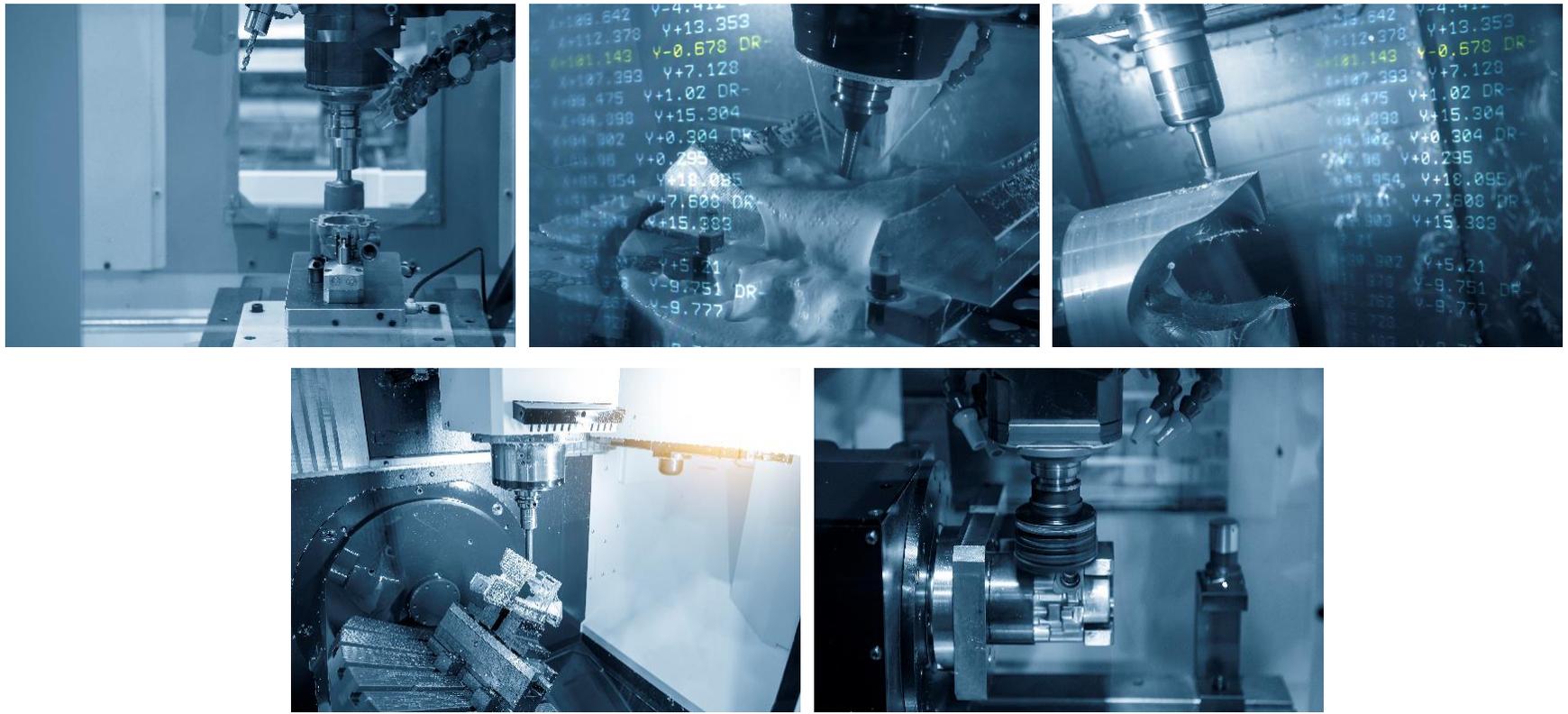


High Pressure Devices and Components
For Hydrogen Fuel Cell Applications

HAMAI

Tokyo, Japan



WHAT HAMAI CAN DO

We are committed to contributing to the development of the industrial world by creating new innovations by maintaining our longstanding commitment to "safety," "security" and "high quality" and improving our advanced technologies.



Company History

HAMAI was founded in February 1927 by Sakae Hamai for the purpose of manufacturing gas blowers.

We started manufacturing valves for LPG cylinders in 1953.

Two plants are located in Otaki County, Chiba Prefecture and Fuchu City, Tokyo.

- Otaki plant manufactures LPG cylinders valves and ball valves for facilities.
- Fuchu plant manufactures a wide range of valves for high-pressure gas and special gases.

And in 2002 . . .

For more product information, please visit our website.

<http://www.hamai-valve.com/>

HAMAI
INDUSTRIES LTD.
SINCE 1927



TIMELINE

RESEARCH & DEVELOPMENT FOR THE VALVES OF HYDROGEN FUEL CELL VEHICLES

Research & development has begun

HAMAI launched a project that focuses on the development of hydrogen fuel cell valves.

2002

2008

Developed

HAMAI developed an in-tank solenoid valve for 35 MPa hydrogen fuel cell vehicles.

35MPa Solenoid Valve

35MPa hydrogen fuel cell vehicle equipped with a 35 MPa in-tank solenoid valve was released from a major automobile manufacturers to North America and Japan.



Developed 70MPa devices

Several products developed for 70MPa hydrogen fuel cell vehicles were installed in the vehicles and leased in North America and Japan.



2009

Started development of 70MPa

HAMAI started development of the valves and components for 70MPa hydrogen fuel cell vehicle.

2014

70MPa Thermal Pressure Relief Device

HAMAI Developed Thermal Pressure Relief Device for 70MPa hydrogen fuel cell vehicle and acquired Global Technical Regulation (GTR No.13) and UN-R134 .

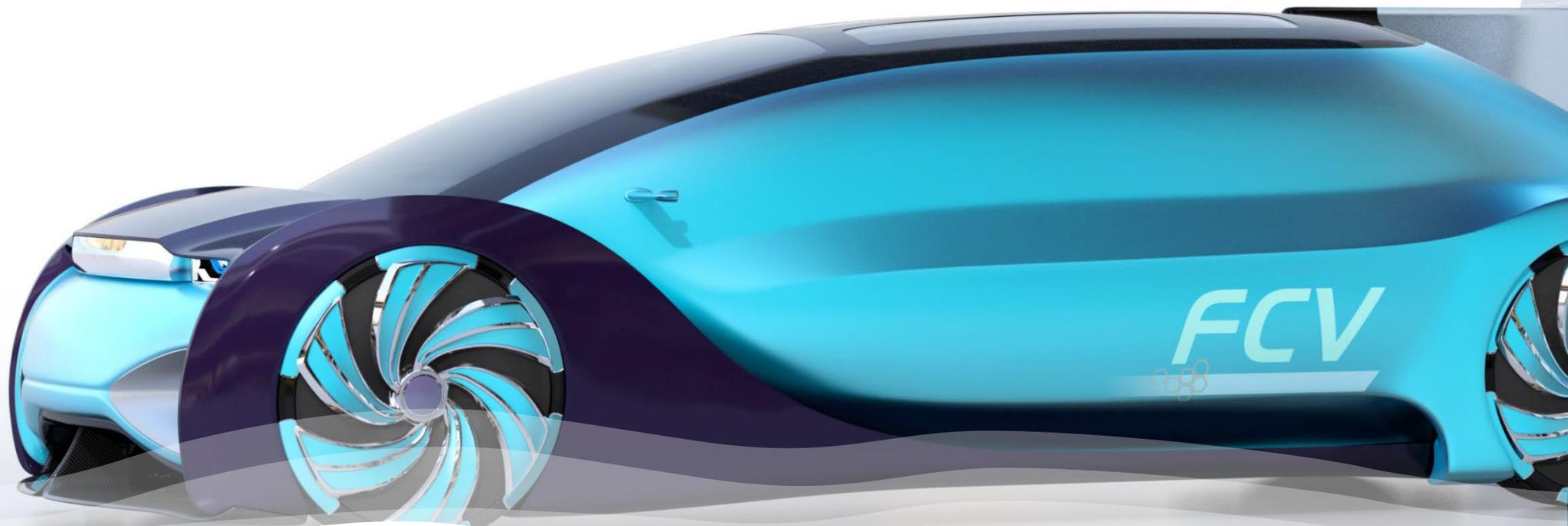


2015

Developed 70MPa Solenoid Valve

HAMAI developed 70MPa solenoid valve ,regulator , several devices and components for 70 MPa hydrogen fuel cell vehicles.

2020



OUR HYDROGEN PROJECTS

Towards to The Next Generation Energy “Hydrogen”
To Support the *Future* world power

HAMAI continues to challenge for the future

For **Hydrogen** Fuel Cell Applications

70MPa VALVES

HAMAI has developed a full range of On-tank valve, Thermal pressure relief device (TPRD), End-boss TPRD, Regulator, Check valve and Receptacle for 70 MPa hydrogen fuel cell applications.

These devices and components are for hydrogen fuel cell vehicles and heavy-duty vehicles(buses, trucks and trains). 70MPa devices comply with major international standards.

- On-tank Solenoid Valve
- TPRD
- End-boss TPRD
- Regulator
- Check Valve
- Receptacle



Design and Production : HAMAI in Japan



ON-TANK VALVE OSVA-H70

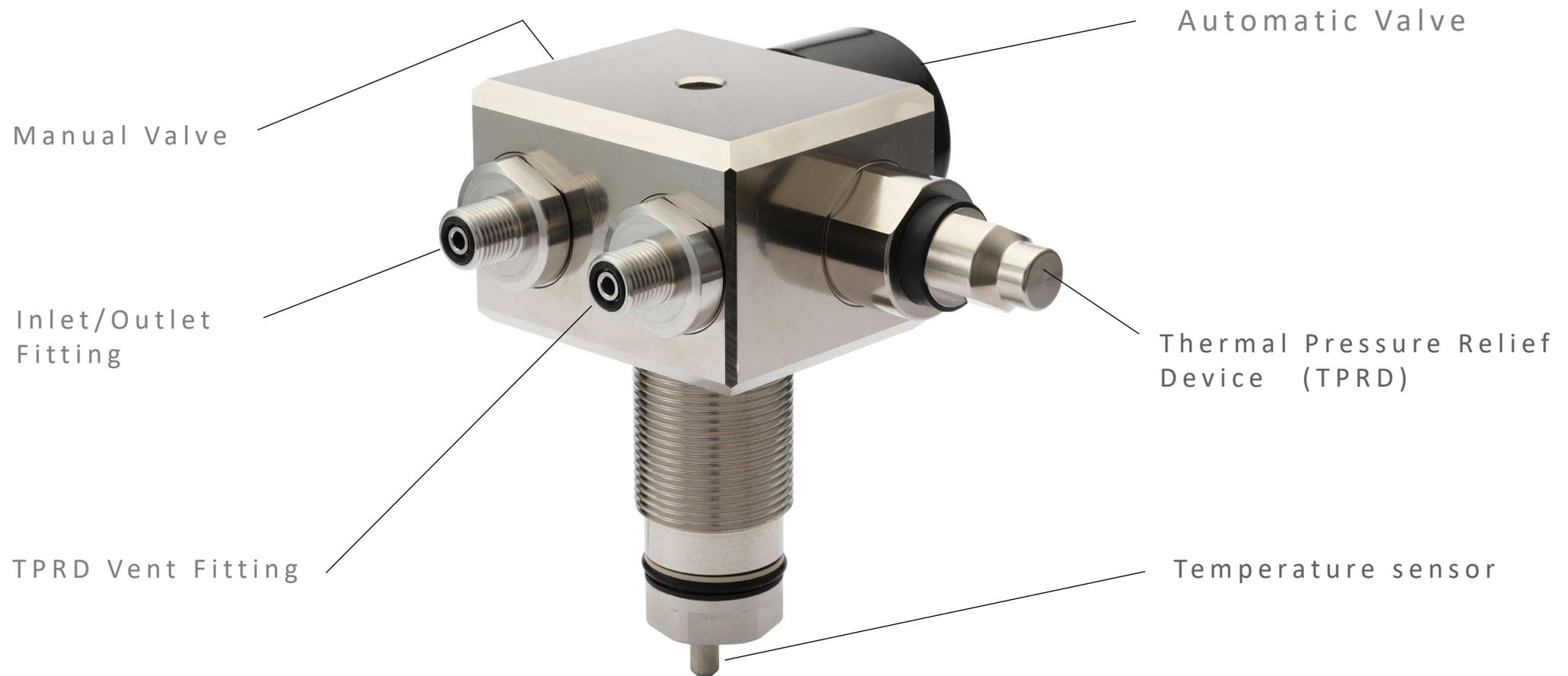
Design Specifications

Nominal Working Pressure (NWP)	70MPa (700bar) @15°C
Max operating pressure (MOP)	87.5MPa (875bar)
Temperature range	-40°C~+85°C
Coil	(※)
Temperature sensor	Thermocouple
Body material	Aluminum
Filter size	(※)
TPRD activation temperature (PRD-AH70)	112°C
Compliance standards	Global Technical Regulation No.13 High Pressure Gas Safety Act.(JP)

(※) Depending on user requirement specifications

OSVA-H70

OSVA-H70 is designed to interact with all the required performance for 70MPa Hydrogen Applications. Mobilities (70MPa FCV, buses, tracks, trains and motorbikes) and service facilities (storage and transport).

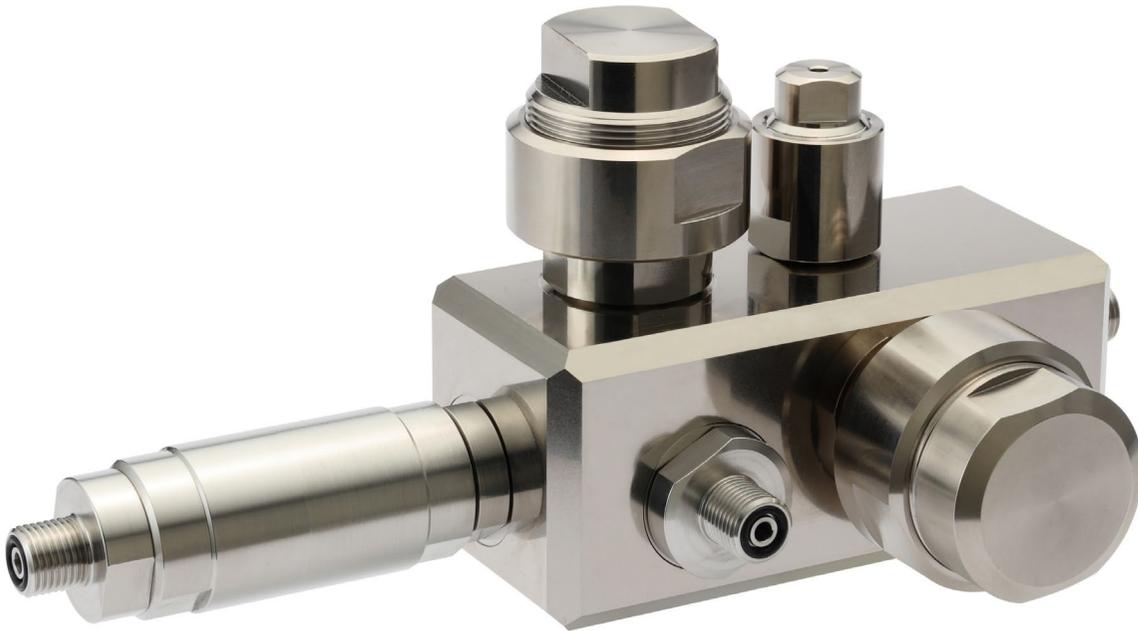


Design and Production : HAMAI in Japan

REGULATOR

RE-H70

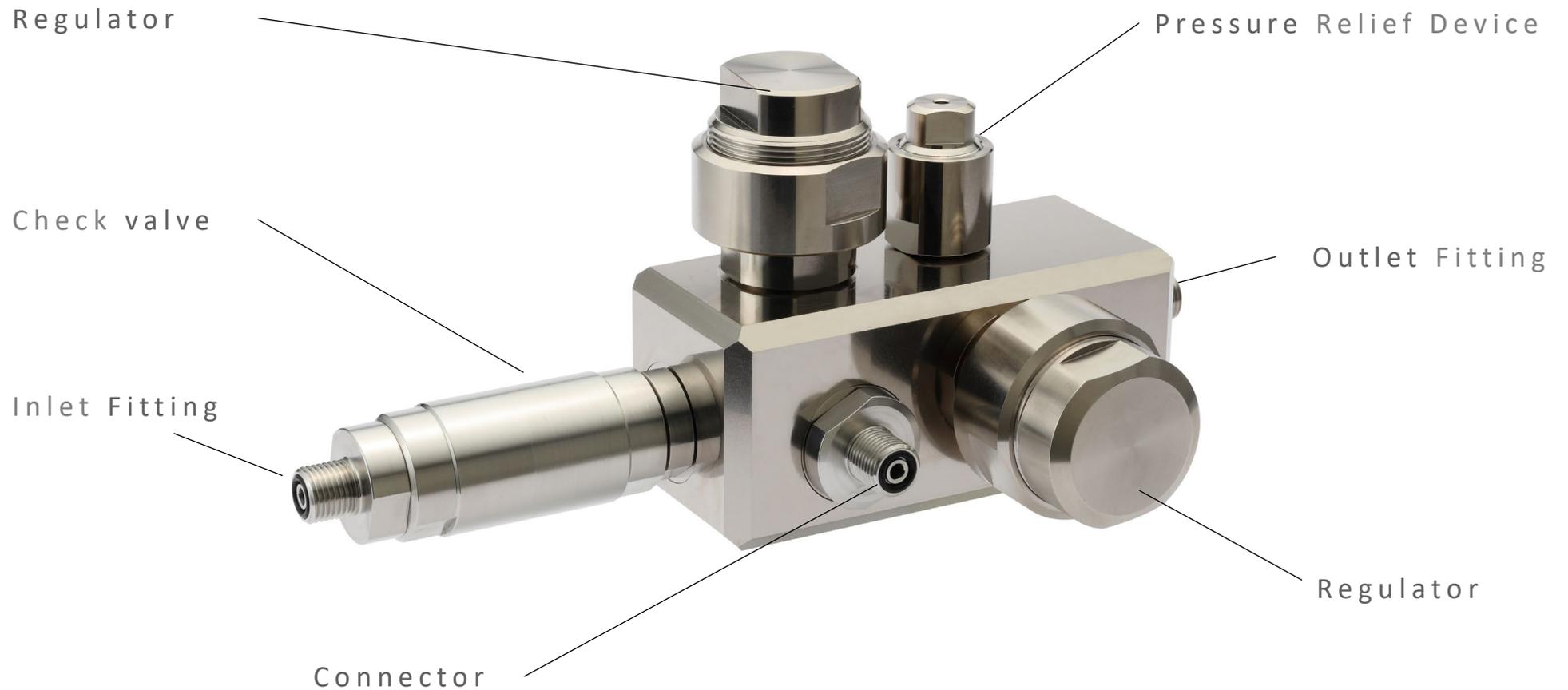
Design Specifications



Inlet Nominal Working Pressure	70MPa (700bar) @15°C
Inlet Max operating pressure	87.5MPa (875bar)
Temperature range	-40°C~+85°C
Regulated pressure	Inlet : NWP70MPa @15°C Outlet :1.5MPa (±0.5MPa) @15°C

RE-H70

The RE-H70 provides optimal and stable pressure reduction performance when used in combination with OSVA-H70.



DEVICES H70



**THERMAL PRESSURE RELIEF DEVICE
(Temperature Triggered)
PRD-AH70**

With 70MPa FCV



**END BOSS
THERMAL PRESSURE RELIEF DEVICE
(Temperature Triggered)
EPRD-H70**

For 70MPa FCV

DEVICES H70



CHECK VALVE

CEK-H70-E01

For 70MPa FCV



RECEPTACLE

FSP-H70-E01

For 70MPa FCV

DEVICES H70

Model	PRD-AH70	EPRD-H70	CEK-H70-E01	FSP-H70-E01
Nominal Working Pressure (NWP)	70MPa (700bar) @15°C			
Max operating pressure (MOP)	87.5MPa (875bar)			
Temperature range	-40°C~+85°C			
Body Material	Aluminum	Aluminum	Stainless steel	Stainless steel
Filter size	—		(※)	(※)
TPRD activation temperature	112°C		—	—
Certifications	UNECE Regulation R-134 UNECE Regulation R-146 Global Technical Regulation No.13 High Pressure Gas Safety Act.(JP)		—	SAEJ2600 : 2015 ISO17268 : 2012

(※) Depending on user requirement specifications

For **Hydrogen** Fuel Cell Applications

35MPa VALVES

HAMAI has developed a complete range of high pressure valves, In-tank solenoid valve with Regulator and Thermal pressure relief device, End-boss TPRD, Check and Receptacle for hydrogen fuel cell vehicles.

- In-tank Solenoid Valve with regulator and TPRD
- End-boss TPRD
- Check Valve
- Receptacle



Design and Production : HAMAI in Japan

IN-TANK VALVE ISVA-H501

Design Specifications



Nominal Working Pressure (NWP)	35MPa (350bar) @35°C
Max operating pressure (MOP)	43.75MPa (437.5bar)
Temperature range	-40°C ~ +85°C
Coil	(※)
Temperature sensor	Thermocouple
Body material	Stainless steel
Filter size	(※)
TPRD activation temperature (PRD-SH70)	112°C
Regulated pressure (RE-H35)	Inlet :NWP35MPa Outlet :1.5MPa (±0.5MPa)

(※) Depending on user requirement specifications

ISVA-H501

ISVA-H501 is designed to interact with all the required performance for mobilities (35MPa FCV, buses, tracks and forklifts) and service facilities (storage and transport).



DEVICES H35



REGULATOR

RE-H35

For 35MPa FCV



RECEPTACLE

FSP-H35-E01

For 35MPa FCV

DEVICES H35

Model	RE-H35	FSP-H35-E01
Normal Working Pressure (NWP)	35MPa (350bar)	
Max operating pressure (MOP)	43.8MPa (438bar)	
Temperature range	-40°C~+85°C	
Body Material	Stainless steel	Stainless steel
Filter size	—	(※)
Regulated pressure	Inlet : NWP35MPa Outlet : 1.5MPa (±0.5MPa)	—
Certifications	—	SAEJ2600 : 2015 ISO17268 : 2012

(※) Depending on user requirement specifications

For **Hydrogen** Transport Vehicles and Trucks

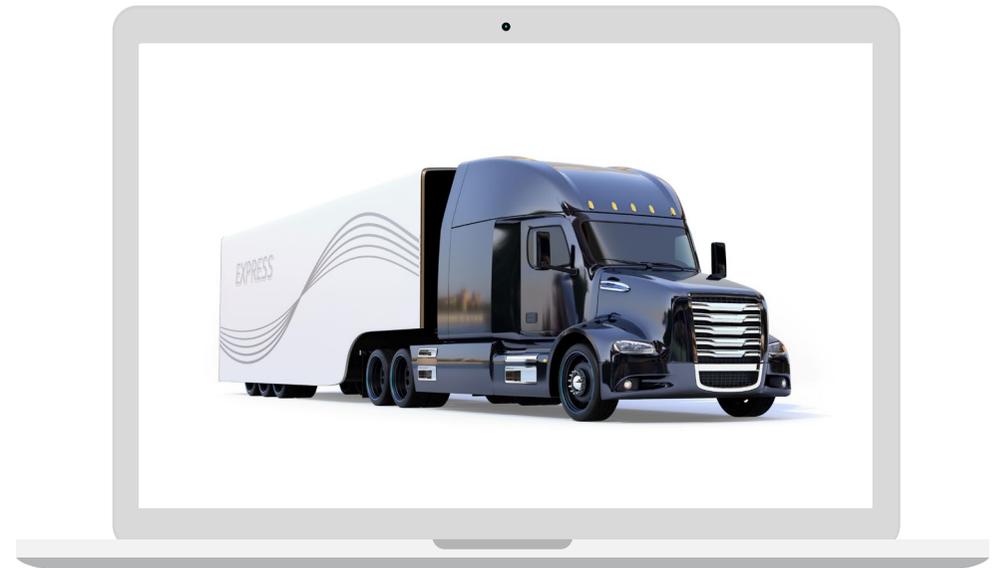
45MPa VALVES

HAMAI has developed high pressure valves and end boss TPRD as a complete range of components for the supply, transport, truck and storage of compressed hydrogen gas.

The manual valves and thermal pressure relief device for use at medium pressure of 45 MPa can be used in a wide range of applications.

In the low pressure range, HAMAI also offer a range of valves and purge and relief valves for hydrogen supply.

- Manual Valve
- End-boss TPRD



VALVE H45

MODEL: **OTMV-H45**

SERVICE PRESSURE: **45MPa (450bar)**

TEMPERATURE RANGE: **-40°C to +85°C**

ACTIVATION TEMPERATURE: **109°C±3°C**

CERTIFICATION: High Pressure Gas Safety Act.(JP)
JPEC-S0006(2016)

Design and Production : HAMAI in Japan.
For the Japanese Market



**MANUAL VALVE
with TPRD
OTMV-H45**



**END BOSS THERMAL
PRESSURE RELIEF DEVICE
EPRD-H45**

OUR POLICY

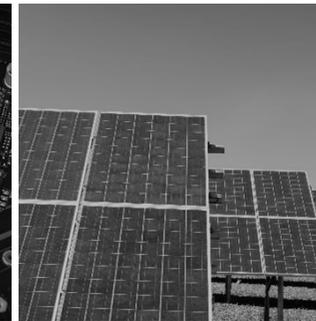
HAMAI continues to implement and grow our quality policy with all its employees in order to meet the diversified needs of our customers and to "provide better products stably"

TO STUDY THE ADVANCED TECHNOLOGIES

HAMAI focus on the development of products with higher value-added functions in response to the demands of an era in which the evolution of information technology requires major changes.

TO CREATE THE INNOVATION

HAMAI commits to contributing to the development of the industrial world by creating new innovations by maintaining our longstanding commitment to "safety," "security" and "high quality" and improving our advanced technologies.



OUR FACILITIES



RESEARCH AND DEVELOPMENT

Our R&D Department is a team of top engineer with long experience in high pressure components, fluid control studies and safety devices. HAMAI has a laboratory and dedicated equipment for development and can perform internally a variety of tests.



PRODUCTION AND IMPROVEMENT

Our Production Department is capable of :

- Work with the R&D Department to design production and improve products for commercialization.
- Product validation.
- Formation of a production system for prototype lots and mass production lots.



QUALITY

HAMAI implement the following quality control system :

- APQP Validation Process
- CPKS definition
- IMDS
- PFMEA
- Failure root analysis
- Continues improvements
- Auditing suppliers
- Certifications and Approvals



MACHINING

HAMAI has a wide range of machining and automation systems, including high-performance, high-efficiency multitasking machines and machining centers. We use them flexibly to finish products and parts that are complex and require high machining accuracy.

Stay in touch with Us

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