung load at the midpoint of the output shaft extension—see selection tables.
X-(in.) Distance from the shoulder on the output shaft to the application point of load.
F_X-(lb.) Permissible overhung load at the point X
a-(lb-in.) Gear unit constant - see chart for values.
b,c,d-(in.) Gear unit constant - see chart for values.

The permissible OHL is the smaller of the two values obtained from the following formulae, F_{XL} and F_{XW}, and is denoted as F_X. The permissible OHL, F_X, **must be** greater than the calculated equivalent overhung load, F.

Permissible OHL, $F_{XL} \quad F_{Ra} \quad \frac{c}{d \quad x}(lb)$

Permissible OHL based on shaft stress, $F_{XW} \quad \frac{a \quad 10^3}{b \quad x}(lb)$

Note: F_{XW} applies only when reducer torque, T_a, is maximum.



Frame Size	a lb-in.	b in.	c in.	d in.
F 37	0.95	0	4.86	3.88
F 47	1.58	0	6.04	4.86
F 57	4.86	1.26	6.72	5.34
F 67	3.65	0	7.14	5.56
F 77	6.96	0	8.50	6.53
F 87	10.53	0	10.35	7.99
F 97	18.50	0	13.78	11.02
F 107	37.44	0	14.70	11.36
F 127	83.63	0	17.42	13.29
F 157	92.93	0	20.16	16.02

Unit Selection

In order to select the most suitable gear unit it is essential that a thorough knowledge of the characteristics of the driven machine are known. The gear units are normally designed for constant torque load and only a few starts/stops. If these conditions do not exist, it is necessary to determine a service factor, f_B, from the start/stop frequency, Load Class, and the daily operating time as shown in the diagram below.

For gearmotors, the appropriate service factor taken from the diagram is then compared with the service factor given with each speed/power combination listed in the gearmotor selection tables. To ensure a long, trouble free service life it is essential that the unit selected has a service factor equal to, or greater than, that determined from the diagram.

For speed reducers, the output torque shown in the reducer selection tables is based on $f_B = 1.0$. The product of the torque requirement and the required service factor may not exceed the speed reducer's listed torque rating.

Load Classification

I = Uniform load. Permissible inertia acceleration factor 0.2

II = Moderate shock load. Permissible inertia acceleration factor 3.0

III = Heavy shock load. Permissible inertia acceleration factor 10

For inertia acceleration factor > 10, please contact your nearest SEW-Eurodrive representative.

Inertia acceleration factor = $\frac{J_L}{J_m}$

Where: J_L = Reflected Load Inertia
J_m = Motor Inertia

All external load inertias, J, must be reflected back to the input side of the gear unit.

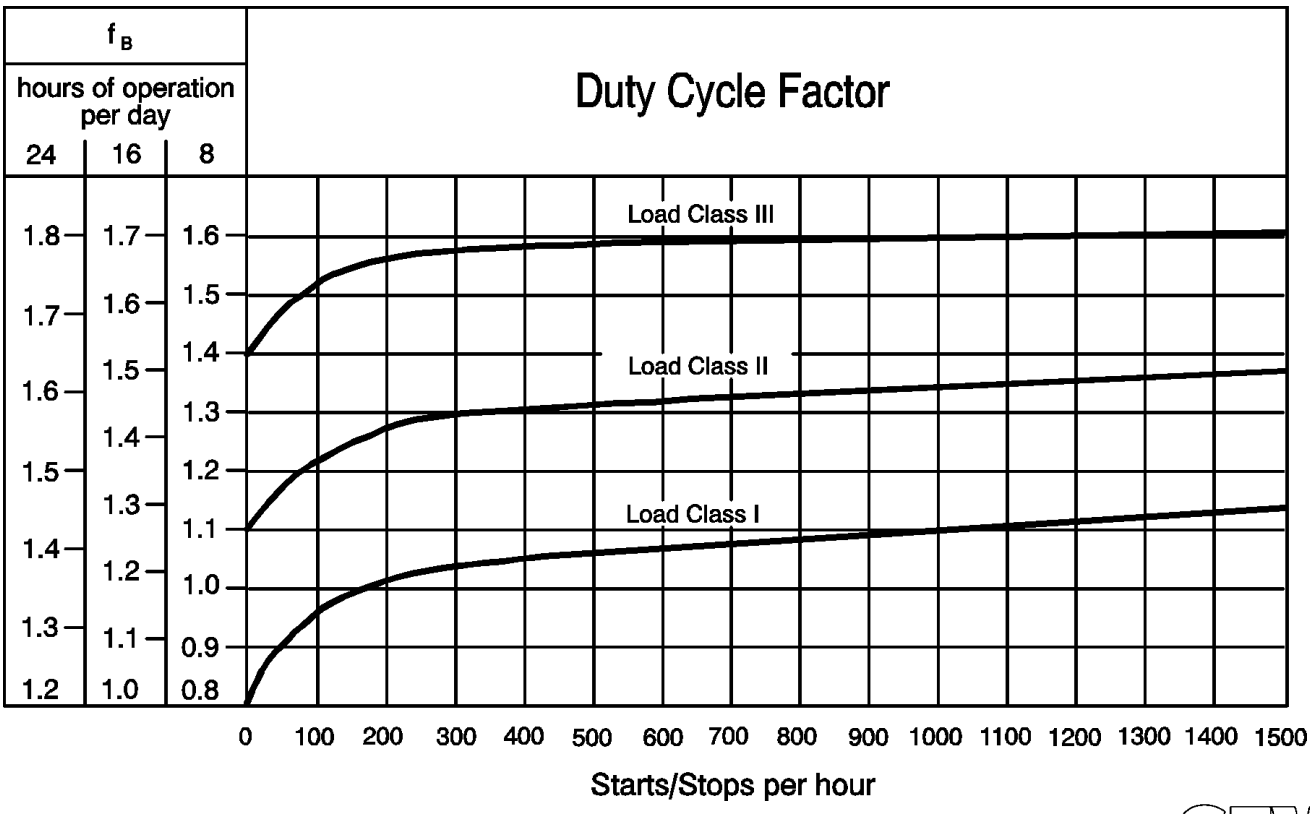
Example: $J_L \quad J \quad \frac{1}{(Gear\ Ratio)^2}$

Included in the number of starts and stops per hour must be all regenerative brake actions and the speed changes from high to low speed as experienced with multi-speed motors.

Example: Load Class I with 200 starts and stops per hour and operating time of 24 hours per day gives $f_B = 1.36$.

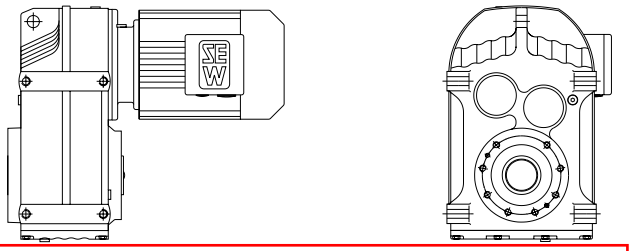
AGMA

For Service Factors using AGMA criteria, please refer to the guidelines on page 4.



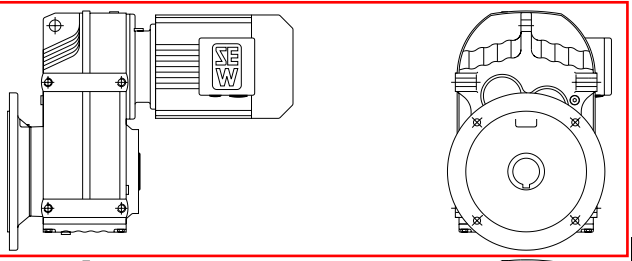
FV..B

Splined hollowshaft (DIN 5480)
Rail mount with tapped holes



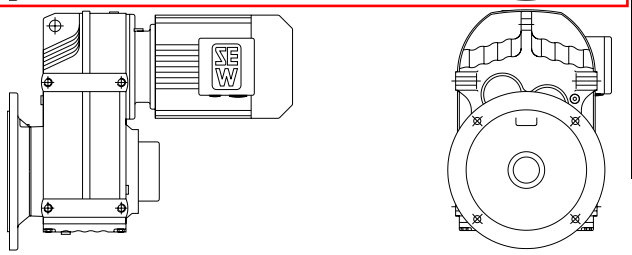
FAF

Hollowshaft with key
Flange mount (D & B5 style flange with through holes)



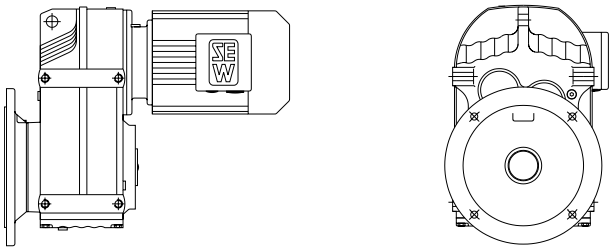
FHF

Shrink disc hollowshaft
Flange mount (D & B5 style flange with through holes)



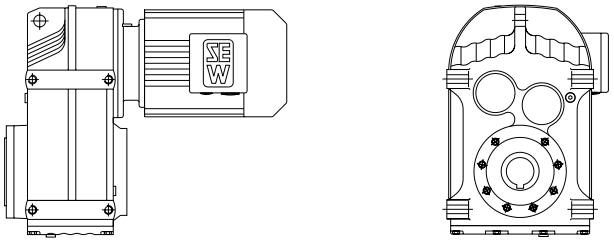
FVF

Splined hollowshaft (DIN5480)
Flange mount (D & B5 style flange with through holes)



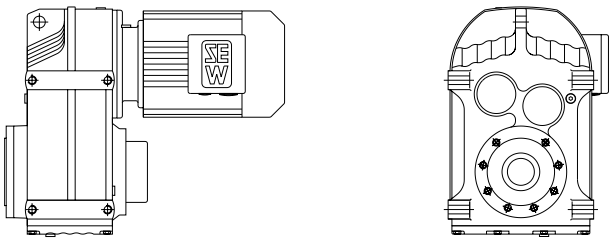
FAZ

Hollowshaft with key
Face mount (C & B14 style flange with tapped holes)



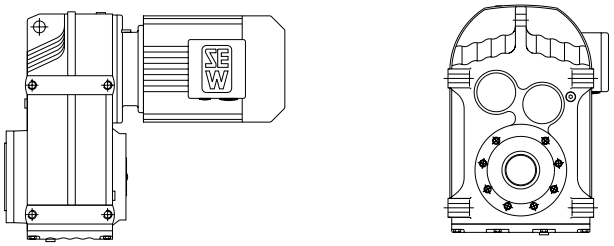
FHZ

Shrink disc hollowshaft
Face mount (C & B14 style flange with tapped holes)



FVZ

Splined hollowshaft (DIN 5480)
Face mount (C & B14 style flange with tapped holes)



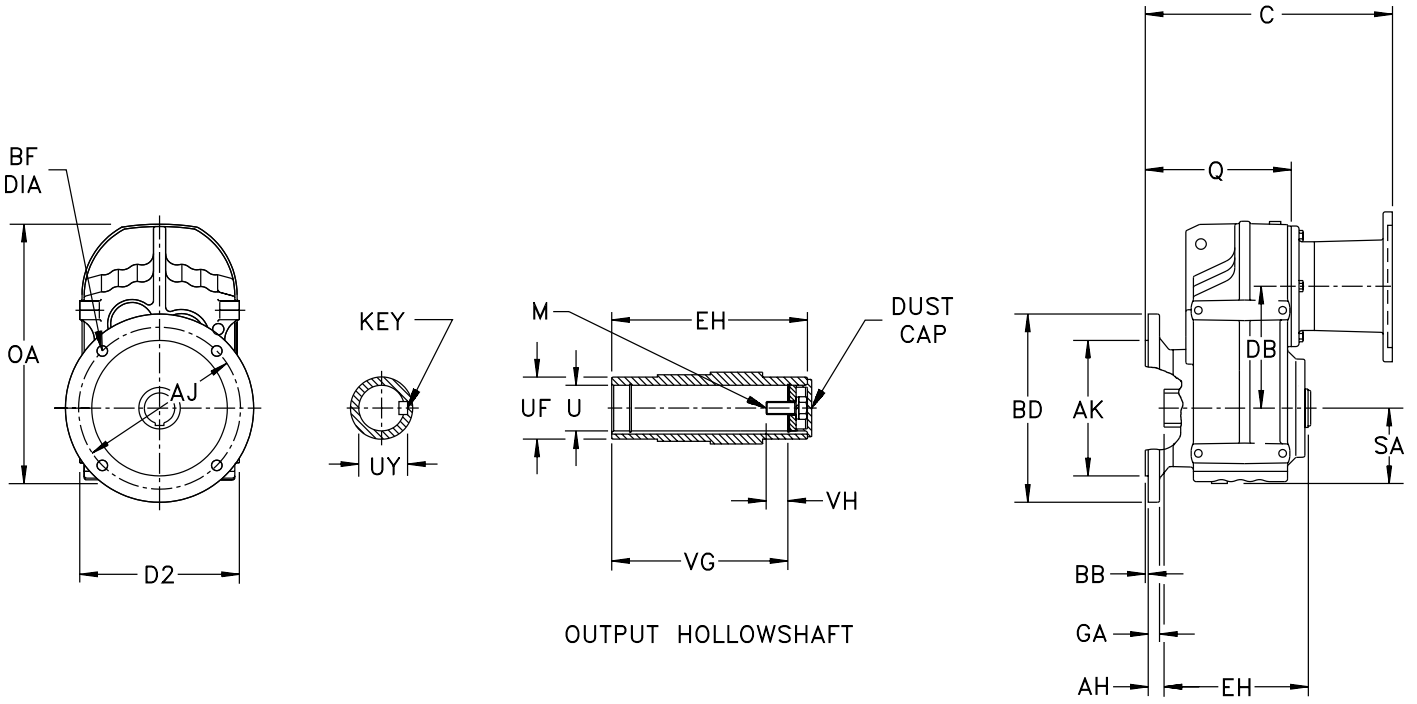
Selections
Speed Reducer with NEMA C-Face Adapter - Type F..LP..
Input Speed = 1750 rpm - Service Factor = 1.0

F..77

Gear Ratio	Output Speed	Output Torque	Output OHL [1]	Stages [2]		LP = AM					
i	n_a	$T_{a\ max}$	F_{Ra}								
	rpm	lb-in	lb	Pri.	Sec.	56	143	145	182	184	213/215
281.71	6.2	13300	3530	3	-						
262.93	6.7	13300	3530	3	-						
225.79	7.8	13300	3530	3	-						
198.31	8.8	13300	3530	3	-						
188.40	9.3	13300	3530	3	-						
166.47	11	13300	3530	3	-						
142.27	12	13300	3530	3	-						
130.42	13	13300	3530	3	-						
114.45	15	13300	3530	3	-						
108.46	16	13300	3530	3	-						
94.93	18	13300	3530	3	-						
85.52	20	13300	3530	3	-						
75.02	23	13300	3530	3	-						
72.50	24	13300	3530	3	-						
66.46	26	13300	3530	3	-						
58.32	30	13300	3530	3	-						
55.27	32	13300	3530	3	-						
48.37	36	13300	3530	3	-						
43.58	40	13300	3530	3	-						
38.23	46	13300	3530	3	-						
33.74	52	13300	3530	3	-						
29.91	59	13300	3530	3	-						
25.54	69	12800	3610	3	-						
36.58	48	9820	4010	2	-						
31.51	56	12200	4010	2	-						
28.75	61	12700	3920	2	-						
25.50	69	13300	3530	2	-						
21.43	82	13300	3530	2	-						
19.70	89	13300	3530	2	-						
17.49	100	13300	3530	2	-						
15.64	112	13300	3380	2	-						
14.06	124	13300	3310	2	-						
12.20	143	13300	3230	2	-						
10.93	160	13300	3180	2	-						
9.30	188	9560	3100	2	-						
8.26	212	9560	3010	2	-						
7.39	237	9560	2930	2	-						
6.64	264	9560	2870	2	-						
5.76	304	9560	2790	2	-						
5.16	339	9560	2730	2	-						
4.28	409	8940	2640	2	-						

[1] Applies to foot mounted with solid shaft units only.
[2] Pri. = primary reducer, Sec. = secondary reducer
Dimension information begins on page 202.

Dimensions
Type FAF Speed Reducers with NEMA C-Face - Flange Mounted with Hollowshaft



Gearcase

Model	D2	DB	OA	Q	SA
FAF77	10.63	7.87	16.77	9.21	4.76
	270	200	426	234	121

Flange (Specify BD dimension when ordering)

	AH	AJ	AK	BB	BD	BF	GA
~~Option 1~~	~~1.46~~	~~10.43~~	~~9.055 +.0006 -.0005~~	~~0.16~~	~~11.81~~	~~0.53~~	~~0.63~~
	~~37~~	~~265~~	~~230 +.016 -.013~~	~~4~~	~~300~~	~~13.5~~	~~16~~
Option 2 [1]	1.46	8.46	7.087 +.0006 -.0004	0.16	9.84	0.53	0.59
	37	215	180 +.014 -.011	4	250	13.5	15

Output Shaft Inch Series/*Optional Metric Series* **For solid shaft design, see page 266.**

Model	EH	U	UF	UY	VG	VH	Key	M
FAF77	8.27	2.000 +.001 -0	2.76	2.22	7.20	1.16	½ ½ 2⅝	⅝ 11 1¾
	210	*50 +.025 -0*	*70*	*53.8*	*183*	*32*	*14 x 9 x 80*	*M16 x 45*

Motor Compatibility - NEMA

Model		56C	NEMA LP 143TC 145TC	182TC 184TC	213TC 215TC
FAF77	C	13.58	14.09	16.69	16.69
		345	358	424	424

Motor Compatibility - IEC

Model		IEC LP 63	71	80	90	100	112	132S/M
FAF77	C	12.66	12.66	13.23	13.82	15.67	15.67	16.69
		321.5	321.5	336	351	398	398	424

Dimensions are **inch** / ***mm***

Dimension C is to motor mounting surface

For the selected LP adapter size the pinion bore must be available in the desired gear ratio for the reducer. Please see the compatibility tables beginning on page 182.

Refer to page 556 for standard NEMA C-Face dimensions.

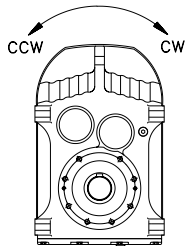
See page 265 for available output shaft sizes.

[1] This flange option reduces the gearbox torque rating - contact SEW-Eurodrive for details.

Mounting Positions

It is essential when ordering a drive to select a desired mounting position from the following pages to ensure the correct amount of oil lubricant is supplied with the drive.
In addition the following details must also be specified:

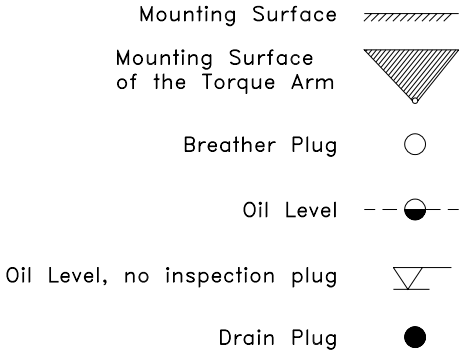
a. Direction of rotation of the output shaft (only if a backstop or a unidirectional torque monitor is required).



If these details are not specified then the drive will be supplied:

Mounting Position — H1

The mounting positions show the following (when applicable):



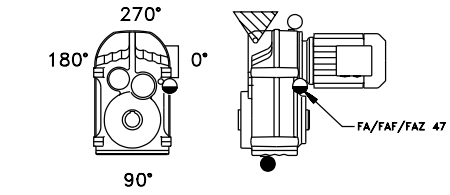
With certain mounting positions the first gear reduction stage is completely immersed in oil. On the larger gear unit sizes and with high peripheral speeds of the input stage (low reduction ratios) churning losses constitute a factor which must be taken into account. Please contact our engineering department on this issue (also see notes on the Mounting Position pages).

Additionally, the mounting position H6 where the high speed input shaft seals are completely immersed in oil is acceptable though generally not preferred. Avoiding these positions provides additional security against oil leakage as the high speed input shaft seals wear.

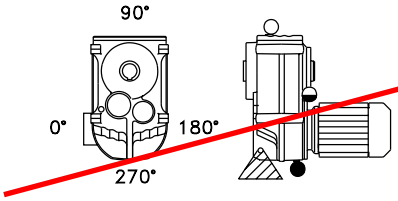
The RF27 does not have oil level plugs; fill to required quantity per the lubrication table. Breather plugs are only provided for mounting positions V1, V3, V5 and V6 for these units as well.

Gearcase Sizes: FA/FH/FV/FAF/FHF/FVF/FAZ/FHZ/FVZ37-157

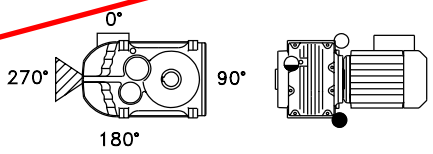
M1



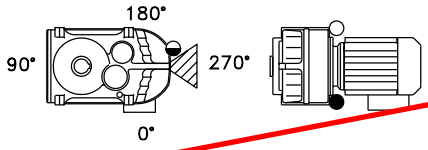
H2*



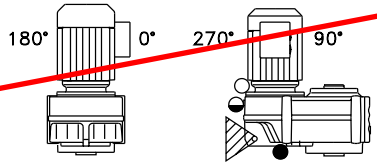
H3*



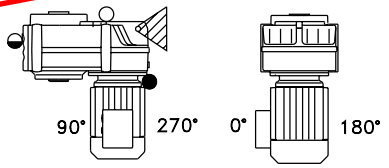
H4*



H5*



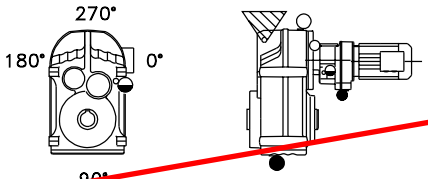
H6*



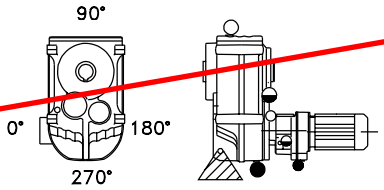
* For gear unit sizes F..97 and F..107 with input speeds greater than 2500 rpm as well as gear unit size F..157 with input speeds greater than 1500 rpm, please refer to our engineering department.

Gearcase Sizes: FA/FH/FV/FAF/FHF/FVF/FAZ/FHZ/FVZ37R17 - 157R97

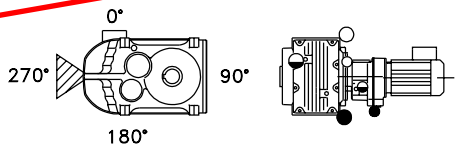
H1



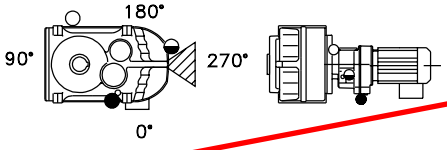
H2



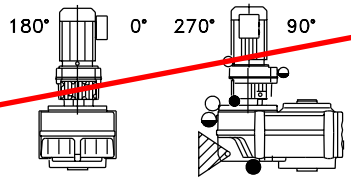
H3



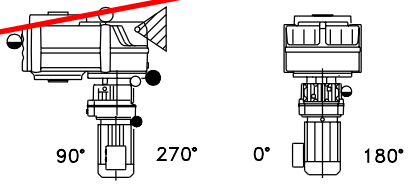
H4



H5



H6



Each gear unit is supplied from the factory with the correct grade and quantity of lubricant for the specified mounting position. The following lubricants are supplied from our North American Facilities. Under special circumstances such as high or low ambient temperatures optional oils should be used.

Standard Oil

USA			
Gear Units	**Type**	**Manufacturer**	**Ambient Temperature °C**
F..37 - 157	Mobilgear 630 [M]	Mobil Oil Corp.	0 to +40
CANADA			
F..37 - 157	Omala 220 [M]	Shell Oil Co.	0 to +40

[M] Mineral Oil
[S] Synthetic Oil

Optional Oil

USA			
Gear Units	**Type**	**Manufacturer**	**Ambient Temperature °C**
F..37 - 157	Mobilgear 629 [M]	Mobil Oil Corp.	-15 to +25
F..37 - 157	Mobil SHC630 [S]		-25 to +60
F..37 - 157	Mobil SHC629 [S]		-30 to +50
CANADA			
F..37 - 157	Omala RL220 [S]	Shell Oil Co.	-30 to +80

For ball and roller bearings of gear units the following greases are recommended:

Mineral Grease

Type	Manufacturer	Ambient Temperature °C
Mobilux EP2	Mobil Oil Corp.	-20 to +40
Alvania Grease R3	Shell Oil Co.	-30 to +60

Synthetic Grease

Type	Manufacturer	Ambient Temperature °C
Mobiltemp SHC 32	Mobil Oil Corp.	-45 to +60

The approximate lubricant in US **gallons/liters** per mounting position is as follows:

Gear Unit	Mounting Position										
	M1	B5	B6	H2,B5II, B6II	H3, B5III, B3I, B8I	H4, B3, B8	B5I	H5	V1	V5	H6, V3, V6
F..37	0.26/1	0.26/1	0.26/1	0.18/0.7	0.29/1.1	0.26/1	0.26/1	0.34/1.3	0.32/1.2	0.32/1.2	0.32/1.2
F..47	0.40/1.5	0.42/1.6	0.40/1.5	0.29/1.1	0.45/1.7	0.40/1.5	0.40/1.5	0.50/1.9	0.50/1.9	0.50/1.9	0.50/1.9
F..57	0.71/2.7	0.73/2.8	0.69/2.6	0.55/2.1	0.79/3.0	0.77/2.9	0.77/2.9	1.08/4.1	1.08/4.1	1.06/4.0	1.00/3.8
F..67	0.71/2.7	0.71/2.7	0.71/2.7	0.50/1.9	0.84/3.2	0.77/2.9	0.77/2.9	1.00/3.8	1.00/3.8	1.00/3.8	1.00/3.8
F..77	1.32/5	~~1.35/5.1~~	~~1.32/5~~	~~1.14/4.3~~	~~1.66/6.3~~	~~1.59/6~~	~~1.59/6~~	~~2.11/8~~	~~2.14/8.1~~	~~2.11/8~~	~~1.93/7.3~~
F..87	2.64/10	2.72/10.3	2.64/10	2.06/7.8	2.96/11.2	2.85/10.8	2.91/11	3.65/13.8	3.72/14.1	3.65/13.8	3.49/13.2
F..97	4.89/18.5	5.02/19	4.89/18.5	3.33/12.6	5.42/20.5	4.89/18.5	4.99/18.9	6.65/25.2	6.74/25.5	6.65/25.2	5.94/22.5
F..107	6.47/24.5	6.74/25.5	6.47/24.5	5.15/19.5	7.40/28	7.13/27	7.26/27.5	9.91/37.5	10.17/38.5	9.91/37.5	8.45/32
F..127	10.30/39	10.96/41.5	10.70/40.5	8.98/34	12.94/49	12.28/46.5	12.28/46.5	16.11/61	16.64/63	16.11/61	14.79/56
F..157	17.95/68	19/72	18.22/69	16.9/64	20.86/79	22.18/84	22.97/87	27.46/104	27.98/106	27.72/105	27.72/105

For compound drives the R reducer requires its own oil filling as shown in the chart:

Gear Unit	Input Shaft Orientation	
	Horizontal	Vertical
~~R37~~	~~0.08/0.3~~	~~0.29/1.1~~
~~R57~~	~~0.21/0.8~~	~~0.53/2~~
~~R77~~	~~0.32/1.2~~	~~0.98/3.7~~
~~R87~~	~~0.61/2.3~~	~~2.1/7.9~~
~~R97~~	~~1.21/4.6~~	~~3.7/14~~

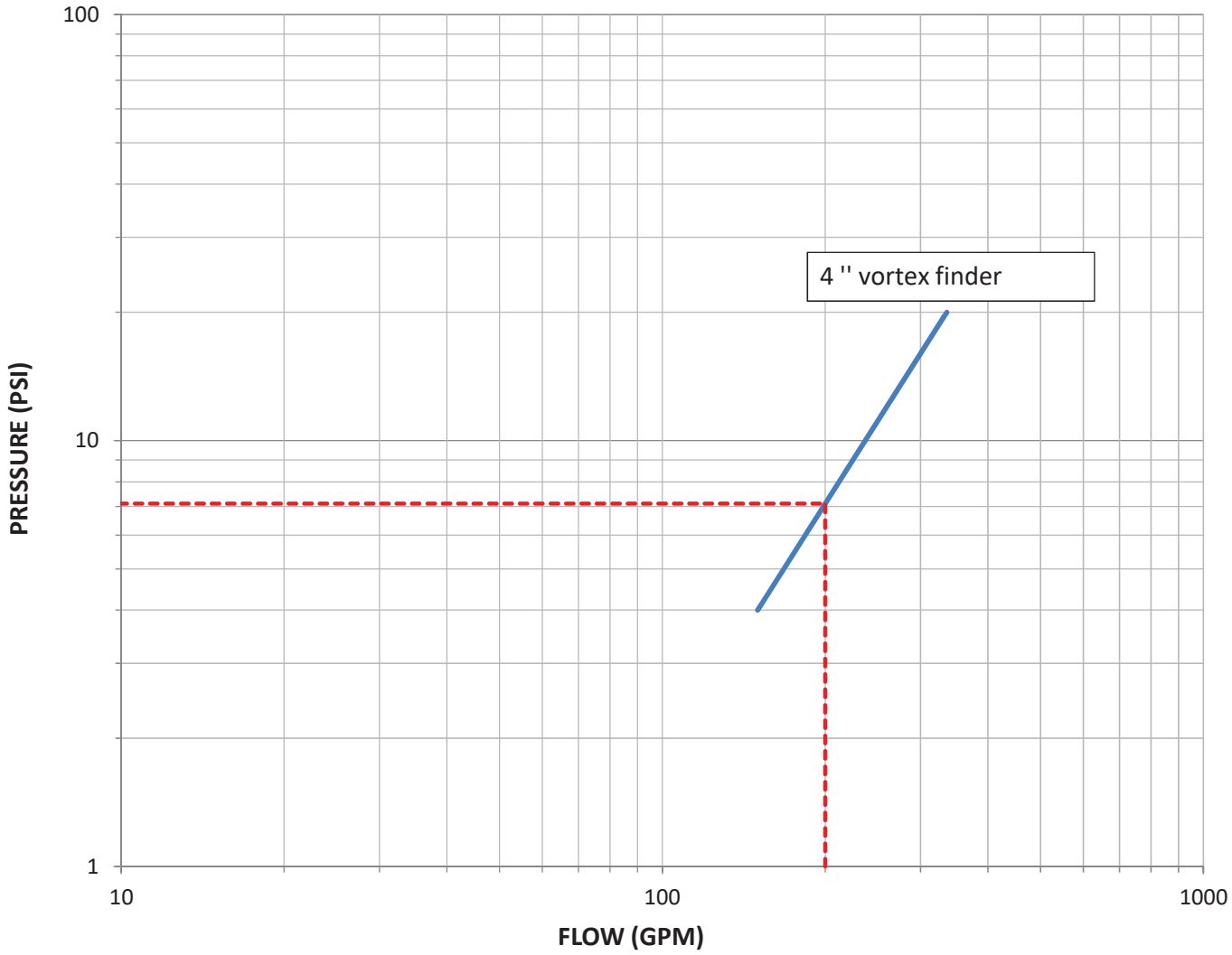
4.2.2.3 Hydro-Cyclone

Flow: 200 GPM
Pressure: 7,11 psi
Vortex finder Ø: 4 in

Krebs Cyclone
Model no.: D10LB-S844-SDM
Capacity Curve
No.: D10LB-S844-SDM-7,8-4-2-BPC

VWTC PART NUMBER:
CMHCGM338171

7.80 SQ.IN. INLET ORIFICE

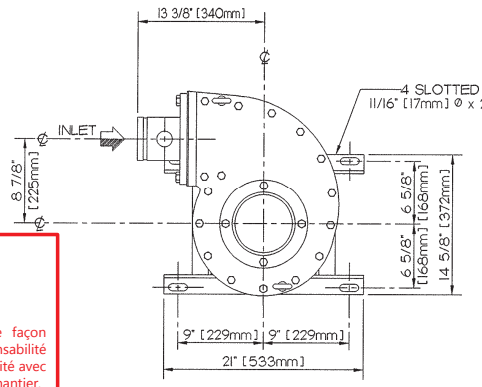


Capacity is based on water at ambient temperature and apex diameter equal to one half the vortex finder diameter, and may vary at different ratios

KREBS ENGINEERS
5505 West Gillette Road
Tucson, AZ, 85743
TEL: (520) 744-8200
FAX: (520) 744-8300
www.krebs.com

FLSmidth Krebs
5505 W Gillette Rd • Tucson, AZ 85743-9501 • USA
Tel +1 520 744 8200 • Fax +1 520 744 8300
www.krebs.com

KREBS CYCLONE
MODEL DIOLB-844



PLAN
(VICTAULIC FITTINGS NOT SHOWN)

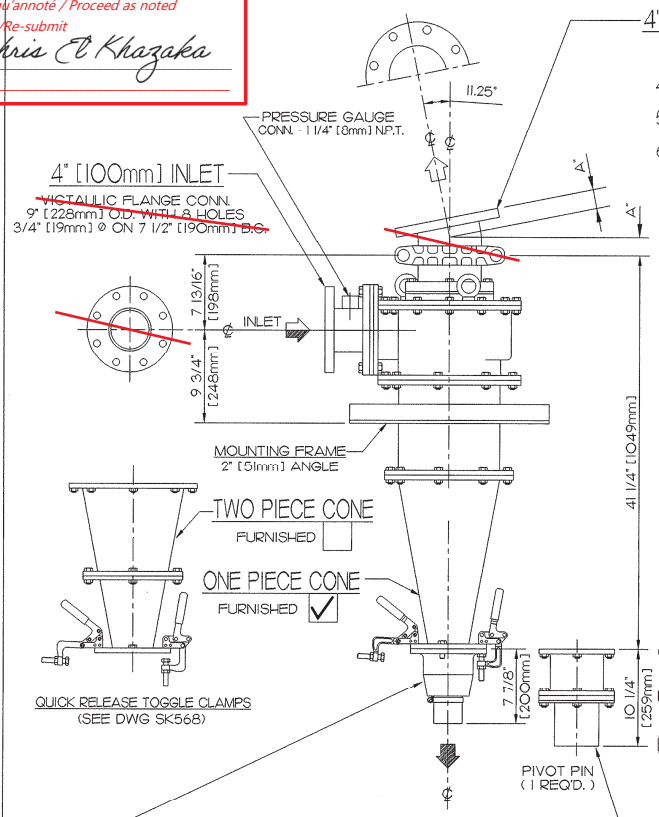
PARTS LIST INDEX		
APEX ASSEMBLY	PARTS LIST NUMBER	
	ONE PIECE CONE	TWO PIECE CONE
168 ADJUSTABLE	PL207-SDM	PL334-SDM
368 FIXED (SMALL)	PL333-SDM	PL335-SDM
368 FIXED (LARGE)	PL210-SDM	PL293-SDM
368-369 ADJUSTABLE	PL195-SDM	PL336-SDM

VEOLIA

EXAMINÉ/EXAMINED
L'examen de ce dessin ne relève en aucune façon l'entrepreneur ou le fournisseur de sa responsabilité quant à l'exactitude de ce dessin ou à sa conformité avec les documents contractuels et les conditions de chantier.
Examination of this drawing will not release in any way the Contractor or Supplier of his responsibilities as of the precision of this drawing or to its compliance with the contract documents and job site conditions.

☑ *Procéder tel quel / Proceed as is*
☐ *Procéder tel qu'annoté / Proceed as noted*
☐ *Resoumettre / Re-submit*

Par / by: Chris El Khazaka
Date: 2022-02-09



4" [100mm], 5" [125mm], OR 6" [150mm] OVERFLOW
~~VICTAULIC FLANGE CONN. W/ ANSI 150# BOLT PATTERN~~

4" [100mm]	☐	"A" = 1 3/4" [44mm]
5" [125mm]	☐	"A" = 2" [51mm]
6" [150mm]	☑	"A" = 2" [51mm]

PRESSURE GAUGE & FITTINGS
FURNISHED ☑
NOT FURNISHED ☐

CONNECTING FITTINGS
FURNISHED ☐
NOT FURNISHED ☑

INLET HEAD LINER PART NO. 102LR-BPC-7.8 SIZE

VORTEX FINDER PART NO. 105L-NH-4.0 SIZE

APEX ORIFICE PART NO. 68R-BPC-2.0 SIZE

BARE WEIGHT SHIPPING WEIGHT

ADJUSTABLE APEX ASS'Y. NO. 168
FURNISHED ☑

FIXED APEX ASSEMBLY NO. 368
SMALL ☐ LARGE ☐

ADJUSTABLE APEX ASSY. NO. 368-369
FURNISHED ☐

CERTIFIED FOR _____
P.O. No. _____
REQ. No. _____ S.O. No. _____
QUAN. _____ MODEL _____
SERIAL NO. _____
BY _____ DATE _____

KREBS ENGINEERS
5505 WEST GILLETTE ROAD TUCSON, ARIZONA 85743
PHONE: (520) 744-8200 FAX: (520) 744-8300

NO.	DATE	REVISION DESCRIPTION
8	10/30/01	REVISED THE PRESSURE GAUGE CONN. FROM 1/4" TO 1 1/4"
7	2-22-99	UPDATED TO ACAD '99' CONFIGURATION.

REVISION STATUS 8
Dwn. By: RLD
KREBS® ENGINEERS
5505 WEST GILLETTE ROAD TUCSON, AZ 85743

Date:	Scale:	Dwn. By:	Date:	Appvd. By:	S.O.
10/30/01	-----	SAS	10-19-78	SAS RS	

Appvd. By: 8

GENERAL ARRANGEMENT
KREBS CYCLONE - MODEL DIOLB-844
WITH OPTIONAL APEX ASSEMBLIES

C | © KREBS ENGINEERS 1999 | DWG. NO. S844-SDM

TOLERANCE SCHEDULE: UNLESS OTHERWISE SPECIFIED.		
-24"=±1/4"	+24" thru 100"=±1/2"	+100"=±1"
[-600mm = ±6mm]	[+600mm thru 2500mm = ±12mm]	[+2500mm = ±25mm]

5 CONTROL SYSTEM

5.1 Functional Description

FUNCTIONAL DESCRIPTION

JOHN MEUNIER HEADWORKS
GRIT REMOVAL SYSTEM
MECTAN® GRIT REMOVAL MECHANISM WITH GRIT PUMP
SAM® TYPE GDS GRIT DEWATERING SCREW

				Document no	5000222018_FD_AU_VWT
Rev	**Written**	**Prepared**	**Verified**	**Revision Date**	**Description**
1	Watame Blanchette, CPI	Xavier Monette, P. Eng.		2022-06-10	For approval

WATER TECHNOLOGIES

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1.1.3.2. Recovery After General Emergency Stop 6
1.1.3.3. General Emergency Stop Alarm 6
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1. GENERAL DESCRIPTION

This document describes the control components as well as the equipment components in order to determine the overall typical operation of the system. Some of the described components may not be supplied by VEOLIA.

The **grit removal system** is composed of the following equipment:

- **One (1) MECTAN® Grit Removal Mechanism with Grit Pump**
- **One (1) SAM® Type GDS Grit Dewatering Screw**

The control system shall be supplied by the pre-treatment equipment manufacturer. It shall provide total automatic and manual operation with required protections to prevent damage of the equipment.

The control system shall be rated for the following classifications:

▪ Main control panel	NEMA 4X SS304 enclosure, outdoor installation in non-hazardous area
▪ Local control station(s)	NEMA 7 enclosure, Type 4 seal, outdoor installation in Class I, Division I, Group D area

1.1. Main Control Panel

The control system shall be automatically operated by an **Schneider M241 Programmable Logic Controller (PLC)**. A **Harmonis ST6 7" operator interface terminal (HMI)** shall also be provided mounted on the panel front door for operation display and remote manual operation. The PLC and HMI shall communicate with the plant SCADA system via Ethernet.

The following basic components shall be assembled in the system main control panel enclosure and pre-wired to identified terminal blocks. This enclosure shall provide upfront panel door operation.

- Main fusible type disconnect sized for the application shall be front panel mounted c/w NEMA-4X operating handle and interlock;
- Full voltage motor starters (IEC rated) sized for the application with manual starter, circuit and adequate magnetic overload and overcurrent protection (if applicable);
- Front door operator devices shall be 22 mm diameter, type NEMA-4X;

Control panel shall be rated to operate between 23°F (-5°C) and +107°F (+42°C). An air conditioning is included in the control panel to regulate the inside temperature.

All motors and instruments are controlled by the system's panel. Panel connections on site will be done by others and are not included in VEOLIA's scope of supply.

All required hardware and software programming shall be integrated in the control panel for providing cloud-based monitoring and support assistance. The control system shall include an access device for remote internet support capability and extraction of PLC data for Key Process Indicator (KPI) monitoring. Internet connection shall be available through local network (Ethernet or Wi-Fi) or cellular connection.

1.1.1. Front Door Operators

Caption	Type	Color	
"POWER ON"	Pilot light	White	
Switched ON when there is electrical power in the control panel.			
"EMERGENCY STOP"	Mushroom – Pushbutton	Red	
Stops all the system equipment when pushed.			
"GENERAL ALARM"	Light	Red	
Blinking: An unacknowledged system alarm is present or the "EMERGENCY STOP" push button is activated. Steady ON: An alarm is present or an "EMERGENCY STOP" push button is activated. Steady OFF: No alarm present.			
"RESET"	Pushbutton – Momentary	Black	
Resets of all alarms. Note: If an alarm condition is still active, the corresponding alarm will not be reset.			

Additional operator devices may also be present on the control panel front door for operations display and manual remote operations of the equipment. If applicable, these devices will be detailed in the equipment dedicated sections.

1.1.2. Power On

Upon reception of a 120V surveillance relay, the following event shall be initiated:

- Signal sent, through the Ethernet communication port, to the plant SCADA system.

1.1.3. Emergency Stop

1.1.3.1. General Emergency Stop Actions

When an emergency stop button or pull-cord switch is activated (on the main control panel or on any equipment within the system), a general alarm is triggered. The fault associated with this alarm will latch. The emergency stop shall stop all the system equipment controlled by the main control panel. It shall be active in both automatic and manual modes.

During an emergency stop, many stopping actions are initiated on the equipment (stop motors, close solenoid valves,…). The current automatic sequence is also cancelled.

The emergency stop push button shall NOT be used for maintenance purposes.

1.1.3.2. Recovery After General Emergency Stop

When all emergency stop buttons are back into normal position, a system reset is required by pushing the main control panel front door “RESET” button in order to have the system back in service. This reset will also re-initialize all automatic sequences and remove the hardwired latch of the alarm.

An automatic cleaning cycle sequence of all the equipment controlled by the control system (if applicable) will be launched.

1.1.3.3. General Emergency Stop Alarm

Alarm
Upon activation of an emergency stop push button, the following events shall be initiated:

- All system equipment components shall be stopped/deactivated.
- "GENERAL ALARM" warning light on the main control panel is activated.
- "GENERAL EMERGENCY STOP ALARM" message is displayed on the HMI.
- Signal sent, through the Ethernet communication port, to the plant SCADA system and trough dry contact.

Activation conditions for this alarm:

- Always active

1.1.4. Operator Interface Terminal

The operator interface displays the operating status of the equipment.

Operator mode: Allows manual operation of equipment from the HMI. The automatic sequence cannot start.

Program Mode: Allows equipment to operate in automatic sequence. The equipment selector must be in the automatic position.

Hand mode: Allows the equipment to be operated from its local station, only when its selector is in the “manual” position. A hand symbol appears next to the device on the HMI to indicate manual status.

1.1.5. Security Levels

Several security levels are set in the control system to manage the access to the PLC and HMI information. The following security levels should be pre-set in the system:

User	Password ME	Group	Letter assign to the Group
Veolia	****	SuperAdmin	ABCDEFGHIJK
JMI	****	SuperAdmin	
Eng1	1234	Engineering	E
Op1	1111	Operator	A
OpS	2222	Operator Supervisor	B
Maint1	3333	Maintenance	C
MaintS	4444	Maintenance Supervisor	D
Admin	admin	Admin	G
Manager	na	Manager	F
Guest	na		I
Default	Logged Off		I

1.1.6. Alarm and Warning Management

1.1.6.1. Alarm/Warning Priorities

Alarms and warnings are grouped in to two various attention requirements:

Alarms
- Needs immediate operator attention.
- An equipment component may be stopped.

Warnings
- Does not need immediate operator attention.
- May precede an alarm.

1.1.7. Typical Motor

1.1.7.1. Wired Logic Stop

Regardless of selector's position and selected mode, hardwired logic stop conditions protect the motor and force its stopping. These conditions, if relevant, are described in each of the motor sections.

1.1.7.2. Motor Alarm Delay

The motor alarm delay is common to all motors. If a motor's delay is different from common delay, it is specified in the motor's section.

1.1.7.3. Start Fault Alarm

Alarm
If the motor start command is activated, the running status is not and the alarm delay runs out, the start fault alarm is activated. Operator must address the situation and reset the fault to restart.

This alarm occurs with the presence of one of the following conditions:
- Local selector or override module in Off position;
- Local disconnect open.

1.1.7.4. Overload Alarm

Alarm
The detection of a motor overload is a transmitted signal from the overload relay of a DOL starter to the digital input of the automation system.
The overload alarm is activated as soon as the overload detection signal is detected. Operator must locally reset the overload relay and reset fault in order to restart.

1.1.7.5. Running Time

Runtime totalizer are available on the HMI for each motor.

1.1.7.6. Local Disconnect Switch

If a disconnect switch is installed, it shall be lockable and installed near the motor. It shall contain an auxiliary contact that open's the motor starter's control circuit.

Note: The disconnect switch must never be activated when the motor is running. The motor should be stopped before activating or deactivating the disconnect switch. The local switches are not provided by VEOLIA.

1.1.9. Detectors

1.1.9.1. General

Detectors give a digital signal. A change of state produces an alarm and/or an action. A common alarm delay, adjustable or not, is always programmed to avoid false alarms. Detectors may be high level switches, low level switches, etc.

1.1.9.2. Digital Alarm Delay

The digital alarm delay is common to all detectors. If a detector's delay is different from common delay, it is specified in the detector's section.

1.1.9.3. Security Logic

When a detector's dry contact is used to trigger an alarm, it is wired to trigger the alarm when the circuit opens (power loss).

1.1.9.4. Activation conditions for alarms

The activation conditions for detector's alarms are particular to each detector and depend on the process phase in which it is required. When an alarm requires an activation condition, these are noted with the detector's description.

1.2. Local Control Stations

Local control stations shall be supplied, as detailed in the equipment dedicated sections.

Operators shall be provided for local manual operation of the equipment for maintenance and tests operation. The local manual control of the equipment shall be reserved and performed to fully trained personnel, with clear understanding of the system.

When operated locally, the dedicated equipment will be controlled manually regardless of other conditions. Priority shall be given to the local control station and all operation signals from the main control panel (program or operator modes) are disabled. Hand mode will be displayed at the main control panel.

Manual operation is under the operator's responsibility and it requires the presence of an operator at close proximity of the equipment.

2. MECTAN® Grit Removal Mechanism with Grit Pump

Each MECTAN® Grit Removal Mechanism with Grit Pump includes the following electrical components:

Description	Electrical details
One (1) Paddles motor	1.0 HP (FLA 2.43 A), 460V/3Ph/60Hz
One (1) Water fluidization solenoid valve	120V/60Hz
One (1) Grit extraction pump	7.5 HP(FLA 9.95 A), 460V/3Ph/60Hz
One (1) Low vacuum switch	120V/60Hz

2.1. Main control panel

2.1.1. Front Door Operators

The following operators shall be provided on the system main control panel per unit:

Caption	Type	Color
"PADDLES" "OFF / AUTO"	Selector switch 2 positions	Black
"OFF": Prevents any operation of the paddles motor. "AUTO": Automatic sequences of operation of the equipment.		
"PADDLES MOTOR RUNNING"	Pilot light	Green
Switched ON when the motor is running.		
"PADDLES MOTOR FAULT"	Pilot light	Red
Switched ON when the motor is stopped because of an overload or an overcurrent.		
"GRIT EXTRACTION" "MANUAL / OFF / AUTO"	Selector switch 3 positions	Black
"MANUAL": Continuous operation - Starts pump motor in forward motion, opens fluidization solenoid valve. "OFF": Prevents any grit extraction (grit pump motor, fluidization solenoid valve). "AUTO": Automatic sequences of operation of the equipment.		
"FLUIDIZATION VALVE OPENED"	Pilot light	Green
Switched ON when the solenoid valve is opened.		
"PUMP MOTOR RUNNING"	Pilot light	Green
Switched ON when the motor is running.		
"PUMP MOTOR FAULT"	Pilot light	Red
Switched ON when the motor is stopped because of an overload or an overcurrent		

"PUMP LOW VACUUM ALARM"	Pilot light	Red	
Switched ON when the grit pump is running and a low vacuum is detected.			

2.1.2. HMI Displays

The following operating conditions can be viewed through the operator interface terminal:

Operator Interface Display	State	Condition
"PADDLES MOTOR"	Running	The motor is running.
	Stopped	The motor is stopped.
	Faulted	The motor is stopped with fault.
"GRIT PUMP MOTOR"	Running	The motor is running.
	Stopped	The motor is stopped.
	Faulted	The motor is stopped with fault.
"WATER FLUIDIZATION SOLENOID VALVE"	Opened	The valve is opened.
	Closed	The valve is closed.
	Faulted	The valve is faulted.

2.1.3. Operator Mode

When OPERATOR mode is selected, the following can be operated through the operator interface terminal:

Device	Function
"PADDLES MOTOR"	START / STOP
"GRIT PUMP"	START / STOP
"FLUIDIZATION SOLENOID VALVE"	OPEN / CLOSE

2.2. Local Control Station

Each MECTAN® Grit Removal System will be supplied with a local control station located near the unit including the following operators:

Caption	Type	Color	
"EMERGENCY STOP"	Pushbutton - Mushroom	Red	
Stops all the system equipment when pushed.			
"SCREEN" "OFF / REMOTE / MAN. TEST"	Selector switch 3 positions	Black	
"OFF": Prevents any operation of the screen motors and washing system solenoid valve. "REMOTE": Operation from the main control panel. "MAN. TEST": Activates the automatic **Cleaning cycle sequence** - Spring return to "REMOTE"			

2.3. Automation

2.3.1. Automatic Sequences of Operation

2.3.1.1. Paddles Normal Operation

The paddles motor shall run continuously.

2.3.1.2. Grit Extraction Sequence

The automatic grit extraction start signal shall be controlled by an adjustable pre-set *grit extraction time* table.

At reception of a start command, the **grit extraction sequence** shall be activated as follow:

1. The water fluidisation solenoid valve shall open.
2. At the end of the adjustable pre-set *pre-fluidization duration*, the grit pump motor shall start.
3. Simultaneously with the grit pump motor, a signal shall be sent to start a **grit dewatering sequence**.
4. At the end of the adjustable pre-set *grit fluidization duration*, the fluidization solenoid valve shall close.
5. At the end of the adjustable pre-set *grit extraction duration*, the grit pump motor shall stop.

If the grit dewatering screw motor is in fault, the grit extraction sequence should not be allowed.

This sequence will also be launched by:

- The "MAN. TEST" position of the selector located on the local control station;

2.3.1.3. Adjustable Variables

Name	Type	Device	Range	Factory set-up
Grit extraction time	Timetable	PLC	24 Configurable Setpoints	Every Hour
Pre-fluidization duration	Timer	PLC	1 to 3600 seconds	180 sec.
Fluidization duration	Timer	PLC	1 to 3600 seconds	120 sec.
Grit extraction duration	Timer	PLC	1 to 3600 seconds	900 sec.

2.3.2. Paddles Motor

This motor operates in one direction with one speed.

2.3.2.1. Operation

Start / Stop command:

- **Program Mode of the main control panel**
- **Operator Mode of the main control panel**

Interlock:

- None.

Upon reception of a start command, the following events shall be initiated:

1. Start the motor.
2. "PADDLES MOTOR RUNNING" light is activated on the main control panel.
3. Status is displayed on the OIT equipment page.

Upon reception of a stop command, the following events shall be initiated:

1. Stop the motor.
2. "PADDLES MOTOR RUNNING" light is deactivated on the main control panel.
3. Status is displayed on the OIT equipment page.

2.3.2.2. Overload

The overload protection circuit shall protect the motor in case of:

- Motor overheating
- Short-circuit
- Loss of phase

The overload protection shall be sized according to the motor nameplate full load rating.

Alarm

Upon reception of a signal from the overload protection circuit, the following events shall be initiated:

1. Stop the dedicated paddles motor, close its associated solenoid valve(s) (if applicable) and stop the current sequence.
2. "PADDLES MOTOR FAULT" light is activated on the main control panel.
3. Message is displayed on the OIT alarm page.

Activation conditions for this alarm:

- Always active

The protection circuit shall be reset manually inside the control panel.

When the overload alarm is deactivated, a manual reset is required on the overload module in order to re-initialize all automatic sequences and remove the hardwired latch of the alarm.

2.3.3. Grit Pump Motor

This pump operates in one direction with one speed.

2.3.3.1. Operation

Start command:

- **Program Mode of the main control panel**
  - **Grit extraction sequence**
- **Operator Mode of the main control panel**

Interlock:

- None

Upon reception of a start command, the following events shall be initiated:

1. Start the pump.
2. "PUMP MOTOR RUNNING" light is activated on the main control panel.
3. Status is displayed on the OIT equipment page..

Upon reception of a stop command, the following events shall be initiated:

1. Stop the pump.
2. "PUMP MOTOR RUNNING" light is deactivated on the main control panel.
3. Status is displayed on the OIT equipment page.

2.3.3.2. Overload

The overload protection circuit shall protect the motor in case of:

- Motor overheating
- Short-circuit
- Loss of phase

The overload protection shall be sized according to the motor nameplate full load rating.

Alarm priority

Upon reception of a signal from the overload protection circuit, the following events shall be initiated:

1. Stop the dedicated pump motor, close its associated solenoid valve (if applicable) and stop the current sequence.
2. "PUMP MOTOR FAULT" light is activated on the main control panel.
3. Message is displayed on the OIT alarm page.

Activation conditions for this alarm:

- Always active

The protection circuit shall be reset manually inside the control panel.

When the overload alarm is deactivated, a manual reset is required on the overload module in order to re-initialize all automatic sequences and remove the hardwired latch of the alarm.

2.3.3.3. Pump Low Vacuum Alarm

The pump low vacuum alarm shall be activated when low vacuum is detected.

Alarm priority
Upon reception of a signal from the low vacuum protection circuit, the following events shall be initiated:

1. Stop the dedicated pump, close its associated solenoid valve (if applicable) and stop the sequence.
2. "PUMP LOW VACUUM ALARM" light is activated on the main control panel.
3. Message is displayed on the OIT alarm page.

Activation conditions for this alarm:

- Always active

When the low vacuum alarm is deactivated, a system reset is required using the "RESET" push button of the main control panel, in order to re-initialize all automatic sequences and remove the hardwired latch of the alarm.

2.3.4. Fluidization Solenoid Valve

This solenoid valve is normally closed with spring return when deactivated.

2.3.4.1. Operation

Open command:

- **Program Mode of the main control panel**
  - **Grit extraction sequence**
- **Operator Mode of the main control panel**

Interlock:

- None.

Upon reception of an open command, the following events shall be initiated:

1. Open the valve.
2. "FLUIDIZATION VALVE OPENED" light is activated on the main control panel.
3. Status is displayed on the OIT equipment page.

Upon reception of a close command, the following events shall be initiated:

1. Close the valve.
2. "FLUIDIZATION VALVE OPENED" light is deactivated on the main control panel.
3. Status is displayed on the OIT equipment page.

3. SAM® Type GDS Grit Dewatering Screw

Each SAM® Type GDS Grit Dewatering Screw includes the following components:

Description	Electrical details
One (1) Grit screw motor	1.0 HP (FLA 1.43 A), 460V/3Ph/60Hz

3.1. Main control panel

3.1.1. Front Door Operators

The following operators shall be provided on the system main control panel per unit:

Caption	Type	Color
"GRIT SCREW" "MANUAL / OFF / AUTO"	Selector switch 3 positions	Black
"MANUAL": Continuous operation - Starts grit screw motor in forward motion. "OFF": Prevents any operation of the grit screw motor. "AUTO": Automatic sequences of operation of the equipment.		
"GRIT SCREW MOTOR RUNNING"	Pilot light	Green
Switched ON when the motor is running.		
"GRIT SCREW MOTOR FAULT"	Pilot light	Red
Switched ON when the motor is stopped because of an overload or an over current.		

3.1.2. HMI Displays

When Program mode is selected, the following operating conditions can be viewed through the operator interface terminal:

Operator Interface Display	State	Condition
"GRIT SCREW MOTOR"	Running	The motor is running.
	Stopped	The motor is stopped.
	Faulted	The motor is stopped with a fault.

3.1.3. Operator Mode

When Operator mode is selected, the following can be operated through the operator interface terminal:

Device	Function
"GRIT SCREW MOTOR"	START / STOP

3.2. Local Control Station

Each SAM® Type GDS Grit Dewatering Screw will be supplied with a local control station located near the unit including the following operators:

Caption	Type	Color	
"EMERGENCY STOP"	Pushbutton - Mushroom	Red	
Stops all the system equipment when pushed.			
"GRIT SCREW" "OFF / REMOTE / MAN. TEST"	Selector switch 3 positions	Black	
"OFF": Prevents any automatic operation of the grit dewatering screw (grit screw motor). "REMOTE": Operation from the main control panel. "MAN. TEST": Activates the automatic **Grit dewatering sequence** - Spring return to "REMOTE"			

3.3. Automation

3.3.1. Automatic Sequences of Operation

3.3.1.1. Grit Dewatering Sequence

The automatic grit dewatering sequence signal shall be activated by the associated grit chamber **grit extraction sequence**.

When a start command is received, the **grit dewatering sequence** shall be activated as follow:

1. The grit dewatering screw motor shall start.
2. When the start signal is deactivated, the grit dewatering screw operation shall continue for an additional adjustable pre-set *grit dewatering duration* before its motor stops.

This sequence can also be launched by:

- The "MAN. TEST" position of the selector located on the local control station;

3.3.1.2. Adjustable Variables

Name	Type	Device	Range	Factory set-up
Grit dewatering duration	Timer	PLC	1 to 1440 minutes	10 min.

3.3.2. Grit Screw Motor

This motor operates in one direction with one speed.

3.3.2.1. Operation

Start command:

- **Program Mode of the main control panel**
  - **Grit dewatering sequence**
- **Operator Mode of the main control panel**

Interlock:

- None.

Upon reception of a start command, the following events shall be initiated:

1. Start the motor.
2. "GRIT SCREW MOTOR RUNNING" light is activated on the main control panel.

Upon reception of a stop command, the following events shall be initiated:

1. Stop the motor.
2. "GRIT SCREW MOTOR RUNNING" light is deactivated on the main control panel.

3.3.2.2. Overload

The overload protection circuit shall protect the motor in case of:

- Motor overheating
- Short-circuit
- Loss of phase

The overload protection shall be sized according to the motor nameplate full load rating.

Alarm

Upon reception of a signal from the overload protection circuit, the following events shall be initiated:

1. Stop the dedicated grit screw motor, close its washing system solenoid valve (if applicable) and stop the current sequence.
2. "GRIT SCREW MOTOR FAULT" light is activated on the main control panel.
3. Message is displayed on the OIT alarm page.

Activation conditions for this alarm:

- Always active

The protection circuit shall be reset manually inside the control panel.

When the overload alarm is deactivated, a manual reset is required on the overload module in order to re-initialize all automatic sequences and remove the hardwired latch of the alarm.

5.2 Main Panel and Local Stations Drawings

VEOLIA			VWT CANADA #			5000222018-PSDS-0001-AU-VWT
			Project #			5000222018
			Date			2022-06-10
			Automation System			
CLIENT	**DESCRIPTION**	**DATE**	**Written by**	**Prepared by**	**Checked by**	**REV**
Jefferson GA	For Approval	2022-06-10	Watamé Blanchette CPI	Xavier Monette P.Eng		1
						2
PROJECT						3
						4
						5
						6
Panel Tag	CP-01					
General	Voltage		Volts	460		1
	Panel Enclosure	Material		Nema 4X (outdoor installation)	SS304	1
	Panel type	Cable Entry		Wall Mounted		1
	Control Panel Approval			UL		1
	Wires color			Veolia standard		1
	Local Station			Nema 7 (outdoor installation)	Type 4 seal	1
	UPS			N/A		1
	Motor control			Control panel		1
	Remote Access			N/A		1
Environnement	Panel Location			Outdoor	A/C provided	1
	Min. Temperature		°C	-5 (23°F)		1
	Max . Temperature		°C	42 (107°F)		1
	Max. Humidity		%	97.5		1
	Corrosive Atmosphere			Non corrosif		1
	Freeze			Yes		1
	Comments			Outdoor package	Heater not provided	1
Safety	Electrical Classification			Non Hazardous Area		1
	Province/State			USA	Georgia	1
Process Controller	Brand			Schneider		1
	Model			M241-TM241CE24R	14 in / 10 out embedded	1
	Memory			8 MB		1
	Nodes			150		1
	Estimated memory consumption			50%		1
	Spare I/O			20%		1
	Digital inputs cards			N/A		1
	Digital outputs cards			N/A		1
	Analog inputs cards			N/A		1
	Analog outputs cards			N/A		1
	Communication cards			N/A		1
	Power supply			N/A		1
	Remote I/O	Model		N/A		1
HMI	Brand			Schneider		1
	Model			Harmony ST6		1
	Size		in	7		1
	Resolution		Pixels	640x480		1
SCADA Hardware	Brand			N/A		1
	Model			N/A		1
	Screen size	Screen Quantity	in	N/A		1
	Resolution		Pixels	N/A		1
	Printer			N/A		1
	MS Office			N/A		1
	Reporting			N/A		1
Software	PLC Software	Version		EcoStruxure Machine Expert	V2.0.2.1	1
	HMI Software	Version		EcoStruxure™ Operator Terminal Expert	3.30	1
	SCADA Software	Version		N/A	N/A	1
Motor Control	VFNR	Model	Schneider	TeSys island	Ethernet/Ip	1
	VFD	Model		N/A		1

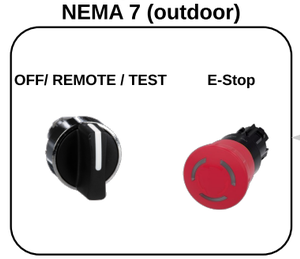
IP addresses:

eWon:	192.168.XX.XX
HMI:	192.168.XX.XX
PLC:	192.168.XX.XX
Tesys:	192.168.XX.XX

Client's Network
(Internet for remote VPN support)

Paddles Motor Local Station
NEMA 7 (outdoor)

Grit Pump Local Station
NEMA 7 (outdoor)



Hardwired (by others)

Grit Classifier Local Station
NEMA 7 (outdoor)

Main Control Panel
NEMA 4X (outdoor)

480 VAC
(By others)

HMI
Schneider ST6 7in

eWon Flexy

Switch
(unmanaged)

PLC
Schneider M241

Starter
Tesys Island

E
E
E
E
E

DO NOT USE FOR CONSTRUCTION
FOR INFORMATION ONLY

Legend

- E — Cat6a by Veolia
- E — Cat6a by others
- FO — Optical cable by Veolia
- FO — Optical cable by other
- Cable by Veolia
- Cable by other

Network

Subnet : 255.255.255.0

Default gateway : XXX.XXX.XXX.XXX

DNS : XXX.XXX.XXX.XXX

VEOLIA

DATE	DRAWN BY	PREPARED BY	VERIFIED BY	PROJECT	DRAWING	SHEET / REV
2022-06-08	Watame Blanchette, CPE	Xavier Monette, P.Ing.		5000222018	5000222018_CA_0001_AU_VWT	1 OF 1 / 1

TITLE: NETWORK ARCHITECTURE

CLIENT: Jefferson, GA

JEFFERSON (GA)
MECTAN, GRIT PUMP, SAM
#5000222018

REV	DESCRIPTION	DATE	REVD	CHKD	APVD	ECN
1	FOR APPROVAL	2022-02-08	SB	RA	–	–

DESIGNER	DATE
CHECKER	DATE
ENGINEER	DATE
SCALE:	

TITLE: MECTAN, GRIT PUMP, SAM
TITLE PAGE

CLIENT: JEFFERSON (GA)

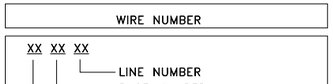
VEOLIA WATER TECHNOLOGIES CANADA INC. 4105 Sartelon, Saint-Laurent, Qc, Canada. Tel: (514) 334-7230

PROJECT DRAWING	INTERNAL	SHEET	REV
5000222018 – EPL-0001-AU-VWT		1 OF 7	1

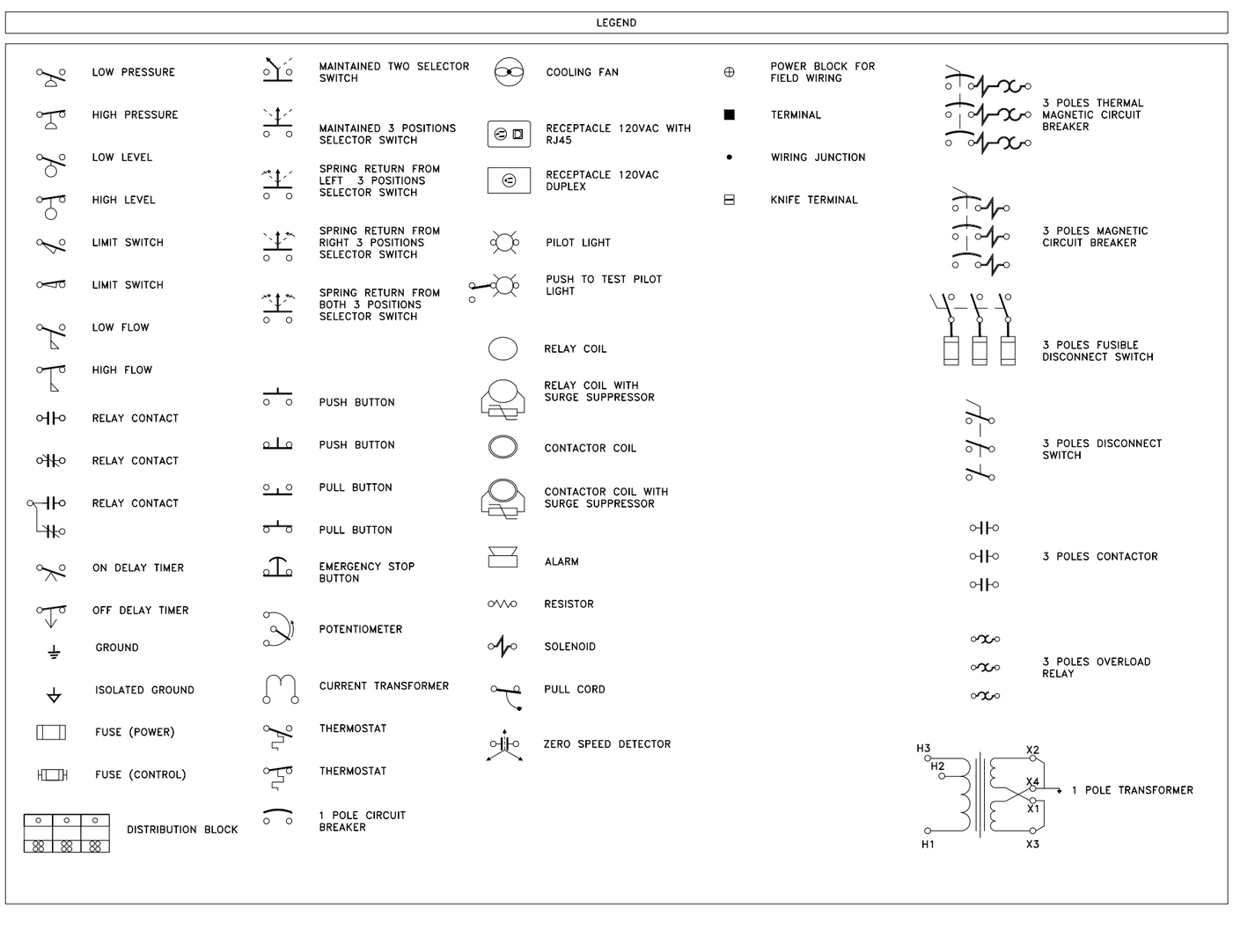
DESCRIPTION	DRAWING NUMBER
TITLE PAGE	5000222018-EPL-0001-AU-VWT-001
DRAWING LIST AND LEGEND	5000222018-EPL-0001-AU-VWT-002
EXTERNAL LAYOUT	5000222018-EPL-0001-AU-VWT-003
INTERNAL LAYOUT	5000222018-EPL-0001-AU-VWT-004
BILL OF MATERIAL	5000222018-EPL-0001-AU-VWT-005
LOCAL STATION	5000222018-EPL-0001-AU-VWT-006
TERMINAL LAYOUT	5000222018-EPL-0001-AU-VWT-007
ELECTRICAL SCHEMATIC	5000222018-ELD-0001-AU-VWT-001
ELECTRICAL SCHEMATIC	5000222018-ELD-0001-AU-VWT-002
ELECTRICAL SCHEMATIC	5000222018-ELD-0001-AU-VWT-003
ELECTRICAL SCHEMATIC	5000222018-ELD-0001-AU-VWT-004
ELECTRICAL SCHEMATIC	5000222018-ELD-0001-AU-VWT-005
ELECTRICAL SCHEMATIC	5000222018-ELD-0001-AU-VWT-006
ELECTRICAL SCHEMATIC	5000222018-ELD-0001-AU-VWT-007
ELECTRICAL SCHEMATIC	5000222018-ELD-0001-AU-VWT-008
ELECTRICAL SCHEMATIC	5000222018-ELD-0001-AU-VWT-009
ELECTRICAL SCHEMATIC	5000222018-ELD-0001-AU-VWT-010
ELECTRICAL SCHEMATIC	5000222018-ELD-0001-AU-VWT-011
ELECTRICAL SCHEMATIC	5000222018-ELD-0001-AU-VWT-012
ELECTRICAL SCHEMATIC	5000222018-ELD-0001-AU-VWT-013
ELECTRICAL SCHEMATIC	5000222018-ELD-0001-AU-VWT-014
ELECTRICAL SCHEMATIC	5000222018-ELD-0001-AU-VWT-015
ELECTRICAL SCHEMATIC	5000222018-ELD-0001-AU-VWT-016

WIRE COLOR CODE	
MINIMAL CONTROL 16AWG GAUGE	
POWER 120VAC	BLACK
CONTROL 120VAC	RED
NEUTRAL	GRAY
24VDC	BLUE
0VDC	BLUE/WHITE
DRY CONTRACT	YELLOW
POWER	BLACK
NON-ISOLATED GROUND	GREEN
ISOLATED GROUND	GREEN
TWISTED PAIR	(-) BLACK & (+) WHITE

WIRE NUMBER



LEGEND



REV	DESCRIPTION	DATE	REVD	CHKD	APVD	ECN
1	FOR APPROVAL	2022-02-08	SB	RA	–	–

DESIGNER	DATE
CHECKER	DATE
ENGINEER	DATE
SCALE:	

TITLE: MECTAN, GRIT PUMP, SAM
DRAWING LIST AND LEGEND

CLIENT: JEFFERSON (GA)

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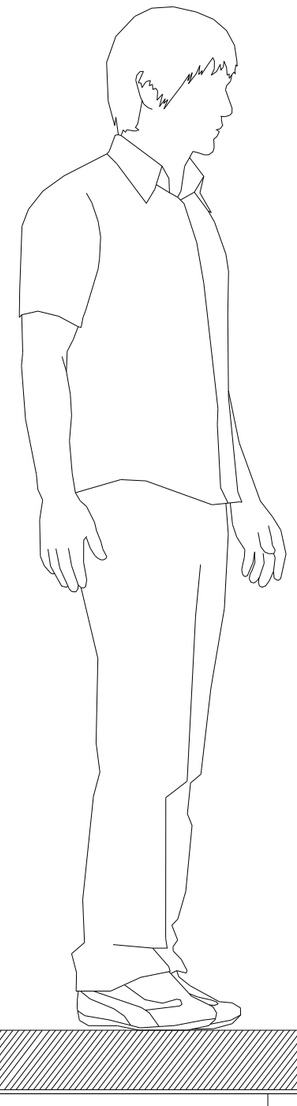
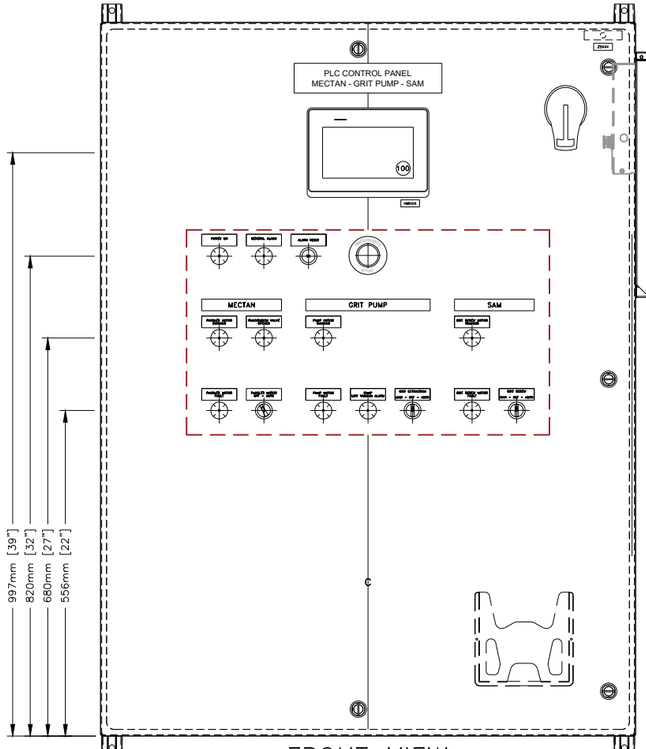
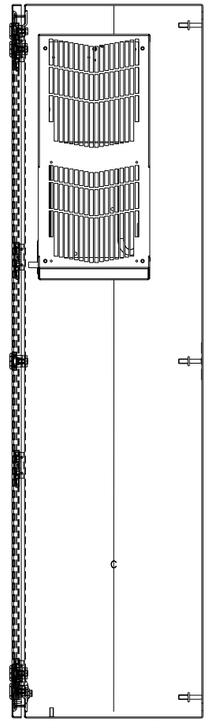
PROJECT	DRAWING	INTERNAL	SHEET	REV
5000222018 –	EPL-0001-AU-VWT		2 OF 7	1

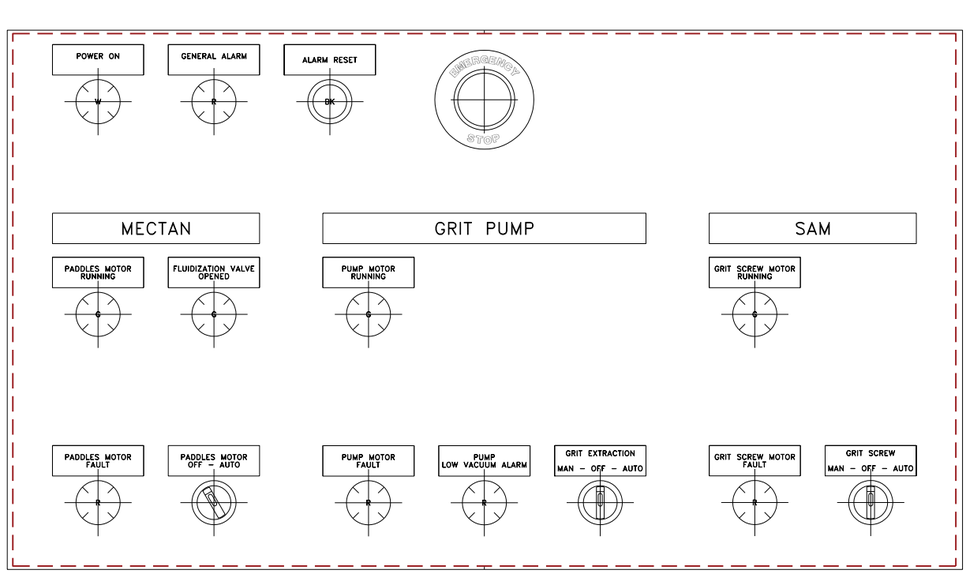
ENCLOSURE TYPE 4X–SS304
48H'' X 36W'' X 12D''
cUL APPROVAL





FRONT VIEW


SIDE VIEW



REV	DESCRIPTION	DATE	REVD	CHKD	APVD	ECN
1	PRELIMINARY	2022–06–02	EH	RA	–	–

DESIGNER	DATE
CHECKER	DATE
ENGINEER	DATE
SCALE:	

TITLE: MECTAN, GRIT PUMP, SAM
EXTERNAL LAYOUT

CLIENT: JEFFERSON (GA)

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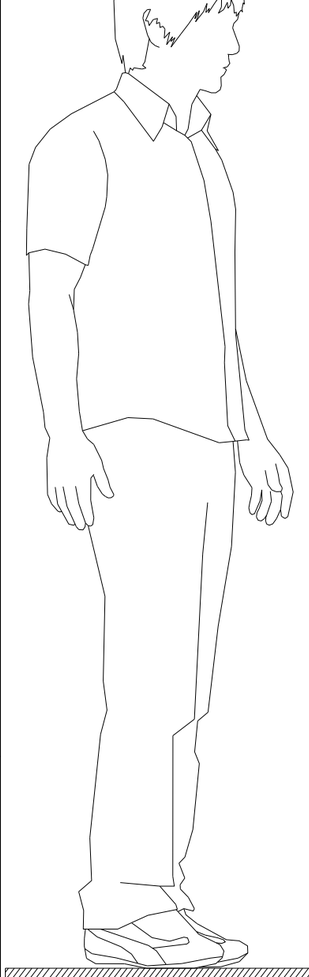
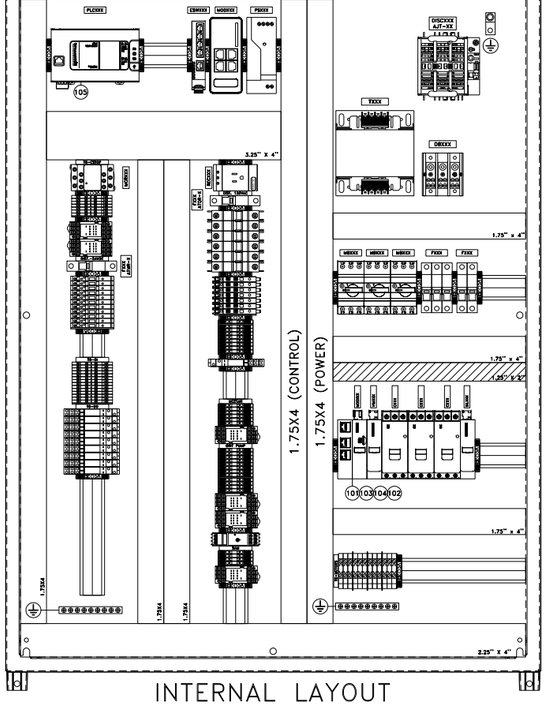
PROJECT	DRAWING	INTERNAL	SHEET	REV
5000222018 –	EPL–0001–AU–VWT		3 OF 7	1





INTERNAL LAYOUT

REV	DESCRIPTION	DATE	REVD	CHKD	APVD	ECN
1	PRELIMINARY	2022-06-02	EH	RA	–	–

DESIGNER	DATE
CHECKER	DATE
ENGINEER	DATE
SCALE:	

TITLE: MECTAN, GRIT PUMP, SAM

INTERNAL LAYOUT

CLIENT: JEFFERSON (GA)

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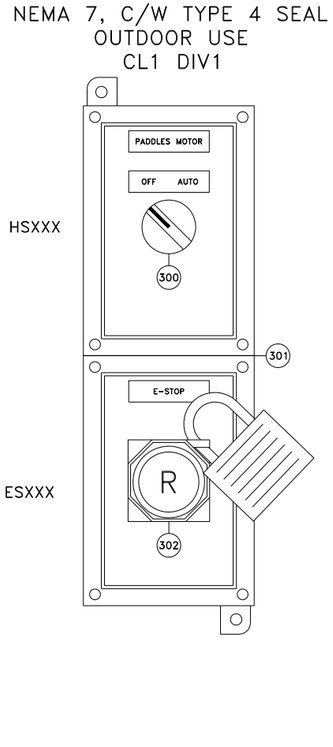
PROJECT	DRAWING	INTERNAL	SHEET	REV
5000222018 –	EPL-0001-AU-VWT		4 OF 7	1

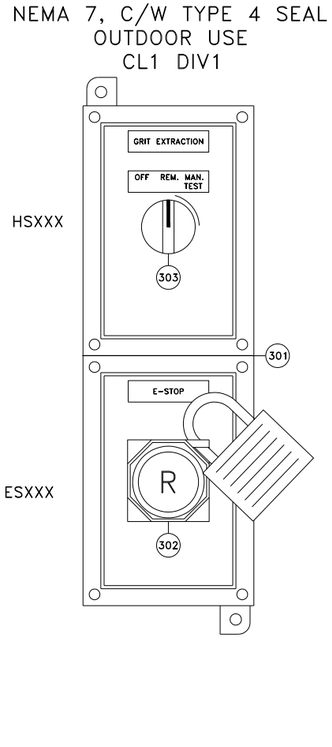
LOCAL STATION AND JB PARTS LIST

ITEM	DESCRIPTION	PART NUMBER	MANUF.	QTY	BY
300	2 POSITION SELECTOR 30.5mm C/W CONTACT 800T-XA4(1X)	800H-HP2KB6AAXX	ALLEN-BRADLEY	1	ENV
301	NEMA 7 LOCAL STATION 2 HOLES C/A COVER 800H-NP30(10X) & 800HN479/800HNP20(10X)	800H-2HVX7	ALLEN-BRADLEY	3	ENV
302	RED EMERGENCY PUSH BUTTON	800H-FPX6D4	ALLEN-BRADLEY	3	ENV
303	3 POSITION SELECTOR SPRING RETURN FORM RIGHT 30mm, C/W CONTACT 800T-XA4(1X)	800H-JP5KE7AAXX	ALLEN-BRADLEY	2	ENV

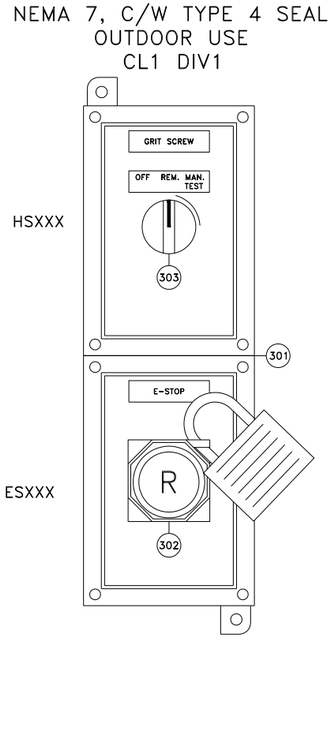
MECTAN
LOCAL STATION
NEMA 7, C/W TYPE 4 SEAL
OUTDOOR USE
CL1 DIV1



GRIT PUMP
LOCAL STATION
NEMA 7, C/W TYPE 4 SEAL
OUTDOOR USE
CL1 DIV1



SAM
LOCAL STATION
NEMA 7, C/W TYPE 4 SEAL
OUTDOOR USE
CL1 DIV1



REV	DESCRIPTION	DATE	REVD	CHKD	APVD	ECN
1	PRELIMINARY	2022-06-02	EH	RA	–	–

DESIGNER	DATE
CHECKER	DATE
ENGINEER	DATE
SCALE:	

TITLE: MECTAN, GRIT PUMP, SAM
LOCAL STATION

CLIENT: JEFFERSON (GA)

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PROJECT	DRAWING	INTERNAL	SHEET	REV
5000222018	– EPL-0001-AU-VWT		6 OF 7	1