

1800 SERIES ROTARY FISH SCREEN



INTRODUCTION

The Morrill Industries, Inc. 1800 Series Hydraulic Driven Self-Cleaning Rotary Fish Screens (HRS) are Active Screens engineered to meet the guidelines and criteria set forth by National Marine Fisheries Service (NMFS) for Anadromous Salmonids. (The HRS also meets the requirements of California for Delta Smelt).

" ... Guidelines and criteria for functional designs of downstream migrant fish passage facilities at hydroelectric, irrigation, and other water withdrawal projects. It is promulgated by the National Marine Fisheries Service (NMFS), Southwest Region as a result of its authority and responsibility for prescribing fishways under the Endangered Species Act (ESA), the Federal Power Act, administered by the Federal Energy Regulatory Commission (FERC), and the Fish and Wildlife Coordination Act (FWCA), administered by the U.S. Fish & Wildlife Service."

Utilizing the guidelines from NMFS, Morrill Industries, Inc. has designed a robust system to meet the physical demands for installation in Streams, Rivers, Canals, Lakes, Reservoirs, and Tidal Areas. Multiple sizes and configurations are designed to meet flow requirements of 1200 G.P.M up to 47,000 G.P.M. For higher flows multiple units must be used. The 1800 Series Rotary Screens are generally "Project" items. They involve many agencies and personnel to properly permit, build, and install. Our catalog represents the Filtration or intake aspect of the setup and provides basic information about the screen only. The "Project" approach provides the main Intake components as shown, along with Track out systems to allow the HRS to be moved to different levels of the water or pulled out of the water source during flood stages or for maintenance. There is also pumping docks / decks that are built with the systems for mounting pumps and for maintenance around the systems. Many of these docks are setup over the water source or off banks. Morrill Industries, Inc. provides a complete systems approach for efficient and easy installations. Please call us for additional information.

For further information regarding the NMFS criteria and guidelines please reference www.morrillinc.com/nmfs/ or call us for further information.

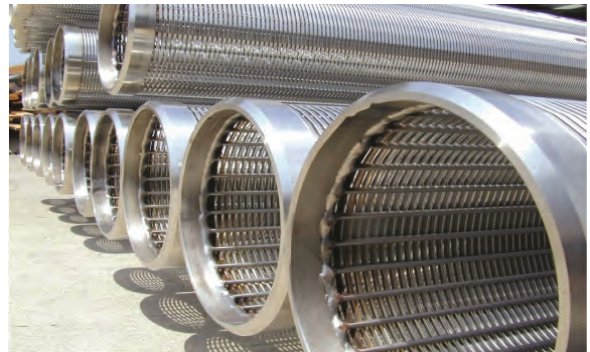
OPERATION

The 1800 Series Screens (HRS) are a water intake screen under suction applications or direct flow applications. Water is removed from a given water source through the use of a Suction Pump and Suction Pipeline that is connected to a Manifold, which is connected to a Rotary Screen. On direct flow applications, water would flow directly through the screen and into a pumping bay. A Wedge-wire (Profile Bar) Cylindrical Screen is used as the "Filtering" element. Under NMFS Anadromous Salmonid Design Section 11.10.1.2, it is required under Active Screens that they be cleaned automatically. The 1800 HRS's are connected to a main drive axle that allows the screen to rotate clockwise or counterclockwise using a Hydraulic Motor. As the screen rotates, a set of fixed Nylon brushes remove debris accumulation from the Cylindrical Screen. This cleaning action is setup through a timing mechanism that allows control of how often the screen will rotate and the direction of rotation. Water is moved from outside of the screen into the suction pipeline at a controlled velocity which is determined by the screen area and wire size. This controlled velocity ensures that water being pulled into the pump or suction pipe is at a slow / low enough velocity as to not impede the swimming ability of fish within the water source.

FILTER CONSTRUCTION

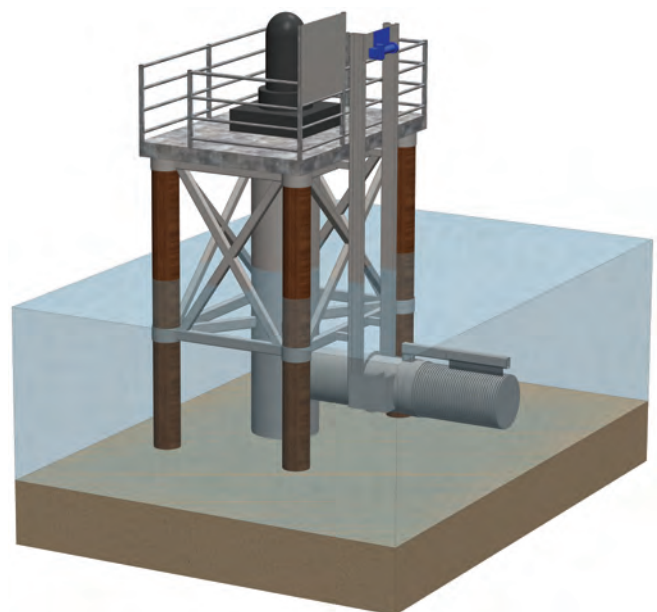
The 1800 Series HRS units are constructed of 304/304L materials with the exception of:

- Brass Axle Bushing
- Rubber or Polyurethane Guide Wheels
- Hydraulic Drive Motor is constructed of 316/316L Stainless Steel with a composite case.
- Nylon Brushes
- Typical Screen Characteristics
 - o Wedge-Wire Screen with a open area of 48.9%
 - o Screen wire width of .071" and slot size of .068"
 - o Screen cylinder length is 1.66 times the cylinder diameter



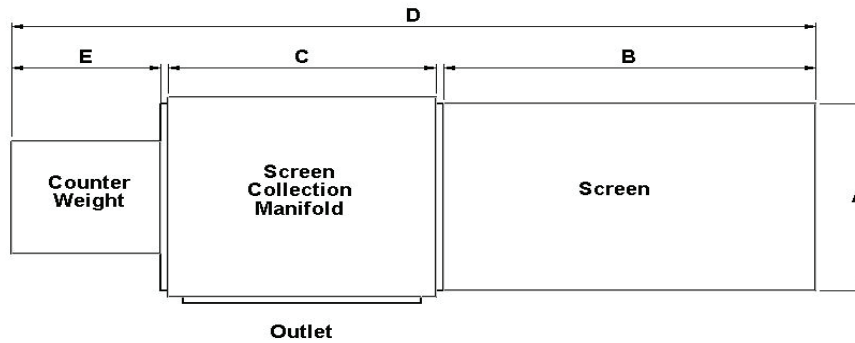
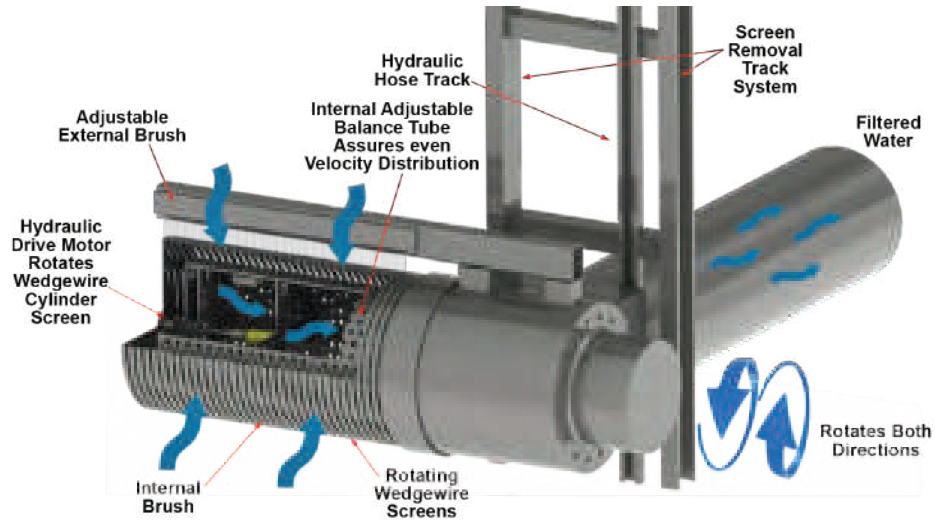
STANDARD FITTINGS

The 1800 Series Rotary Fish Screens are sold as a complete system. They have many options, but will always come with all parts necessary for a complete system.



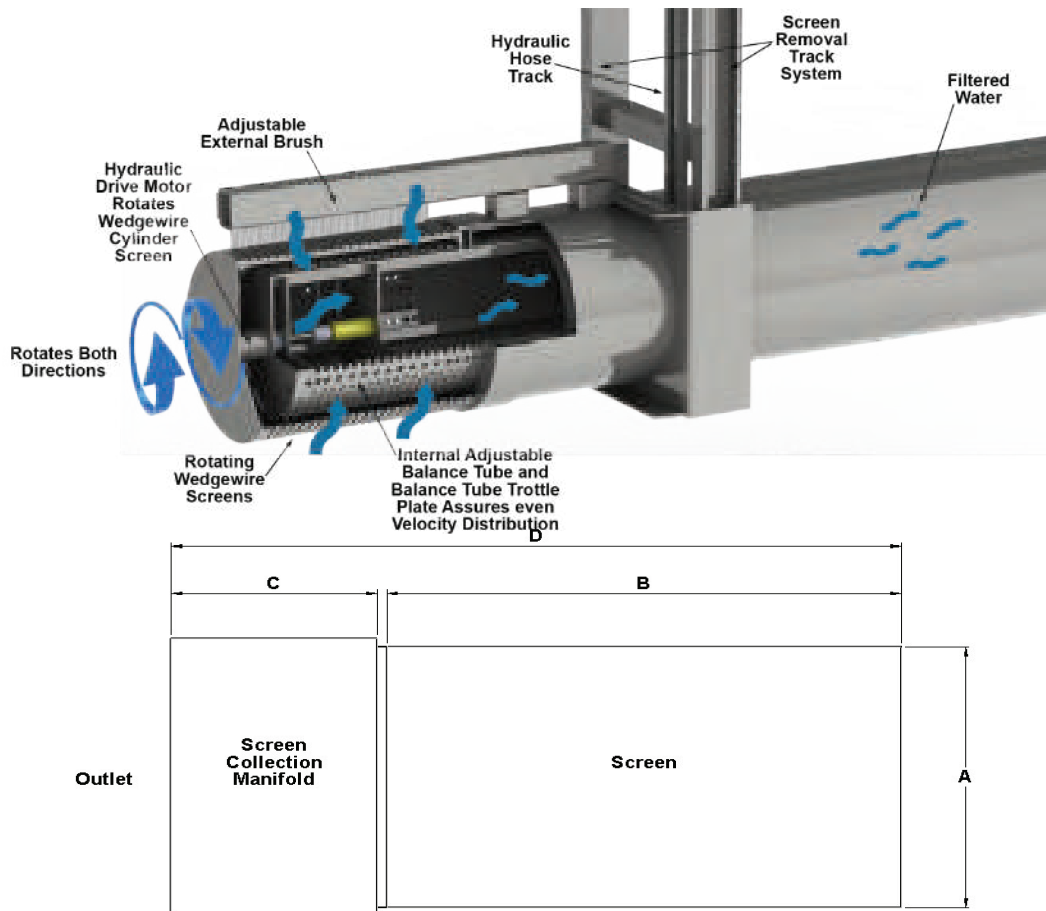
**CONTACT MORRILL INDUSTRIES FOR
ENGINEERED PLANS AND ORDERING DETAILS**

SINGLE SCREEN - SIDE FEED



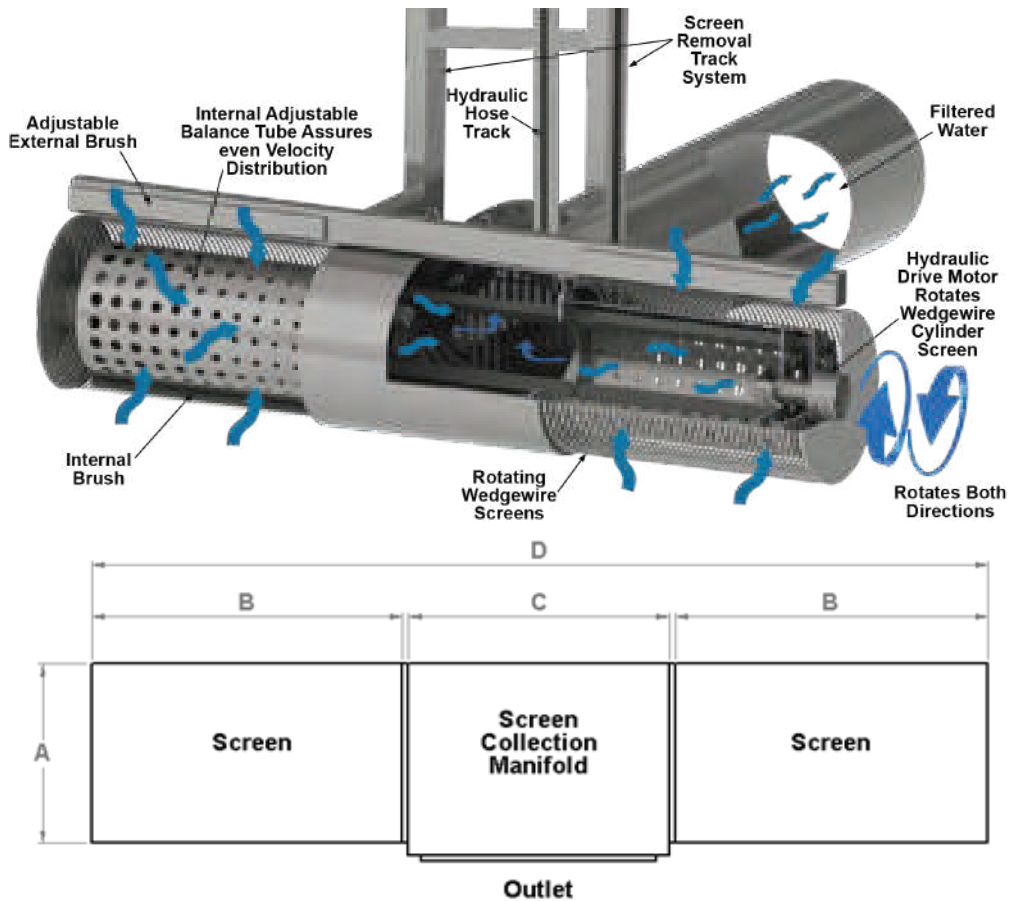
SINGLE SCREEN - SIDE FEED											
MODEL	SCREEN DIMENSIONS					UNIT WEIGHT (LBS)	TOTAL SCREEN SURFACE AREA	SLOT VELOCITY @ 0.5 ft/s	APPROACH VELOCITY		
	A	B	C	D	E				0.2 ft/s (DELTA SMELT)	0.33 ft/s (SALMONID)	0.4 ft/s
18SF-2032	20	32	20	53	16	625	13.9 ft ²	3.4 CFS	2.8 CFS	4.6 CFS	5.5 CFS
								1530 GPM	1250 GPM	2064 GPM	2468 GPM
18SF-2440	24	40	36	93	16	900	20.8 ft ²	5 CFS	4.1 CFS	6.9 CFS	8.3 CFS
								2244 GPM	1840 GPM	3095 GPM	3725 GPM
18SF-3050	30	50	42	109	16	1200	32.5 ft ²	7.9 CFS	6.5 CFS	10.8 CFS	13 CFS
								3545 GPM	2915 GPM	4845 GPM	5830 GPM
18SF-3660	36	60	48	125	16	1500	46.8 ft ²	11.4 CFS	9.3 CFS	15.6 CFS	18.7 CFS
								5115 GPM	4200 GPM	7000 GPM	8400 GPM
18SF-4270	42	70	48	135	16	1900	63.7 ft ²	16.4 CFS	12.7 CFS	21.2 CFS	25.4 CFS
								7380 GPM	5715 GPM	9525 GPM	11430 GPM
18SF-4880	48	80	48	145	16	2300	83.2 ft ²	20.2 CFS	16.6 CFS	27.7 CFS	33.2 CFS
								9085 GPM	7465 GPM	12445 GPM	14935 GPM
18SF-5490	54	90	54	160	16	2700	1060 ft ²	25.9 CFS	21.2 CFS	35.3 CFS	42.4 CFS
								11620 GPM	9514 GPM	15855 GPM	19028 GPM
18SF-6010	60	100	60	176	16	3100	130.9 ft ²	32 CFS	26.1 CFS	43.6 CFS	52.3 CFS
								14360 GPM	11749 GPM	19580 GPM	23498 GPM

SINGLE SCREEN - END FEED



SINGLE SCREEN - END FEED										
MODEL	SCREEN DIMENSIONS				UNIT WEIGHT (LBS)	TOTAL SCREEN SURFACE AREA	SLOT VELOCITY @ 0.5 ft/s	APPROACH VELOCITY		
	A	B	C	D				0.2 ft/s (DELTA SMELT)	0.33 ft/s (SALMONID)	0.4 ft/s
18EF-2032	20	32	18	50	500	13.9 ft ²	3.4 CFS	2.8 CFS	4.6 CFS	5.5 CFS
							1530 GPM	1250 GPM	2070 GPM	2475 GPM
18EF-2440	24	40	20	61	800	20.8 ft ²	5 CFS	4.1 CFS	6.9 CFS	8.3 CFS
							2244 GPM	1840 GPM	3095 GPM	3725 GPM
18EF-3050	30	50	20	71	1100	32.5 ft ²	7.9 CFS	6.5 CFS	10.8 CFS	13 CFS
							3545 GPM	2915 GPM	4845 GPM	5830 GPM
18EF-3660	36	60	24	85	1400	46.8 ft ²	11.4 CFS	9.3 CFS	15.6 CFS	18.7 CFS
							5115 GPM	4200 GPM	7000 GPM	8400 GPM
18EF-4270	42	70	24	95	1700	63.7 ft ²	16.4 CFS	12.7 CFS	21.2 CFS	25.4 CFS
							7380 GPM	5714 GPM	9525 GPM	11430 GPM
18EF-4880	48	80	24	105	2100	83.2 ft ²	20.2 CFS	16.6 CFS	27.7 CFS	33.2 CFS
							9085 GPM	7465 GPM	12445 GPM	14935 GPM
18EF-5490	54	90	24	115	2400	106.0 ft ²	25.9 CFS	21.2 CFS	35.3 CFS	42.4 CFS
							11620 GPM	9514 GPM	15855 GPM	19028 GPM
18EF-60100	60	100	24	125	2700	130.9 ft ²	32 CFS	26.1 CFS	43.6 CFS	52.3 CFS
							14360 GPM	11749 GPM	19580 GPM	23498 GPM

DOUBLE SCREEN - SIDE FEED



DOUBLE SCREEN - SIDE FEED										
MODEL	SCREEN DIMENSIONS				UNIT WEIGHT (LBS)	TOTAL SCREEN SURFACE AREA	SLOT VELOCITY @ 0.5 ft/s	APPROACH VELOCITY		
	A	B	C	D				0.2 ft/s (DELTA SMELT)	0.33 ft/s (SALMONID)	0.4 ft/s
18DS-2440	24	40	36	118	1300	41.6 ft ²	10 CFS	8.2 CFS	13.8 CFS	16.5 CFS
							4488 GPM	3680 GPM	6190 GPM	7450 GPM
18DS-3050	30	50	42	144	1800	65.0 ft ²	15.8 CFS	13.0 CFS	21.6 CFS	26.0 CFS
							7090 GPM	5830 GPM	9690 GPM	11660 GPM
18DS-3660	36	60	48	170	2400	93.6 ft ²	22.8 CFS	18.6 CFS	31.2 CFS	37.4 CFS
							10230 GPM	8400 GPM	14000 GPM	16800 GPM
18DS-4270	42	70	60	202	2800	127.4 ft ²	32.8 CFS	25.4 CFS	42.4 CFS	50.8 CFS
							14760 GPM	11430 GPM	19050 GPM	22860 GPM
18DS-4880	48	80	60	222	3600	166.4 ft ²	40.4 CFS	33.2 CFS	55.4 CFS	66.4 CFS
							18170 GPM	14930 GPM	24890 GPM	29870 GPM
18DS-5490	54	90	66	248	4400	212.0 ft ²	51.8 CFS	42.4 CFS	70.6 CFS	84.8 CFS
							23240 GPM	19028 GPM	31710 GPM	38056 GPM
18DS-6010	60	100	72	274	5200	166.4 ft ²	64 CFS	52.5 CFS	87.2 CFS	104.6 CFS
							28720 GPM	23498 GPM	39160 GPM	46996 GPM