CONNECTORS

THE CONNECTION SOLUTION

NGV REFUELLING CONNECTIONS

REFUELLING

Comprehensive range of NGV 1 compatible products for the refuelling of all kinds of Compressed Natural Gas vehicles in a safe environment

- NGV 1, ISO 14469 Design
- High flow receptacles and nozzles
- Approved construction
- Safe design

for:

- Fleets
- Self-serve
- Heavy and light duty vehicles

STÄUBLI

STÄUBLI NGV REFUELLING CONNECTIONS

HIGH FLOW TYPE 1 NOZZLE *PAGES 4 / 5*

- **GMV 09** for quick refuelling of heavy duty vehicles as well as light duty vehicles from the same dispenser (bus refuelling within 3 minutes*)

TYPE 2-3 NOZZLES *PAGES 6 / 7*

- **CMV 08/2** for time fill (or fast fill)

STAINLESS STEEL NGV 1 PROFILE RECEPTACLES *PAGES 8 / 10*

- **GMV 08/C:** for refuelling of light and heavy duty vehicles
- **GMV 09:** for refuelling of heavy duty vehicles

IN LINE BREAK - AWAY *PAGES 12 / 13*

Safety system between refuelling station and vehicle

- **BRW 02:** for time fill
- **BRW 08:** for fast and time fill

* When using high flow nozzle and receptacle GMV 09 STÄUBLI (1000 litres (260 gallons) at 200 bar (3000 psi)).

STÄUBLI RECOMMENDED INSTALLATIONS

FAST FILL				
Heavy duty vehicle	Break-away BRW 08 *page 12*	Nozzle GMV 09 *page 4* Nozzle CMV 08/2 *page 6*	Receptacle GMV 09 *page 8*	Check Valve GMV 09 *page 11*
Light duty vehicle	Break-away BRW 08 *page 12*	Nozzle GMV 09 *page 4* Nozzle CMV 08/2 *page 6*	Receptacle GMV 08/C *page 8*	Check Valve GMV 08/C *page 11*
TIME FILL				
Heavy duty vehicle	Break-away BRW 08 *page 12*	Nozzle CMV 08/2 *page 6*	Receptacle GMV 09 *page 8*	Check Valve GMV 09 *page 11*
Light duty vehicle	Break-away BRW 02 *page 12*	Nozzle CMV 08/2 *page 6*	Receptacle GMV 08/C *page 8*	Check Valve GMV 08/C *page 11*

VEHICLE CHECK VALVE *PAGE 11*

- **GMV 08/C:** for refuelling of light duty vehicles
- **GMV 09:** for refuelling of heavy duty vehicles

REFUELLING LINES READY TO USE *PAGE 14*

AVERAGE FILLING FLOW OF THE NGV RANGE *PAGE 15*

STÄUBLI products should be used in compliance with applicable federal, state and local laws and regulations. Product selection should be based on physical specifications and limitations and compatibility with the environment and materials to be handled. You must check the regulations applicable to the country where the product will be in use and make your selection accordingly.

HIGH FLOW TYPE 1 NOZZLE

FOR ALL TYPES OF COMPRESSED NGV'S

GMV 09

Blue (200 bar - 3000 psi)
Yellow (250 bar - 3600 psi)

APPLICATIONS

- Self serve applications.
- For quick refuelling of **heavy duty vehicles** as well as **light duty vehicles** from the same dispenser (bus refuelling within 3 minutes*) when using with STÄUBLI high flow NGV 1 Receptacle (GMV 09).

CE Marking

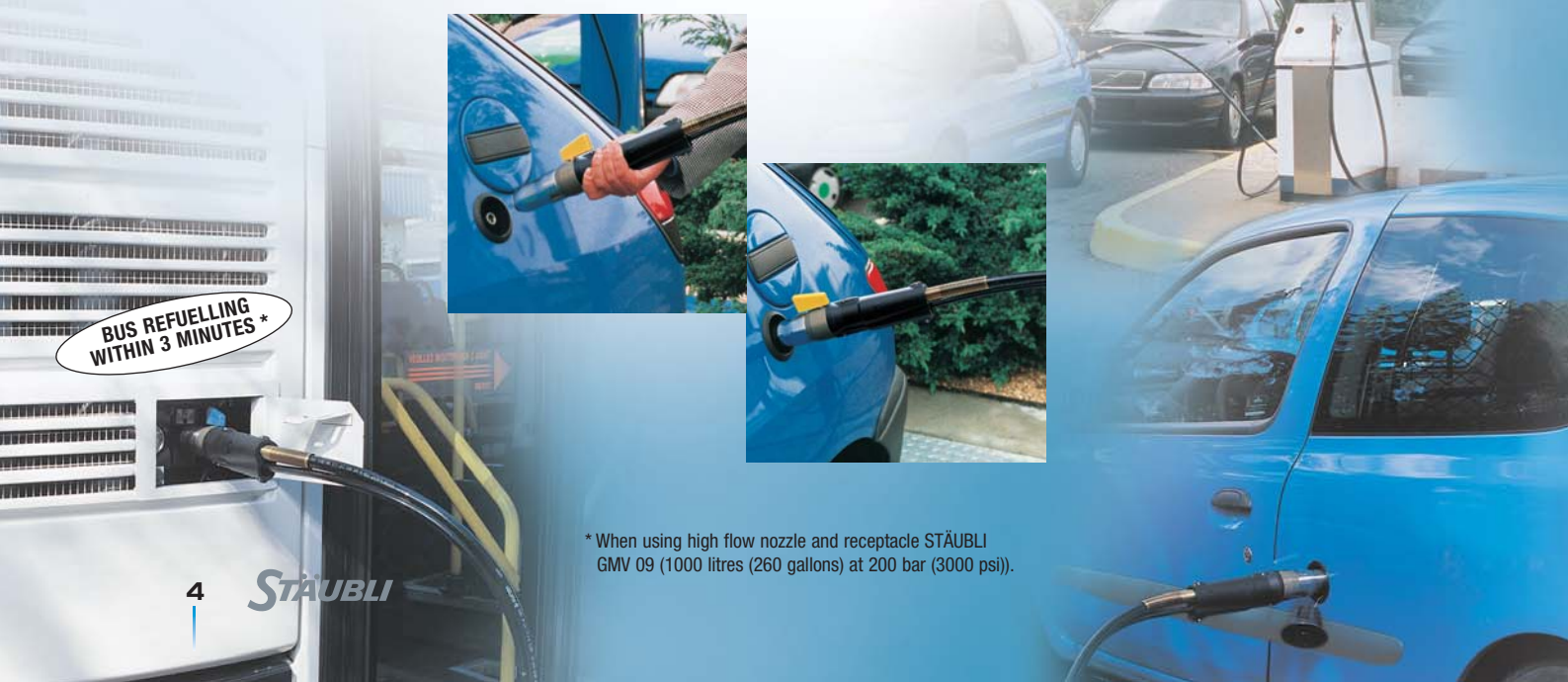
PED
ATEX

NGV 1 and ISO 14469-1 ISO 14469-3 COMPATIBLE

- High flow capability when refuelling with high flow STÄUBLI NGV 1 receptacle
- **Comply with the European directive PED 97/23/CE**
- **Designed to be incorporated in environments according to ATEX 94/9/CE**

STORAGE REQUIREMENT TO PROTECT THE NOZZLE FROM WATER AND DIRT

When not in use, each nozzle must be protected from water and dirt. It is why we propose the nozzle storage rack shown in the opposite page.



* When using high flow nozzle and receptacle STÄUBLI GMV 09 (1000 litres (260 gallons) at 200 bar (3000 psi)).

FEATURES	BENEFITS
Stäubli new high flow design	■ Fast refuelling: 1000 litres (260 gallons) at 200 bar (3000 psi) under 3 minutes ■ Designed to refill high volume tanks (busses, heavy duty trucks)
Complies with NGV 1 standard	■ Can be used with any type of vehicles (heavy or compact) equipped with a NGV 1 receptacle
Protected operating trigger	■ Excellent resistance against shock, contamination or corrosion ■ Protected against dust
Ergonomic design	■ Light weight: 1.640kg (3.62 Lbs)
User friendly operation	■ Easy handling
Smooth opening of the filling line	■ Compact ■ Convenient low effort operation
Integrated 3-way valve, with auto vent	■ Pressure automatically vented for safe disconnection
Venting to recovery storage	■ No gas released into the air
Colour coded for service pressure	■ Instant identification: Blue: 200 bar (3000 psi) - Yellow: 250 bar (3600 psi)
Mechanical interlock for proper service pressure connection	■ No misconnection ■ Safety lock provides convenient operation
Safety	■ No possible disconnection if the pressure in the venting hose is higher than 1 bar (14.5 psi)

TECHNICAL DATA

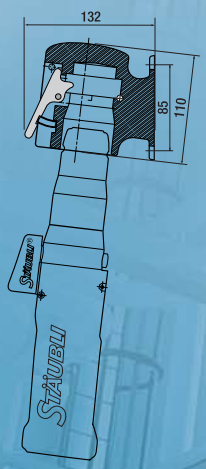
- Internal diameter: 9 mm (3/8”).
- Flow area: 63 mm² (0.098 sq. in.).
- Material: stainless steel.
- Pressure range: according to the NGV 1 and ISO 14469-1: 200 bar (3000 psi) ISO 14469-3: 250 bar (3600 psi).
- Flow rate: see page 15.
- Service temperatures: - 40 °C to 85 °C (- 40 °F to 185 °F)

Important:
The gas must be dry and clean.

NOZZLE STORAGE RACK

The nozzle storage rack protects nozzle from water and dirt when not in use.

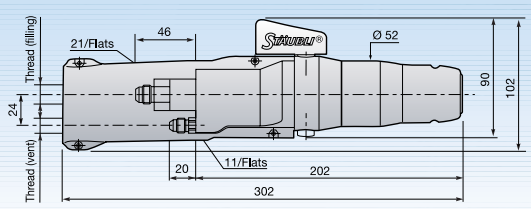
Contact us for other options.



STORAGE RACK PART NUMBER	
BLUE 200 bar (3000 psi) P 30 - B 200 profile	YELLOW 250 bar (3600 psi) P 36 - B 250 profile
N 007 446 00	

For instructions of installation and use, see instruction sheet RV1080100

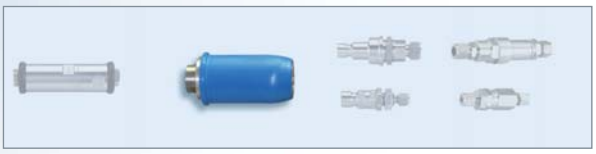
NOZZLE



THREADS		NOZZLE PART-NUMBERS	
FILLING	VENT	BLUE 200 bar (3000 psi) P 30 - B 200 profile	YELLOW 250 bar (3600 psi) P 36 - B 250 profile
UN 9/16 - 18 JIC 37°	UN 7/16 - 20 JIC 37°	N 012 100 02	N 012 101 02
UN 3/4 - 16 JIC 37°	UN 7/16 - 20 JIC 37°	N 012 102 02	N 012 103 02

All dimensions in mm

NGV 1 TYPE 2-3 NOZZLES



NGV 1

CMV 08/2

Blue (200 bar - 3000 psi)
Yellow (250 bar - 3600 psi)

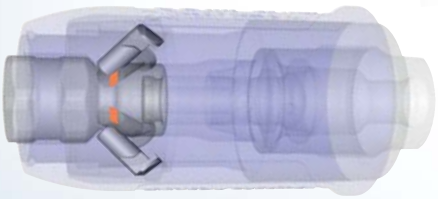
PED
ATEX

APPLICATIONS

- Designed for time fill and fast fill, public and private station.
- Specially recommended for fleet applications (refuelling of heavy or light duty vehicles).
- High flow capability.

- **TÜV certified for :**
  - **PED 97/23/CE - CE 0036**
  - **ISO 14469-1**
  - **ISO 14469-3**
- **Designed to be incorporated in environments according to ATEX 94/9/CE**

Pat. pending



Revolutionary locking mechanism using independent fingers

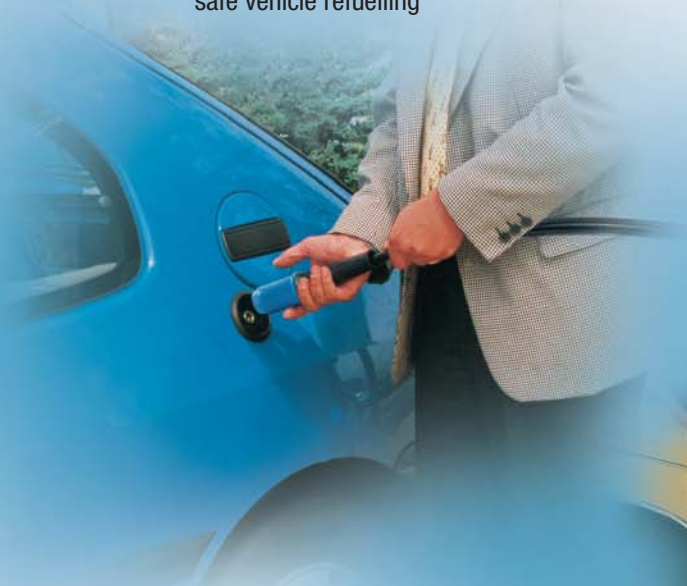
- no receptacle deformation due to the large surface area of contact between each finger and the receptacle
- locking safety: audible "click" indicates that the nozzle is properly connected allowing safe vehicle refuelling

Automatic, one-hand operation
Push to connect
Pull to disconnect
Reduced connecting efforts

Safety
Shut-off valve prevents flow of gas when nozzle is disconnected

Increased life system

- reduction of the number of seals: no seal in the gas flow path
- balanced locking efforts: no radial stress, no internal deformation, reduced wear of the locking elements,
- double alignment guiding system



CMV 08/2

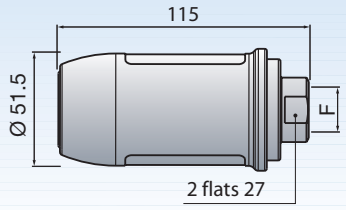
TECHNICAL DATA

- Internal diameter: 7.8 mm (5/16”)
- Flow area: 47.8 mm² (0.074 sq. in.)
- Material: aluminium, stainless steel and brass
- Cv = 1.15
- Pressure range: according to the NGV 1 and ISO 14469-1: 200 bar (3000 psi)
  ISO 14469-3: 250 bar (3600 psi)
- Flow rate: see page 15
- Service temperatures: - 40 °C to 85 °C (- 40 °F to 185 °F)
- Weight : 585 g

Important:
The gas must be dry and clean.

PART-NUMBERS

Available from stock in 2 different service pressures

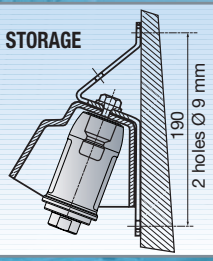
	THREADS	PART-NUMBERS	
		BLUE 200 bar (3000 psi) P 30 - B 200 profile	YELLOW 250 bar (3600 psi) P 36 - B 250 profile
	G 1/4 female thread	**N 011 797 07**	**N 005 869 08**
	UN 9/16 - 18 female thread	**N 011 759 07**	**N 005 868 08**

For instructions of installation and use, see instruction sheet RV1130100

STORAGE TO PROTECT THE NOZZLE FROM WATER AND DIRT

When not in use, each nozzle must be protected from water and dirt. It is why we propose the nozzle storage rack.

Contact us for other options.

NOZZLE STORAGE RACK*	PART-NUMBERS	
	BLUE 200 bar (3000 psi)	YELLOW 250 bar (3600 psi)
	**CMV 08. 9000/30**	

* Use CMV 08 storage rack only with CMV 08/2 nozzle

All dimensions in mm

STAINLESS STEEL NGV 1 PROFILE RECEPTACLES

ECE R 110

GMV 09

High flow - heavy duty

FOR REFUELLING OF HEAVY DUTY VEHICLES

APPLICATIONS

Receptacle designed to last for the lifetime of the vehicle

QUIET

The internal technology of the plug reduces the intensity of vibrations caused by fluid passage during refuelling.

QUICK

EFFICIENT

Minimal pressure for valve opening.

LONG LIFE EXPECTANCY

Due to its high quality construction, the material used and the machining accuracy.

ECE R 110

GMV 08 / C

Time flow - light duty

FOR REFUELLING OF LIGHT AND HEAVY DUTY VEHICLES

The STÄUBLI receptacles are leak-free at low and high pressure, whatever the temperature.

The receptacles are tested individually in connected and disconnected position.

Check valve prevents flow of gas when nozzle is disconnected.

Excellent flow rates make STÄUBLI standard size receptacles the best choice for **any** type of vehicle.

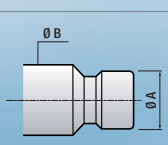
All STÄUBLI receptacles can be used with any STÄUBLI nozzle or with any nozzle complying with the NGV 1 and ISO 14469-1 or ISO 14469-3 requirements.

Stainless steel construction gives strength and durability.

Cycle tested to withstand more than 20,000 connections.

KEYING SYSTEM

Ensures that a 250 bar pressure nozzle cannot connect onto a 200 bar pressure receptacle but allows a 200 bar pressure nozzle to connect onto a 250 bar pressure receptacle.



PRESSURE	A (mm)	B (mm)
200 bar (3000 psi)	20.5	25
250 bar (3600 psi)	20.5	24

STORAGE REQUIREMENT

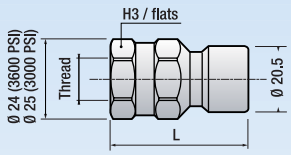
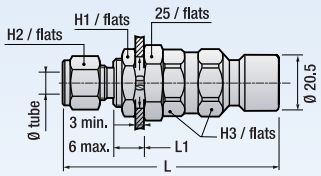
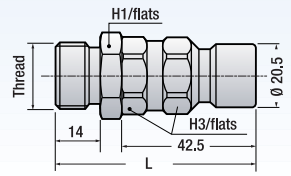
Use a dust cap to keep dust and water from entering the fuel system.

TECHNICAL DATA FOR GMV 08/C

- Internal diameter: 6 mm (1/4”)
- Material: stainless steel.
- Service temperatures:
  - 40 °C to 120 °C
  (- 40 °F to 250 °F).
- Pressure range:
  according to the NGV 1,
  ISO 14469-1 and
  ECE R 110: 200 bar (3000 psi)
  ISO 14469-3: 250 bar (3600 psi).
- Flow area:
  28 mm² (0.043 sq. in.)
- Flow rate: see page 15.

Important:
The gas must be dry and clean.

PART-NUMBERS GMV 08/C RECOMMENDED FOR LIGHT AND HEAVY DUTY

Every receptacle is delivered with dust cap	THREAD OR Ø TUBE	DIMENSIONS (mm)						PART-NUMBERS		
								BLUE 200 bar (3000 psi) P 30 - B 200 profile		YELLOW 250 bar (3600 psi) P 36 - B 250 profile
		L	L1	ØD	H1	H2	H3	CSA / NGV 1	ECE R 110	CSA
Receptacle female thread 	UN 9/16 - 18	42.5					23 (200 bar) 22 (250 bar)	N 003 100 02	N 011 400 96	N 011 401 96
Bulkhead mounted receptacle for tubing 	Ø 1/4”	83	15	16.5	23.8	14	23 (200 bar)	N 003 101 02	N 011 402 96	N 011 403 96
	Ø 3/8”	83	15	16.5	23.8	19		N 003 102 02	N 011 404 96	N 011 405 96
	Ø 1/2”	87	15	22.3	27	22		N 003 103 02	N 011 406 96	N 011 407 96
	Ø 6 mm	78	11	18.3	22	14		N 003 104 02	N 011 408 96	N 011 409 96
	Ø 8 mm	79	11	18.3	22	17	22 (250 bar)	N 003 105 02	N 011 410 96	N 011 411 96
	Ø 10 mm	80	11	18.3	22	19		N 003 106 02	N 011 412 96	N 011 413 96
	Ø 12 mm	87	15	22.3	22	22		N 003 107 02	N 011 414 96	N 011 415 96
Receptacle male thread 	G 1/2	73.5			25		23 (200 bar) 22 (250 bar)	N 003 108 02	N 011 416 96	N 011 417 96

For instructions of installation and use, see instruction sheet RV1210100

All dimensions in mm

RECEPTACLES WITH 80 µm FILTER

Available. Contact us.

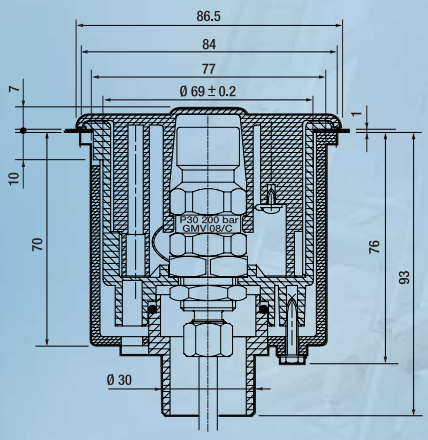
SPECIFIC ASSEMBLY

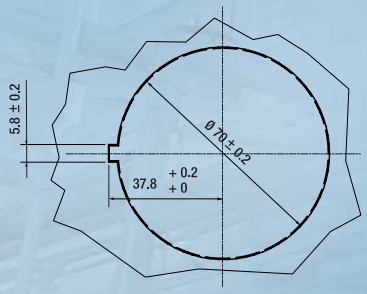
Available. Contact us.

MOUNTING POT

- Built-in housing to integrate GMV 08/C receptacle.
- Equipped to connect venting gas hose.
- Protective cap with stainless steel cord.

Part number: **S 004 365 03**





Drilling of the car body

GMV 09

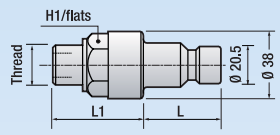
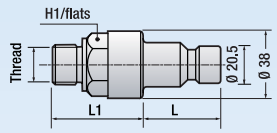
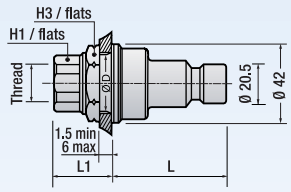
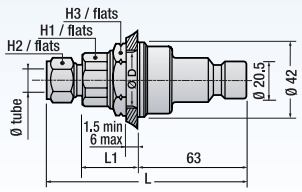
ECE R 110

TECHNICAL DATA FOR GMV/09

- Internal diameter: 9 mm (3/8”)
- Material: stainless steel.
- Service temperatures:
  - 40 °C to 85 °C
  (- 40 °F to 185 °F).
- Pressure range:
  according to the NGV 1,
  ISO 14469-1 and
  ECE R 110:
  200 bar (3000 psi)
  ISO 14469- 3:
  250 bar (3600 psi).
- Flow area:
  63 mm² (0.098 sq. in.)
- Flow rate: see page 15.

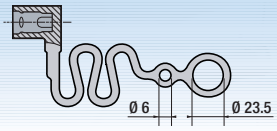
Important:
The gas must be dry and clean.

PART-NUMBERS GMV 09 RECOMMENDED FOR HEAVY DUTY

Every receptacle is delivered with dust cap	FITTING	DIMENSIONS (mm)						PART-NUMBERS	
								BLUE 200 bar (3000 psi) P 30 - B 200 profile	YELLOW 250 bar (3600 psi) P 36 - B 250 profile
		L	L1	ØD	H1	H2	H3	ECE R 110	
Receptacle female thread 	G 1/2	43	50		32			**N 002 592 02**	**N 004 153 01**
Receptacle male thread 	UN 7/8-14	43	50		32			**N 002 593 02**	**N 004 155 01**
Bulkhead mounted receptacle female thread 	G 1/2	63	30.5	33	29		35	**N 002 594 02**	**N 004 157 01**
Bulkhead mounted receptacle for tubing 	Ø 1/2”	114	30.5	33	29	22	35	**N 002 595 02**	**N 004 159 01**

For instructions of installation and use, see instruction sheet RV1220100

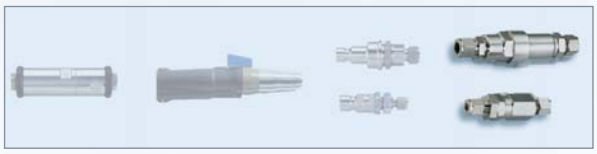
DUST CAP FOR GMV 08/C AND GMV 09

	PART-NUMBERS
	**GMV 08.8550/30**

Other dust caps available on request: contact us.

All dimensions in mm

CHECK VALVE



GMV 09

ECE R 110

GMV 08 / C

ECE R 110

STÄUBLI check valves are designed specifically for high-flow NGV applications.

STÄUBLI NGV system components are designed to work together, assuring system integrity.
We recommend to use on the same fuel line both STÄUBLI receptacle and check valve.

APPLICATIONS

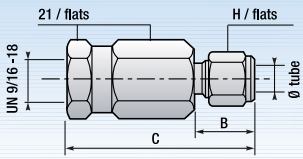
- Designed to allow flow of gas in one direction only.
- Provides redundant leak protection in the fuelling line.
- Prevents station blow-back.
- Offers additional protection in a vehicle crash.

TECHNICAL DATA

Important: the gas must be dry and clean.

	GMV 08/C CHECK VALVE	GMV 09 CHECK VALVE
Material	stainless steel	stainless steel
Internal diameter	6 mm (1/4")	9 mm (3/8")
Flow area	28 mm^2 (0.043 sq. in.)	63 mm^2 (0.098 sq. in.)
Working pressure	260 bar (3 770 psi)	260 bar (3 770 psi)
Service temperatures	- 40 °C to 120 °C (- 40 °F to 250 °F)	- 40 °C to 85 °C (- 40 °F to 185 °F)

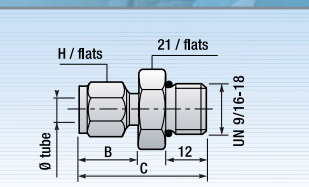
PART-NUMBERS GMV 08/C CHECK VALVES



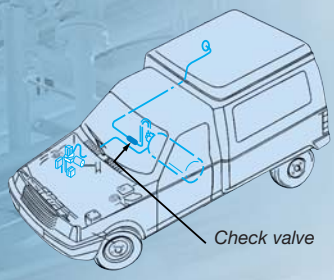
FITTING	DIMENSIONS (mm)			PART-NUMBERS
	B	C	H/FLATS	ECE R 110
Ø 6 mm	18	56.5	14	N 006 502 02
Ø 8 mm	18.5	57	17	N 006 503 02

For instructions of installation and use, see instruction sheet RV1230100

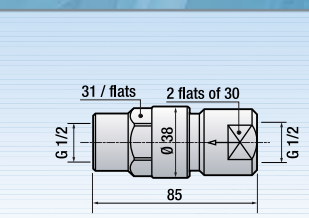
FITTINGS FOR GMV 08/C



FITTING	DIMENSIONS (mm)			PART-NUMBERS
	B	C	H/FLATS	
Ø 6 mm	18	38	14	N 009 330 98
Ø 8 mm	18.5	38.5	17	N 009 331 98



PART-NUMBERS GMV 09 CHECK VALVES



FITTING	PART-NUMBERS
	ECE R 110
G 1/2	N 004 160 01

For instructions of installation and use, see instruction sheet RV1240100

IN LINE BREAK - AWAY

- **Comply with the European directive PED 97/23/CE**
- **Designed to be incorporated in environments according to ATEX 94/9/CE**

BRW 02

APPLICATIONS

- 2 models designed for Vehicle Refuelling Appliances:
  - **BRW 02:** for time fill.
  - **BRW 08:** for fast and time fill.
- Positioned in the refuelling hose so that the hose will breakaway if the car drives away with the nozzle connected.

BRW 08

CE Marking

In-line mounting: the break-away must be installed between 2 hoses of 500 mm (20 inches) min. length on both sides (vehicle and dispenser).

Automatically disconnects regardless of whether the system is pressurized or depressurized.

Upon disconnection of the breakaway, flow from the compressor is stopped instantaneously by a valve ; the check valve on the vehicle closes automatically preventing flow from the tank.

Safety and long life: due to the closing of the valve before disconnection (no shocks at disconnection).

BRW 02

- **Easy reconnection**
  By simply pushing together the mating parts.
  Reconnection imperatively without pressure.

BRW 08

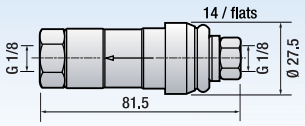
- **Easy reconnection**
  Simple and manual with a **specific reconnection tool**.
- Number of possible reconnections: 100.

TECHNICAL DATA FOR BRW 02

- Working pressure:
  200 bar (3 000 psi).
  Higher working pressure:
  consult us.
- Material:
  coated aluminium
  and stainless steel.
- Flow rate: see page 15.
- Service temperatures:
  - 40 °C to 85 °C
  (- 40 °F to 185 °F).

Important:
The gas must be dry and clean.

BRW 02 FOR TIME FILL ONLY

THREAD		PART-NUMBERS
G 1/8 **female thread**		**N 001 101 01**

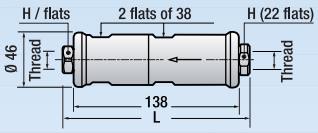
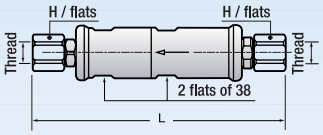
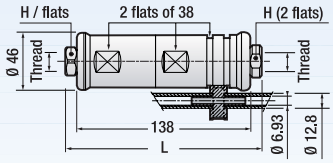
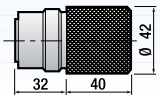
For instructions of installation and use, see instruction sheet RV1090100

TECHNICAL DATA FOR BRW 08

- Working pressure:
  300 bar (4 350 psi)
- Material:
  brass and stainless steel.
- Flow rate: see page 15.
- Service temperatures:
  - 40 °C to 85 °C
  (- 40 °F to 185 °F).

Important:
The gas must be dry and clean.

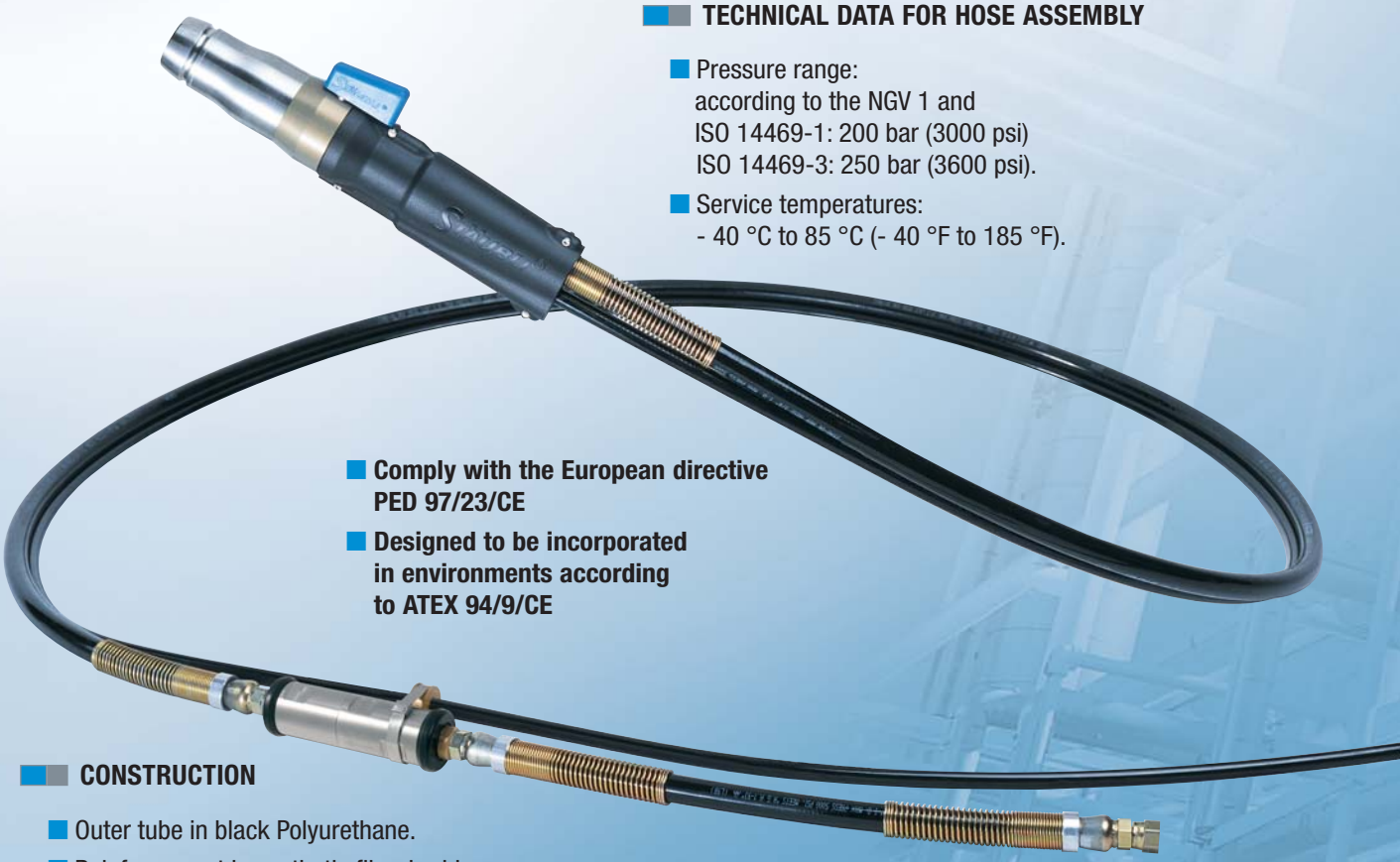
BRW 08 FOR TIME AND FAST FILL

THREAD		DIMENSIONS (mm)		PART-NUMBERS
		L	H	
UN 9/16-18 **female thread**		155	22	**BRW 08.9314**
G 3/8 **female thread**		201	24	**BRW 08.9102**
G 1/2 **female thread**		207	27	**BRW 08.9103**
UN 7/8-14 **female thread**		211	32	**BRW 08.9322**
UN 9/16-18 **female thread** **with vent connection**		155	22	**N 003 487 01**
Reconnection tool				**BRW 08.9100**

For instructions of installation and use, see instruction sheet RV1070100

All dimensions in mm

REFUELLING LINES READY TO USE



TECHNICAL DATA FOR HOSE ASSEMBLY

- Pressure range:
  according to the NGV 1 and
  ISO 14469-1: 200 bar (3000 psi)
  ISO 14469-3: 250 bar (3600 psi).
- Service temperatures:
  - 40 °C to 85 °C (- 40 °F to 185 °F).

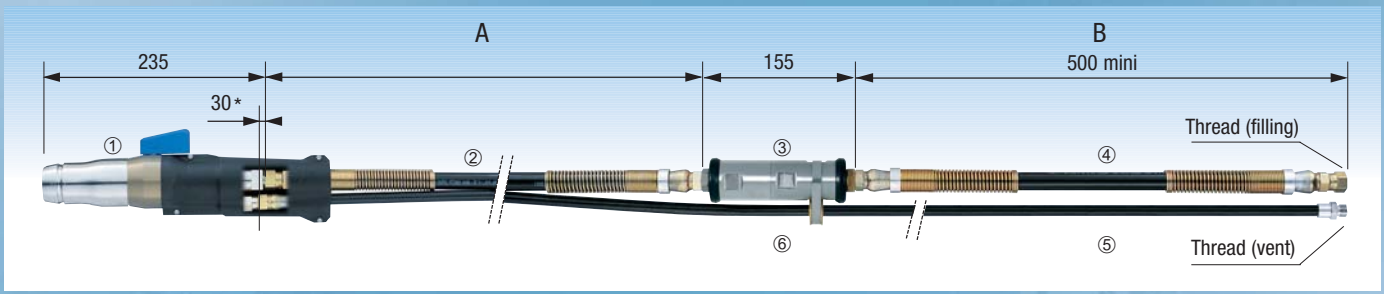
- **Comply with the European directive PED 97/23/CE**
- **Designed to be incorporated in environments according to ATEX 94/9/CE**

CONSTRUCTION

- Outer tube in black Polyurethane.
- Reinforcement in synthetic fibre braid.
- Electroconductive inner tube in Polyamide (PA).

Standard twin hoses fitting the filling and vent circuits.

Low volume expansion.



* The filling hose must be 30 mm shorter than the venting hose.

When asking for a quote, please specify the hoses A and B.

① Type 1 nozzle
② Twin hose assembly (fill and vent)
③ Filling line break-away
④ Filling hose
⑤ Venting hose
⑥ Venting line break-away

	LENGTH		PART-NUMBERS	
			200 bar (3000 psi) P 30 - B 200 profile	250 bar (3600 psi) P 36 - B 250 profile
Light duty assembly hose	4.89 m	3/8" hose	**N 007 213 00**	**N 007 214 00**
Heavy duty assembly hose	4.89 m	1/2" hose	**N 007 211 00**	**N 007 212 00**

AVERAGE FILLING FLOW OF THE NGV RANGE

METHOD OF MEASUREMENT (according to the proposed standard ISO 14 469)

- Test fluid: air.
- Filling at 200 bar of a 30 litres receiver tank: R_2
- Storage:
  300 litres at initial pressure of 240 bar: R_1
- Measurement of the filling time of the receiver tank R_2 from 0 to 200 bar.
- Measurement of the pressure in the receiver tank R_2 3 hours later (temperature balance).

- Calculation of the average flow according to the ISO/DIS 14 469 formula:

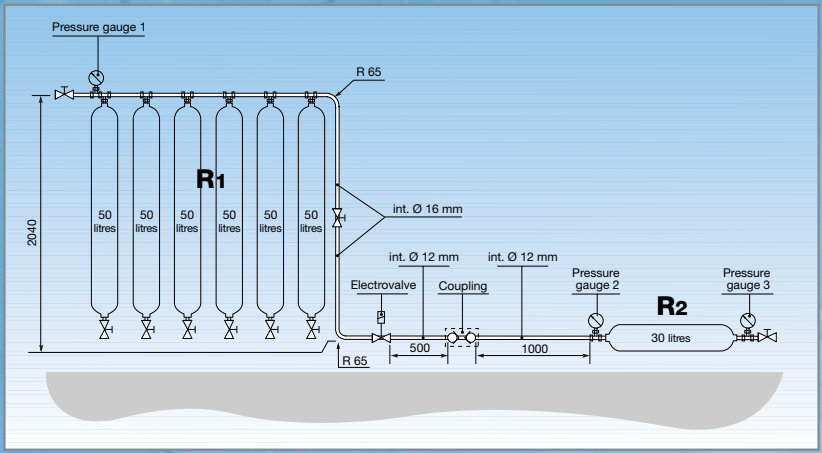
$$Q = \frac{30 \times P \times 60}{1.013 \times t}$$

with

Q = average flow in (Nl/mn)

P = final pressure of the receiver tank R_2 after 3 hours (bar).

t = filling time (s).



NOZZLE	RECEPTACLE	AVERAGE AIR FLOW
Nozzle GMV 09	Receptacle GMV 09	3320 Nm³/h 1950 scfm
Nozzle GMV 09	Receptacle GMV 08/C	2360 Nm³/h 1400 scfm
Nozzle CMV 08/2	Receptacle GMV 09	3230 Nm³/h 1900 scfm

Break-away BRW 08		2780 Nm³/h 1640 scfm
Break-away BRW 02		95 Nm³/h * 56 scfm

* Initial pressure in the tank R1: 230 bar (3335 psi)

The flow measurements are performed in laboratory with air.
The same test, performed with natural gas, would give equal or higher results.

RESULT

- Average air flow of filling from 0 to 200 bar (3000 psi) (air).
- Initial pressure in the tank R_1:
  240 bar (3480 psi).
- Initial pressure in the receiver tank R_2: 0 bar.
- Upstream to downstream volume ratio: 10.

We reserve the right to modify product specifications without prior notice.

Z 960.08 e A

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