The Flow Control Simphor is used to control the “Kicks” during logging operations in:

- Difficult wells
- Highly deviated or horizontal wells
- Hot formations
- Cased or open hole wells
- High pressure or temperature wells

(1) PATENTED AND TRADE MARK OF IFP
Oil or gas wells are drilled more and more deeper with higher down hole pressure and temperature. On standard logging or completion operations there is a direct fluid communication from the down hole to the surface through the conventional tool conveyed support and the drill pipes. Now, for safety reasons, in difficult wells, during the drilling and logging phases, clients require to control “kicks”, particularly, well flowing through drill pipes.

Vinci Technologies now proposes, the “FLOW CONTROL SIMPHOR”, able to eliminate the risk of “kicks” through drill pipe during the logging operation procedure from “pipe in” to “pipe out” of the well.

**PRINCIPLE OF THE SYSTEM**

The logging tools and electronic cartridges are connected to the tool support and attached to the end of the drill string. An electric connection is established downhole between the tool support and the electric transmission cable run inside the drill-pipes. A side entry sub takes the cable from the inside to the outside of the drill string, and is located in the vertical or slightly slanted part of the well.

A valve located inside the “FLOW CONTROL SIMPHOR”, underneath the male wet connector, stops the fluid flowing back from the formation pressure, and the mud pressure, inside the drill pipes.

The valve is normally closed. It is assumed that the valve would not allow drill pipe to fill from the borehole fluid as the pipe is tripped into the well. Frequent filling of the pipe from surface with mud, is necessary.

With the valve acting in closed position, drill pipes will be run dry in the well because no possible flow back from the formation through the “FLOW CONTROL SIMPHOR” and drill pipes.

During all logging operations with the “FLOW CONTROL SIMPHOR”, there is a continued ability to direct circulate through drill pipe to the formation. The fluid will return by the annulus because the valve is in open position.

Circulation is necessary to control the well, to cool down the electronic tools, to maintain the mud in circulation and to pump the wet connector during the latching operation. A set of screens are to filter mud from the well.

The wet connector is working in equalize pressure.
A FIELD PROVEN EQUIPMENT

SIMPHOR Modular equipment, Slim Hole and Ultra Slim Hole, has been commercially available, for many years, through the main logging services companies. So far several thousand commercial operations have been performed world-wide for most major oils companies and independents, and have demonstrated that higher efficiency and hence significant money savings could be obtained.

Also, accumulated experience in difficult, highly deviated hot environments and all types of complex wells has proven the high reliability of SIMPHOR system.

The New “FLOW CONTROL SIMPHOR”, present main advantages to secure the well, eliminated risk of “kicks” and flowing through drill pipe if unbalanced well and permit to make logs in smaller sizes wells.

MAIN ADVANTAGES OF THE “FLOW CONTROL SIMPHOR”

- Small diameter sinker bar : 1 11/16” (42 mm),
- Standard High Pressure, High Temperature wet connector (30,000psi, 400 °F)
- Piston floating valve
- Large flow rate are inside tool support permit mud circulation
- Mud circulation around the male connector for a better cleaning and reduced risks of debris accumulated inside tool support if screen are used
- Set of large screen to filter mud from the hole
- Possibility to remove screens if need
- Possibility to lock the valve if need
- The valve is naturally closed assisted with springs
- The valve is easily access to control and change it
- Low maintenance, no dynamic seal for the valve
- No need stroking the drill to cause the mud to purge. The differential pressure to open the valve is low. So when tripping out the drill pipe, the mud will flow down. This prevents pulling a wet string even at normal trip out speeds
- The logging head is fixed at the outside tube support and not directly to the male support. So it is stronger.
VARIOUS CONFIGURATIONS

<table>
<thead>
<tr>
<th>Simphor type</th>
<th>Connector</th>
<th>Sinker Bar</th>
<th>Flow Control</th>
<th>Connexion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modular 5”-3 3/8”</td>
<td>DLS 400</td>
<td>42 mm</td>
<td>Yes with the 5” body No with the 3 3/8” body</td>
<td>5” or 3 ½” DP if using the 5” body 3 ½” DP or 2 7/8” tubing if using the 3 3/8” body</td>
</tr>
<tr>
<td>Modular 4 1/2”- 2 3/4”</td>
<td>DLS 400</td>
<td>42 mm</td>
<td>Yes with the 4 1/2” body No with the 2 3/4” body</td>
<td>5” of 3 ½ “ or 2 7/8” DP if using the 4 ½ “ body 3 ½” DP or 2 7/8” tubing if using the 2 ¾” body</td>
</tr>
</tbody>
</table>

SPECIFICATIONS

Working conditions:
- Maximum Operating temperature ... from 60°F to 400°F
- Maximum Operating pressure ........ 30000 PSI
- Type of fluids ......................... All type including saturated salt water up to 300 g/l
- Sour atmosphere ...................... Yes up to 10 % H2S
- Maximum Differential pressure rating 500 bar (7,250 PSI)
- Maximum connecting speed of connector 3 m/s

Main electrical data:
- Withstanding voltage ............ Test : 1000 V AC
  Operating : 600 V DC
- Current ............ 5 Amps at room temp
  ............ 1.7 Amps at 350°F
- Electrical Insulation .......... 10 MΩ at 400°F contact to contact
  .......... 20 MΩ at 400°F contact to earth
  .......... 5000 MΩ at room temperature
- Compatible with different logging tools and cable heads (it has to be defined).

Auxiliary Equipment
- Side entry subs for
  ✓ 5” DP, 3”1/2 DP and 2” 7/8 tubing
- Cable cutter sub for
  ✓ 5”DP, 3”1/2 DP and 2” 7/8 tubing
- Cable protectors
  For 3 ½”, 4 ½ “ and 5” drill pipes

Protective sleeves for logging tools
Adapted to Induction, Sonic, Dual Laterolog, Density and Micro Scanner tools (other designs upon request). Can be run only with Standard and Modular Simphor.