SUBMITTAL REVIEW COMMENTS

Date:	Aug 10, 2016
Project:	Tulalip 88th St Screen Improvements - 216-1598-090
Contractor:	Spirac USA Inc..
Submittal Title:	Screen Submittal
Submittal Number:	002
Specification Section:	Purchase Order
Submittal Disposition:	Make Correction Noted
Reviewer:	Art Stokes, A Maas

Review comments are as follows:

1. ~~Review of submittal is not "Approval". Review is for checking general conformance with design concept.~~ Noted by Spirac
2. Tab 4.0 General Arrangement: Screen support and pivot point may not be located on concrete slab. Because complete equipment measurements were not provided, supplier shall conduct field measurements to verify what equipment will be necessary for installation. Field measurements made by Spirac
3. ~~General Arrangement: Discharge chute is located over pump wet well cover. Access to pumps will require moving dumpster~~. Note to operators.
4. ~~General Arrangement: Drawings shows 2 mm perforated screen. 4 mm is required. Revise~~ No exception taken
5. ~~Tab 03.1, 2.12 Electrical Control Panel – Noted as being supplied by others~~.
6. Tab 05.1, page 1 – indicates a 5 HP motor is to be used. Tab 5.2 Motor Data indicates a 3HP motor is to be supplied? These sections appear to be in conflict – Please Clarify Not able to verify.
7. Tab 06.1 Siemens Pointek ULS 200 Level Element and transmitter noted as being supplied. Noted
8. Tab 06.2 Heat Trace – BriskHeat self-regulating heat tape - Noted.
9. Tab 06.3 Redhat Solenoid Valve for C1D2 classified areas – Could not determine if the solenoid valve to be supplied is "Continuous Duty" Verify that the valves are continuous duty rated– Submit Specified Item No Exception taken

02 August 2016

Tulalip Tribes
ATTN: Jereme Gobin
2601 88th Street, NE
Tulalip, WA 98271

Re: SPIRAC Resubmittal – PO# 802-00, Quote# 15-1018rev3

Dear Mr. Gobin,

Enclosed is SPIRAC's resubmittal package for the above project, for your review and approval.

If during the course of your review, if you have a need for additional information on any item, please don't hesitate to contact the undersigned.

We look forward to working with you. Once we are in receipt of your approval to manufacture, we will establish a target completion date and coordinate a delivery time that works with your schedule.

Sincerely,

J. Combest

Jessica Combest
SPIRAC (USA) INC.

SPIRAC (USA) INC
75 Jackson Street, Suite 300, Newnan, Georgia 30263, USA
Tel: 770 632 9833 Fax: 770 632 9838
Website: www.spirac.com

Response to PARAMETRIX Submittal Review Form
Submittal No. 001, Dated 07.06.16
Reviewer: Art Stokes, A Maas

SPIRAC Project – 890 Tulalip,WA
Purchase Order#802-00

Remarks – Numbered to correspond with reviewer comments

Review Comments:

1. Noted.
2. Verified. See Tab 04.0 General Arrangement Drawings Rev A in resubmittal package
3. Directed at others.
4. Revised. See Tab 04.0 General Arrangement Drawings Rev A in resubmittal package
5. Agreed.
6. Revised. See Tab 05.1 SEW Data Rev A in resubmittal package. Clarification: 3HP motor is being supplied. Tab 05.1, page 1 was included in data sheets in error.
7. Agreed.
8. Agreed.
9. Verified. See Tab 06.3 ASCO Redhat Solenoid Valve NEMA 7 Rev A in resubmittal package.

NOTHING ELSE FOLLOWS

SPIRAC (USA) INC
75 Jackson Street, Suite 300, Newnan, Georgia 30263, USA
Tel: 770 632 9833 Fax: 770 632 9838
Website: www.spirac.com

SUBMITTAL REVIEW COMMENTS

Date:	July 6, 2016
Project:	Tulalip 88th St Screen Improvements - 216-1598-090
Contractor:	Spirac USA Inc..
Submittal Title:	Screen Submittal
Submittal Number:	001
Specification Section:	Purchase Order
Submittal Disposition:	Submit Specified Item
Reviewer:	Art Stokes, A Maas

Review comments are as follows:

1. Review of submittal is not "Approval". Review is for checking general conformance with design concept.
2. Tab 4.0 General Arrangement: Screen support and pivot point may not be located on concrete slab. Because complete equipment measurements were not provided, supplier shall conduct field measurements to verify what equipment will be necessary for installation. Submit Specified Item.
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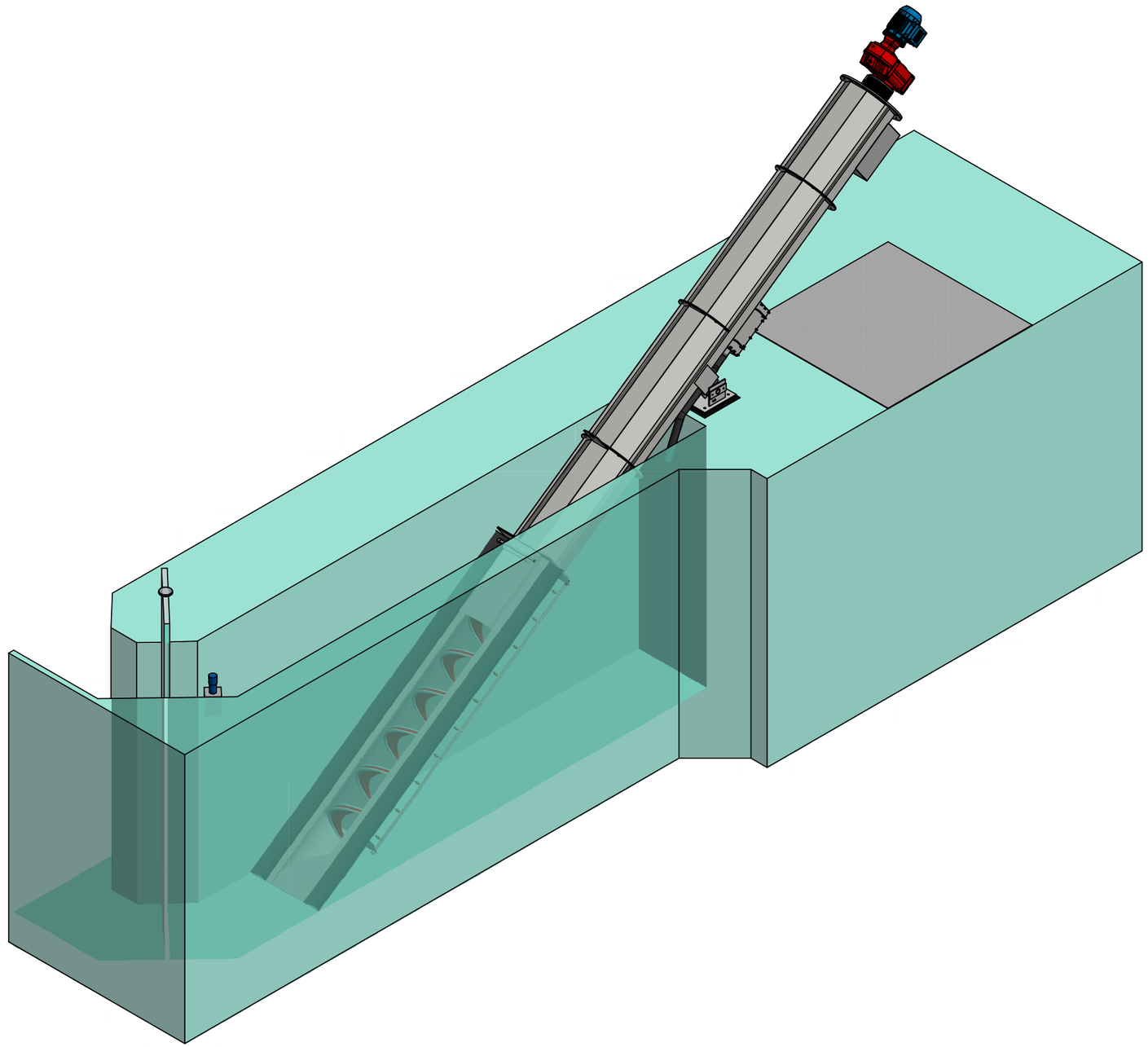
9. Tab 06.3 Redhat Solenoid Valve for C1D2 classified areas – Could not determine if the solenoid valve to be supplied is "Continuous Duty" Verify that the valves are continuous duty rated– Submit Specified Item

1	**MOTOR**	WEG
	HP	3
	Frame Size	182TC
	Environment	Exp-Proof
	Electrical	230/460V
	Manufacturers Part Number	00318XT3ER182TC
2	**GEARBOX**	SEW
	Style	FA87
	AM Adaptor	AM184
	Gear ratio	109.49
	RPM	15
	Mounting Position	M1
	Inclination	35 Deg
4	**Bell Housing**	HDG
5	**Drive Shaft**	1045 / K1040
6	**CONVEYOR**	
	Trough Type/Size-mm	OK500
	Trough Material	11ga 304SS
	Lids	11ga 304SS
	Driveplate	5/8" 304SS
	Flanges	1/4" 304SS
	Chutes	11ga 304SS
7	**LINER**	
	Liner Material	12mm SPX
8	**SPIRAL (TYP OD/PITCH)-mm**	AB460/375
	Spiral Material	HTMAS
	Spiral Handed / Direction	RH/Pull
	SUPPLEMENTAL ITEMS	
9	Ultrasonic Level Sensor Mfr	Siemens
	Ultrasonic Level Sensor Model	ULS-200
10	HeatTrace Mfr	Brisk Heat
11	Solenoid Valve Mfr/Qty	Red Hat (2)
	Solenoid Valve Model	EF8210G003



SPIRAC®
75 Jackson Street,
Suite 300
Newnan, GA 30263
☎770-632-9833

Project: 890 Tulalip,WA

Model: SPIROGUARD CS500

Position: CHANNEL ME102

FA87BAM184/00318XT3ER182TC
3HP/460V/15RPM

REV	DATE	DESCRIPTION	BY	CHK
A	8.2.16	REVISED TO COMPLY WITH 7.6.16 SUBMITTAL REVIEW COMMENTS 2 & 4	JCC	

SPIRAC (USA) INC.
75 Jackson Street Suite 300
Newnan, GA 30263
ph (770) 632-9833
fax (770) 632-9833

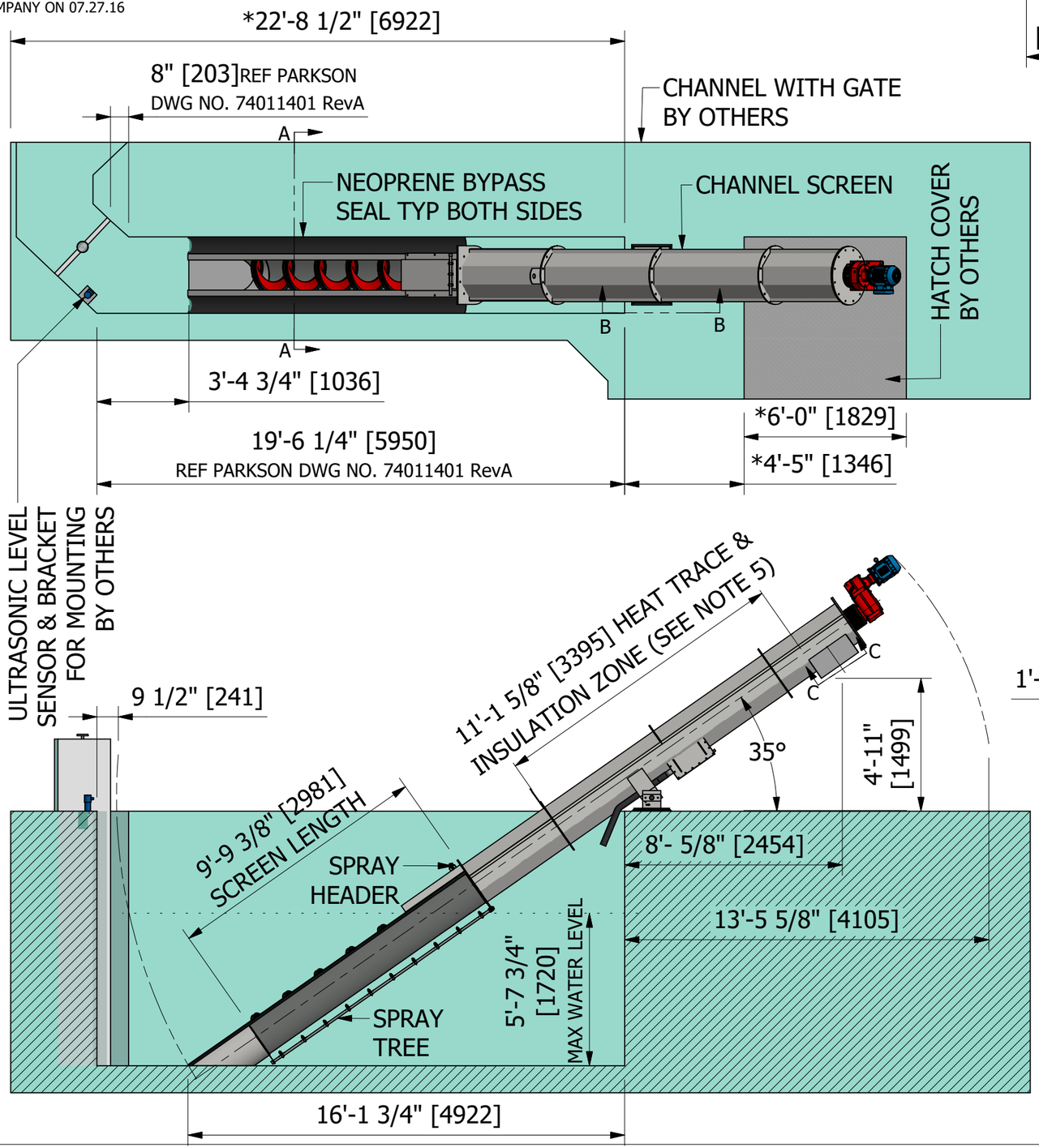
TOLERANCES EXCEPT WHERE OTHERWISE STATED:-
UP TO 120 IN ±1/8 in
120 IN AND OVER ±1/4 in
HOLE CENTERS ±1/16 in
CLEARANCE HOLE DIA ±1/16 in
ALL ANGLES ±1°
DIMENSIONS IN INCHES DO NOT SCALE

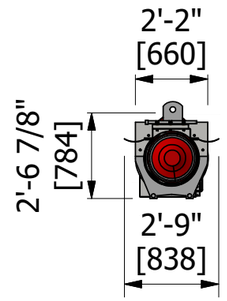
890-Tulalip,WA
General Arrangement
ISO & DATA
CS500-SPX/HDX/304SS

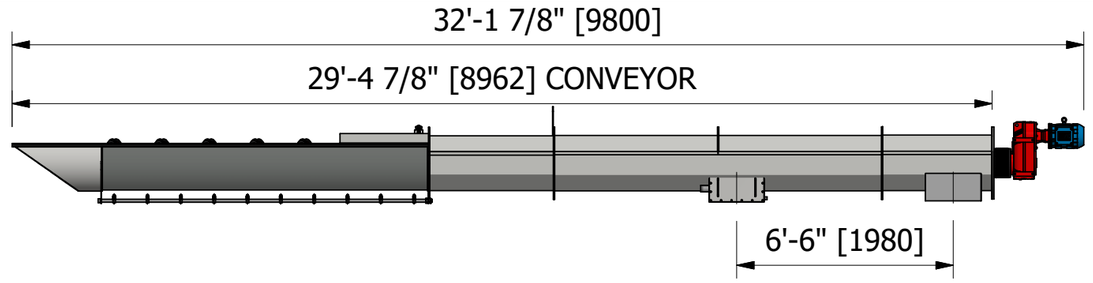
DRAWN: JCC | CHECKED: JB
DATE: 6.20.16
SHEET: 1 | SCALE: NTS
DWG. No. GA-890-01 | REV. A

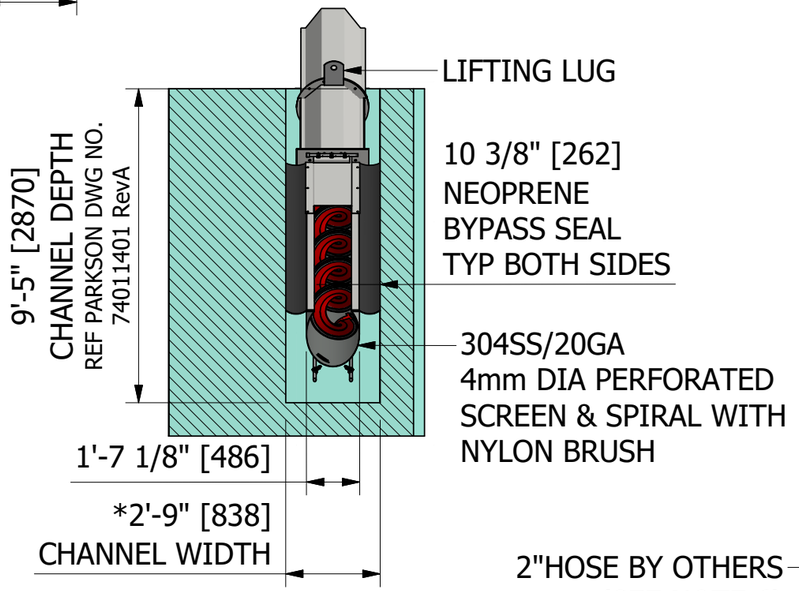
NOTES:
1. APPROX SHIP WEIGHT: 2750LBS
2. ALL LIDS ARE FULLY GASKETED AND BOLTED
3. HARDWARE IS STAINLESS STEEL
4. FIELD WELDING OF SPIRAL REQUIRED AT INSTALLATION
5. XP SOLENOID VALVES AND HEAT TRACE BY SPIRAC, FOR INSTALLATION BY OTHERS
6. SPRAY BOX WITH 2" DRAIN PIPE BY SPIRAC, CUSTOMER'S CONNECTION TO 2" DRAIN PIPE SUPPLIED AND INSTALLED BY OTHERS

* DIMENSIONS VERIFIED IN THE FIELD BY J. NIELSEN WITH TREATMENT EQUIPMENT COMPANY ON 07.27.16

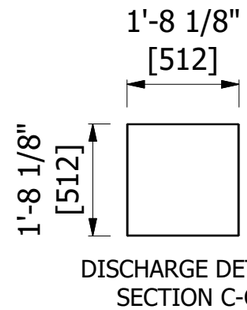




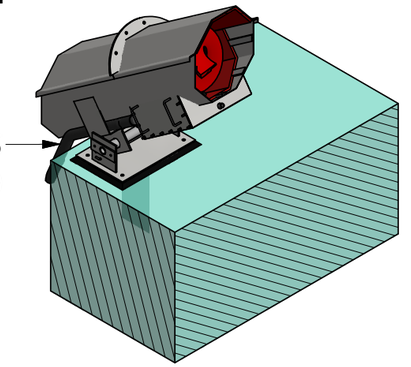


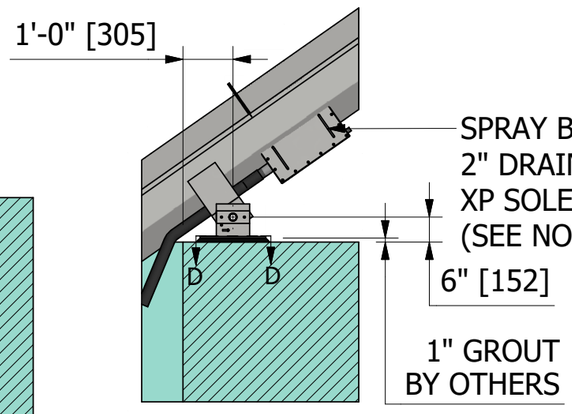


SECTION A-A

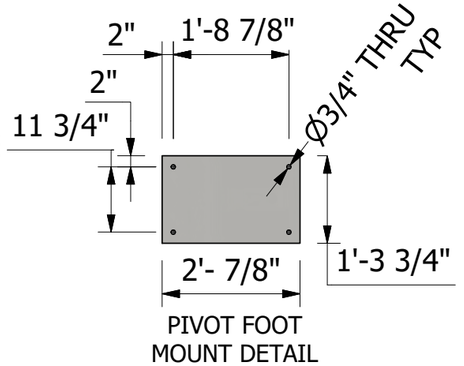


DISCHARGE DETAIL
SECTION C-C





SECTION B-B



PIVOT FOOT MOUNT DETAIL
SECTION D-D

REV	DATE	DESCRIPTION	BY	CHK
B	8.2.16	REVISED TO COMPLY WITH 7.6.16 SUBMITTAL REVIEW COMMENTS 2 & 4	JCC	
A	6.21.16	Adjusted to accommodate swing	JCC	

SPIRAC (USA) INC.
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fax (770) 632-9833

TOLERANCES EXCEPT WHERE OTHERWISE STATED:-
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120 IN AND OVER ±1/4 in
HOLE CENTERS ±1/16 in
CLEARANCE HOLE DIA ±1/16 in
ALL ANGLES ±1°
DIMENSIONS IN INCHES DO NOT SCALE

890-Tulalip,WA
Channel Screen
Plan & Elevation
CS500-SPX/HDX/304SS

DRAWN: JCC | CHECKED: JB
DATE: 5.26.16
SHEET: 2 | SCALE: NTS
DWG. No. GA-890-02 | REV. B

Technical Note

Breathers

Mechanical

General:
The movement of meshing gears inside a gear reducer during normal operation produces friction and heat that cause the oil and air to expand. Expansion produces pressure that can become strong enough to cause seal failure, oil leakage and failure.

However, during rest periods, the oil and air cool to create a vacuum that draws outside air into the reducer. Consequently, water begins to collect as the moisture from the outside air condenses inside the reducer. Since water and oil do not mix, the water combines with oxygen and metal to produce rust, which is catastrophic to the bearings and gears. Even a small amount of water can be devastating.

Therefore, all SEW reducers are supplied with pressure relief breathers, with the following exceptions:

- W-series reducers
- R07, R17, R27 reducers in mounting positions M1, M3, M5, and M6 (M2 and M4 positions are supplied with breathers)

Features/Benefits:
The SEW breather, shown in Figure 1, offers the following features:

- **Brass construction** – provides excellent corrosion resistance and reliable operation.
- **Check Valve** - contains a spring-loaded one-way check valve that allows venting from the inside out. Since it prevents outside air from entering the reducer during cooling, the entry of moisture is minimized.
- **4 psi Rating** – the venting pressure is approximately 4 psi, regardless of reducer type or size.

Breathers are equipped with a protective band (see Figure 1) to prevent the breather's vents from becoming clogged during painting. This band is normally removed by SEW before shipping to allow the breather to vent properly.

The top portion of the band merely provides a grip to aid in removal. The bottom portion actually protects the vents. To remove the band, peel off the top ring and use it as a grip to remove the remaining part.

Compact Series:
The breathers used for the Compact series of gear reducers are an open type, allowing an unobstructed transfer of air between the reducer's interior and the surrounding atmosphere. The breather is filled with a filtering agent (similar to fine steel wool) to help prevent outside contaminants from entering the reducer.

Technical Note

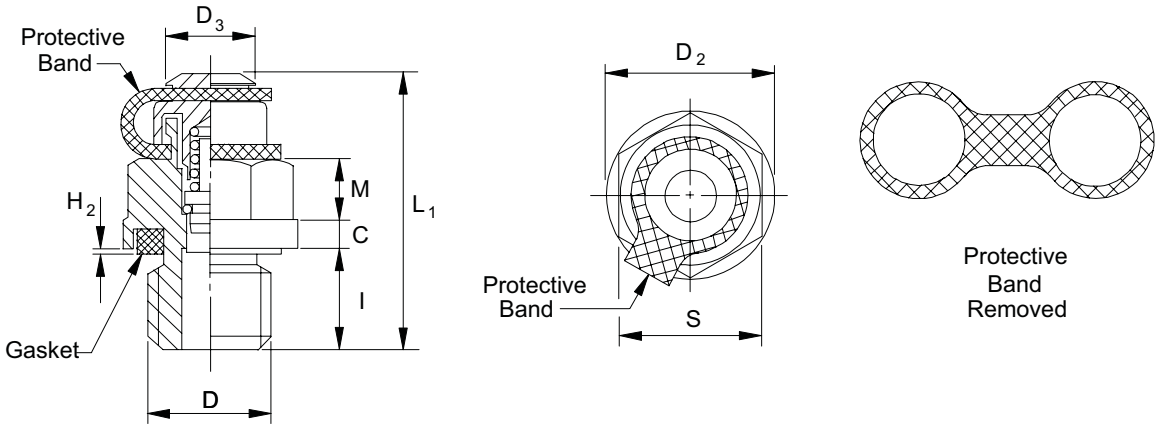


Figure 1

Specifications:

	Breather (in/mm)				
Dimensions	**M10 x 1**	**M12 x 1.5**	**M22 x 1.5**	**M33 x 2**	**M42 x 2**
L_1	0.98/25	1.06/27	1.08/27.5	1.32/33.5	1.32/33.5
I (± 0.008/0.2)	0.31/8	0.39/10	0.39/10	0.51/13	0.51/13
C	0.12/3	0.12/3	0.14/3.5	0.18/4.5	0.184.5
M	0.24/6	0.24/6	0.24/6	0.31/8	0.31/8
L_1 - I	0.67/17	0.67/17	0.69/17.5	0.81/20.5	0.81/20.5
D_3	0.43/11	0.43/11	0.43/11	0.43/11	0.43/11
H_2	0.01/0.25	0.01/0.25	0.01/0.25	0.01/0.3	0.01/0.3
S (-0.008/-0.2)	12mm	13mm	19mm	27mm	30mm
D_2 (-0.008/-0.2)	0.55/14	0.67/17	1.06/27	1.54/39	1.93/49
Reducer Sizes					
R series*	07 – 67	77 – 87	97 – 137	147	167
F series	27 – 67	77 – 87	97 – 107	127	157
S series	37 – 67	77 – 87	97	-	-
K series	37 – 67	77 – 87	97 – 107	127	157 – 187
Part number	013 030 3	013 031 1	013 032 X	013 033 8	013 034 6
Tightening Torque (lb-in/Nm)	70/8	140/16	400/45	885/100	1400/160

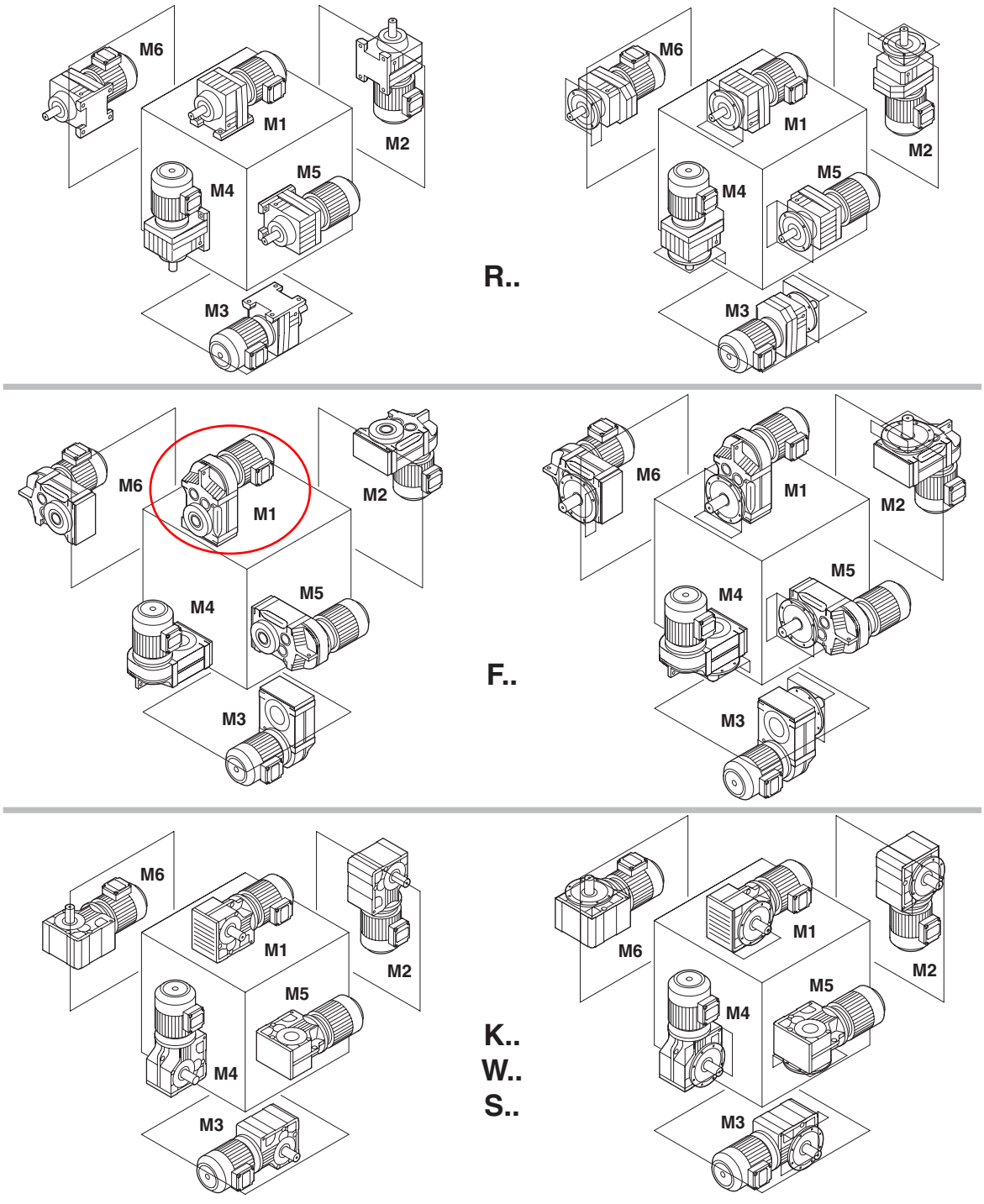
* No breather required for R07, R17, R27 mounted in M1, M3, M5, and M6 positions. (M2 and M4 positions are supplied with breathers)

8 Mounting Positions

8.1 General information on mounting positions

Mounting position designation

SEW differentiates between six mounting positions M1 ... M6 for gear units. The following figure shows the spatial orientation of the gearmotor in mounting positions M1 ... M6.



03203AXX

Figure 14: Depiction of mounting positions M1 ... M6

FA.., FH.., FV.., FAF.., FHF.., FVF.., FAZ.., FHZ.., FVZ..:

Gear unit type	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
F..27	0.60	0.80	0.65	0.70	0.60	0.60
F..37	0.95	1.25	0.70	1.25	1.00	1.10
F..47	1.50	1.80	1.10	1.90	1.50	1.70
F..57	2.70	3.50	2.10	3.40	2.90	3.00
F..67	2.70	3.80	1.90	3.80	2.90	3.20
F..77	5.9	7.3	4.30	8.0	6.0	6.3
F..87	10.8	13.0	7.7	13.8	10.8	11.0
F..97	18.5	22.5	12.6	25.2	18.5	20.0
F..107	24.5	32.0	19.5	37.5	27.0	27.0
F..127	39.0	54.5	34.0	61.0	45.0	46.5
F..157	68.0	103.0	62.0	104.0	85.0	77.0

Helical-bevel (K) gear units

K.., KA..B, KH..B, KV..B:

Gear unit type	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
K..37	0.50	1.00	1.00	1.25	0.95	0.95
K..47	0.80	1.30	1.50	2.00	1.60	1.60
K..57	1.20	2.30	2.50	2.80	2.60	2.40
K..67	1.10	2.40	2.60	3.45	2.60	2.60
K..77	2.20	4.10	4.40	5.8	4.20	4.40
K..87	3.70	8.0	8.7	10.9	8.0	8.0
K..97	7.0	14.0	15.7	20.0	15.7	15.5
K..107	10.0	21.0	25.5	33.5	24.0	24.0
K..127	21.0	41.5	44.0	54.0	40.0	41.0
K..157	31.0	62.0	65.0	90.0	58.0	62.0
K..167	33.0	95.0	105.0	123.0	85.0	84.0
K..187	53.0	152.0	167.0	200	143.0	143.0

KF..:

Gear unit type	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
KF37	0.50	1.10	1.10	1.50	1.00	1.00
KF47	0.80	1.30	1.70	2.20	1.60	1.60
KF57	1.30	2.30	2.70	3.15	2.90	2.70
KF67	1.10	2.40	2.80	3.70	2.70	2.70
KF77	2.10	4.10	4.40	5.9	4.50	4.50
KF87	3.70	8.2	9.0	11.9	8.4	8.4
KF97	7.0	14.7	17.3	21.5	15.7	16.5
KF107	10.0	21.8	25.8	35.1	25.2	25.2
KF127	21.0	41.5	46.0	55.0	41.0	41.0
KF157	31.0	66.0	69.0	92.0	62.0	62.0

Lubricant table

01 805 09 92US

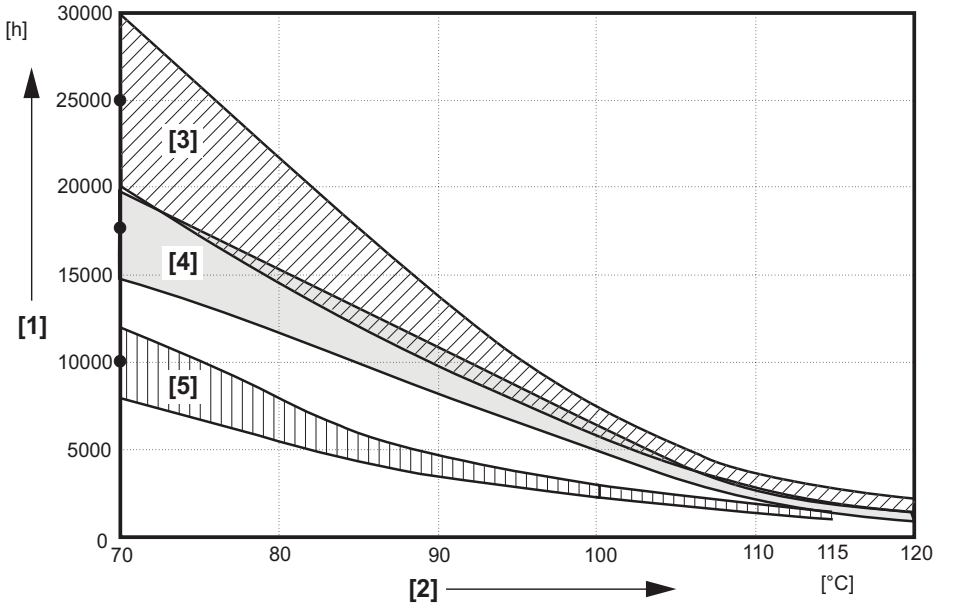
	5) °C	DIN (ISO)	ISO,NLGI	ExxonMobil	Shell	Klüber	ARAL	bp Tribol	TEXACO	Optimol	FUCHS	TOTAL
R...	Standard -10 +40	CLP(CC)	VG 220	Mobilgear 600XP 220	Shell Omala 220	Klüberoil GEM 1-220 N	Aral Degol BG 220	BP Energol GR-XP 220 / Tribol 1100/220	Meropa 220	Optigear BM 220	Renolin CLP 220	Carter EP 220
K...(HK...)	-25 +80	CLP PG	VG 220	Mobil Glygoyle 30	Shell Tivela S 220	Klübersynth GH 6-220	Aral Degol GS 220	BP Enersyn SG-XP 220 / Tribol 800/220	Synlube CLP 220	Optiflex A 220		Carter SY 220
	4) -40 +80	CLP HC	VG 220	Mobil SHC 630	Shell Omala HD 220	Klübersynth GEM 4-220 N	Aral Degol PAS 220	Tribol 1510/220	Pinnacle EP 220	Optigear Synthetic A 220	Renolin Unisyn CLP 220	
F...	4) -40 +40	CLP HC	VG 150	Mobil SHC 629	Shell Omala HD 150	Klübersynth GEM 4-150 N			Pinnacle EP 150			Carter SH 150
	-20 +25	CLP (CC)	VG 150 VG 100	Mobilgear 600XP 100	Shell Omala 100	Klüberoil GEM 1-150 N	Aral Degol BG 100	BP Energol GR-XP 100 / Tribol 1100/100	Meropa 150	Optigear BM 100	Renolin CLP 150	Carter EP 100
	-30 +10	HLP (HM)	VG 68-46 VG 32	Mobil D.T.E. 13M	Shell Tellus T 32	Klüberoil GEM 1-68 N	Aral Degol BG 46	Tribol 1100/68	Rando EP Ashless 46	Optigear 32	Renolin B 46 HVI	Equivis ZS 46
	4) -40 +10	CLP HC	VG 32	Mobil SHC 624		Klüber-Summit HySyn FG-32			Cetus PAO 46			Dacnis SH 32
	4) -40 -20	HLP (HM)	VG 22 VG 15	Mobil D.T.E. 11M	Shell Tellus T 15	Isoflex MT 30 ROT		BP Energol HLP-HM 15	Rando HDZ 15			Equivis ZS 15
S...(HS...)	Standard 0 +40	CLP (CC)	VG 680	Mobilgear 600XP 680	Shell Omala 680	Klüberoil GEM 1-680 N	Aral Degol BG 680	BP Energol GR-XP 680 / Tribol 1100/680	Meropa 680	Optigear BM 680	Renolin CLP 680	Carter EP 680
	-20 +60	CLP PG	VG 680 1)		Shell Tivela S 680	Klübersynth GH 6-680		BP Enersyn SG-XP 680 / Tribol 800/680	Synlube CLP 680			
	4) -30 +80	CLP HC	VG 460	Mobil SHC 634	Shell Omala HD 460	Klübersynth GEM 4-460 N			Pinnacle EP 460			
	4) -40 +10	CLP HC	VG 150	Mobil SHC 629	Shell Omala HD 150	Klübersynth GEM 4-150 N			Pinnacle EP 150			Carter SH 150
	-20 +10	CLP (CC)	VG 150 VG 100	Mobilgear 600XP 100	Shell Omala 100	Klüberoil GEM 1-150 N	Aral Degol BG 100	BP Energol GR-XP 100 / Tribol 1100/100	Meropa 150	Optigear BM 100	Renolin CLP 150	Carter EP 100
	-25 +20	CLP PG	VG 220 1)	Mobil Glygoyle 30	Shell Tivela S 220	Klübersynth GH 6-220	Aral Degol GS 220	BP Enersyn SG-XP 220 / Tribol 800/220	Synlube CLP 220	Optiflex A 220		Carter SY 220
	4) -40 0	CLP HC	VG 32	Mobil SHC 624		Klüber-Summit HySyn FG-32			Cetus PAO 46			Dacnis SH 32
R...,K...(HK...), F...,S...(HS...)	Standard -20 +40	CLP PG	VG 460 1)			Klübersynth UH1 6-460						
	4) -30 +40	HCE	VG 460		Shell Cassida Fluid GL 460	Klüberoil 4UH1-460 N	Aral Eural Gear 460			Optileb GT 460		
	-20 +40	E	VG 460			Klüberbio CA2-460	Aral Degol BAB 460			Optisynt BS 460		
W...(HW...)	Standard -20 +40	SEW PG	VG 460 2)			Klüber SEW HT-460-5						
	4) -40 +10	API GL5	SAE 75W90 (~VG 100)	Mobilube SHC 75 W90-LS								
	-20 +40	CLP PG	VG 460 3)			Klübersynth UH1 6-460						

6 Inspection and Maintenance

6.1 Inspection and maintenance intervals

Frequency	What to do?
• Every 3000 machine hours, at least every 6 months.	• Check oil and oil level. • Check the seals visually for leakage. • For gear units with a torque arm: Check the rubber buffer and change it, if necessary
• Depending on the operating conditions (see chart below), every 3 years at the latest. • According to oil temperature.	• Change mineral oil.
	• Replace anti-friction bearing grease (recommendation). • Replace oil seal (do not install it in the same track).
• Depending on the operating conditions (see chart below), every 5 years at the latest. • According to oil temperature.	• Change synthetic oil
	• Replace anti-friction bearing grease (recommendation). • Replace oil seal (do not install it in the same track).
• Gear unitsR07, R17, R27, F27 and Spiroplan® are have lubrication for life and are therefore maintenance-free	
• Varying (depending on external factors).	• Touch up or renew the surface/anticorrosion coating.

6.2 Lubricant change intervals



53232AXX

Figure 13: Oil change intervals for standard gear units under normal environmental conditions

[1] Operating hours
[2] Sustained oil bath temperature
- Average value per oil type at 70 °C

[3] CLP PG
[4] CLP HC / HCE
[5] CLP / HLP / E

6.3 Inspection and maintenance of the gear unit

Do not intermix synthetic lubricants and do not mix synthetic and mineral lubricants together!

The standard lubricant is mineral oil (except for Spiroplan® gear units).

The position of the oil level and oil drain plug and the breather valve depends on the mounting position. Refer to the diagrams of the mounting positions.

Checking the oil level

1. **De-energize the gearmotor and secure it to prevent it from being switched on inadvertently!**

   Wait until the gear unit has cooled off – Danger of burns!
2. Refer to Sec. "Installing the gear unit" when changing the mounting position!
3. For gear units with an oil level plug: Remove the oil level plug, check the fill level and correct it if necessary. Screw the oil level plug back in.

Checking the oil

1. **De-energize the gearmotor and secure it to prevent it from being switched on inadvertently!**

   Wait until the gear unit has cooled off – Danger of burns!
2. Remove a little oil from the oil drain plug.
3. Check the oil consistency.
   - Viscosity
   - If you can see that the oil is heavily contaminated, we recommend that you change the oil even if this is outside the service intervals specified in "Inspection and maintenance periods".
4. For gear units with an oil level plug: Remove the oil level plug, check the fill level and correct it if necessary. Screw the oil level plug back in.

Changing the oil

Only change the oil when the gear unit is at operating temperature.

De-energize the gearmotor and secure it to prevent it from being switched back on inadvertently!

Wait until the gear unit cools down - Danger of burns!

Note: The gear unit must still be warm otherwise the high viscosity of excessively cold oil will make it harder to drain the oil correctly.

With oil drain plug / oil level screw

1. Place a container underneath the oil drain plug
2. Remove the oil level plug, breather plug/breather valve and oil drain plug.
3. Drain all the oil.
4. Screw in the oil drain plug.
5. Pour in new oil of the same type through the vent hole (if changing the oil type, please first contact our customer service). Do not mix synthetic lubricants.
   - Pour in the volume of oil in accordance with the mounting position (see Sec. "Lubricant fill quantities") or as specified on the nameplate.
   - Check at the oil level plug.
6. Screw the oil level plug back in
7. Screw in the breather plug/breather valve.

Without oil drain plug / oil level plug

1. Remove cover plate.
2. Drain the oil through the cover plate opening.
3. Pour in new oil of the same type through the vent hole (if changing the oil type, please first contact our customer service). Do not mix synthetic lubricants.
   – Pour in the volume of oil in accordance with the mounting position (see Sec. "Lubricant fill quantities") or as specified on the nameplate.
4. Check the oil level (→ Sec. "Check oil level for gear units with oil level plug")
5. Attach cover plate (observe the tightening torque and series → Sec. "Check the oil level for gear units without an oil level plug")

Changing the oil seal

1. **De-energize the gearmotor and secure it to prevent it from being switched on inadvertently!**

   Wait until the gear unit has cooled off – Danger of burns!
2. When changing the oil seal, ensure that there is a sufficient grease reservoir between the dust lip and protective lip, depending on the type of gear unit.
3. If you use double oil seals, the space has to be filled one-third with grease.

6.4 Inspection / maintenance of AM / AQA adapters

Frequency	What to do?
• Every 3000 machine hours, at least every 6 months	• Check torsional play • Visually check the elastic annular gear • Check the adapter visually for leakage
• After 25000 - 30000 machine hours	• Renew the anti-friction bearing grease • Replace oil seal (do not install it in the same track) • Change the elastic coupling spider

6.5 Inspection / maintenance of AD adapters

Frequency	What to do?
• Every 3000 machine hours, at least every 6 months	• Check running noise for possible bearing damage • Check the adapter visually for leakage
• After 25000 - 30000 machine hours	• Renew the anti-friction bearing grease
	• Change the oil seal

7 Malfunctions

Customer service

Please have the following information to hand if you require the assistance of our customer service:
- Data from the nameplate (complete)
- Nature and extent of the fault
- Time and peripheral circumstances of the fault
- Presumed cause

7.1 Gear unit malfunctions

Problem	Possible cause	Remedy
Unusual, regular running noise	A Meshing/grinding noise: Bearing damage. B Knocking noise: Irregularity in the gearing	A Check the oil (see Sec. "Inspection and Maintenance"), change bearings B Contact customer service
Unusual, irregular running noise	Foreign bodies in the oil	• Check the oil (see Sec. "Inspection and Maintenance") • Stop the drive, contact customer service
Oil leaking[1)] • From the gear cover plate • From the motor flange • From the motor oil seal • From the gear unit flange • From the output end oil seal	A Rubber seal on the gear cover plate leaking B Seal defective C Gear unit not vented	A Tighten the bolts on the gear cover plate and observe the gear unit. Oil still leaking: Contact customer service B Contact customer service C Vent the gear unit (see Sec. "Mounting Positions")
Oil leaking from breather valve	A Too much oil B Drive operated in incorrect mounting position C Frequent cold starts (oil foams) and/or high oil level	A Correct the oil level (see Sec. "Inspection and Maintenance") B Mount the breather valve correctly (see Sec. "Mounting Positions") and correct the oil level (see "Lubricants")
Output shaft does not turn although the motor is running or the input shaft is rotated	Connection between shaft and hub in gear unit interrupted	Send in the gear unit/gearmotor for repair

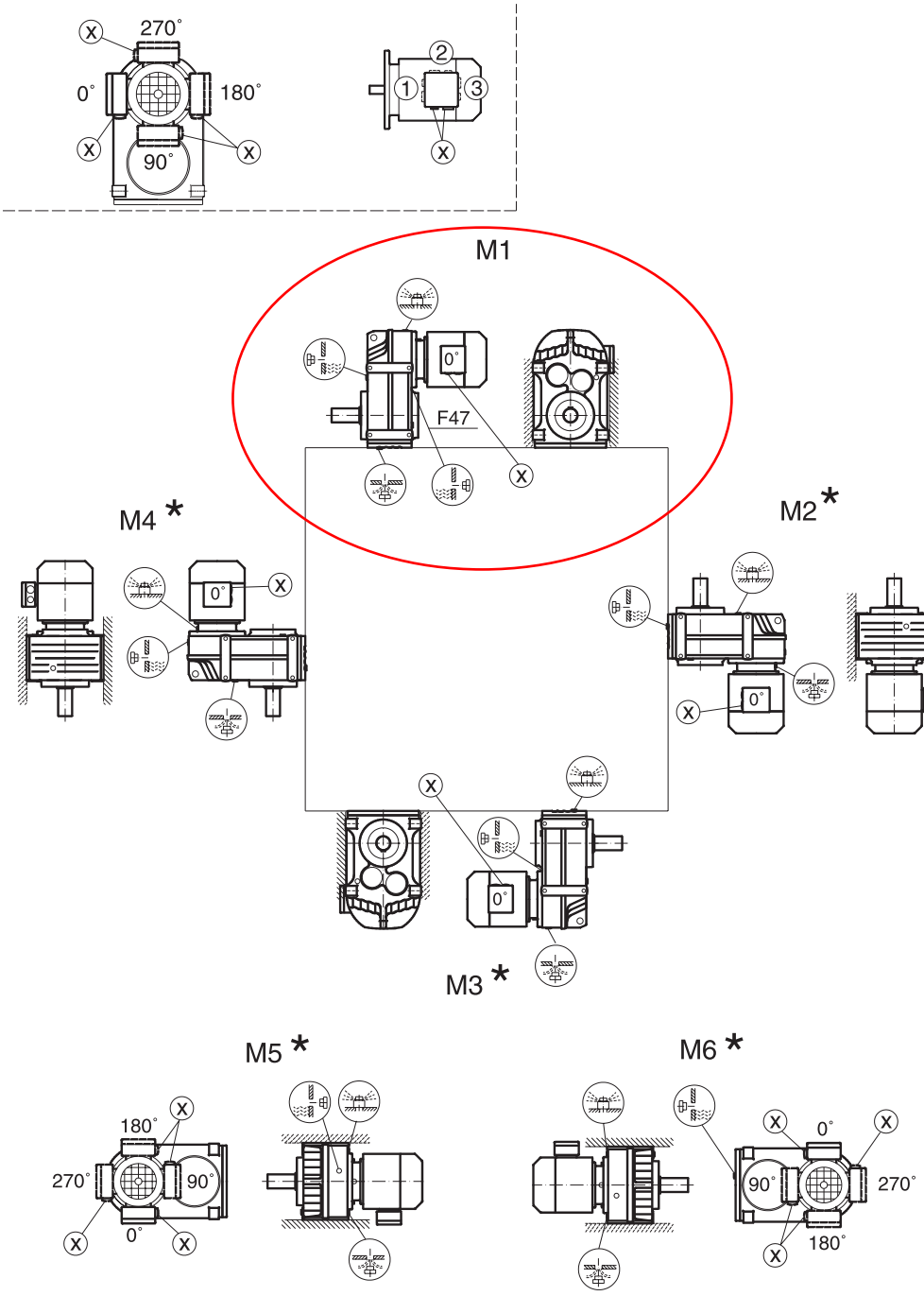
1) Short-term oil/grease leakage at the oil seal is possible in the run-in phase (24 hours running time).

7.2 AM / AQA / AL adapter malfunctions

Problem	Possible cause	Remedy
Unusual, regular running noise	Meshing/grinding noise: Bearing damage	Contact SEW-EURODRIVE customer service
Oil leaking	Seal defective	Contact SEW-EURODRIVE customer service
Output shaft does not turn although the motor is running or the input shaft is rotated	Connection between shaft and hub in gear unit interrupted	Send the gear unit to SEW-EURODRIVE for repair.
Change in running noise and / or vibrations occur	A Annular gear wear, short-term torque transfer through metal contact B Bolts to secure hub axially are loose.	A Change the coupling spider B Tighten the bolts
Premature wear in annular gear	A Contact with aggressive fluids / oil; ozone influence; too high ambient temperatures etc, which can cause a change in the physical properties of the annular gear. B Impermissibly high ambient/contact temperature for the annular gear; maximum permitted temperature –20 °C to +80 °C. C Overload	Contact SEW-EURODRIVE customer service

Mounting positions for parallel shaft helical geared motors

F/FA..B/FH27B-157B, FV27B-107B



F..27 M1, M3, M5, M6

F..27 M1 M6

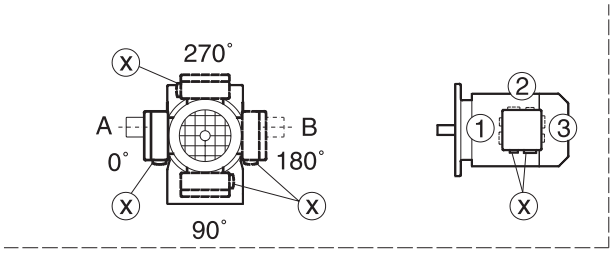
F..27 M1, M3, M5, M6

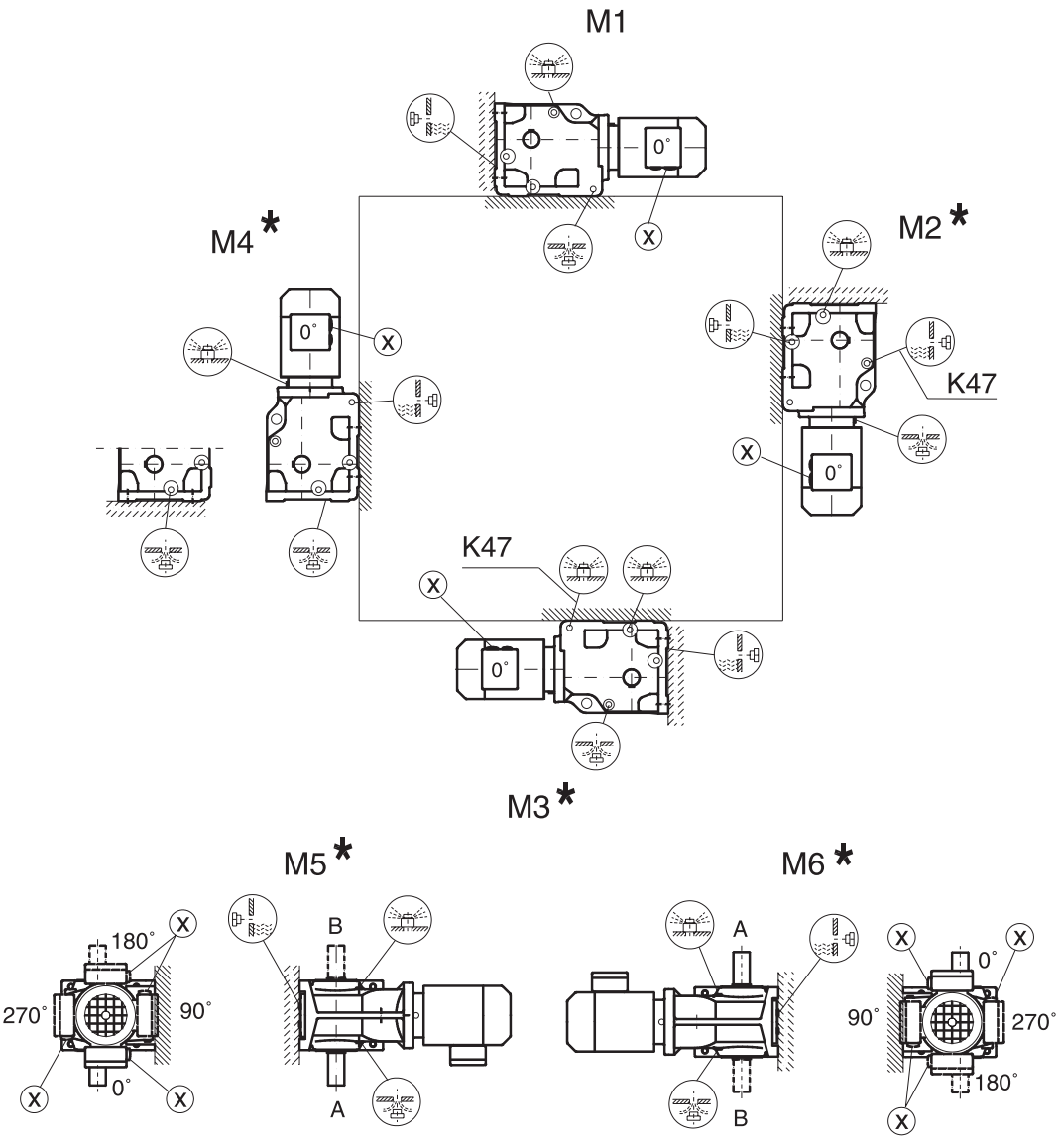
* → page 11

SEW EURODRIVE

Mounting positions for helical-bevel geared motors

K/KA..B/KH37B-157B, KV37B-107B





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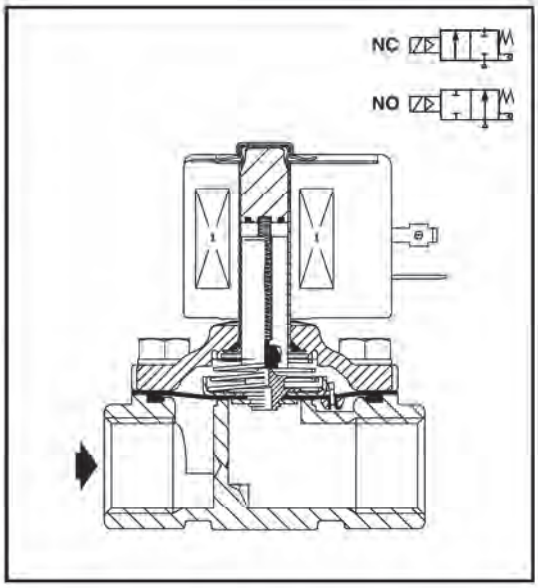
Features

- 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
H	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: RedHat II - Watertight, Types 1, 2, 3, 3S, 4, and 4X; RedHat - Type I.

Optional: RedHat 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 8210B057, 8210B058, and 8210B059, which are not available with Explosionproof enclosures.)
See Optional Features Section for other available options.

Nominal Ambient Temp. Ranges

RedHat II/
RedHat AC: 32˚F to 125˚F (0˚C to 52˚C)

RedHat II DC: 32˚F to 104˚F (0˚C to 40˚C)
RedHat 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. RedHat II meets applicable CE directives.
Refer to Engineering Section for details.