ALMACENAMIENTO DE H_2

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Executive Summary

Calvera will design and manufacture the hydrogen trailers, the mobile storage modules and associated auxiliary systems (i.e., pressure reduction units for the operation of the FC at the Port of Palma in WP 2 and 3.).

Considering the equipment that Calvera must supply in this project, the present document aims to provide the specification of each equipment that will be supplied by Calvera.

1. Equipment

CALVERA MAQUINARIA E INSTALACIONES S.L will supply the following equipment according to the Gran Agreement Number 101007201:

Equipment	Quantity	Description
H_2 tube trailer	2	H_2 tube trailer with a minimum capacity of 462 Kg (@15ºC) each at 300 bars.
H_2 mobile storage	6	Mobile storage with a minimum capacity of 18 Kg each at 300 bars.
Hydrogen Filling Panel	1	Unloading station for the tube trailer and H_2 supply to the Fuel Cell.

1.1 H_2 Tube Trailer

Calvera will supply two H_2 tube trailers with the same characteristics. The tube trailers transport the hydrogen, produced by solar energy, from PV parks to the different end users.

General properties			
Item	Description	Specification	Notes
1	P&ID	IDI20001-GH-PID-CONT30	See appendix 1
2	Units	2	
3	TAG	To be defined by client	
4	Manufacturer	Calvera	
5	Model	H_2-T MEGC 30 feet 300 bar	
6	Type	MEGC – CYLINDERS TYPE II	
7	Cylinders position	Cylinders in vertical position	
8	Service	Hydrogen transport (Gas)	
9	Design codes and standards	ADR 2021 TPED 2010/35/EU UNE-EN13807:2017	

General properties			
Item	**Description**	**Specification**	**Notes**
		EN 13480-3:2017 ISO 11119-1:2020	
10	Location	Outdoor	
11	ATEX Classification	Zone 2 IIC T1	

Environmental Conditions			
Item	**Description**	**Specification**	**Notes**
12	Altitude above sea level (m)	13	
13	Air Quality	Ambient air	
14	Room temperature (min/max) ºC	-12.1/+38.6	
15	Barometric pressure (bar)	1.013	
16	Relative humidity (%)	70-85	
17	Max. wind speed (m/s)	9.7	

Operating Conditions			
Item	**Description**	**Specification**	**Notes**
19	Input/Output connection	RBL11 quick release coupling (Stäubli). IDI20001-GH-RBL-QUICK.	See appendix 4
20	Type of fluid (Input/Output)	Hydrogen (Gas)	
21	Operating pressure (bar)	300	
22	Operating temperature (ºC)	-20/+65ºC	
23	H_2 composition (%)	>99.995	
24	Heat generated (kW)	N/A	
25	Energy consumed (kW)	N/A	
26	Power supply (Vac)	N/A	

Operating Conditions			
Item	Description	Specification	Notes
27	Compressed air pressure (bar)	6 < P < 10	Instrument air to MEGC panel must comply with ISO 8573-1: 2010

Design Conditions			
Item	Description	Specification	Notes
28	Design room temperature (ºC)	-20/+65	
29	Design temperature (ºC)	-20/+65	
30	Design pressure (bar)	450	ACC. EN 13807:2017

Mechanical properties			
Item	Description	Specification	Notes
31	Input/Output connection	RBL11 quick release coupling (Stäubli)	Male conector
32	Hydrogen capacity Tº: 15ºC (Kg)	462	
33	Capacity Nm3 – Tº: 0ºC (Nm3)	5690	
34	Storage capacity (vol. of water) (m3)	21.87	
35	Number of cylinders	143	
36	Capacity per cylinder (m3)	0.153 ± 3,5%	
37	Length x Depth x Height (mm)	9125 x 2438 x 2215	Gas structure
38	Material of pipping and tubing	AISI 316	
39	No load weight (Kg)	27442	Gas structure
40	No load weight (Gas structure + Chassis) (Kg)	32442	Without tractor head
41	External treatment	C5M	Structure

TEST			
Item	Description	Specification	Notes
42	Hydrostatic test	PWX x 1.5 = 450 bar	Only welded parts
43	Leak test	PW=300 Bar	

Scope of Calvera for supply			
Item	Description	Specification	Notes
44	Transport	Yes	Mallorca
45	Installation	No	
46	Unloading equipment	No	
47	Training	Yes	To be defined
48	FAT	According to internal procedure	
49	SAT	According to internal procedure	

Fittings			
Item	Description	Specification	Notes
50	Ball valve	Yes	H_2 storage
51	Manometer	Yes	H_2 storage
52	Anti-tow away	Yes	Chassis
53	Rear obstacle detector	N/A	Chassis
54	Camera	N/A	Chassis
55	Ground connection	Yes	Chassis

Spare parts			
Item	Description	Specification	Notes
56	Commissioning	N/A	

Spare parts			
Item	**Description**	**Specification**	**Notes**
57	Spare part list (2 years)	To be defined	

Certificates/Documents			
Item	**Description**	**Specification**	**Notes**
58	CE/TPED marking	Yes	
59	Material 3.1 certificates	Yes	Only cylinders and piping

1.2 H_2 mobile storage

Calvera will supply six mobile modules to storage the H_2. These will be installed in one of the end users.

Due to project requirements these modules will not be used as mobile storage as was initially agreed. Therefore, these six modules will be stationary storage and they work as a single storage.[1]

They can be used as single storage because Calvera supply one manifold, which will interconnect the six H_2 mobile storages. The input/Output of this manifold will be the same as used in each mobile storage.

The installation of this manifold is out of the scope of Calvera supply.

General properties			
Item	**Description**	**Specification**	**Notes**
1	General Arrangement	IDI20001-GH-GA-H2GT6	See appendix 2
2	Units	6	
3	TAG	To be defined by client	
4	Manufacturer	Calvera	
5	Model	H2T6-T2-Pod	
6	Type	CYLINDERS TYPE II	
7	Cylinders position	Vertical	

[1] On 11/07/2022 the officer request rewording "H_2 mobile storage" → "H_2 stationary storage". The change is not done due to requirements of Grant Agreement as Calvera clarify in the clarification letter sent.

General properties			
Item	**Description**	**Specification**	**Notes**
8	Service	Hydrogen storage (Gas)	
9	Design codes and standards	ADR 2021 TPED 2010/35/EU UNE-EN13807:2017 EN 13480-3:2017 ISO 11119-1:2020	
10	Location	Outdoor	
11	ATEX Classification	Zone 2 IIC T1	

Environmental Conditions			
Item	**Description**	**Specification**	**Notes**
12	Altitude above sea level (m)	13	
13	Air Quality	Ambient air	NO2, PM10, PM2,5
14	Room temperature (min/max) ºC	-12.1/+38.6	
15	Barometric pressure (bar)	1.013	
16	Relative humidity (%)	70-85	
17	Max. wind speed (m/s)	30.83	

Operating Conditions			
Item	**Description**	**Specification**	**Notes**
18	Input/Output connection	RBL06 quick release coupling (Stäubli). IDI20001-GH-RBL-QUICK	Se appendix 4
19	Type of fluid (Input/Output)	Hydrogen (Gas)	
20	Operating pressure (bar)	300	
21	Operating temperature (ºC)	-20/+65ºC	

Operating Conditions			
Item	**Description**	**Specification**	**Notes**
22	H_2 composition (%)	>99.995	
23	Heat generated (kW)	N/A	
24	Energy consumed (kW)	N/A	
25	Power supply (Vac)	N/A	

Design Conditions			
Item	**Description**	**Specification**	**Notes**
26	Design room temperature (ºC)	-20/+65	
27	Design temperature (ºC)	-20/+65	
28	Design pressure (bar)	450	

Mechanical properties			
Item	**Description**	**Specification**	**Notes**
29	Input/Output connection	RBL06 quick release coupling (Stäubli)	Male conector
30	Hydrogen capacity Tº: 15ºC (Kg)	19.38	
31	Capacity Nm3 – Tº: 0ºC (Nm3)	238.76	
32	Storage capacity (vol. of water) (m3)	0.918	
33	Number of cylinders	6	
34	Capacity per cylinder (m3)	0.153 ± 2,5%	
35	Length x Depth x Height (mm)	2525 x 1157,5 x 815,5	Without venting
36	Material of pipping and tubing	AISI 316	Elements in contact with H_2
37	No load weight (Kg)	1293	
38	Structure material	S275 JR	
39	External treatment	Galvanized and painted	

TEST			
Item	Description	Specification	Notes
40	Hydrostatic test	PWX x 1.5 = 450 bar	Only welded parts
41	Leak test	PW=300 Bar	

Scope of Calvera for supply			
Item	Description	Specification	Notes
42	Transport	Yes	Mallorca
43	Installation	No	
44	Unloading equipment	No	
45	Training	Yes	To be defined
46	FAT	According to internal procedure	
47	SAT	According to internal procedure	

Fittings			
Item	Description	Specification	Notes
48	Anchor bolts	No	
49	Solar protection	Yes	
50	Temperature transmitters	No	
51	Pressure transmitters	No	
52	Manometer	Yes	
53	Safe valve	No	
54	Ground plate	No	

Spare parts			
Item	Description	Specification	Notes
55	Commissioning	N/A	
56	Spare part list (2 years)	To be defined	

Certificates/Documents			
Item	Description	Specification	Notes
57	CE/TPED marking	Yes	
58	Material 3.1 certificates	Yes	Only cylinders and piping

1.3 Hydrogen Filling Panel

This equipment is an unload panel for the tube trailer and H_2 supply to the Fuel Cell.

The operator will have to use the tube trailer valve, the control panel to select start/stop, and the control panel to use the vent valve.

General properties			
Item	Description	Specification	Notes
1	P&ID	IDI20001-GH-PID-UP350	See appendix 3
2	Units	1	
3	TAG	To be defined by client	
4	Manufacturer	Calvera	
5	Model	HFP-300-M	
6	Type	HFP 300	
7	Installation	Floor anchoring	Out of the scope of Calvera supply
8	Service	Hydrogen (Gas)	
9	Design codes and standards	2014/34/EU 2014/30/EU	

General properties			
Item	**Description**	**Specification**	**Notes**
		2014/35/EU 2014/68/EU EN 1127-1:2012 EN13463-1:2011 EN 60079-0:2017 EN 60079-14:2016 EN 60079-29-2:2016 EN60079-32-1:2018 EN60439-1-1:2012 EN13480-3:2017 EN ISO 12100-1:2012 ITC BT 29	
10	Marking	II 3G Ex II C	
11	ATEX Classification	Zone 2	
12	T code	T4	
13	H_2 input from tube trailer	- Hose: 3,5 meters. - Breakaway: Included. - Connector: RBL11 quick release coupling (Stäubli). IDI20001-GH-RBL-QUICK (See appendix 4)	
14	Regulated output at 10 bars	Ferrule fitting 12 mm "OD	
15	Hose connection for Stationary Storage (Inlet/Outlet)	RBL06 quick release coupling (Stäubli). IDI20001-GH-RBL-QUICK	See appendix 4
16	Manual operating	Through HDMI (Control Panel)	
17	Length x Depth x Height (mm)	To be defined	General Arrangement will be defined in January 2022 by Calvera.

General properties			
Item	**Description**	**Specification**	**Notes**
18	Material	Stainless steel	Elements in contact with H_2
19	Controlled venting	Flow restrictor	Venting towers are out of the scope of Calvera supply.

TEST			
Item	**Description**	**Specification**	**Notes**
20	Leakage test	300 bars	20 bars (Output lines with regulated pressure)
21	Functional testing	Verify the control systems	
22	Standard test	According to internal procedure	

Environmental Conditions			
Item	**Description**	**Specification**	**Notes**
23	Barometric pressure (bar)	1.013	
24	Room temperature (min/max) ºC	-20/+45	
25	Relative humidity (%)	70-85	
26	Type of fluid (Inlet/Outlet)	Hydrogen (Gas)	

Operating Conditions			
Item	**Description**	**Specification**	**Notes**
27	Line Pressure of Regulated discharge (bar)	< 12	
28	H_2 Inlet pressure from tube trailer (bar)	30 < P < 300 (15ºC)	Based on previous experiences, lower pressures for 30 bar could be reach.

Operating Conditions			
Item	**Description**	**Specification**	**Notes**
29	Minimum/Maximum pressure of tube trailer connection (Inlet/Outlet hose) (bar)	0 / 330 bar	Pressure compensated by temperature.
30	H_2 Suction temperature (ºC)	Environment	
31	H_2 composition (%)	>99.995	
32	Compressed Air Flow (l/maneuver)	4,8 l/unload-upload	General shut-off valves with pneumatic actuator.
33	Compressed air pressure (bar)	6 < P < 10	Instrument air to hydrogen filling panel must comply with ISO 8573-1: 2010

Design Conditions			
Item	**Description**	**Specification**	**Notes**
34	Design temperature (ºC)	-20/+65ºC	
35	Design pressure (bar)	PS 450	

Control			
Item	**Description**	**Specification**	**Notes**
36	Emergency stop	Activated by emergency button or internal system interlock. Once the emergency button is activated, all circuits are deactivated, except the circuits intrinsically safe. Manual reset on emergency button and control panel.	

Mean Components			
Item	**Description**	**Specification**	**Notes**
37	Pressure transmitters	II 1 G Ex ia IIC T6...T1 Ga OR II 1/2 G Ex ia IIC T6...T1 Ga/Gb OR	1/2"NPT-M

Mean Components			
Item	Description	Specification	Notes
		II 2 G Ex ia IIC T6...T1 Gb	
38	Temperature transmitters	Thermocouple type K simple. Aluminium head with screw cap Transmitter: 4-20 mA/HART.II 1 G Ex ia IIC T4...T6 Ga, II 1 D Ex ia IIIC Da, I M1 Ex ia Ma	Superficial contact with pipe
39	Limit Swith	Ex II 2GD Exi, Protection level IP66/67. Inductive NAMUR proxy NJ2-V3-N, 2 wire, 8V DC, up to SIL3.	Two inductive limit switch per valve at open and closed failure. Visual indicator.
40	Pneumatic actuator	II 2 GD Ex h IIB + H2 T6 Gb X IP 67	Material: AISI316, 0,375" (9,52 mm) Cv: 3,51 Max. pressure: 15000PSI
41	Electrovalves	Declassified. Activation: Air flow through actuators.	Fluid: Air.
42	Pressure regulator	Inlet=414 bar Outlet=10 bar. H_2 peek/epdm, cv=0,5, 1/4"npt, 1 inlet-1 outlet. (-096=balanced design, non-venting & increased inlet pressure)	Assessed against the requirements of the ATEX directive 2014/34/EU.
43	Manometers	Stainless steel solid-front series. Model mgs20. Box diameter dn100. radial racord., field scale 0...600 bar/psi, connection to the process 1/2" npt male, sphere in aluminum, white background, graduation and numbering in black, box and bayonet closure ring in stainless steel, mechanism of precision in	ATEX II 2G c EN 837-1/S3 y ASME B40.1. IP67, Solid front

Mean Components			
Item	Description	Specification	Notes
		stainless steel, needle in aluminum, black color, precision ±1.0%, filled with glycerin, degree of protection ip67, safety visor in double tempered glass.	
44	Safety valves	High tare: 377 bars Low tare: 12 bars	
45	Hydrogen filter	Filter 1/2" NPT H 5 microns (1034 bar, Tª -217ºC. OT +260ºC)	
46	Non return valves	Mawp: 15,000 psi @ 100 f. [1,034 bar @ 38 c.] temperature limits: -50 f to 400 f [-46 c to 204 c] cracking pressure: 20 psi 30% minimum orifice: .359" [9.13] cv: 2.3	
47	General control panel	Unclassified area. Touch screen control	220 V AC / Emergency button / reset button. Minimum distance from mechanical part to general control panel: 4 meters.
48	Terminal control and power	II 3G Ex eb db IIC T4	Client connection: To be defined by client.

Cable protection			
Item	Description	Specification	Notes
49	The mechanical protection of the cable between uploading/unloading panel and control panel is out of scope of Calvera supply.	Calvera Recommendation: Protective Tray + cover according to UNE-EN 50085.	Metal system Crush resistance: 20J. Min. storage temp.: -45 °C. Min. installation temp.: -25 °C

Cable protection			
Item	**Description**	**Specification**	**Notes**
	Wiring between Control Panel and uploading/Unloading Panel is out of scope of Calvera supply.		Max. temp.: 120 °C Flame retardant. System with electrical continuity. Not electrically insulated. Level of protection: IP44. Steel galvanized: Protection internally and externally against corrosive substances.

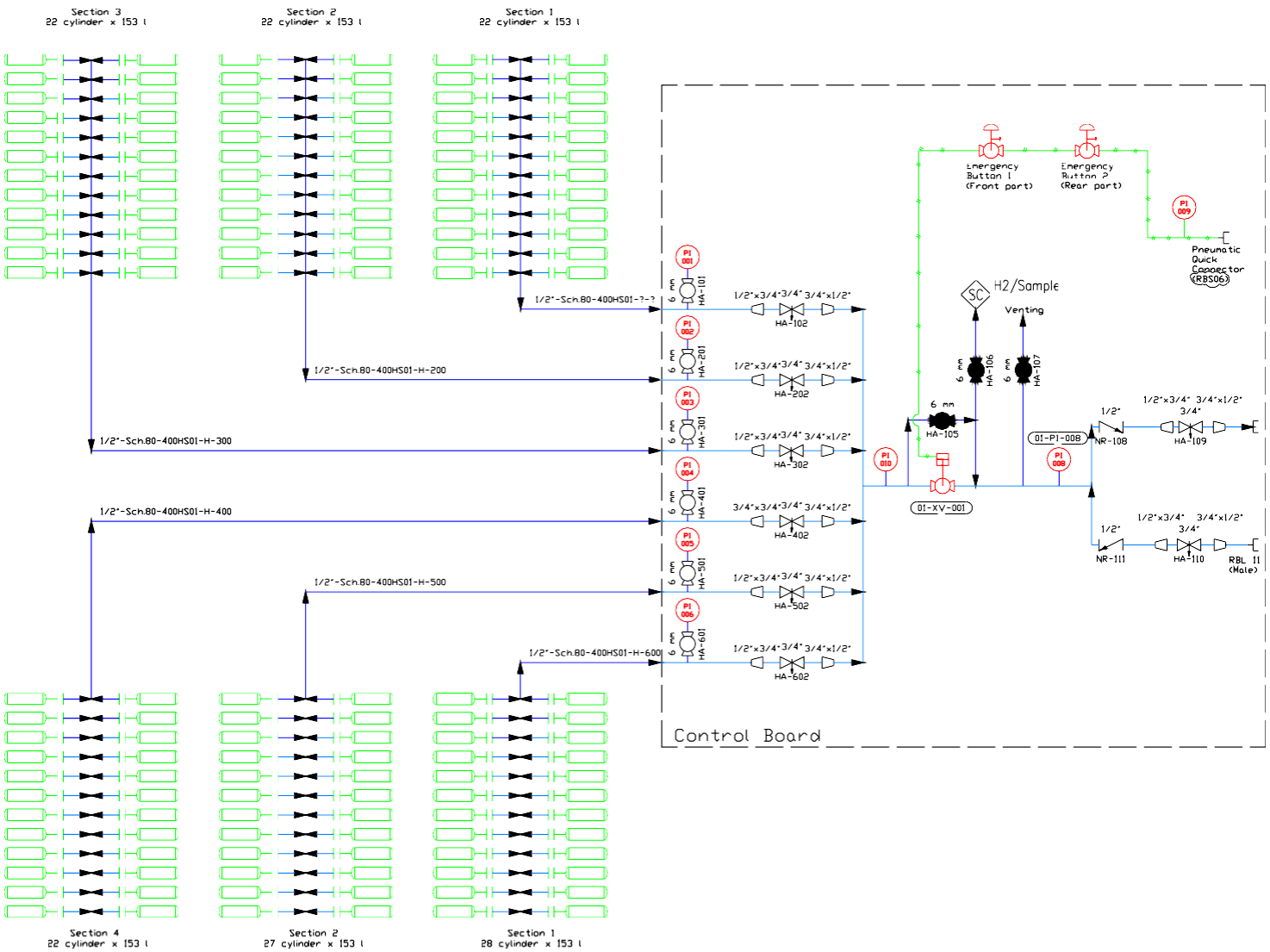
Scope of Calvera for supply			
Item	**Description**	**Specification**	**Notes**
50	Transport	Yes	Mallorca
51	Installation	No	
52	Unloading equipment	No	
53	Training	Yes	To be defined
54	FAT	According to internal procedure	
55	SAT	According to internal procedure	

Spare parts			
Item	**Description**	**Specification**	**Notes**
56	Commissioning	N/A	
57	Spare part list (2 years)	To be defined	

Certificates/Documents			
Item	Description	Specification	Notes
58	CE marking	Yes	
59	Material certificates 3.1	Yes	Only piping
60	PED	Yes	
61	Technical construction File	In custody	
62	Declaration of conformity	Yes	
63	Operation and maintenance manual	Yes	
64	Calibration certificate	No	

Appendix

NO.	Document	Rev.	Description
1	IDI20001-GH-PID-CONT30	2	Tube trailer P&ID
2	IDI20001-GH-GA-H2GT6	0	General arrangement drawing of mobile storage.
3	IDI20001-GH-PID-UP350	5	Hydrogen Filling Panel P&ID
4	IDI20001-GH-RBL-QUICK	0	Datasheet quick release coupling (Stäubli connectors)
5	IDI20001-GH-PID-SYMBOLOGY	0	PID Symbology



General Notes

No.	Revision/Issue	Date
2	Revision 2	03/05/22
1	Revision 1	22/02/22
0	Revision 0	03/05/21

Drawing Name

CONT30-T2-143

Multi-Element Gas Container 30 ft 143 cylinders / 300 bar outlet

Project Name and Address

Hydrogen Hub
H2 Transport Trailers

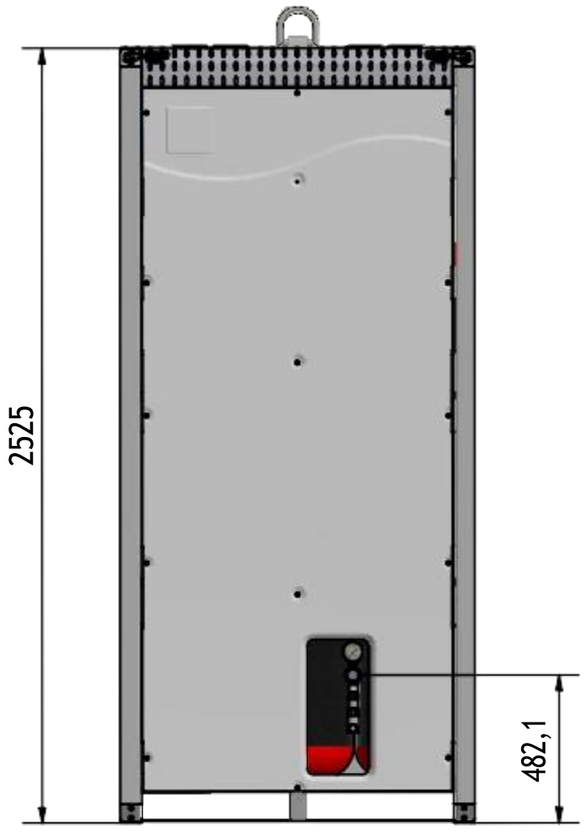
Green Hysland
Mallorca

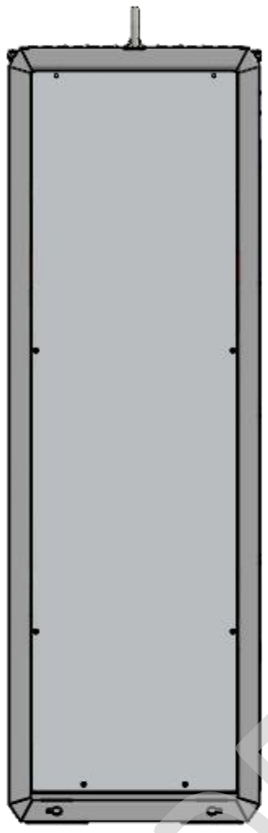
Area
N/A

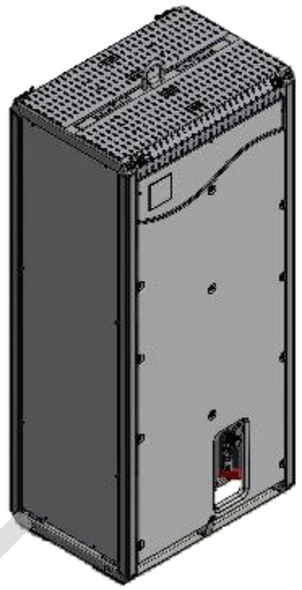
Drawing Number
IDI20001-GH-PID-CONT30

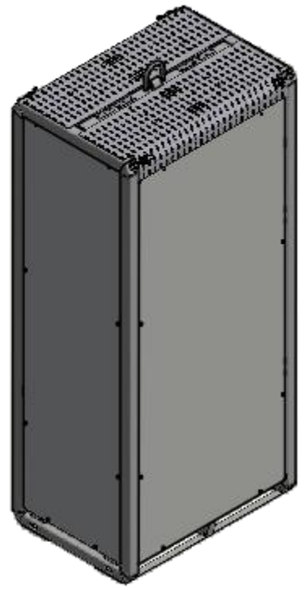
Author
Juan Quiros

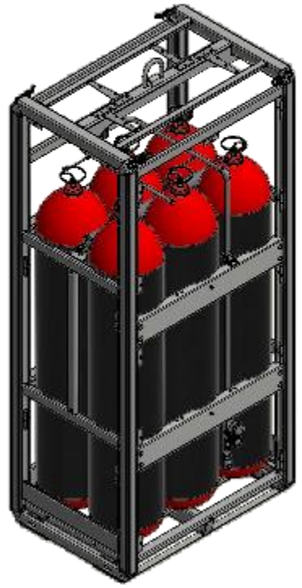
Stamp

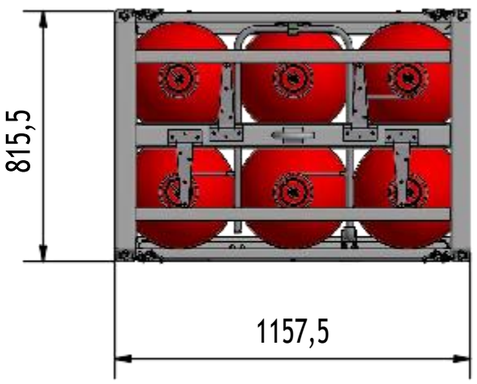


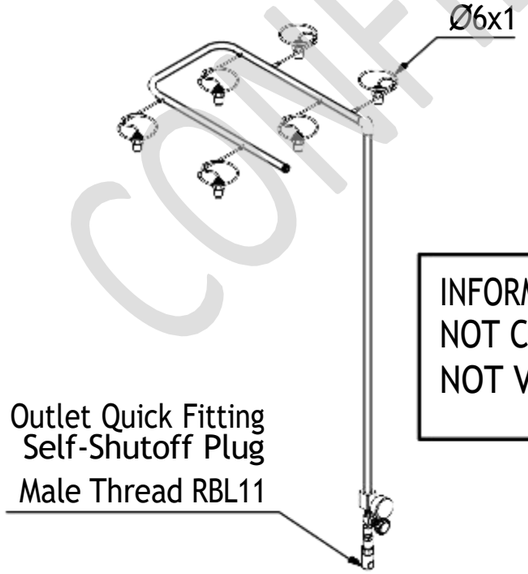












INFORMATIVE DOCUMENT
NOT CONTROLLED COPY
NOT VALID FOR MANUFACTURE

6 Cylinders 153 Litros
Total Volumen 918 Litros
Meassure millimeters, degree centigrade
Tolerancias Generales segun ISO 2768-cK

Pág.:1 /A3	Scale:	Material:	Weight:
	Date	Name	Description:
Created	28/10/2021	sergio	Bundle 6 Cylinders
Checked			
Aproved			
CALVERA		Drawing Nº: CI-H2GT6-T2-Pod	Rev.: 0
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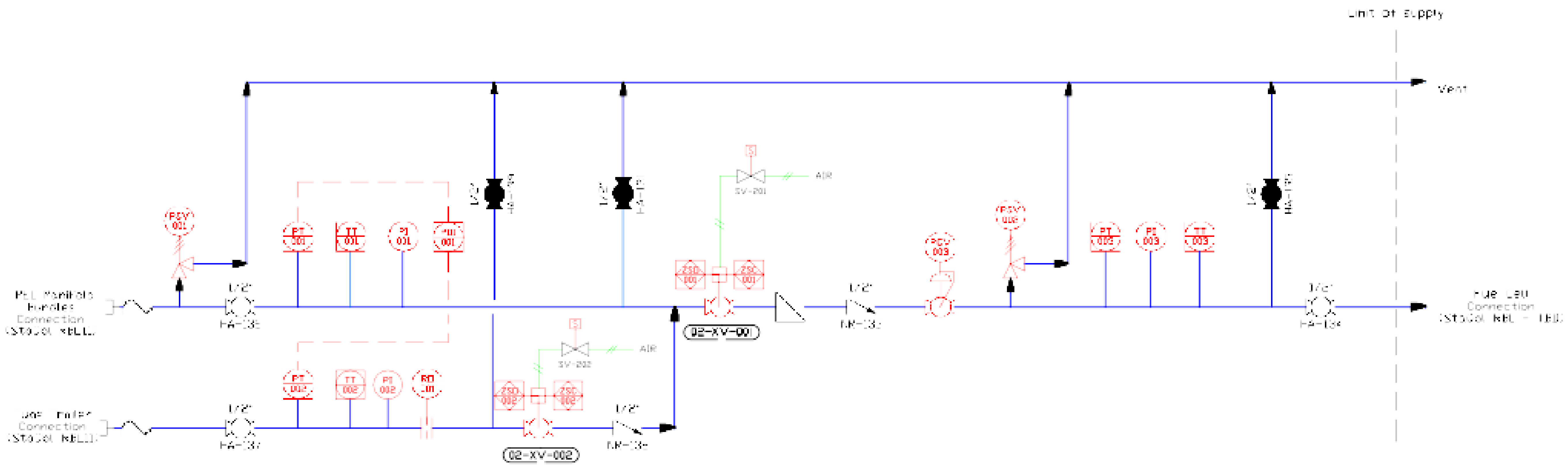


General Notes		
05	Revision 1	22/02/2022
04	Limit switch added	20/12/2021
03	MEGC filling modification	26/07/2021
02	MEGC filling modification	26/07/2021
01	Rack filling modification	07/07/2021
No.	Revision/Issue	Date

Drawing Name

Discharge Panel

UP-350-2B

Project Name and Address

H2 MEGC Storage
MEGC Hydrogen
Storage for Mallorca

Green Hysland
Mallorca

Area

Unloading Panel

Drawing Number

[illegible]

Author

David Luesma

Stamp

FAST MOVING TECHNOLOGY

STÄUBLI

RBL quick-release coupling

All fluids | Stainless steel high pressure

Connections in high pressure circuits carrying corrosive liquids and gases in an aggressive environment

Five diameters

Product available in nominal diameters 03, 06, 08, 11 and 19 mm.

Constant pressure guaranteed

by the large fastening surface area between the socket and the plug in the connected position and using a lock with a long reach inside the socket.

Maximum safety

thanks to the design of the product, the quality of the materials used and the right seal type for the particular fluid involved. This aspect is particularly important in high-pressure circuits carrying corrosive gases and fluids.

Efficiency and simplicity of push-button technology

Connected and disconnected with one hand for greater ease of use:

- Connected by pushing directly the plug into the socket.
- Disconnected by pressing the locking button.

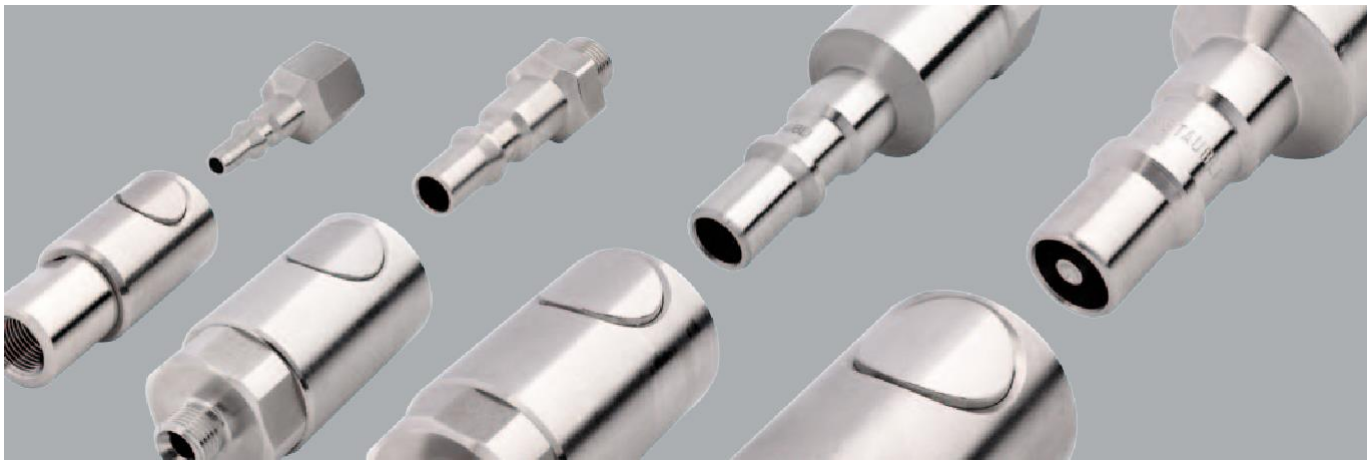
Compatible with a large number of liquids and gases

thanks to its mainly stainless steel 316 serie construction.

Applications

- High-pressure hydrogen circuits
- High-pressure circuits containing non-aggressive fluids in a corrosive environment
- High-pressure cleaning in the agri-food sector
- Process industry
- Laboratories
- High-pressure gas filling of cylinder racks

Technical characteristics



	RBL 03	RBL 06	RBL 08	RBL 11	RBL 19
Nominal diameter DN (mm)	3	5.5	8	11	19
Maximum allowable pressure PS (bar)*	400	450	400	350	300
Cross section (mm^2)	7	23.75	50	95	284

* For hazardous gases as defined in the Directive 2014/68/UE, please ask us for the maximum operating pressure.

Hydraulic flow rate in l/min at a velocity of 5 m/s:

	RBL 03	RBL 06	RBL 08	RBL 11	RBL 19
Single shutoff	2.1	7.2	15.1	28.5	85
Double shutoff	1.5	5	12.2	24.5	76
No shutoff	2.1	7.2	15.1	28.5	85

See the charts on page 5.

Construction

Mainly stainless steel 316 series.
Springs: stainless steel with 18% chrome.
For more informations, please contact us.

Vacuum tightness

1.10^{-3} $N.cm^3$ / s. in connected and disconnected position (code W).
For even more stringent requirements, please ask us.

Oxygen applications

Suggested options for your circuit applications:

- **Industrial oxygen** requiring pressure **below 50 bar: code JV/OX**
- **Breathable oxygen** requiring pressure **below 50 bar: code JE/OX**
- **Oxygen** requiring pressure **above 50 bar:** we recommend our **ROX 05** sockets, specifically designed to withstand autoignition (adiabatic compression).

See page 6 to find out how to create your part-number.

Tightness

The choice of material for the seals depends on the fluid being carried and the operating temperature. Please do not hesitate to contact our technical interlocutor for advice. All our expertise in quick-release couplings is at your disposal.

Material	Code	Minimum and maximum allowable temperatures TS (°C)	Applications
Nitrile (NBR)	**standard**	- 15 to + 100	▪ Current applications. ▪ High mechanical strength.
Fluorocarbon (FPM)	**JV**	- 10 to + 200	▪ Good chemical resistance. ▪ Outstanding resistance to high temperatures up to 200 °C. ▪ Resistance to mineral oils, synthetic hydraulic oils, fuels, chemical products, hydrocarbons and coolants.
Ethylene - Propylene (EPDM)	**JE**	- 20 to + 150	▪ Excellent temperature characteristics. ▪ Compatible with phosphate-based brake fluids - esters, hot and cold water, steam.
Perfluoro-elastomer (FFKM)	**JK**	0 to + 250	▪ Remarkable resistance to heat and most chemical agents including inorganic and organic acids. ▪ Coolants.
Fluorosilicone (FMQ)	**JS3**	- 45 to + 175	▪ Maximum working pressure: 50 bar ▪ Good resistance to low and high temperatures. ▪ Resistance to mineral oils, fuels.

KES sealing kit

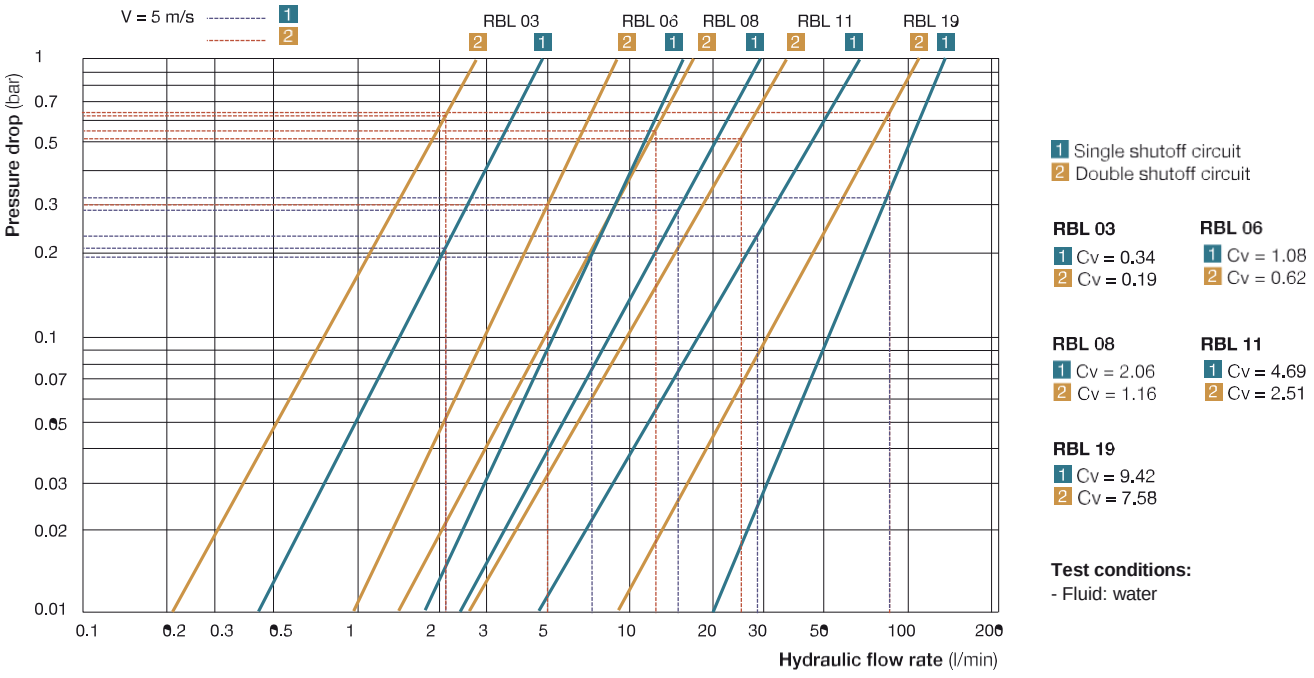
KES sealing kits consist of a retaining ring and an O-ring to create a perfect seal between the socket and the plug with its base.

Part references that are compatible with this option are indicated with the symbol (KES) in the part-number tables on pages 7 à 11.

KES sealing kits must be ordered separately.

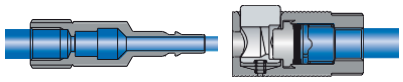
Select the ring and seal materials depending on your application, using our new documentation KES RP003.

Flow rate / pressure drop hydraulic charts



Shutoff

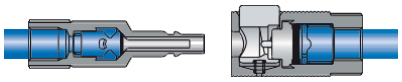
Single shutoff



Socket with automatic closing.
Full flow plug.

Socket: **standard**
Plug: **full flow**

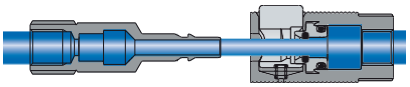
Double shutoff



Socket and plug with automatic closing.

Socket: **code OD**
Plug: **self-shutoff**

No shutoff



Full flow socket and plug.

Socket: **code OS**
Plug: **full flow**

Options

Push-button lock

Recommended for frequent disconnection or if protective gloves are worn ..... **Code VD**

Fixing for protective dust cap on socket

The protective dust cap must be ordered separately ..... **Code FB**

See page 11.

How to create your part-number for...

Socket

Standard socket
(pages 7 to 11)

RBL03.1100/IC / JE / OD / VD / FB

Construction: mainly stainless steel 316 series
Seals: Nitrile (NBR)
Shutoff: simple
No special options

Tightness (pages 4 and 5)	JV • JV/OX • JE • JE/OX • JK • JS3
Shutoff (page 6)	OS • OD
Options (page 6)	**Push-button lock:** VD • **Cap fixing:** FB

Plug

Standard plug
(pages 7 to 11)

Full flow: **RBL03.6100/IC**

Self-shutoff: **RBL03.7100/IC / JS3**

Construction: mainly stainless steel 316 series
Seals: Nitrile (NBR)

Shutoff (pages 4 and 5)	JV • JV/OX • JE • JE/OX • JK • JS3

PART NUMBERS

RBL 03

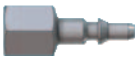
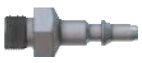
Sockets

Recessed sockets

Female thread	Part numbers	Fittings	Part numbers	
	RBL03.1100/IC	G 1/8	RBL03.2100/IC	
	RBL03.1110/IC	Rc 1/8	RBL03.2110/IC	
	RBL03.1200/IC	NPT 1/8	RBL03.2200/IC	
	RBL03.1201/IC	NPT 1/4	RBL03.2201/IC	
	RBL03.1311/IC	UN 7/16*	RBL03.2311/IC	* to norm SAE J1926/1
Male thread 60° cone				
	RBL03.1150/IC	G 1/8	RBL03.2150/IC	
	RBL03.1151/IC	G 1/4	RBL03.2151/IC	
	RBL03.1250/IC	NPT 1/8	RBL03.2250/IC	
	RBL03.1251/IC	NPT 1/4	RBL03.2251/IC	
For calibrated stainless steel pipe**				
	RBL03.1766/IC	Ø 6 mm ext.	RBL03.2766/IC	
	RBL03.1768/IC	Ø 8 mm ext.	RBL03.2768/IC	
	RBL03.1753/IC	Ø 1/4" ext.	RBL03.2753/IC	

Full flow plugs

Self-shutoff plugs

Female thread	Part numbers	Fittings	Part numbers	
	RBL03.6100/IC	G 1/8	RBL03.7100/IC	
	-	Rc 1/4	RBL03.7110/IC	
	RBL03.6200/IC	NPT 1/8	RBL03.7200/IC	
	RBL03.6201/IC	NPT 1/4	RBL03.7201/IC	
	-	UN 7/16*	RBL03.7311/IC	* to norm SAE J1926/1
Male thread 60° cone				
	RBL03.6150/IC	G 1/8	RBL03.7150/IC	
	RBL03.6151/IC	G 1/4	RBL03.7151/IC	
	RBL03.6250/IC	NPT 1/8	RBL03.7250/IC	
	RBL03.6251/IC	NPT 1/4	RBL03.7251/IC	
For calibrated stainless steel pipe**				
	RBL03.6766/IC	Ø 6 mm ext.	RBL03.7766/IC	
	RBL03.6768/IC	Ø 8 mm ext.	RBL03.7768/IC	
	RBL03.6753/IC	Ø 1/4" ext.	RBL03.7753/IC	

** Characteristics of stainless steel pipes: compliant with ISO 1127 class D4 and ASTM A 269 class 1 (installation instructions RV1300100).

Protective dust caps: see part numbers page 11.

PART NUMBERS

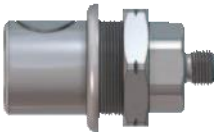
RBL 06

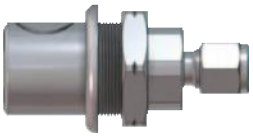
Sockets

Recessed sockets

Female thread	Part numbers	Fittings	Part numbers
	RBL06.1100/IC	G 1/8	RBL06.2100/IC
	RBL06.1101/IC	G 1/8	RBL06.2101/IC
	RBL06.1102/IC	G 3/8	RBL06.2102/IC
	RBL06.1103/IC	G 1/2	RBL06.2103/IC
	RBL06.1111/IC	Rc 1/4	RBL06.2111/IC
	RBL06.1200/IC	NPT 1/8	RBL06.2200/IC
	RBL06.1201/IC	NPT 1/4	RBL06.2201/IC
	RBL06.1202/IC	NPT 3/8	RBL06.2202/IC
	RBL06.1314/IC	UN 9/16*	RBL06.2314/IC
Male thread 60° cone			
	RBL06.1150/IC	G 1/8	RBL06.2150/IC
	RBL06.1151/IC	G 1/4	RBL06.2151/IC
	RBL06.1152/IC	G 3/8	RBL06.2152/IC
	RBL06.1153/IC	G 1/2	RBL06.2153/IC
	RBL06.1250/IC	NPT 1/8	RBL06.2250/IC
	RBL06.1251/IC	NPT 1/4	RBL06.2251/IC
	RBL06.1252/IC	NPT 3/8	RBL06.2252/IC
	RBL06.1253/IC	NPT 1/2	RBL06.2253/IC
For calibrated stainless steel pipe**			
	RBL06.1766/IC	Ø 6 mm ext.	RBL06.2766/IC
	RBL06.1768/IC	Ø 8 mm ext.	RBL06.2768/IC
	RBL06.1770/IC	Ø 10 mm ext.	RBL06.2770/IC
	RBL06.1753/IC	Ø 1/4" ext.	RBL06.2753/IC
	RBL06.1755/IC	Ø 3/8" ext.	RBL06.2755/IC
	RBL06.1756/IC	Ø 1/2" ext.	-

* to norm SAE J1926/1





Full flow plugs

Self-shutoff plugs

Female thread	Part numbers	Fittings	Part numbers
	RBL06.6100/IC	G 1/8	RBL06.7100/IC
	RBL06.6101/IC	G 1/4	RBL06.7101/IC
	RBL06.6102/IC	G 3/8	RBL06.7102/IC
	-	Rc 1/4	RBL06.7111/IC
	RBL06.6200/IC	NPT 1/8	RBL06.7200/IC
	RBL06.6201/IC	NPT 1/4	RBL06.7201/IC
	RBL06.6202/IC	NPT 3/8	RBL06.7202/IC
	-	UN 9/16*	RBL06.7314/IC
Male thread 60° cone			
	RBL06.6150/IC	G 1/8	RBL06.7150/IC
	RBL06.6151/IC	G 1/4	RBL06.7151/IC
	RBL06.6152/IC	G 3/8	RBL06.7152/IC
	RBL06.6153/IC	G 1/2	RBL06.7153/IC
	RBL06.6250/IC	NPT 1/8	RBL06.7250/IC
	RBL06.6251/IC	NPT 1/4	RBL06.7251/IC
	RBL06.6252/IC	NPT 3/8	RBL06.7252/IC
For calibrated stainless steel pipe**			
	RBL06.6766/IC	Ø 6 mm ext.	RBL06.7766/IC
	RBL06.6768/IC	Ø 8 mm ext.	RBL06.7768/IC
	RBL06.6770/IC	Ø 10 mm ext.	RBL06.7770/IC
	RBL06.6753/IC	Ø 1/4" ext.	RBL06.7753/IC
	RBL06.6755/IC	Ø 3/8" ext	RBL06.7755/IC

* to norm SAE J1926/1

** Characteristics of stainless steel pipes: compliant with ISO 1127 class D4 and ASTM A 269 class 1 (installation instructions RV1300100).

Protective dust caps: see part numbers page 11.

PART NUMBERS

RBL 08

Sockets

Recessed sockets

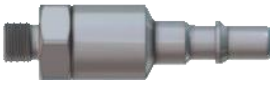
Female thread	Part numbers	Fittings	Part numbers
	RBL08.1101/IC	G 1/4	RBL08.2101/IC
	RBL08.1102/IC	G 3/8	RBL08.2102/IC
	RBL08.1103/IC	G 1/2	RBL08.2103/IC
	RBL08.1112/IC	Rc 3/8	RBL08.2112/IC
	RBL08.1201/IC	NPT 1/4	RBL08.2201/IC
	RBL08.1202/IC	NPT 3/8	RBL08.2202/IC
	RBL08.1203/IC	NPT 1/2	RBL08.2203/IC
	RBL08.1319/IC	UN 3/4 - 16*	RBL08.2319/IC
Male thread 60° cone			
	RBL08.1151/IC	G 1/4	RBL08.2151/IC
	RBL08.1152/IC	G 3/8	RBL08.2152/IC
	RBL08.1153/IC	G 1/2	RBL08.2153/IC
	RBL08.1251/IC	NPT 1/4	RBL08.2251/IC
	RBL08.1252/IC	NPT 3/8	RBL08.2252/IC
	RBL08.1253/IC	NPT 1/2	RBL08.2253/IC
For calibrated stainless steel pipe**			
	RBL08.1770/IC	Ø 10 mm ext.	RBL08.2770/IC
	RBL08.1772/IC	Ø 12 mm ext.	RBL08.2772/IC
	RBL08.1755/IC	Ø 3/8" ext.	RBL08.2755/IC
	RBL08.1756/IC	Ø 1/2" ext.	RBL08.2756/IC

* to norm SAE J1926/1

Full flow plugs

Self-shutoff plugs

Female thread	Part numbers	Fittings	Part numbers
	RBL08.6101/IC	G 1/4	RBL08.7101/IC
	RBL08.6102/IC	G 3/8	RBL08.7102/IC
	RBL08.6103/IC	G 1/2	RBL08.7103/IC
	-	Rc 3/8	RBL08.7112/IC
	RBL08.6201/IC	NPT 1/4	RBL08.7201/IC
	RBL08.6202/IC	NPT 3/8	RBL08.7202/IC
	RBL08.6203/IC	NPT 1/2	RBL08.7203/IC
	-	UN 3/4 - 16*	RBL08.7319/IC
Male thread 60° cone			
	RBL08.6151/IC	G 1/4	RBL08.7151/IC
	RBL08.6152/IC	G 3/8	RBL08.7152/IC
	RBL08.6153/IC	G 1/2	RBL08.7153/IC
	-	NPT 1/4	RBL08.7251/IC
	-	NPT 3/8	RBL08.7252/IC
	RBL08.6253/IC	NPT 1/2	RBL08.7253/IC
For calibrated stainless steel pipe**			
	RBL08.6770/IC	Ø 10 mm ext.	RBL08.7770/IC
	RBL08.6772/IC	Ø 12 mm ext.	RBL08.7772/IC
	RBL08.6755/IC	Ø 3/8" ext.	RBL08.7755/IC
	RBL08.6756/IC	Ø 1/2" ext.	RBL08.7756/IC



* to norm SAE J1926/1

** Characteristics of stainless steel pipes: compliant with ISO 1127 class D4 and ASTM A 269 class 1 (installation instructions RV1300100).

Protective dust caps: see part numbers page 11.

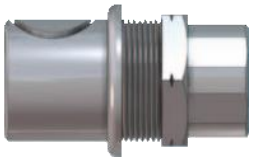
PART NUMBERS

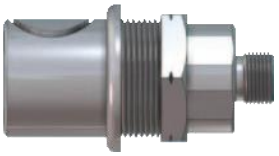
RBL 11

Sockets

Recessed sockets

Female thread	Part numbers	Fittings	Part numbers
	RBL11.1102/IC	G 3/8	RBL11.2102/IC
	RBL11.1103/IC	G 1/2	RBL11.2103/IC
	RBL11.1104/IC	G 3/4	RBL11.2104/IC
	RBL11.1113/IC	Rc 1/2	RBL11.2113/IC
	RBL11.1202/IC	NPT 3/8	RBL11.2202/IC
	RBL11.1203/IC	NPT 1/2	RBL11.2203/IC
	RBL11.1204/IC	NPT 3/4	RBL11.2204/IC
	RBL11.1322/IC	UN 7/8 - 14*	RBL11.2322/IC
Male thread 60° cone			
	RBL11.1152/IC	G 3/8	RBL11.2152/IC
	RBL11.1153/IC	G 1/2	RBL11.2153/IC
	RBL11.1154/IC	G 3/4	RBL11.2154/IC
	RBL11.1252/IC	NPT 3/8	RBL11.2252/IC
	RBL11.1253/IC	NPT 1/2	RBL11.2253/IC
	RBL11.1254/IC	NPT 3/4	RBL11.2254/IC

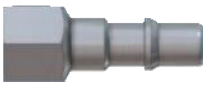




* to norm SAE J1926/1

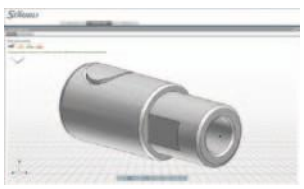
Full flow plugs

Self-shutoff plugs

Female thread	Part numbers	Fittings	Part numbers
	RBL11.6101/IC	G 1/4	-
	RBL11.6102/IC	G 3/8	RBL11.7102/IC
	RBL11.6103/IC	G 1/2	RBL11.7103/IC
	RBL11.6104/IC	G 3/4	RBL11.7104/IC
	-	Rc 1/2	RBL11.7113/IC
	-	NPT 3/8	RBL11.7202/IC
	RBL11.6203/IC	NPT 1/2	RBL11.7203/IC
	RBL11.6204/IC	NPT 3/4	RBL11.7204/IC
	-	UN 7/8 - 14*	RBL11.7322/IC
Male thread 60° cone			
	RBL11.6152/IC	G 3/8	RBL11.7152/IC
	RBL11.6153/IC	G 1/2	RBL11.7153/IC
	RBL11.6154/IC	G 3/4	RBL11.7154/IC
	-	NPT 1/2	RBL11.7253/IC
	RBL11.6254/IC	NPT 3/4	-

* to norm SAE J1926/1

3D models and sizing plans are available on request.



PART NUMBERS

RBL 19

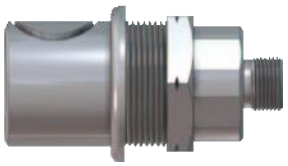
Sockets

Recessed sockets

Female thread	Part numbers	Fittings	Part numbers
	**RBL19.1104/IC**	G 3/4	**RBL19.2104/IC**
	RBL19.1105/IC	G 1	**RBL19.2105/IC**
	RBL19.1204/IC	NPT 3/4	**RBL19.2204/IC**
	RBL19.1205/IC	NPT 1	**RBL19.2205/IC**
	RBL19.1114/IC	Rc 3/4	**RBL19.2114/IC**
	RBL19.1333/IC	UN 1- 5/16*	**RBL19.2333/IC**

* to norm SAE J1926/1

Male thread 60° cone			
	**RBL19.1154/IC**	G 3/4	**RBL19.2154/IC**
	RBL19.1155/IC	G 1	**RBL19.2155/IC**
	RBL19.1254/IC	NPT 3/4	**RBL19.2254/IC**
	RBL19.1255/IC	NPT 1	**RBL19.2255/IC**



Full flow plugs

Self-shutoff plugs

Female thread	Part numbers	Fittings	Part numbers
	**RBL19.6104/IC**	G 3/4	**RBL19.7104/IC**
	RBL19.6105/IC	G 1	**RBL19.7105/IC**
	RBL19.6204/IC	NPT 3/4	**RBL19.7204/IC**
	RBL19.6205/IC	NPT 1	**RBL19.7205/IC**
	-	Rc 3/4	**RBL19.7114/IC**
	-	UN 1- 5/16*	**RBL19.7333/IC**

* to norm SAE J1926/1

Male thread 60° cone			
	**RBL19.6154/IC**	G 3/4	**RBL19.7154/IC**
	RBL19.6155/IC	G 1	**RBL19.7155/IC**
	RBL19.6254/IC	NPT 3/4	**RBL19.7254/IC**
	RBL19.6255/IC	NPT 1	**RBL19.7255/IC**

Protective dust caps must be ordered separately (supplied if an order is placed for a self-shutoff plug)

Stainless steel cap for socket: **RBE xx.8500/IC**

Stainless steel cap for plug: **RBE xx.8550/IC**

Chloroprene steel cap for plug: **RBE xx.8550/BC**

Replace xx with the bore diameter of the corresponding socket or plug. E.g.: RBL 03.8550 = cap for a plug with bore diameter 3 mm.

RC1050301B

■ Stäubli Units ○ Representatives/Agents

Global presence of the Stäubli Group

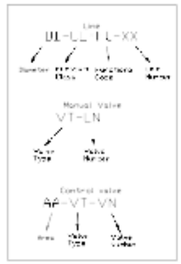
www.staubli.com

STÄUBLI

Line Types

- Process Line
- Electrical Signal
- Pneumatic Signal
- Software Link

Line nomenclature



Valve Denomination

XV	Block Valve
PSV	Pressure Safety Valve
NR	Check valve
PCV	Pressure Regulator
MV	Manual Valve
SV	Solenoid Valve

Valve Type

- Pressure regulator
- Pneumatic Block Valve
- Check Valve
- Manual Needle Valve
- Pressure Relief Valve
- Manual Ball Valve

Valve state

- Normally closed Valve
- Normally opened Valve
- Fail Close (FC)
- Fail Open (FO)
- Locked close (LC)
- Locked open (LO)

Instrument Type

- PI — Pressure gauge
- PT — Pressure transmitter
- PAT — Pressure Transmitter Alarm
- TE — Temperature Element
- TT — Temperature transmitter
- TAT — Temperature Transmitter Alarm
- FE — FLOW Element
- FT — FLOW Transmitter
- FAT — FLOW Transmitter Alarm
- ZSO — Limit Switch Open Position
- ZSO — Limit Switch Position Feedback Open Position
- FO — Restriction Orifice
- ZSC — Limit Switch Close Position
- ZSC — Limit Switch Position Feedback Close Position
- AIT — Analyser Indicator Transmitter
- AAT — Analyser Transmitter Alarm
- BE — Flame Scanner
- BAT — Flame Scanner Alarm

Fittings

- Reducer
- Elbow / Cap
- Nozzle
- Flange
- Restriction Orifice

Other Elements

- Compressor
- Filter
- Cylinder
- Hose
- B — Break Away
- D — Air Dryer

General Notes

No.	Revision/Issue	Date
1	Revision 1	22/02/22

Drawing Name

P&ID Legend

Project Name and Address

Green Hysund
Mallorca

Area
N/A

Drawing Number
IDI2021H-L -PID-LEGEND

Author
Juan Guirao

Stamp