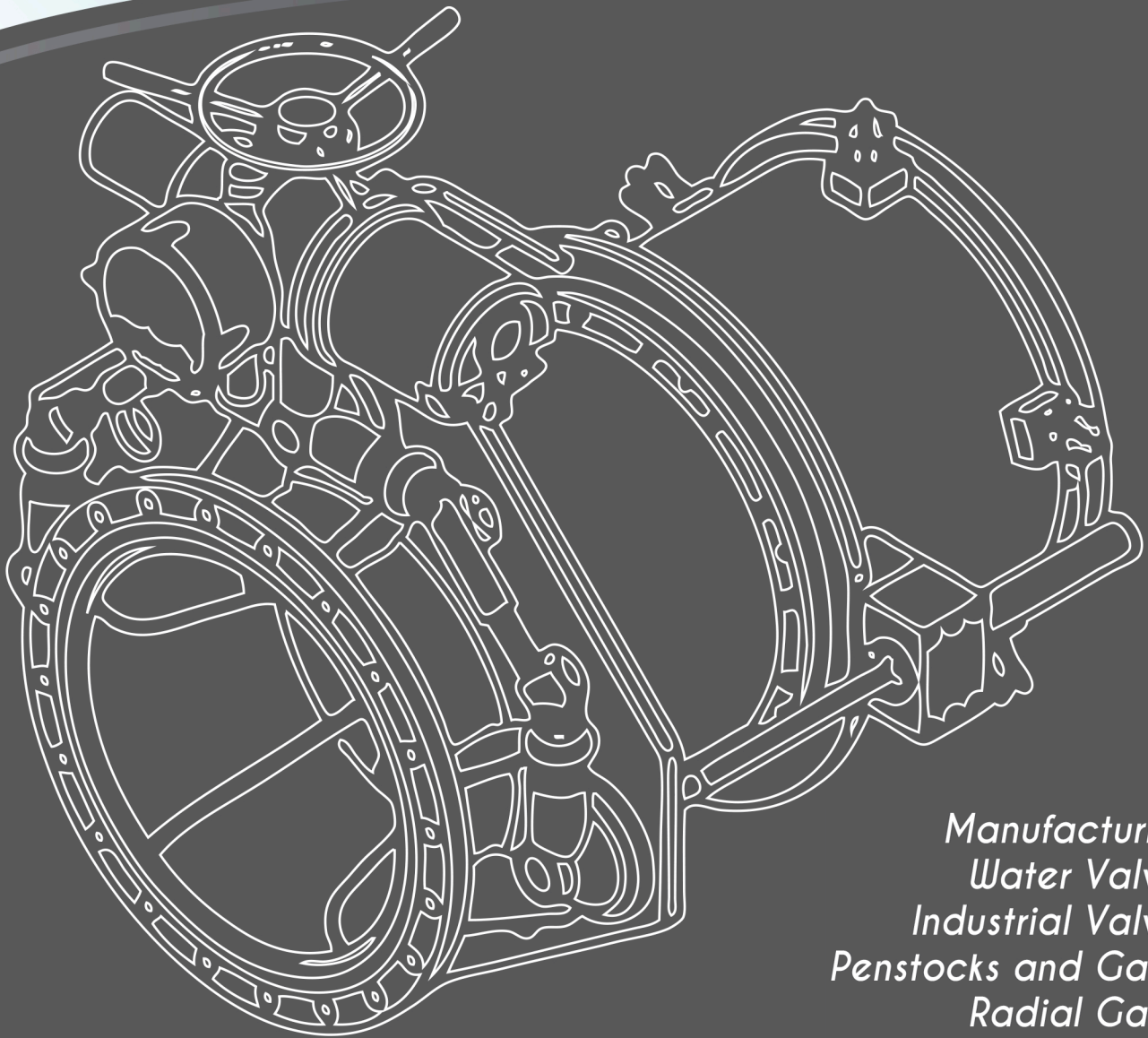




# DINICOLA®



*Manufacturing  
Water Valves  
Industrial Valves  
Penstocks and Gates  
Radial Gates  
Special Applications*

## HOWELL BUNGER CONE DISCHARGE VALVE



Organismo accreditato da ACCREDIA  
Body certified by ACCREDIA

SISTEMA DI GESTIONE  
CERTIFICATO

UNI EN ISO 9001:2015





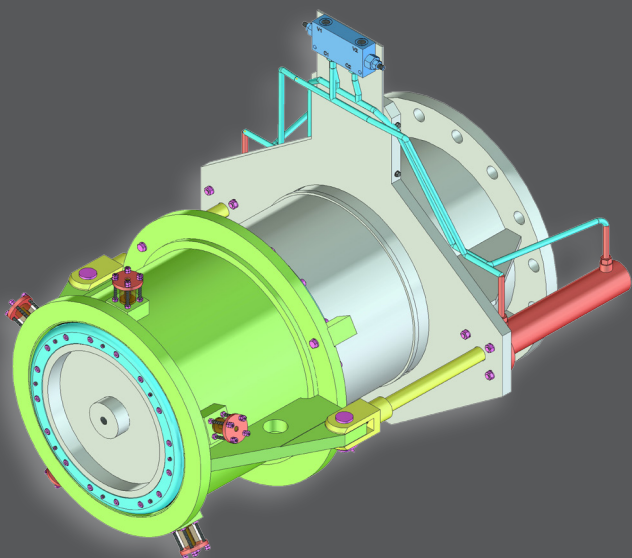
Our firm reserves the right to make any technical changes without any notice to the client.



## 01 Company

Over the years, Di Nicola has improved the design and manufacturing of Outlet cone fixed valves improving clients' processes, avoiding cavitation phenomena, vibrations and reduce their operation and maintenance costs long lasting. Our products are developed to meet and surpass even the most difficult conditions. Di Nicola manufacture outlet bottom dam valves cone , Hollow jet and Howell Bunger type open drain, room dissipation, or discharge submerged under construction EN S275J0 steel and stainless steel with high nickel content with sizes between 200 and 2000 mm and nominal pressures from 2.5 bar to 64 bar. Di Nicola manufacture such valves according to operation and installation conditions in order to create time by time a tailor made valve able to ensure performances in the particular conditions in which they will operate and erected. Di Nicola offer to its Customer dimensioning on project conditions time by time, although this catalogue is issued in order to give the most suitable standard informations to the end users.

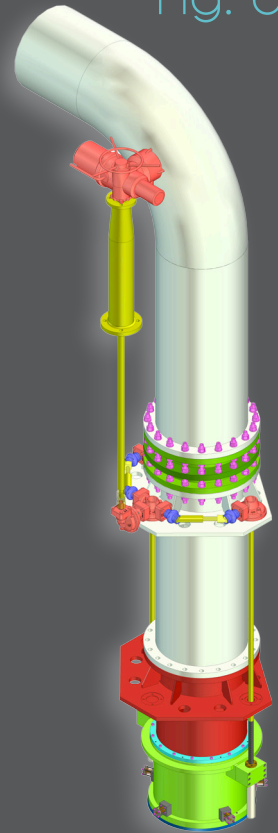
Fig. 5



## 02 Application

Di Nicola Outlet bottom Dam Fixed Cone, Hollow jet and Howell Bunger type Valve is used to regulate flow from dams and reservoirs. It is a free discharge valve that is commonly used as a turbine bypass valve, reservoir drain, or continuous discharge flow control valve. Di Nicola manufactures fixed cone valve with contoured ribs that eliminate the vibration problems associated when discharging into the atmosphere, the jet spreads out in a wide cone angle and breaks up into a fine spray. If containment of the jet is desired, a hood can be installed which concentrates the flow. Depending on the design of the stilling basin, Di Nicola fixed cone valves can be installed in:

Fig. 6



- A. Standard version with open discharge (Figure 5)
- B. Special version assembled with a hood pipe as a jet-guide pipe to concentrate the water flow after the valve,
- C. Submerged version in order to dissipate the hydraulic energy during discharging .
- D. Vertical version with discharge in a closed or semi opened chamber . (Figure 6).

The advantage of using a hollow-jet valve in combination with a hood pipe is that the water flow after the valve is concentrated nearly in the same diameter of the hood pipe.

## 03 Design

The valve shall be designed as a free discharging fixed cone valve capable of operating throughout its range without cavitation or vibration. The valve shall be metal/EPDM "O" ring seated achieving drip tight shut off. Di Nicola valve is the one and only Fixed cone Howell bungler valve with new "free spring sleeve design" avoiding any blocking due to breaking of adjusting springs located on the sleeve obturator in common competitors design.

## 04 Valve body

The body will be of a cylindrical design with an upstream flange for connecting to a conduit/pipe. The downstream end will contain an EPDM "O" Ring seal replaceable and encapsulated by means of a retaining stainless steel Aisi 304 flange anchored to the end of the valve body ( in standard version with open discharge ) with A2 bolting. The body will incorporate three vanes for smaller sizes ( Up to 400 mm) and five vanes for bigger diameters designed as stabilizers to allow the valve gate to travel from open to closed without vibration. The conical seat will be field replaceable without removing the valve from the line. The body will contain a rear seal groove to seal the sleeve gate and prevent leakage during operation.

## 05 Valve Sleeve obturator

The sleeve obturator is cylindrical and uses a linear motion to open and close the valve. In A , B and C version the gate seat is in St.st 304 /316 machined in conical shape . In D version (Vertical) with discharge in a closed or semi opened Chamber Seating is achieved by an internal EPDM "O" Ring seal replaceable and encapsulated by means of a retaining Aisi 304/316 stainless steel flange anchored to the sleeve by means of A2 bolting.

## 07 Testing

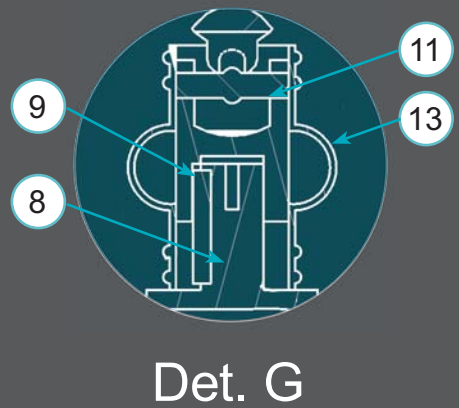
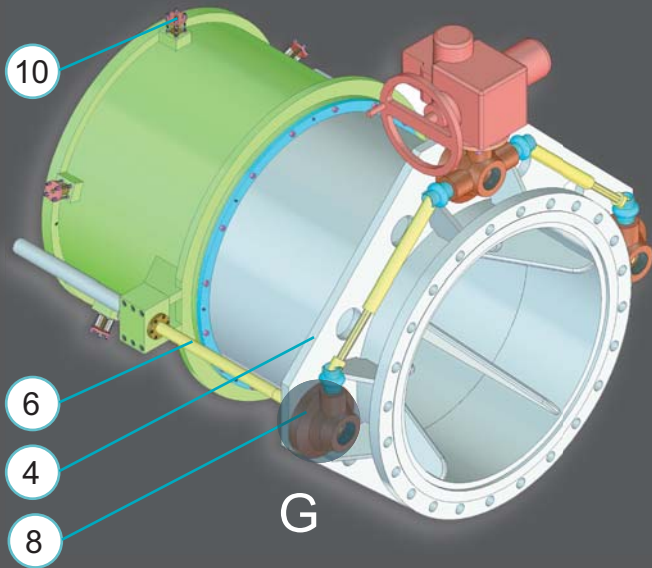
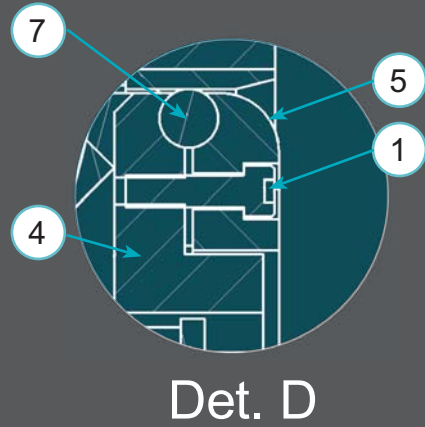
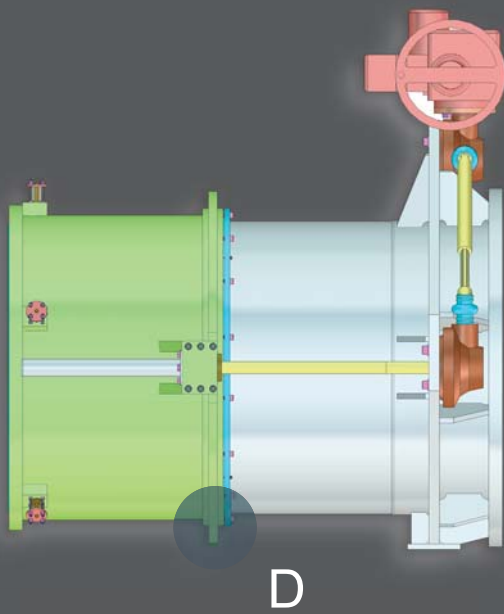
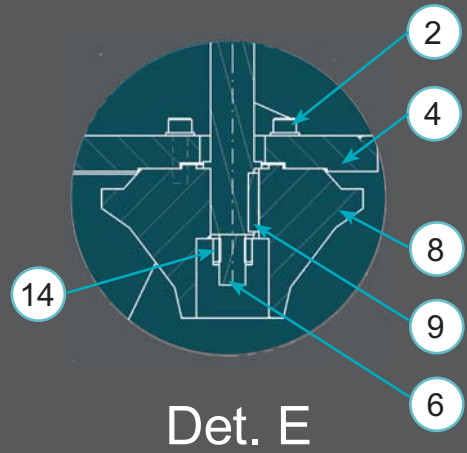
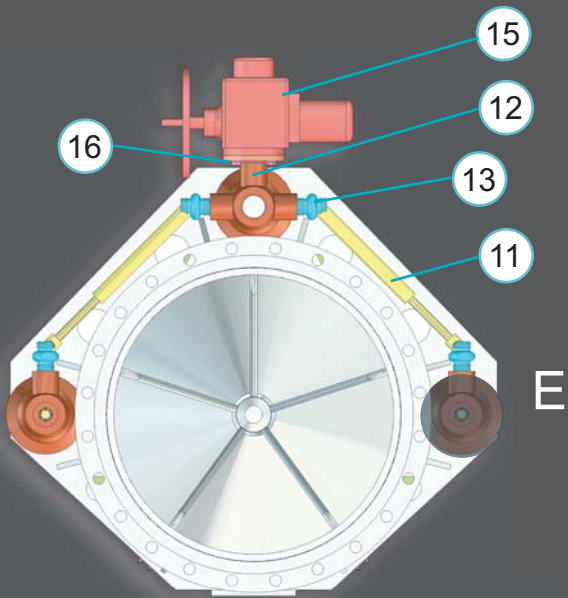
The valve shall be hydrostatically tested at 1,5 times working (rated) pressure for 10 minutes and shall show no sign of leakage at the welded areas or through the body. The body and gate (sleeve) seat when in the closed position shall be drip tight.

## 06 Hoods

When a hood is required to direct the discharge flow stream it should be attached to the valve sleeve gate by a connecting flange.

Item	Part name	Materials	Item	Part name	Materials
1	TCEI UNI5931	A2-70 UNI EN ISO 3506/2	9	Key	X5Cr Ni1810 EN 10088/3
2	TCEI UNI5931	A2-70 UNI EN ISO 3506/2	10	Obturator	S275J0/R EN 10025
3	Washer UNI 6592	X5Cr Ni1810 EN 10088/3	11	Cardan joint	X5Cr Ni1810 EN 10088/3
4	Body	S27J0/R EN 10025	12	Gear box	GJL250
5	Seat ring	S27J0/R EN 10025	13	Joint Cover	PR ISO 1629
6	Stem	X30CR13 EN 1088/3	14	Threaded pin UNI5927	A2-70 UNI EN ISO 3506/2
7	O-ring	NBR ISO 1629	15	Electric actuator	Assembled
8	Gear Box	GJL250	16	Bolt TE UNI 5739	A2-70 UNI EN ISO 3506/2





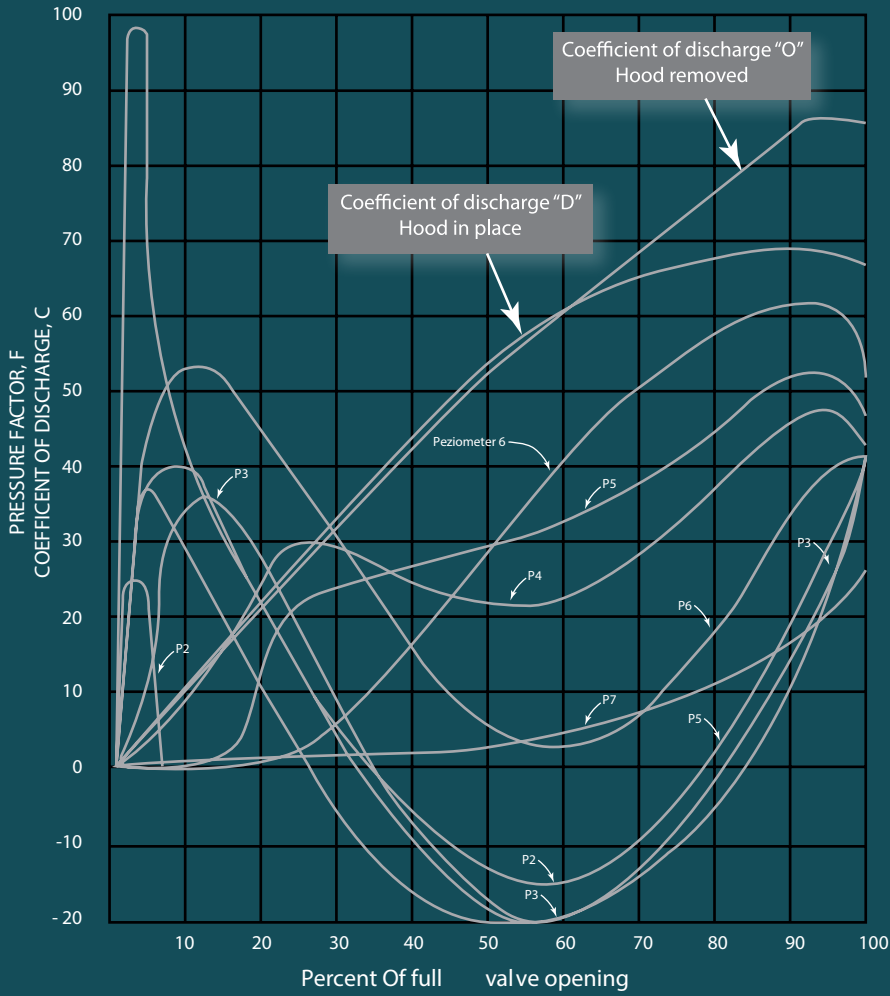
**NOTE**

$$H = \text{Total head} * h + \frac{1 \cdot V}{2a}$$

h = Static head one diameter upstream

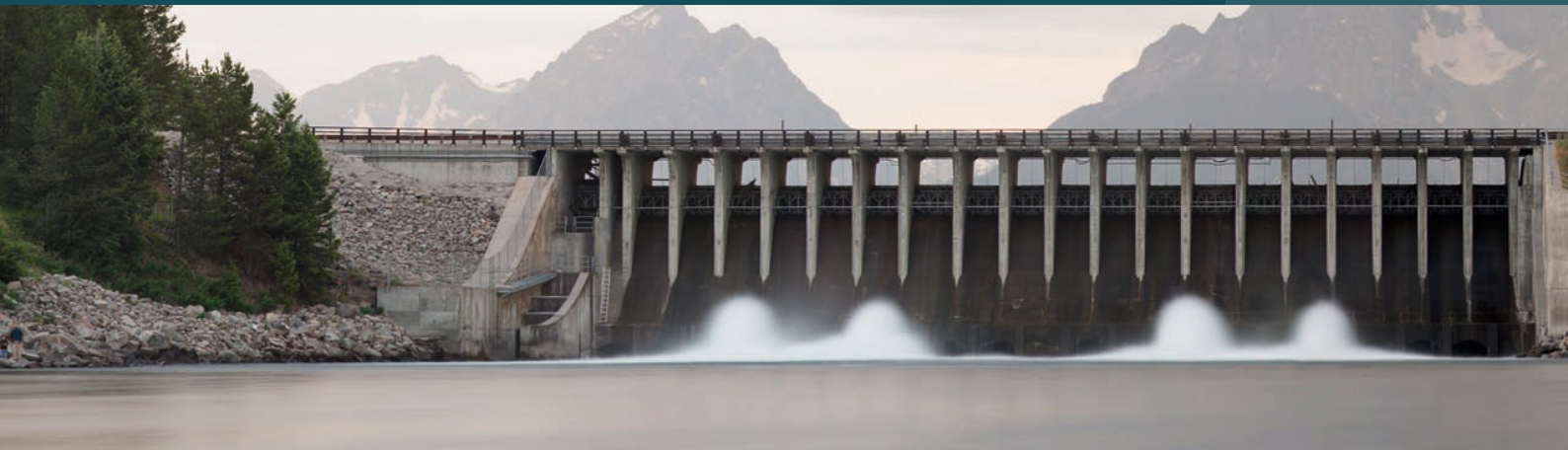
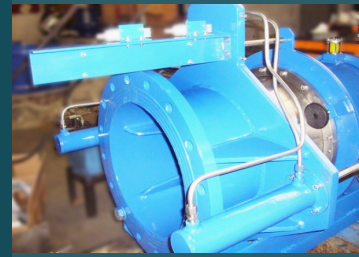
$$C = \frac{Q}{A \sqrt{2gh}}$$

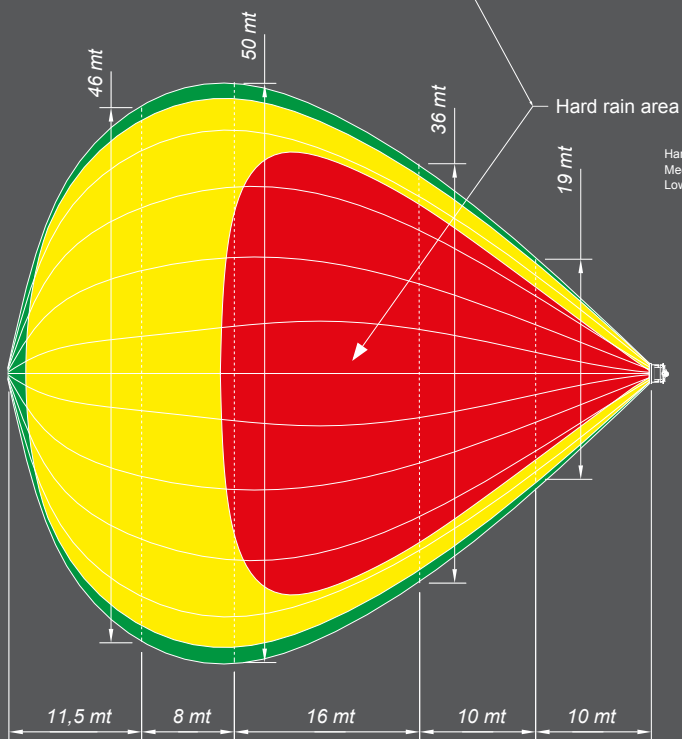
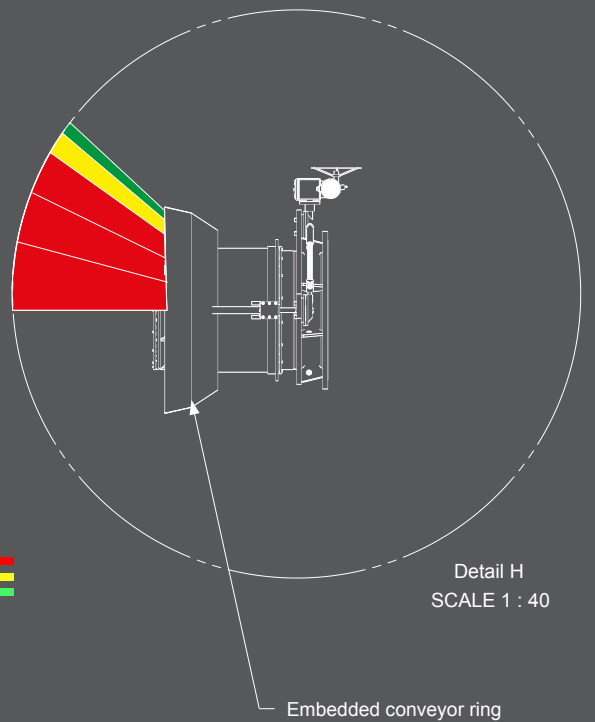
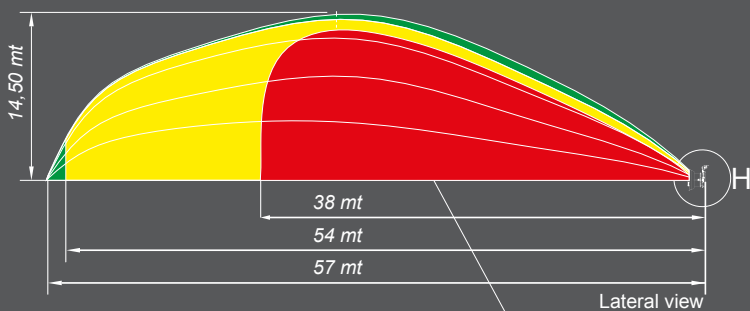
a = Inlet area sq. ft  
F = Measured piez. head



**HOWELL - BURGER VALVE STUDIES**  
**COEFFICIENT AND PRESSURE FACTOR CURVES**  
 PRESSURES AND CHARACTERISTICS DETERMINED FROM 6-INCH HYDRAULIC MODEL  
 VALVE DISCHARGING INTO ATMOSPHERE

- Dis. free - Hood in place
- - - Dis. free - Hood in removed





**Data:**

Head: 35 m H<sub>2</sub>O  
 vertical inclination of HB valve : 0°  
 Air resistance: not considered  
 dissipation phenomena: not considered  
 action of wind: not considered





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