



Smartflow Spill Prevention Couplings
Installation, Operation & Maintenance Manual
1 inch Couplings





GENERAL SAFETY GUIDLINES

!!! IMPORTANT !!!

READ THE COMPLETE MANUAL BEFORE USE AND RETAIN FOR FUTURE REFERENCE

- Do not make modifications or additions that are not authorised by the manufacturer
 - Only use genuine CEJN spare parts for maintenance

Document Revision Table:

Description	Date
First Issue	02/01/2021
REVA – ATEX Gas Ph IIa > IIb	20/10/22
REVB – Address added to label	10/05/23
REVC – Disassembly/Assembly instructions updated	20/03/24
REVD – Updated to CEJN	01/11/24

Installation Advice

Before installation commences it is essential to check that material and performance specifications are acceptable for the specific end user application. The pressure rating (PS) and other safe operating limits and primary materials of construction relating to each Smartflow product are clearly identified on the data label of each product, see Figure 1.

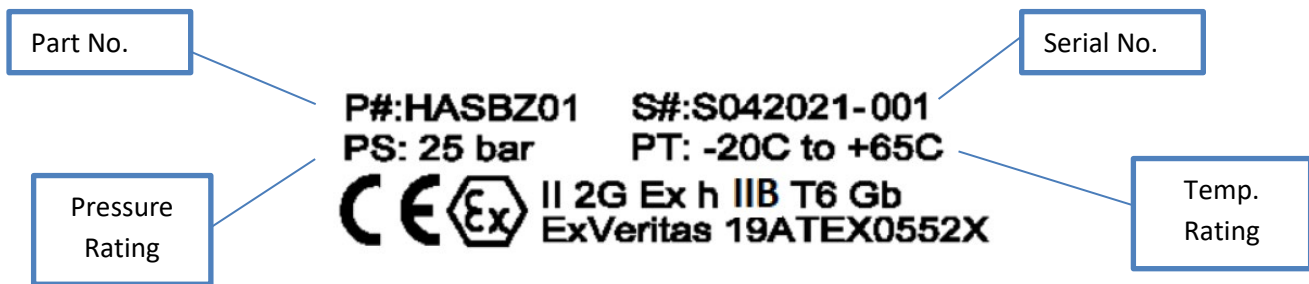


Figure 1

Before commencing any further activities, the **USER** is advised of the following:

- Temperature of couplings may exceed touch limits thus user is responsible for PPE requirements, e.g. gloves.
- Entrained solids can seriously affect coupling seal integrity and thus user is responsible for installing appropriate upstream filtering.
- User is responsible for installing coupling in an appropriately designed system with adequate over pressure, pressure limiting protection.
- The couplings are not design for fire engulfment; the user is responsible for taking appropriate measures.

Additional information relating to the materials of construction for each individual component is available upon request. The Technical Department at CEJN are always happy to provide guidance on material suitability for given processes and transfer media. Our data is a collective of our own application experiences and published chemical resistance information. If unsure regarding a particular application, ask.

Do not assume that the products supplied for a specific application are suitable for similar applications. The performance of the materials of construction can be affected by many variables. If you wish to use your Smartflow product for a different application than that originally specified check with the Technical Department at CEJN to ensure compatibility before installation.

Preliminary checks should be undertaken to ensure safe and satisfactory operation of the installed products, which fulfils the requirements of the applicable prevailing industry and associated local, national and international standards. Attention shall be paid to pressure ratings, operating temperatures, flow velocities, safety factors and position of upstream and downstream process closures.

Ensure maximum flow velocity does not exceed 5.25 m/s to reduce the static electrical build-up of process media transfer. If the velocity is greater than the stated above, the end user is responsible to ensure that correct and adequate grounding is achieved to eliminate static electrical build up from occurring. See API 2003 for further details on how to reduce static charge generation.



Installation

Particular care should be taken to ensure that the correct installation takes place ensuring safe and satisfactory operation. The installed product does not interfere with the correct operation of affiliated equipment in the process transfer line. (i.e. isolation valves, excess flow valves, safety devices, etc.)

Before securing the flange or threaded connections to mating equipment, it is essential that NO foreign objects, dirt, grit are present in the coupling interface.

All connections, flanged or threaded, should be made without imparting excessive strain to the equipment and leak tight pressure test shall be performed to at least 1.5 time the 'cold' working pressure of the lowest installed system component prior to use but not exceeding the maximum 'cold' working pressure of the installed product. All gaskets and sealing materials use to make the connection should be of suitable material and able to operate to at least the maximum pressure and the temperature parameters of the equipment.

Where the hose or loading arm assembly is the primary static dissipation or earth route, the electrical continuity shall be checked to ensure regulatory compliance.

Every Smartflow coupling is designed to take reasonable axial loads associated with good handling practice but is not designed to accept continuous excessive load values associated with maladjustment or poor installation. Excessive strain will increase component wear and possible premature failure if not installed and used corrected.

Loading Arm Balancing

Careful attention should be paid to the balancing of loading arms, the weight of the coupling plus transfer media should be taken into account at the specification stage. It is usual for loading arm balance settings to account for weight variations due to differences in the full and empty cycles. The loading arm should be set to balance in the condition present at the time of connection.

When Smartflow equipment is used with hoses; attention should be paid to hose lengths to ensure correct handling characteristics. The hose assembly should be designed that the minimum hose length is supported by the coupling or the operator.

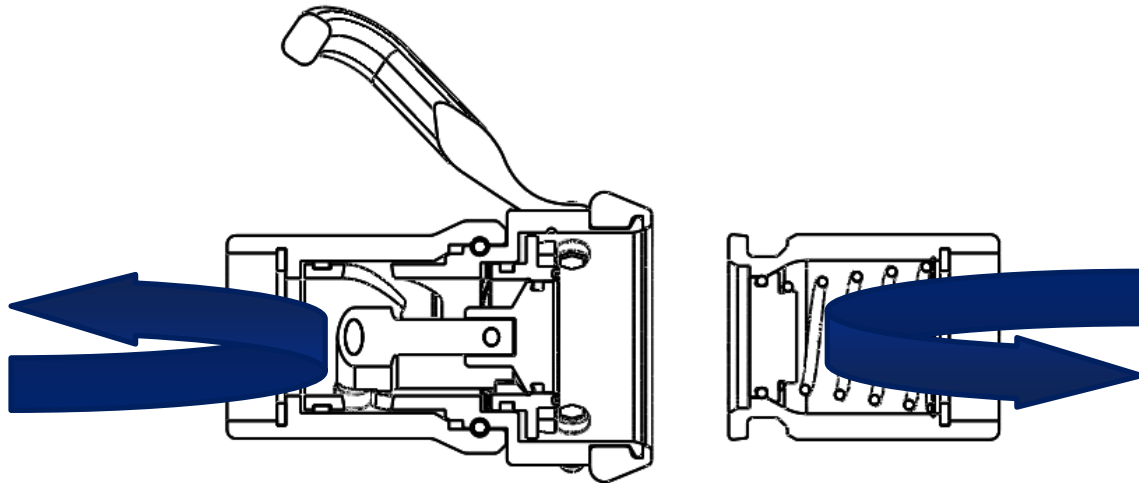
User Instructions

The Principle of Operation

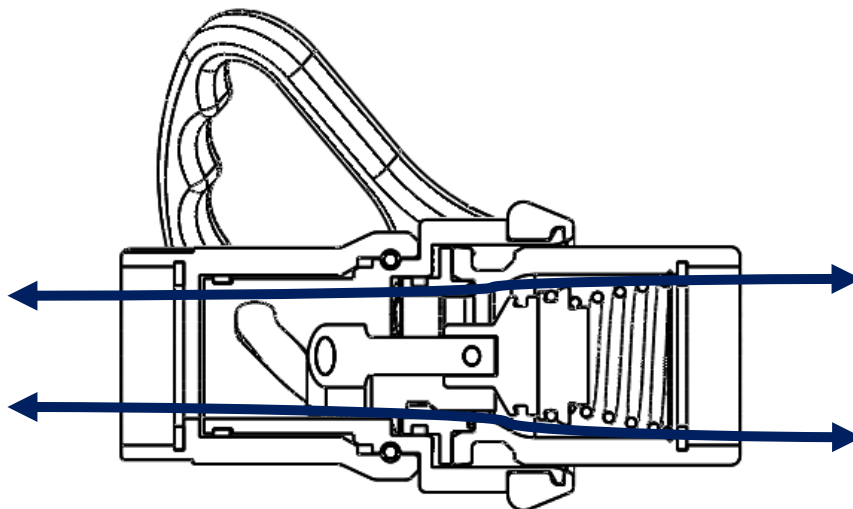
The function and design of all Smartflow Spill Prevention Couplings mean they all follow the same simple operating principle.

To connect, align the Hose unit over the Tank unit and push until the three rollers engage in the three slots and then rotate the Hose unit approximately 106° clockwise. This will allow the valves to open and medium to flow.

Disconnection is as simple as the connection process, rotate anti-clockwise and pull away from the Tank unit. See the figures below.



No connection, no flow



Connection, full flow



Making a connection & disconnection

It is recommended that the following steps are taken when making or breaking Smartflow coupling connections. These recommendations are given to reduce any potential harm to the equipment, operator and environment.

The Hose unit: ensure that all line isolations have been made and that no line pressure is present at the hose unit

The Tank unit: ensure that all line isolations upstream of the tank unit are fully open

Ensuring that the hose is correctly supported, lift the hose unit into the correct position to begin the connection process. It is important that the hose assembly is balanced correct as to reduce any excessive axial forces being applied to the coupling connection.

The larger coupling ranges come with handle that are suitable to aid with hose alignment.

Once the hose assembly has been correctly supported, the hose unit should slide easily over the tank unit. All three of the rollers engage in the three slots in any one of three positions at 120 degree centre.

Coupling connection is achieved by pushing the hose unit towards the tank unit and then rotating the hose unit until resistance is felt against the rotational movement. Do not apply excessive force as damage may occur to the unit, rendering it inoperable for future use.

The coupling assembly is now ready to receive fully process medium flow. Site operating procedures should be adhered to during this process.

To reduce the likelihood of pressure surges it is preferable that the 'destination' receptacle line isolations are the last isolations to be operated in the transfer sequence.

The disconnection procedure is the reverse of the connection procedure as outlined above.

Important Notes regarding the use of Smartflow products:

The hose assembly should be designed that the minimum hose length is supported by the coupling or operator.

Hose lengths should be of sufficient length to ensure they operate with the hose manufactures stipulated minimum bend radius.

Care should be taken to ensure that the fluid flow should not exceed 5.25 m/s. This will help reduce the static electrical charge build-up.

Service and Maintenance

The following service and maintenance activities should only be carried out by trained, competent persons and use genuine CEJN spare parts, failure to do so will invalidate any warranties.

The following tools and equipment will be required for the maintenance of Smartflow tank units see figure 2. Suitable spanners, Hexagon headed wrenches, O-ring removal picks, Loctite 270 thread lock, Penetrating oil spray, Suitable water retaining container.

Tank Units

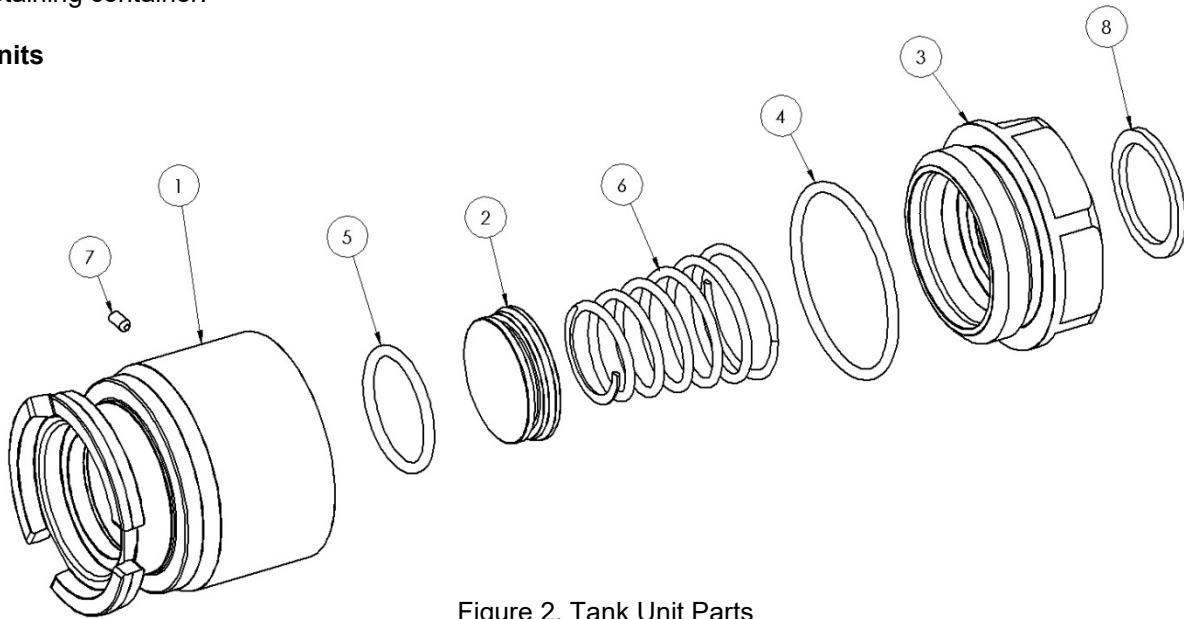


Figure 2. Tank Unit Parts

ITEM NO.	PART NUMBER	DESCRIPTION
1	MPTOB	Tank Outer Body
2	MPTPH	Tank Poppet Head
3	MPTAD	Tank Threaded Adapter
4	BPOS13275*	O-ring Seal
5	BPOS12175*	O-ring Seal
6	MPTCS	Tank Compression Spring
7	BPGS	Grub Screw
8	MPUGSUPB	Gasket Seal PTFE

Table 2. Tank Unit Part Descriptions

Items marked with “*” have variations in part numbers, please contact CEJN when ordering these spare parts.



Tank unit disassembly instructions

1. Carefully remove the gasket seal if the unit has parallel threaded interface connection.
2. Soak the tank unit in shallow water $>80<90^{\circ}\text{C}$ for 10-20mins before beginning the disassembly operations to weaken the Loctite 270 jointing compound. DO NOT apply direct heat to the interface between the tank main body and the threaded adaptor.
3. Remove the locking grub screw using hex headed wrench.
4. Secure the tank unit in a work holding apparatus by two of the six flats and unscrew the threaded adaptor from the main tank body.
5. Remove poppet, and the compression spring.
6. Remove O-rings using O-ring removal pick.
7. Inspect all items for any signs of damage or wear. Replace as necessary.

Tank unit assembly instructions

1. Ensure all parts are clean from grease and or other debris. Inspect thoroughly to ensure all parts are fit for service. If any parts are found to be damaged or worn, replace immediately.
2. Secure the threaded tank adaptor in a work holding apparatus by two of the flats.
3. Install the O-ring on the poppet head.
4. Install the spring into to the back of the poppet head.
5. Fit the spring/poppet sub assembly in to the threaded adapter.
6. Insert the second larger O-ring into the main tank body, taking care not to damage the O-ring on the threads.
7. Apply a small thin coating of Loctite 270 thread lock to the first two threads of the threaded adaptor.
8. Taking the tank main body carefully align all components and push down to compress the spring, at the same time screw the tank body on to the threaded adaptor.
9. Insert the grub screw in to the threaded hole and screw until tight.
10. Ensure the gasket seal is fitted correctly in the gasket seal groove.
11. Allow at least 24hrs for the thread lock compound to set before pressure testing to 1.5 time MWP of the unit.

Hose units

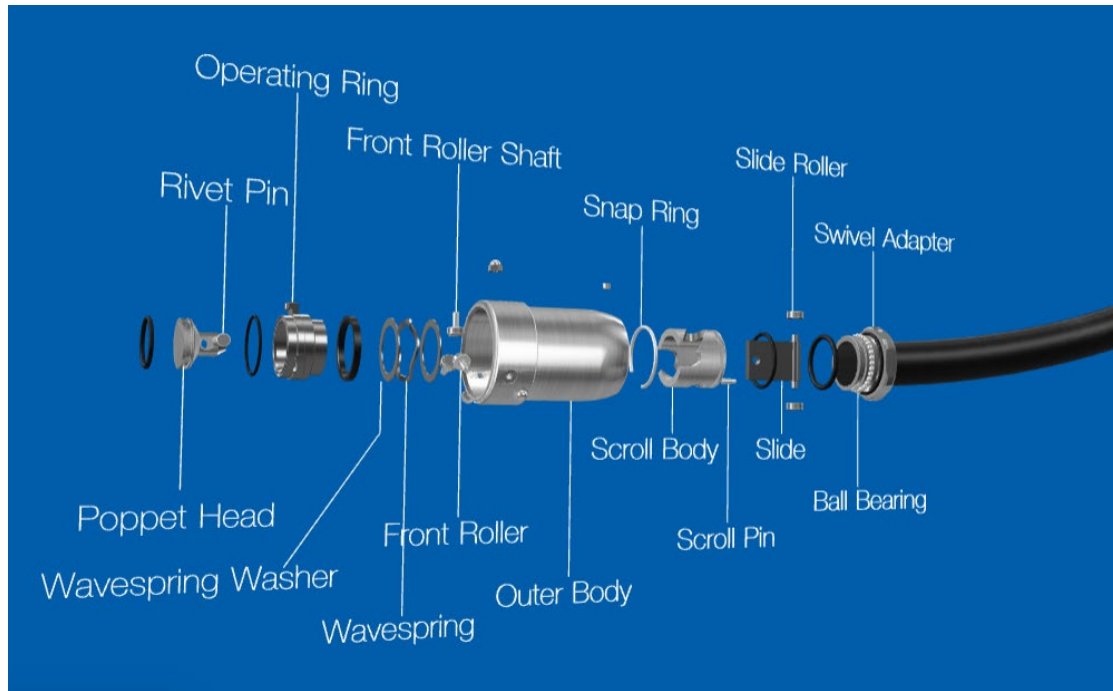


Figure 3. Hose Unit Parts

ITEM NO.	PART NUMBER	DESCRIPTION	ITEM NO.	PART NUMBER	DESCRIPTION
1	MPHSB	Hose Scroll Body	12	MPHWW	Wavespring Washer
2	MPHOR	Hose Operating Ring	13	MPHBR	Hose Bounce Ring
3	MPHOB	Hose Outer Body	14	MPHSR	Hose Slide Roller
4	MPHPH	Hose Poppet Head	15	MPHCB	Scroll Bearing Ring
5	MPHSL	Hose Slide	16	BPDM	Dome Nut
6	MPHRP	Hose Rivet Pin	17	BPSW	Spring Washer
7	MPHFS	Front Roller Shaft	18	BPBS	Button Head Screw
8	MPHFR	Hose Front Roller	19	BPSW	Spring Washer
9	MPHBH	Hose Handle	20	BPGS	Grub Screw
10	BPBB	Ball Bearing	21	MPUGS	Gasket Seal PTFE
11	MPHWS	Hose Wavespring	*	MPHOK	Hose O-ring Kit

Table 2. Hose Unit Part Descriptions

Items marked with “*” have variations in part numbers, please contact CEJN when ordering these spare parts.



Hose units

Hose unit disassembly

1. Carefully remove the gasket seal if the unit has parallel threaded interface connection.
2. Remove the ball plug and apply generously the penetrating oil spray directly into the ball groove. Using a suitable open container, carefully rotate the swivel adapter allowing the roller ball bearings to fall out of the ball plug hole. Reapplication of penetrating oil spray may be required during this process.
3. Once all ball bearing have been removed. Carefully remove swivel adapter from the main body.
4. Secure the open end of a 12mm claw spanner in to a bench vice.
5. Locating the rear end of the coupling over the claw spanner use this to turn the slide and rotate the operating ring until the lugs are clear of the front rollers, allowing the operating ring sub-assembly to be removed.
6. Using the O-ring removal tool, carefully remove all O-rings.
7. Inspect the wave springs, washers and all rollers. Replace if any signs of damage is noted.
8. Removal of the front rollers can be achieved by unfastening the retaining hex nuts and spring washers.
9. Inspect the operating ring and slide for signs of damage or excessive wear. Replace if required.

Hose unit assembly

1. Ensure parts are clean from grease and or other debris. Inspect thoroughly to ensure all parts are fit for returned service. If any parts are found to be damaged or worn, replace immediately.
2. Reinstall front rollers if removed.
3. Carefully replace all O-ring on to the operating ring sub assembly.
4. Loosely insert the slide rollers on to the back of he slide.
5. Carefully insert the operating ring sub assembly into the scroll body.
6. Using the 12mm claw spanner to turn the slide until the lugs of the op-ring are rotated under the front rollers correctly.
7. Replace the o-ring on the swivel adapter and carefully insert in to the rear of the main body.
8. Apply small amounts of recommended grease into the ball plug hole during insertion and rotation of the ball bearings.
9. Reinstall the ball plug once all ball bearings are reinstalled
10. If the unit has parallel threaded interface connection, reinstall the gasket seal carefully.

Pressure test

All Smartflow couplings are pressure tested to 1.5 time maximum working pressure (cold) prior to leaving the factory. After any maintenance work that has been carried out the units require the same pressure test criteria to be applied. The acceptance of the test must hold pressure without any variation in pressure using a closed loop system for a minimum set time of 5 minutes.

All pressure test equipment must be suitable for testing and have current certificates of calibration.

CEJN reserves the right to make changes at any time in models, specifications, materials and prices and hold the right to discontinue models without notice or further obligations.

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