SEPARATORS & FILTRATION SYSTEMS

GRISWOLD FILTRATION

1525 E. Sixth Street
Corona, CA. 92879
Tel:(951) 270-1776
FAX: (951) 735-0798

Serving Industry through Innovative Engineering

HVACR

Irrigation

Water Treatment

Dairies

Waste Water Treatment

Oil Recycling

Heat Transfer

Steel Mills

How Griswold Dual-Stage Separators* Work

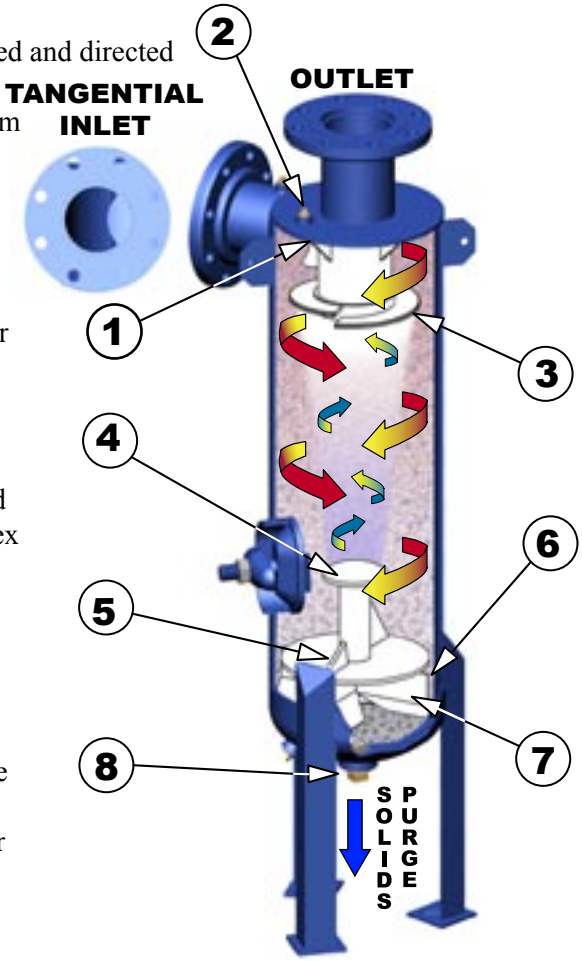
The solids-laden stream of liquid enters the separator tangentially through the parabolic design velocity accelerator pad. This pad is designed to give the fluid stream an instantaneous acceleration up to 3.5 times the inlet velocity, immediately creating a strong centrifugal force on the solids content.
Wherever saturated air is present in the fluid stream, built-in diffuser vanes (1) collect the tiny air bubbles in the air collection area and relieve them when pressure reaches the relief valve setting (2).

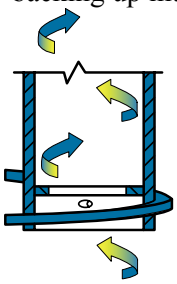
The stream is further guided and directed by the path created by the spiral ring (3), at the bottom edge of the discharge nozzle. It is the outer edge of this ring that maintains the velocity and circular path of solids down to the midsection of the separator body.

The top spin plate (4) deflects solids that may enter the vortex region and shortens the travel of vortex with much cleaner liquid.

Decelerated solids are trapped by two opposite vanes (5) directed at an angle against the rotation of the fluid. Solids pass the gap between the bottom spin plate (6) and the inner wall of the separator, and are deposited gently in the collection chamber.

Bottom spin arrestors (7) help prevent solids from backing up into the system. A collection of purged solids is formed at the bottom of the separator in an elliptical head (8).





The exiting fluid vortex formed at the center, having the same rotational flow moves upwards toward the discharge nozzle may still carry smaller particles.

A second stage centrifugal separation starts at the entry to the discharge nozzle, where a choke ring (a) impedes the encircling smaller solids. A venturi effect is created in the 2 opposite nozzles (b) angled toward the direction of the flow, drawing the solids to a vacuum chamber and further releasing them back into the main stream.

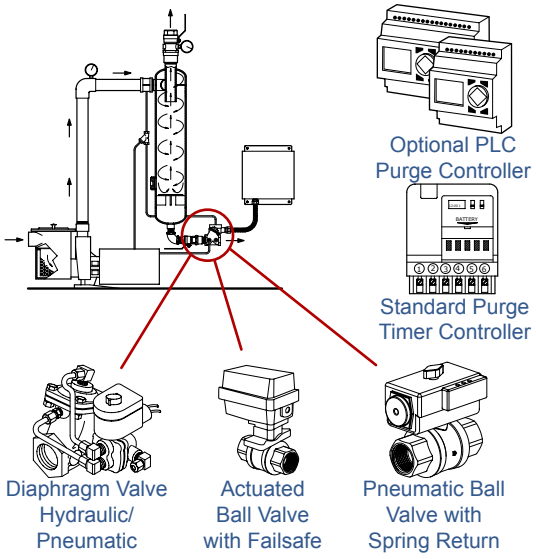
The resulting fluid past the choke ring is cleaner.

This method and design are best suited for streams that have surges or spikes in solids content, minimizing the chance of solids returning back to the process liquid.

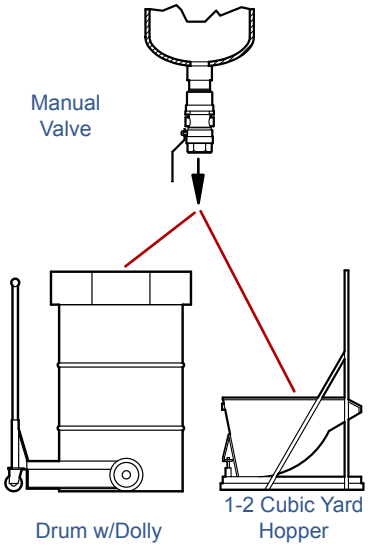
*Patent Pending

Purging Choices

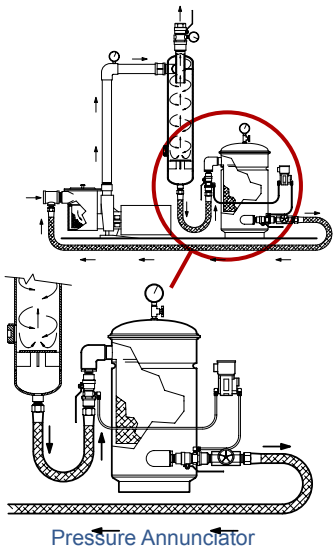
CSS- Auto Purge System



Manual Purge System

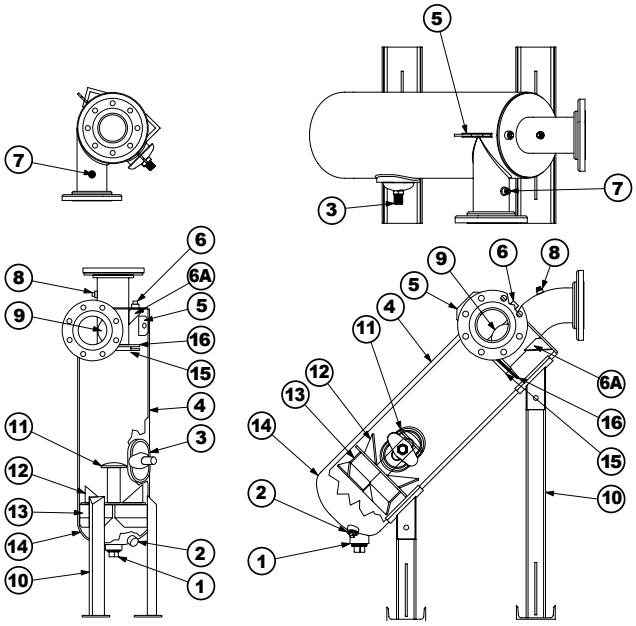


CSR- Closed Recovery System



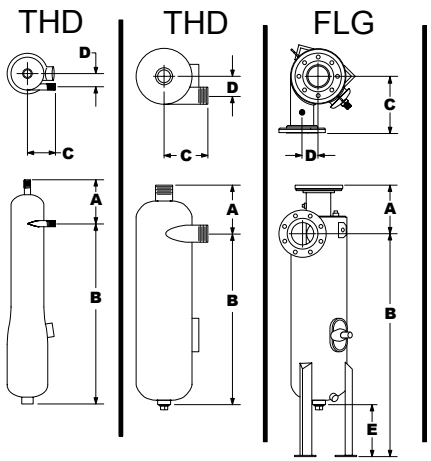
Features of Griswold
High Efficiency Dual-Stage Separators

1 Purge outlet
2 Auxiliary bleed outlet
3 Inspection/clean-out port
4 Hydraulically sized body
5 Lifting lug
6 Air relief port
6A Air diffuser vane
7,8 Inlet and outlet pressure gauge connections
9 Parabolic design velocity pad
10 Adequately sized legs and pads to absorb and carry dynamic weights.
11 Internal top spin plate
12 Collection vanes located 180° apart
13 Bigger bottom spin arrestors @ 45° angle
14 Bigger collection chamber to accommodate higher solids content.
15 Stepped down and longer exit nozzle lowers differential pressure.
16 Spiralex vane & tangential nozzles.
17 Options:
- A – ASME Rated and stamped units.
- B – Removable head for internal inspection
- C – Grooved end connections
- D – Unidirectional inlet & outlet mounting to accommodate existing piping configuration.
- E – CRN vessels (Canadian Registration Number)
- F – BSP and other European threaded connections.

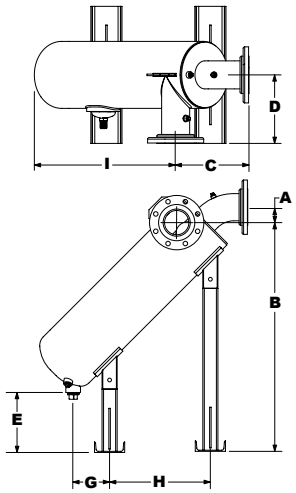


General Specs & Dimensions

Vertical Units



Low Profile



Tolerance ±1". Consult factory for exact dimensions. For closer tolerances, contact factory. Dimensions based on flanged models only. Dimensions subject to change without notice. Consult factory for a certified drawing on a particular model.

MODEL	FLOW RANGE	INLET/OUTLET	PURGE SIZE		CLEAN	VESSEL GAL.	WEIGHTS LBS.		DIMENSIONS							
	GPM	CONNECTIONS	MAIN	AUX.	OUT	CAPACITY	DRY	WET	A	B	C	D	E	F	G	H
.375T	3-6.5	3/8" THD	1" NPT	-	1.5" NPT	0.55	19	22	3-5/8"	18-3/8"	2-14"	1-1/8"				
0.5T	4.5-12	1/2" THD, FLG	1" NPT	-	1.5" NPT	0.55	20	22	8-3/4"	19"	5-7/8"	1-5/16"				
.75T	8.5-19	3/4" THD, FLG, GE	1" NPT	-	1.5" NPT	0.65	24	26	8-7/8"	19-5/8"	5-7/8"	1-1/4"				
1T	14-29	1" THD, FLG, GE	1" NPT	-	1.5" NPT	0.8	28	30	9-9/16"	20-11/16"	6-7/16"	1-9/16"				
1.2T	24-54	1.25" THD, FLG, GE	1" NPT	-	1.5" NPT	1.5	43	41	7-3/4"	15-5/8"	6-1/2"	1-7/16"				
1.5T	31-71	1.5" THD, FLG, GE	1" NPT	-	2" NPT	1.5	43	47	7-7/8"	18-1/4"	7-1/4"	1-13/16"				
2T	56-120	2.0" THD, FLG, GE	1" NPT	-	2" NPT	2.8	95	47	8-3/8"	21-1/8"	7-3/4"	2-1/8"				
2.5T	76-170	2.5" THD, FLG, GE	1" NPT	-	2" NPT	2.8	99	47	8-9/16"	21-7/16"	8"	1-7/8"				
3T	115-270	3" THD, FLG, GE	1" NPT	3/4" NPT	3 X 4	5.6	122	130	9-1/8"	36-5/8"	9"	2-9/16"				
4T	190-450	4" FLG, GE	1.5" NPT	3/4" NPT	4 X 6	21	280	340	9-3/8"	42-3/4"	11"	3-1/8"	10"	7/8"	5-5/16"	16-3/8"
5T	310-710	5" FLG, GE	1.5" NPT	3/4" NPT	4 X 6	21	300	352	10-1/2"	49"	12"	3-9/16"	10"	1-5/8"	5-5/8"	20-3/4"
6T	440-1200	6" FLG, GE	1.5" NPT	3/4" NPT	4 X 6	39	375	552	10-3/4"	54-3/4"	13"	3-11/16"	10"	1-7/8"	5-1/2"	25"
8T	790-1800	8" FLG, GE	2" NPT	3/4" NPT	4 X 6	73	560	971	12-3/8"	67-1/8"	15"	4-11/16"	10"	2-1/4"	6-1/8"	33-3/4"
10T	1250-2800	10" FLG, GE	2" NPT	1" NPT	6 X 8	120	850	1575	13-3/8"	80-1/8"	17"	5-5/8"	10"	2-3/8"	7-3/16"	41-7/8"
12T	1750-3900	12" FLG, GE	2" NPT	1" NPT	6 X 8	163	1200	2252	14-3/4"	94-5/8"	18"	6-5/8"	12"	4-11/16"	8-1/8"	49-15/16"
14T	2400-5000	14" FLG	3" NPT	1" NPT	6 X 8	291	1385	3806	15-1/8"	106-1/2"	21"	8"	12"	3-13/16"	8-5/16"	57-11/16"
16T	3300-6800	16" FLG	3" NPT	1" NPT	6 X 8	338	1720	4446	16-7/8"	122-3/8"	23"	9"	14"	3-15/16"	9-13/16"	65-5/8"
18T	4000-8200	18" FLG	3" NPT	1.5" NPT	11 X 15	511	1930	6010	17-1/2"	134-3/4"	25"	10"	14"	7-3/4"	10-3/8"	74-3/16"
20T	6100-12000	20" FLG	3" NPT	1.5" NPT	11 X 15	707	2500	7923	19-1/8"	149-1/4"	27"	11"	16"	5"	11"	83"
24T	7100-14000	24" FLG	3" NPT	1.5" NPT	11 X 15	1000	3700	8330	24-1/2"	161-1/16"	32-7/8"	13"	16"	9"	13"	92"

How to Size a Separator

1. ***Know specific gravities of solids vs. liquids:***

In order for a separator to be efficient for the purpose it is intended to, the difference between the specific gravities of solids vs. liquid must be greater than 1.0 (less than 1.0 - consult factory).

1.1 Know percent solids load and particle size distribution, if applicable
more than 3% solids load by weight might require installing 2 or more separators in series.

Typical Specific Gravities of Solids

Specific Gravity Range	Type of Solids	Industry / Applications
1.7 – 2.2	Silt, Dust, Paper Pulp, Burnt Corn Grits	Water Treatment, Pulp & Paper, Food Process
2.2 – 2.6	Dissolved Minerals, Sand, Glass, Silica	HVACR, Heat Transfer, Petrochemical
2.6 – 3.5	Rust, Pipe Scales, Metal Swarfs, Gravel	Machine Tool Coolant, Automotive, Mining
3.6 – 5.0	Steel Scales	Steel Rolling Mills, Foundry

2. *Know flow required:*

Using the flow vs. pressure differential chart, determine the size of the separator by plotting the efficient operational range between 4-10psid, the higher the psid-the higher the separation efficiency. The dotted lines of the separator flow range indicates limitations. Using this chart, the fluid velocity and its corresponding relative separation efficiency with reference to particle size removal is determined.

3. *Know materials of construction of the unit using chemical and/or abrasion resistance charts:*

Chemical resistance based on pH levels

pH Level	Recommended Material
lower than 1.0	Consult Factory
1–3	Consult Factory
3–5	316 Stainless Steel
5–6	304 Stainless Steel
6–9	Carbon Steel
9–10	304 Stainless Steel
10–12	316 Stainless Steel
13–Higher	Consult Factory

Abrasion resistance levels

Abrasion Level	Solids Content by Weight or % Solids by Weight	Recommended Material Internal Coatings/Linings
None–Mild	up to 1000ppm or .10%	Standard Carbon Steel/ Internal Coating
Mild–Moderate	1000–10,000ppm or 1%	Carbon Steel with Internal Epoxy Coating
Moderate–Medium	10,000–20,000ppm or 2%	3M Scotchkote Coating
Medium–Heavy	20,000–30,000ppm or 3%	AR Lining

3.1 Using the General Specification Chart, the flow range to be specific, separator size can be determined.

4. *Know type of piping connection:*

Using pipe connection chart, determine type of inlet/outlet connection.

4.1 Others: Know if unit must be ASME Coded or Non-Coded vessel, if applicable

Example Sizing and Selection:

-Heat Transfer Application, given flow @ 100 GPM; liquid pH of 8.5; and a typical light load of pipe scales, dissolve minerals and sand

Step 1: Using Flow, Velocity, Pressure Loss and Efficiency Charts on Page 4, plot the flow at a higher velocity range from 5.5 – 10.2 ft/sec (higher fluid velocities result in higher separation efficiency and/or removal of much smaller and lighter particulates.)

Step 2: Select Separator model 2T

Step 3: Determine material of construction as CS (Carbon Steel) from Chemical Resistance Chart in 3.

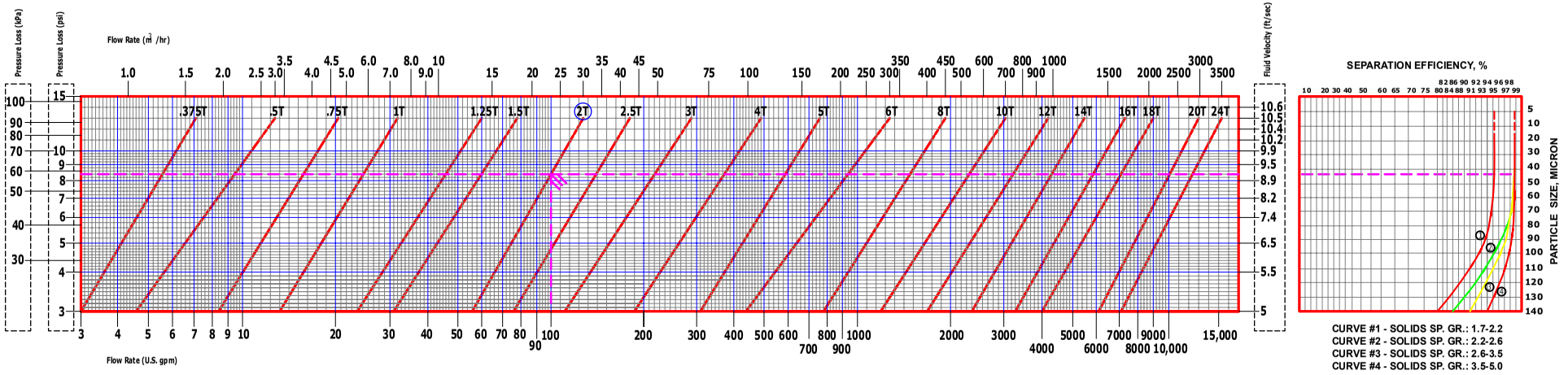
Step 4: Determine piping connection - THD (Threaded) as standard on this model.

Final Selection:

Step 5: To determine relative separation efficiency, on the Flow, Velocity, Pressure Loss and Particle Size Chart, draw an imaginary horizontal line from the red plotted flow line to the right, reaching the relative efficiency chart. Connect this line to the curve related to its specific gravity. For this example, Curve #2 would be used, and read @ 98% efficient down to 40 microns.

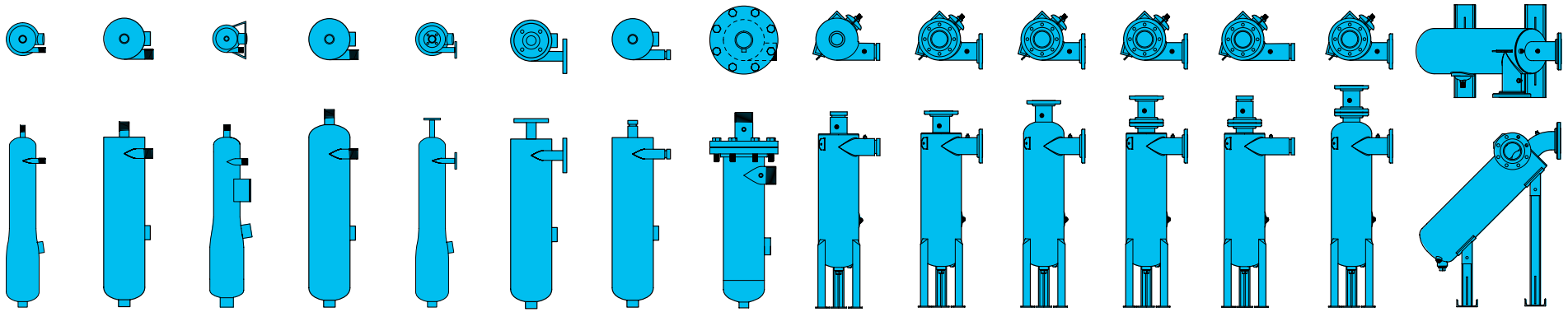
Flow, Velocity, Pressure Loss, Particle Size and Efficiency Chart

Determining flow vs. differential pressure is made easy using this chart. For best separation efficiency, it is recommended to select models from 4–10 psid differential pressure range.



Type of Pipe Connections

Units are available in different piping connections to accommodate current piping installation. We also offer low profile models (LPF) to fit low-headroom spaces.



THD
0.375T-1T
Threaded
Standard

THD
1.2T-3T
Threaded
Standard

THA
0.375T-1T
Threaded
ASME

THA
2T-3T
Threaded
ASME

FLG
0.5T-1T
Flanged

FLG
1.2T-2.5T
Flanged

GE
1T-3T
Grooved
End

RDT
1.2T-3T
Removeable
Dome Threaded

GE
4T-12T
Grooved
End

FLG
3T-20T
Flanged

FLA
3T-20T
Flanged
ASME

RDF
3T-20T
Flanged
Removable
Dome

RDG
3T-12T
Grooved End
Removable
Dome

RDA
3T-20T
Flanged
Removable
Dome ASME

LPF
Low Profile
Flanged
* Consult
factory for
other
Configurations

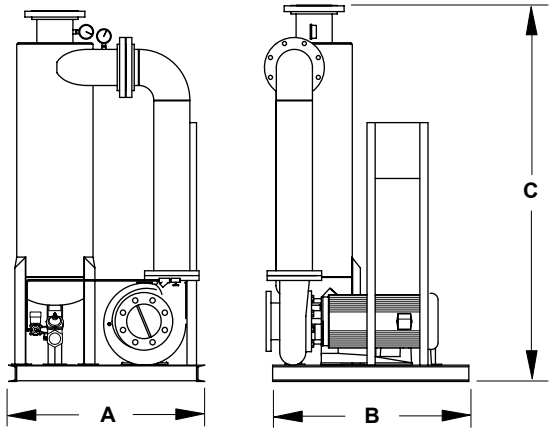
System Design Features

- Eliminates solids and fouling problems in cooling water system piping and its equipment
- Reduces liquid loss thru blow-down
- Reduces manual cleaning of tower basins, chillers, condensers, heat exchanges and boilers
- Improves performance and efficiency of heat transfer equipment
- Reduces water treatment chemical usage
- Provides energy savings
- Environmentally designed to contain and minimize discharges of solids and chemicals into sewer stream
- Helps in controlling growth of harmful bacteria

Griswold Separator Systems are designed for Full-Flow, Side-Stream and/or Sump (Cooling Tower) basin cleaning. Centered at the performance of its Dual Stage High Efficiency Separators, Griswold's CSS (Auto Purge System) and CSR (Closed Solids Recovery) Models are compact, rigid, economical and effective filtration packages. Complete with its own pump (end suction pump for flooded suction and self-priming for negative suction) pipe manifolds, pressure gauges, suction basket strainer (std. on HH & SP systems from 1"- 3" models), pump control panel, standard timer or PLC purge controller (optional for CSS model). Closed Solids Recovery tank with pressure annunciator, sight flow indicator and manual valves (for CSR models). For performance and efficiency, please see Flow, Pressure Loss, Velocity ad Relative Separation Efficiency Chart. This chart is the product of independent tests conducted by different recognized institution, laboratory and actual tests with clients.

System Dimensions

Tolerance ±1". Consult factory for exact dimensions. For closer tolerances, contact factory. Dimensions subject to change without notice. Dimensions shown based on "HP" models with high flow capacity



System Pkg. #	Dimensions (Inches)		
	A	B	C
100-102	26	29	48
120-122			
150-152			
200-202			
250-252			
300-302			
400-402	36	36	60
500-502	36	36	68
600-602	42	42	68
800-802	66	80	80
1000-1002	70	84	94
1200-1202	80	84	112
1400-1402	96	90	122

How to Size a Separator System

I Sump or Cooling Tower Basin Sweeper System

A standard Griswold Separator System uses an end-suction centrifugal pump. When flooded suction is not available, the use of the self-priming pump is necessary. A sweeper system uses eductors or flat nozzles, used in conjunction with Griswold Separator Systems -- either Automatic Purging Units (CSS Models) or Closed Solids Recovery Units (CSR Models). Positioned strategically to cover a sweeping area of influence (see eductor chart) inside the sump or basin, these eductors continuously circulate and direct the fluid stream toward the suction of the pump, preventing solids from settling at the bottom of the sump/basin. Model selection is based on the recirculation flow rate (RFR) of the basin and/or size of the cooling tower in tons. RFR is calculated as follows:

1. RFR = Area of Sump/Basin x turn-over rate per sq.ft.
   = L x W x Turn-over factor (select from chart below)

Depth of Water	Turn-Over Factor
From 6"-24"	5.33
From 24"-60"	8.33
From 60"-120"	10.00
120" and above	12.50

2. Once the RFR is known, refer to the separator systems selection chart. Select the model that has an RFR equal to or greater than the calculated RFR.

3. To determine the quantity of eductors to use, divide the correspond ing minimum filtration rate by the type of eductor's motive flow.

Sizing Example:
A cooling tower basin measuring 10' wide by 30' long with water average depth of 9", determine filtration flow rate a 10% side stream and number of sweeper nozzles (eductors) needed:

a. Basin recirculation flow rate (RFR) = 10 x 30 x 5.33 = 1599 gpm
b. 10% of 1599 = 160 gpm
c. Refer to Separator System Selection Chart on page 6; equivalent to 330 tons capacity @ 990 RFR
d. Select CSR/CSS – 251 – HH (closed solid recovery or automated purging) -(system model size) - (high pressure @ 80' TDH sweep)
e. Determine no. and type of eductors using eductor chart

Using E-10 eductors, 160 /10 =16 eductors. Eductors/nozzles strategic locations and pipe size manifolds would be drawn by Griswold at no extra charge to clients.

II Side Stream Filtration

Self-contained and packaged with its own pump, a Griswold Separator System may be installed side-stream at 10–20% of the main system flow, which is almost equal to the recirculation flow rate (see illustration and Separator System Selection Chart). An appropriately sized model will eliminate the majority of troublesome solids in the fluid stream.For proper model selection, determine the desired amount of filtration based on 10%–20% range, and or desired turn-over rate.

1. Determine recirculation flow rate or main system flow (RFR).
2. Determine filtration flow rate (10% minimum, 20% maximum).
3. Determine size and operational model of the system.

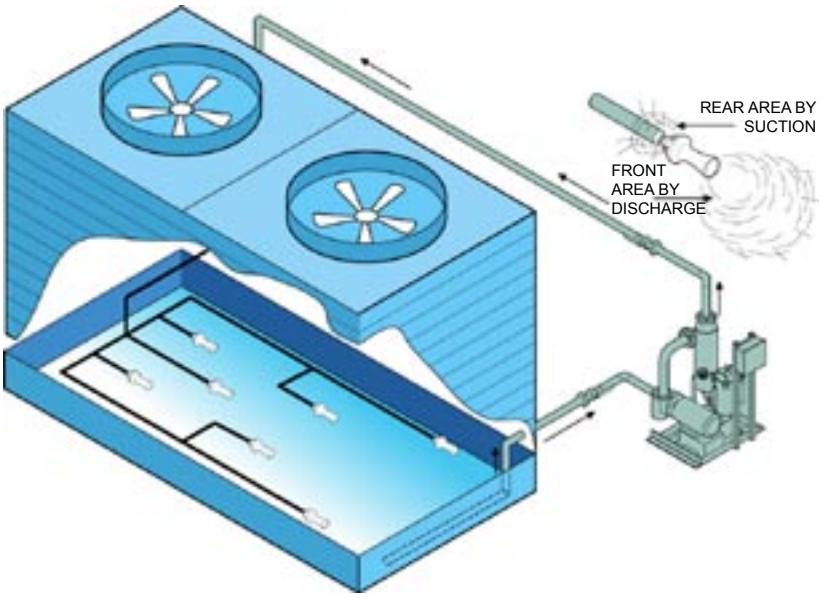
For Side Stream Filtration Sizing Example, see next page. Contact Griswold Separators for further details.

Filtration Types

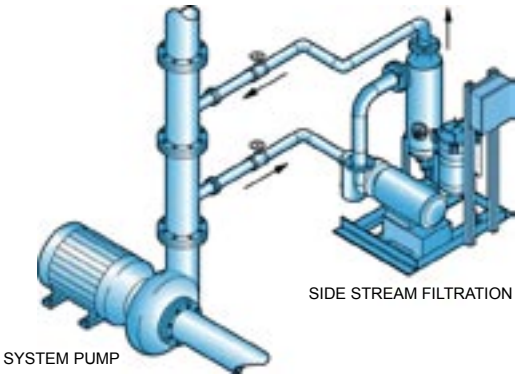
Sump or Basin Sweeper System

Eductors Area of Influence

EDUCTOR TYPE	NOZZLE SIZE	MOTIVE FLOW	SUBMERGENCE REQUIREMENT	AREA OF INFLUENCE	
				REAR	FRONT
E-5	1/4"	5 GPM	2"	0.75 sq.ft.	2 sq.ft.
E-10	3/8"	10 GPM	3"	1.5 sq.ft.	5 sq.ft.
E-20	3/4"	20 GPM	6"	3 sq.ft.	10 sq.ft.
E-50	1-1/2"	50 GPM	18"	5 sq.ft.	15 sq.ft.
SN-3 (FLAT)	3/8"	3 GPM	NONE	0.25 sq.ft.	5 sq.ft.



Side Stream Filtration



Side Stream Filtration Sizing Example:
A condenser-cooling tower system of 500 tons capacity

a. 660 tons x 3 gpm/ton = 1980 gpm RFR
b. a 10% side stream filtration flow rate = 198 gpm
c. refer to chart below. Selected model would be:

CSR/CSS- 300-LH

- CSR/CSS → Closed Solids Recovery or Auto Purge
- 300 → Model/Size
- LH → Low Head @ 40' TDH (booster)

Separator System Selection Chart

Cooling Tower Cap. Tons	Recirc Flow Rate (GPM)	Flow Range (GPM.)			System Range			Pump Style and HP Range			System Connection Range			
		NOM.	HIGH	LOW	NOM.	HIGH	LOW	SP	HH	LH	SP Inlet	HH Inlet	LH Inlet	Outlet
75	225	23	28	15	100	101	102	.75	1-1.5	.75-1	2" Thd	1.5" Thd	1.5" Thd	1"
100	300	40	50	27	120	121	122	.75-1.5	1.5-3	.75-1	2" Thd	1.5-2" Thd	1.25-2" Thd	1.25"
150	450	54	68	33	150	151	152	1-2	3	.75-1.5	2" Thd	1.5-3" Thd	1.25-2" Thd	1.5"
200	600	90	115	60	200	201	202	2-5	3-5	1.5-3	2-2.5" Thd	2-3" Thd	2-2.5" Thd	2"
330	990	130	160	82	250	251	252	3-5	5	2-3	2-2.5" Thd	2.5-3" Thd	2-2.5" Thd	2.5"
450-600	1350-1980	200	250	130	300	301	302	5-7.5	5-10	3-5	2.5" Thd - 4" Flg	3" Thd - 4" Flg	2.5-3" Thd	3"
750-1050	2250-3150	340	420	200	400	401	402	7.5-15	7.5-15	5-7.5	3-4" Flg	3-5" Flg	4-5" Flg	4"
1150-1500	3450-4500	510	650	340	500	501	502	10-20	15-20	7.5-15	3-4" Flg	5" Flg	5" Flg	5"
1800-2900	5400-8700	810	1100	490	600	601	602	15-40	15-30	7.5-15	4-6" Flg	5-8" Flg	5-6" Flg	6"
3300-4500	9900-13500	1400	1700	850	800	801	802	30-50	25-50	15-25	6" Flg	5-8" Flg	6-8" Flg	8"
5500-7000	16500-21000	2000	2700	1400	1000	1001	1002	40-75	50-75	20-40	6-10" Flg	8-10" Flg	10-12" Flg	10"
7500-11500	22500-34500	2900	3700	1900	1200	1201	1202	Consult Factory	50-100	30-50	Consult Factory	10-12" Flg	10-12" Flg	12"
12500-16000	37500-48000	3900	4800	2700	1400	1401	1402		100-125	40-75		12" Flg	12" Flg	14"

CSS= Automatic Purge System
CSR= Recovery Tank System
Pump Basket Strainer is Std. on 100-300 HH Series and 100-300 Series SP Systems

LH=Low Head, 40' TDH required for side stream booster
HH= High Head, 80 TDH required for Cooling Tower or Sump with sweeper pipe system
SP= Self Priming, 80 TDH required for Cooling Tower or Sump with negative suction lift and includes sweeper pipe system (Consult factory on inlet size), used with sweeper pipe system @80' TDH

ELECTRICAL DATA:			
STD. VOLTAGE		ALT. VOLTAGE	
D	460/3/60	A	115/1/60
E	575/3/60	B	230/1/60
M	415/3/50	C	230/3/60
		F	208/3/60
		H	230/1/50
		J	190/3/50
		K	230/3/50
		L	380/3/50
		P	110/1/50
		Q	440/3/50

Separator & System Engineering Specifications

GENERAL:

1.1 The Filtration System by Centrifugal Separation shall be designed to remove solids with specific gravity range higher than 2.0, solids spherical size greater than 30 microns and solids concentration of 3% by weight.

1.2 The System shall be compact and complete with pump basket strainer (from 1"to 3" HH & SP systems), properly sized centrifugal pump, solids purging system, NEMA rated control panel with pump magnetic starter and purge controller (in case of CSS models) closed solids recovery tank (in case of CSR models) pipe manifolds, pressure gauges and mounted on common fabricated base plate with factory powder coat.

CENTRIFUGAL SEPARATOR:

2.1 The separator shall be welded construction, a centrifugal vortex style, with tangential inlet capable of passing a solid with spherical size equal to 25% of the connection pipe size without obstructing path of separation.

2.2 The separator's head shall be stationary/non-removable with air vent for removing trapped air, and an access/inspection port at the separation chamber for removing trapped solids with size equal to or greater than 25% of the inlet connection size. Removable Dome is an option.

2.3 Solids separation shall be accomplished using a parabolic velocity plate at the tangential inlet that shall increase fluid velocity of no less than 3.5 times the inlet velocity; solids laden fluid shall travel circumferentially downwards of the separator body, creating a cleaner central vortex, causing contaminants to rotate near the wall of the vessel due to the centrifugal force exerted to the fluid stream; a conical top plate shall be welded on top of the spin plate to immediately reduce the velocity of the settling solids, shortening travel of the vortex and overall length of the vessel; dual collection vanes shall be installed on top of the spin plate @ 60 degree angle facing the rotation and allow the solids to be immediately trapped and directed to the collection chamber; spin arrestor plates shall be installed under the spin plate at 45° break angle against the rotational direction of the fluid to allow quiescent settling of the solids and prevent solids to move upwards; the volumetric size of the solids collection chamber shall be able to hold no less than 3% solids by weight.

2.4. Separator materials of construction shall be carbon steel with body made from SA 36 or other high quality grade steel and head material made from SAE 285C/Gr.70. All flanges shall be rated at 150 psi ANSI raised face, all couplings shall be Class 3000.

2.5. Separator shall have _____ inch (flanged, threaded, grooved) tangential inlet, ___in. (flanged, threaded or grooved)outlet. It shall have ____ in. inspection /clean out port, _____ in. purge outlet and _____ in. auxiliary drain port and _____ in. half coupling inlet/outlet pressure gauges ports and 3/8" half coupling air vent.

2.6. Separation shall be rated at _____ gpm, flow @150 psi max operating pressure, and _____ psid differential pressure at the designed flow range.

2.7. The Separator design shall be of low-pressure drop type, with a minimum of 3 PSID and a maximum of 11 PSID.

2.8. Separator performance shall be 97.4% or greater, by weight, of particles 40 micron and larger with solids specific gravity of 2.6 or greater, in fluids with specific gravity of 1.0 or less.

2.9. The separator shall be capable of removing solids up to 3% content by weight, in single pass.

CENTRIFUGAL PUMP:

3.1 The pump shall be close-coupled/back pull-out design, bronze-fitted construction with cast iron-body and frame, with mechanical seal using carbon ceramic and/or tungsten carbide faces to withstand abrasion.

3.2 The pump shall be rated to meet or exceed 40 feet head for side stream and/or booster, or 80 feet head for sweeper piping operations.

3.3 The electric motor shall be Totally Enclosed Fan-Cooled (TEFC) except integral horsepower self-priming requirement which may be Open-Dip Proof (ODP).

3.4 Self priming pumps shall be complete with pump basket strainer (1-3" systems), that is internally accessible without the use of tools. Internal basket shall be of stainless steel material with min. 1/4" openings.

3.5 Pump Electrical Panel Enclosure shall be NEMA 3R Std. (NEMA 4 or NEMA 4X optional). It shall include disconnect starter with thermal overload protection, magnetic contactor, HOA selector switch, and door interlock. It shall accommodate the PLC purge controller (optional) or standard timer purge controller (CS Timer), and transformer (whichever is applicable).

SOLIDS PURGING:

4.1. Automated Purging System (CSS Models) shall be controlled by cycles between purges, duration, and specific days of the week using a standard programmable 24/7 real time clock (CS Timer). The Timer shall have a minimum purge duration of 4.8 seconds, with adjustable duration of 6, 7.2, and 8.4 seconds using jumper pins. 24/7 real time clock (CS Timer) has a max. 20 purge cycles per day. The optional PLC (Programmable logic controller) offers a duration range from 1sec. through 999.99 seconds, cycles between purges 1 min. through 99 hrs & 59 min., and adjustable hours of operation. An optional system blowdown by cooling water system conductivity is available using a PLC.

4.1.1.Purge valve shall be diaphragm type (LPV), normally closed motorized ball valve (MBV, requires power to open and power to close), motorized ball valve fail safe w/battery pack (MBVFS), pneumatic pinch valve (PPV), or pneumatic ball valve with spring return (PBVSR).

4.2. Continuous purging through a closed solids recovery tank (CSR models) where solids are trapped by the 25 micron fiber felt filter bag. Liquid passing through the bag shall be directed back to the system through the suction of the pump to minimize liquid loss. A pressure annunciator package shall be installed to monitor condition of the filter bag, relaying signal of the desired pressure differential to (SL-Optional) service light and/or to the centralized control center. Service disconnect valves at the inlet and outlet of the tank shall allow the filter bag to be replaced without interrupting the filtration/separation process. A manual pressure relief valve shall be mounted on top of the tank to relieve excess air and hydraulic pressure. Inlet and outlet pressure gauges and sight flow indicator shall be installed to monitor flow. The tank shall be made of high quality carbon steel or stainless steel (as required) material and shall be rated at 125 psig max. operating pressure. Other materials and higher working pressure are also available.

PIPING:

5.1 Sweeper Piping Systems rated 50 psi shall have schedule 80 PVC piping with threaded connections from 1-3", and steel flange pipe 4" or above.

5.2 HH & LH Systems rated 150 psi shall have steel piping with threaded connections from 1-3", and steel flange pipe 4" or above.

5.3 Separator Outlets with grooved end, or BSP thread connections are also available.

BASEPLATE:

6.1 The fabricated metal baseplate skid shall be constructed of structural angle and channel steel.

6.2 The metal skid shall be primered with rust-inhibiting paint and finished with powder coating.

WARRANTY:

7.1 The separator shall be warranted to be free from manufacturing defect for a period of 60 months from date of installation or 66 months from date of delivery, whichever comes first.

7.2 All components, except the Separator, of the systems shall be warranted to be free from manufacturing defect for a period of 12 months from date of installation or 18 months from date of delivery, whichever comes first.

Representative Information

GRISWOLD FILTRATION
1525 E. Sixth St., Corona, CA. 92879
Phone: 951-270-1774 FAX: 951-735-0798