INSTRUCTIONS 59131 e

Section	
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Original instructions

SLC 12/18 i HT pumps 100°C up to 200°C

Additional instructions for ATEX certified equipment

a DOVER company

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Your distributor :

ECCENTRIC PISTON PUMPS
MOUVEX PRINCIPLE
ADDITIONAL INSTRUCTIONS FOR ATEX CERTIFIED EQUIPMENT
MODELS : SLC 12/18 i HT 100 up to 200°C

The following instructions must be read at the same time as :

1. standard NF C 15 100,
2. standard NF EN 60 079-14 (electric installations in explosive gaseous atmospheres),
3. standard NF EN 60 079-17 (inspection and maintenance in dangerous locations),
4. rulings, orders, laws, directives, circulars for application, standards, professional practices and any other document related to its place of installation.

We disclaim any responsibility in the case of non-conformity with these documents.

This manual is an addition to our general manual.

For equipment other than the pump (probe, motor, etc.), the instructions in this manual are intended to help during assembly, but shall in no way replace the specific instruction manuals of equipment manufacturers. These specific instruction manuals must be read before assembling the equipment.

The equipment must be installed by qualified, skilled and authorised personnel.

Our equipment is labelled CE by virtue of directive ATEX 2014/34/EU.

It is designed for use in explosive atmospheres for the gas groups and zones below :

- Group IIB
- Category 2GD or 3GD
- Zone 1, 21, 2 or 22

Check the compatibility between the informations on the rating plate, the explosive atmosphere present, the area of use and the ambient and surface temperatures.

According to the directive 2014/34/EU, the accessories or (and) components assembled and equipping the motors of our pumps must have a standard CE declaration of inspection.

TABLE OF CONTENTS *Page*

1. CATEGORY 2 AND 3 CERTIFICATION FOR MOUVEX PUMPS AND UNITS

MOUVEX pumps and units carry category 2 certification (high level of protection). They are, therefore, obviously suited to category 3 uses (standard level of protection).

In the case of equipment with category 3 certification, the required level of protection does not take the expected malfunctions into account. Recommendations concerning the following points can then not be applied :

- controlling the product temperature (§ 4),
- running without product in the pump (§ 5), (CAUTION : These recommendations are still applicable when the pumped product generates its own explosive atmosphere).

All other recommendations remain applicable.

2. TABLE OF PUMP CHARACTERISTICS

SL series pump	**SLC 12 i HT 100 up to 200°C**	**SLC 18 i HT 100 up to 200°C**
Max. flow ($m^3.h^{-1}$)	12	18
Acceptable continuous max. speed (rpm)	530	530
Maximum suction pressure acceptable (bar)	1,5	1,5
Acceptable maximal differential pressure (bar)	9	6
Maximum temperature of cleaning product (°C)	200	200
Maximum temperature of product pumped (°C)	200	200

Minimum running temperature : See pump Instructions manual.

3. REPLACEMENT OF PARTS

All operations on MOUVEX ATEX equipment must be carried out by MOUVEX personnel or by personnel specifically authorised to carry out such operations.

Parts can only be replaced by MOUVEX parts corresponding to the original configuration of the pump. If this is not the case, the pump's characteristics will be modified and its ATEX certification will no longer be applicable.

Non-conformity with this rule will result in the loss of the MOUVEX ATEX certification.

4. CLASSIFICATION OF PUMP TEMPERATURES

Pumps are devices whose surface temperatures greatly depend on the pumped product / heating product / cleaning product.

Any overshooting of the maximum temperature of the product pumped and/or the heating product and/or the cleaning product is considered as abnormal operation of the pump that can lead to surface temperatures higher than the classification temperature T for which the pump is certified.

The user of the pump must ensure that the temperature of the product pumped and/or the temperature of the heating product and/or the cleaning product must never exceed the maximum temperature specified. This can be done, for example, by sufficiently controlling the installation to guarantee the temperature of the pumped product (e.g. : known tank temperature and no heating between tank and pump).

These controls can be automated by using a pump shutdown control device.

This device must conform to current regulations and especially with regulation related to electric equipment in explosive atmosphere. The choice of its characteristics (temperature resistance, category, etc.) must guarantee a level of protection at least equal to that of the pump.

Maximum temperature of product pumped, heating product and cleaning product	Temperature class (*)
100°C	130°C (T4)
105°C	135°C (T3)
110°C	140°C (T3)
115°C	145°C (T3)
120°C	150°C (T3)
125°C	155°C (T3)
130°C	160°C (T3)
135°C	165°C (T3)
140°C	170°C (T3)
145°C	175°C (T3)
150°C	180°C (T3)
155°C	185°C (T3)
160°C	190°C (T3)
165°C	195°C (T3)
170°C	205°C (T2)
175°C	210°C (T2)
180°C	215°C (T2)
185°C	220°C (T2)
190°C	225°C (T2)
195°C	230°C (T2)
200°C	235°C (T2)

NOTICE :
The maximum temperature of the pumped product is indicated on the pump marking plate as "MAX TEMP FLOW :".

4.1 Control of bearing temperature

The temperature of the bearing do not depend only of product pumped / heating product / cleaning product temperature, the pump must be equipped with a temperature limiting device controlling shutdown of the installation if the maximum values are exceeded.

Temperature class	235°C (T2)
Setting threshold of the temperature limiter device	230 ±5°C

* When using the pump at very high temperatures, the standard pump SL 12/18 I HT is not suitable, a special design depending of the maximum temperature of the pump product is required.

5. OPERATION WITHOUT ANY PUMPED PRODUCT

Pumps using the MOUVEX principle SL series can be run dry, without any pumped product in the pump, throughout the pump priming time without generating any additional ignition source (for example during the priming or emptying of pipes). However, this is allowed only on condition that the restrictions are complied with limitations specified in § 5.1, 5.2 and 5.3.

It is strictly forbidden to operate the pump without observing these recommendations.

The user must evaluate his installation and list all possible situations in which it functions without pumped product and take the necessary steps to ensure compliance with the operating limits.

The situations involving operation without pumped fluid can for example be the following :

- priming of the pump,
- draining the pipes,
- interruption of pump feed (tank empty),
- suction pipe blocked (valve, filter fouled, etc.),
- air block at suction,
- …

This can for example be checked by an operator ensuring that the applications dependent on the pump are working or that the physical values dependent on the presence of product (flow, pressure, torque, etc.) correspond to those expected.

These control measures can be automated by using a pump shutdown control device.

This device must conform to current regulations and especially with regulation related to electric equipment in explosive atmosphere. The choice of its characteristics (temperature resistance, category, etc.) must guarantee a level of protection at least equal to that of the pump.

5.1 Operation on a product that does not generate its own explosive atmosphere or generate an explosive atmosphere with an ignition temperature that is higher than 200°C

- the temperature of the external surfaces of the pump at start-up is less than 40°C[a],
- the differential pressure when the pump works without the pumped product is less or equal than 3 bar[b],
- the operating time in the absence of pumped product must not exceed 6 min. This duration may be spread over several operating periods spaced at least 15 minutes apart. Any operation for longer than this period will entail detailed inspection of the equipment and possibly disassembly of it to ensure that the previous operation did not lead to any additional ignition risks (particular attention will be paid to the fact that even though the external temperatures of the pump comply with the limits defined above, the inside surfaces can nonetheless be at high temperatures).

5.2 Operation on a product that generates its own explosible atmosphere and with an ignition temperature of less than 200°C

It is forbidden to operate without the pumped product.

5.3 Presumed pump failure

When the behaviour of the pump indicates that an equipment failure has occurred (drop in flow rate / pressure, abnormal noise, etc.), the pump must not operate without pumped product.

Consequently, the pipe must not be drained by the pump.

(a) Special arrangements have to be made for cases where the pumped product requires that the pump be reheated before it is started up. Please contact our Technical department for more information.

(b) Compliance with this limit can for example be guaranteed by checking the maximum possible differential pressure in the specific conditions of the installation (speed, product pumped).

6. PROTECTION AGAINST OVERPRESSURE

Any overshoot of the maximum allowable pressures is considered to be abnormal pump operation which can lead to surface temperatures in excess of the pump temperature classification, as well as risks to the user and/or the installation.

To avoid these risks, the user must equip the pump with a pressure limiter with a threshold chosen according to the lowest allowable maximum pressure for the circuit components (including head losses) and the acceptable maximal differential pressure for the pump.

6.1 Protection by pressure switch

Protection may be provided by installing a pressure switch that stops the equipment in the event of overpressure.

This device must conform to current regulations and especially with regulation related to electric equipment in explosive atmosphere. The choice of its characteristics (temperature resistance, category, etc.) must guarantee a level of protection at least equal to that of the pump.

6.2 External bypass

Over-pressure protection can be provided by installing an external bypass with return to the tank.

In this case, the user must ensure that the circuit complies with the recommendations of § CLOSED-CIRCUIT OPERATION.

We also recommend checking that heating on the bypass remains compatible with the temperature classification of the zone in which it is installed.

7. CLOSED-CIRCUIT OPERATION

Closed-circuit operation with small volumes of pumped product can lead to significant heating of the pumped product.

The user must check that the recirculation circuit is large enough to ensure that the pumped product temperature rise remains below the temperature limits defined in the § CLASSIFICATION OF PUMP TEMPERATURES.

This check can for example be carried out by installing a temperature sensor controlling shutdown of the equipment if the maximum allowable values are exceeded.

This equipment must conform to current regulations and especially with regulation related to electric equipment in explosive atmosphere. The choice of its characteristics (temperature resistance, category, etc.) must guarantee a level of protection at least equal to that of the pump.

8. CONTROLLING THE ROTATION SPEED

Any overshoot of the maximum allowable speed is considered to be abnormal pump operation which can lead to surface temperatures in excess of the pump temperature classification, as well as risks to the user and/or the installation.

At first start-up or after any modification to the pumping unit or its settings, the pump rotation speed must be checked and must remain below the maximum allowable speed mentioned in § TABLE OF PUMP CHARACTERISTICS.

9. SOLVENTS NOT COMPATIBLE WITH PUMP SEALS

The user must ensure that the seals equipping the pump are compatible with the product pumped and products used to clean the pump.

10. RISKS OF EXOTHERMIC REACTION

When the pump is operated successively on different products, the user must make the necessary arrangements to avoid heating through an exothermic reaction between the various products pumped.

11. PROTECTION AGAINST FOREIGN BODIES

The user will take the necessary steps to protect the installation against ingress of any foreign bodies that could damage the pump, for example by ensuring that neither the pumped product nor the piping contain foreign bodies liable to damage the pump, or by installing an appropriate suction filter.

If the pump is operated without pumped product, particular attention must be given to the risk of sparks and hot surfaces generated by friction between foreign bodies and the inner surfaces of the pump. This must be assessed prior to any use of the pump without pumped product.

12. POSSIBLE LEAKS OF THE PUMPED PRODUCT

Possible leaks of product via the pump seals do not lead to risks of fire provided that the explosive atmosphere surrounding the equipment corresponds exactly to the type of atmosphere for which it was selected.

Make sure to check that the products pumped do not generate an explosive atmosphere, for which the equipment has not been designed, when coming into contact with the atmosphere surrounding the pump or with material located near it.

SL Series pumps must be stopped if product leaks via the pump drive breather.

13. MAINTENANCE

Excessive wear of pump parts is considered to be abnormal pump operation which can lead to surface temperatures in excess of the pump temperature classification, as well as risks to the user and/or the installation.

The user must carry out the maintenance recommended by the manufacturer.

13.1 Lubrication

13.1.1 Checking the oil level

Before starting the pump for the first time, or after any operation on the pump drive, the oil level must be checked at ambient temperature (non-emulsified oil). A clean metal rod must be inserted into the oil-filling orifice until it comes into contact with the pump shaft and must show an oil level from 135 to 140 mm above the shaft.

Then the drive shaft seals must be inspected regularly after every 1,000 hours operation. In the case of loss of lubricant, the user must make the necessary repairs (refer to the relevant § of the pump's Instructions).

13.1.2 Oil change

The user must follow the oil change intervals recommended by the manufacturer and stated in the pump Instructions.

13.2 Friction parts

The user must check that the wear on the cylinder and the piston remains below the maximum allowable values defined in the Instructions supplied with the pump.

13.3 Transmission

The user must follow the preventive maintenance recommendations defined in the Instructions supplied with the pump.

14. PAINT

If the painting on the pumps is retouched, the user must make sure that the recommendations of standard NF EN 13463-1 are being complied with regard to non-conductive coatings on metal surfaces(total thickness of non-conductive coating not exceeding 2 mm for group IIA and IIB gas and vapours).

To do this, it may be necessary to sand the pump before doing any paint retouches.

15. DUST

To prevent any risk of dust igniting, the user must check that the layer of dust on the pump is no more than 5 mm thick.

16. PUMP DRIVE

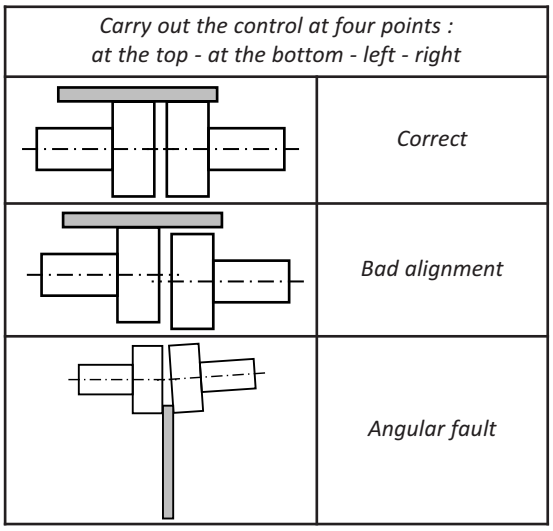
16.1 Alignment of the pump and drive

To carry out alignment of the pump and drive, use a perfectly straight steel rule to control misalignment and feeler gauges for angular misalignment.

It is important to control the alignment of each step of the installation in order to ensure that none of the steps lead to stresses on the unit or the pump :

- after fastening on the foundations,
- after fastening the piping,
- after the pump has operated at normal operating temperature.

The following three figures show the various faults that could be encountered. The allowable misalignment values are stated in the Instructions supplied with the coupling.



REMINDER :
A flexible coupling does not avoid to do a good alignment.

16.2 Elastic coupling

ATEX certified elastic couplings must be used. These couplings must have a level of protection equivalent or better than that of the pump unit. For instructions on maintenance of elastic couplings, refer to the instructions of the manufacturer's instructions supplied with the equipment.

16.3 Electric installation of the pump motor or gear motor

Check that the indications on the pump rating plate and the supply voltage match.

Comply with the instructions of the manual accompanying the pump to connect the motor to the mains supply.

Refer to the wiring diagram, use wiring adapted to the power and ensure that the contacts are tightened vigorously.

Motors must be protected by circuit breakers and fuses provided in the manufacturer’s Instructions.

Connect the regulatory earthing connections.

Start the pump up empty to check that the connections are correct and check that the direction of rotation corresponds well with the direction of suction and discharge of the installation.

16.4 ATEX characteristics of the pump motor or gear motor

The motor or gear motor used must conform to current regulations and especially with regulation related to electric equipment in explosive atmosphere.

The level of protection selected has to be equal to or greater than that of the pumping unit. For instructions on maintenance of motor and gear motor, refer to the instructions of the manufacturer's instructions supplied with the equipment.

17. EARTHING CONNECTION

To avoid the risk of ignition due to electrostatic discharge, the pump and the pumping unit must be grounded.

Particular attention should be given to earthing connection for the pumping units mobile or mounted on truck.

18. DIRECT SUNLIGHT EXPOSURE

A direct exposure of the pump / pumping unit to the radiance of the sun is likely to increase the temperature of their surface above ambient temperature.

As a result of fact, the User must take sure that the pump / pumping unit is not displayed in the direct radiance of the sun or the temperature of the external surfaces of the pump is compatible with its level of protection.

19. ATEX CHARACTERISTICS OF THE PUMPING UNIT

A pumping unit can be composed of components (motor, gear motor, sensors, etc.) whose ATEX characteristics are different to those of the pump.

In this case, the ATEX characteristics of the unit will correspond to those of the component with the lowest level of protection.

20. PUMP MARKING

The marking of the SLC 12/18 i HT pumps is as follows :

MOUVEX F89 AUXERRE
Ppe SLC 12/18 i HT ...
II 2 GD c b IIB T235°C - Max Temp Flow 200°C
or
II 3 GD c b IIB T235°C - Max Temp Flow 200°C
N° Serie
Year
59131A X

The marking of the SLC 12/18 i HT pump units is as follows :

MOUVEX F89 AUXERRE
Gpe SLC 12/18 i HT ...
II 2 GD c b IIB T235°C - Max Temp Flow 200°C
or
II 3 GD c b IIB T235°C - Max Temp Flow 200°C
N° Serie
Year
59131A X

In the case of a MOUVEX pumping unit :

- the pump marking is removed and replaced by the pumping unit marking. This marking takes into account all the components of the pumping unit at its delivery,
- all other ATEX-certified components in the pumping unit retain their marking.