

# INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS FOR THE SERIES



4000MEC & 4100MEC series



# Sommaire

1	Safety Instructions	P.4
2	Instructions for the Environment	P.8
3	Storage	P.9
4	Installation	P.9
5	Operation	P.9
6	Maintenance	P.10
7	Possible malfunctions	P.11

## 1 Security

The purpose of this chapter is to provide you with all the necessary information to ensure maximum safety during storage, handling and operation of **Duff-Norton Europe** check-valves.

Therefore, these operating instructions are an essential complement to the **Duff-Norton Europe** check-valve in your possession.

**Duff-Norton Europe** can not be held responsible for any damage, if all the recommendations defined in this operating instructions have not been followed.

**Duff-Norton Europe** informs the operator of the rotating fitting of its obligation to ensure that its staff received this notice.



Dangerous situation that could result in death or serious bodily injury.



This can damage the rotary connector or surrounding equipment.



Useful information

**Duff-Norton Europe's 4000MEC & 4100MEC** series check-valves in carbon steel with chemical nickel treatment are referenced with the suffix "K". For the rest of this manual, these rotary connectors will be called "K-Models".

**Duff-Norton Europe's 4000MEC & 4100MEC series** check-valves in 316L stainless steel are referenced with the suffix "I". For the rest of this manual, these rotary connectors will be referred to as "I models".

## 1.1 Operating Conditions for 4000MEC & 4100MEC Series check-valves

The tables below describe the most commonly used **Duff-Norton Europe 4000MEC & 4100MEC Series** check-valve applications. For any specific use other than the one described in the table below, please consult us in order to obtain our written agreement of use.

### Check-valves « K models » :

Model	Operating temperature	Fluids					
		Water	Air	Hydraulic oil	Steam	(Natural) Gas	Other fluids
4013KMEC - 4113KMEC	From -4°F to + 392°F	X	X	X	X	X	Consult us
4017KMEC - 4117KMEC	From -4°F to + 392°F	X	X	X	X	X	Consult us
4021KMEC - 4121KMEC	From -4°F to + 392°F	X	X	X	X	X	Consult us
4027KMEC - 4127KMEC	From -4°F to + 392°F	X	X	X	X	X	Consult us
4034KMEC - 4134KMEC	From -4°F to + 392°F	X	X	X	X	X	Consult us
4042KMEC - 4142KMEC	From -4°F to + 392°F	X	X	X	X	X	Consult us
4049KMEC - 4149KMEC	From -4°F to + 392°F	X	X	X	X	X	Consult us
4060KMEC - 4160KMEC	From -4°F to + 392°F	X	X	X	X	X	Consult us

### Check-valves « I models » :

Model	Operating temperature	Fluids					
		Water	Air	Hydraulic oil	Steam	(Natural) Gas	Other fluids
4013IMEC - 4113IMEC	From -4°F to + 392°F	X	X	X	X	X	Consult us
4017IMEC - 4117IMEC	From -4°F to + 392°F	X	X	X	X	X	Consult us
4021IMEC - 4121IMEC	From -4°F to + 392°F	X	X	X	X	X	Consult us
4027IMEC - 4127IMEC	From -4°F to + 392°F	X	X	X	X	X	Consult us
4034IMEC - 4134IMEC	From -4°F to + 392°F	X	X	X	X	X	Consult us
4042IMEC - 4142IMEC	From -4°F to + 392°F	X	X	X	X	X	Consult us
4049IMEC - 4149IMEC	From -4°F to + 392°F	X	X	X	X	X	Consult us
4060IMEC - 4160IMEC	From -4°F to + 392°F	X	X	X	X	X	Consult us



To convey oxygen, the rotary coupling must be made of 316L stainless steel and degreased, which means all components must be cleaned and free of grease before using the check-valve.

## 1.2 Applications prohibited with the use of the **4000MEC & 4100MEC series** check-valves **Duff-Norton Europe**.

This section informs you about misapplications known to date for the use of the **4000MEC & 4100MEC series** check-valve of **Duff-Norton Europe**.

### ➤ **FOODSTUFFS**

**Duff-Norton Europe 4000MEC & 4100MEC series** check-valves cannot be used on food equipment.

### ➤ **HIGH PRESSURE EQUIPEMENT**

**Duff-Norton Europe 4000MEC & 4100MEC Series** check-valves can be used on high pressure installations. The maximum permissible pressure for **4000MEC & 4100MEC series** is 700 bar. The table below shows the maximum permissible pressures for each model.

Model	Max. Permissible pressure ( bar)
4013KMEC - 4113KMEC	700
4017KMEC - 4117KMEC	700
4021KMEC - 4121KMEC	500
4027KMEC - 4127KMEC	500
4034KMEC - 4134KMEC	500
4042KMEC - 4142KMEC	300
4049KMEC - 4149KMEC	300
4060KMEC - 4160KMEC	300

Model	Max. Permissible pressure ( bar)
4013IMEC - 4113IMEC	300
4017IMEC - 4117IMEC	300
4021IMEC - 4121IMEC	200
4027IMEC - 4127IMEC	150
4034IMEC - 4134IMEC	150
4042IMEC - 4142IMEC	100
4049IMEC - 4149IMEC	100
4060IMEC - 4160IMEC	100

### ➤ **EQUIPMENT CONVEYING FLUIDS AT HIGH TEMPERATURE**

**Duff-Norton Europe Series 4000MEC & 4100MEC** check-valves cannot be used on high temperature fluids. The operating range is from -4 ° F to + 392 ° F.

### ➤ **ATEX EQUIPMENT**

**Duff-Norton Europe** check-valves do not have ATEX certification. As a result, **Duff-Norton Europe** cannot be held liable for the use of a **Duff-Norton Europe** check-valve in explosive atmospheres.

## 1.3 Safety instructions

### RISK OF BURNS



Depending on the application, more or less hot fluids can be conveyed. The steel design of **Duff-Norton Europe** check-valves does not prevent heat transfer. **Duff-Norton Europe** check-valves can therefore be more or less burning (depending on the temperature of the fluid being conveyed), leading to serious injuries. It is therefore important for the operator to ensure that proper protective gloves are used by his staff when handling the check-valve after operation.



**Duff-Norton Europe** recommends to the operator, in the case of medium- and high-temperature fluids transfer, to shield the check-valve as much as possible from contact with the surrounding personnel. In the same way; **Duff-Norton Europe** recommends placing a sign or poster on the risk of burning.

### FLEXIBLE HOSES OR PIPES



As with the rotary seal, the operator must ensure compatibility between the materials used for the flexible pipes and the fluid. An incompatibility between the hoses and the transferred fluid can cause porosity and / or bursting of the hoses. **Duff-Norton Europe** recommends that the operator verify at least the following parameters for hoses :

- Compatibility with the fluid,
- Compatibility with the fluid pressure,
- Current regulations.

**Duff-Norton Europe** shall not be held liable for damage and / or injury caused in the event that one or more hoses rupture or become porous.

### INCORRECT INSTALLATION OF THE CHECK-VALVE DUFF-NORTON EUROPE



If the installation of the **Duff-Norton Europe** check-valve has not been done properly, leakage may occur. Depending on the fluid being conveyed, these leaks can cause injury or damage to surrounding equipment. **Duff-Norton Europe** rotary coupling can also cause seizure of the Duff-Norton Europe rotary coupling, which can cause severe damage to the equipment, as well as the risk of severe injury (pulling out a hose).

## 2 Instructions for the preservation of the Environment



The primary function of a **Duff-Norton Europe** check-valve is to transfer fluid from a fixed part to a rotating part. Therefore, depending on the fluid being transferred, precautions must be taken to protect the environment in order to avoid pollution. Nevertheless, a check-valve has wear parts, such as the rotary seal, which if not replaced regularly can cause leakage and consequently potential pollution. This section provides information on the recommendations to be put in place in.

### 2.1 Transfer of liquids

In the case of liquid transfer, **Duff-Norton Europe** recommends that the operator provide a leakage receptacle positioned below the check-valve to collect all potential leaks.

**Duff-Norton Europe** also recommends that there be no fluid, pressure or residual pressure in the circuits where the check-valve is to be installed. This recommendation is also valid before any operation of uninstalling the check-valve of the machine.

If the check-valve of the machine is uninstalled, the check-valve may still contain fluid after disassembly. Operation will therefore ensure that the check-valve is completely drained and the residual fluid is properly collected before any transport and / or manipulation of the check-valve.

### 2.2 Gas Transfer

In the case of gas transfer, **Duff-Norton Europe** recommends that the operator provide a leakage receptacle positioned around the check-valve to collect all potential leaks. **Duff-Norton Europe** check-valve are equipped with drain holes. **Duff-Norton Europe** rope then recommends that the operator connect these drainage holes and collect any leaks.

**Duff-Norton Europe** also recommends that there be no gas, no discharge pressure or residual pressure in the circuits where the check-valve is to be installed. This recommendation is also valid before any operation of uninstalling the check-valve of the machine.

### 3 Storage of check-valves Duff-Norton Europe

All **Duff-Norton Europe** check-valves are supplied in individual, identified cardboard packages. **Duff-Norton Europe** recommends that its check-valves be stored in their original packaging in a dry place at a temperature between 68 and 86 ° F.

### 4 Installation of check-valves Duff-Norton Europe

In order to correctly install the **Duff-Norton Europe** check-valve, please follow the instructions below in chronological order :

➤ **Step 1**

Visually inspect all connections of the check-valve, as well as those of the equipment where the check-valve is installed.

➤ **Step 2**

Clean all sealing surfaces with a dry cloth.

➤ **Step 3**

Connect the flexible hose to the rotating union of **Duff-Norton Europe**.

➤ **Step 4**

Connect the hose to the **Duff-Norton Europe** check-valve.

➤ **Step 5**

Check that there is no stiffness, torsion or pinching on the hose after connection.

➤ **Step 6**

Pressurize the **Duff-Norton Europe** check-valve.

➤ **Step 7**

Check for leaks.

### 5 Operation of the check-valve Duff-Norton Europe

**Duff-Norton Europe 400MEC & 4100MEC series** check-valves are threaded. As a result, it is quite normal to observe an off-centering of the check-valve when it is rotated. Therefore, the hose must be sufficiently flexible to absorb this eccentricity and not to generate any axial or radial load on the **Duff-Norton Europe** check-valve.

## **6** Maintenance of the check-valve **Duff-Norton Europe**

### **6.1** Instructions for disassembling the check-valve **Duff-Norton Europe**



- Remove circlip mark 2.
- Remove the reference cup 3.
- Remove the spring mark 4.
- Remove the piston mark 5.
- Remove the O-ring mark 6.

### **6.2** Check-valve Maintenance Instructions **Duff-Norton Europe**

- Change the spring

### **6.3** Instructions for reassembling the check-valve **Duff-Norton Europe**

- For reassembly, clean all parts and visually inspect them.
- Put the O-ring mark 6 on the piston mark 5.
- Insert the piston mark 5 into the body mark 1.
- Insert the spring mark 4.
- Insert the reference cup 3.
- Insert the circlip mark 2.

## **7** Possible malfunctions of the check-valve **Duff-Norton Europe**

### **CHECK-VALVE NOT SEALED AFTER INSTALLATION**

- **POOR INSTALLATION**  
Switch off equipment. Make sure the various connections are tight. Make sure that all hoses are free of tension (pinching, twisting). Make sure all sealing surfaces are clean.
- **ROTATING SEAL DAMAGED**  
Pack the Duff Norton check-valve and return it to **Duff-Norton Europe**.
- **CHECK-VALVE DEFECTIVE**  
Pack the Duff Norton check-valve and return it to **Duff-Norton Europe**.

### **THE CHECK-VALVE HAS PREMATURE WEAR**

- **THE FLUID CONVEYED IS POLLUTED**  
Replace the fluid in the circuit, taking care to clean all components in the circuit, and then replace the check-valve.
- **THE APPLICATION IS NOT COMPATIBLE WITH THE CHECK-VALVE **Duff-Norton Europe****  
Contact Duff-Norton Europe to ensure the compatibility of the **Duff-Norton Europe** check-valve and the application.

### **THE CHECK-VALVE VIBRATES**

- **THE CHECK-VALVE IS INCORRECTLY CONNECTED TO THE EQUIPMENT**  
Tighten the connections of the check-valve.



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