OPERATION AND MAINTENANCE MANUAL

RICE LAKE STATE FISH AND WILDLIFE AREA
UPPER MISSISSIPPI RIVER RESTORATION
HABITAT REHABILITATION AND ENHANCEMENT PROJECT
FULTON COUNTY, ILLINOIS

SEPTEMBER 2021

APPENDIX I

PUMP STATION CONTROL BUILDING
LIGHT FIXTURES

METALUX®

DESCRIPTION

The DMF Series is an energy efficient family of industrials that feature premium performance and durability. The industrial series incorporates heavy duty, embossed, reflectors that precisely direct and effectively control light. The versatile DMF Series can be installed using various mounting methods and numerous options and accessories are available.

The DMF Series can be utilized in simple task and area lighting to the most demanding industrial applications.

Catalog #	DCMF-232-UNV-EB81-DIF	Type
Project	Rice Lake	A
Comments		Date
Prepared by		

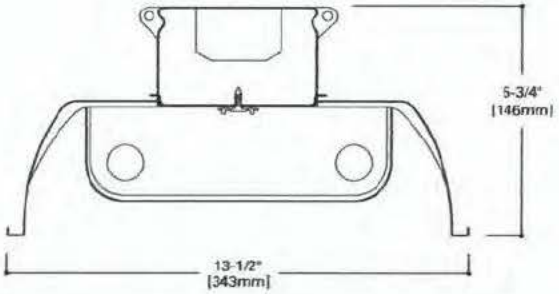
SPECIFICATION FEATURES

Construction
Channel is code gauge prime cold rolled steel. Die formed with deep V-grooves for tong hanger. Die formed channel connector assures straight rows and continuity of ground through set screws. Lampholder mounting brackets are easily inserted with snap-in action.

Electrical*
Ballast are CBM/ETL Class "P" and positively secured by mounting bolts. Metal clad lampholders are spring loaded for turret safety. UL/CUL listed. Suitable for damp locations.

Finish
Multistage iron phosphate pretreatment ensures maximum bonding and rust inhibitor. Lighting grade, baked white enamel finish.

Reflectors
Die formed prime steel, code gauge. Deep draw full width ribs formed with one press stroke. Side flanges lend strength with upward turn. Easily cleaned. Baked white enamel 13-1/2" width. Four foot sections. Reflectors secured by positive retaining screw. Reflector aligners provided. Standard with 20% uplight (DMF). Closed top reflector (DCMF). Optional industrial fixtures are available incorporating silver technology enhancements. (SilverLining)

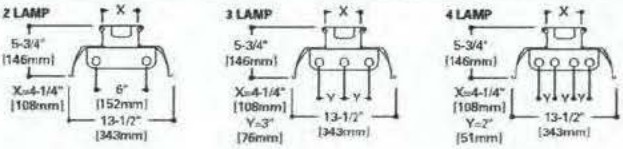


DMF
232
332
432

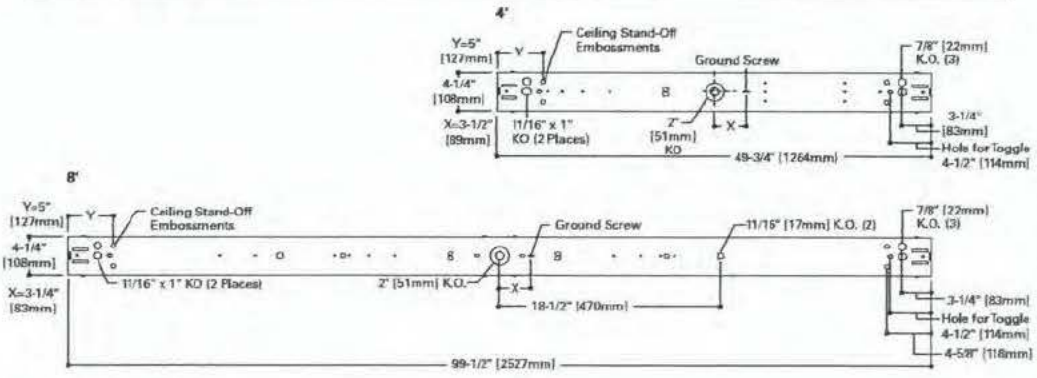
4' OR 8' INDUSTRIAL
2, 3 OR 4 LAMP

Heavy Duty Industrial

LAMP CONFIGURATIONS



MOUNTING DATA



ENERGY DATA

Input Watts:
ES Ballast & STD Lamps
232 (71), 332 (108), 432 (142)

Luminaire Efficacy Rating
LER = FI-78
Catalog Number: DMF-232

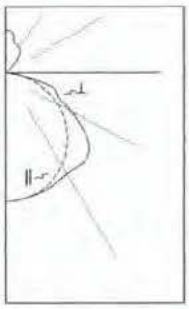
Yearly Cost of 1000 lumens, 3000 hrs at .08 KWH = $3.08

*Reference the lamp/ballast data in the Technical Section for specific lamp/ballast requirements.

LAMPS CONTAIN MERCURY. DISPOSE ACCORDING TO LOCAL, STATE OR FEDERAL LAWS

LINEAR DISCONNECT
Safe and convenient means of disconnecting power.

PHOTOMETRICS



DMF-232
Electronic Ballast
F32T8/35K Lamps
2850 Lumens
Spacing criterion: (||) 1.3 x mounting height, (⊥) 1.4 x mounting height
Efficiency 90.8%
Test Report: DMF232.IES
LER = FI-78
Yearly Cost of 1000 lumens, 3000 hrs at .08 KWH = $3.08

Coefficients of Utilization

Effective floor cavity reflectance									20%										
rc	80%				70%				50%			30%			10%			0%
rw	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR																		
0	105	105	105	105	100	100	100	100	93	93	93	86	86	86	79	79	79	76
1	95	91	87	84	91	88	84	81	81	78	76	75	73	71	70	68	66	64
2	87	79	73	68	83	76	71	66	71	66	62	66	62	59	61	58	55	53
3	79	70	62	57	76	67	61	55	62	57	52	58	53	50	54	50	47	44
4	72	61	54	48	69	59	52	47	55	49	44	51	46	42	48	44	40	38
5	66	54	46	40	63	52	45	39	49	42	37	45	40	35	42	37	34	31
6	60	48	40	34	57	46	39	33	43	37	32	40	35	30	38	33	29	27
7	55	43	35	29	53	42	34	29	39	32	28	36	31	26	34	29	25	23
8	51	38	31	25	49	37	30	25	35	28	24	32	27	23	30	25	22	20
9	47	34	27	22	45	33	26	21	31	25	20	29	23	19	27	22	19	17
10	43	31	24	19	41	30	23	19	28	22	18	26	21	17	25	20	16	15

Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixture
0-30	1016	17.8	19.6
0-40	1703	29.9	32.9
0-60	3238	56.8	62.5
0-90	4330	76.0	83.7
90-180	846	14.8	16.3
0-180	5176	90.8	100.0

Candela

Angle	Along ||	45°	Across ⊥
0	1278	1278	1278
10	1258	1264	1268
20	1195	1214	1228
30	1092	1133	1180
40	952	1039	1174
50	781	972	1075
60	582	817	724
70	367	472	553
80	157	251	138
90	15	30	21
100	31	65	50
110	96	18	38
120	169	45	20
130	240	140	64
140	304	244	173
150	358	286	286
160	398	369	311
170	424	426	420
180	434	434	434

ORDERING INFORMATION

SAMPLE NUMBER: DMF-232-120V-EB81-U

Tandem
Blank=4' Length
8T=8' Length

Series
DMF=Apertured Reflector
DCMF=Closed Top Reflector

Lamp Spacing
Blank=Standard Spacing
N=Narrow Spacing for 2 Lamp Only (10% uplight)

Silver Reflector
SS=Silver-Lining Reflector

Number of Lamps
2, 3 or 4 Lamps (Not included)

Wattage (Length)
32=32W T8 (48")

Voltage [1]
120V=120 Volt
277V=277 Volt
UNV=Universal Voltage 120-277

Options
GL=Single Element Fuse
GM=Double Element Fuse
EL=Emergency Installed

Ballast Type [1]
EB8_=T8 Electronic Instant Start, Total Harmonic Distortion < 10%
No. of Ballast 1, 2 or 3
EB8_/PLUS=T8 Electronic Instant Start, High Ballast Factor >1.13, Total Harmonic Distortion < 20%
No. of Ballast 1, 2 or 3
ER8_=T8 Electronic Program Rapid Start, Total Harmonic Distortion < 10%
No. of Ballast 1, 2 or 3

Options
RIF1=Radio Interference Suppressor
6-3/18 SJT-C&P-515P=Cord & Plug (120V)
6-3/18 SJT-C&P-L715P=Cord & Plug (277V)
PI/CPI=Plug-In Option
TILW=Tandem In-Line Wiring Option (Consult TILW Option Catalog Page)
POX=Porlux Finish
(See options & accessories)

Packaging
U=Unit Pack
4B=4 Bulk

NOTES. [1]*Products also available in non-US voltages and frequencies for international markets.*

Specifications & dimensions subject to change without notice. Consult your Cooper Lighting Representative for availability and ordering information.

ACCESSORIES

(Order Separately)

A1B/Spacer-U=Spacer 1-1/2" to 2-1/2" from ceiling (Use 2 per fixture)
ATG-DIF-4-U=Tong Hanger (Use 2 per fixture)
SCF=Fixed Stem Set (Specify Length)
SCS=Swivel Stem Set (Specify Length)
SCA=Adjustable 48" Stem Set
AYC-Chain/Set-U=Chain Hanger Set (Use 1 set per fixture)
WG/DIF4FT-U=Wire Guard
GYM GUARD, GG-DIF=Wire Gym Guard
MECL-DIF/SL-48-U=Metal Egg Crate Louver
MECL-DIF/SL-96-U=Metal Egg Crate Louver
DIF2 LONG CONN (PREPAINTED)=Long Connector
DIF CLOSED END PLATE=Closed End Plate

SHIPPING INFORMATION

Catalog No.	Wt.
DMF-232	15 lbs.
8TDMF-232	30 lbs.
DMF-332	25 lbs.
DMF-432	25 lbs.

DESCRIPTION

The DMF Series is an energy efficient family of industrials that feature premium performance and durability. The industrial series incorporates heavy duty, embossed, reflectors that precisely direct and effectively control light. The versatile DMF Series can be installed using various mounting methods and numerous options and accessories are available.

The DMF Series can be utilized in simple task and area lighting to the most demanding industrial applications.

Catalog #	DCMF-232-120V-EB81-EM-DIF	Type
Project	Rice Lake	B
Comments		Date
Prepared by		

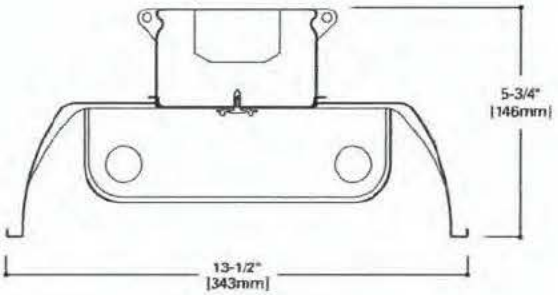
SPECIFICATION FEATURES

Construction
Channel is code gauge prime cold rolled steel. Die formed with deep V-grooves for tong hanger. Die formed channel connector assures straight rows and continuity of ground through set screws. Lampholder mounting brackets are easily inserted with snap-in action.

Electrical*
Ballast are CBM/ETL Class "P" and positively secured by mounting bolts. Metal clad lampholders are spring loaded for turret safety. UL/CUL listed. Suitable for damp locations.

Finish
Multistage iron phosphate pretreatment ensures maximum bonding and rust inhibitor. Lighting grade, baked white enamel finish.

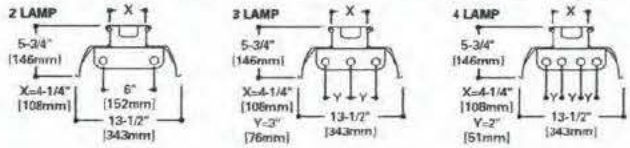
Reflectors
Die formed prime steel, code gauge. Deep draw full width ribs formed with one press stroke. Side flanges lend strength with upward turn. Easily cleaned. Baked white enamel 13-1/2" width. Four foot sections. Reflectors secured by positive retaining screw. Reflector aligners provided. Standard with 20% uplight (DMF). Closed top reflector (DCMF). Optional industrial fixtures are available incorporating silver technology enhancements. (SilverLining)



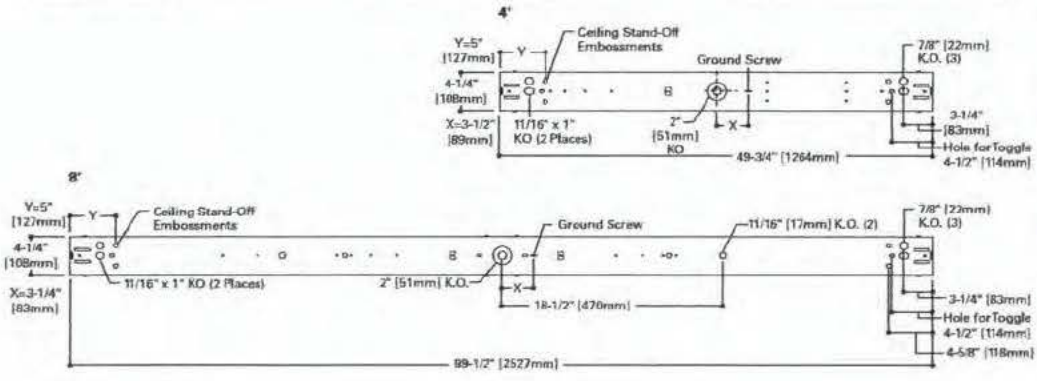
DMF
232
332
432

4' OR 8' INDUSTRIAL
2, 3 OR 4 LAMP
Heavy Duty Industrial

LAMP CONFIGURATIONS



MOUNTING DATA



ENERGY DATA

Input Watts:
ES Ballast & STD Lamps
232 (71), 332 (108), 432 (142)

Luminaire Efficacy Rating
LER = FI-78
Catalog Number: DMF-232

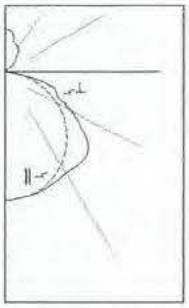
Yearly Cost of 1000 lumens, 3000 hrs at .08 KWH = $3.08

*Reference the lamp/ballast data in the Technical Section for specific lamp/ballast requirements.

LAMPS CONTAIN MERCURY. DISPOSE ACCORDING TO LOCAL, STATE OR FEDERAL LAWS

LINEAR DISCONNECT
Safe and convenient means of disconnecting power.

PHOTOMETRICS



DMF-232
Electronic Ballast

F32T8/35K Lamps

2850 Lumens

Spacing criterion: (II) 1.3 x mounting height, (⊥) 1.4 x mounting height

Efficiency 90.8%

Test Report: DMF232.IES

LER = FI-78

Yearly Cost of 1000 lumens, 3000 hrs at .08 KWH = $3.08

Coefficients of Utilization

Effective floor cavity reflectance									20%										
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9	47	34	27	22	45	33	26	21	31	25	20	29	23	19	27	22	19	17
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Zonal Lumen Summary

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90-180	846	14.8	16.3
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Candela

Angle	Along II	45°	Across ⊥
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120	169	45	20
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140	304	244	173
150	358	286	286
160	398	369	311
170	424	426	420
180	434	434	434

ORDERING INFORMATION

SAMPLE NUMBER: DMF-232-120V-EB81-U

Tandem
Blank=4' Length
8T=8' Length

Series
DMF=Apertured Reflector
DCMF=Closed Top Reflector

Lamp Spacing
Blank=Standard Spacing
N=Narrow Spacing for 2 Lamp Only (10% uplight)

Silver Reflector
SS=Silver-Lining Reflector

Number of Lamps
2, 3 or 4 Lamps (Not included)

Wattage (Length)
32=32W T8 (48")

Voltage [1]
120V=120 Volt
277V=277 Volt
347V=347 Volt
UNV=Universal Voltage 120-277

Options
GL=Single Element Fuse
GM=Double Element Fuse
EL=Emergency Installed

Ballast Type [1]
EB8_=T8 Electronic Instant Start. Total Harmonic Distortion < 10%
No. of Ballast
1, 2 or 3
EB8_/PLUS=T8 Electronic Instant Start. High Ballast Factor >1.13. Total Harmonic Distortion < 20%
No. of Ballast
1, 2 or 3
ER8_=T8 Electronic Program Rapid Start. Total Harmonic Distortion < 10%
No. of Ballast
1, 2 or 3

Options
RIF1=Radio Interference Suppressor
6-3/18 SJT-C&P-515P=Cord & Plug (120V)
6-3/18 SJT-C&P-L715P=Cord & Plug (277V)
PI/CPI=Plug-In Option
TILW=Tandem In-Line Wiring Option (Consult TILW Option Catalog Page)
POX=Perlux Finish
(See options & accessories)

Packaging
U=Unit Pack
4B=4 Bulk

NOTES: [1]Products also available in non-US voltages and frequencies for international markets.

Specifications & dimensions subject to change without notice. Consult your Cooper Lighting Representative for availability and ordering information.

ACCESSORIES

(Order Separately)

A1B/Spacer-U=Spacer 1-1/2" to 2-1/2" from ceiling (Use 2 per fixture)
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SCF=Fixed Stem Set (Specify Length)
SCS=Swivel Stem Set (Specify Length)
SCA=Adjustable 48" Stem Set
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MECL-DIF/SL-96-U=Metal Egg Crate Louver
DIF2 LONG CONN (PREPAINTED)=Long Connector
DIF CLOSED END PLATE=Closed End Plate

SHIPPING INFORMATION

Catalog No.	Wt.
DMF-232	15 lbs.
8TDMF-232	30 lbs.
DMF-332	25 lbs.
DMF-432	25 lbs.

COOPER LIGHTING - LUMARK®

DESCRIPTION

The Lumark Wal-Pak Series of wall luminaires provides traditional architectural style with high performance energy efficient illumination. Rugged die-cast aluminum construction, stainless steel hardware along with a sealed and gasketed optical compartment make the Wal-Pak virtually impenetrable to contaminants. IP65 Rated. Six available lamp sources including patent pending energy efficient LED, pulse start metal halide, compact fluorescent, ceramic metal halide, standard metal halide and high pressure sodium. UL and cUL wet location listed. The Wal-Pak wall luminaire is ideal for pathway illumination, building entrances, vehicle ramps, schools, tunnels, stairways and loading docks.

Catalog #	HPWP-PL-150-120V-LL-PE	Type
Project	Rice Lake	C
Comments		Date
Prepared by		

SPECIFICATION FEATURES

Housing
Rugged one-piece die-cast aluminum housing and hinged, removable die-cast aluminum door. One-piece silicone gasket seals the optical chamber. UL 1598 wet location listed and IP65 ingress protection rated. Not recommended for car wash applications.

Electrical
Ballasts, LED driver and related electrical components are hard mounted to the die-cast housing for optimal heat sinking and operating efficiency. Wiring is extended through a silicone gasket at the back of the housing. Three ½" threaded conduit entry points allow for thru-branch wiring. LED thermal management system incorporates both conduction and natural convection to transfer heat rapidly away from LED source. Integral LED electronic driver incorporates internal fusing designed to withstand a 3kV surge test and is Class 2 rated for 120-277V with an operating temperature of -30° to 60°C. Wal-Pak LED systems maintain greater than 70% of the initial light output after 50,000 hours of operation. UL listed HID high power factor ballasts are Class H insulation rated (metal halide: 150, 175, 200, 250, 320, 350, 400W [-30°C / -20°F], (high pressure sodium: 50, 70, 100, 150, 250, 400W [-40°C / -40°F]. High efficiency HID ballasts are available in 120V, 208V, 240V, 277V, 347V and 480V. Compact fluorescent high power factor ballasts are Class P insulation rated for 120-277V and have a starting temperature of -18°C / 0°F.

Optical
Highly reflective anodized aluminum reflectors provide high efficiency illumination. Optical assemblies include impact resistant borosilicate refractive glass, Solite™ flat diamond patterned glass and full cutoff IESNA compliant configurations. Patent pending, solid state LED luminaires are thermally optimized with 2400 or 4000 lumen package modules. HID models are offered in horizontal medium or mogul-based metal halide [MH / MP] or high pressure sodium [HP] lamps. T6 ceramic metal halide [CM] and 4-pin compact fluorescent [CF] lamp models offer high efficiency energy saving illumination.

Door Assembly
Single point, captive stainless steel hardware secures the removable hinged door allowing for ease of installation and maintenance. Door assembly is hinged at the bottom for easy removal, installation and re-lamping.

Finish
Housing and door are protected with 5-stage TGIC dark bronze polyester powder coat paint. Premium TGIC power coat finishes withstand extreme climate changes while providing optimal color and gloss retention. Optional premium colors are available.

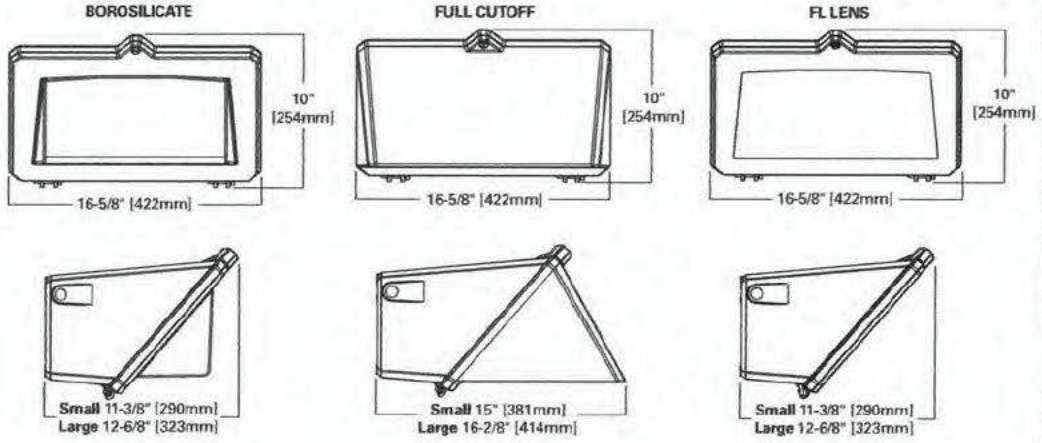
DARK SKY COMPLIANT FCO Full Cutoff

WP WAL-PAK

2400 - 4000 Lumen LED
39 - 400W
High Pressure Sodium
Pulse Start Metal Halide
Metal Halide
Ceramic Metal Halide
32 - 140W
Compact Fluorescent

WALL MOUNT LUMINAIRE

DIMENSIONS



TECHNICAL DATA
UL and cUL Wet Location Listed
IP65 Rated
40°C Maximum Ambient Temperature
External Supply Wiring 90°C Minimum
EISA ©, ARRA, Title 20 Compliant
LM79 / LM80 Compliant

ENERGY DATA
Reactor Ballast Input Watts
50W HPS NPF (58 Watts)
70W HPS NPF (82 Watts)
100W HPS NPF (118 Watts)
150W HPS NPF (175 Watts)
High Reactance Ballast Input Watts
50W MP HPF (69 Watts)
70W MP HPF (94 Watts)
100W MP HPF (129 Watts)
150W MP HPF (185 Watts)
CWA Ballast Input Watts
200W HPS HPF (250 Watts)
200W MP HPF (227 Watts) ©
250W MP HPF (283 Watts) ©
320W MP HPF (365 Watts) ©
350W MP HPF (400 Watts) ©
400W HPS HPF (465 Watts)
400W MP HPF (452 Watts) ©

SHIPPING DATA
Approximate Net Weight:
32-42 lbs. (15-19 kgs.)

ADH092103 pc
2010-11-03 17:10:12

COOPER Lighting
www.cooperlighting.com

ORDERING INFORMATION

Sample Number: MPWP-GL-250-MT-2EM/SC/MR

Lamp Type
MP=Pulse Start Metal Halide
HP=High Pressure Sodium
LD=Solid State Light Emitting Diodes (LED)
CF=Compact Fluorescent [1]
CM=Ceramic Metal Halide [2]
MH=Metal Halide [3]

Series
WP=Wal-Pak

Door Type [4]
GL=Borosilicate Glass Door
FC=Full Cutoff Door
FL=Flat Solite Glass Door
PL=Polycarb Refractor Door

Lamp Wattage [5]
LED
2A=(2400 Initial Lumens)
4A=(4000 Initial Lumens)
MP
50=50W
70=70W
100=100W
150=150W
200=200W
250=250W
320=320W
350=350W
400=400W
MH
175=175W
250=250W
400=400W
HP
50=50W
70=70W
100=100W
150=150W
250=250W
400=400W
CM
39=39W
70=70W
100=100W
150=150W
CF
32=32W
42=42W
57=57W
70=70W
64=(2-32)
84=(2-42)
114=(2-57)
140=(2-70)

Voltage [6]
120V=120V
208V=208V
240V=240V
277V=277V
347V=347V [7]
480V=480V
DT=Dual-Tap
MT=Multi-Tap
TT=Tri-Tap
5T=5-Tap
E=Electronic Ballast [8]
ED=Electronic LED Driver

Options [9]
F1=Single fuse [10]
F2=Double fuse [10]
PE=Photocontrol button [10]
LL=Includes lamp [2]
BK=Black housing
WH=White housing
GM=Graphite Metallic housing
AP=Grey housing
DP=Dark Platinum housing
DIMA=CF Dimming Ballast [11]
DIMB=CF Dimming Ballast [11]
SGL=Solite Glass Lens [12]
Q=Quartz Restrike T4 Lamp [13]
EM=Emergency Quartz Restrike T4 Lamp with Time Delay Relay [13]
EM/SC=Emergency Separate Circuit T4 Lamp [13]
QMR=Emergency Back-Up 1-MR16 Lamp [14,15]
2QMR=Emergency Back-Up 2-MR16 Lamps [14,15]
2QMR/SC=Emergency Back-Up MR16 and EM separate circuit 2-MR16 Lamp [14,15]
EMMR=Emergency Back-Up 1-MR16 Lamp with Time Delay Relay [14,15]
2EMMR=Emergency Back-Up 2-MR16 Lamps with Time Delay Relay [14,15]
2EMMR/SC=Emergency Back-Up 1-MR16 Lamp with Time Delay Relay and EM Separate Circuit [14,15,16]
EM/SC/MR=Emergency Back-Up Separate Circuit 1-MR16 Lamp [14,15,16]
2EM/SC/MR=Emergency Back-Up Separate Circuit 2-MR16 Lamps [14,15,16]
EM/SC/12V=Emergency Separate Circuit 12V 1-MR16 Lamp [14,16,17]
2EM/SC/12V=Emergency Separate Circuit 12V 2-MR16 Lamps [14,16,17]
EMI40=Emergency Cold Temperature UL 924 CF Power Pack 1 Lamp [18]
EMI40/2L=Emergency Cold Temperature UL 924 CF Power Pack 2 Lamp [18]
CF-EM=Emergency UL924 CF Power Pack 1 Lamp [19]
CF-EM/2L=Emergency UL924 CF Power Pack 2 Lamp [19]
EMLED-CD=LED Battery Back-Up Cold Temperature [20]

Accessories [21]
WG/WPGL=Wire Guard Borosilicate Glass Lens Door
WG/WPFC=Wire Guard Full Cutoff Door
WG/WPFL=Wire Guard FL Lens Door
TR/WP=Tamper Resistant Screw and Bit
VS/WPGL=Polycarbonate Vandal Shield for Borosilicate Glass Lens Door

STOCK SAMPLE NUMBER - LAMP INCLUDED

SAMPLE NUMBER: WPP40C

Series
WP=Wal-Pak

Lamp Type
L=LED
P=Pulse Start Metal Halide
S=High Pressure Sodium

Lamp Wattage
2A=28W
4A=40W
10=100W
15=150W
25=250W
32=320W
40=400W

Door/Glass Type
Blank=Standard
C=Full Cutoff Door

NOTES: Options not available with stock products. Refer to standard order information to add options. MT is standard. Lamp Type: MP not available in 100W. HPS not available in 320W. Borosilicate glass door is standard. 2A and 4A models available in LED only. LED models are 120-277V.

BUG RATING	B	U	G		B	U	G
Borosilicate Glass Door (GL)				Flat Lens Door (FL)			
LDWP-GL-2A-ED	0	3	2	LDWP-FL-2A-ED	0	2	1
LDWP-GL-4A-ED	1	3	2	LDWP-FL-4A-ED	0	3	1
Polycarbonate Lens (PL)				Full Cutoff Door (FC)			
LDWP-PL-2A-ED	0	3	2	LDWP-FC-2A-ED	0	1	1
LDWP-PL-4A-ED	1	3	2	LDWP-FC-4A-ED	0	1	1

For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit www.iesna.org/PDF/Erratas/TM-15-07BugRatingsAddendum.pdf

NOTES:
1 CF Single lamp offered in all door configurations. CF dual lamp models not offered with FL door type. 70W models not available with EMI40-2L, CF-EM, CF-EM-2L. CF not available in 347V.
2 All CM models offered with T6 envelope G12 lamp base. T6 Lamp included with CM models. Order LL with CM models. Ceramic Metal Halide (CM) is available with (MP) pulse start metal halide or E - Electronic Ballast. 400W MP must be ordered with LL option to be Title 20 Complaint.
3 MH products available for non-US markets only.
4 Small housing offered for 175W and below, CF and LD models. Large housing for 200W-400W. FL door not available with CF or 200-400W models. Polycarbonate lens available in models up to 175W max including LD. Polycarbonate lens not available with full cutoff door or FL models. Solite stipple glass is standard for FL lens. Clear glass is standard for full cutoff door types except for LD. LD full cutoff door is standard with solite glass.
5 LD nominal initial lumens prior to optical and configuration losses based on 67 CRI/5000K package at 25°C ambient. MH and MP 175W and below are medium base all others are mogul base. CF 64, 84, 114 and 140 models are offered in borosilicate glass and full cuteff doors only. In cold temperatures, compact fluorescent lamps produce lower illumination levels. CF 140 models and 400W HPS rated for 25°C.
6 See Voltage Chart for descriptions. 5T available in 400W MH models only. 90°C Rated wire required for thru-branch wiring for units 175W and lower. 105°C Rated wire required for thru-branch wiring for units 200W and higher. Thru-branch wiring is rated for 40°C for LD and 175W and below. Higher wattage thru-branch wiring is rated for use in 25°C ambient operating environments.
7 347V not available with thru-branch wiring. For 347 or 480V LD specify voltage. ED will be supplied with integral step down transformer. 347V not available with CF lamps.
8 Available with 70-150W MP or CM lamps. E is standard for all CF models. All electronic ballasts are universal 120-277V.
9 Not all options can be combined. Only one emergency or battery back-up option available within the fixture. CF Models utilize EMI40, EMI40/2L, CF/EM or CF-EM/2L option for emergency egress. LD Models utilize EM-LED or EMLED-CD options only for battery back-up.
10 Must specify voltage. F1=120, 277 or 347V. F2=208, 240 or 480V. PE=120, 208, 240 or 277V.
11 DIMA dimming ballast, specify number of lamps, available for 1 or 2-26W or 1-32W, 1-42W. DIMB available for 2-42W, 1-57W or 1-70W.
12 SGL optional on HID and CF models only. See note number 4.
13 Q or EM not available with LD or E electronic ballast. Q or EM Minimum HID wattage is 70 watts. EM/SC available in 120V only, EM/SC not available with LD. Maximum 100W 120V T4 DC Bayonet Quartz lamp. Lamp supplied by others.
14 QMR, 2QMR, EMMR, 2EMMR & 2EMMR/SC not available with LD or E electronic ballast. Minimum HID wattage is 70 watts.
15 1 or 2 GU10 base 50W max - 120V Halogen. Lamps supplied by others. EM/SC/MR, 2EM/SC/MR, EM/SC/12V, 2EM/SC/12V not available with LD.
16 Emergency lamp leads out of the back of the unit to auxiliary power. Lamps independently wired to separate circuits.
17 Low Voltage 1 or 2 GU5.3 MR16 base, 12V DC, 35W max. Lamps supplied by others.
18 For use in 25°C ambient operating temperature environments. EMI40, EMI40/2L used for CF lamps. Specify 120 or 277V. EMI40 supports 1-70W CF max, EMI40/2L supports 2-32W CF max. Minimum -18°C/-4°F.
19 For use in 25°C ambient operating temperature environments. Specify 120 or 277V, CF-EM supports up to 1-57W CF. CF-EM/2L supports 2-18W CF, 18W lamps supplied by others. Minimum temperature is 0°F/32°C.
20 EMLED-CD available with 4A models only. For use in 25°C ambient operating temperature environments. Specify 120 or 277V. EMLED-CD minimum -20°C/-4°F. Battery pack is a UL recognized component.
21 Order separately.

VOLTAGE CHART	
DT=Dual-Tap	120/277 (wired 277V)
MT=Multi-Tap	120/208/240/277 (wired 277V)
TT=Tri-Tap	120/277/347 (wired 347V)
5T=5 Tap	120/208/240/277/480 (wired 480V)
E=Electronic Ballast	120-277V (Universal) (50/60 HZ)
ED=Electronic LED Driver	120-277V (Universal) (50/60 HZ)

LAMP TYPE	WATTAGE
Pulse Start Metal Halide	50, 70, 100, 150, 200, 250, 320, 350, 400W
Metal Halide	175, 250, 400W
High Pressure Sodium	50, 70, 100, 150, 250, 400W
T6 Ceramic Metal Halide	39, 70, 100, 150W
Compact Fluorescent	(1) 32, (1) 42, (1) 57, (1) 70, (2) 32, (2) 42, (2) 57, (2) 70
LED	2A (2400 Initial Lumens), 4A (4000 Initial Lumens)

FLUORESCENT LAMPS

800 Series T8 Lamps, 700 Series T8 Lamps

Philips F32T8/TL741/ALTO
Rice Lake

Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Average Life 3 Hr. Start (202)	Rated Average Life 12 Hr. Start (241)	Approx. Initial Lumens (203,204)	Design Lumens (208, 239)	CRI
800 SERIES T8 FLUORESCENT LAMPS											
T8 Medium Bipin Featuring ALTO II™ Technology											
17	36787-0	$ ● X	F17T8/TL830/ALTO	25	TL 830, 3000K	24	24,000	30,000	1400	1300	85
	36791-2	$ ●	F17T8/TL835/ALTO	25	TL 835, 3500K	24	24,000	30,000	1400	1300	85
	36793-8	$ ●	F17T8/TL841/ALTO	25	TL 841, 4100K	24	24,000	30,000	1400	1300	85
	14123-4	$ ●	F17T8/TL850/ALTO	25	TL 850, 5000K	24	24,000	30,000	1325	1225	82
25	36813-4	$ ● X	F25T8/TL830/ALTO	25	TL 830, 3000K	36	24,000	30,000	2225	2050	85
	36814-2	$ ●	F25T8/TL835/ALTO	25	TL 835, 3500K	36	24,000	30,000	2225	2050	85
	36825-8	$ ●	F25T8/TL841/ALTO	25	TL 841, 4100K	36	24,000	30,000	2225	2050	85
	14124-2	$ ●	F25T8/TL850/ALTO	25	TL 850, 5000K	36	24,000	30,000	2150	2040	82
32	24667-8	$ Ⓔ ●	F32T8/TL830/ALTO	25	TL 830, 3000K	48	24,000	30,000	2950	2800	85
	27236-9	$ Ⓔ ●	F32T8/TL830/ALTO PLZ	1350	TL 830, 3000K	48	24,000	30,000	2950	2800	85
	24670-2	$ Ⓔ ●	F32T8/TL835/ALTO	25	TL 835, 3500K	48	24,000	30,000	2950	2800	85
	27233-6	$ Ⓔ ●	F32T8/TL835/ALTO PLZ	1350	TL 835, 3500K	48	24,000	30,000	2950	2800	85
	24671-0	$ Ⓔ ●	F32T8/TL841/ALTO	25	TL 841, 4100K	48	24,000	30,000	2950	2800	85
	27235-1	$ Ⓔ ●	F32T8/TL841/ALTO PLZ	1350	TL 841, 4100K	48	24,000	30,000	2950	2800	85
	27229-4	$ Ⓔ ●	F32T8/TL850/ALTO	25	TL 850, 5000K	48	24,000	30,000	2850	2710	82
40	36831-6	$ ● †	F40T8/TL830/ALTO	25	TL 830, 3000K	60	24,000	30,000	3775	3500	86
	36834-0	$ ● †	F40T8/TL835/ALTO	25	TL 835, 3500K	60	24,000	30,000	3775	3500	86
	36847-2	$ ● †	F40T8/TL841/ALTO	25	TL 841, 4100K	60	24,000	30,000	3775	3500	86
	20698-7	$ ● †	F40T8/TL850/ALTO	25	TL 850, 5000K	60	24,000	30,000	3600	3250	86
700 SERIES T8 FLUORESCENT LAMPS											
T8 Medium Bipin Featuring ALTO II™ Technology											
17	36807-6	$ ●	F17T8/TL730/ALTO	25	TL 730, 3000K	24	24,000	30,000	1325	1200	78
	36808-4	$ ●	F17T8/TL735/ALTO	25	TL 735, 3500K	24	24,000	30,000	1325	1200	78
	36812-6	$ ●	F17T8/TL741/ALTO	25	TL 741, 4100K	24	24,000	30,000	1325	1200	78
25	36826-6	$ ●	F25T8/TL730/ALTO	25	TL 730, 3000K	36	24,000	30,000	2125	1925	78
	36828-2	$ ●	F25T8/TL735/ALTO	25	TL 735, 3500K	36	24,000	30,000	2125	1925	78
	36829-0	$ ●	F25T8/TL741/ALTO	25	TL 741, 4100K	36	24,000	30,000	2125	1925	78
32	27252-6	$ Ⓔ ●	F32T8/TL730 ALTO	25	TL 730, 3000K	48	24,000	30,000	2800	2660	78
	27282-3	$ Ⓔ ●	F32T8/TL730/ALTO PLZ	1350	TL 730, 3000K	48	24,000	30,000	2800	2660	78
	27249-2	$ Ⓔ ●	F32T8/TL735/ALTO	25	TL 735, 3500K	48	24,000	30,000	2800	2660	78
	27259-1	$ Ⓔ ●	F32T8/TL735/ALTO PLZ	1350	TL 735, 3500K	48	24,000	30,000	2800	2660	78
	27248-4	$ Ⓔ ●	F32T8/TL741/ALTO	25	TL 741, 4100K	48	24,000	30,000	2800	2660	78
	38351-3	$ Ⓔ ●	F32T8/TL741/ALTO	10	TL 741, 4100K, 10PK	48	24,000	30,000	2800	2660	78
	27255-9	$ Ⓔ ●	F32T8/TL741/ALTO PLZ	1350	TL 741, 4100K	48	24,000	30,000	2800	2660	78
	27268-2	$ Ⓔ ●	F32T8/TL750/ALTO	25	TL 750, 5000K	48	24,000	30,000	2700	2550	78
40	36851-4	$ ● X	F40T8/TL730/ALTO	25	TL 730, 3000K	60	24,000	30,000	3600	3250	78
	36852-2	$ ● X	F40T8/TL735/ALTO	25	TL 735, 3500K	60	24,000	30,000	3600	3250	78
	36853-0	$ ● X	F40T8/TL741/ALTO	25	TL 741, 4100K	60	24,000	30,000	3600	3250	78

For the most current product information, go to the e-catalog on **www.philips.com**
Fluorescent symbols and footnotes located on page 120

RATED AVERAGE LIFE

PHILIPS 700 SERIES AND 800 SERIES T8
Warranty Period: 30 months*

* Certain limitations and conditions apply. See Philips for futher warranty details.

Metalux

Electronic T8 Instant Start Generic Ballast Operating Characteristics

SPECIFICATION COMPLIANCE

September, 2012

The Generic Ballast nomenclature has been setup to allow for prompt customer service response and order delivery. The ballast will be Cooper Lighting supplied and chosen from a major ballast manufacturer and shall fall within the following guidelines.

Cooper Lighting manufacturers fluorescent luminaires in accordance with the specifications outlined in Underwriters Laboratories (UL) Standard for Safety, sections 935, 1570 and 1598, applicable ANSI standards and the 2008 issue of the National Electric Code (NFPA 70). All ballasts meet NEMA premium standards and are CEE approved under the specifications and guidelines of the Consortium for Energy Efficiency under the Lighting Initiative.

Guide for Generic Electronic Ballast Operation

EB8_ for 2, 3, and 4ft T8 Linear Lamps, Non Energy-Savings lamps Only

1. Ballast shall operate from 50 to 60 Hz input source, with a sustained tolerance of +/-10% with no damage to the ballast.
2. Voltage range shall be from 120V through 277V or UNV (Universal Voltage) designation.
3. Ballast will be Instant Start.
4. Ballast must have a total harmonic distortion of less than 10%.
5. Ballast has a sound rating of "A" or better.
6. Ballast shall comply with EMI and RFI limits set by the FCC, CFR 47 part 18, non-consumer.
7. Ballast must meet ANSI standards and are UL listed as class P, Type 1 Outdoor.
8. Ballast operates lamps at a minimum frequency of 20-30 kHZ, or greater than 40 kHz.
9. Ballast shall have internal shutdown circuitry for end of lamp life protection.
10. Warranty shall be provided by the ballast manufacturer.
11. Ballast factor must be greater than or equal to 0.87, and not to exceed 1.00.
12. Ballast shall be high power factor (0.95 or greater).
13. Ballast crest factor shall be 1.7 or less.
14. Ballast efficacy factors shall be ≥ 3.11 (1-lamp), ≥ 1.58 (2-lamp), ≥ 1.05 (3-lamp), and ≥ 0.80 (4-lamp).
15. Minimum operating starting temperature for standard full wattage T8 lamps is 0-deg. F (-17.7 deg. C).
16. Ballast shall have a minimum ballast case temperature of 70-deg. C (158 deg. F).
17. Parallel lamp wiring/instant start configuration is required.

Specifications is subject to change without notice.

Cooper Lighting
1121 Highway 74 South
Peachtree City, Georgia 30269
P: 770.486.4800 F: 770.486.4801

Innovation you can rely on™

COOPER Lighting

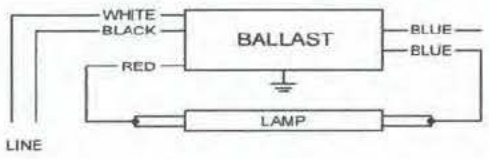
ADVANCE TRANSFORMER CO.

Electrical Specifications

ICN-2P32-N @ 120V	
Brand Name	**CENTIUM**
Ballast Type	**Electronic**
Starting Method	**Instant Start**
Lamp Connection	**Parallel**
Input Voltage	**120-277**
Input Frequency	**50/60 HZ**
Status	**Active**

Lamp Type	Num. of Lamps	Rated Lamp Watts	Min. Start Temp (°F/C)	Input Current (Amps)	Input Power (ANSI Watts)	Ballast Factor	MAX THD %	Power Factor	MAX Lamp Current Crest Factor	B.E.F.
* F17T8	1	17	0/-18	0.17	21	1.08	10	0.99	1.6	5.14
F17T8	2	17	0/-18	0.26	32	0.90	10	0.99	1.6	2.81
F25T8	1	25	0/-18	0.24	29	1.05	10	0.99	1.6	3.62
F25T8	2	25	0/-18	0.38	45	0.89	10	0.99	1.6	1.98
F32T8	1	32	0/-18	0.31	37	1.05	10	0.99	1.6	2.84
F32T8	2	32	0/-18	0.49	56	0.89	10	0.99	1.6	1.59
F32T8/ES (25W)	1	25	60/16	0.24	28	1.05	10	0.99	1.6	3.75
F32T8/ES (25W)	2	25	60/16	0.38	45	0.92	10	0.99	1.6	2.04
F32T8/ES (28W)	1	28	60/16	0.24	31	1.03	10	0.99	1.6	3.32
F32T8/ES (28W)	2	28	60/16	0.41	48	0.89	10	0.99	1.6	1.85
F32T8/ES (30W)	1	30	60/16	0.28	33	1.03	10	0.98	1.6	3.12
F32T8/ES (30W)	2	30	60/16	0.45	54	0.89	10	0.99	1.6	1.65
F40T8	1	40	32/00	0.35	42	1.00	10	0.98	1.6	2.38

Wiring Diagram



Diag. 68

Insulate unused blue lead for 1000V

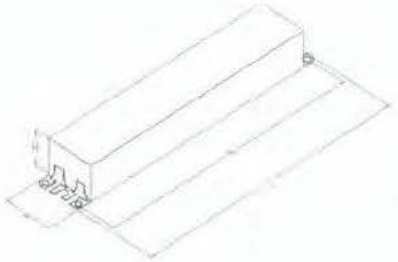
The wiring diagram that appears above is for the lamp type denoted by the asterisk (*)

Standard Lead Length (inches)

	in.	cm.
Black	24	61
White	24	61
Blue	28	71.1
Red	45	114.3
Yellow		0
Gray		0
Violet		0

	in.	cm.
Yellow/Blue		0
Blue/White		0
Brown		0
Orange		0
Orange/Black		0
Black/White		0
Red/White		0

Enclosure



Enclosure Dimensions

OverAll (L)	Width (W)	Height (H)	Mounting (M)
9.5 "	1.3 "	1.0 "	8.9 "
9 1/2	1 3/10	1	8 9/10
24.1 cm	3.3 cm	2.5 cm	22.6 cm

Revised 01/30/12

Data is based upon tests performed by Advance Transformer in a controlled environment and representative of relative performance. Actual performance can vary depending on operating conditions. Specifications are subject to change without notice. All specifications are nominal unless otherwise noted.

ADVANCE TRANSFORMER CO.
O'HARE INTERNATIONAL CENTER · 10275 WEST HIGGINS ROAD · ROSEMONT, IL 60018
Customer Support/Technical Service: Phone: 800-372-3331 · Fax: 847-768-7768
Corporate Offices: Phone: 800-322-2086

ADVANCE TRANSFORMER CO.

Electrical Specifications

ICN-2P32-N @ 120V	
Brand Name	**CENTIUM**
Ballast Type	**Electronic**
Starting Method	**Instant Start**
Lamp Connection	**Parallel**
Input Voltage	**120-277**
Input Frequency	**50/60 HZ**
Status	**Active**

Notes:

Section I - Physical Characteristics

1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.

1.2 Ballast shall be provided with integral leads color-coded per ANSI C82.11.

Section II - Performance

2.1 Ballast shall be _____ (Instant, Rapid or Programmed) Start.

2.2 Ballast shall provide Independent Lamp Operation (ILO) for Instant Start ballasts allowing remaining lamp(s) to maintain full light output when one or more lamps fail.

2.3 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power (except T8/HO ballast).

2.4 Ballast shall operate from 50/60 Hz input source of _____ (120V through 277V or 347V through 480V) with sustained variations of +/- 10% (voltage and frequency).

2.5 Ballast shall be high frequency electronic type and operate lamps at a frequency above 42 kHz to avoid interference with infrared devices and eliminate visible flicker.

2.6 Ballast shall have a Power Factor greater than 0.98 for primary lamp.

2.7 Ballast shall have a minimum ballast factor for primary lamp application as follows: 0.75 for Low Watt, 0.85 for Normal Light Output and 1.20 for High Light.

2.8 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less.

2.9 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% when operated at nominal line voltage with primary lamp.

2.10 Ballast shall have a Class A sound rating for all 4-foot lamps and smaller.

2.11 Ballast shall have a minimum starting temperature of _____ [-18C (0F) for standard T8 and Long Twin Tube lamps, 10C (50F) for standard T12 lamps, 0C (32F) for Slimline T8 lamps, -29C (-20F) for HO lamps,] for primary lamp application. Ballast shall have a minimum starting temperature of 16C (60F) for energy-saving lamps.

2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions.

2.13 Ballast for T8 lamps shall provide lamp striation-reduction circuitry.

2.14 Ballast for FT5 lamps shall provide lamp EOL protection circuitry.

Section III - Regulatory

3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).

3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.

3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.

3.4 Ballast shall comply with ANSI C82.11 where applicable.

3.5 Ballast shall comply with applicable requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, for Non-Consumer equipment.

3.6 Ballast shall comply with NEMA 410 for in-rush current limits.

3.7 Ballast for T8 lamps shall meet NEMA Premium/CEE High Performance T8 Lighting System Specifications.

3.8 Ballast shall meet RoHS Compliance Standards

Section IV - Other

4.1 Ballast shall be manufactured in a factory certified to ISO 9001 Quality System Standards.

4.2 Ballast shall carry a five-year warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 70C.

4.3 Manufacturer shall have a twenty-year history of producing electronic ballasts for the North American market.

4.4 Energy saving T8 lamps (25W, 28W or 30W) may experience lamp striations if operated on ballasts not rated for their use.

Revised 01/30/12

ADVANCE TRANSFORMER CO.
O'HARE INTERNATIONAL CENTER - 10275 WEST HIGGINS ROAD - ROSEMONT, ILLINOIS 60018
TELEPHONE: (847)390-5000 FAX: (847)768-7768

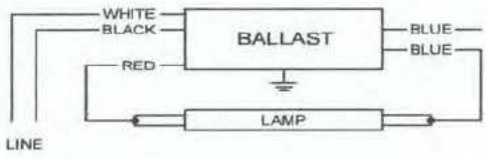
ADVANCE TRANSFORMER CO.

Electrical Specifications

ICN-2P32-N @ 277V	
Brand Name	**CENTIUM**
Ballast Type	**Electronic**
Starting Method	**Instant Start**
Lamp Connection	**Parallel**
Input Voltage	**120-277**
Input Frequency	**50/60 HZ**
Status	**Active**

Lamp Type	Num. of Lamps	Rated Lamp Watts	Min. Start Temp (°F/C)	Input Current (Amps)	Input Power (ANSI Watts)	Ballast Factor	MAX THD %	Power Factor	MAX Lamp Current Crest Factor	B.E.F.
* F17T8	1	17	0/-18	0.08	21	1.07	10	0.97	1.6	5.10
F17T8	2	17	0/-18	0.11	31	0.90	10	0.99	1.6	2.90
F25T8	1	25	0/-18	0.11	29	1.05	10	0.98	1.6	3.62
F25T8	2	25	0/-18	0.16	45	0.89	10	0.99	1.6	1.98
F32T8	1	32	0/-18	0.13	36	1.05	10	0.99	1.6	2.92
F32T8	2	32	0/-18	0.22	56	0.89	10	0.99	1.6	1.59
F32T8/ES (25W)	1	25	60/16	0.10	27	1.05	10	0.99	1.6	3.89
F32T8/ES (25W)	2	25	60/16	0.16	46	0.92	10	0.99	1.6	2.00
F32T8/ES (28W)	1	28	60/16	0.12	30	1.03	10	0.99	1.6	3.43
F32T8/ES (28W)	2	28	60/16	0.17	47	0.90	10	0.99	1.6	1.92
F32T8/ES (30W)	1	30	60/16	0.12	33	1.03	10	0.98	1.6	3.12
F32T8/ES (30W)	2	30	60/16	0.19	52	0.89	10	0.99	1.6	1.71
F40T8	1	40	32/00	0.15	42	1.00	10	0.98	1.6	2.38

Wiring Diagram



Diag. 68

Insulate unused blue lead for 1000V

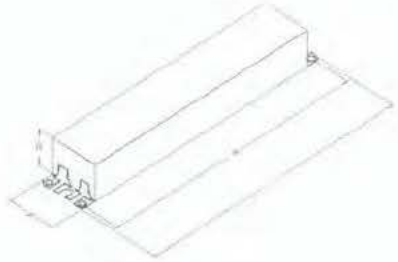
The wiring diagram that appears above is for the lamp type denoted by the asterisk (*)

Standard Lead Length (inches)

	in.	cm.
Black	28	71.1
White	45	114.3
Blue	24	61
Red	24	61
Yellow		0
Gray		0
Violet		0

	in.	cm.
Yellow/Blue		0
Blue/White		0
Brown		0
Orange		0
Orange/Black		0
Black/White		0
Red/White		0

Enclosure



Enclosure Dimensions

OverAll (L)	Width (W)	Height (H)	Mounting (M)
9.5 "	1.3 "	1.0 "	8.9 "
9 1/2	1 3/10	1	8 9/10
24.1 cm	3.3 cm	2.5 cm	22.6 cm

Revised 03/07/12

ADVANCE TRANSFORMER CO.
O'HARE INTERNATIONAL CENTER · 10275 WEST HIGGINS ROAD · ROSEMONT, IL 60018
Customer Support/Technical Service: Phone: 800-372-3331 · Fax: 847-768-7768
Corporate Offices: Phone: 800-322-2086

ADVANCE TRANSFORMER CO.

Electrical Specifications

ICN-2P32-N @ 277V	
Brand Name	**CENTIUM**
Ballast Type	**Electronic**
Starting Method	**Instant Start**
Lamp Connection	**Parallel**
Input Voltage	**120-277**
Input Frequency	**50/60 HZ**
Status	**Active**

Notes:

Section I - Physical Characteristics

1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.

1.2 Ballast shall be provided with integral leads color-coded per ANSI C82.11.

Section II - Performance

2.1 Ballast shall be _____ (Instant, Rapid or Programmed) Start.

2.2 Ballast shall provide Independent Lamp Operation (ILO) for Instant Start ballasts allowing remaining lamp(s) to maintain full light output when one or more lamps fail.

2.3 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power (except T8/HO ballast).

2.4 Ballast shall operate from 50/60 Hz input source of _____ (120V through 277V or 347V through 480V) with sustained variations of +/- 10% (voltage and frequency).

2.5 Ballast shall be high frequency electronic type and operate lamps at a frequency above 42 kHz to avoid interference with infrared devices and eliminate visible flicker.

2.6 Ballast shall have a Power Factor greater than 0.98 for primary lamp.

2.7 Ballast shall have a minimum ballast factor for primary lamp application as follows: 0.75 for Low Watt, 0.85 for Normal Light Output and 1.20 for High Light.

2.8 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less.

2.9 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% when operated at nominal line voltage with primary lamp.

2.10 Ballast shall have a Class A sound rating for all 4-foot lamps and smaller.

2.11 Ballast shall have a minimum starting temperature of _____ [-18C (0F) for standard T8 and Long Twin Tube lamps, 10C (50F) for standard T12 lamps, 0C (32F) for Slimline T8 lamps, -29C (-20F) for HO lamps,] for primary lamp application. Ballast shall have a minimum starting temperature of 16C (60F) for energy-saving lamps.

2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions.

2.13 Ballast for T8 lamps shall provide lamp striation-reduction circuitry.

2.14 Ballast for FT5 lamps shall provide lamp EOL protection circuitry.

Section III - Regulatory

3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).

3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.

3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.

3.4 Ballast shall comply with ANSI C82.11 where applicable.

3.5 Ballast shall comply with applicable requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, for Non-Consumer equipment.

3.6 Ballast shall comply with NEMA 410 for in-rush current limits.

3.7 Ballast for T8 lamps shall meet NEMA Premium/CEE High Performance T8 Lighting System Specifications.

3.8 Ballast shall meet RoHS Compliance Standards

Section IV - Other

4.1 Ballast shall be manufactured in a factory certified to ISO 9001 Quality System Standards.

4.2 Ballast shall carry a five-year warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 70C.

4.3 Manufacturer shall have a twenty-year history of producing electronic ballasts for the North American market.

4.4 Energy saving T8 lamps (25W, 28W or 30W) may experience lamp striations if operated on ballasts not rated for their use.

Revised 03/07/12

ADVANCE TRANSFORMER CO.
O'HARE INTERNATIONAL CENTER - 10275 WEST HIGGINS ROAD - ROSEMONT, ILLINOIS 60018
TELEPHONE: (847)390-5000 FAX: (847)768-7768

Philips Lighting Electronics North America Ballast and LED Driver Limited Warranty

Philips Lighting Electronics North America ("Philips") warrants that its ballasts and LED drivers (collectively, "Products") will be free from defects in material and workmanship from the date of manufacture by Philips for the following periods:

(2) Years

Standard Magnetic Fluorescent
High Intensity Discharge (HID)
Magnetic Fluorescent & HID Sign
Matchbox (case temp. 65°C or less)
AmbiStar (case temp. 65°C or less

(3) Years

Mark III Magnetic Fluorescent
E-PAK Magnetic Fluorescent
Centium Electronic 90C T5/HO (case temp. between 71°C and 90°C)
Optanium Electronic T5/HO (case temp. between 71°C and 90°C)
SmartMate Compact Fluorescent (case temp. between 76°C and 85°C)
Electronic Sign (case temp. 90°C or less)
e-Vision Electronic HID (case temp. between the maximum rating marked on the ballast and 9°C below such maximum rating)
DynaVision Electronic HID (case temp. 76°C or less)

(5) Years

Standard Electronic (case temp. 70°C or less)
Centium Electronic (case temp. 70°C or less)
Centium Electronic 90C T5/HO (case temp. 70°C or less)
Optanium Electronic T5/HO (case temp. 70°C or less)
Optantum Electronic (case temp. 70°C or less)
Mark 5 Electronic (case temp. 70°C or less)
SmartMate Compact Fluorescent (case temp. 75°C or less)
PowrKut Frequency Electronic (case temp. 90°C or less)
Mark 7 0-10V Electronic Dimming (case temp. 70°C or less)
Mark 10 Powerline Elecronic Dimming (case temp 70°C or less)
ROVR Electronic Dimming (case temp 70°C or less)
e-Vision Electronic HID (case temp at least 10°C below the maximum rating marked on the ballast)
CosmoPolis Electronic HID (case temp. no higher than the maximum rating marked on the ballast)
Xitanium LED Drivers (case temp. 75°C or less)

This warranty is further conditioned upon proper storage, installation, use and maintenance. This warranty is not applicable to any Product which is not installed and operated in accordance with the National Electric Code (NEC), the Standards for Safety of Underwriters' Laboratory, Inc. (UL), the Standards for the American National Standards Institute (ANSI), or, in Canada, the Canadian Standards Association (CSA), and with Philips instructions and guidelines for the Product. This warranty does not apply to damage or failure to perform arising from abuse, misuse, abnormal stresses and operating conditions, lightening, electrical surges or acts of God.

This warranty only flows to the original purchaser or first end-user purchaser. If a Product covered by this warranty fails to conform to this warranty and is returned by purchaser in accordance with Philips published Warranty Service Program during the warranty period, Philips will, at its option, either repair or replace the Product or the non-conforming part thereof, or reimburse the purchaser for the purchase price of the specific ballast. For purposes of clarity, "repair or replace the Product or the non-conforming part thereof" does not include any removal or reinstallation costs or expenses, including without limitation labor costs or expenses. If Philips choses to replace the Product and is not able to do so because it has been discontinued or is not available, Philips may replace it with a comparable product.

THE WARRANTIES AND REMIEDIES SET FORTH HEREIN ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES WHETHER, EXPRESS OR IMPLIED, INCLUDING ALL WARRANTIES OR MERCHANTIABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND ALL WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OR TRADE. Purchaser's exclusive remedy, and Philips sole liability, for any nonconformity or defect in any Product shall be only those explicitly set forth herein.

LIMITATION OF LIABILITY: Philips will not under any circumstances whether as a result of breach of contract, breach of warranty, tort, strict liability or otherwise be liable for consequential, incidental, special or exemplary damages, including but not limited to, loss of profits or revenues, loss of use of the Product or any other goods or associated equipment or damage to any associated equipment, cost of capital, cost of substitute products, facility of services, down time cost, or claims of claimant's customers. Philips liability on any claim of any kind for any loss or damage arising out of, resulting from or concerning any aspect of this warranty or from the product or services furnished hereunder shall not exceed the price of the specific Product which gives rise to the claim.

www.philips.com

Philips Lighting
10275 West Higgins Road
Rosemont, IL 60018
Tel: 800-322-2086 Fax: 888-423-1882
Customer Support/Technical Service: 800-372-3331
OEM Support: 866-915-5886
www.philips.com/advance

Universal Lighting Technologies

B232IUNV-C

APPLICATION and PERFORMANCE SPECIFICATION

Description: Electronic ballast(s) for **(1/2) F32T8** or (1/2) F25T8 or (1/2) F17T8 or (1) F40T8 or (2) F25T12 lamps (also operates equivalent U-bend lamps)

- Line Voltage: 120-277 vac, ±10%, 50/60Hz
- Parallel Lamp Operation
- Instant Start
- Active Power Factor Correction

Model	Line Volts	No. of Lamps	Lamp Type	Input Watts	Nominal Line Amps	Ballast Factor	Ballast Efficacy Factor	Power Factor	Haromonic Total	Crest Factor
B232IUNV-C	**120**	**2**	**F32T8**	**58**	**0.48**	**0.88**	**1.52**	**> 0.98**	**< 10%**	**< 1.7**
	277	**2**	**F32T8**	**56**	**0.20**	**0.88**	**1.57**	**> 0.98**	**< 10%**	**< 1.7**
	120	1	F32T8	35	0.29	1.02	2.91	> 0.98	< 10%	< 1.7
	277	1	F32T8	35	0.13	1.02	2.91	> 0.98	< 10%	< 1.7
	120	2	F25T8	45	0.37	0.90	2.00	> 0.98	< 10%	< 1.7
	277	2	F25T8	44	0.16	0.90	2.05	> 0.98	< 10%	< 1.7
	120	1	F25T8	28	0.24	1.02	3.64	> 0.98	< 10%	< 1.7
	277	1	F25T8	28	0.11	1.02	3.64	> 0.98	< 10%	< 1.7
	120	2	F17T8	31	0.27	0.91	2.94	> 0.98	< 10%	< 1.7
	277	2	F17T8	31	0.12	0.91	2.94	> 0.98	< 10%	< 1.7
	120	1	F17T8	20	0.17	1.04	5.20	> 0.98	< 10%	< 1.7
	277	1	F17T8	20	0.08	1.04	5.20	> 0.95	< 10%	< 1.7
	120	1	F40T8	43	0.37	0.99	2.30	> 0.98	< 10%	< 1.7
	277	1	F40T8	42	0.16	0.99	2.36	> 0.98	< 10%	< 1.7
	120	2	F25T12	47	0.40	0.89	1.89	> 0.98	< 10%	< 1.7
	277	2	F25T12	46	0.17	0.89	1.93	> 0.98	< 10%	< 1.7

Application and Peformance Specification Information Subject to Change without Notification.

Performance:
- Meets ANSI Standard C82.11-1993
- Meets ANSI Standard C62.41-1991
- Meets FCC Part 18 (Class A) for EMI and RFI Non-Consumer Limits

Application:
- Minimum Starting Temperature: 0 °F, -18 °C
- Maximum Ambient Temperature: 105 °F, 40°C
- Maximum Case Temperature(tc): 167 °F, 75 °C
- Sound Rating: Class A
- Remote Mounting: 18 ft.
- Wire Trap, Plug-in Connectors are Standard (use 18 AWG solid copper wire)

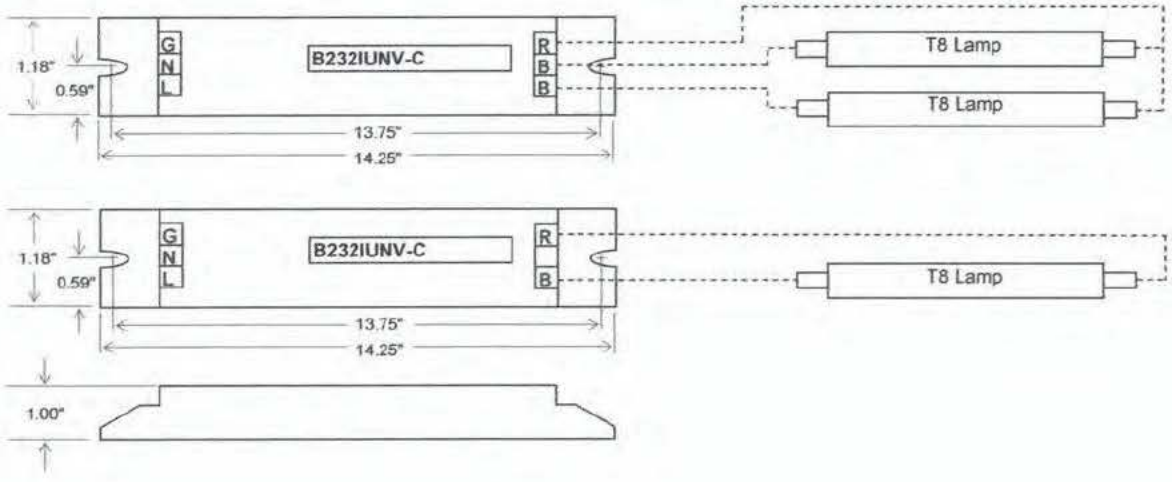
Safety:
- No PCB's
- UL listed (Class P, Type 1 Outdoor)
- CSA Certified

Physical Parameters

	Inches	Metric
• Mounting Length: (Center to Center)	13.75" +/- 0.01"	349.3 mm
• Overall Length:	14.25" +/- 0.01"	362 mm
• Width:	1.18" + 0.03"/- 0.02"	30 mm
• Height:	1.00" + 0.04"/- 0.01"	25.4 mm
• Weight:	1 lbs.	0.4 kg

Warranty:
Universal Lighting Technologies warrants to the purchaser that each electronic ballast will be free from defects in material or workmanship for a period of 5 years from date of manufacture when properly installed and under normal conditions of use. Call **1-800-BALLASTx800** for technical assistance.

Manufactured in North America



Ground to Case or Input Terminal (G)

QUICKTRONIC® T8 Instant Start Universal Voltage Systems

RoHS compliant

Lamp Striation Control
Normal Ballast Factor

Professional Series

QTP T8 ISN

Lamp / Ballast Guide

32W T8 – OCTRON® lamps
1-lamp QTP1x32T8/UNV ISN-SC
2-lamp QTP2x32T8/UNV ISN-SC
3-lamp QTP3x32T8/UNV ISN-SC
4-lamp QTP4x32T8/UNV ISN-SC

Also operates:
FB032, FB031, FO25, FB024, FO17, FB016, FO30/SS (30W), FB030/SS (30W), FB029/SS (29W), FO28/SS (28W) & FO25/SS (25W)

FO40T8 operation:
1 lamp on 2L ballast, 2 lamps on 3L ballast, 3 lamps on 4L ballast

Key System Features

- Universal voltage (120-277V)
- Small can enclosure size
- Lamp Striation Control (LSC)
- 0.88 ballast factor
- 30-40% energy savings
- Min. Starting Temp:
  - -20°F (-29°C) for T8 lamps
  - 60°F (16°C) for Energy Saving T8 lamps
  - 0°F (-18°C) for FO40T8 lamps
- <10% THD
- Virtually eliminates lamp flicker
- RoHS compliant
- Lead-free solder and manufacturing process

Application Information

SYLVANIA QUICKTRONIC 32 UNV ballasts
are ideally suited for:
- Commercial
- Retail
- Hospitality
- Institutional
- New Construction
- Retrofit

SYLVANIA QUICKTRONIC Professional Series products are typically used in OEM (original equipment manufacturers) standard fixtures and Trade/Distributor Basic stocked products for replacement.

SYLVANIA QUICKTRONIC SYSTEM 32 UNV electronic T8 ballasts offer several advantages:

1. **Operate OCTRON T8 lamps** with maximum efficacy and high lumen output
   - **30-40% energy savings** when compared to F40T12 magnetically ballasted systems (see table below)
2. **Parallel Circuitry:** keeps remaining lamps lit if one or more go out
3. **Small Can Enclosure for:**
   - low profile fixture design
   - transportation, inventory and ergonomic benefits
4. **Lamp Striation Control (LSC):** T8 energy saving lamps should be operated above 60°F, but under certain conditions the lamps may striate. LSC circuitry may minimize or eliminate this condition; however there are limited applications where LSC circuitry may not entirely mitigate lamp striations

These ballasts are also RoHS compliant and feature lead-free solder and manufacturing process.

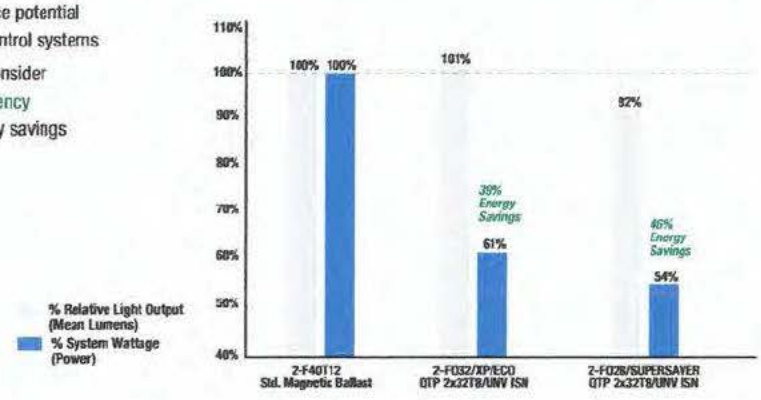
Setting the standard for quality, QUICKTRONIC T8 Instant Start 32 UNV-ISN systems are covered by the QUICK 60+® warranty, the first and most comprehensive lamp & ballast system warranty in the industry.

System Information

SYLVANIA QUICKTRONIC SYSTEM 32 (QTP) UNV system advantages:

- Operate from 120V through 277V
  - Eliminates "wrong voltage" errors
  - Reduces inventory by 50%
- Utilizes Instant Start operation for
  - Highest System Efficacy
  - Low temperature starting capability
- Very low harmonic distortion (<10%)THD
- Operate at >42 kHz to reduce potential interference with infrared control systems
- Customers should always consider upgrading to our High Efficiency Systems to maximize energy savings

System Type	Input Power (W)	Initial System Lumens	System Efficacy LPW	Mean System Lumens	Relative Mean Light Output	Energy Savings
F40T12 - Std. Magnetic Ballast	96	5795	60	4925	Baseline	Baseline
E.S. Magnetic Ballast	86	5795	67	4925	Baseline	10%
F34T12 - Std. Magnetic Ballast	82	4665	58	3965	81%	15%
E.S. Magnetic Ballast	72	4665	66	3965	81%	25%
FO32/XP® - QTP2x32T8/UNV-ISN-SC	59	5280	89	4965	101%	39%
FO28/SS - QTP2x32T8/UNV-ISN-SC	52	4795	92	4510	92%	46%



ECS410 - 6-13

SEE THE WORLD IN A NEW LIGHT SYLVANIA

SPECIFICATION DATA

Catalog # Date Type

Project Prepared by

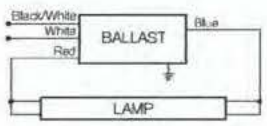
Comments

Universal Voltage (120-277V), Lamp Striation Control

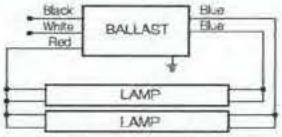
RoHS compliant

Item Number	OSRAM SYLVANIA Description	Input Current (AMPS)	Lamp Type	Rated Lumens (lm)	No. of Lamps	Ballast Factor (BF)	System Lumens	Mean Lumens	Input Power (W)	System Efficacy (lm/W)	BEF[1]
	QTP1x32T8/UNV ISN-SC										
49905	*Banded Pack*	0.26/0.11	F032/XP®	3000	1	0.88	2640	2480	30	88	2.93
49941	*10-Pack*	0.25/0.11	F030/SS	2850	1	0.88	2510	2360	28	90	3.14
49942	*Pallet Pack*	**0.23/0.10**	**F028/SS**	**2725**	**1**	**0.88**	**2400**	**2255**	**26**	**91**	**3.38**
		0.20/0.09	F025/SS	2475	1	0.88	2180	2050	23	95	3.83
	QTP2x32T8/UNV ISN-SC										
49906	*Banded Pack*	0.50/0.21	F032/XP	3000	2	0.88	5280	4965	59	89	1.49
49943	*10-Pack*	0.46/0.20	F030/SS	2850	2	0.88	5015	4715	55	91	1.60
49944	*Pallet Pack*	**0.43/0.19**	**F028/SS**	**2725**	**2**	**0.88**	**4795**	**4510**	**52**	**92**	**1.69**
		0.39/0.16	F025/SS	2475	2	0.88	4355	4095	46	95	1.91
	QTP3x32T8/UNV ISN-SC										
49907	*Banded Pack*	0.72/0.31	F032/XP	3000	3	0.88	7920	7445	86	92	1.02
49945	*10-Pack*	0.69/0.30	F030/SS	2850	3	0.88	7525	7075	81	93	1.09
49946	*Pallet Pack*	**0.65/0.28**	**F028/SS**	**2725**	**3**	**0.88**	**7195**	**6760**	**76**	**95**	**1.16**
		0.58/0.25	F025/SS	2475	3	0.88	6535	6140	67	98	1.31
	QTP4x32T8/UNV ISN-SC										
49908	*Banded Pack*	0.95/0.40	F032/XP	3000	4	0.88	10,560	9925	112	94	0.79
49947	*10-Pack*	0.91/0.39	F030/SS	2850	4	0.88	10,030	9430	105	96	0.84
49948	*Pallet Pack*	**0.85/0.37**	**F028/SS**	**2725**	**4**	**0.88**	**9590**	**9015**	**98**	**98**	**0.90**
		0.74/0.31	F025/SS	2475	4	0.88	8710	8190	88	99	1.00

Banded Pack, (add "-B" to Description). Banded Pack and 10-Pack contain 10 pieces each. Pallet Pack contains 840 pieces, (add "-PAL" to Description).
1 Ballast Efficiency Factor (BEF) shown = (Ballast Factor X 100) divided by Input Power (Note: calculation based on lowest wattage value).

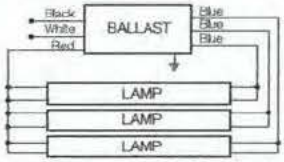


QUICKTRONIC 1x32



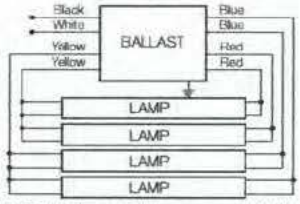
Note: For one lamp application, cap any blue lead. Insulate to 600 volts.

QUICKTRONIC 2x32



Note: For two lamp application, cap any blue lead. For one lamp application, cap any two blue leads. Insulate to 600 volts.

QUICKTRONIC 3x32



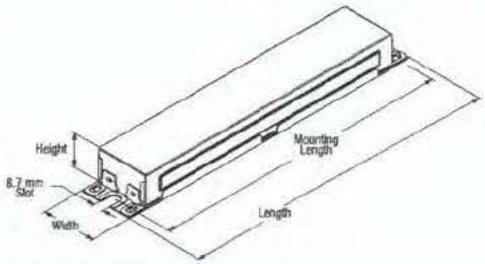
Note: For three lamp application, cap any unused blue lead. For two lamp application, cap two blue leads individually. For one lamp application, cap two blue leads, one red and one yellow lead individually. Insulate to 600 volts.

QUICKTRONIC 4x32

Dimensions:
Overall: 9.5" L x 1.68" W x 1.18" H
Mounting: 8.90"

Product Weight:
1.6 lbs each (approx.)

Wiring:
Leads only (no connectors provided)



Item Number — 49907 QTP 3 x 32T8 / UNV ISN - SC — Case Size
QUICKTRONIC PROFESSIONAL — Starting/Ballast Factor
Number of Lamps — Line Voltage (120-277V)
Primary Lamp Wattage

Normal Ballast Factor

T8 Instant Start

Professional Series

Performance Guide

Data based upon SYLVANIA OCTRON® lamps shown. QUICKTRONIC® 32ISN-SC is also compatible with other lamp manufacturers equivalent lamp types that meet ANSI specifications.

All models will also operate F17, F25 and F32 (and the SUPERSAVER & U-Bend equivalent) T8 lamps. Complete performance data is available in the QUICKSYSTEMS section of the SYLVANIA Ballast Technology & Specification Guide.

QTP T8 ISN

Specifications

Data based on F32T8

Starting Method: Instant Start
Ballast Factor: 0.88
Circuit Type: Parallel
Lamp Frequency: >42 kHz
Lamp CCF: Less than 1.7
Starting Temp:[2]
-20°F (-29°C) for OCTRON® T8 lamps;
60°F (16°C) for SUPERSAVER® T8 lamps
0°F (-18°C) for F040T8
Input Frequency: 50/60 Hz
Low THD: <10%
Power Factor: >98%
Voltage Range: ±10% of 120-277V rated line (108-305V)

UL Listed Class P, Type 1 Outdoor
CSA Certified
70°C Max Case Temperature
75°C Max Case Temp. (4-lamp model)
FCC 47CFR Part 18 Non-Consumer
Class A Sound Rating
RoHS Compliant[3]
ANSI C62.41 Cat. A Transient Protection
GFCI compatible
Emergency ballast compatible
Remote Mounting (Max. wire length from ballast case to lampholder):

- 20 ft: full wattage T8s
- 10 ft: energy saving T8s
- 4 ft: 25W energy saving T8s

2 Operation below 50°F (10°C) may affect light output or lamp operation – see "Low Temp. Starting" definition.
3 Complies with European Union Restriction of Hazardous Substances Directive (Directive EC 2002/95)

System Life / Warranty

QUICKTRONIC products are covered by the QUICK 60+® warranty, a comprehensive lamp and ballast system warranty. For additional details, refer to the QUICK 60+ warranty bulletin.

OSRAM SYLVANIA
National Customer
Service and Sales Center
1-800-LIGHTBULB
(1-800-544-4828)
www.sylvania.com

Specifications subject to change without notice.

the system solution

QUICK 60+®
Limited Warranty

Subject to change without notice.

The Heart of a Comprehensive System Service Program

Compare lighting system warranties – you'll see that our QUICK 60+ warranty offers better coverage, more service options and, more important, peace of mind.

Combination Lamp and Ballast System Limited Warranty

OSRAM SYLVANIA Inc. (OSRAM SYLVANIA) warrants SYLVANIA lamps installed on QUICKTRONIC® ballasts to be free from defects in material and workmanship and to operate from the date of installation (or date of manufacture if installation date is not known or available) for the time periods and subject to the Terms and Conditions specified below.

If lamps fail to operate for the warranty period, OSRAM SYLVANIA will provide a free replacement lamp (but no labor allowance). If a QUICKTRONIC ballast fails to operate within the warranty period, OSRAM SYLVANIA will provide a free replacement ballast and labor allowance in accordance with the "Labor Options" set forth below.

System[3,4,5]	Lamp	Ballast Warranty Period[6]	Lamp Warranty Period*
QUICKTRONIC T8[1]	OCTRON® Family[2]	60 mos.	30 mos.
QUICKTRONIC T8[1]	OCTRON XPS®, XP® & XP/SS, XPPLUS/SS[2,3]	60 mos.	36 mos.
QUICKTRONIC T8[1]	OCTRON XV™ & XV/SS[2,3]	60 mos.	36 mos.
QUICKTRONIC T8[1]	OCTRON XP/XL & XP/XL/SS Family[2,3]	60 mos.	60 mos.
QUICKTRONIC T8 High Ambient[1,8]	OCTRON XP, XP/SS[2,3]	36/60 mos.@<90°/70°C	36 mos.
QUICKTRONIC 59	OCTRON FO96/XP, XP/SS, XV & XV/SS[2,3]	60 mos.	30 mos.
QUICKTRONIC 59	OCTRON FO96[3]	60 mos.	24 mos.
QUICKTRONIC 86/T8HO High Ambient[1]	OCTRON FO96HO[3]	36/60 mos.@<90°/70°C	30 mos.
QUICKTRONIC T5, T5/HO[1]	PENTRON® Family[10]	60 mos.	24 mos.
QUICKTRONIC 54T5/HO[1]	PENTRON FP54/HO, FP54/C/HO, FP54/HO/SS	60 mos.	36 mos.
	PENTRON HO/XL	60 mos.	60 mos.
QUICKTRONIC 54T5HO High Ambient[1]	PENTRON FP54/HO, FP54/C/HO, FP54/HO/SS	36/60 mos.@<90°/70°C	36 mos.
	PENTRON HO/XL	36/60 mos.@<90°/70°C	60 mos.
QUICKTRONIC ICE[1,5]	ICETRON®	60 mos.	60 mos.
QUICKTRONIC 54PHO & DL40	DULUX® FT55DL, FT40DL & FT40DL/SS Family	60 mos.	24 mos.
QUICKTRONIC CF[1]	DULUX D/E, D/E/SS, T/E, T/E/IN, T/E/IN/SS T/E/C	60 mos.	24 mos.
QUICKTRONIC MH[7]	METALARC® Family[6] (7K-12K hrs. avg. rated life)	36/60 mos.	6 mos.
QUICKTRONIC MH[7]	METALARC Family[6] (15K-20K hrs. avg. rated life)	36/60 mos.	12 mos.
QUICKTRONIC HPS[7]	LUMALUX® Family[6] (≥30K hrs. avg. rated life)	36/60 mos.	24 mos
QUICKTRONIC 96IS/96HO & 4QT12	N/A	60 mos.	N/A

*Note: Fluorescent lamp warranty periods are based on a 3 hour minimum cycle, unless otherwise noted, with a maximum of 4400 hours per year. Other operating cycles may affect warranty period. Lamp warranty can renew when installation is group relamped, contact OSRAM SYLVANIA for details.

[1] Occupancy sensor application, 10 minute/start minimum, allowed with QUICKTRONIC PROStart® and with QUICKTRONIC ICE ballasts.
[2] OCTRON SUPERSAVER® bi-pin lamps operate on many of our QUICKTRONIC® T8 electronic ballasts, see specs for details.
[3] QUICKTRONIC, Professional Series and High Efficiency Series including all IS, PS & DIM models where applicable.
[4] Labor options must be pre-approved by OSRAM SYLVANIA. Any labor option or cost that is not pre-approved will not be eligible for reimbursement.
[5] QUICKTRONIC ballasts and ICETRON lamp warranty period allows up to 8760 hrs per year (continuous operation).
[6] Contact OSRAM SYLVANIA for detailed specifications of METALARC and LUMALUX lamps.
[7] QUICKTRONIC MH and HPS ballasts warranty is 36 or 60 months, depending on maximum case temperature. Refer to product specifications for details. Electronic HID system warranty period is based on a minimum cycle of 10hr/start up to a maximum operation of 6,000 hours/year.
[8] Maximum Case Temp. <70°C, for normal environmental operating conditions (40°C max. ambient) unless noted. Refer to product specifications for details.
[9] QUICKTRONIC T8 High Ambient (HT) Series
[10] PENTRON 14, 21, 28 and 35W and PENTRON HO 24, 39 and 80W.

TERMS AND CONDITIONS

SYLVANIA lamps and QUICKTRONIC ballasts must be installed together as a system and be installed and operated under suitable environmental conditions and in accordance with the latest National Electrical Code, Underwriters Laboratory Bulletins, and ANSI Specifications. **This warranty will not apply in the event of conditions demonstrating abnormal use or stress, such as operating temperatures in excess of maximum rated temperatures, under/over voltage conditions, excessive switching cycles (see above Note #1) or operating hours, dirty or cracked sockets, or improper lamp or ballast installation.** Replacement of SYLVANIA lamps with lamps of other manufacturers will void the lamp portion of this warranty. Replacement of the QUICKTRONIC ballast with any other ballast will void the entire warranty.

WARRANTY ACTIVATION / SERVICE CLAIMS

The QUICK 60+ warranty is automatically activated after OSRAM SYLVANIA receives a completed QUICK 60+ warranty registration form within 30 days after installation. An acknowledgment will be sent for each registration along with a reference number for future correspondence. Service claims can be made by contacting 1-800-654-0089 to initiate the process for problem resolution.

LABOR OPTIONS (Ballast only and ICETRON lamps only)

No labor allowance is made for any lamp replacement except ICETRON, during the warranty period. OSRAM SYLVANIA will provide one of the following labor options for service under the QUICK 60+ warranty program, at OSRAM SYLVANIA's discretion.

1. OSRAM SYLVANIA will contact a service provider and coordinate replacement at no cost to the user of the ballast, or
2. OSRAM SYLVANIA will reimburse the purchaser reasonable, customary and necessary labor charges required to install the ballast replacement.
3. Labor options must be pre-approved by OSRAM SYLVANIA. Any labor option or cost that is not pre-approved will not be eligible for reimbursement.

RETURN OF DEFECTIVE PRODUCT

After contacting OSRAM SYLVANIA and receiving a RETURN MATERIAL AUTHORIZATION NUMBER, the user shall promptly return the product at the user's expense to OSRAM SYLVANIA after receiving instructions as to if, when and where to ship product. Failure to follow this procedure shall void this warranty.

REPLACEMENT OF PRODUCT, LIMITS OF LIABILITY

The foregoing shall constitute the sole and exclusive remedy of the purchaser and the sole and exclusive liability of OSRAM SYLVANIA. NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE IS MADE OR IS TO BE IMPLIED. OSRAM SYLVANIA will not, under any circumstance, whether as a result of breach of contract or warranty, tort, or otherwise, be liable for any incidental, special or consequential damages, including lost profits or revenues or any other costs or damages.

OSRAM SYLVANIA reserves the right to examine all failed lamps and/or ballasts and reserves the right to be the sole judge as to whether any lamps and/or ballasts are defective and covered under this warranty.

QUESTIONS? Please call customer service at 1-800-654-0089 or contact your local OSRAM SYLVANIA representative.

SYLVANIA

ECS140R12 10-13

For warranty registration visit
www.sylvania.com/Warranty

GE Lighting

72267 - GE232MAX-N-42T

GE LFL UltraMax™ Electronic High Efficiency Multivolt Instant Start Ballast

- Energy saving high efficiency instant start electronic ballast (> 90%)
- Multi-Voltage Technology handles voltage from 120 to 277V
- UL Type CC Rating provides protection against arcing in electrical devices.
- Active Current Regulation regulates the output to each lamp with individual lamp inverter modules.
- Anti-Striation Control for better light quality, with no striations.
- Cold temperature -20F Minimum Starting Temperature

GENERAL CHARACTERISTICS

Application	2 or 1- F32T8 120 to 277 "N".87 BF Pallet Pack
Category	Linear Fluorescent
Ballast Type	Electronic - High Efficiency Multivolt Instant Start
Starting Method	Instant start
Lamp Wiring	Parallel
Line Voltage Regulation (+/-)	10.0 %
Case Temperature (MAX)	70.0 °C
Ballast Factor	Normal
Power Factor Correction	Active
Sound Rating	A (20-24 decibels)
Additional Info	Anti-striation control / Auto-restart / Thermally protected

PRODUCT INFORMATION

Product Code	72267
Description	GE232MAX-N-42T
Standard Package	Pallet
Standard Package GTIN	50043168722679
Standard Package Quantity	420
Sales Unit	Pallet Pack
No Of Items Per Sales Unit	1
No Of Items Per Standard Package	420
UPC	043168722674

DIMENSIONS

Case dimensions	
Length (L)	9.5 in(241.30 mm)
Width (W)	1.3 in(33.02 mm)
Height (H)	1.2 in(29.97 mm)
Mounting dimensions	
Bracket Length (BL)	NaN in(NaN mm)
Mount Length (M)	8.9 in(226.06 mm)
Mount Width (X or F)	1.1 in(27.94 mm)
Mount Slots (MS)	0.3 in(7.62 mm)
Weight	1.4 lb
Exit Type	Side
Remote Mounting Distance	18.0 ft
Remote Mounting Wire Gauge	18.0 AWG

Lead lengths	Qty	Exit	Length (± 1 in.)
Black	1	Left	25 (635 mm)
Red	1	Left	37 (940 mm)
White	1	Left	25 (635 mm)
Blue	2	Right	31 (787 mm)

ELECTRICAL CHARACTERISTICS

Supply Current Frequency	50.0 Hz / 60.0 Hz

SAFETY & PERFORMANCE

- cUL Listed
- FCC - CLASS A Non-Consumer
- NRCan
- UL Class P
- UL Listed
- UL Type 1 Outdoor
- UL Type CC
- UL Type HL
- NEMA Premium®
- Product is compliant with material restriction requirements of RoHS

SPECIFICATIONS BY LAMP & WATTAGE

Lamp	# of Lamps	Line Volts	System Watts	Nom. Line Current	System Ballast Factor	Ballast Efficacy Factor	Power Factor% (>=)	Crest Factor (<=)	THD% (<=)	Min. Starting Temp (°F/ °C)
FE15T8	1	120	15	0.13 A	0.91	6.07	99	1.5	11.0	-22.0 °F / NaN
FE15T8	1	277	16	0.08 A	0.91	5.69	77.91	1.5	40.0	-22.0 °F / NaN
FE15T8	2	120	25	0.21 A	0.91	3.64	99	1.5	8.0	-22.0 °F / NaN
FE15T8	2	277	25	0.97 A	91.00	364.00	95	1.5	16.0	-22.0 °F / NaN
F32T8/WM	1	120	29	0.24 A	0.88	3.03	99	1.5	7.0	60.0 °F / NaN

F32T8/WM	1	277	30	0.11 A	0.88	2.93	96	1.5	12.0	60.0 °F / NaN
F32T8/WM	2	120	53	0.45 A	0.88	1.66	99	1.5	5.0	60.0 °F / NaN
F32T8/WM	2	277	52	0.19 A	88.00	169.23	99	1.5	8.0	60.0 °F / NaN
F32T8/25W	1	120	25	0.0 A	0.87	3.48	99	1.5	10.0	60.0 °F / NaN
F32T8/25W	1	277	25	0.0 A	0.87	3.48	97	1.5	10.0	60.0 °F / NaN
F32T8/25W	2	120	44	0.0 A	0.87	1.98	99	1.5	10.0	60.0 °F / NaN
F32T8/25W	2	277	43	0.0 A	0.87	2.02	98	1.5	10.0	60.0 °F / NaN
F32T8	1	120	31	0.26 A	0.87	2.81	99	1.5	7.0	-22.0 °F / NaN
F32T8	1	277	31	0.12 A	0.87	2.81	96	1.5	12.0	-22.0 °F / NaN
F32T8	2	120	54	0.47 A	0.87	1.61	99	1.5	5.0	-22.0 °F / NaN
F32T8	2	277	53	0.2 A	0.87	1.64	99	1.5	8.0	-22.0 °F / NaN
F28T8	1	120	28	0.23 A	0.87	3.11	99	1.5	7.0	60.0 °F / NaN
F28T8	1	277	28	0.11 A	0.87	3.11	95	1.5	13.0	60.0 °F / NaN
F28T8	2	120	49	0.41 A	0.87	1.78	99	1.5	4.0	60.0 °F / NaN
F28T8	2	277	48	0.18 A	0.87	1.81	98	1.5	8.0	60.0 °F / NaN
F25T8	1	120	25	0.21 A	0.93	3.72	99	1.5	8.0	-22.0 °F / NaN
F25T8	1	277	26	0.98 A	0.93	3.58	94	1.5	13.0	-22.0 °F / NaN
F25T8	2	120	45	0.38 A	0.93	2.07	99	1.5	6.0	-22.0 °F / NaN
F25T8	2	277	45	0.16 A	0.93	2.07	98	1.5	10.0	-22.0 °F / NaN
F25T12	1	120	26	0.22 A	0.93	3.58	99	1.5	7.0	0.0 °F / NaN
F25T12	1	277	27	0.1 A	0.93	3.44	95	1.5	13.0	0.0 °F / NaN
F25T12	2	120	48	0.4 A	0.93	1.94	99	1.5	5.0	0.0 °F / NaN
F25T12	2	277	47	0.17 A	0.93	1.98	98	1.5	9.0	0.0 °F / NaN
F17T8	1	120	19	0.16 A	0.92	4.84	99	1.5	9.0	-22.0 °F / NaN
F17T8	1	277	19	0.08 A	0.92	4.84	87	1.5	16.0	-22.0 °F / NaN
F17T8	2	120	32	0.27 A	0.92	2.88	99	1.5	7.0	-22.0 °F / NaN
F17T8	2	277	32	0.12 A	0.92	2.88	96	1.5	13.0	-22.0 °F / NaN

CAUTIONS & WARNINGS

Warning

- Risk of Electric Shock
  - Properly ground ballast and fixture.
  - Turn power off before servicing--see instructions.

WARRANTY INFORMATION

GE Lighting warrants to the purchaser that each ballast will be free from defects in material or workmanship for period as defined in the attached documents from the date of manufacture when properly installed and under normal conditions of use.

Ballast Limited Warranty

GE
Lighting

GE Lighting ("GE") is pleased to provide the following limited warranty covering the GE electronic and electromagnetic ballasts listed below purchased directly from GE.

GE warrants that the below-referenced ballasts comply with GE's published specifications and are free from defects in materials and workmanship for the respective periods of time set forth below.

GE Linear Fluorescent, Compact Fluorescent and HID Electronic Ballasts	60 Months
GE Linear Fluorescent and HID Electromagnetic Ballasts	24 Months

Remedy: If a GE linear fluorescent, compact fluorescent, or HID ballast mentioned above fails due to defects in materials or workmanship within the periods of time indicated above, after the date of manufacture, then GE will, at its option, either (1) provide a credit to Purchaser equal to the current price GE charges Purchaser for the ballast and, in GE's discretion, either retain a service provider to install the warranty replacement ballast or pay a reasonable labor allowance that is pre-approved by GE, or (2) refund the purchase price paid to GE for the ballast. This warranty applies only to GE ballasts that have been properly wired and installed; operated within the electrical values shown on the ballast label; and operated in lighting equipment designed and approved for the application and in environmental conditions (temperature, humidity and air movement) within the normal specified operating range of the system.

Terms & Conditions: The foregoing ballast warranty applies only to direct purchases from GE, but does not apply to failures caused by acts of God or as a result of any abuse, misuse, abnormal use, or use in violation of any applicable standard, code or instructions for use in installations, including, but not limited to, those contained in the National Electrical Code, the Standards for Safety of Underwriters Laboratory, Inc., Standards for the International Electrotechnical Commission, Standards for the American National Standards Institute or, in Canada, the Canadian Standards Association. *GE reserves and has the right to examine failed ballasts to determine the cause of failure and patterns of usage.*

The foregoing warranty constitutes the sole and exclusive remedy of the purchaser and the sole liability of GE for ballast warranties. **NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE IS MADE OR IS TO BE IMPLIED.** In no event shall GE be liable for any other costs or damages including lost profits, indirect, incidental, special or consequential damages.

To Make a Warranty Claim: To make a warranty claim, retain the failed products and notify your GE sales representative in writing within thirty (30) days of the failure. This warranty extends only to Purchaser. However, GE will honor, under the terms of this Limited Warranty, valid warranty claims made by Purchaser for the remedy set forth above as a result of warranty claims made to Purchaser by its customers and indirect customers.

To Register your GE Products: Register your GE products at www.gelighting.com/warrantyregistration.

CONDUITS AS REQUIRED BY NFPA 70 TO ACCOMMODATE THE ACTUAL CABLES PROVIDED. MINIMUM RACEWAY SIZES ARE INDICATED.

LIGHT FIXTURE SCHEDULE

TYPE	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN CATALOG NUMBER	VOLTAGE	DESCRIPTION
A	COOPER - METALUX COLUMBIA LIGHTING	DCIM-232-120-EB81-CEP KL4-232-ST-EU-KLEC	120 V.	4' HEAVY DUTY INDUSTRIAL FLUORESCENT PROVIDE WITH ELECTRONIC BALLAST, WHITE COLOR FINISH WITH END PLATES; SOLID TOP, 4100 °K LAMP COLOR TEMP., 2-F32T8/SP41/RS LAMPS
B	COOPER - METALUX COLUMBIA LIGHTING	DCIM-232-120-EM-EB82-CEP KL4-232-ST-EU-EL-KLEC	120 V.	4' HEAVY DUTY INDUSTRIAL FLUORESCENT PROVIDE WITH ELECTRONIC BALLAST & EMERGENCY POWER BATTERY PACK BALLAST, WHITE COLOR FINISH WITH END PLATES; SOLID TOP, 4100 °K LAMP COLOR TEMP., 2-F32T8/SP41/RS LAMPS
C	COOPER - LUMARK	HPWP-PL-150-120-PE-LL	120 V.	EXTERIOR H.I.D. WALLPACK WITH POLYCARBONATE REFRACTOR DOOR, CAST ALUMINUM HOUSING, PHOTOCELL,. COLD WEATHER BALLAST TO -30 °F, 150 WATT, 120VAC HIGH PRESSURE SODIUM LAMP
D				NOT USED
E	COOPER - SURE-LITES	LPHX7-0-R-WH	120 V.	SELF POWERED LED EXIT LIGHT WHITE TEXTURED POLYBARBONATE HOUSING RED LETTERING, UNIVERSAL FACE SEALED LEAD CALCIUM "NO MAINTENANCE" BATTERY WITH TEST SWITCH AND POWER INDICATOR LIGHT

PANELBOARD SCHEDULE

CKT. NO.	LOAD DESCRIPTION
1	LTG - BLDG INTERIOR
3	LTG - BLDG EXTERIOR
5	SPARE BREAKER
7	SPARE BREAKER
9	SPARE BREAKER
11	SPARE BREAKER
13	SPARE BREAKER
15	SPARE BREAKER
17	SPARE BREAKER
19	SPARE BREAKER
21	SPARE BREAKER
23	SPARE BREAKER
25	SPARE BREAKER
27	SPARE BREAKER
29	SPARE BREAKER
	TOTAL CONNECTED LOAD:
#	ONE (1) OR TWO (2) DIGIT NUMBERS SEPARATE CONSIDERATION, BUT N

B

I-22

A

\pw_working\mvrb5eddie\d0153758\EP102E-602.dgn
00:20 PM
5EDDEJ

Rick Hammond

From: Kevin McCartan [kmccartan@comcast.net]
Sent: Friday, November 11, 2011 11:17 AM
To: Rick Hammond; Randy A. Smith
Cc: 'Kevin McCartan'
Subject: Quote: RICE LAKE - RICE LAKE
Attachments: UL File Numbers - Cooper Lighting.pdf; UL Metalux File Merge.pdf

We do not ship out any fixtures that do not meet UL.
I have attached a UL letter showing the UL File Numbers based on the fixture types (series).

The ballast are warranted by the ballast manufacturers.
I have provided a list below for the ballast manufacturer's that we currently use.
The ballast warranties can be found on the ballast manufacturer's websites.
Typically, in the past most all EB8_ ballast have had a 5 year warranty.

Let me know if you need anything else.

Generic #	Manufacturer	Catalog #	Voltage	# of Lamps	Lamp Watts	Lamp Diameter	Lamp Length	Ballast Mtg	Ballast Type	Lamp Type	B Size W
1034/2034	Advance	ICN-1P32-N	UNV	1		T8		8.9"	I	R	9.5" x
	OS/SYL	QTP1X32T8UNVISNSC	UNV	1		T8		8.9"	I	R	9.5" x
	GE	GE132-MV-N	UNV	1		T8		8.9"	I	R	9.5" x
	ULT	B132IUNVHP-B	UNV	1		T8		8.9"	I	R	9.5" x
1035/2035	Advance	ICN-2P32-N	UNV	2		T8		8.9"	I	R	9.5" x
	Howard	EP232IS/MVMC	UNV	2		T8		8.9"	I	R	9.5" x
	OS/SYL	QTP2X32T8UNVISNSC	UNV	2		T8		8.9"	I	R	9.5" x
	GE	GE232-MV-N	UNV	2		T8		8.9"	I	R	9.5" x
	ULT	B232IUNVHP-B	UNV	2		T8		8.9"	I	R	9.5" x
1036/2036	Advance	ICN-3P32-SC	UNV	3		T8		8.9"	I	R	9.5" x
	Howard	EP332IS/MVMC	UNV	3		T8		8.9"	I	R	9.5" x
	OS/SYL	QTP3X32T8UNVISNSC	UNV	3		T8		8.9"	I	R	9.5" x
	GE	GE332-MV-N	UNV	3		T8		8.9"	I	R	9.5" x
	ULT	B332IUNVHP-A	UNV	3		T8		8.9"	I	R	9.5" x

1037/2037	Advance	ICN-4P32-SC	UNV	4		T8		8.9"	I	R	9.5" x
	Howard	EP432IS/120-277SC	UNV	4		T8		8.9"	I	R	9.5" x
	Howard	EP4/32IS/MV/MV/HE	UNV	4		T8		8.9"	I	R	9.5" x
	OS/SYL	QTP4X32T8UNVISNSC	UNV	4		T8		8.9"	I	R	9.5" x
	GE	GE432-MV-N	UNV	4		T8		8.9"	I	R	9.5" x
	ULT	B432IUNVHP-A	UNV	4		T8		8.9"	I	R	9.5" x

Thank You!

Kevin McCartan
Pilipuf-Grist Central IL Office
217-519-3696 Cell
217-876-0242 Fax

Cooper Lighting File Numbers

	FileNumber	File type	Standard
	E108027	Luminaire Fittings	UL1598
	E112134	Incandescent Recessed Luminaires	UL1598
	E112980	Exit Fixtures	UL924
	E113705	Fluorescent Recessed Luminaires	UL1598
Retail	E114943	Fluorescent Surface Mounted Luminaires	UL1598
	E116089	High Intensity Discharge Recessed Luminaires	UL1598
	E120720	Emergency Lighting and Power Equipment	UL924
	E139418	Emergency Lighting Equipment for use in Hazardous Locations	UL844
	E139636	Fixtures for use in Hazardous Locations	UL844
	E150466	Switches, Photoelectric	UL773A
	E158353	Luminaire Fittings	UL1598
	E161308	Portable Lamps	UL153
	E164768	Landscape Lighting Systems, Low Voltage	UL1838
	E170116	Nightlights	UL1786
	E170117	Lighting and Power Equipment, auxilliary	UL924
	E175508	Emergency Lighting and Power Equipment	UL924
	E175509	Exit Fixtures	UL924
	E182662	Portable Lamps	UL153
	E185550	Starters, automatic	UL542
	E189643	Recessed Luminaire Trims	UL1598
	E192955	Portable Lamps	UL153
	E193568	Low Voltage Incandescent Luminaires and Fittings	UL2108
	E215246	Submersible Luminaires	UL676
	E217489	Fluorescent ballasts	UL935
	E238374	Appliance Controls	UL508
	E247045	Busways and Associated Fittings	UL857
	E248427	Industrial Control Switches	UL508
	E32570	High Intensity Discharge Surface Mounted Luminaires	UL1598

	FileNumber	File type	Standard	
	E40128	Track Lights and Track	UL1574	
	E50535	Portable Lamps	UL153	
	E54664	Emergency Lighting and Power Equipment	UL924	
	E61165	Luminaire Fittings	UL1598	
	E64726	High Intensity Discharge Surface Mounted Luminaires	UL1598	
	E65048	Emergency Lighting and Power Equipment	UL924	
	E69466	Exit Fixtures	UL924	
not valid →	E71514	Fluorescent Surface Mounted Luminaires	UL1598	(Not listed On UL website)
	E71880	High Intensity Discharge Surface Mounted Luminaires	UL1598	
All-Pro	E75170	Fluorescent Surface Mounted Luminaires	UL1598	
	E75440	*Incandescent Recessed Luminaires*	UL1598	
	E76383	Photo Controls, Plug-In, Locking type	UL773	
	E76559	Luminaire Fittings	UL1598	
	E77214	Fluorescent Recessed Luminaires	UL1598	
	E77616	Manufactured Wiring Systems	UL183	
Fail-Safe	E78458	Fluorescent Surface Mounted Luminaires	UL1598	
	E80574	Fluorescent Recessed Luminaires	UL1598	
	E81767	Incandescent Surface Mounted Luminaires	UL1598	
	E81913	Incandescent Surface Mounted Luminaires	UL1598	
	E83008	Portable Work Lights	UL153	
	E84023	High Intensity Discharge Recessed Luminaires	UL1598	
	E95388	Incandescent Surface Mounted Luminaires	UL1598	

1121 Highway 74 South
Peachtree City, Georgia 30269
770 486-4800
FAX: 770 486-4599

COOPER Lighting

Date: December 17, 2007

Subject: Metalux U.L. File Merge

We completed a project to merge all of the Metalux files in with current Cooper files.

The Metalux products files have been revised as shown below:

	Old File Number	New File Number	Old Vol	New Vol
Exit & Emergency	E54664	E65048	1	new, created Vol 14, final pages received, COMPLETE
Fittings	E61165	E76559	2	new, created Vol 9, final pages received, COMPLETE
Surface	E71514	E75170	1	new, created E75170, V6, final pages received, COMPLETE
Surface	E71514	E75170	2	new, created E75170, V7, final pages received, COMPLETE
Recessed	E77214	E80574	1	new, created E80574, V7, final pages received, COMPLETE
Recessed	E77214	E80574	2	new, created E80574, V8, final pages received, COMPLETE

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High Power
Class P, Sound Rated A
Type 1 Outdoor
Inherent Thermal Protection
Protection Thermiques Integree
No PCB's
GROUNDING:
Ballast case must be grounded. Mount lamps within 3/4" of grounded metal reflector
BLACK
WHITE
BALLAST
BLUE
BLUE
RED
LINE
LAMP
OCV=600Vrms
Insulate unused leads for 600V
WARNING:
Install in accordance with National and Local Electrical Codes
LAMP* TYPE
LINE CURRENT 120V
LINE CURRENT 277V
MIN START TEMP
(2) F32T8 0.50A 0.210A 0°F
(2) F25T8 0.39A 0.165A 0°F
(2) F17T8 0.28A 0.120A 0°F
Also Compatible with
(1) F32T8, (1) F25T8, (1) F17T8: 0°F
(1) F40T8: 32°F
(2) OR (1) 48" 30W, 28W, 25W T8/ESAT 60°F
*Includes U-bent T8 lamps

08.12.2014

OPERATION AND MAINTENANCE MANUAL

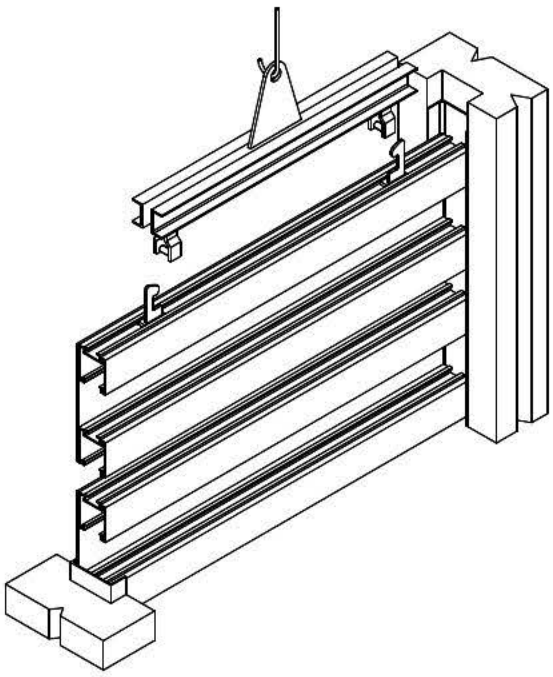
RICE LAKE STATE FISH AND WILDLIFE AREA
UPPER MISSISSIPPI RIVER RESTORATION
HABITAT REHABILITATION AND ENHANCEMENT PROJECT
FULTON COUNTY, ILLINOIS

SEPTEMBER 2021

APPENDIX J

OUTLET STRUCTURE
STOP LOG AND SLIDE GATES

Installation, Operation, & Maintenance Manual



Stop Log Gates

G1950-OG

DO NOT DISASSEMBLE GATE FOR INSTALLATION

3888 E. 45th Avenue #120 • Denver • Colorado • 80216 • 1-800-678-8228 • FAX (303) 287-8531
www.hydrogate.com

CONTENTS

CAUTIONARY STATEMENT FOR INSTALLATION, OPERATION, & MAINTENANCE MANUAL

This manual describes the recommended procedures for installation, adjustment, operation and maintenance of Hydro Gate gates. When it is used in conjunction with installation drawings that have been supplied by Hydro Gate, this manual will be sufficient for most installations. Proper care and precautions must be taken in handling and storing the gates at the delivery site. For further details on the handling, storing, and installation of a specific project, contact Hydro Gate's headquarters.

PRECISE AND ACCURATE INSTALLATION IS CRITICAL TO SATISFACTORY OPERATION. HYDRO GATE ASSUMES NO LIABILITY, EXPRESSED OR IMPLIED, FOR INTERPRETATION OF THE CONTENTS OF THIS MANUAL. IF YOU HAVE ANY QUESTIONS CONCERNING THE INTERPRETATION OF THE CONTENTS OF THIS MANUAL OR INSTALLATION PROCEDURES IN GENERAL, YOU SHOULD CONTACT HYDRO GATE'S COLORADO FACILITY. HYDRO GATE EXPRESSLY DISCLAIMS ALL LIABILITY, EXPRESSED OR IMPLIED, FOR FAULTY INSTALLATION OF ANY GATE OR ASSOCIATED EQUIPMENT AND FOR ANY DIRECT, CONSEQUENTIAL, OR INCIDENTAL DAMAGES THAT MAY RESULT.

FOREWORD

The purpose of this Installation, Operation, and Maintenance Manual is to provide information on the correct procedures for installation, adjustment, operation and maintenance of Hydro Gate Stop Log Gates and their component parts.

The stop logs, lifting beam, and accessories were accurately fabricated, assembled, adjusted, and inspected before leaving the Hydro Gate Corporation factory. For best results, read and follow the applicable parts of this Manual carefully, including thorough cleaning and lubrication of parts and final adjustment. If the stop logs will not be installed immediately, consult the long-term storage instructions following.

Caution
Do not disassemble the stop logs or lifting beam.

Notes

Spare Parts – Hydro Gate does not recommend the stocking of spare parts. Replacement parts are readily available for worn or broken parts. Contact Hydro Gate or our representative in your area.

Special Tools – Special tools are not required to operate and/or maintain the equipment supplied by Hydro Gate on this project.

Price List – Prices for individual parts and/or assemblies may be obtained from Hydro Gate at the time that they are needed.

Disassembly – Hydro Gate does not recommend the disassembly/reassembly of any of the equipment on this project.

Emergencies – Emergency/shutdown procedures do not differ from normal operating procedures for this project. If you should need assistance, please contact Hydro Gate's Field Service Department at (303) 288-7873.

INSTALLATION

Safety Precautions

To help ensure your workers' safety, Hydro Gate recommends the personnel responsible for installation, operation, and maintenance of the gates for this project read and study the instructions and precautions in the Installation, Operation, and Maintenance Manual, and follow all directions carefully. The following are major items associated with safe installation, operation, and maintenance of this stop log gate.

- **Do not** operate equipment before carefully reviewing the Installation, Operation, and Maintenance Manual.
- Always use proper equipment when lifting or unloading heavy items.
- **Do not** stack equipment too high for storage. Always use heavy wood blocking between equipment. Refer to the storage instructions contained herein for details.
- Adequately support and brace heavy items during placement of equipment.
- Wear proper personal protective equipment (PPE) and clothing when working on or around gates, (e.g., hard hats, heavy boots, safety glasses, and breathing apparatus, if necessary).
- **Never** place bodily obstructions in the path of moving parts. When operating gates and accessories, stand clear of all moving parts. Serious injury can result from contact with moving parts.
- Use caution when performing operations and maintenance. Watch for loose or damaged parts. Stop all functions until any damage has been corrected.
- **Do not** use any mechanical devices other than the factory-supplied equipment to operate the gates for this project.
- **Do not** attempt operational procedures other than set forth in the Operation and Maintenance Manual.
- Contact your Hydro Gate representative with any questions you may have regarding safety in installing, operating, and handling Hydro Gate products.

Things To Do and Not To Do during Installation of This Gate

To properly install this gate, Hydro Gate recommends that personnel study these instructions and installation drawings and follow the installation directions carefully. These stop logs are precision fabricated, quality checked, and designed for low leakage. Attention must be given to proper storage, careful handling, and accurate location of embedded items for this gate to operate as designed.

Some DO'S and DON'TS to ensure proper gate installation.

- ✓ DO – Read and follow the Installation instructions and drawings in this Manual.
- ✓ DO – Carefully inspect the gates and accessories when received, before unloading trucks or cars. Report **ALL** shortages or suspected damage by marking the Bill of Lading and Receiving Reports at this time. Latent shortages must be reported in writing within 30 days of shipment.
- ✓ DO – Store stop logs evenly on planks or timbers. Even the heaviest stop logs are subject to permanent warpage if unevenly blocked during storage.
- ✓ DO – Support full length of stop logs and protect seals during storage and handling.
- ✓ DO – Accurately locate and brace embedded items during placement of concrete.
- ✓ DO – Contact your Hydro Gate representative with questions regarding this gate. Hydro Gate and its related companies have 100 years combined experience in the water control industry.
- ✓ DON'T – Stack stop logs without heavy wood blocking between logs.
- ✓ DON'T – Disassemble the stop logs (seals) for installation.
- ✓ DON'T – Allow excess concrete to overlap stop log guides.
- ✓ DON'T – Tighten nuts for studs or anchors unevenly, or try to pull a guide tightly against an uneven wall surface. This, in most cases, will cause excessive leakage.
- ✓ DON'T – Operate gates with concrete and debris on them.

Installing Guides on Concrete Wall

1. Secure all anchor bolts in proper position in the forms. For proper size, length, projection, and spacing, see the installation drawings.

2. Two nuts are provided per bolt. Leave sufficient grout space for adjustment of the back nut on the anchor bolt.

3. Pour concrete and strip forms.

4. Apply anti-seize compound on anchor bolt threads. Place a nut on each anchor bolt and establish a flat vertical plane as close as possible to the wall using taut lines, plumb lines, or straight edges. Starting with upper corner anchor bolt back nuts, drop a plumb line down past the face of the nut. Bring the other back nuts up to the plumb line. Using a straight edge or taut line, bring back nuts on anchor bolts across top and bottom in line with nuts on corner anchors (**Figure 1).**

5. Place assembled stop log guide in position on the anchor bolts. Install front nuts and tighten being careful not to move the back nut out of the plane established in No. 4 above.

6. Carefully grout in the guides with a cement-based "non shrink" grout such as U.S. Grout Corporation's "5 Star Grout."

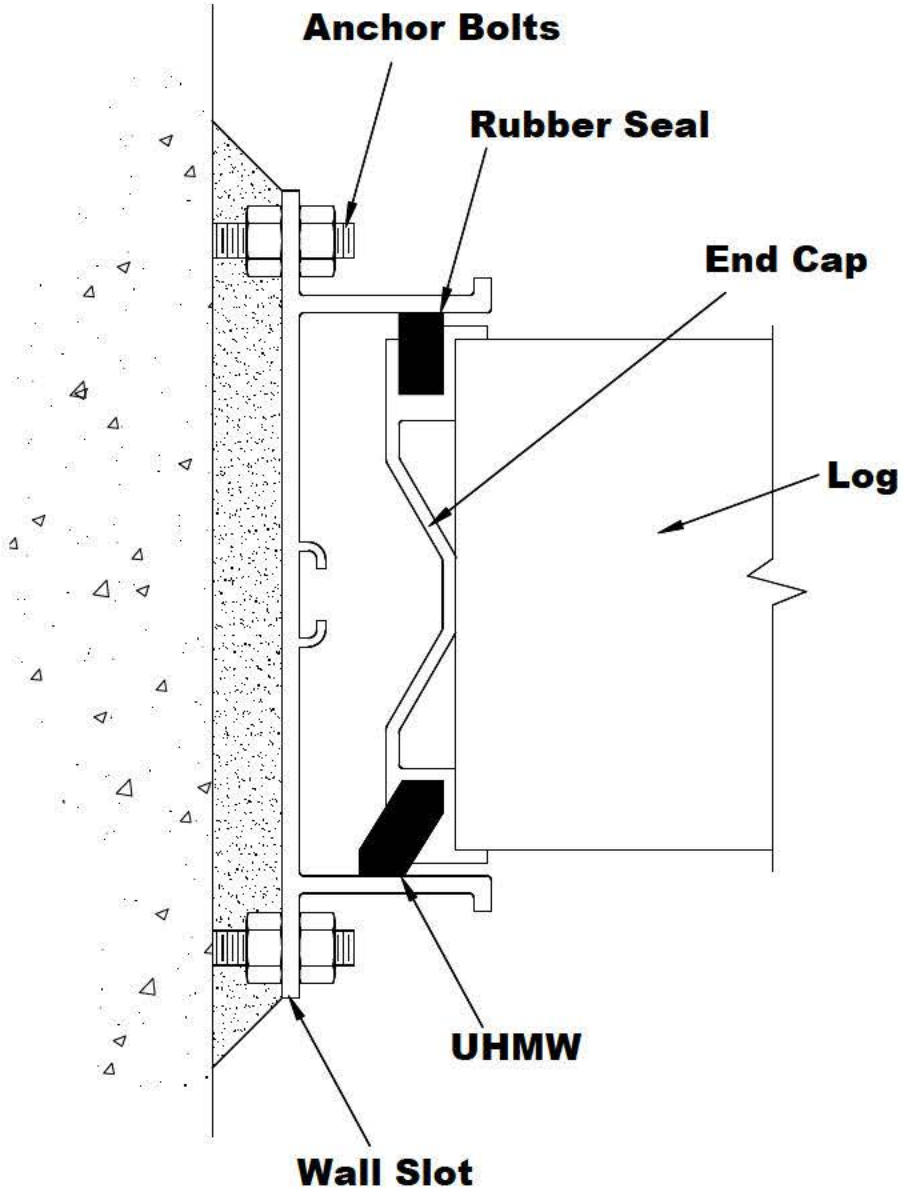
7. After the grout has set, ensure no voids exist between the guide and the concrete.

Installation Note
Because of possible shrinkage of certain types of grout, it may be necessary to loosen the guide and apply a sealing compound between the gate seat and the wall.

8. Tighten all nuts or anchor bolts uniformly.

Installation Note
Do not warp the guide to conform to an uneven surface, excessive leakage can result.

Figure 1 – Top View of Side Wall Showing Anchor Bolts and Stop Log Guides



Installing Guides in Concrete Channel after Original Pour of Concrete

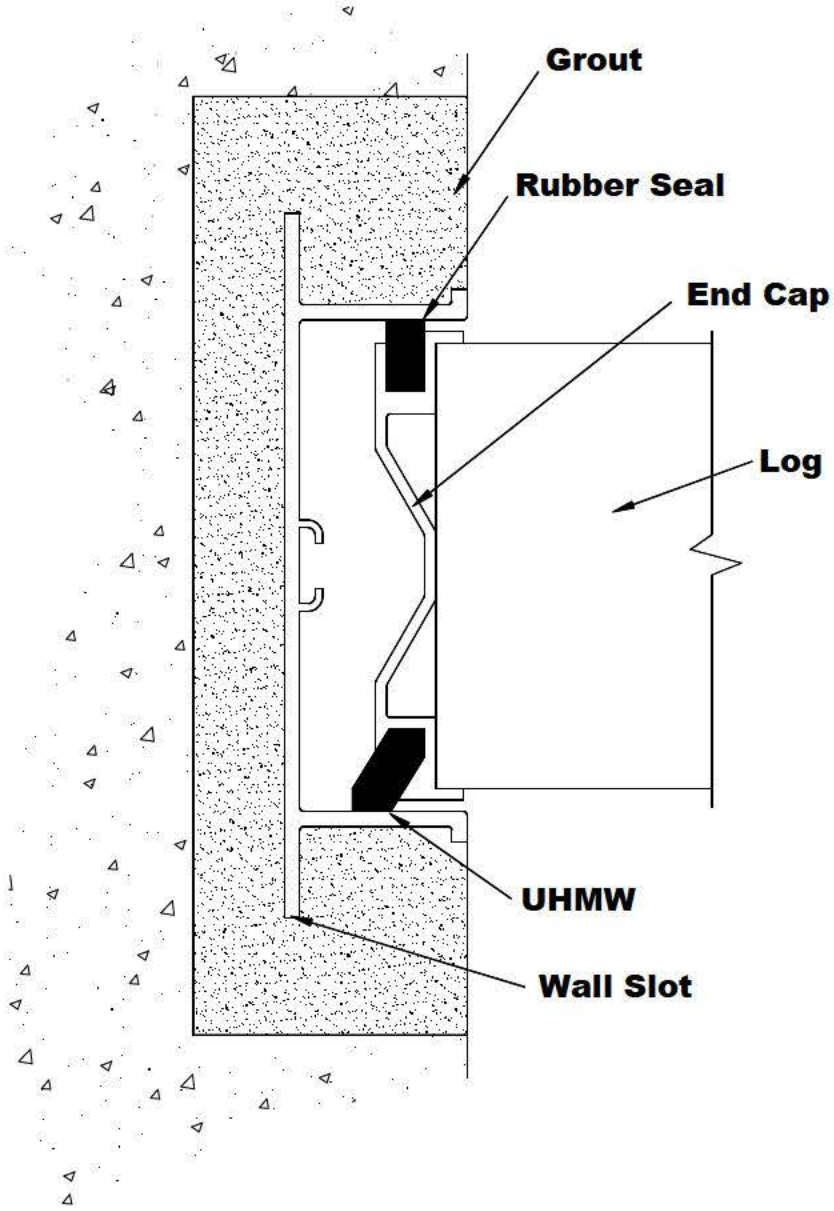
1. A recess (block-out) must be made in the original pour of concrete to receive the guide. For the minimum width and depth of this recess, see the installation drawings. Use plumb lines and spirit levels to ensure the frame is straight and plumb before pouring.

2. Pour the concrete. Strip the forms including removal of material used to form the block-out.

3. Set the assembled guide in the recess along the sides and across the bottom of the structure. Guide anchor bolts are not required because the irregular shape of the section holds the gate frame in position after grouting **(Figure 2).**

4. By blocking and shimming, align the guide in the vertical position. Use care to maintain the side guides in a plane without warping or distorting the guides.

Figure 2 – Top View of Wall Showing Block-Out and Stop Log Guides



Installing Invert Sill Plate

1. Gates that have a sill plate embedded in concrete should have the sill plate installed at the invert of the opening **(Figure 3).**

2. A recess should be formed in the invert for the sill plate. The dimensions of the recess are shown on the installation drawing.

3. For guides with adjustable sill plates, set anchor bolts in the concrete recess as shown on the installation drawings.

Installation Note
Do not cast the bottom sill plate into an original concrete pour.

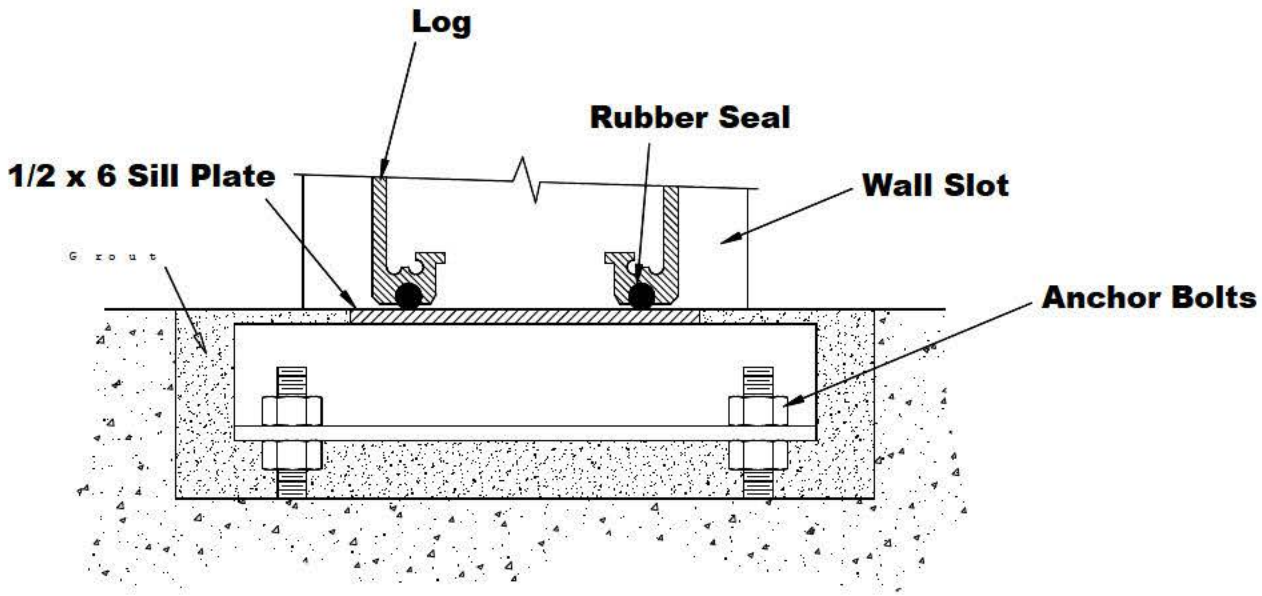
4. Pour concrete and strip forms.

5. Place one nut on each anchor bolt. Position the nuts so that the sill plate will be flat and flush with the invert and form a 90-degree angle with the vertical guide.

6. Place the sill plate on the anchors and install top nuts on the anchor bolts.

7. Level the sill plate and grout it in place.

Figure 3 – Side View of Invert Sill Plate in Floor



OPERATION

General Operation Information

Stop log gates are used to control flow of or retain a volume of water, effluent, or other fluids. Typical applications include dams, flood control, and many other applications that require accurate control of liquid flow.

Depending on size, most stop log gates can operate without error in diverse conditions. Some extenuating circumstances may include large amounts of ice or other solids that will obstruct the travel path of the stop logs. In most cases, when the obstruction is removed, normal operation can be resumed.

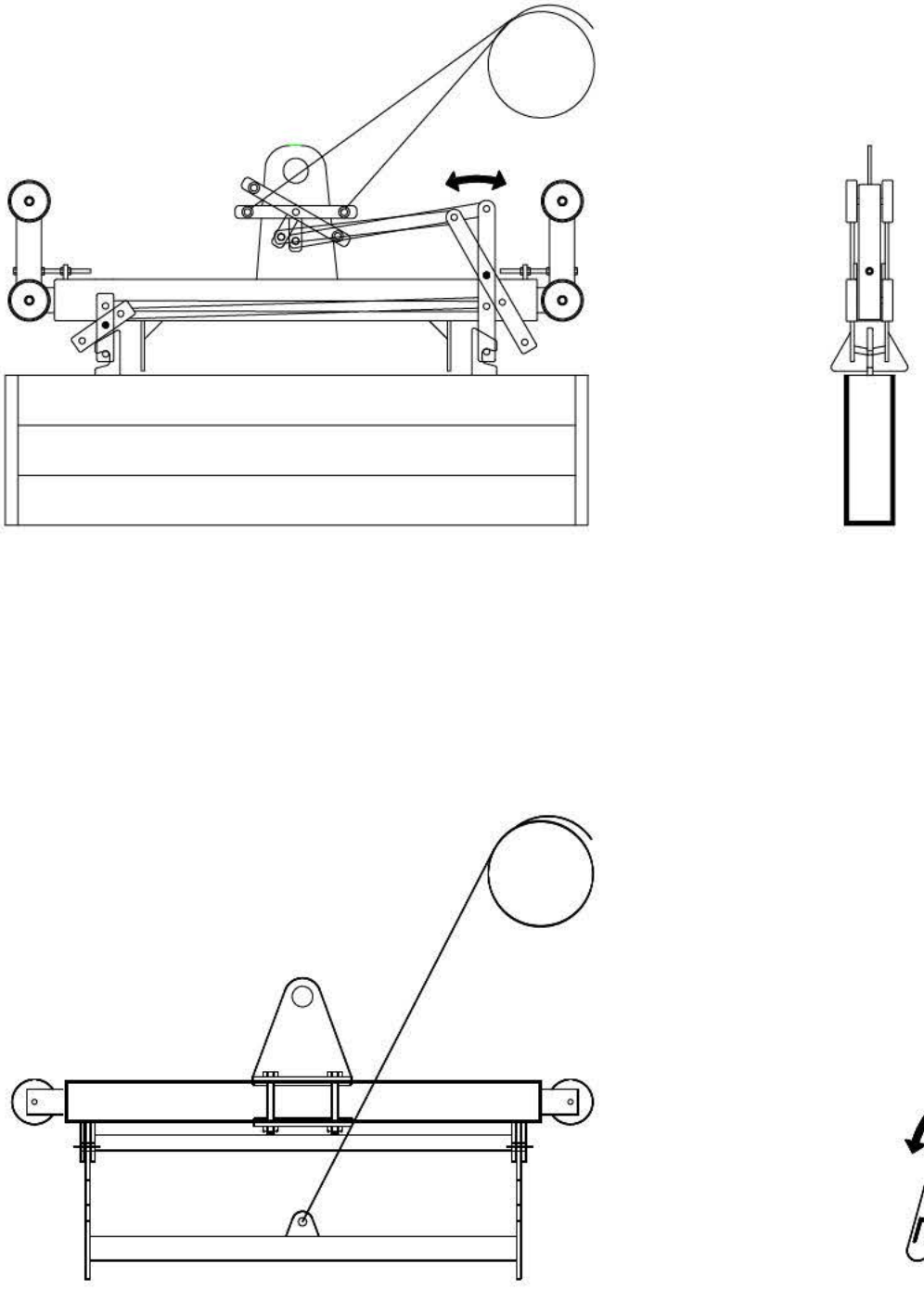
Stop Log Gate Operation Procedures

The following sections cover the general operating procedures associated with Hydro Gate Stop Log Gates. Read and follow the operating procedures. If you have any questions concerning safe operation of this gate, contact Hydro Gate immediately.

Hydro Gate Lifting Beams

Two styles of lifting beams are shown on the following page **(Figure 4).** Either type may or may not have adjustable spans to cover different widths of stop log openings. To adjust the widths, remove the clevis pin clips, pull the heavy pins, slide the telescoping wheel assemblies in or out, and reinstall the pins and clips.

Figure 4 – Lifting Beam Configurations



Using the Hydro Gate Lifting Beam

Inserting Stop Logs into Guides

Stop logs are integrated units and require no field assembly. The following procedures should be followed when using the Hydro Gate Lifting Beam to insert stop logs into guides:

1. Inspect the lifting beam lanyard line for damage.

Safety Note
Do not use the lifting beam if the lanyard line is defective, personal injury or damage to the beam or stop logs can occur.

2. Secure the lifting beam to a crane or other substantial lifting device by the center lifting eye.

3. Position the beam directly over the stop log to be moved.

4. Lower over the lifting lugs on top of the stop log. The beam will automatically latch over the lugs.

Operation Note
Stop logs are designed for insertion into the guide rails at balanced head or zero-flow conditions. Allow the stop log to fill with water before lowering to the desired elevation.

5. Raise the stop log for transport to the point of use.

Safety Note
The Hydro Gate Stop Log Lifting Beam is a self-contained device designed exclusively for handling Hydro Gate Stop Logs. Use of this device for purposes other than installing and removing Hydro Gate Stop Logs could cause personal injury or damage to the Stop Log Lifting Beam.

6. Position the stop log directly over the stop log guides.

7. Lower the lifting beam until the stop log rests firmly on the sill plate or previously installed stop log.

8. Pull lanyard line to release latches from the stop log lugs.

9. Raise the lifting beam while holding the lanyard.

10. After the lifting beam clears the lugs, release the lanyard and raise the lifting beam from the guide rail slot.

Removing Stop Logs from Guides

The following procedures should be used when using the Hydro Gate Lifting Beam to remove stop logs from guides:

1. Inspect the lanyard line for damage.

Safety Note
Do not use the lifting beam if the lanyard line is defective, personal injury or damage to the beam or stop logs can occur.

2. Secure the lifting beam to a crane or other substantial lifting device by the center lifting eye.
3. Position the beam directly over the stop log to be moved.
4. Lower over the lifting lugs on the top of the stop log. The beam will automatically latch over the lugs.
5. Raise the stop log above the surface of the water and drain before removal from guide slots.
6. Position the stop log directly over the designated release point.
7. Lower the stop log until it rests firmly on an appropriate storage area as described later in this Manual.

Storage Note
Clean the stop logs and lifting beam as needed before storage. Do not use solvents. Damage to the seals and slide material can result.

8. Pull the lanyard line to release the latches from the lugs.
9. Raise the lifting beam while holding the lanyard.
10. After the lifting beam clears the lugs, the lanyard can be released and the lifting beam moved.

MAINTENANCE

Maintenance of Stop Logs

Hydro Gate Stop Logs are a single integrated unit fitted with a permanent neoprene seal. The only maintenance required is inspection of the seal for damage and cleaning of the stop log after each use to remove dirt and other debris that could cause difficult installation upon re-use.

Maintenance Note
Do not use solvents for cleaning. Damage to the seals and slide material can result.

Storage of Stop Logs

1. Store stop logs neatly in either the horizontal or vertical position on flat hard surface or on timbers. Do not store directly on the ground or on uneven surfaces that will flatten or damage seals.

2. Store stop logs in a shaded or covered area to avoid degradation of neoprene seals caused by UV rays of sunlight.

3. Store stop logs in storage racks, if specified by contract.

Maintenance of Lifting Beams

Before each use, check all moving parts to ensure proper working condition. Lubrication of moving parts is not normally required. Clean as required.

Storage of Lifting Beams

1. Store lifting beams on hard flat surface or on timbers. Do not store directly on the ground.

2. Coil and protect the lanyard cable to prevent tangling and kinking.

Maintenance and Lubrication Summary

Activity	Frequency	Lubricant
General Cleaning and Inspection	After each use, as often as conditions require or permit, or every 6 months.	N/A
Inspect Rubber Stop Log Seals	Before each installation.	N/A
Inspect Lifting Beam	Before each use.	N/A

Troubleshooting Tips for Hydro Gate Stop Logs

Stop logs depend on water pressure to seal. The purpose of the stop logs is to control the flow or divert the flow. Tight shutoff of water is not possible. Stop logs are not a substitute for valves or gates; therefore, some fluid leakage around the stop logs should be expected. Proper seal inspection and maintenance will help limit the leakage.

Excessive Leakage around Seals

Excess leakage around seals can be caused by the bottom or side seals being damaged through improper storage or handling. Check for foreign material, cuts, or other damage on the seal surfaces. Scrape off any extraneous material or replace the seals if the damage is not repairable.

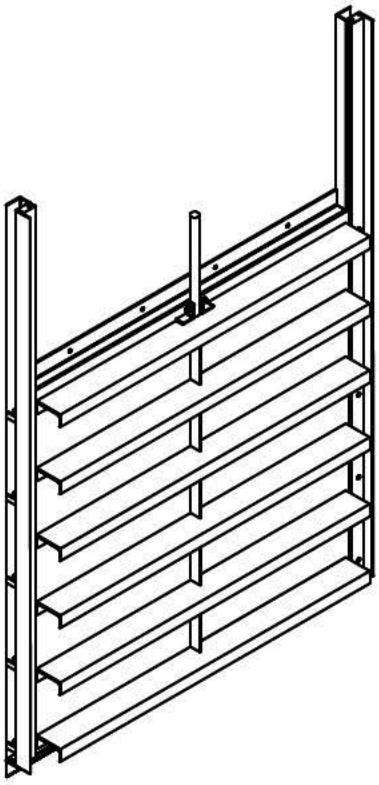
Excessive Leakage between Stop Logs

If the stop logs are not seated properly, excessive leakage between the stop logs will result. Check for debris on top of the bottom log or debris in the channel guide frame. Remove all debris and reinstall the stop logs.

Binding of Stop Logs during Removal

If the stop logs bind during removal, check for debris on top of or beside the stop logs. Remove all debris. Ensure the lifting beam has engaged BOTH lift lugs on the log. If a stop log is not properly engaged, reseat the lifting beam and ensure the lanyard line is not in tension and the linkage on the beam is operating properly.

Installation, Operation, & Maintenance Manual



Alum Fabricated Slide Gates

G1900

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Date of issue 8/2/13

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CAUTIONARY STATEMENT FOR INSTALLATION, OPERATION, & MAINTENANCE MANUAL

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FOREWORD

The purpose of this Installation Manual is to provide information on the correct procedures for installation, adjustment, operation and maintenance of Hydro Gate Slide Gates and their component parts.

The gate, lift, and accessories were accurately machined, fabricated, assembled, adjusted, and inspected before leaving the Hydro Gate Corporation factory. For best results, read and follow the applicable parts of this Manual carefully, including thorough cleaning and lubrication of moving parts and final adjustment. If the equipment will not be installed immediately, consult the long-term storage instructions following.

Installation Note
Do not disassemble the gate or lift for installation.

Warranty Note
Installation and/or operation of the gate lift and stem without proper lubrication will void the equipment warranty. Thorough cleaning of the stem and seating faces is required before gate operation. Details are described in the appropriate sections of this Manual.

Notes

Spare Parts – Hydro Gate does not recommend the stocking of spare parts. Replacement parts are readily available for worn or broken parts. Contact Hydro Gate or our representative in your area.

Special Tools – Special tools are not required to operate and/or maintain the equipment supplied by Hydro Gate on this project.

Price List – Prices for individual parts and/or assemblies may be obtained from Hydro Gate at the time that they are needed.

Disassembly – Hydro Gate does not recommend the disassembly/reassembly of any of the equipment on this project.

Emergencies – Emergency/shutdown procedures do not differ from normal operating procedures for this project. If you should need assistance, please contact Hydro Gate's Field Service Department at (303) 288-7873.

INSTALLATION

Safety Precautions

To help ensure your workers' safety, Hydro Gate recommends the personnel responsible for installation, operation, and maintenance of the gates for this project read and study the instructions and precautions in the Installation, Operation, and Maintenance Manual, and follow all directions carefully. The following are major items associated with safe installation, operation, and maintenance of this slide gate.

- **Do not** operate equipment before carefully reviewing the Installation, Operation, and Maintenance Manual.
- Always use proper equipment when lifting or unloading heavy items.
- **Do not** stack equipment too high for storage. Always use heavy wood blocking between equipment. Refer to the storage instructions contained herein for details.
- Adequately support and brace heavy items during placement of equipment.
- Wear proper personal protective equipment (PPE) and clothing when working on or around gates, (e.g., hard hats, heavy boots, safety glasses, and breathing apparatus, if necessary).
- **Never** place bodily obstructions in the path of moving parts. When operating gates and accessories, stand clear of all moving parts. Serious injury can result from contact with moving parts.
- Use caution when performing operations and maintenance. Watch for loose or damaged parts. Stop all functions until any damage has been corrected.
- **Do not** use any mechanical devices other than the factory-supplied equipment to operate the gates for this project.
- **Do not** attempt operational procedures other than set forth in the Installation Manual.
- Contact your Hydro Gate representative with any questions you may have regarding safety in installing, operating, and handling Hydro Gate products.

Things To Do and Not To Do during Installation of This Gate

To properly install this gate, Hydro Gate recommends that personnel study these instructions and installation drawings and follow the installation directions carefully. This gate is precision fabricated, shop adjusted, quality checked, and designed for low leakage. Attention must be given to proper storage, careful handling, and accurate location of embedded items for this slide gate to operate as designed.

Some DO'S and DON'TS to ensure proper gate installation.

- ✓ DO – Read and follow the Installation instructions and drawings in this Manual.
- ✓ DO – Carefully inspect the gates and accessories when received, before unloading trucks or cars. Report **ALL** shortages or suspected damage by marking the Bill of Lading and Receiving Reports at this time. Latent shortages must be reported in writing within 30 days of shipment.
- ✓ DO – Store gates evenly on planks or timbers. Even the heaviest castings are subject to permanent warpage if unevenly blocked during storage.
- ✓ DO – Support full length of stems and protect threads during storage and handling.
- ✓ DO – Accurately locate and brace embedded items during placement of concrete.
- ✓ DO – Contact your Hydro Gate representative with questions regarding this gate. Hydro Gate and its related companies have 100 years combined experience in the water control industry.
- ✓ DON'T – Stack gates without heavy wood blocking between gates.
- ✓ DON'T – Disassemble the gates for installation.
- ✓ DON'T – Allow excess concrete to overlap gate or frame.
- ✓ DON'T – Tighten nuts for studs or anchors unevenly, or try to pull a gate frame tightly against an uneven wall surface. This, in most cases, will cause excessive leakage.
- ✓ DON'T – Operate gates with concrete and debris on them.
- ✓ DON'T – Operate gate stems dry (without grease).

Placing Gate on Concrete Surface with Drill-In Anchors

1. Use only adhesive-type or epoxy-grouted anchors. Mechanical wedge anchors are not recommended and gate performance cannot be guaranteed with wedge-type anchors. Hydro Gate usually furnishes the all-thread studs but does not furnish the adhesive capsules or cartridges due to shelf life and site storage conditions.

2. Accurately layout positions of anchors or use the gate as a template.

3. Drill holes to diameter and depth required for size anchors used. If rebar is encountered during drilling causing an impossible completion of hole, consult the owner's site engineer for instructions on how to proceed. Cutting of rebar may not be permitted. In some cases, a new hole (or holes) may be field drilled in the gate frame to compensate for out of position anchors. Consult Hydro Gate's Engineering Department for advice and limitations.

4. Blow and brush all holes clean according to adhesive system instructions and place anchors with adhesive. Maintain proper projection and alignment and allow sufficient cure time, particularly in cold weather.

5. Align and install gate by following steps 1 through 8 in the following section (Installation of Flange Back Gates on Concrete).

Safety Note Concerning Mechanical Anchors

Because of the dynamic/reversing load on the gates involving unseating or seating loads and the use of front and back nuts for alignment, wedge anchors are not satisfactory since they require tension in them at all times to "grip" the concrete. The loss of "tension" in the wedge anchor may cause them to fail.

Special design "under out" or bell-bottom mechanical anchors are available from a couple of sources; however, they require specialized and costly drills and installation tools to the point of impracticality for typical installations. For more information where the under-out mechanical anchor may be the only good solution, contact Hydro Gate's Engineering Department.

Installation of Flange Back Gates on Concrete

1. Secure all anchor bolts in proper position in the forms. For proper size, length, projection and spacing, see the Hydro Gate installation drawing.

Installation Note
An upper anchor is often required for supporting the upper gate frame.

2. Two nuts are provided per bolt. Sufficient grout space must be left for adjustment of the back nut on the anchor bolt.

3. Pour concrete and strip forms.

4. Place a nut on each anchor bolt and establish a flat vertical plane as close as possible to the wall using taut lines, plumb lines or straight edges **(Figure 1).** Starting with upper corner anchor bolt back nuts, drop a plumb line down past the face of the nut. Bring the other back nuts up to the plumb line. Using a straight edge or taut line, bring back nuts on anchor bolts across top and bottom in line with nuts on corner anchors.

5. Place the assembled gate in position on the anchor bolts. Install front nuts and tighten, being careful not to move the back nut out of the plane established in No. 4 above. Check for proper seating tolerance with .005-inch feeler gauge.

6. Carefully grout in the gates with a cement-based "non shrink" grout such as U.S. Grout Corporation's "5 Star Grout."

7. After the grout has set, ensure no voids exist between the gate seat and the concrete. Because of possible shrinkage of certain types of grout, it may be necessary to loosen the gate and apply a sealing compound between the gate seat and the wall.

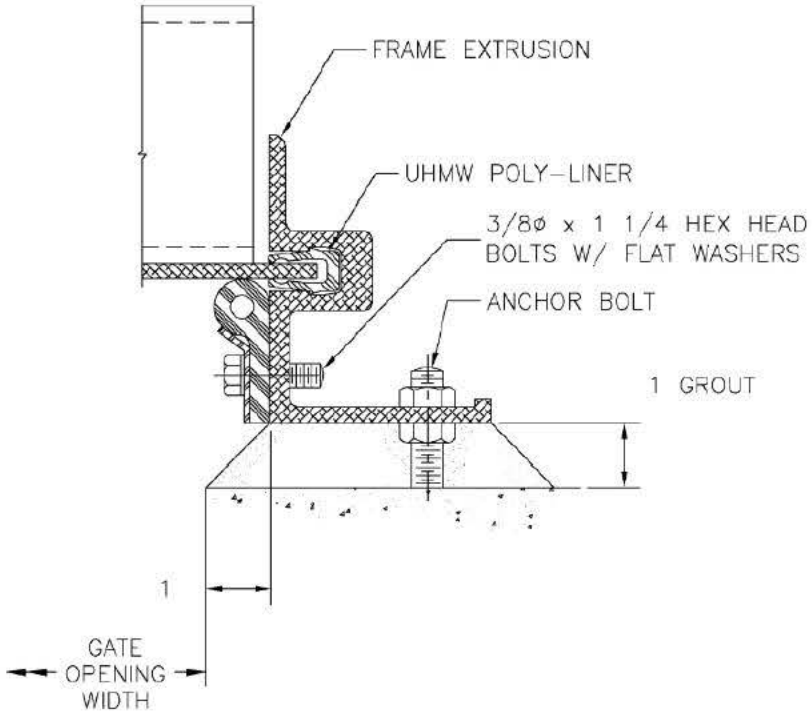
8. Lubricate all nuts and anchor bolts with anti-seize lubricant and tighten uniformly.

Installation Note
Do not warp the gate to conform to any uneven surfaces.

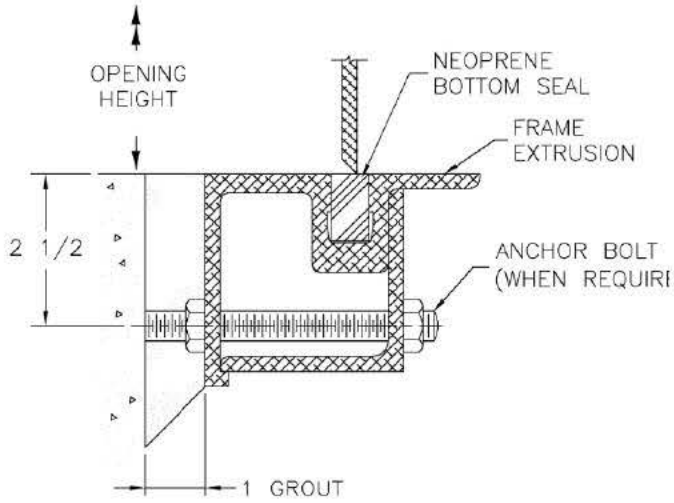
Torque Table for Tightening Nuts or Hex Bolts Used for Assembly

Capscrew Diameter (Inches)	Torque Specifications (Pound Feet)
1/2	45
5/8	75
3/4	125
7/8	200
1	300

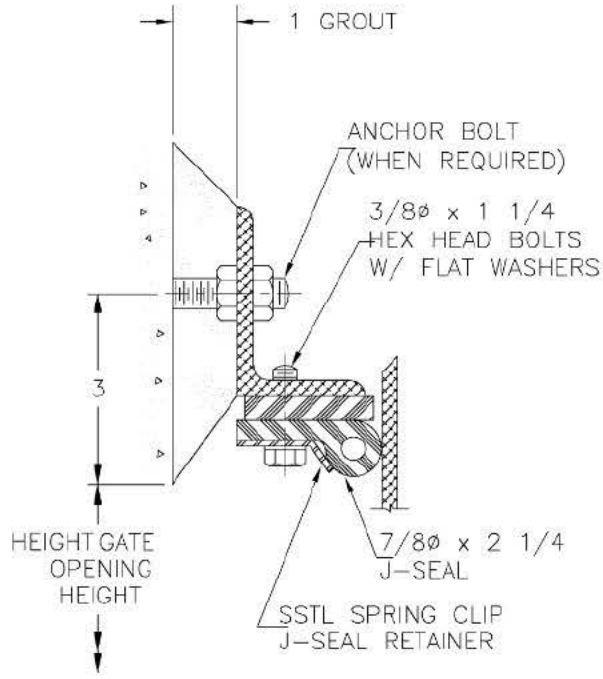
Figure 1 – Top View of Anchor Bolt Mounting with Flanged Back Gate



TYPICAL SIDE SECTION



TYPICAL BOTTOM SECTION



TYPICAL TOP SECTION

Installation of Gates in Concrete Channel after Original Pour of Concrete

1. A recess must be made in the original pour of concrete to receive the gate. For a minimum width and depth of this recess, see the Hydro Gate installation drawing. These gates should all be flush bottom closure type. A recess for the flush bottom closure is required in the invert of the structure **(Figure 2)**.

2. Pour the concrete and strip forms, including removal of material used to form the block-out.

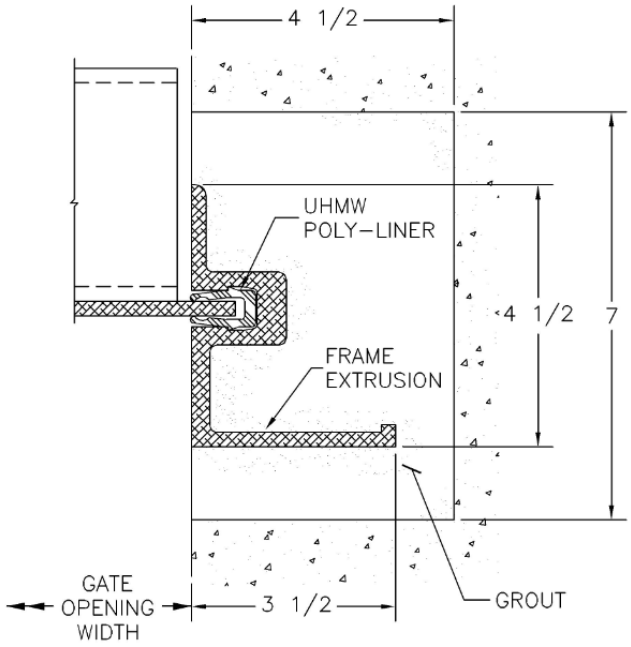
3. By blocking and shimming, align the gate in the vertical position. Use care to maintain the slide and the side guides in a plane without warping or distorting the guides and bottom member of the frame. Use plumb lines and spirit levels to ensure the frame is straight and plumb before pouring concrete, or grouting.

4. Carefully grout the gate in position.

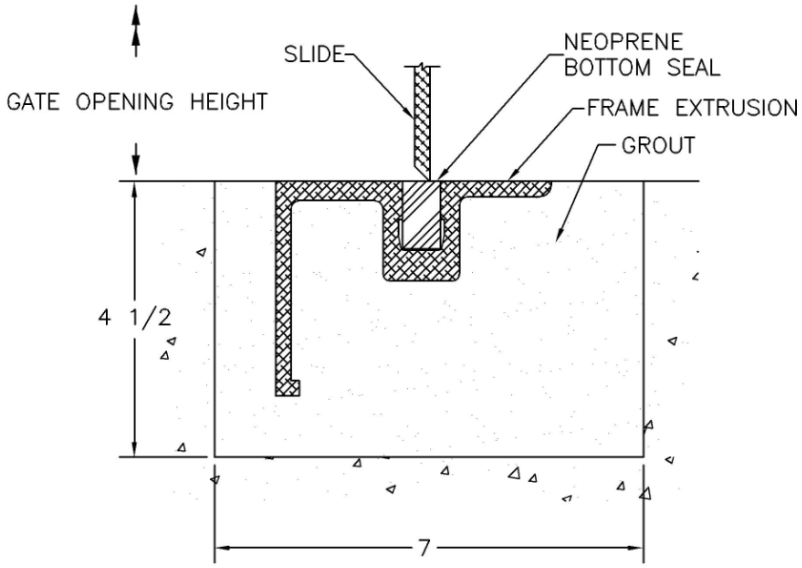
5. After the grout has set, ensure no voids exist between the gate frame and the grout. When voids are detected, refill with the grout or seal with a compound that has low cold-flow characteristics.

6. Large gates may have clips that help stabilize the frame during shipment and installation. Remove these clips after installation and before operation.

Figure 2 – View of Recess for Embedded Aluminum Gate



TYPICAL SIDE SECTION



TYPICAL BOTTOM
SECTION

Gate Stem and Guides Installation

1. Place the anchor bolts for the lift and stem guides as shown on the installation drawings. Check for proper alignment of the lift, stem guides, and gate. The lift stem and gate stem block must be in vertical alignment within 1/8 inch per each 10 feet of distance.

2. Provide opening with adequate clearance in the lift platform for the gate stem.

3. Pour concrete and strip forms.

4. Install stem guide brackets on anchors, but do not tighten nuts; leaving them loose so the bracket can be moved for later alignment. Loosen all assembly bolts holding the collars to the bracket. Stem guide collars may be 1- or 2-piece construction. Place 1-piece collars on each succeeding stem section as it is installed. After each collar is installed, re-bolt it to its bracket, but do not tighten.

5. When more than one gate is to be installed, stems may be of different diameters or lengths. Stems are marked and/or tagged for each installation. Separate the stems per individual gate installation.

Installation Note
Exercise care when handling and installing threaded stems; nicks or burrs will damage lift nut threads.

6. Insert the stem block into the gate slide pocket.

7. Stems may be in more than one piece to facilitate shipment and installation. If two or more pieces are furnished for an installation, they must be installed in their proper order from bottom to top to place splices in correct location so they will not interfere with the stem guides when the gate is opened or closed. Measure the stem section lengths and install.

8. Lower the bottom section of the stem into place through the hole of the gate slide and thread it all the way into the block and align the keyways (**Figure 4).**

Installation Note
Immediately insert the key to lock the bottom section of the stem to the block. (The key is omitted on non-rising stem gates as the turning motion is between the block and the stem.)

9. Place all of the succeeding stem sections. Double-check the installation drawings to ensure that one-piece stem guide collars are in place. Join together with splices as provided (**Figure 5).**

Safety Note
Insert all bolts or keys in each stem splice immediately after sections are installed and aligned to prevent one section disconnecting from another when the gate is operated.

10. Immediately before lowering the lift over the threaded portion of the stem, remove the protective wrapping from the stem and thoroughly clean off all foreign material.

11. Lubricate stem threads with recommended lubricants. Do not leave lubricated stem exposed to contamination before completing the installation.

Figure 4 – Stem Block and Key

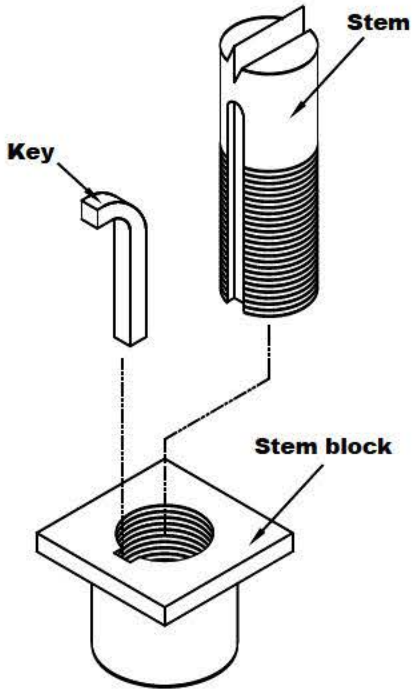
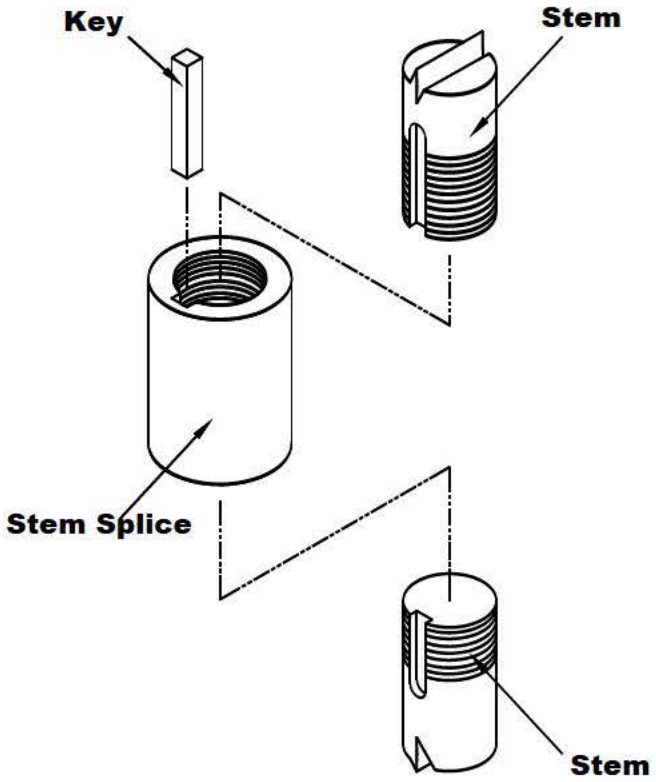


Figure 5 – Stem with Splice



Lift Installation and Adjustment of Stem Guides

1. Remove protective covering or plugs from the gate-lifting device. Clean the interior threads of the nut.

Installation Note
Foreign material in the nut threads may cause damage and make the gate harder to operate. Each threaded nut should be carefully swabbed out even if it appears to be clean.

2. Clean the threaded section of the stem, removing all foreign material, and lubricate with recommended lubricant as described in the "Gate Stem and Guide" section of this manual.

Warranty Note
Operation of the gate assembly without proper lubrication of the stem will void the equipment warranty.

3. Raise the lift and lower it over the previously installed and lubricated threaded stem section. When starting threaded stem into the bottom of the lift nut, care must be taken to avoid damage to the threads. Rough handling may result in damage to the bottom edge of the threaded lift nut and prevent the stem from being threaded into the lift nut freely. Hold the lift to prevent its rotation. Turn the handwheel or crank to lower the pedestal onto its anchor bolts.

Installation Note
When all parts are cleaned, the threaded lift nut will turn onto the threaded stem with very little effort.

4. Using shims, double nuts on anchors, or other leveling devices under the lift, align the centerline of the lift nut until parallel with the stem centerline. Vertical alignment of gate stem and the gate slide stem block must be within 1/8 inch per 10 feet of distance. Tighten nuts on the anchors uniformly.

5. The crank should turn freely for two or three turns in each direction until the clearance between the top or bottom of the stem block in the gate slide is taken up. If any binding occurs during operation of the lift with the slight vertical movement of the gate slide, the stem alignment should be checked. Slight misalignment will cause undue wear to the threaded lift nut. When binding is not caused by misalignment, recheck to be certain all threads on the stem and in lift nut are clean.

6. Place the two-piece stem guide collars around the stem above each bracket. Place the bolts through the projection of the bracket and the ends of the collars. Do not tighten the bolts.

7. Grout under the lift (if required). After the grout has set, tighten the anchor bolts uniformly.

Installation Note
Before opening the gate, clean all grout, stones, or other foreign material from the top of the gate and recheck the projection of the anchors or studs across the top of the gate opening. Excess bolt projection will damage the seating face on the slide when it is opened.

8. Turn the lift crank or handwheel to open the gate, until the gate slide is pulled from its seat. The stem is now in tension. Check the stem to be certain it is straight. Tighten the nuts on the anchors through the stem guide brackets, center the stem guide collars around the stem, and tighten the assembly bolts holding the collars in position on the brackets.

9. Move the gate to its fully opened position and check the position of the stems. If the stem is being deflected by the collars, a stem alignment problem exists and must be corrected, indicating the gate may not be plumb. Consult Hydro Gate for ways to correct or compensate for this condition.

10. Tighten the setscrews through the stop nut to hold it in place **(Figures 6 & 6a).**

11. Install the stem cover, indicator, etc., as required.

Figure 6 – Handwheel and Stop Nut

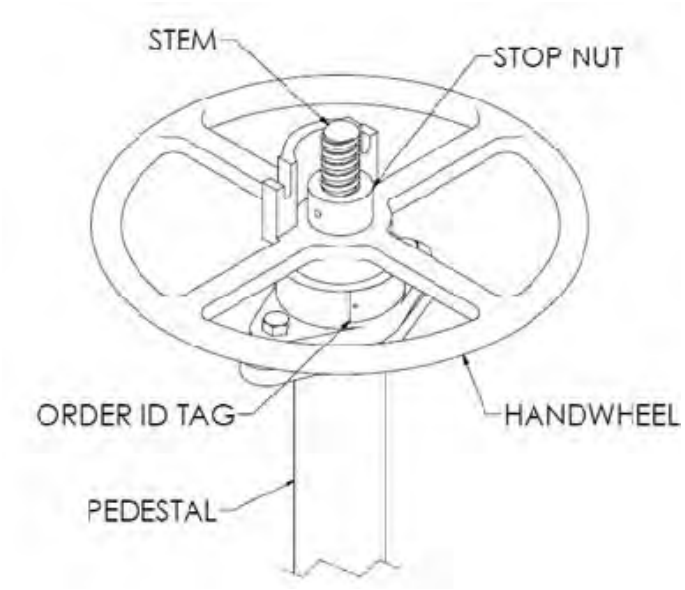
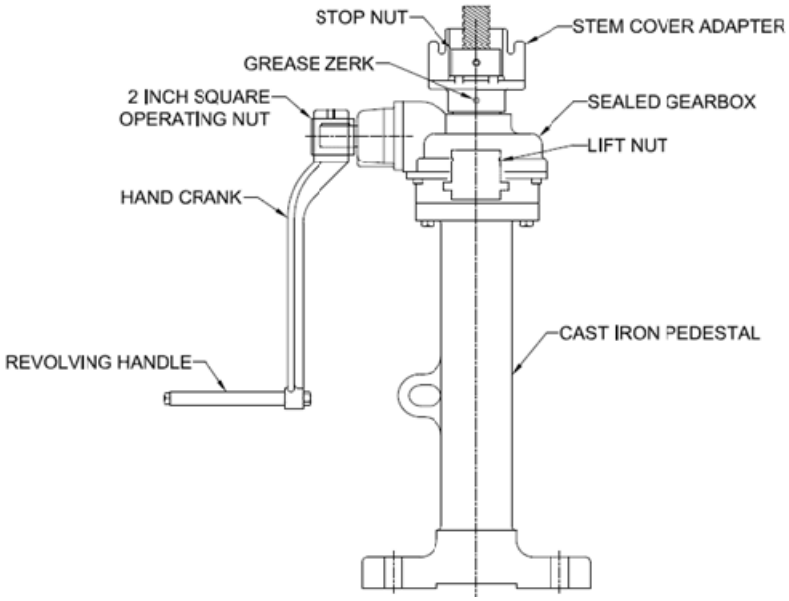


Figure 6a – Crank Detail (Bench Mount Shown)



Installation of Tandem Stems

Some gates have wide openings with relatively short gate heights, requiring tandem lifts. When the installation drawings show tandem lifts, install each lift in accordance with the preceding Steps 1 through 5. After each lift has been installed and each stem is connected to the gate slide at the bottom and the lift at the top, proceed as follows:

1. Turn the input shaft of each lift in the direction to open the gate until each stem makes firm contact with the top of its connection on the gate slide.

2. Place a level on the top of the gate slide and move one stem or the other of the gate up or down until the slide is completely level.

3. A tandem interconnecting shaft is furnished to connect the two lifts and cause them to act in unison for raising or lowering the gate. Loosen the fasteners on one of the jaws of the flexible coupling and slide it toward the center of the shaft until the shaft can be connected between the two lifts. Complete the connection and retighten all fasteners.

4. Move the gate slide up and down by turning the input shaft of one lift. Ensure the gate is installed with its top level and that the gate is moving freely.

5. Complete the installation of any stem guides, lubricate the stem, adjust the stop nuts, etc, as described in the preceding steps 1 through 9 in the section entitled Lift Installation and Adjustment of Stem Guides for Gates Not Self-Contained.

OPERATION

General Operation Information

Fabricated Slide Gates are used to control flow of or retain a volume of water, effluent, or other fluids. Typical applications include industrial water treatment facilities, municipal water treatment facilities, irrigation, dams, flood control, and many other applications that require accurate control of liquid flow.

The simplicity of a slide gate makes it a popular choice when designing flow controls. From the basic hand-cranked manual model to the microprocessor-controlled, fully integrated electric slide gate, actuation consists of the basic open or closed operation. An open gate allows flow and a closed one does not.

Depending on size, most slide gates can operate without error in diverse conditions. Some extenuating circumstances may include large amounts of ice or other solids that will obstruct the travel path of the gate. In most cases, when the obstruction is removed, normal operation can be resumed without adjustment to the gate.

Slide Gate Operation Procedures

The following sections cover the general operating procedures associated with two manual-operation systems (handwheel and handcrank) and an electrical-operation system. Read and follow the operating procedures for the applicable system. If you have any questions concerning safe operation of this Slide Gate, contact Hydro Gate immediately.

HB Series Actuator (Manual Handwheel)

Opening – To open this slide gate observe the direction of rotation noted on the handwheel. Turn in the direction of opening. If the gate has been closed for an extended period the gate may be difficult to "unseat." If, after several turns of the wheel, the rotation becomes increasingly difficult stop rotation when a **moderate** pressure is achieved. Allow the pressure in the stem to unseat the gate (a "POP" sound typically signals the gate has begun to travel. Continue to turn the handwheel until the desired gate position has been achieved. Observe the relative position of the top of the stem in relation to the Mylar decal on the stem cover (if equipped.) When the top of the stem is equal to the OPEN or 100% indicator the gate is considered to be FULL open and should not be opened further.

Operation Note
Do not over-open the gate. Serious damage to the gate stem and sealing surfaces can result.

Closing – To close this slide gate turn the handwheel in the direction opposite of the Open indicator until the stopnut on the stem has **moderately** seated on the top of the lift. When the top of the stem is equal in height to the bottom/zero height indicator, the gate is considered to be FULL CLOSED and should not be closed further. Should the gate or stop nut require adjustment, refer to the appropriate section of the Installation, Operation, and Maintenance Manual or call Hydro Gate **before** any adjustments are made.

Operation Note
Do not attempt to adjust the position of the stopnut to achieve additional closing stem travel. Serious damage to the gate stem and sealing surfaces can result.

CPS Series Actuator (Manual Handcrank)

Opening – To open this slide gate observe the direction of rotation noted on the lift housing. Crank in the direction of opening. If the gate has been closed for an extended period the gate may be difficult to "unseat." If, after several turns of the handcrank, the rotation becomes increasingly difficult stop rotation when a **moderate** pressure is achieved. Allow the pressure in the stem to unseat the gate (a "POP" sound typically signals the gate has begun to travel. Continue to turn the handcrank until the desired gate position has been achieved.

Operation Note
Do not over-open the gate. Serious damage to the gate stem and sealing surfaces can result.

Closing – To close this slide gate turn the crank in the direction opposite of the Open indicator until the stopnut on the stem has **moderately** seated on the top of the lift. After the gate has been closed as noted on the indicator, the gate is considered to be FULL CLOSED. Then reverse the rotation of the crank and relieve the pressure on the stem and lift. Should the gate or actuator require adjustment, refer to the appropriate section of the Installation, Operation, and Maintenance Manual or call Hydro Gate **before** any adjustments are made.

Operation Note
Do not attempt to adjust the position of the stopnut to achieve additional closing stem travel. Serious damage to the gate stem and sealing surfaces can result.

MAINTENANCE

Maintenance and Lubrication

Occasional adjustment and lubrication of Hydro Gate Slide Gate components will be required. The frequency will depend upon how often the gate is used, location, and operating conditions. Periodic inspection, adjusting, and cleaning are recommended as conditions at the site permit.

Lift and Stem Maintenance

Maintenance of the threaded operating portion of the gate stem is critical and should be performed as frequently as the operating environment requires.

Maintenance Note
Failure to maintain stem thread lubrication causes operating difficulties and premature failure of the lift nut and stem threads.

Recommended inspection frequency and procedures are as follows:

- Initial inspection - after 25 cycles of gate operation.
- Subsequent inspection - after 50 cycles of gate operation.
- Operational inspection - after each 100 cycles of gate operation or six months, whichever occurs first.

A “cycle” of gate operation is operation of the gate slide from closed to open to closed position. At each inspection, verify the following items:

- Inspect the stem threads and lift nut threads for wear and verify the trueness and dimension of the thread form.
- Check the amount of lubricant remaining and add if necessary.
- Relubricate if necessary - threads should be cleaned and relubricated with fresh lubricant.

More severe conditions or operating modes require a slightly different schedule of inspection and service. For example: Modulating gates with electric motor operators may make position changes several times a day but seldom go full stroke. There is a portion of the stem that gets a lot of use. These stems should be inspected at least weekly. The lubricant on the stem threads should be monitored closely. As the lubricant is depleted and becomes contaminated, it should be cleaned away and replenished.

When excess dried grease or other foreign material is carried into the threads of the lift nut, extremely hard operation will result. If serious binding occurs, the only way to correct it is to remove the threaded stem from the lift nut and clean the thread interior. If this foreign material is not cleaned from the interior threads of the lift nut, heavy pulls on the handcrank or seizure will result.

Stem threads may be cleaned with solvent, rags, and brushes. Run the gate open. While in the process of opening (running the stem out above the lift nut), clean off the old grease. Inspect the threads for roughness. If the threads are rough, they may be filed and polished. Be careful to keep filings and grit out of the lift nut. Rough stem threads accelerate the wear of the lift nut threads.

Relubricate the stem threads by brushing or smearing grease onto/into the threads as the gate is closing (the stem is going into the lift). This puts fresh lubricant into the lift nut and carries out the old contaminated grease. It is recommended that the contaminated grease be cleaned from the stem as it exits underneath the lift where the stem is accessible from below. Of course, replenish grease on the underside stem.

The recommended stem thread lubricant is a mixture of "La Co Slic-Tite Paste" and Fiske Bros. "Lubriplate No. 630 AAA" in the ratio of 24 ounces of paste per gallon of grease. "Slic-Tite Paste" is a pipe dope with Teflon fibers and is available from most plumbing supply stores or from:

La Co Industries, Inc.
1201 Pratt Blvd.
Elk Grove Village, IL 60007
Phone: 847-956-7600
Fax: 847-956-9885
Web site: www.laco.com

An equal alternate for La Co's "Slic-Tite" is "Dayton Pipe Thread Sealant Paste with Teflon", Stock Nos. 4X222 or 5X998, which is available at W. W. Grainger Inc. stores in major cities nationwide.

Equivalent lubricants to Fiske Brothers' "Lubriplate 630AAA" include:

Conoco's "All Purpose Superlube"
Texaco's "Multi Fak Heavy Duty No. 2"
Shell Oil Company's "Alvania No. 1"
Mobil's "Mobilux EP2"
Exxon's "Ronex MP"
Fiske Brothers' "Lubriplate No. 630 AA"

Recommended for potable water is a vegetable-based lubricant, "Lubriplate Super FML 2".

Lifts may be furnished with a stem lubricator Zerk Fitting which is located in the "stem cover adapter" to facilitate lubrication of stem threads with pressure greasing equipment. To be effective, lubricant should be injected while the stem is moving through the lift.

Manual crank lifts have sealed thrust bearing and do not require lubrication.

Exercise of infrequently operated lifts and gates is recommended. An annual exercise will ensure the gate is operable when needed and the lubrication condition will be maintained.

Removal of the stem nuts for thread inspection of frequently modulated gates is recommended. This avoids "surprise" when the nut threads have worn so thin they strip out and drop the gate. Replacement or spare nuts can be ordered from Hydro Gate. Spare parts are usually not needed or recommended, because they are readily available on short notice from Hydro Gate. In those cases where equipment operation or downtime is critical and the gate is operated extremely often, a spare lift nut may be wise to have on hand.

Maintenance Schedule and Lubrication Summary
Fabricated Slide Gates and Manual Lifts

Activity	Frequency	Lubricant
General Cleaning and Inspection	As often as conditions require or permit, or every 6 months.	N/A
Stem Thread and Lift Nut Wear Inspection	Initial inspection after 25 cycles. Subsequent inspection after 50 cycles. Operational inspection after each 100 cycles, or every 6 months.	N/A
Stem Thread Lubrication and Cleaning Inspection	After 100 cycles or 6 months. Clean grease if dried or contains foreign material.	*****Mixture of 24 fluid ounces La Co Slic-Tite Paste and 1 gallon of Fiske Bros. Lubriplate No. 630 AAA or AA. (An equal alternate is Dayton Pipe Thread Sealant Paste with Teflon, Stock Nos. 4X222 or No. 5X998)
		*****Equivalent lubricants to Fiske Bros. Lubriplate No. 630 AAA or AA include the following: Conoco's All Purpose Superlube Texaco's Multi Fak Heavy Duty No. 2 Shell Oil Company's Alvania No. 1 Mobil's Mobilux EP2 Exxon's Ronex MP

Notes

- Inspect crank lift for the collection of moisture beneath the stem cover housing. Unthread the stem cover housing and examine the space surrounding the stem. A convenient method of removing the moisture is by utilizing a Squeeze Bulb, Siphon or Baster.
- For potable water treatment plants use a vegetable-based lubricant such as Lubriplate Super FML-2.
- La Co Slic-Tite Paste is available at plumbing supply stores or from La-Co Industries, 1201 Pratt Blvd., Elk Grove Village, IL 60007 (847) 956-7600.

Lubrication Equivalents

Hydro Gate considers any of the following greases/lubricants to be acceptable:

A. Fiske Brothers “Lubriplate” No. 630 AAA or AA
B. Sta-Lube “Sta-Lube” No. 3121
C. Conoco “All Purpose Superlube”
D. Texaco “Multi Fak Heavy Duty” No. 2
E. Shell Oil Company “Alvania” No. 1
F. Mobil “Mobilux EP2”
G. BP Energrease LS 2

Hydro Gate recommends the following pipe thread sealants with Teflon:

A. La-Co Slic-Tite Paste
B. Dayton Pipe Thread Sealant with Teflon\
C. McMaster-Carr Pipe Thread Sealant with Teflon
D. Any other commercially available pipe thread sealants containing Teflon.

For potable water treatment plants, Hydro Gate recommends using a vegetable-based lubricant such as Lubriplate Super FML-2.

Interchangeable

Leakage

The most frequent cause of excess leakage through a newly installed gate is improper installation and/or failure to make final adjustments to the gate before operation. When you encounter this problem, first verify that Hydro Gate's installation instructions have been carefully followed and that final adjustments and greasing have been accomplished. If not, then follow step-by-step the adjustment procedures as outlined in the appropriate instructions.

Another important check is to ensure the gates were not disassembled for installation. The outside of this Manual states, **"DO NOT DISASSEMBLE GATE FOR INSTALLATION"**. This is repeated in the text of this Installation, Operation, and Maintenance manual at several critical locations. Occasionally, we still find that gates are disassembled for easier handling, painting, etc. When it is absolutely necessary to partially disassemble a gate or remove the slide to facilitate installation, use extreme care in handling the parts, particularly the frame. As pointed out above and in our installation instructions, the amount of leakage through the gate is highly dependent upon the quality of the installation.

Installation Note
Without the slide in place, the frame is very fragile. Hydro Gate cannot be responsible for performance problems caused by rough handling and damage to gate parts.

In the case of fabricated slide gates without rubber seals, there are no machined seating faces or wedging devices. **THESE GATES ARE RECOMMENDED FOR SEATING HEADS ONLY**. Slides are somewhat flexible under maximum seating heads. This slight deflection is helpful as it causes the gate slide to seat against the frame and be fairly watertight under the maximum head. **THERE IS PROBABLY MORE LEAKAGE THROUGH THIS TYPE OF GATE WITH ONLY A FEW INCHES OF WATER ON THE GATE THAN THERE IS WITH MAXIMUM HEAD**. As in gates with machined faces, fine particles in the water have an additional benefit of sealing the small space between faces after the gates have been closed for a while. Rubber "J" seals can be provided to improve the watertightness of these models. The rubber seal is mounted on the backside of the gate frame or on the inside wall of the gate opening with the bulb of the seal making contact with the back of the slide.

Troubleshooting Tips for Slide Gates

Fabricated slide gates depend on water pressure with a slight deflection of the gate slide to seal. At best, leakage through gates without rubber seals will probably be several times that which occurs through sluice gates. Proper installation and cleaning of seating faces are still necessary to cause the gate to be as watertight as possible.

Excessive Localized Leakage

Check this condition by opening the gate slide to its FULL UP position. Use thin wire, string, or straight edge to check the gate frame. Stretch the wire along each side. If there is significant (1/32 inch or more) variation in the seating face, excess leakage will result in those locations where warpage has occurred. Also, stretch the wire corner-to-corner across the opening. If the strings do not touch at the center, then one corner, or the other, has been pulled back considerably from the plane. To repair this faulty installation it is necessary to loosen bolts, push the frame out as required and align it before tightening or regrouting.

Dirty Seating Faces

Excess leakage can also be caused by foreign material on the seating faces of the gate frame or slide. Check for drops of paint, cement runs onto seating faces, or other construction grime. To correct, remove foreign material from the perimeter of the seating faces on both slide and frame, and reseat the gate.

Excessive Leakage near Top of Slide

If leakage occurs primarily at the top near the stem pocket, there is probably excess compression in the stem, which is pulling the gate slide from its frame. Check by turning the handwheel or handcrank in the direction to open the gate. When excess pressure on the stem is removed, the slide will spring back into position. Reset the top nut, or adjust the torque or limit switches as described later in this section.

Excessive Leakage near Top of Slide, Frame Not Warped

If leakage occurs primarily at the top, and the slide is not warped or pushed out of position, then ensure the top frame member is not pulled against the concrete. This is most likely to occur on gates wide enough to have expansion anchors in the top frame member. To correct misalignment, loosen the bolts into the cinch anchors and shim behind the top frame member to push it away from the concrete. Use a straight edge or thin wire stretched along the upper frame member to set the member straight. Check for seal contact or close fit with the slide before regrouting. This space may also be packed with lead wool or epoxy grout.

Excessive Leakage Past J-Seals

If J-seals are not properly contacting the slide, the gate will leak excessively. When seals are properly adjusted, a .005-inch to .015-inch gauge should not fit between seal and slide. If the leakage is localized, dewater and open the gate as required to provide access to the seal retainer bolts. Loosen the seal retainer bolts around the leak and pry or pull the seal toward the slide. On occasion, the seal retainer sticks to the seal. If this happens, all of the retainer bars on a side need to be loosened and the retainer pried away from the seal before the adjustment can be made.

Leakage across Bottom of Flush Bottom Gates

If a sheet of water is coming from the bottom of the gate, the gate is not completely closed. To completely close the gate, the stop nut or limit switch may need to be reset. When properly closed, the slide will be embedded approximately 1/16 inch into the flush bottom seal and neither a .005-inch to.015-inch gauge will fit between the flush bottom seal and the bottom of the slide. Use of a flashlight or a trouble light on the opposite side will also indicate if good contact is being made.

Excessive Leakage at Lower Corners on Flush Bottom Gates

This indicates the gate is being overclosed, which pushes the side J-seals away from the bottom seal, opening up gaps. Turn the handcrank or handwheel in the open direction just enough to relieve some of the pressure on the bottom seal but not enough to have the bottom of the slide separate from the bottom seal. Slightly opening and slowly closing the gate while watching the leakage will also work. When the point of minimum leakage is found, the stop nut or limit switch should be reset accordingly.

Another cause of corner leakage is small gaps between the J-seals and flush bottom seal without the gate over-closed. When the seals are dry, seal these gaps with caulking, such as silicone, to minimize leakage.

Stem Bends when Gate Is Closed

Hand-Operated Lifts

1. Ensure stem guide collars are properly located to hold the stem in alignment. Bolts on collars must be tightened so the collar is not slipping on the guide bracket.

2. Ensure stem guides are all located properly. If the spacing exceeds that shown on the installation drawing, the stems may be deflecting before the gates are tightly closed.

3. If stem guides are correctly located and collars are tight, then the load being applied to the stem by the lift is in excess of that needed to close the gate, or the load recommended for a particular stem size. Reset the stop nut to prevent an excess load from being applied to the stem after the gate is closed.

Excess Force Is Required on Handwheel or Crank

1. Ensure the stem is lubricated as recommended.

2. If a simple application of lubricant does not appear to solve the problem, check for foreign material jammed in the nut threads by either disassembly or working back and forth with generous application of penetrating oil and grease.

3. If the stem is properly greased and the lift nut does not appear to be dirty or binding, ensure the stem, stem guides, and lift are in proper alignment. On most installations, the stem will be installed in the vertical position. A carpenter's level can be used to verify that it is in vertical plane in both directions. Check for binding through individual stem guides. Check the pedestal to ensure it is vertical in both directions and the stem threads are straight through the lift nut.

4. In locations where the stem is not installed vertically, such as on the face of a dam, alignment can be checked using a thin wire stretched tightly between the top of the slide and the bottom of the lift. Realign by adjusting the stem guides and/or shimming one side of the lift as required.

5. Check the frame guide grooves. Remove any foreign material. Check tightness of rubber seals. Loosen if necessary. Reposition or replace if rolled over, torn, or wadded up.

Long-Term Storage Instructions for Slide Gates, Lifts, Stems, and Accessories

1. Gate assemblies must be stored horizontally and flat, with the backside (flange side) down. The storage area must be flat, graded, comprised of compacted soil, concrete, or asphalt. Storage on uneven surfaces can cause permanent distortion of the gate, creating installation problems.

2. Place timber, minimum 4-inch x 4-inch, to provide substantially complete perimeter support under the gate frame assembly. Longitudinal timbers, spaced a maximum of 4 feet, may also be used.

3. Stacking of gates is permissible. The stacked height should not exceed 3/4 of the bottom gate's width or height. Stack gates of different sizes in a pyramid fashion. Do not stack large gates on top of smaller gates.

4. Stacked gates should be separated with timber. The separating timbers should form a flat and level base for the gate above.

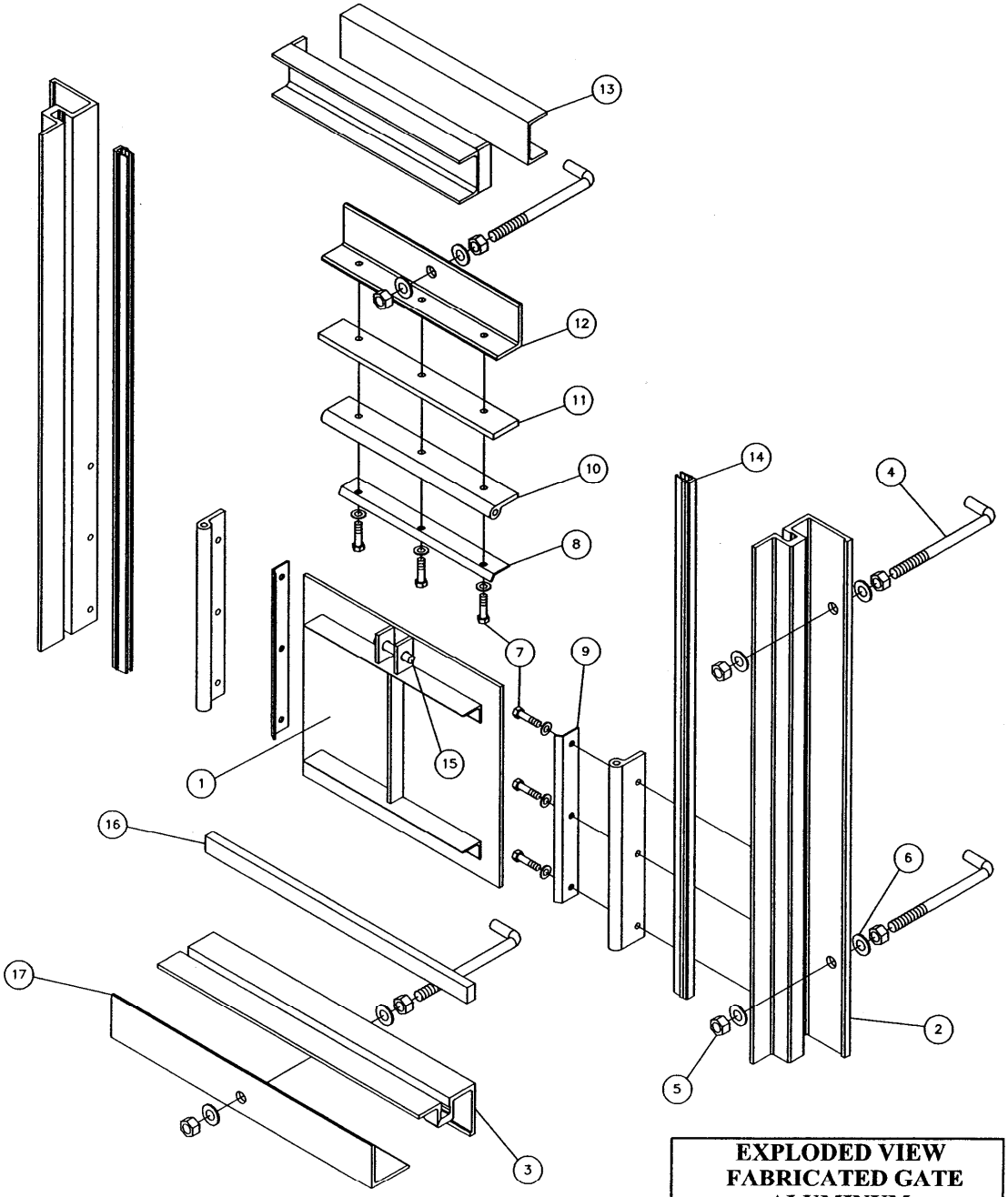
5. Store the lift assemblies either upright with plastic plugs/caps in place to keep dirt out of the nut threads, or leave in original shipping cartons. Do not store the lifts directly on the ground.

6. Stems and stem covers should be stored horizontally on timbers spaced 4 to 8 feet apart. Protective sleeves should be left on all stem threads and stem covers.

7. Miscellaneous accessories and hardware should be stored off the ground.

8. Bronze stem blocks, lift nuts, and stainless steel accessories are targets for theft and resale as scrap. Report all shortages at once and note it on shipping papers. Hydro Gate cannot be held responsible for theft and loss of equipment stored on the job site.

9. Inside dry storage is the best for all equipment. Covering equipment stored outside with tarpaulins is recommended to minimize degradation of paint from rain and sunlight, until finish paint is applied. Uncovered outdoor storage may result in staining of painted surfaces from rain and sunlight.



NOTE: J-SEAL IS VULCANIZED AS ONE PIECE, NOT AS SHOWN ON DRAWING.

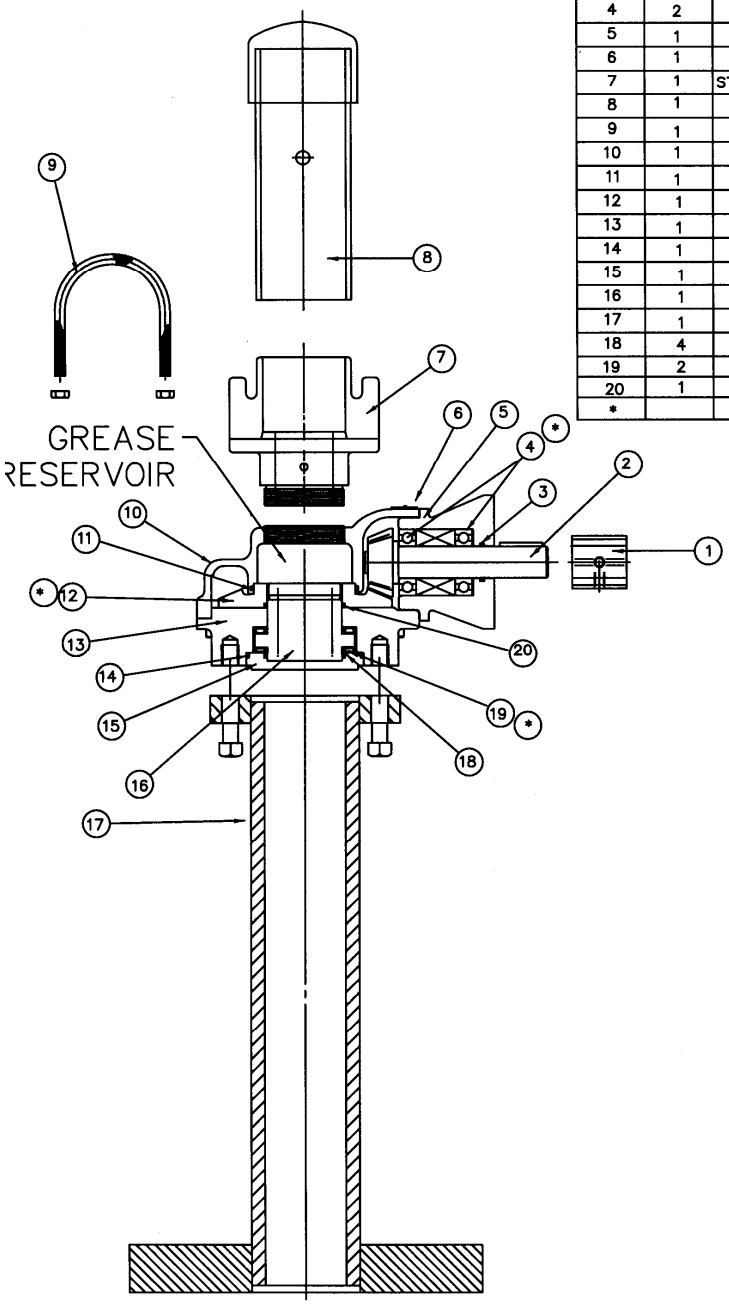
EXPLODED VIEW
FABRICATED GATE
ALUMINUM

Hydro Gate

NO.	PARTS LIST	QTY.
1.	SLIDE	1
2.	FRAME EXTRUSION (SIDE)	2
3.	FRAME EXTRUSION (BOTTOM)	1
4.	ANCHOR BOLT	AS REQD
5.	HEX NUT	AS REQD
6.	FLAT WASHER	AS REQD
7.	HEX BOLT	AS REQD
8.	J–SEAL RETAINER SPRING CLIP (TOP)	1
9.	J–SEAL RETAINER SPRING CLIP (SIDE)	2
10.	J–SEAL (VULCANIZED)	1
11.	UHMW	1
12.	TOP J–SEAL MOUNTING ANGLE	1
13.	YOKE SET (SELF CONTAINED GATES ONLY)	1
14.	UHMW PINCH SEAL	2
15.	STEM CONNECTOR FASTENER SET	1
16.	NEOPRENE FLUSH BOTTOM SEAL	1
17.	FLUSH BOTTOM MOUNTING ANGLE	1

PARTS LIST
FABRICATED GATE
ALUMINUM

Hydro Gate



NO.	QTY.	PARTS LIST
1	1	AWWA 2" SQ. CRANK ADAPTOR
2	1	INPUT SHAFT/PINION GEAR
3	1	INPUT SHAFT O RING SEAL
4	2	INPUT SHAFT BEARINGS
5	1	INPUT HOUSING
6	1	IDENTIFICATION TAG
7	1	STEM COVER ADAPTOR W/ ZERK
8	1	STEM COVER
9	1	STEM COVER MOUNTING U BOLT
10	1	PRIMARY GEAR HOUSING
11	1	BEVEL GEAR O RING SEAL
12	1	BEVEL GEAR
13	1	BASE PLATE
14	1	SPIGOT RING O RING SEAL
15	1	SPIGOT RING
16	1	LIFT NUT
17	1	FABRICATED PEDESTAL
18	4	THRUST WASHERS
19	2	THRUST BEARINGS
20	1	DRIVE NUT O RING SEAL
*		LUBRICATION PRESENT

HYDRO GATE CPS SERIES LIFTS

Water Control Gate Guarantee

For a period of one year from the date indicated, Hydro Gate hereby guarantees that its water control gates will be free from defects in material and in workmanship and agrees to repair or, at its discretion, to replace any part or parts found defective within such one year, provided the Purchaser gives immediate notice of such defect, and such defect, in the opinion of Hydro Gate clearly demonstrates the existence of defective materials or workmanship.

This guarantee is applicable only if the product is properly stored and protected as prescribed by us, between the interval of its receipt by the Buyer and actual installation and if the product is properly installed and lubricated in accordance with our instructions.

The liability of Hydro Gate shall not in any case exceed the cost of repairing or replacing the defective parts. The guarantee and the remedies provided for defective parts set forth above are in lieu of and shall supersede any and all guarantees or warranties, express or implied, or remedies provided by law or otherwise (including those set forth in purchase order forms or other sales documents). In no event shall Hydro Gate be liable for loss of income, any other expenses, consequential damages or incidental damages. At the end of said one year, all liability of Hydro Gate shall cease and terminate.

Hydro Gate guarantees equipment of other manufacturers only insofar as such equipment is guaranteed to it. Information with respect to such guarantees is available on request.

Effective Date: Start Up

SPARE PARTS

Warnings
- Check size of parts before attempting to store them
- Spare parts should be stored in clean, dry and protected warehouse until ready for installation.

HOW TO ORDER REPLACEMENT OR SPARE PARTS

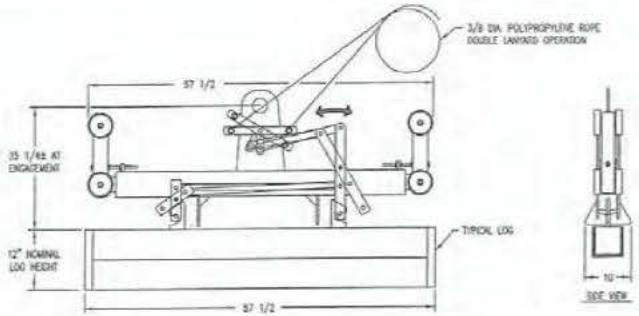
Parts may be ordered from your local Hydro Gate Representative or direct from Hydro Gate.

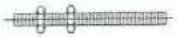
Please have the following information:

1. Hydro Gate sales information found on the blue anodized tag located on the gate or pedestal.
2. The item and/or tag number must be relayed to Hydro Gate
3. Description of replacement Part(s)

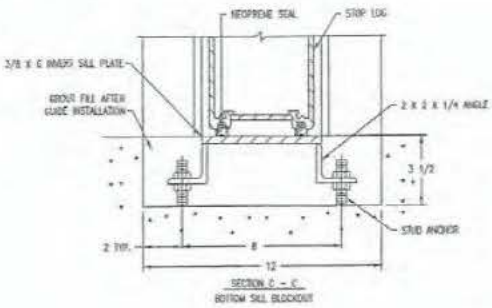
Spare Parts List

1	Stop Nut
2	Stop Collar
3	Lift Nuts
4	Stem Cover
5	Thrust Bearing for Gate lift

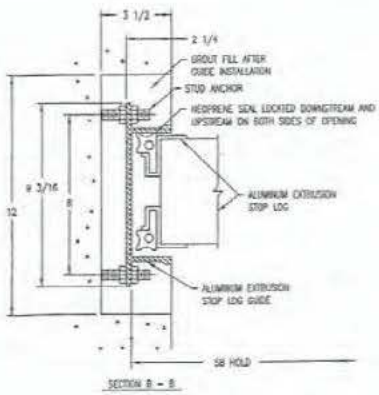




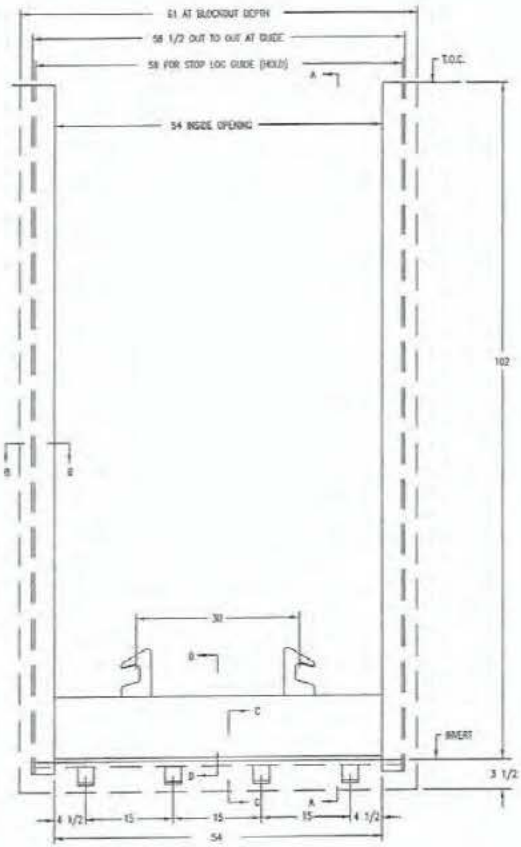
STUD ANCHOR DETAIL
(ADHESIVE NOT BY HYDRO)



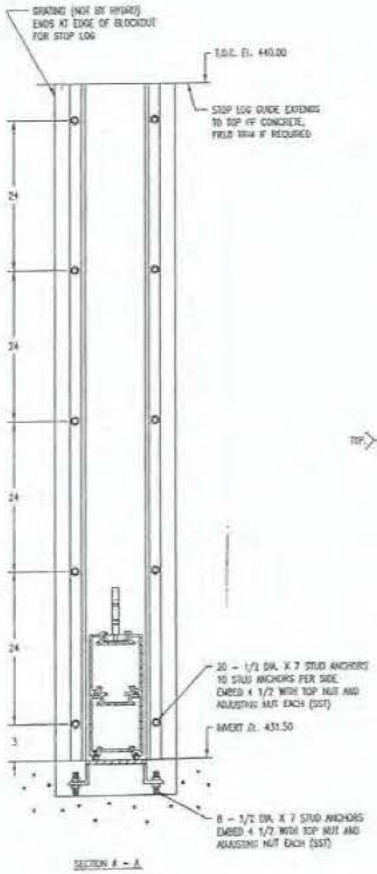
SECTION C - C
BOTTOM SILL BLOCKOUT



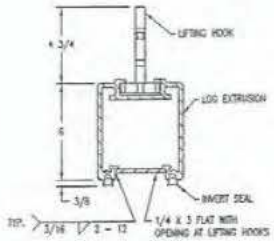
SECTION B - B



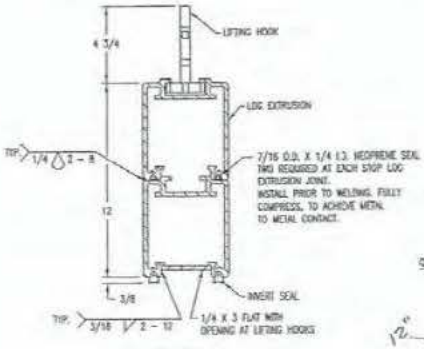
FRONT VIEW
(ONE 12" STOP LOG SHOWN FOR REFERENCE)



SECTION A - A



SECTION D - D
6" HIGH LOG PRIOR TO INVERT SEAL COMPRESSION



SECTION D - D
12" HIGH LOG PRIOR TO INVERT SEAL COMPRESSION

NOTES:

1. STRUCTURAL TOLERANCES APPLY ON ALL SURFACES.
2. ALL DIMENSIONS ARE IN INCHES UNLESS NOTED OTHERWISE.
3. MATERIAL SPECIFICATIONS AND COATINGS PER DRAWING: 1497585S00
4. SEE MANUAL G1950 FOR INSTALLATION AND ADJUSTMENT INSTRUCTIONS.
5. TAG: 1497788-01
6. LOCATION: OUTLET STRUCTURE - ROCK LAKE HABITAT RESTORATION & ENHANCEMENT
   ILLINOIS WATERWAY LAGRANGE POOL, FULTON COUNTY, ILLINOIS
7. REFERENCE SPECIFICATION SECTION: 35 20 16.54
   REFERENCE FLOW DRAWING SHEETS: C-201, C-204 AND C-309

QUANTITIES:

- 2 EMBEDDED GUIDE SET REQUIRED AT 103 LONG
- 2 INVERT SILL PLATE REQUIRED
- 26 6" HIGH STOP LOGS REQUIRED
- 12 12" HIGH STOP LOGS REQUIRED
- ONE LIFTING BEAM REQUIRED

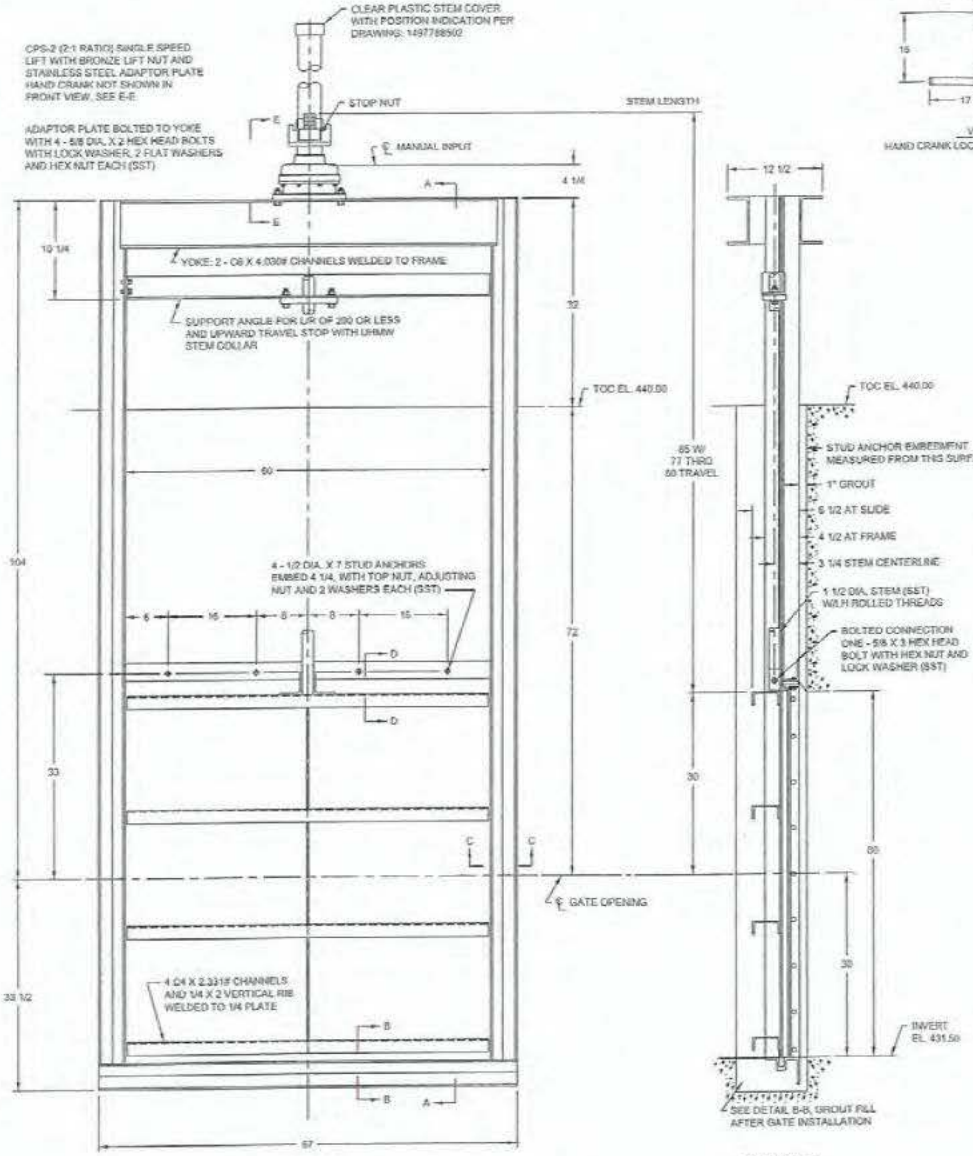
Hydro Gate

54" WIDE BI-DIRECTIONAL ALUMINUM STOP LOGS
EMBEDDED GUIDES WITH SILL PLATE, GALV. LIFTING BEAM

QUANTITY: CHART LOG MATERIAL: AL-6061 SCALE: NTS

REV.	DATE	INITIALS

DRAWN BY: MAA	CUSTOMER NO.: 102511 JMC	SALES ORDER: 1497788
CHECKED BY: MAA	DATE: 12/16/11	DRAWING NO.: 1497788-01



NOTES:

1. ALL DIMENSIONS IN INCHES UNLESS NOTED OTHERWISE.
2. OUTLINE DIMENSIONS FOR CASTING OR STRUCTURAL EQUIPMENT HAVE A TOLERANCE OF + OR - 1/4 INCH. DIMENSIONS FOR BOLT LOCATIONS A TOLERANCE OF + OR - 1/16 INCH AS MEASURED FROM THE APPLICABLE AXIS AT CENTERLINE OF GATE OPENING.
3. MATERIAL SPECIFICATIONS AND COATINGS PER DRAWING 1497788501
4. OPERATING DESIGN HEAD:
   MEASURED FROM GATE INVERT — 5 FEET SEATING, 5 FEET UNSEATING
   GATE DESIGN HEAD:
   MEASURED FROM GATE INVERT — 6 FEET SEATING, 6 FEET UNSEATING
5. SEE MANUAL G-1900 FOR INSTALLATION AND ADJUSTMENT INSTRUCTIONS.
6. TAG: 1497788-02 / 60 x 60 ASG
7. LOCATION: OUTLET STRUCTURE - RICE LAKE HABITAT REHAB & ENHANCEMENT ILLINOIS WATERWAY LAGRANGE POOL, FULTON COUNTY, ILLINOIS
8. REFERENCE SPECIFICATION SECTION: NONE
   REFERENCE CONTRACT DRAWING SHEET: C-201, S-204 AND S-309

Hydro Gate

60" X 60" FABRICATED SLIDE GATE
SELF-CONTAINED, EMBEDDED/WALL MOUNT FRAME, RISING STEM
QUANTITY: ONE MATERIAL: ALUMINUM SCALE: NTS

REV.	DATE	INITIALS

DRAWN BY MAA	CUSTOMER NO. 102511 JMC	SALES ORDER 1497788
CHECKED BY MAA	DATE 12/20/11	DRAWING NO. 1497788-02

MATERIAL SPECIFICATIONS

GATE PART OR ITEM OF ASSEMBLY	MATERIAL DESCRIPTION	MATERIAL CODE	MATERIALS SHOWN IN ASTM SPECIFICATION UNLESS NOTED OTHERWISE
EMBEDMENTS			
ANCHOR BOLTS	STAINLESS STEEL	(L)	A276, TYPE 304
ANCHOR NUTS	STAINLESS STEEL	(L)	F594, ALLOY GROUP 1 (304)
GATE ASSEMBLY			
FRAME EXTRUSIONS, SLIDE PLATES AND REINFORCINGS	ALUMINUM	(R)	B308, ALLOY 6061-T6 (STRUCTURAL) B209, ALLOY 6061-T6 (PLATES)
FASTENERS	STAINLESS STEEL	(L)	F593 (BOLTS), ALLOY GROUP 1 (304) F594 (NUTS), ALLOY GROUP 1 (304)
FLUSH BOTTOM SEAL AND J-SEAL	NEOPRENE	(BB)	D2000, GRADE 1BE625
J-SEAL SPRING CLIP	STAINLESS STEEL	(L)	A240, TYPE 304
UHMW POLYMER SEATING AND GUIDES	POLYETHYLENE	(T)	D4020
STEM AND ACCESSORIES			
STEM	STAINLESS STEEL	(L)	A276, TYPE 304
FASTENERS	STAINLESS STEEL	(L)	F593 (BOLTS), ALLOY GROUP 1 (304) F594 (NUTS), ALLOY GROUP 1 (304)
LIFT ASSEMBLY			
ADAPTOR PLATE	STAINLESS STEEL	(P)	A240, TYPE 316/316L
GEARED LIFT HOUSING	CAST IRON	(A)	A126, CLASS B
CRANK ARM	CAST ALUMINUM	(R)	B26, ALLOY AA713
LIFT NUT	MANGANESE BRONZE	(K)	B584, ALLOY 865
STOP NUT	ALUMINUM	(R)	B211, ALLOY 6061-T6
FASTENERS	STAINLESS STEEL	(L)	F593 (BOLTS), ALLOY GROUP 1 (304) F594 (NUTS), ALLOY GROUP 1 (304)

J-52

COATING SPECIFICATIONS

CLEANING: ☒ BLAST CLEAN (FER STEEL STRUCTURES PAINTING COUNCIL)

NEAR WHITE BLAST GRADE SSPC-SP10

NON-SUBMERGED COATING: (PRIME COAT)
AMERON, AMERLOCK 400 HIGH SOLIDS EPOXY COLOR GR-2 MEDIUM GRAY
ONE SHOP COATS FOR A TOTAL DRY FILM THICKNESS OF 5 MILS MIN.

NON-SUBMERGED COATING: (TOP COAT)
AMERON, AMERCOAT 450H POLYURETHANE COLOR GR-2 MEDIUM GRAY
ONE SHOP COATS FOR A TOTAL DRY FILM THICKNESS OF 3 MILS MIN.

FOR THE FOLLOWING COMPONENTS:

☒ CAST IRON LIFT HOUSING

NOTE :

1. ALUMINUM SURFACES IN CONTACT WITH CONCRETE TO RECEIVE ONE COAT OF TNEMEC SERIES 46-465 COAL TAR PAINT AT 10 MILS MIN. DFT (SOLVENT CLEAN BEFORE PAINTING).

Hydro Gate

MATERIAL AND COATING SPECIFICATIONS FOR ALUMINUM SLIDE GATES

REV.	DATE	INITIALS	DRAWN BY	CUSTOMER NO.	SALES ORDER
			MAA	102511JMC	1497788
			CHECKED BY	DATE	DRAWING NO.
			MAA	12/20/11	149788501

HYDRO GATE

DWG NO 1497788-02

GATE SIZE 60X60 ASG

LIFT MODEL CPS-2

LIFT RATIO 2-1

OPEN

J-53

OPERATION AND MAINTENANCE MANUAL

RICE LAKE STATE FISH AND WILDLIFE AREA
UPPER MISSISSIPPI RIVER RESTORATION
HABITAT REHABILITATION AND ENHANCEMENT PROJECT
FULTON COUNTY, ILLINOIS

SEPTEMBER 2021

APPENDIX K

DISTRIBUTION LIST

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Illinois Department of Natural Resources
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Springfield, IL 62702-1271

Loren Wobig, Director
Office of Water Resources
Illinois Department of Natural Resources
One Natural Resources Way
Springfield, IL 62702-1271

Arthur Neal, Civil Engineer
Division of Architecture & Engineering
Illinois Department of Natural Resources
One Natural Resources Way
Springfield, IL 62702-1271

Scott Schlueter, Site Superintendent
Rice Lake State Fish & wildlife Area
19721 North U.S. 24
Canton, IL 61520

Rob Hilsabeck (Fisheries – Reg. 1)
Jubilee College State Park
13921 West Route 150
Brimfield, IL 61517

Barrie McVey (Forestry – Dist. 5)
Argyle Lake State Park
640 Argyle Park Road
Colchester, IL 62326

Dan Stephenson, Chief Fisheries Division
Illinois Department of Neural Resources
One Natural Resources Way
Springfield, IL 62702-1271

Lawrence Patterson, Fed. Program Coordinator
Office of Architecture, Engineering & Grants
Illinois Department of Neural Resources
One Natural Resources Way
Springfield, IL 62702-1271

Kathy Justison, Acting Federal Aid Coordinator
Office of Grant Management
Illinois Department of Neural Resources
One Natural Resources Way
Springfield, IL 62702-1271

Mike McClelland
Inland Waterways Management Program
700 South 10th Street
Havana, IL 62644

Michelle Simone (Natural Heritage – Reg. 1)
Jubilee College State Park
13921 West Route 150
Brimfield, IL 61517

Byron Paulson (Wildlife – Dist. 7)
Jake Wolf Memorial Fish Hatchery
25410 North Fish Hatchery Road
Topeka, IL 61567

US Army Corps of Engineers, Mississippi Valley Division
PO Box 80
Vicksburg, MS 39181-0080
Attn: CEMVD-MD-PR (Terry Smith)

US Army Corps of Engineers, Rock Island District
Clock Tower Building
PO Box 2004
Rock Island, Illinois 61204-0004
Attn:

CEMVR-PM-M (Goetzmann) (digital copy)
CEMVR-CC (Romic) (digital copy)
CEMVR-OD-T (digital copy)
CEMVR-EC (digital copy)
CEMVR-EC-D (digital copy)
CEMVR-EC-G (digital copy)
CEMVR-EC-H (digital copy)
CEMVR-EC-HH (digital copy)
CEMVR-EC-HQ (digital copy)
CEMVR-EC-CC (digital copy)
CEMVR-EM (digital copy)
CEIT-OPI-VC (digital copy)
CEMVR-PM-M (Millhollin) - PW
CEMVR-EC-DN (Fellman) - PW
CEMVP-PD-F (Niles) - PW
CEMVP-PD-C (Carmack) - PW