

PEM 23000 Series Flow Straightening Flanges have special formed orifice configurations that will remove effectively most bulk profile flow distortion, except for multi swirl distortion. PEM 23000 Series Flow Straightening Flanges are made of virgin cast bronze or at extra cost of stainless steel

PEM 23000 Series Flow Straightening Flanges require orifice & flow sized pump suction strainers, see PEM Catalog Design Data for suction strainer sizing. Never use in line basket strainers in the pump suction except as protection for pump.

**Suggested Suction Strainers sizes in red in table for maximum flows.**

For best effectiveness allow minimum 1 - 2 times pipe size distance of straight pipe between the flow straightening flange and supply pipe fitting. Allow at least 5 - 8 times pipe size distance of straight pipe between the flow straightening flange and the spray jet.

For maximum spray performances and/or for use with silted water: Order spray jets with flanged pipe connection and steel orifice sleeves.

PEM 23000 Series FLOW STRAIGHTENING FLANGES are less effective to remove multiple swirl flow distortion (as caused by multiple closely connected pipe fittings and valves) than PEM 21000 Series Flow Straighteners but have a lesser pressure loss and are more convenient to install. For applications with maximum flow distortion use only PEM 21000 Series Flow Straighteners

For smaller pipe size Flow Straighteners see: PEM 01050 Series



# PEM

## 23000 Series

### FLOW STRAIGHTENING FLANGES

# 520-4000



PEM Serial	23025 520-4025	23030 520-4030	23040 520-4040	23060 520-4060	23080 520-4080	23110 520-4100	23120 520-4120							
With order state: Inside pipe diam. & ASA or BSP Flat Flange														
<b>PIPE SIZE</b>	<b>2-1/2"</b>	<b>3"</b>	<b>4"</b>	<b>6"</b>	<b>8"</b>	<b>10"</b>	<b>12"</b>							
<b>O.D. of Flange</b>	127mm 5.000"	136mm 5.375"	175mm 6.900"	229mm 9.000"	280mm 11.000"	340mm 13.375"	411mm 16.187"							
<b>Thickness of Flange</b>	10mm 0.394"	10mm 0.394"	10mm 0.394"	10mm 0.394"	10mm 0.394"	10mm 0.394"	10mm 0.394"							
<b>Length of Unit in pipe</b>	18.6mm 0.725"	18.6mm 0.725"	18.6mm 0.725"	21.8mm 0.850"	21.8mm 0.850"	28.7mm 1.100"	28.7mm 1.100"							
<b>Fit into pipe O.D. of Unit</b>	60mm 2.362"	74mm 2.913"	99mm 3.898"	150mm 5.905"	198mm 7.795"	251mm 9.882"	302mm 11.890"							
<b># of Orifices</b>	36	31	32	53	50	56	58							
<b>Lesser I.D. of Orifice</b>	4.826mm 0.190"	6.477mm 0.255"	9.321mm 0.367"	14.097mm 0.555"	20.447mm 0.805"	24.892mm 0.980"	29.972m 1.180"							
<b>Suct.Str. Orifice Size</b>	3.175mm 0.125"	4.826mm 0.187"	6.000mm 0.250"	9.525mm 0.375"	10.000mm 0.393"	12.700mm 0.500"	15.875mm 0.625"							
<b>Suct.Str.Type PEM 7280/90</b>	<b>'C'</b> <b>7299</b>	<b>'B'</b> <b>7294</b>	<b>'B'</b> <b>7298</b>	<b>'A'</b> <b>7297</b>	<b>'A'</b> <b>Multiple 7297</b>	<b>'A'</b> <b>Multiple 7297</b>	<b>'A'</b> <b>Multiple 7297</b>							
<b>Flow : GPM = USGPM</b>  Flow Straightening Flanges are made of virgin bronze or At extra cost: Of # 316 alloy stainless steel for sea water or Of hardened # 460 alloy stainless steel for silted water	<b>Flow</b>	<b>Flow</b>	<b>Flow</b>	<b>Flow</b>	<b>Flow</b>	<b>Flow</b>	<b>Flow</b>	<b>Flow</b>	<b>Flow</b>	<b>Flow</b>	<b>Flow</b>	<b>Flow</b>	<b>Flow</b>	
	<b>Press Loss</b>	<b>Press Loss</b>	<b>Press Loss</b>	<b>Press Loss</b>	<b>Press Loss</b>	<b>Press Loss</b>	<b>Press Loss</b>	<b>Press Loss</b>	<b>Press Loss</b>	<b>Press Loss</b>	<b>Press Loss</b>	<b>Press Loss</b>	<b>Press Loss</b>	
	<b>GPM</b>	<b>GPM</b>	<b>GPM</b>	<b>GPM</b>	<b>GPM</b>	<b>GPM</b>	<b>GPM</b>	<b>GPM</b>	<b>GPM</b>	<b>GPM</b>	<b>GPM</b>	<b>GPM</b>	<b>GPM</b>	
	<b>Feet</b>	<b>Feet</b>	<b>Feet</b>	<b>Feet</b>	<b>Feet</b>	<b>Feet</b>	<b>Feet</b>	<b>Feet</b>	<b>Feet</b>	<b>Feet</b>	<b>Feet</b>	<b>Feet</b>	<b>Feet</b>	
	50	1.018	50	0.223	150	0.594	400	0.453	500	0.172	800	0.157	1000	0.016
	60	1.469	60	0.322	200	1.135	500	0.709	600	0.248	1000	0.247	1500	0.240
	75	2.305	75	0.504	250	1.647	600	1.022	800	0.442	1200	0.356	2000	0.432
	<b>100</b>	<b>4.095</b>	<b>100</b>	<b>0.897</b>	<b>300</b>	<b>2.370</b>	<b>800</b>	<b>1.818</b>	<b>1000</b>	<b>0.691</b>	<b>1500</b>	<b>0.559</b>	<b>2500</b>	<b>0.675</b>
	<b>150</b>	<b>9.230</b>	<b>150</b>	<b>2.021</b>	<b>350</b>	<b>3.230</b>	<b>900</b>	<b>2.301</b>	<b>1200</b>	<b>0.997</b>	<b>2000</b>	<b>0.992</b>	<b>3000</b>	<b>0.972</b>
			<b>200</b>	<b>3.549</b>	<b>400</b>	<b>3.585</b>	<b>1000</b>	<b>2.835</b>	<b>1600</b>	<b>1.771</b>	<b>2500</b>	<b>1.549</b>	<b>3500</b>	<b>1.325</b>
<b>L/min</b>	<b>m.</b>	<b>L/min</b>	<b>m.</b>	<b>L/min</b>	<b>m.</b>	<b>L/min</b>	<b>m.</b>	<b>L/min</b>	<b>m.</b>	<b>L/min</b>	<b>m.</b>	<b>L/min</b>	<b>m.</b>	
189.0	0.310	189.0	0.068	567.7	0.181	514.0	0.138	1892.4	0.052	2271.0	0.047	3785.4	0.003	
226.8	0.440	226.8	0.098	757.2	0.345	892.4	0.216	2271.0	0.076	3028.2	0.075	5677.8	0.073	
<b>283.8</b>	<b>0.702</b>	<b>283.8</b>	<b>0.153</b>	<b>946.2</b>	<b>0.501</b>	<b>2271.0</b>	<b>0.311</b>	<b>3028.2</b>	<b>0.554</b>	<b>3785.4</b>	<b>0.108</b>	<b>7580.8</b>	<b>0.131</b>	
<b>378.0</b>	<b>1.248</b>	<b>378.0</b>	<b>0.273</b>	<b>1135.2</b>	<b>0.724</b>	<b>3028.2</b>	<b>0.554</b>	<b>3785.4</b>	<b>0.210</b>	<b>5677.8</b>	<b>0.170</b>	<b>9463.2</b>	<b>0.205</b>	
		<b>750.6</b>	<b>1.095</b>	<b>1514.0</b>	<b>1.092</b>	<b>3785.4</b>	<b>0.864</b>	<b>6056.0</b>	<b>0.539</b>	<b>9463.2</b>	<b>0.472</b>	<b>1349.2</b>	<b>0.403</b>	

# PEM



## 23000 Series FLOW STRAIGHTENING FLANGES

# 520-4000



### Comparison of PEM 874B, 38.1mm / 1.500" Orifice on 4", 90° Elbow Fitting



PEM 874B Jet  
directly on 4", 90° Elbow,  
without Flow Straightening Flange & riser pipe



PEM 874B Jet with Riser Pipe  
& PEM 21040 Flow Straightener  
on 4", 90° Elbow ( as below)

#### Flow / Pressure Loss Formula for PEM 23000

$$h = V^2 (fL/D+k) / 2g$$

*f*=friction factor(Darcy-Wisbach formula)

*L*=pipe length , ft

*D*=inside pipe diameter

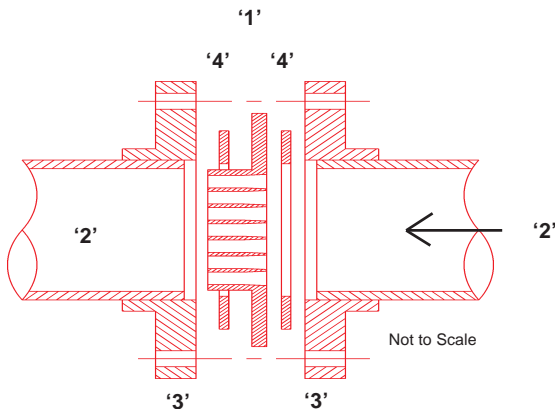
*g*=acceleration of gravity, 32.17 ft/s<sup>2</sup>

*k*=0.25

*V*=velocity of the stream , ft/s

#### FLOW STRAIGHTENING FLANGE PLACEMENT

Flow Straightening Flanges are inserted into pipe between flat companion flanges with suitable size flange ring gaskets (2)



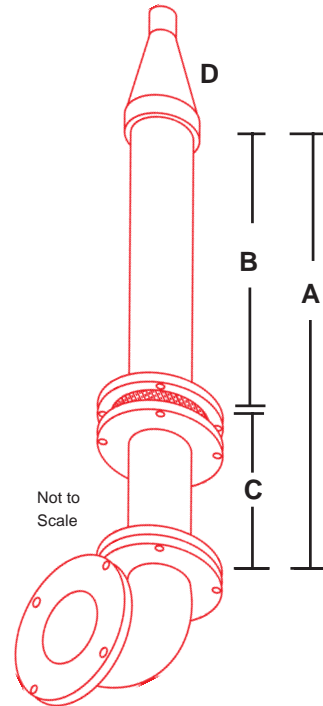
'1' Flange of Flow Straightener

'2' Pipe ( Inside Diameter to be specified )

'3' (2) Flat Face Pipe Flanges (ASA or BSP)

'4' (2) Flange Gaskets

#### NOZZLE / JET RISER PIPE WITH FLOW STRAIGHTENING FLANGE ON ELBOW FITTING



- A = Minimum Length of overall Straight Pipe Riser = 10 x Pipe Size
- B = Length of Straight Pipe Riser between end of flow straightening flange and nozzle = 5 - 8 times pipe size
- C = Length of straight pipe between inflow elbow and flow straightening flange = minimum. 1 - 2 times pipe size
- D = Nozzle or Jet, either with threaded or flanged pipe connection or long tapered pipe reducer from riser pipe size to nozzle pipe size