

## Instrumentation and Controls for Hydrogen Applications

### PRESSURE & TEMPERATURE INSTRUMENTS

PRESSURE & TEMPERATURE SWITCHES



PRESSURE TRANSMITTERS



TEMPERATURE TRANSMITTERS



MANOMETERS THERMOMETERS



MILITARY AND SHIP CONSTRUCTION  
MINISTRY OF DEFENSE and assimilated  
(NAVAC-GROUP, NAVANTIA, ...)



RAILWAYS CONSTRUCTION  
ALSTOM, SNCF, RATP, BOMBARDIER,  
FAIVELEY, ...



POWER : PRODUCTION & TRANSPORT OF  
ELECTRICITY  
EDF, ENGIE, FRAMATOME, GE,  
CGN, KHNP, ...  
(Nuclear, Thermal, Hydraulic, Transport industries and  
assimilated)



### INTRINSICALLY SAFE ELECTRONIC INTERFACE COMPONENTS

INTRINSICALLY SAFE INTERFACES



ZENER BARRIERS



INDICATORS



SIGNAL CONDITIONING



Sûreté des Procédés Industriels

Currently installed at various sections in the H2 process chain

- Production: bio-mass, natural gases, etc...
- Conversion & Storage: electricity from renewable sources to H2 by electrolysis of water & synthetic methane
- Usage – Skids, railway applications



# HYDROGEN FOCUS



Hale Hamilton

	<p><b>Actuated Stop Valves Flanged High Pressure</b></p>	<ul style="list-style-type: none"> <li>• Max. Working pressure: up to 500 bar (7250 psi) Some adaptors may have a lower pressure rating - see adaptor data sheet</li> <li>• Flow factor (Cv): approx. 6</li> <li>• Nominal Bore: 15 mm</li> </ul>	<ul style="list-style-type: none"> <li>• Port Adaptors: see adaptor options. Other port adaptors can be supplied</li> <li>• Actuator Ports: Rc1/8 (1/8" BSP taper) female</li> <li>• Actuator Pressure: 6 to 10bar (87 to 145psi)</li> <li>• Temperature range: -20 to +70°C</li> <li>• Weight: approx. 9kg</li> </ul>
	<p><b>Actuated Stop Valves</b></p>	<ul style="list-style-type: none"> <li>• Inlet pressure: up to 420 bar (6090 psi) Some adaptors may have a lower pressure rating - see adaptor data sheet</li> <li>• Flow factor (Cv): 5.5</li> <li>• Nominal Bore: 13 mm (1/2")</li> <li>• Port Adaptors: see adaptor options. Other port adaptors can be supplied</li> </ul>	<ul style="list-style-type: none"> <li>• Actuator Ports: Rc1/8 (1/8" BSP taper) female</li> <li>• Actuator Pressure: 6 to 10bar (87 to 145psi)</li> <li>• Temperature range: -40 to +70°C (-10 to +70°C for ASV158 Mk1)</li> <li>• Weight: approx. 8kg</li> </ul>
	<p><b>N Series Stop Valve</b></p>	<ul style="list-style-type: none"> <li>•Maximum working pressure: Brass body - 420 bar (6090psi) Stainless steel body - 500 bar (7250psi) Some adaptors may have a lower pressure rating - see adaptor options</li> <li>• Nominal Bore: 11mm (7/16")</li> <li>• Flow factor (Cv): 4.5</li> </ul>	<ul style="list-style-type: none"> <li>• Port Adaptors: see adaptor options. Other port adaptors can be supplied</li> <li>• Temperature range: -20 to +70°C</li> <li>• Weight: less than 4.8kg excluding adaptors. Adaptors are approximately 0.4kg each.</li> </ul>
	<p><b>Series DR &amp; DFR</b></p>	<ul style="list-style-type: none"> <li>•Intel Pressure: 420 barg (6000 psig)</li> <li>•Seat Sizes: 1/4", 3/8", 1/2", 3/4", 1"</li> <li>•Regulator Cv: 2,3,4,5,9,12</li> <li>•Outlet Pressure: 250 barg (3625 psig)</li> <li>•Pilot Regulator Setting Ranges: 0-2- barg (0-290 psig, 0-10 barg (0-145 psig)</li> </ul>	<ul style="list-style-type: none"> <li>•Filtration (microns): 10 &amp; 20</li> <li>•Service Temperature Range (HNBR – Standard option): -40°C to 80°C</li> <li>•Service Temperature Range (FPM): -20°C to 150°C</li> <li>•Service Temperature Range (EPDM): -20°C to 150°C</li> <li>•Seat and Outboard Leakage (standard): Bubble Tight</li> <li>•Body / Dome material: Stainless Steel 316L</li> </ul>
	<p><b>N6 High-Pressure Stop Valve – “Pi” Marked for TPED</b></p>	<ul style="list-style-type: none"> <li>• Nominal Bore: 11mm (7/16")</li> <li>• Design pressure: up to 414 bar (6000 psi)</li> <li>• Flow factor (Cv): 4.5</li> <li>• Weight: less than 3kg</li> </ul>	<ul style="list-style-type: none"> <li>• Inlet &amp; outlet Ports: G3/4 male (seal on end face of port)</li> <li>• Temperature range: -20 to +70°C</li> </ul>
	<p><b>Stop Valves Flanged High Pressure TPED</b></p>	<ul style="list-style-type: none"> <li>• Max. Working pressure: up to 500 bar (7250 psi) Some adaptors may have a lower pressure rating - see adaptor data sheet</li> <li>• Flow factor (Cv): approx. 6</li> <li>• Nominal Bore: 15 mm</li> </ul>	<ul style="list-style-type: none"> <li>• Port Adaptors: see adaptor options. Other port adaptors can be supplied</li> <li>• Temperature range: -20 to +70°C</li> <li>• Weight: approx. 6kg</li> </ul>
	<p><b>NRS &amp; NR series High-Pressure Non-Return Valve</b></p>	<p><b>Standard Specifications</b></p> <ul style="list-style-type: none"> <li>• Temperature range: -20 to +70°C (extended temperature range versions can be supplied)</li> </ul>	<p><b>Standard materials</b></p> <p>Body: Nickel Aluminium Bronze, Brass, Monel or Inconel • Spindle: Stainless Steel or Phosphor Bronze • O rings: Nitrile, Viton</p>
	<p><b>Series 28-15 NACE Hydraulic or Gas Applications</b></p>	<p><b>Standard Specifications</b></p> <ul style="list-style-type: none"> <li>• Inlet pressure: up to 465 bar (6750 psi) for gas, up to 690 bar (10000 psi) for liquid</li> <li>• Temperature range: -20 to +70°C (extended temperature range versions can be supplied)</li> <li>• Regulators for gas service have a filter in the inlet</li> </ul>	<p><b>Standard materials</b></p> <ul style="list-style-type: none"> <li>• Body: Stainless Steel</li> <li>• Valve: Stainless Steel</li> <li>• Valve Seat: PEEK or Stainless Steel (GHP25 &amp; GLP26)</li> <li>• O rings and Diaphragm: Nitrile</li> <li>• Back up rings: PTFE</li> </ul>



# HYDROGEN FOCUS



<b>Series 28-20 NACE Compatible Regulator for Hydraulic Oil or Gases</b>	<b>Standard Specifications</b> <ul style="list-style-type: none"> <li>• Inlet pressure: up to 465 bar (6750 psi) for gas, up to 690 bar (10000 psi) for liquid</li> <li>• Temperature range: -20 to +70°C (extended temperature range versions can be supplied)</li> <li>• Regulators for gas service have a filter in the inlet</li> </ul>	<b>Standard materials</b> <ul style="list-style-type: none"> <li>• Body: Stainless Steel</li> <li>• Valve: Stainless Steel</li> <li>• Valve Seat: PEEK</li> <li>• O rings and Diaphragm: Nitrile</li> <li>• Back up rings: PTFE</li> </ul>
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FEATURES
Zero leakage up to 95% of cracking pressure
Positive reseal at high percentage of cracking pressure
Accurate set pressure
PED certifications and CE marking available for most models
No chatter or squeal
No pressure rise with increasing flow
Externally adjustable



TECHNICAL DATA	5300 Series (RV53-73 valve)
Operating Pressure	400 to 10,500 psig
Proof Pressure	16,000 psig
Burst Pressure	40,000 psig min
Operating Temperature	-65° F to +250° F
Service Media	Gaseous Hydrogen
Leakage Ascending Pressure	5cc/min max to 95% of CP
Leakage Descending Pressure	15cc/min max at reseal
Lubricant	Seals, Threads and spring ends with PFPE

If you require transport or storage hydrogen, at Tamo we can help you to find the perfect solution. Contact us and talk with our engineers, call us on 01895200015 or send us an email to sales@tamo.co.uk